American River Parkway

# NATURAL RESOURCES MANAGEMENT PLAN

SACRAMENTO COUNTY

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American River Parkway

# NATURAL RESOURCES MANAGEMENT PLAN

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# EXECUTIVE SUMMARY

## PURPOSE AND SCOPE OF THE NRMP

The American River Parkway Natural Resources Management Plan (NRMP) is intended to provide relevant and defensible information to the Sacramento County Department of Regional Parks (Regional Parks) for making informed decisions for managing, maintaining, and enhancing Parkway resources. In general, the NRMP provides an understanding of existing Parkway resources, the effects of disturbances such as flood, fire, invasive species, and human impacts, as well as opportunities for protections and enhancements. The NRMP advises resource management for promoting healthy ecosystems and resource protections, while balancing concurrent Parkway goals of flood control, recreational opportunities, and public safety.

The NRMP builds on years of previous data collection conducted for the Lower American River Corridor Management Plan (RCMP) (2002), American River Parkway Plan (Parkway Plan) (2008), American River Watershed Common Features General Reevaluation Report EIR/EIS (2015), and efforts by Sacramento County, the American River Parkway Foundation (ARPF), the United States Army Corps of Engineers (USACE), the Sacramento Area Flood Control Agency's (SAFCA) Lower American River Task Force (LARTF) Bank Protection Working Group, and other agencies and organizations.

The NRMP is a guidance document that informs only Regional Parks' management of the Parkway and includes no directives applicable to other agencies and organizations with jurisdiction, or that conduct activities, in the Parkway. However, because management of the Parkway is a highly collaborative effort that involves numerous entities, the NRMP incorporates recommendations that inform how Regional Parks should collaborate with outside agencies and organizations to achieve the goals and objectives of the NRMP.

## RELATIONSHIP TO THE PARKWAY PLAN

The Parkway Plan is the policy document for the American River Parkway that guides land use decisions affecting the Parkway. The Parkway Plan specifically addresses the Parkway's preservation, use, development, and administration. As described further in NRMP Chapter 2, Goals and Objectives, the Parkway Plan serves as the management plan for the portion of the Lower American River (LAR) designated as a Wild and Scenic River (WSR) by the Federal and State Wild and Scenic Rivers Acts (WSRA). The LAR from the Nimbus Dam to the confluence of the American River and Sacramento River is designated a "Recreation" river in the Federal and State WSR Systems. The Parkway Plan guides decision-making affecting the Parkway, which includes most of the area designated as WSR. The LAR from Hazel Avenue to Nimbus Dam is part of the Folsom Lake State Recreation Area and is managed by the California Department of Parks and Recreation (California State Parks).

The NRMP guides natural resources management of the same areas of the Parkway covered under the Parkway Plan; that is, the American River and adjacent floodplain from the river's confluence with the Sacramento River to Hazel Avenue. The Parkway Plan calls for the development of an integrated vegetation and wildlife management plan in Policy 3.5 and Implementation Measure 1.a. The NRMP serves as the plan that fulfills Policy 3.5 and Implementation Measure 1.a. The NRMP aligns with the goals and policies of the Parkway Plan.

## NRMP DEVELOPMENT PROCESS

In 2008, Regional Parks began a process to develop a NRMP for the Parkway. The original NRMP Stakeholder Committee worked with Regional Parks from 2008 to 2010. The Committee was charged with gathering and evaluating natural resource data in order to provide recommendations to both protect and improve the health of the Parkway's ecosystems and natural values. In 2014, Regional Parks reinitiated the NRMP effort with the goal of creating a document that would be aligned with the goals and policies of the 2008 Parkway Plan. A new Stakeholder Committee convened in the spring and summer of 2015 to develop a set of recommended draft Plan Specifications to establish guidelines and parameters for the NRMP.

In 2018, Regional Parks solicited proposals for the NRMP and secured a team of consultants. Work on the NRMP began in late 2018, starting with data collection and preparation of a GIS database. Two administrative draft NRMPs were prepared, the first in February 2020 and the second in January 2021.

Beginning in June 2020, Regional Parks entered into an agreement with ICF consulting and SAFCA to launch a NRMP Task Force. The NRMP Task Force consisted of a group of technical experts with jurisdiction in the Parkway or with experience working on natural resources projects in the Parkway. The Task Force was tasked with providing input on the draft NRMP content, including the goals and objectives, resource management categories, potential projects, and other key aspects of the NRMP. From June 2020 through February 2021, the Task Force met in a series of nine meetings in the lead up to the release of the NRMP public drafts, including a preliminary public draft in February 2021 and a public review draft in March 2021. The Task Force reconvened in October and November 2021 and February and May 2022 to assist in the finalization of the NRMP and development of the accompanying Monitoring Plan.

The final NRMP was completed in the summer of 2022. Concurrent with the preparation of the NRMP, Sacramento County prepared a Supplemental EIR (SEIR) for the NRMP, as required under the California Environmental Quality Act. An SEIR was prepared because the NRMP is a plan that falls within the scope of the Parkway Plan, for which an EIR was prepared in 2008.

Throughout development of the NRMP, Regional Parks and its consultants conducted community and stakeholder workshops to engage and receive input from the public on the draft NRMP material. In 2020 and 2021, Regional Parks hosted a total of 11 public workshops. The feedback received from the community and stakeholder workshops is summarized in Appendix A Public Outreach Summary Report.

# NRMP ORGANIZATION

The NRMP is intended to be a comprehensive, high-level document detailing the County's plan to conserve preserve, and rehabilitate Parkway natural resources; the regulatory requirements that guide and constrain Parkway management; the existing conditions of the Parkway, including biological resources, physical resources, cultural resources, recreational opportunities, and built infrastructure; activities that affect the health and integrity of Parkway resources; and recommended management actions and implementation measures to achieve the County's goals and objectives. The NRMP includes eight chapters that address these topics. The flow of the NRMP is such that the initial discussion of the NRMP background and goals and objectives first gives the reader an understanding of the scope and mission of the NRMP. Then, the NRMP documents the existing conditions, including resources infrastructure, and scientific understanding of Parkway dynamics, upon which the goals, objectives, and management actions are based. An overview of the impacts of human activities on Parkway resources follows. The first seven NRMP chapters contain the integral information that supports the recommended management actions and implementation and monitoring considerations contained within the final chapter. The eight chapters are as follows:

*Picnic tables and bench in the Upper Sunrise area. Photo Credit: MIG*

**CHAPTER 1. INTRODUCTION**

**CHAPTER 2. NRMP GOALS AND OBJECTIVES**

**CHAPTER 3. PARKWAY SETTING**

**CHAPTER 4. BIOLOGICAL RESOURCES**

**CHAPTER 5. PHYSICAL RESOURCES**

**CHAPTER 6. CULTURAL RESOURCES**

**CHAPTER 7. HUMAN USE IMPACT REDUCTION**

**CHAPTER 8. MANAGEMENT, MONITORING, AND IMPLEMENTATION**

The NRMP is accompanied by a set of appendices that detail the findings of the NRMP community engagement process, provide technical background and consideration on the hydrogeomorphology of the Parkway, provide important details on the special-status and invasive plant and wildlife species in the Parkway, and lay out the NRMP's resource monitoring plan, which provides Regional Parks with a tool to track and monitor the implementation of the NRMP's goals and objectives. The Monitoring Plan also includes suggestions for monitoring protocols and best practices.

# GOALS AND OBJECTIVES

The management recommendations of the NRMP are guided by a set of five overarching Goal Areas and accompanying goals and objectives. The five Goals Areas include:

- Goal Area 1. Biological Resources
- Goal Area 2. Physical Resources
- Goal Area 3. Cultural Resources
- Goal Area 4. Human Use Impact Reduction
- Goal Area 5. Agency and Community Coordination

The NRMP's Goal Areas encompass the three categories of natural resources that exist in the Parkway and address management of human impacts and the cross-agency and organization coordination required to manage Parkway natural resources. Each Goal Area includes a set of overarching goals and corresponding objectives that serve as the main implementation measures of the NRMP.

# MANAGEMENT RECOMMENDATIONS

The NRMP applies an adaptive management approach in which a flexible, iterative management process allows the County and its partners to make changes to the NRMP's goals, objectives, and actions after initial implementation of the NRMP. It is important that the County is allowed to make future changes to the NRMP content for several reasons: 1) to ensure the NRMP continues to be informed by the most recent scientific advancements in knowledge and technology and 2) to adjust goals, objectives, performance measures, and actions based on data and understandings gained through previous management and monitoring efforts. To facilitate adaptive management of the Parkway's natural resources, Regional Parks will revisit the NRMP annually to assess successes and challenges and will review the document at least every five years.

The NRMP's management recommendations are intended to be high-level. The NRMP does not make recommendations specific to every location in the Parkway. Rather, the NRMP lays out potential projects at the Area Plan level and provides details on site-specific resource management projects that are in-progress or conducted by a non-County agency.

## Resource Management Categories

Management recommendations contained within the NRMP fall under four resource management categories. The management categories correspond with the degree of intervention involved in managing the natural resources in an area. The management categories are intended to guide management decisions, including implementation of the NRMP objectives, in the Parkway. The management categories and examples of management actions that would fall under each management category are provided below.

- **CONSERVATION (LOWEST LEVEL OF MANAGEMENT INTENSITY):** Areas designated as conservation currently meet most applicable natural resource goals and those values will be conserved. This includes existing mitigation sites that require protection in perpetuity, as well as non-mitigation sites that meet desired conditions and provide high quality habitat. Considering the dynamic nature of all natural habitats, additional actions (e.g., restoration/enhancement) may be deemed suitable in Conservation areas in order to maximize suitable habitat values. Implementing restoration/enhancement actions within existing formal mitigation sites should be consistent with existing regulatory agreements/commitments. Federal mitigation sites, which have long-term commitments to protect habitat values, are mapped as a unique subset of the conservation category.
  - Examples of Management Actions: Includes routine O&M activities such as:
    - » Weed management (e.g., mowing and herbicide application)
    - » Small-scale invasive plant removal (e.g., hand-pulling)
    - » Vegetation management for fire prevention
    - » Management of illegal camping sites consistent with County policies
- **RESTORATION (MODERATE LEVEL OF MANAGEMENT INTENSITY):** Areas designated as restoration generally meet desired conditions in their current form but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved (e.g., habitat restoration/ enhancement) to meet goals. The need for ongoing restoration of degraded areas is expected.
  - Example Management Actions: May include the activities above under Conservation, plus:
    - » Invasive plant removal
    - » Planting native vegetation
    - » Management of social trails
    - » Redesign or relocation of facilities

- **NATURALIZATION (HIGHEST LEVEL OF MANAGEMENT INTENSITY):** Areas designated as naturalization were substantially altered in the past and should be modified in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP, NRMP, and W&SR policies. This applies to areas previously altered and outcomes are generally native habitat types that would typically be expected to occur in the Parkway. Naturalization also includes converting areas that have not been altered by past actions (unaltered) to heighten, intensify, or improve highly valued resource functions that may have been lost or degraded over time. Generally, this entails conversion of land cover type.
  - Example Management Actions: May include the activities described above under Restoration, plus these types of actions in previously altered areas:
    - » Substantial earthwork to restore or create more natural hydrology and site features
    - » Material removal (e.g., cobble and dredge tailings)
    - » Replacement/amendment/modification of substrate for planting
    - » Removal of material (e.g., channel bed and bank)
    - » Addition of material (e.g., gravel)
- **REHABILITATION:** Rehabilitation is applicable to any area, whether it be Conservation, Restoration, or Naturalization, could be degraded or damaged in the future and require action to improve their condition. Rehabilitation is suitable in any of the other categories and can happen anywhere in the Parkway, just as all areas in the Parkway are subject to degradation or damage.
  - Example Management Actions: Generally may include those activities necessary to bring the site back to conditions prior to recent damage, which may include:
    - » Temporarily limiting public access
    - » Debris removal
    - » Post-fire cleanup
    - » Minor surface grading to address damaged conditions
    - » Large-scale planting of appropriate native vegetation
    - » Large-scale invasive plant removal (e.g., with mechanized equipment)

Chapter 8, Management, Monitoring, and Implementation, gives additional detail on the four management categories, including example projects, and depicts areas feasible for resources management (i.e., areas that are not developed with recreational amenities, hardscape, or other features that would preclude management) within the Parkway as one of the four management categories.

Four key indicators were used to help develop the natural resource management categories and guide potential future management actions. These include level of alteration, inundation, vegetation communities, and land use. Chapter 8 of the NRMP contains maps showing these indicators throughout the Parkway.

There are several past and future projects within the Parkway that require mitigation for their impacts to various Parkway resources. Example projects include flood control/bank protection projects, transportation/bridge projects, and utilities such as electric transmission and sewer. The Parkway key indicators and the resource management categories provide a framework for identifying locations in the Parkway that are likely suitable for mitigation purposes. Chapter 8 of the NRMP contains maps showing the potential mitigation areas in the Parkway.

*Social trail in the Discovery Park Area. Photo Credit: MIG.*

# NRMP IMPLEMENTATION AND MONITORING PLAN

Included in Chapter 8 of the NRMP are criteria intended to assist Regional Parks in determining the acceptability of potential projects in the Parkway. The criteria are also intended for project proponents to self-evaluate their projects and document their process for inclusion in their submittal to Regional Parks.

The degree of evaluation required for a project varies depending on the applicable management category and level of prior landscape/channel alteration assigned to a given area. Regional Parks will consider this information in evaluating proposed projects. A determination will be made as to whether the project will:

- Contribute to meeting Parkway Plan and NRMP goals and objectives without unacceptable indirect or unintended adverse effects.
- Achieve specific goals and objectives stated in the Parkway Plan and NRMP.
- Resolve any potential indirect or unintended adverse effects.
- Be readily achieved and sustainable.
- Set reasonable expectations for success for the short-and long-term.
- Result in values substantially better than the values that would exist without the project, post construction, and three and five years later.

A high priority will be placed on projects that assist in the implementation of the NRMP. These potential projects are reflected either in the goals and objectives and/or the Area Plan maps. Chapter 8 of the NRMP contains additional detail on the recommended process of evaluation of potential projects.

## Potential Funding

Funding the potential projects described within and prompted by the NRMP is a key concern in NRMP implementation. There are numerous potential funding sources to implement various aspects of the NRMP. Primary among these sources is the County's General Fund. However, these sources are often limited and are subject to variability due to year-to-year differences in tax receipts. Other sources come from partner agencies that are active in the Parkway including the Wildlife Conservation Board (WCB), the flood management agencies including USACE and SAFCA, and the Water Forum. Furthermore, state grant opportunities, federal funding opportunities through the Natural Resources Conservation Service (NRCS), U.S. Fish and Wildlife Service (USFWS) Section 6 grants, and NGO funding opportunities may be available.

## Monitoring Plan

The NRMP Monitoring Plan is included as Appendix D of the NRMP. The Monitoring Plan was developed to ensure the successful implementation of the NRMP over time by providing a framework for documenting activities, monitoring the health of Parkway resources, determining if NRMP goals are being achieved, and identifying where adaptive management should be applied. The Monitoring Plan identifies what needs to be documented to understand 1) if management practices and projects are meeting the goals and objectives of the NRMP, and 2) how the Parkway's natural resources are changing. Regional Parks and a Technical Advisory Committee will take the further step of adapting the plan to new information and changing conditions. While the Monitoring Plan is a broad oversight tool, it includes metrics that are specific to tracking the NRMP goals and objectives. The Monitoring Plan lays out a framework for data reporting and data management, including a sample data management plan and a sample standardized monitoring form. It also establishes an adaptive management process for Regional Parks to assess the success of NRMP implementation over time through a comprehensive review of the NRMP every five years and adjustments to the NRMP goals and objectives if warranted.

# 1 INTRODUCTION


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CHAPTER 1

# INTRODUCTION AND OVERVIEW

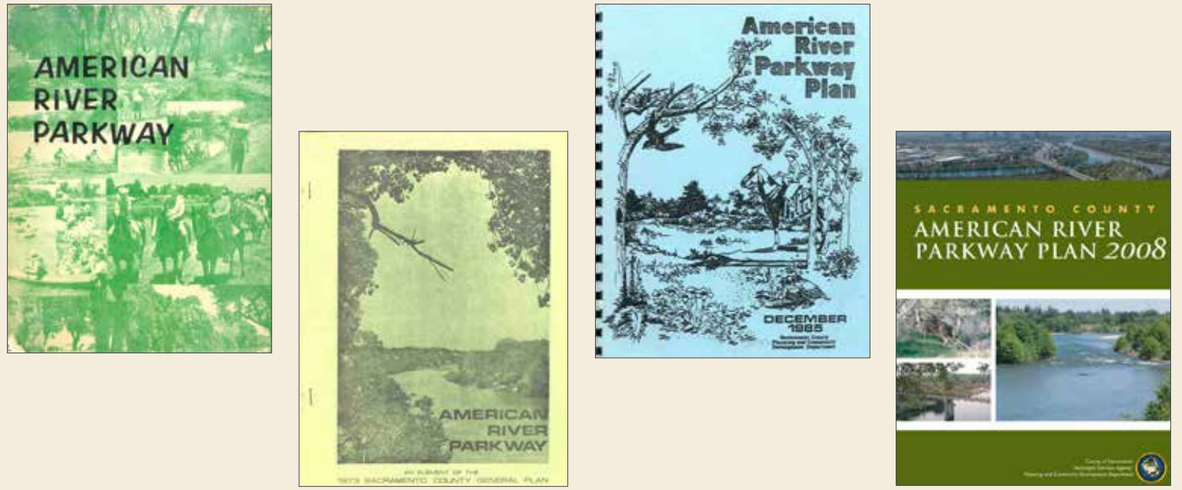
The American River is the lifeblood of the surrounding communities, sustaining residents with fresh air, clean water, access to nature, recreation, and a deep sense of place. The American River Parkway (Parkway) lands bordering the river are diverse civic spaces, spanning multiple jurisdictions and creating a sense of continuity and regional identity across the otherwise urban landscape.

The Parkway has been a focal gathering point over the centuries, and past generations have left behind rich layers of cultural artifacts that attest to human dependence on the river for nourishment, wealth, and respite from our increasingly urban lives.

The American River and its surrounding habitats are home to a diversity of plants and animals that rely on it to provide food, shelter, and movement corridors. Though many species are threatened due to habitat loss and fragmentation, the American River provides a sanctuary of uninterrupted habitat throughout an urbanized environment.

Maintaining these vital functions for both human and natural uses is of critical importance, and a holistic approach to resource planning and management must be applied. This approach honors the multifaceted nature of river systems and seeks to balance human needs and uses with the need to protect and enhance the extraordinary natural and cultural resources of the river and Parkway (see Figure 1-1). The Natural Resource Management Plan (NRMP) documents these resources, while creating a unified vision that seamlessly integrates recreational, cultural, and environmental protection within the Parkway.

**FIGURE 1-1 NATURAL RESOURCES MANAGEMENT PLAN**




*The 1968, 1973, 1985, and 2008 American River Parkway Plan. Photo Credit: Regional Parks*

The Parkway is an open space greenbelt extending approximately 29 miles and covers approximately 7,000 acres. The Sacramento County Department of Regional Parks (Regional Parks) manages lands on the lower 23 miles of the Parkway from the Hazel Avenue Bridge to the American River's confluence with the Sacramento River, approximately 5,000 acres. Several urban communities are located along the edges of the Parkway, including the City of Sacramento, the City of Rancho Cordova (on the south side), and portions of unincorporated Sacramento County, including the communities of Carmichael and Fair Oaks (on the north side).

The Parkway is surrounded primarily by urban development within Sacramento County. Undeveloped "bars" (elevated landforms near a river) contain larger areas of natural vegetation on both sides of the river in the upper half of the Parkway. These bars and designated parks (from upriver to downriver) include Sailor Bar, Sacramento Bar, Rossmoor Bar, Ancil Hoffman County Park, River Bend Park, and Arden Bar. Major vegetation types in the Parkway include grassland, oak woodland, willow riparian, cottonwood forests, ponds, marshes/seeps, introduced vegetation, and agricultural. Due to past mining activities along and in the river, there are also significant areas of barren land and mine tailings/rock piles.

The Parkway was conceptualized in 1915 when a City of Sacramento planner created a plan for a continuous park called the "American River Parkway" along the Lower American River (LAR). Sacramento County officially adopted a concept master plan for the Parkway in 1962, which was then incorporated into the County General Plan. The 1962 Parkway Plan was then revised and bolstered considerably in 1968 when the County added administrative policies to the document. It was subsequently updated in 1976, 1985, and most recently in 2008. The NRMP acknowledges the complex nature of the Parkway as it seeks to balance natural resource protection with maintenance of recreational opportunities and access, along with flood management activities (Figure 1-1).

# 1.1 PURPOSE OF THE PLAN

In 2008, Regional Parks began a process to develop a NRMP for the Parkway. The original NRMP Stakeholder Committee worked with Regional Parks from 2008 to 2010. The Committee was charged with gathering and evaluating natural resource data in order to provide recommendations to both protect and improve the health of the Parkway's ecosystems and natural values. In 2014, Regional Parks reinitiated the NRMP effort with the goal of creating a document that would be aligned with the goals and policies of the 2008 American River Parkway Plan (Parkway Plan). A new Stakeholder Committee convened in the spring and summer of 2015 to develop a set of recommended draft Plan Specifications to establish guidelines and parameters for the NRMP.

The NRMP is a guide for implementation of a multifaceted natural resource management program for the Parkway. It integrates ecological resource management and conservation with cultural resources protection, recreational use and impacts, and other human uses in the Parkway. The NRMP informs the management, conservation, and rehabilitation of Parkway land and natural resources, and helps to ensure compliance with environmental laws and regulations. Utilizing an adaptive management approach, the effectiveness of natural resource management efforts in the Parkway will be re-evaluated and the NRMP will be updated periodically.

The purpose of the NRMP is to establish resource management guidelines to minimize the impact of human uses on the Parkway and the environment. The NRMP includes goals and objectives designed to maintain natural communities located within the Parkway and identifies projects for implementation to accomplish goals and objectives. The NRMP takes an integrative approach to planning for ecological resources, cultural resources, and human use. However, it is important to note that the emphasis of the NRMP is to manage human uses in a manner that minimizes impacts to natural and cultural resources while maintaining recreational access.

*Gathering area at Soil Born Farms in the River Bend Park Area. Photo Credit: Wildlife Conservation Board*

# 1.2 PLANNING FRAMEWORK

The NRMP takes an integrative approach by considering the overlapping nature of ecological resources, human uses (e.g., utilities, electrical infrastructure, recreation), and cultural resources. A challenge associated with natural resource planning is determining an appropriate scale of analysis. The Parkway covers a relatively large area (23 miles under County jurisdiction covering over 5,000 acres), and is within and adjacent to multiple jurisdictions. As such, the natural and social systems within the Parkway vary substantially. The NRMP considers a Parkway-wide scale and is not intended to address every natural resource detail or issue that may occur at the site level. Taking a large-scale approach acknowledges that what happens in one area may impact what happens in an adjacent area. Planning recommendations are made within the 19 areas or area plans (described in detail in Chapter 3.0 Parkway Setting). The projects (or potential management actions) identified in this plan are programmatic in nature. Some projects, if implemented, will require a separate environmental review consistent with CEQA and/or NEPA, if applicable. Furthermore, planning at larger scales involves collaborating and cooperating with other agencies that have overlapping authority or jurisdiction (Haas 2001).

Planning at a broader scale acknowledges that some ecological processes require larger areas. Begon et al. (2006) note that the overall goal of conservation is to separate the species of interest in a region from the processes that threaten it (e.g., invasive species). Also, larger protected areas are more likely to have greater species diversity compared to that of a smaller area. Currently, the Parkway provides a rare linear connection between the Sierra Nevada foothills and the Sacramento River through an area that has rapidly urbanized over the past decades. Overall, the Sacramento Valley region has been converted from grasslands and wetlands to agricultural and urbanized land uses. Therefore, the Parkway provides habitat protection in a critical riparian area surrounded by areas altered by development.

This planning approach seeks to maintain the diversity of recreational opportunities while limiting the impact of these activities on ecological and cultural resources. The Parkway provides a wide array of recreational opportunities in highly developed areas, such as Discovery Park, but also has areas where natural features predominate and recreation use is less prevalent. The Plan assumes that maintaining diverse ecosystems is consistent with providing quality recreational experiences.

Another key aspect of the NRMP is the integration of key resource categories found within the Parkway, including: (1) biological resources, (2) physical resources, (3) cultural resources, and (4) human uses. Overall, the NRMP seeks a sustainable solution to manage these, at times, conflicting resource needs. This Plan acknowledges that recreational use is a major component of the Parkway and seeks to develop approaches to reduce recreational impacts on natural resources rather than limit or eliminate recreational opportunities.

It is acknowledged that there are many issues facing the Parkway but this Plan focuses on issues that: (1) impact natural resources in the Parkway; and (2) can be addressed by Regional Parks. Therefore, some key issues, such as climate change or upstream water releases from dams, are considered and discussed, but are outside of the scope of what Regional Parks can change through management. Overall, policies and management action recommendations will be provided Parkway-wide and at the Area level, where appropriate.

In addition to considering issues within the Parkway, the NRMP considers regional resources in the Greater Sacramento area. For example, the ecological resources discussion considers how the natural communities within the Parkway fit into the larger context of the Sacramento Valley and Sierra Nevada foothills. Also, regional recreational resources, managed by Regional Parks and other agencies, are considered when discussing the recreational resources available in the Parkway. Pastor et al. (2009) argue that regional approaches are appropriate because issues or problems do not always fit within “neat” boundaries. As discussed previously, this supports the notion that these planning processes require cooperation and/or oversight with other agencies and organizations.

# 1.3 BACKGROUND

It is important to understand the physical and social context of the Parkway. In this section, key issues for managing natural resources in the Parkway are discussed, including climate change, population growth and urbanization, upstream water releases (from dams), salmonid habitat enhancement, homelessness, wildland fire, habitat protection, sensitive species, and vegetation enhancement. These topics are addressed throughout the NRMP.

## Climate Change

Climate change results when greenhouse gases accumulate in the atmosphere and trap the sun's energy, resulting in a warming effect (CACC 2019). Climate change has the potential to alter natural systems and increase the occurrence and severity of weather events, such as flooding and drought (National Aeronautics and Space Administration (NASA) 2019). Addressing the causes of climate change is outside Regional Parks' purview and this document. However, considering how climate change impacts the Parkway is important and consideration for potential mitigation strategies, such as increasing resiliency, is consistent with the Plan.

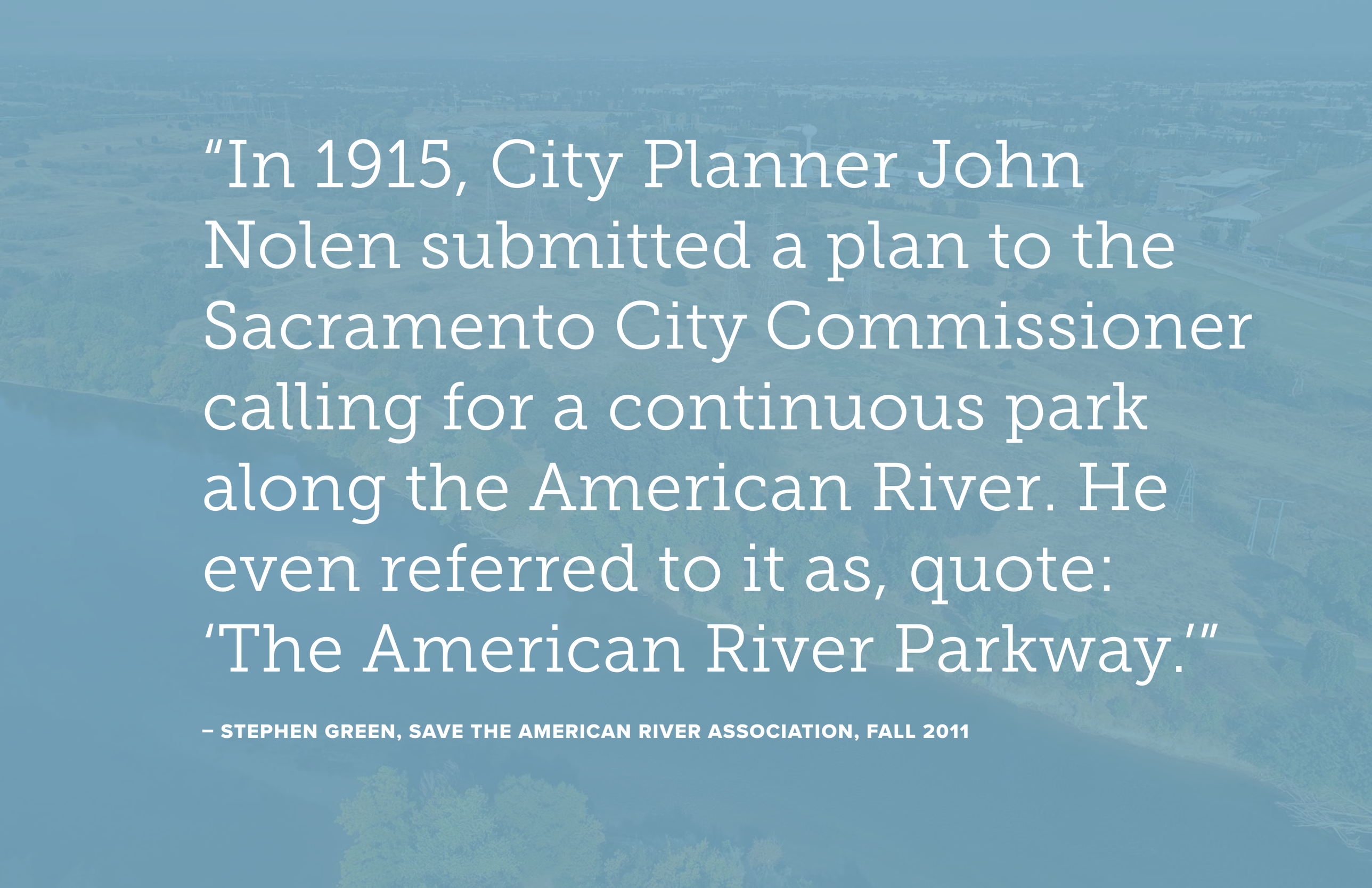
## Population Growth and Urbanization

Population growth has been significant in Sacramento County since the Parkway was established. According to the U.S. Census Bureau (Forstall 1996) and the California Department of Finance (2019), the population of Sacramento County increased by approximately 180 percent in the 50 years between 1960 and 2010. The rate of population growth in Sacramento County between the present year and the mid-twenty-first century is projected to slow compared to the growth of 1960 to 2010. Though the rate of population growth is expected to slow, the County would still see an approximate 40 percent increase in population from 2020 to 2060, adding about 700,000 people. Assessing future population growth is critical in determining the future of the Parkway. Continuing population growth will likely result in an increase in recreation use in the Parkway and increased strain on natural resources. Along with significant population growth, the Greater Sacramento area has experienced increased urbanization, which typically results in increased urban runoff due to a decrease in permeable surfaces. Urbanization may also result in habitat modification and/or destruction. While population growth and urbanization have impacted and may continue to impact the Parkway, Regional Parks must consider what these two trends mean for future use in the Parkway and potential associated impacts.

## Upstream Water Releases

Water levels and flows of the LAR are dictated by release operations at both the Folsom Dam and at the Nimbus Dam (Sacramento County 2008a). The Folsom Dam and Reservoir and Nimbus Dam and Lake Natoma Reservoir are part of the Central Valley Project (CVP), regulated and operated by the U.S. Bureau of Reclamation (USBR). The main function of the dams is to provide flood control protection, but the dams also store water for electrical power generation, domestic use, and irrigation uses (Sacramento County 2008a). Water releases from these dams are outside the purview of Regional Parks, but still impact the Parkway.

*Aerial view of the Paradise Beach and Cal Expo Areas.*
*Photo Credit: John Hannon*



"In 1915, City Planner John Nolen submitted a plan to the Sacramento City Commissioner calling for a continuous park along the American River. He even referred to it as, quote: 'The American River Parkway.'"

**– STEPHEN GREEN, SAVE THE AMERICAN RIVER ASSOCIATION, FALL 2011**

Water releases from these dams have the potential to directly impact flood control, fishery preservation, and recreational activities. Both dams release water prior to intense storm events in order to prevent flooding in the areas directly adjacent to the American River (Sacramento County 2008). Water releases may impact the river flows, water temperatures, and habitat enhancement features key to sustaining spawning fish species in the LAR (Welcomme, et al. 2006). Although USBR regulates and operates the dams, local associations collaborate with federal agencies to ensure the preservation of cultural, ecological, and recreational resources. USBR, and associated federal resource agencies, have agreed on flow management standards for the LAR, including water flows, water temperature, and establishment of a management group of water resource managers, biologists, monitors, and stakeholders (Sacramento County 2008a). Collaboration and communication with USBR and other water resource agencies, such as the Water Forum, will be essential to achieve recreational and ecological goals for the Parkway.

*Aerial view of the Nimbus Fish Hatchery and American River Trout Hatchery (photo foreground, right) in the Upper Sunrise Area and the Nimbus Dam (photo background). Photo Credit: John Hannon*

## Salmonid Habitat Enhancement

From the mid-nineteenth century through the late-twentieth century, mining activities and dam construction significantly altered natural resources in the Parkway. Gold mining in the nineteenth century resulted in dredge tailings throughout the Parkway. Mining deposited silt and aggregate materials into the river channel. As a result, terrestrial habitat areas were degraded and mining debris raised the riverbed, which reduced salmonid survival rates (Sacramento County 2008a). The construction of the Old Folsom Dam in 1893, and the modern Folsom Dam and Nimbus Dam as part of the CVP in 1955, further modified the river channel. The dams blocked the upstream migration of anadromous species, which removed access to the majority of salmonid spawning habitat and some areas of salmonid rearing habitat (Sacramento County 2008a). Construction of the dams involved moving aggregate from the LAR, which lowered the riverbed elevation that was previously raised by mining activities. In addition, the dams blocked the natural downstream transportation of sediments.

The Central Valley Project Improvement Act (CVPIA) was passed by Congress in 1992 as part of a group of 40 titles for water resources-related projects in the western United States (USBR 2019). The CVPIA mandates that the Department of the Interior implement a program for replenishing spawning gravel and restoring salmonid habitat in the LAR from the Nimbus Dam to the confluence of the American and Sacramento Rivers. Beginning in the late 1990s, multiple groups and agencies became involved in planning and conducting the Lower American River Anadromous Fish Habitat Restoration Project, which aims to fulfill the CVPIA mandate. The gravel bars that have formed as a result of the project can create an attraction for recreationists who may congregate on these bars. This can be an issue for Regional Park staff if illegal activities occur on bars accessible only by patrol boats.

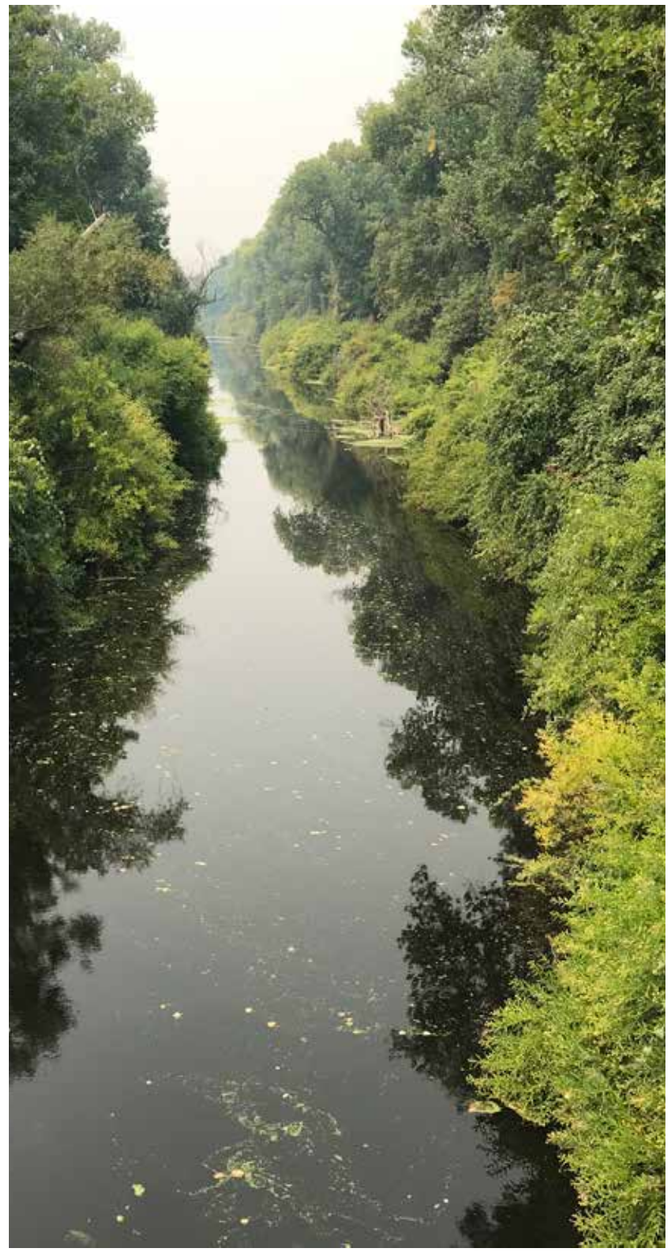
## Homelessness

Homelessness is a statewide issue that impacts the Sacramento area and often results in encampments in the Parkway. This is primarily due to the high cost of living in urban areas and the moderate winter temperatures that allow for long-term living outside. These encampments occur in the riparian forest and woodlands throughout the Parkway. It is particularly prevalent in the approximate 6-mile area of the Parkway from the Discovery Park to Cal Expo Areas. On January 30, 2019, California State University, Sacramento (CSUS) and the Institute for Social Research (Baiocchi et al. 2019) conducted a "Point in Time" (PIT) count of homelessness in Sacramento County. The assessment counted 5,570 homeless individuals, a 19 percent increase in the number of homeless individuals counted in the countywide CSUS 2017 PIT Count. The assessment also found that 70 percent of the homeless people in the 2019 Homeless Count were unsheltered (e.g., living outside, in a vehicle, or in a tent). While the 2019 PIT report did not discuss homelessness specific to the Parkway, the 2017 PIT report (Baiocci et al. 2017) provided the following conclusion: "Individuals who reported continuous homelessness tended to be substantially older and were often encountered in encampments near the American River Parkway, in contrast to younger homeless who were interviewed nearer downtown Sacramento" (p. 4).

The 2017 PIT report notes that chronically homeless individuals are more likely to be suffering from PTSD (post-traumatic stress disorder) and/or have a mental health condition. It is also noted that changing river flows impact where individuals can sleep. A Sacramento Bee article reports that in 2019 park rangers and maintenance staff had cleared 767 abandoned camps per month by April; the article cites an estimate of 500-700 people camping in the Parkway every night (Yoon-Hendricks 2019). It is outside of the scope of this document to solve the homeless issue in the region, but the NRMP will consider strategies to potentially decrease natural resource impacts associated with the issue. Impacts related to encampments include those caused by unregulated campfires, vegetation clearing, potential disturbances to wildlife, and water quality impacts. Regional Parks will need to continue collaboration with other agencies (such as the Sacramento County Department of Health and Human Services) and nonprofits with expertise in addressing this issue.

## Wildland Fire

As with much of California, wildland fire is a concern in the Parkway. A large portion of the outer boundary of the Parkway is wildland-urban interface (WUI) in which the probability of wildland fires is increased. Wildland fires are often directly caused by human activities (both accidental and intentional). Numerous wildland fires occur in the Parkway every year. Fuel loads, including dry, dead plant materials and highly flammable invasive species, are abundant throughout the Parkway. There is also the potential for wildland fires to occur because of campfires or barbecues placed in unregulated locations. Although wildland fire can be beneficial to natural resources as a restoration tool, it can also be damaging to other natural resources, as well as structures within and outside the Parkway. Regional Parks works to minimize potential impacts of wildland fire in the Parkway through collaborative fuel reduction projects.



*Bannon Slough in the Discovery Park Area. Photo Credit: Regional Parks*

## Habitat Protection, Sensitive Species, and Vegetation Enhancement

The Parkway supports a diverse range of habitats and ecosystems, including riverine, riparian, wetland, and oak woodland habitats. Each of these habitats provide unique opportunities for food, cover, and breeding for local and migrating plant and wildlife species. The LAR is home to sensitive, protected species including steelhead. Riparian habitat is extremely valuable in the Parkway because it provides connectivity to the river and maintains wildlife linkages (corridors by which wildlife travel) through the interface between regional natural and urban lands.

Over time, the Parkway has been altered by both natural and anthropogenic processes that have led to a decline in the amount of riparian habitat along the river. Excess debris and trash, wildland fires, habitat loss, bank erosion, water quality issues, and human encroachment all threaten the natural ecosystem of the Parkway. Additionally, invasive plant species occur in every habitat type that is present within the Parkway. The prevalence of invasive species can inhibit native plant establishment, provide poor habitat quality for wildlife, increase hydraulic roughness during high-flow events, increase bank erosion, and exacerbate fire potential.

There is ample opportunity for habitat improvement and continued maintenance within the Parkway. Improvement of sensitive riparian vegetation, specifically in areas no longer able to support natural regeneration, should be a top priority (Lower American River Task Force (LATRF) 2002). Recreational activities should be actively managed in highly sensitive areas to avoid further reduction and degradation of existing ecological resources. In addition, floodway and recreational management strategies occurring within the Parkway need to be compatible with long-term goals for natural resource sustainability.

The NRMP assumes that there are future projects that will be proposed in the Parkway that would result in impacts to natural resources. As such, the Parkway was divided into several categories to advise Regional Parks as to where future mitigation or restoration projects, for example, should occur. These maps may also be used for targeting areas for restoration and enhancement. The following describes the management categories (the maps are included by Area Plan in Chapter 8):

- *Conservation* (lowest level of management intensity): Areas designated as conservation currently meet most applicable natural resource goals and those values will be conserved. This includes existing mitigation sites that require protection in perpetuity, as well as non-mitigation sites that meet desired conditions and provide high quality habitat. Considering the dynamic nature of all natural habitats, additional actions (e.g., restoration/ enhancement) may be deemed suitable in Conservation areas in order to maximize suitable habitat values. Implementing restoration/enhancement actions within existing formal mitigation sites should be consistent with existing regulatory agreements/commitments. Federal mitigation sites, which have long-term commitments to protect habitat values, are mapped as a unique subset of the conservation category.
- *Restoration* (moderate level of management intensity): Areas designated as restoration generally meet desired conditions in their current form but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved (e.g., habitat restoration/ enhancement) to meet goals.

*View of ponds remnant of historical mining activities in the Sacramento Bar Area. Photo Credit: John Hannon*

The need for ongoing restoration of degraded areas is expected.

- *Naturalization* (highest level of management intensity): Areas designated as naturalization were substantially altered in the past and should be modified in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP, NRMP, and W&SR policies. This applies to areas previously altered and outcomes are generally native habitat types that would typically be expected to occur in the Parkway. Naturalization also includes converting areas that have not been altered by past actions (unaltered) to heighten, intensify, or improve highly valued resource functions that may have been lost or degraded over time. Generally, this entails conversion of land cover type.
- *Rehabilitation*: Rehabilitation is applicable to any area, whether it be Conservation, Restoration, or Naturalization, could be degraded or damaged in the future and require action to improve their condition. Rehabilitation is suitable in any of the other categories and can happen anywhere in the Parkway, just as all areas in the Parkway are subject to degradation or damage.

## Human Uses in the Parkway

Recreation is a key human use in the Parkway. The Parkway contains approximately 82 miles of single use and multi-use paved and unpaved trails (Regional Parks 2009). The Parkway has beaches and boating access areas that facilitate swimming and boating activities. Fishing is permitted throughout the year in most locations and occurs along the riverbanks from boats in the river channel and at fishing ponds. The Parkway's active recreational facilities include the Discovery Park archery range, the Campus Commons Golf Course, and the Ancil Hoffman Golf Course. These are recognized as incompatible uses under the Parkway Plan. Unstructured field sports are allowed on the turf fields located in Discovery Park, Ancil Hoffman County Park, and River Bend Park. Additional recreational activities include periodic special events and organized group activities, such as races, festivals, and concerts; these activities are permitted dependent upon issuance of County recreation permit(s). A common issue within recreation areas, including the Parkway, is improper disposal of solid waste (i.e., littering). Solid waste is an aesthetic impact, but it can also have an impact on ecological resources if it enters water or is consumed by wildlife. Solid waste disposal is particularly of concern along the river where boaters may dispose of their waste on shore or in the water due to the inability to access waste bins. Litter can accumulate on the bottom of streams or along the shore where it attracts aquatic and/or terrestrial species that may be harmed by ingestion.

Utility infrastructure exists in the Parkway, including electrical power transmission towers and lines, sewer and water supply pipelines, drainage mains and outfalls, roads, and bridges. Of note, some of these facilities have rights-of-way, including the electrical transmission lines. The areas under the transmission lines are subject to regulations due to wildfires. However, these areas within the Parkway may present an opportunity for vegetation enhancement.

## Protection of Cultural Resources

The Parkway encompasses an area rich with remnants of prehistoric, historic, and industrial activity. Cultural resources in the Parkway include prehistoric era (archaeological) resources (e.g., tools and burial sites), historic era resources (e.g., landmarks and buildings representative of historic architectural styles), and industrial era resources (e.g., bridges and railroads). Cultural resources are important, not only as evidence of prehistoric and historic activities, but also as tools for educating the public and as a form of recreation. Balancing the multiple roles of cultural resources in the Parkway requires careful, strategic management. Cultural resources are valuable to indigenous successors and critical in informing our knowledge of historical peoples and events. Furthermore, identification of cultural resources instills in the public recognition of the Parkway as an epicenter of its rich cultural history. Interpretive areas and centers attract users who enjoy forming a connection with the Parkway's history. Though interpretative centers are recreational in nature, they can be differentiated from other recreational opportunities in that cultural resource locations should remain confidential whenever possible to protect the resources from overuse and degradation (Sacramento County 2008).

## Special Events Management

Special events are allowed in the Parkway with a recreation permit. Large special events are allowed only in Discovery Park. Small special events are allowed in Discovery Park, Ancil Hoffman County Park, River Bend Park, the William B. Pond Recreation Area, and the Effie Yeaw Nature Center (Sacramento County 2008). Regional Parks issues recreation permits for special events in the Parkway, though permits from additional agencies, such as the Sacramento County Environmental Health Division, may be required depending on the size and scope of the event. Special events must be conducted in a manner and at a frequency at which natural resources are not degraded. A recreation permit is issued with conditions of approval specific to the event. It is important to continue to allow for special events, which provide unique recreational opportunities and a source of funding for the County, while minimizing their impact on natural resources.

# 1.4 OVERVIEW OF THE PLAN

The NRMP is designed to be accessible to both the general public and environmental professionals. The Plan is also designed to be practical and implementable. In order to efficiently implement this Plan, it is necessary to first understand the existing conditions within the Parkway and to define the natural resource management goals and objectives. The NRMP is organized in the following manner:

**CHAPTER 1** introduces the planning approach applied in the NRMP;

**CHAPTER 2** outlines the goals and objectives of the Plan;

**CHAPTER 3** describes the Parkway setting in greater detail with a focus on Area-specific attributes (including land use);

**CHAPTERS 4** provides a description and analysis of existing biological resources in the Parkway;

**CHAPTER 5** describes the physical resources in the Parkway;

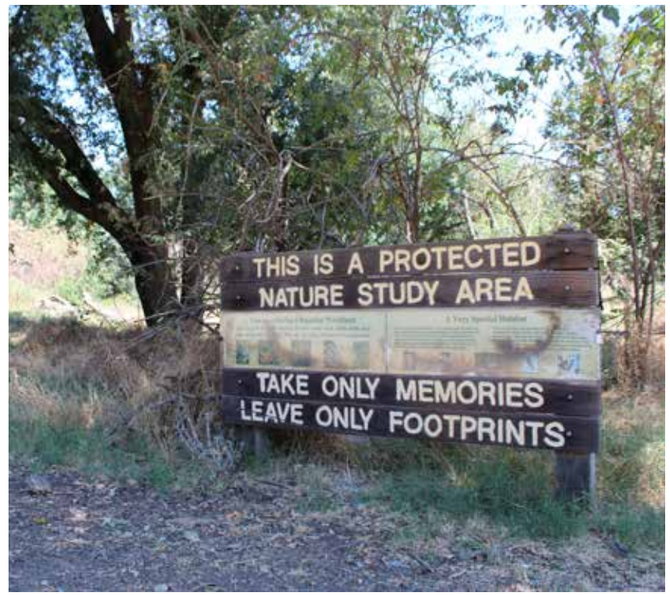
**CHAPTER 6** describes the Parkway's cultural resources;

**CHAPTER 7** discusses human use impact in the Parkway, and how these impacts can be reduced; and

**CHAPTER 8** addresses management, implementation, and monitoring, including potential funding sources and agency roles and responsibilities.

Multi-agency and departmental communication and cooperation is necessary in order to effectively implement the NRMP. This Plan will provide recommendations, including policies, to manage natural resources in the Parkway. This Plan is designed to consider several key issues, but it is not designed to address every single site-specific issue that occurs within the Parkway. There are important issues, such as homelessness, that are considered, but clearly require policy solutions that may be beyond Regional Parks' purview. However, natural resource impacts associated with encampments are discussed. Overall, the NRMP will provide goals and objectives that will lead to implementable actions in order to provide for the sustainable management of natural resources. Additionally, it is important to consider the practical limitation on what can be implemented given financial constraints and limited time.

Concurrent with this Plan, other agencies that have responsibilities in the Parkway are developing plans and/or implementing projects that will impact natural resources in the Parkway. As an example, the U.S. Army Corps of Engineers (USACE), CA Central Valley Flood Protection Board, State Department of Water Resources, and the Sacramento Area Flood Control Agency (SAFCA) are actively engaged in planning and implementing their American River Common Features (ARCF) Project. As a part of this effort, the project sponsors are preparing a Conservation Strategy (CS) that will guide habitat restoration and mitigation efforts of the ARCF, specifically those within the Parkway. The CS will identify areas of conservation opportunities that meet ARCF mitigation needs. The needs and timing of this process lends itself to coordination and cooperation with the NRMP and its task force, with stakeholder input, and utilization of a wide variety of existing plans. Additionally, the work of the Water Forum, including their program of improving habitat for spawning and rearing of listed fish species, also serves as an opportunity for coordination and cooperation. This Plan will lay down broad guidelines as to how these projects can be implemented consistent with the NRMP. Additionally, these projects will need the approval of the County and this may lead to required mitigation strategies that benefit both the project proponent and the Parkway. These projects may also provide a funding source to meet the goals and objectives of the NRMP.




*Nature Study Area signage at the Effie Yeaw Nature Center. Photo Credit: MIG*

*Agricultural plantings at Soil Born Farms in the River Bend Park Area. Photo Credit: MIG*

*Soil Born Farms in the River Bend Park Area. Photo Credit: MIG*

# 1.5 NRMP TASK FORCE

As part of the NRMP development, Regional Parks determined that an interagency task force was needed to create a fully informed and implementable NRMP. The NRMP Task Force ("Task Force") has been tasked with: (1) providing recommendations to Regional Parks on the preparation of the NRMP; (2) identifying recommended strategies and actions for addressing natural resources impacts on the Parkway that are aligned with parallel processes and projects; (3) identifying existing or future projects that align with the NRMP; and (4) identifying funding sources for NRMP implementation.

The NRMP will reflect the input and direction provided by Task Force members. The Task Force is composed of the following agencies and organizations:

- County of Sacramento Department of Regional Parks (Regional Parks)
- Sacramento Area Flood Control Agency (SAFCA)
- The Water Forum
- cbec eco engineering
- U.S. Army Corps of Engineers (USACE)
- Wildlife Conservation Board (WCB)
- Central Valley Flood Protection Board (CVFPB)
- American River Parkway Stakeholders
- WRC Environmental
- County of Sacramento Division of Planning and Review
- U.S. Fish and Wildlife Service (USFWS)
- Sacramento Municipal Utility District (SMUD)
- California Department of Water Resources (DWR)
- MIG
- ICF

The Task Force first convened in June 2020. The eleventh and final Task Force meeting occurred in June 2022.

# 1.6 NRMP COMMUNITY OUTREACH AND ENGAGEMENT

Concurrent with the establishment of the Task Force, an NRMP Community Engagement Plan was devised to solicit public input on draft NRMP concepts and materials, including goals, objectives, and maps. Feedback from community outreach activities have been reviewed and incorporated into the NRMP. Regional Parks conducted the following community engagement activities:

- Four open community workshops to provide an opportunity for the public to provide early input on the NRMP (July 16 & 17, 2020; March 22 & 26, 2021);
- Major NRMP concepts presentation (July 10, 2020) and public review draft NRMP presentation (March 19, 2021) to the American River Parkway Advisory Committee;
- Major NRMP concepts presentation (July 23, 2020) and public review draft NRMP presentation (March 25, 2021) to the Sacramento County Recreation and Parks Commission;
- Public Maptionnaire survey hosted on the County website to seek public feedback on the draft NRMP goals and objectives (July 2020 – September 2020);
- Two Parkway Stakeholders meetings to obtain input on the NRMP draft maps and management actions (December 4, 2020 and January 8, 2021); and
- One Fisheries Stakeholder meeting on February 5th, 2021.

A summary of the public input is provided in the Public Outreach Report, included in the appendices. Public input was incorporated into the NRMP and many of the items are included in the Chapter 8 Area Plans and Area Plan write-ups.

*Native trees leafing out along riverbanks in River Bend Park Area. Photo Credit: Wildlife Conservation Board*

# 2 NRMP GOALS AND OBJECTIVES


2.1 WILD AND SCENIC RIVER LEGISLATION..... 2-4
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CHAPTER 2

# INTRODUCTION AND OVERVIEW

The Goals and Objectives serve as the backbone of the Natural Resources Management Plan (NRMP), establishing standards for success and providing managers with a reference point to determine where resources should be focused. The goals and objectives guide the monitoring plan.

This chapter outlines the Regional Parks' overarching mission statement and goals, as well as the Parkway Plan concept and goals. The chapter also presents a summary of both the federal and state Wild and Scenic River Acts (WSRA). The final section of the Chapter highlights the NRMP's mission and vision, and presents the Plan's goals, objectives, and performance metrics through the "SMART" framework, the components of which are defined as follows:

- **SPECIFIC:** Objectives are linked to a goal or strategic plan and answer the questions, "Who?" and, "What?"
- **MEASURABLE:** The success toward meeting the objective can be measured.
- **ATTAINABLE:** Objectives are realistic and can be achieved in a specific amount of time.
- **RELEVANT:** Objectives are aligned with current interests of the implementing entity.
- **TIME ORIENTED:** Objectives have a clearly defined time-frame for completion.

Tables for each goal area include specific goals and objectives, along with information about agency roles, funding, and timing to help ensure effective implementation.

**TOP LEFT** *Aerial view of a parking lot and the Howe Avenue Bridge in the Howe Avenue Area. Photo Credit: John Hannon.* **TOP RIGHT** *Bikers on the Jedediah Smith Memorial Trail in the Discovery Park Area. Photo Credit: MIG.* **BOTTOM LEFT** *Accessible ramp to fishing platform in the Arden Bar Area. Photo Credit: MIG.* **BOTTOM RIGHT** *Foot trail and trailhead in the Ancil Hoffman County Park Area. Photo Credit: MIG.*

# 2.1 WILD AND SCENIC RIVER LEGISLATION

The Lower American River falls under both the National and State WSRAs and provides context and guidance to managing resources in the Parkway. Congress passed the National WSRA in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to create a nationwide wild and scenic rivers system through which rivers meeting select criteria would receive special protections. Specifically, the Act states:

> It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes. (Section 1. (b) Public Law 90-542; 16 U.S.C. 1271 et seq.)

In 1972, the California Legislature passed the State WSRA (PRC Section 5093.0-5093.70) and entered the LAR from Nimbus Dam to the confluence of the American River and Sacramento River into the State Wild and Scenic River System (State System). This area matches almost exactly the overall boundaries of the Parkway. In 1981, that same portion of the LAR was adopted into the National Wild and Scenic Rivers System (National System) under Section 2(a)(ii) of the National Act by the U.S. Secretary of the Interior upon request of the Governor of California. The designated portion of the LAR was incorporated into the State and National Systems because of its recognized outstandingly remarkable values (ORVs)—recreation and fishery values—which must be preserved under the Acts along with the river's free-flowing condition and water quality (National Wild and Scenic Rivers System 2020). The National WSRA (Section 7(a)) prohibits the federal government from constructing or supporting water resource projects (e.g., dams, bridges, bank armoring, gravel extraction) that would adversely impact a designated river's ORVs. The National Park Service (NPS) ensures consistent enforcement of Section 7(a), usually prompted when the United States Army Corps of Engineers (USACE) issues project permits under the Clean Water Act or Rivers and Harbors Act, or when the California Department of Fish and Wildlife (CDFW) reviews permit applications for its Lake and Streambed Alteration Program (Parkway Plan 2008).

The State and Federal WSRAs effect how Parkway resources are managed by requiring activities must not adversely impact the Parkway's recreation and fishery values. As a political subdivision of the State of California, Sacramento County has principal administrative and management responsibility for the designated portion of the Parkway (Parkway Plan 2008). As a result, Regional Parks is responsible for ensuring projects in the Parkway do not adversely impact recreational opportunities, fishery values, water quality, or the free-flowing condition of the river and the Parkway.

*Aerial view of network of social trails in the Cal Expo Area. Photo Credit: John Hannon*

# 2.2 SACRMENTO COUNTY REGIONAL PARKS

Sacramento County Regional Parks is responsible for managing the Parkway. Regional Parks' mission and goals reflect the need to both provide public access while protecting the resources. This requires Regional Parks to both consider how humans impact resources along with how natural resource decisions may affect recreational use. Thus, the NRMP seeks ways in which recreational uses are accommodated in the Parkway while minimizing the effects on natural resources.

REGIONAL PARKS' MISSION STATEMENT: *Enhance the health, enjoyment, and quality of life in the region by:*

- *Acquiring, managing, and protecting park and open space lands;*
- *Educating the public on the uses and values of leisure time activities, and the cultural and natural history of the County;*
- *Growing and linking a system of regional parks, trails, and open space in Sacramento and neighboring counties;*
- *Providing a broad range of recreational activities for the community's diverse populations;*
- *Providing stewardship and protection of Sacramento County's regional park system through partnerships, planning, and community involvement.*

REGIONAL PARKS' GOALS:

- *Provide affordable, accessible, clean, and safe recreational activities and facilities for all.*
- *Protect natural habitats and the environment.*
- *Preserve cultural and historical resources.*

*Levee borrow pit in the Discovery Park Area between River Mile 12 and the Sacramento Northern Bike Trail. Photo Credit: Wildlife Conservation Board*

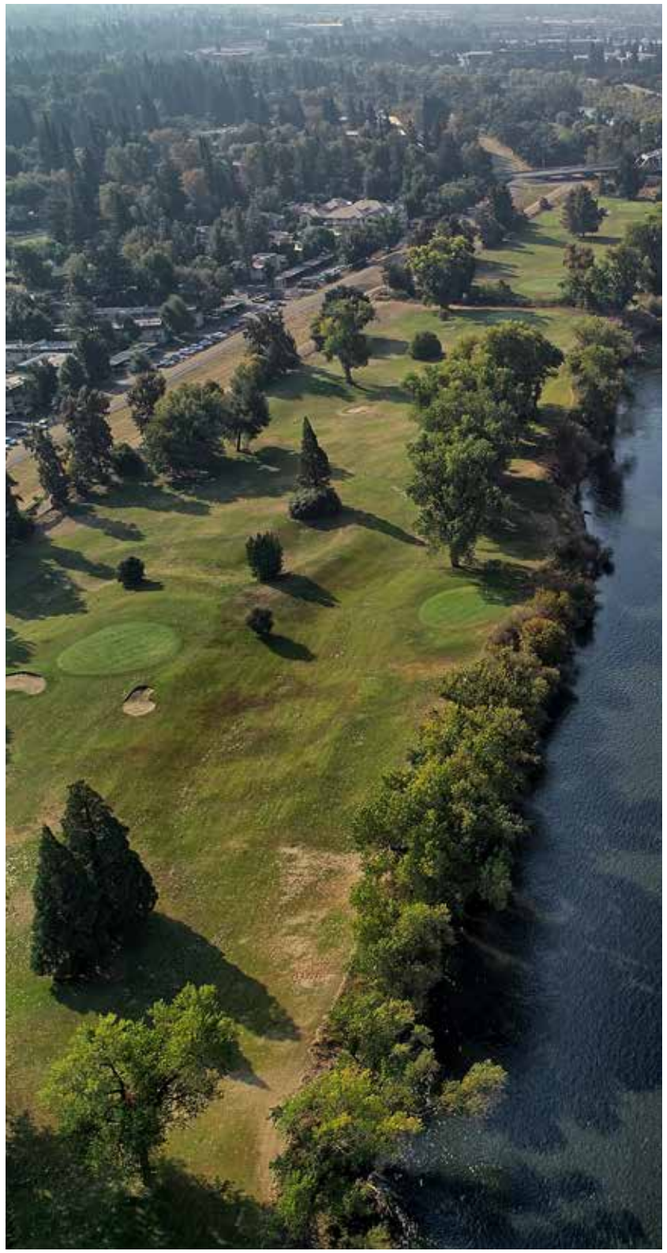
# 2.3 AMERICAN RIVER PARKWAY PLAN

The American River Parkway Plan is the guiding management document for the Parkway. The plan guides land use decisions, including those related to recreation and other human uses. The NRMP is designed to be consistent with the Parkway Plan while the NRMP specifically addresses natural resource management in the Parkway. In this section, the Parkway Plan concept and goals are described.

Parkway Plan Concept: The American River Parkway is a unique regional facility which shall be managed to: a) preserve naturalistic open space and protect environmental quality within the urban environment, and b) contribute to the provision of recreational opportunities in the Sacramento area.

### PARKWAY PLAN GOALS:

- *To provide, protect, and enhance for public use a continuous open space greenbelt along the American River extending from the Sacramento River to Folsom Dam.*
- *To provide appropriate access and facilities so that present and future generations can enjoy the amenities and resources of the Parkway.*
- *To preserve, protect, interpret, and improve the natural, archaeological, historical, and recreational resources of the Parkway, including an adequate flow of high-quality water, anadromous and resident fishes, migratory and resident wildlife, and diverse natural vegetation.*
- *To mitigate adverse effects of activities and facilities adjacent to the Parkway.*
- *To provide public safety and protection within and adjacent to the Parkway.*



*Aerial view of the Campus Commons Area, including the Campus Commons Golf Course. Photo Credit: John Hannon*

“It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.”

**– WILD & SCENIC RIVERS ACT, OCTOBER 2, 1968**

# 2.4 NATURAL RESOURCES MANAGEMENT PLAN

The NRMP is consistent with the Parkway Plan. The purpose of the NRMP is to provide relevant and defensible information to the Parkway Manager for making informed decisions for managing, maintaining, and enhancing Parkway resources. The Plan's goal areas, goals, objectives, and performance measures (PM) are listed in the tables below and follow the framework shown in Figure 2-1. Each goal area includes relevant goals which are linked to specific objectives and performance measures. The tables also identify key implementation categories, including lead and support roles, funding sources, and planned completion dates.

SMART objectives clarify expectations and provide the means to determine if the objective is successfully completed. Initial performance will be measured in a five-year timeframe as follows:

> *Specifically, where feasible, success criteria will be established for individual projects to enable monitoring of each project's success over a 5-year period. After 5 years, the success of the projects will be evaluated to determine if modification of the NRMP's goals and objectives, and projects is needed to improve resource protection, enhancement, and restoration within the Parkway.*

Completion dates for the objectives are placed into three categories: (1) 1-2 years after NRMP completion; (2) 3-5 years after completion and (3) 6-10 years after completion. The completion date of the NRMP is when the document is approved by the Board of Supervisors. After five years, the NRMP will undergo a comprehensive review.

In order to be consistent with the SMART Objectives framework, the objectives associated with *Goal #1.4: Naturalize habitats that have been altered by human activity*, were tied to projects likely to be funded over the term of the Plan. The assumptions are provided to provide context to the objectives. Also, funding of the projects could change both the number of acres proposed for naturalization or the timing. These items will be considered when the NRMP is evaluated annually. It should be noted that all of the naturalization projects would undergo their own environmental review.

The assumptions for the numerical targets on which the Objectives 1.4a-1.4d are based come from the potential proposed projects shown in Table 2-1. Table 2-1 focuses on naturalization as this action would often require external funding. The table shows the entity that is funding the project along with the reason for the project. Then, the number of acres or projects associated followed by the project timeframe are shown. The acreages associated with Goals 1.3 and 1.4 were developed through the mapping effort, which is discussed in greater detail in Chapter 8 that was completed as a part of the NRMP.

The language used in Goals 1.2-1.5 reflects the natural resource management categories described in Chapter 1. These management categories include:

- *Conservation* (lowest level of management intensity): Areas designated as conservation currently meet most applicable natural resource goals and those values will be conserved. This includes existing mitigation sites that require protection in perpetuity, as well as non-mitigation sites that meet desired conditions and provide high quality habitat. Considering the dynamic nature of all natural habitats, additional actions (e.g., restoration/enhancement) may be deemed suitable in Conservation areas in order to maximize suitable habitat values. Implementing restoration/ enhancement actions within existing formal mitigation sites should be consistent with existing regulatory agreements/ commitments. Federal mitigation sites, which have long-term commitments to protect habitat values, are mapped as a unique subset of the conservation category.
- *Restoration* (moderate level of management intensity): Areas designated as restoration generally meet desired conditions in their current form but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved (e.g., habitat restoration/ enhancement) to meet goals. The need for ongoing restoration of degraded areas is expected.
- *Naturalization* (highest level of management intensity): Areas designated as naturalization were substantially altered in the past and should be modified in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP and NRMP. This applies to areas previously altered and outcomes are generally native habitat types that would typically be expected to occur in the Parkway. Naturalization also includes converting areas that have not been altered by past actions (unaltered) to heighten, intensify, or improve highly valued resource functions that may have been lost or degraded over time. Generally, this entails conversion of land cover type.
- *Rehabilitation*: Rehabilitation is applicable to any area, whether it be Conservation, Restoration, or Naturalization, could be degraded or damaged in the future and require action to improve their condition. Rehabilitation is suitable in any of the other categories and can happen anywhere in the Parkway, just as all areas in the Parkway are subject to degradation or damage.

**TABLE 2-1: ASSUMPTIONS FOR GOAL AREA 1-4 ACREAGES**

| FUNDING ENTITY | RATIONALE FOR PROPOSED PROJECT | POTENTIAL NUMBER OF ACRES AND/OR PROJECTS | TIMEFRAME FOR COMPLETION |
|---|---|---|---|
| **USACE** | Mitigation for the proposed bank protection | • 115 acres of native riparian vegetation communities; and<br>• 30 acres native elderberry | 3-5 years |
| **PG&E** | Mitigation for clearing and hardening of transmission lines | • 11 acres of native woodland | 3-5 years |
| **WCB** | Potential future funding from WCB | • Three acres of native riparian vegetation communities;<br>• Three acres native elderberry;<br>• Two acres of native grassland; and<br>• Two acres of native woodland. | 3-5 years |
| **USACE** | Potential Ecosystem Restoration Projects | **Woodlake**<br>• 16 acres of native riparian vegetation communities;<br>• 50 acres of native grassland; and<br>• 41 acres of native woodland.<br>**Cal Expo (Bushy Lake)**<br>• 48 acres of native riparian vegetation communities; and<br>• 70 acres of native woodland. | 6-10 years |
| **CVPIA** | Mitigation for upstream dams | • One salmonid habitat enhancement project annually (about 10 acres/year). | 3-5 years |

FIGURE 2-1 NRMP GOALS AND OBJECTIVES FRAMEWORK

# NRMP GOALS AND OBJECTIVES FRAMEWORK

**GOAL AREA 1**
Biological Resources

**GOAL AREA 2**
Physical Resources

**GOAL AREA 3**
Cultural Resources

**GOAL AREA 4**
Human Use Impact Reduction

**GOAL AREA 5**
Agency and Community Coordination

Goal
Objectives
Performance Measures
Lead/Support Roles
Funding
Timeframe

### GOAL AREA 1. BIOLOGICAL RESOURCES

| GOAL | OBJECTIVES/PERFORMANCE MEASURES | LEAD[1] | FUNDING SOURCES | TARGETED COMPLETION |
|---|---|---|---|---|
| 1.1 Assess biological resources within the Parkway. | 1.1a Update vegetation community maps, including a frequently inundated floodplain/shaded riverine aquatic habitat (SRA) map. | - Regional Parks | - Federal/State Grant Programs<br>- Regional Parks<br>- SAFCA<br>- Water Forum<br>- WCB/LAR Conservancy Programs | 2 years |
| | 1.1b Complete Parkway-wide surveys for sensitive species habitat. | | | |
| | 1.1c Update invasive plant species surveys and maintain a tracking system. | | | |
| | 1.1d Develop and maintain a tracking system for homeless encampments in the Parkway. | | | |
| 1.2 Conserve high-quality native habitats. | 1.2a Conserve high-quality native riparian vegetation communities. | - Project Proponents<br>- Regional Parks | - Federal/State Grant Programs<br>- Mitigation Projects<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 1.2b Conserve high-quality native grassland vegetation communities. | | | |
| | 1.2c Conserve high-quality native woodland vegetation communities. | | | |
| | 1.2d Conserve high-quality native elderberry vegetation communities. | | | |
| 1.3 Restore high-quality native habitats that require improvement. | 1.3a Restore 25 ac of high-quality native riparian vegetation. [2] | - Project Proponents<br>- Regional Parks | - Central Valley Project Improvement Act<br>- Federal/State Grant Programs<br>- Central Valley Project Improvement Act<br>- Mitigation Projects<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 1.3b Restore 1 ac of high-quality native grassland vegetation communities. [2] | | | |
| | 1.3c Restore 6 ac of high-quality native woodland vegetation communities. [2] | | | |
| | 1.3d Restore 19 ac of high-quality native elderberry vegetation communities. [2] | | | |

[1] *Project Proponents refers to any entity that seeks to carry out a project including any governmental organization (e.g., CVFPB, SAFCA, USACE, Water Forum), NPOs/Stakeholders (e.g., ARNHA, APRF, SVC, etc.,), and Utility Companies (e.g., WAPA, PG&E, SMUD). Project proponents are listed alphabetically.*

[2] *Projects must undergo a separate environmental review independent of the NRMP.*

| GOAL | OBJECTIVES/PERFORMANCE MEASURES | LEAD[1] | FUNDING SOURCES | TARGETED COMPLETION |
|---|---|---|---|---|
| 1.4 Naturalize habitats that have been altered by human activity. | 1.4a Naturalization of 50 ac (3-5 years) and 40 ac (6-10 years) of native riparian vegetation communities.[2] | - Local Jurisdictions<br>- Project Proponents<br>- Regional Parks | - Central Valley Project Improvement Act<br>- Federal/State Grant Programs<br>- Mitigation Projects<br>- USACE Restoration Projects<br>- WCB/LAR Conservancy Programs | 3-5 years / 6-10 years |
| | 1.4b Naturalization of 4 ac (3-5 years) and 45 ac (6-10 years) of native grassland vegetation communities.[2] | | | |
| | 1.4c Naturalization of 6 ac (3-5 years) and 86 ac (6-10 years) of native woodland vegetation communities.[2] | | | |
| | 1.4d Naturalization of 30 ac of native elderberry vegetation communities.[2] | | | |
| | 1.4e Coordinate with project proponents to implement 90 to 120 acres of salmonid enhancement projects.[2] | | | |
| 1.5 Rehabilitate habitats damaged or degraded by fire or homeless populations. | 1.5a Preparation of a plan to rehabilitate wildfire-damaged areas, prioritizing vulnerable mature vegetation, to ensure a timely response to minimize undesirable wildfire impacts. Document and evaluate all areas damaged or degraded by wildfire annually. | - Project Proponents<br>- Regional Parks | - Central Valley Project Improvement Act<br>- Federal/State Grant Programs<br>- Mitigation Projects<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 1.5b Parallel to Rehabilitation, identify areas requiring repair, which is different than rehabilitation, and include in annual O&M plans. | | | |
| 1.6 Expand corridors that connect disparate native vegetation communities and wildlife habitat | 1.6a Complete Wildlife Connectivity Opportunity Plan. | - Project Proponents<br>- Regional Parks | - Federal/State Grant Programs<br>- Mitigation Projects<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 1.6b Reduction of barriers to fish and wildlife movement in the Parkway. | | | |
| 1.7 Reduce the prevalence of invasive, non-native species. | 1.7a Update Invasive Plant Management Project. | - Project Proponents<br>- Regional Parks | - Federal/State Grant Programs<br>- Mitigation Projects<br>- Regional Parks<br>- Utility Companies<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 1.7b Replacement of five acres of invasive, non-native species with native species identified in the NRMP. | | | |

*[1] Project Proponents refers to any entity that seeks to carry out a project including any governmental organization (e.g., CVFPB, SAFCA, USACE, Water Forum), NPOs/Stakeholders (e.g., ARNHA, APRF, SVC, etc.,), and Utility Companies (e.g., WAPA, PG&E, SMUD). Project proponents are listed alphabetically.*

*[2] Projects must undergo a separate environmental review independent of the NRMP.*

### GOAL AREA 2. PHYSICAL RESOURCES

| GOAL | OBJECTIVES/PERFORMANCE MEASURES | LEAD[1] | FUNDING SOURCES | TARGETED COMPLETION |
|---|---|---|---|---|
| 2.1 Protect levees throughout the Parkway. | 2.1a Stabilization of 100% of all levees throughout the Parkway consistent with maintaining a natural riverine environment. | - Flood Control Agencies | - Federal, state, and local flood risk management funding sources | On-going |
| 2.2 Improve water quality. | 2.2a Coordination with State Water Quality Control Board to monitor and map high ***E. coli*** levels. | - Regional Parks<br>- SWRCB | - Federal/State Grant Programs<br>- Stormwater Violation Dollars | On-going |
| | 2.2b Identify reaches of the river that have chronic levels of high ***E. coli*** levels. | | | |

### GOAL AREA 3. CULTURAL RESOURCES

| GOAL | OBJECTIVES/PERFORMANCE MEASURES | LEAD[1] | FUNDING SOURCES | TARGETED COMPLETION |
|---|---|---|---|---|
| 3.1 Protect archaeological and historical resources. | 3.1a Protection of 100% of the officially designated archaeological and historical resources (listing is provided in the data management system). | - Regional Parks | - Federal/State Grant Programs<br>- Local Tribes/Tribal Partnership Programs<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| 3.2 Form a partnership with tribal governments to protect and manage cultural resources in the Parkway. | 3.2a Establishment or participation in regular annual meetings with tribal government representatives. | - Regional Parks | - Federal/State Grant Programs<br>- Local Tribes/Tribal Partnership Programs<br>- Regional Parks | 3-5 years |

[1] *Project Proponents refers to any entity that seeks to carry out a project including any governmental organization (e.g., CVFPB, SAFCA, USACE, Water Forum), NPOs/Stakeholders (e.g., ARNHA, APRF, SVC, etc.,), and Utility Companies (e.g., WAPA, PG&E, SMUD). Project proponents are listed alphabetically.*

**GOAL AREA 4. HUMAN USE IMPACT REDUCTION**

| GOAL | OBJECTIVES/PERFORMANCE MEASURES | LEAD[1] | FUNDING SOURCES | TARGETED COMPLETION |
|---|---|---|---|---|
| 4.1 Minimize human use impacts on all Parkway resources. | 4.1a Locate and design future recreational use areas and facilities with sensitivity to water resources. | - Regional Parks | - Federal/State Grant Programs<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 4.1b Documentation and mapping of social trails in the Parkway. | - Regional Parks | | |
| 4.2 Reduce impacts associated with homeless encampments in the Parkway. | 4.2a Elimination or mitigation of the detrimental consequences associated with homeless encampments, such as: (1) accumulated debris; (2) environmental degradation; and (3) health and public safety issues including degradation of public infrastructure such as levees | - Regional Parks | - Federal/State Grant Programs<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| 4.3 Monitor impacts related to large group gatherings and special events. | 4.3a Continue practice of permitting large special event activities within developed recreational areas as per the policies of the American River Parkway Plan. | - Regional Parks | - Regional Parks | 2 years |
| 4.4 Maximize environmentally beneficial opportunities within transmission line corridors. | 4.4a Utilization of transmission line corridors for environmentally beneficial vegetation in accordance with an executed Vegetation Management Agreement. | - Project Proponents<br>- Regional Parks | - Regional Parks<br>- Utility Companies<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 4.4b Execution of Vegetation Management Agreement with transmission corridor utility companies. | | | |
| 4.5 Reduce the amount of ambient light impacting biological resources in the Parkway while ensuring a safe park environment. | 4.5a Complete a baseline ambient night light survey to identify areas in the Parkway where there is an unnecessary amount of ambient light and create a plan for reducing the light, consistent with American River Parkway policies. | - Regional Parks | - Local Jurisdictions<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| 4.6 Interpret environmental, archaeological, and historical resources and educate the public on the significance of the Parkway in the greater Sacramento region. | 4.6a Update the interpretation plan for the American River Parkway. | Regional Parks | - Federal/State Grant Programs<br>- Local Tribes/Tribal Partnership Programs<br>- Mitigation Projects<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 2 years |
| | 4.6b Inclusion of interpretive elements with large environmental enhancement projects including mitigation projects. | Regional Parks | | |

[1] *Project Proponents refers to any entity that seeks to carry out a project including any governmental organization (e.g., CVFPB, SAFCA, USACE, Water Forum), NPOs/Stakeholders (e.g., ARNHA, APRF, SVC, etc.,), and Utility Companies (e.g., WAPA, PG&E, SMUD). Project proponents are listed alphabetically.*

### GOAL AREA 5. AGENCY AND COMMUNITY COORDINATION

| GOAL | OBJECTIVES/PERFORMANCE MEASURES | LEAD[1] | FUNDING SOURCES | TARGETED COMPLETION DATE |
|---|---|---|---|---|
| 5.1 Oversee implementation of NRMP. | 5.1a Create a sub-committee of the American River Parkway Advisory Committee to meet at least once per year with Regional Parks' staff to evaluate the implementation of the NRMP. | - Regional Parks | - Regional Parks | 1 year |
| 5.2 Coordinate with fire agencies to reduce wildfire fuel and hazards in the Parkway. | 5.2a Update and implement the wildfire prevention plan. Develop response, and recovery plans. | - Regional Parks | - Federal/State Grant Programs<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | On-going |
| | 5.2b Develop and maintain a tracking system for wildfires in the Parkway. | | | |
| 5.3 Support scientific research programs to increase the quantity and quality of data describing the condition of Parkway resources. | 5.3a Establishment of ongoing research and data collection programs with CSUS, UC Davis, and other local colleges. | - Regional Parks | - Federal/State Grant Programs<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |
| | 5.3b Development of a citizen science data program. | | | |
| | 5.3c Identify research needs to understand Parkway conditions and fill data gaps. | | | |
| 5.4 Implement a robust Natural Resource Management Plan Monitoring Program. | 5.4a Provide annual updates of monitoring data to the NRMP geodatabase. | - Regional Parks | - Regional Parks<br>- WCB/LAR Conservancy Programs | On-going |
| 5.5 Encourage public outreach and educational activities to increase the public's understanding and appreciation of Parkway resources. | 5.5a Establishment of one educational partnership, per year, with local school districts and community-based organizations to develop curriculum for teaching environmental stewardship and proper use of Parkway resources. | - Regional Parks | - Federal/State Grant Programs<br>- Local Jurisdictions<br>- Regional Parks<br>- WCB/LAR Conservancy Programs | 3-5 years |

# 3 PARKWAY SETTING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CHAPTER 3

# INTRODUCTION AND OVERVIEW

Nestled in the southernmost portion of the Sacramento Valley between the Sacramento-San Joaquin Delta and the Sierra Nevada foothills, the Parkway is a regional greenbelt with significant natural, cultural, and recreational values. It is the largest parkway and one of the largest public open spaces in Sacramento County at 29 miles in length, and it follows the Lower American River (LAR) through a highly urbanized area between Folsom Dam to the east and the Sacramento River to the west.

The NRMP focuses on the roughly 23-mile segment of the LAR between Hazel Avenue and the confluence of the American River and the Sacramento River. Below the LAR, the Sacramento River flows into the Sacramento-San Joaquin River Delta, which ultimately empties into the San Francisco Bay and Pacific Ocean through the Golden Gate Strait.

The LAR's confluence with the Sacramento River is the outlet point of the massive American River Watershed, which encompasses over 1,900 square miles and extends through the Sierra Nevada foothills to the crest of the range at elevations of over 7,000 feet. This watershed is drained by a multitude of streams and rivers that converge into the North, Middle, and South Forks of the American River. These drainages

empty into Folsom Lake, a reservoir along the border of El Dorado and Sacramento Counties. In addition, there are numerous smaller tributaries that flow directly into the LAR from local drainages on the Sacramento Valley floor.

Historically, the LAR corridor consisted of a dynamic and free-flowing main channel and side channels and a contiguous mosaic of habitat types. The Nisenan Maidu, the earliest known human inhabitants of the Parkway, utilized the Parkway's resources, including its abundant flora and fauna, and sometimes actively altered the Parkway landscape. In recent history, agriculture, mining, urban development, and the construction of the Folsom and Nimbus Dams altered the Parkway setting to the extent the LAR channel now navigates an almost fully urbanized metropolitan area.

While the Parkway is no longer the wholly natural corridor it was in the past, it retains naturalistic features that attract recreationists, scientists, nature-lovers, regulatory authorities, and descendants of the Native American Indian tribes alike. Its mixture of biological, cultural, physical, and recreational resources makes it a hotspot of recreational activities and events, educational programming, floodway and utilities infrastructure, and habitat mitigation and restoration projects. The Parkway is arguably one of the most "naturalized" (i.e., approximating, but no longer completely natural) open space facilities in Sacramento County, and it serves important ecological functions in the California Central Valley. The Parkway allows visitors from near and far an opportunity to enjoy expansive, near-natural environments in a highly urbanized setting.

Although the Parkway lies within a fixed boundary, the river corridor is inherently dynamic, and management of its natural resources must account for the ever-changing conditions associated with river geomorphology, the impacts of human use, and a changing climate. The current conditions of the Parkway are described here in terms of the physical features of the river corridor, past and present land uses, and the characteristics of each distinct management area (known as "Areas" in the Parkway Plan). Section 3.1 Physical Setting provides the overall geographical context of the Parkway; Section 3.2 Regulatory Setting describes the federal, state, and local governmental agencies with interests in the Parkway. Section 3.3 describes Parkway land uses followed by a discussion of the areas within the Parkway (Section 3.4). Finally, the contributions of the Parkway to regional conservation goals are described (Section 3.5), followed by a discussion of climate change (Section 3.6).

*The Harold Richey Memorial Bicycle Bridge in the Arden Bar and River Bend Park Areas. Photo Credit: Regional Parks*

# 3.1 PHYSICAL SETTING

The varied topography of the Parkway includes uplands, floodplains, bluffs, banks, and the river channel itself. Elevations within the Parkway range from 466 feet (at maximum water level) at Folsom Lake to roughly 25 feet at the confluence with the Sacramento River (California Department of Parks and Recreation (State Parks) 2019; United States Geological Survey (USGS) 2019). Much of this topography has been altered by both geomorphic processes and human use of the river corridor, including past gold, hydraulic, and aggregate mining operations along the river that created significant areas of disturbed land and dredge tailings.

The Parkway's landscape is relatively undeveloped, though human made structures including recreational facilities, interpretive centers, kiosks, utilities buildings, and infrastructure are located throughout. Major vegetation types occurring within the Parkway include valley and foothill grassland, oak woodland, and riparian vegetation, including cottonwood forests, mixed riparian forest, and riparian scrub.

The Parkway is surrounded by urban development, particularly the lower six miles, and suburban development along its upper reaches. Land and developments associated with the cities of Sacramento and Rancho Cordova, and unincorporated Sacramento County communities (including Carmichael, Fair Oaks, and Gold River) border the Parkway. Adjacent residential, commercial, and industrial land uses form an extensive wildland-urban interface along most of the Parkway's boundaries. While this proximity can create natural resources management challenges for the Parkway, the surrounding urban context also highlights the regional importance of the open space corridor for conservation and the recreation opportunities that it provides. Knowledge of these physical attributes and current uses of the Parkway, as well as an in-depth understanding of the existing ecological, cultural, and recreational resources along the river corridor, will directly inform future management actions.

*Cyclists on the Jedediah Smith Memorial Trail in the Howe Avenue Area. Photo Credit: Regional Parks*

# 3.2 REGULATORY SETTING

The Parkway's regulatory setting dictates how its natural resources are managed. Local, regional, state, and federal plans, laws, regulations, and agencies play a role in establishing limitations, setting priorities, and ultimately guiding what can and cannot be done in the Parkway. This section consists of an overview of the regulatory framework that shapes management of the Parkway.

## 3.2.1 Applicable Federal Regulations

### U.S. Army Corps of Engineers (USACE)

USACE is the administering agency of Section 404 of the Clean Water Act (CWA). Section 404 of the CWA requires a permit for the discharge of dredged or fill material into waters that are "navigable" or connected to a navigable waterway, such as wetlands, rivers, and streams of the United States, unless a project or activity (e.g., some farming and forestry activities) is found exempt from regulation. USACE reviews permit applications and, if found permissible under the program, approves the proposed activities, which may include infill development, dams, levees, infrastructure, and mining projects. In addition, USACE sets the standards for levees nationwide. Construction and dredge/fill activities proposed to take place within and may potentially impact the Parkway's creeks, streams, wetlands, or the river require review and authorization by USACE (Sacramento County 2008b). In addition, see the U.S. Code Section 408 subsection below for discussion on proposed alterations to USACE projects.

Specific to the Parkway, USACE is managing the American River Common Features (ARCF) 2016 Project as a cooperative effort between the U.S. Army Corps of Engineers (USACE), Sacramento Area Flood Control Agency (SAFCA), and Central Valley Flood Protection Board (Board). ARCF includes up to eleven miles of bank protection along the American River.

### U.S. Bureau of Reclamation (USBR)

USBR oversees the operations of Folsom Dam, Nimbus Dam, Folsom Reservoir, and Lake Natoma under the Central Valley Project (CVP), a series of flood control, water storage, and power generation projects authorized by the California State Legislature in 1933 and initiated in 1937 (Bureau of Reclamation 2020). Through operating the Folsom and Nimbus Dams, USBR manages the LAR's flows. No activity proposed to take place within or adjacent to the Parkway is permitted to interfere with operations of the Folsom Dam or Nimbus Dam.

### Clean Water Act (CWA)

The CWA was adopted in 1972 to protect surface water habitats from adverse impacts, such as water pollution, associated with development activities. The sections of the CWA are administered in California by either USACE, the State Water Resources Control Board (SWRCB), or the Regional Water Quality Control Board (RWQCB). Section 404 of the Act is administered by USACE for the purpose of regulating the discharge of dredge or fill into navigable waters and their tributaries (Sacramento County 2008b).

The National Pollutant Discharge Elimination System (NPDES) program was established by Section 402 of the CWA to regulate "point source" (a fixed facility or other location that can be identified as the source of a pollutant) discharges, such as wastewater treatment plant discharges

**TOP** *Boat ramp in the Howe Avenue Area. Photo Credit: Regional Parks*
**BOTTOM** *Fish statue at the Nimbus Fish Hatchery. Photo Credit: MIG*

*Picnic shelter and gazebo in the Discovery Park Area. Photo Credit: MIG*

and stormwater runoff, into surface waters. The Central Valley Regional Water Quality Control Board (Central Valley RWQCB) administers Section 402 of the CWA in the Central Valley Region. The Central Valley RWQCB issues permits to industrial facilities, construction sites, and municipalities (such as counties and cities) to regulate runoff and discharges. The County of Sacramento, along with several local cities, maintains a Municipal Stormwater NPDES permit, which requires the County to develop, enforce, and monitor the results of ordinances and programs intended to minimize entry of pollutants into surface waters (Sacramento County 2008b).

Implementation of the NPDES program impacts the water quality of the LAR and its tributaries in the Parkway. Construction and improvement activities taking place within and adjacent to the Parkway must comply with the County's ordinance requirements, including Erosion Control Ordinance standards, to reduce pollution of water runoff and discharges (Sacramento County 2008b).

### U.S. Code Title 33 Section 408 (Section 408)

U.S. Code Title 33 Section 408 (Section 408) (the amended and codified Section 14 of the Rivers and Harbors Appropriation Act of 1899) allows the Secretary of the Army, upon recommendation of the USACE Chief of Engineers, to permit the alteration of a public work as long as the alteration is not injurious to the public interest and will not impair the usefulness of the work (33 U.S. §408). USACE considers an alteration an action that builds upon, alters, improves, moves, occupies, or otherwise affects the usefulness, or the structural or ecological integrity, of a USACE project (33 U.S. §408). Under Section 408, USACE authorization is required before carrying out an action that would alter lands and property under USACE's jurisdiction in the Parkway. Therefore, an action that would alter Parkway lands and waters included in a USACE project, including federal levees lands and waters situated between federal levees, would require review to ascertain whether it necessitates submission of a Section 408 permission request. Such actions include the construction of new recreational infrastructure, the installation of power lines and pipelines, and improvements to existing flood management features that would alter a USACE project. Routine operations and maintenance (O&M) of USACE lands and property are exempt from Section 408 permissions (USACE 2016). For example, USACE-approved routine O&M undertaken by SAFCA or American River Flood Control District (ARFCD), as public sponsors, of federal levees in the Parkway do not require submission of a Section 408 permission request because such work is covered in the project's Operations and Maintenance Manual.

### Federal Endangered Species Act (ESA)

Congress passed the Federal Endangered Species Act (ESA) in 1973. The ESA is intended to protect and help recover endangered and threatened animal and plant species. As of January 2020, ESA lists over 1,400 animal species and over 900 plant species. The Act classifies listed species as either "Endangered," meaning the species is nearing extinction in all or a significant portion of its range, or "Threatened," meaning the species is on the verge of becoming endangered. The ESA is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) (USFWS 2013).

Under the ESA, endangered and threatened animal species are protected from "take," which is defined in the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct" toward a listed species without a permit. While plant species are not protected from "take," they are protected from illegal collection and harm on federal lands, and from commercial trade and the effects of federal actions (USFWS 2013).

The Parkway contains plant species and provides habitat for animal species listed, proposed for listing, or candidates for listing under the ESA. As a result, natural resource management in the Parkway is subject to the statutes and regulations of the ESA. Appendix C contains a list of special-status species that occur or have the potential to occur in the Parkway.

## National Wild and Scenic Rivers Act (WSRA)

The National WSRA was passed by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior (U.S. Bureau of Land Management (USBLM) et al. 2020).

The LAR was designated a Wild and Scenic River in 1981 by the Secretary of the Department of the Interior at the time under Section 2(a)(ii) of the National WSRA. The LAR is administered by the County of Sacramento as a political subdivision of the State of California (USBLM 2020). Per Section 1(b) of the Act, the LAR from the confluence with the Sacramento River to Nimbus Dam must be maintained in free-flowing condition, its water quality must be protected, and its recreational and fishery values must be preserved. The NRMP shall not suggest nor require actions that would be inconsistent with these mandates. The American River Parkway Plan (described below) is the primary management document for the implementation of this Act.

*Boat ramp in the Discovery Park Area. Photo Credit: MIG*

## National Historic Preservation Act, Section 106 (NHPA)

The National Historic Preservation Act (NHPA) of 1966 established a framework for the federal government to support state, tribal, and local preservation programs and activities, and created the Advisory Council on Historic Preservation (ACHP), a federal agency that addresses historic preservation issues. Section 106 of the Act requires federal agencies to consider the impacts of their undertakings (i.e., a project, activity or program funded, permitted, licensed, or approved by a federal agency) on historic properties. Historic properties include prehistoric and historic districts, sites, buildings, structures, and objects. ACHP guides agencies in compliance with the Section 106 process through a set of regulations called 36 CFR Part 800—Protection of Historic Properties, including how federal agencies should consult with State Historic Preservation Officers (SHPOs), Tribes, Tribal Historic Preservation Officers (THPOs), and Native Hawaiian Organizations (NHOs) in determining project, activity, and program effects on historic properties. A proposed federal agency undertaking that may impact a historic property in the Parkway would trigger the Section 106 process (ACHP 2020).

### National Environmental Protection Act

The 1970 National Environmental Protection Act (NEPA) (42 U.S.C. §4321 et seq.) requires federal agencies to evaluate the potential environmental impacts of proposed federal actions. NEPA covers permit applications, federal land management actions, and construction of public facilities. The Council on Environmental Quality (CEQ) oversees implementation of NEPA, including enforcement of regulations that establish the procedural provisions of the NEPA process. The NRMP is not subject to review under NEPA.

## 3.2.2 Applicable State Regulations

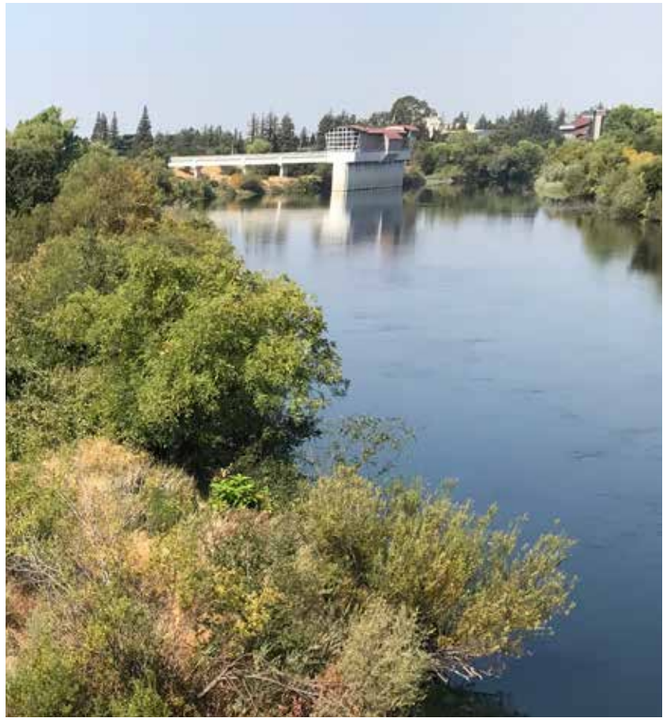
### Bushy Lake Preservation Act

Bushy Lake is a human made lake located in the Cal Expo Area of the Parkway. Cal Expo Area lands on the north bank of the LAR are state-owned California Exposition and State Fair (Cal Expo) lands. The Bushy Lake Preservation Act, adopted in 1976, requires the Cal Expo Board of Directors to preserve the Cal Expo floodplain in a manner consistent with the definition of a state park for public day use and enjoyment, and the Bushy Lake area consistent with the features of a State Nature Preserve. The Act also requires the Cal Expo Board of Directors to preserve the Cal Expo floodplain in accordance with the Parkway Plan as an element of the Sacramento County General Plan. To accomplish this, the Act requires the Cal Expo Board of Directors to manage, or provide for the management of the Bushy Lake area in accordance with land use designations and policies of the Parkway Plan (CA Public Resources Code (PRC) §5830-5835), pursuant to an agreement with the Parkway manager. As a result, the Cal Expo Area, including the Bushy Lake area and Cal Expo floodplain, is managed by Regional Parks in accordance with an agreement between Cal Expo and Regional Parks.

### California Water Code

The California Water Code contains statutory provisions addressing the regulation of water in the state of California, including, but not limited to: regulation of dams and reservoirs, wells, pumping plants, conduits, streams, flood control, water quality, irrigation, and drainage. Under Sections 8700 and 8701 of the California Water Code, actions that adversely affect the facilities of the State Plan of Flood Control, designated floodways, or streams regulated by the Central Valley Flood Protection Board (CVFPB) are unlawful (CWC § 8700, 8701). The Parkway, from approximately 0.5 mile upstream of Watt Avenue to the Nimbus Dam, is a CVFPB Designated Floodway (DWR 2020). Substantial landscape modifications within 300 feet of the Designated Floodway portion of the Parkway are subject to the encroachment authority of the CVFPB and may require issuance of an encroachment permit. The CVFPB's encroachment authority is further recognized in Title 23, Division 1 of the California Code of Regulations (23 CCR T. 23, Div. 1).

In addition, under Sections 8590 - 8613 of the California Water Code, the CVFPB is responsible for monitoring the facilities of local reclamation districts and flood control agencies, such as Sacramento Area Flood Control Agency (SAFCA) and the American River Flood Control District (ARFCD). Any use or work in the Parkway floodplains or within 10 feet of the base of a levee must be approved by the CVFPB through issuance of a permit as permissible by the USACE under Section 408. CVFPB may also require the County to obtain endorsement from SAFCA or ARFCD for proposed work (Sacramento County 2008b).



*Riparian scrub and Fremont cottonwood trees in the Howe Avenue Area. Photo Credit: Regional Parks*

### Oak Woodlands Conservation Program

The State Legislature passed the Oak Woodlands Conservation Act (Senate Bill No.1334) in 2004. The Act requires counties to consider whether a proposed project would significantly impact the environment through conversion of oak woodlands when determining whether an environmental impact report (EIR), mitigated negative declaration (MND), negative declaration (ND), or categorical exemption must be prepared under the California Environmental Quality Act (CEQA). If a project would have a significant impact on oak woodlands, the impact must be mitigated. Therefore, under CEQA, any project proposed to

take place within the Parkway that would significantly impact the environment through alteration of its oak woodlands would need to incorporate mitigation measure(s) to reduce the significance of potential impact(s) (Sacramento County 2008b).

### Urban American River Parkway Preservation Act

The Urban American River Parkway Preservation Act, adopted in 1985 and amended most recently in 2011, is the act by which the California State Legislature adopted the Parkway Plan. The Act defines the Parkway Plan as the revised, updated management plan for the LAR adopted by resolutions of the City and County of Sacramento. The Act declares that the Parkway and its environs contribute to the quality of life within the City of Sacramento, the City of Rancho Cordova, and the County of Sacramento. The adoption of the Act allows local planning efforts related to the Parkway to be eligible for certain types of grants and funding (CA PRC §5840-5843).

### State Wild and Scenic Rivers System Act (WRSA)

The California WSRA was passed in 1972 after the adoption of the National WSRA in 1968. Under California law, "…certain rivers which possess extraordinary scenic, recreational, fishery, or wildlife values shall be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state" (CA PRC §5093.5-5093.7). Rivers are classified as:

- Wild: free-flowing waterways that are unpolluted and generally inaccessible,
- Scenic: free-flowing, undeveloped waterways accessible by roads, or
- Recreational: readily accessible waterways with some development.

This Act preserved about a quarter of California's undeveloped waterways in their natural states. State-designated wild and scenic rivers were adopted into the National WSRA in 1980 (Water Education Foundation 2020). The American River is considered a State-managed river that receives state and federal protection under both WSRAs.

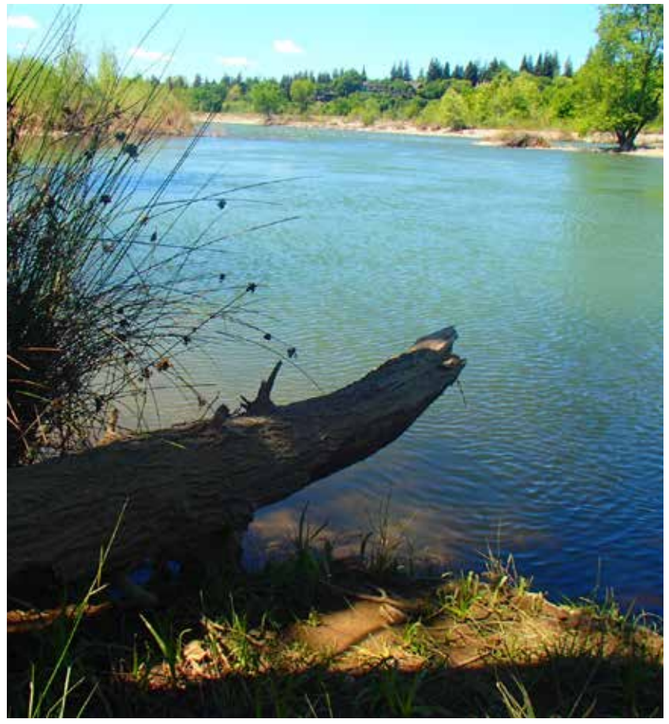
### California Environmental Quality Act (CEQA)

In 1970, the State Legislature enacted CEQA, which requires local and state government agencies to inform decision makers and the public of the potential physical environmental impacts of a proposed project. Under CEQA, the lead local or state agency prepares an environmental document, including project details, potential environmental impacts, and, if applicable, measures to avoid or reduce potential impacts. The environmental document is then released for public review and comment.

Implementation of CEQA is primarily guided by the CEQA Guidelines (CA Code of Regulations, Title 14, Section 15000), which are updated yearly by the California Natural Resources Agency and the Governor's Office of Planning and Research (OPR). Implementation is also guided by court decisions pertaining to interpretation of CEQA and local CEQA procedures (OPR 2020). The NRMP is subject to review under CEQA.

### Assembly Bill No. 52 (AB52)

Through Assembly Bill No. 52 (AB 52), the California State Legislature added new requirements regarding tribal cultural resources in the environmental review process under CEQA. AB 52 established that "a [project] with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment," requiring a lead agency to notify California Native American tribes traditionally and culturally affiliated with an area early on in the CEQA environmental review process. Following notification, a California Native American tribe may request consultation under AB 52. Consultation must occur prior to the public release of a negative declaration, mitigated negative declaration, or environment impact report for a project (OPR 2017). As part of environmental review of the NRMP under CEQA, the County may be required to notify California Native American tribes affiliated with the Parkway of the potential impacts of the NRMP on tribal cultural resources. In addition, individual projects called for by the NRMP that undergo environmental review in the future may be required to comply with AB 52.



*Riverbank in the River Bend Park Area.*
*Photo Credit: Wildlife Conservation Board*

*Arden Pond in the Arden Bar Area. Photo Credit: MIG*

### California Endangered Species Act (CESA)

The California Endangered Species Act (CESA) was enacted in 1970 to protect California's threatened and endangered plant and animal species. Plant and animal species become listed in a formal listing process by the California Fish and Game Commission, after which the California Department of Fish and Wildlife (CDFW) coordinates with agencies, organizations, and landowners to protect CESA-species and conserve their habitats. CESA declares listed species shall not be imported into the state, exported out of the state, "taken," (defined under CESA as hunting, pursuing, catching, capturing, or killing, or attempting to hunt, pursue, catch, capture, or kill a listed species), possessed, purchased, or sold without proper authorization (in the form of a permit) (CDFW 2020). The Parkway contains plant species and provides habitat for animal species listed, proposed for listing, or candidates for listing under CESA. As a result, natural resource management in the Parkway is subject to the statutes and regulations of CESA. Appendix C contains a list of special-status species that occur or have the potential to occur in the Parkway.

### California Fish and Game Code, Section 1602

Section 1602 of the California Fish and Game Code applies to activities that may: 1) substantially divert or obstruct the natural flow, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or 2) deposit or dispose of debris, waste, or other material where it may pass into any river, stream, or lake. Any entity proposed to conduct such an activity must notify CDFW before commencing the activity. CDFW then determines whether the entity proposing the activity must secure a Lake and Streambed Alteration (LSA) Agreement. Pursuant to Section 1602 of the Fish and Game Code, any entity proposing to conduct activities that may impact the LAR, streams, or lakes in the Parkway must notify CDFW (FGC § 1602).

### California Protected Species Statutes

California implements state regulations that provide greater protection for specified species and their habitat beyond that of CESA and FESA. These regulations as described in Section 4.4 Special-Status Species of the NRMP.

### Lower American River Conservancy Act

The Lower American River Conservancy Act (AB 1716) (PRC, § 5845 et seq.) established the Lower American River Conservancy Program under the California Natural Resources Agency. The Lower American River Conservancy Program receives and disburses money through grants and other means to local public agencies and nonprofit organizations to implement projects for the benefit the Lower American River, including the Parkway. The Lower American River Conservancy Act also prioritized allocation of funding to develop and implement a Parkway natural resources management plan as a component of administering the Lower American River Conservancy Program.

## 3.2.3 Applicable Local Regulations

### 2008 American River Parkway Plan

The Parkway Plan is the guiding policy document for the Parkway that contains policy statements of a general and flexible nature to guide management decisions within the Parkway. The Plan acts as an informational document and an invitation for citizen participation in the planning process; the Plan also is the major guiding document for the implementation of the Wild and Scenic River designation. It also provides basic policy guidance for the future of the Parkway. The County of Sacramento has the principal

responsibility for administration and management of the Parkway as guided by the Parkway Plan.

The purpose of the Parkway Plan is to provide a guide for land use decisions affecting the Parkway. The Parkway Plan specifically addresses the preservation, use, development, and administration of the Parkway. The Parkway Plan outlines specific policies for the overall Parkway, as well as Area-specific (e.g., SARA Park, Arden Bar, etc.) policies regarding authorized use of the Parkway and its resources. These include limits on development and protection of natural resources (Sacramento County 2008a).

### River Corridor Management Plan (RCMP)

The River Corridor Management Plan (RCMP) is a plan created in 2002 by the Lower American River Task Force (LARTF) "…to institute a cooperative approach to managing and enhancing the Lower American River [LAR] corridor's aquatic and terrestrial ecosystems, flood-control systems, and recreation values within the framework of the 1985 American River Parkway Plan" (p. 1). The RCMP is not a legally binding document, and inclusion of a project in the RCMP action plan is not intended to imply that the project has been formally approved by agencies with jurisdiction over that project. The RCMP provides a framework for integrated management of the river corridor. The NRMP would fit within the RCMP's management framework as a guidance document to which LARTF-participating organizations and agencies would refer for natural resource management direction.

### Sacramento Area Flood Control Agency (SAFCA)

In 1989, the City of Sacramento, Sacramento County, Sutter County, ARFCD, and Reclamation District No. 1000 formed SAFCA through a Joint Exercise of Powers Agreement to better protect the Sacramento area from the impacts of flood events. SAFCA works with State and local flood control agencies and municipalities and with USACE to plan and implement regional flood control improvement projects, including levee improvement and bank protection projects such as the American River Common Features Project. Any work that may impact the flood control infrastructure over which SAFCA or ARFCD has operational and maintenance responsibility would require coordination with SAFCA or ARFCD as described above under the California Water Code section (SAFCA 2020).

### Sacramento County Floodplain Management Ordinance

The Sacramento County Floodplain Management Ordinance requires all proposed development activities in the county be reviewed by the Sacramento County Department of Water Resources (County DWR) for compatibility with local and Federal Emergency Management Agency (FEMA) floodplain management standards. Specifically, the Ordinance describes the development activities allowed in floodplains and provides standards for development. For example, the Ordinance includes acceptable elevations for public roads and requirements for fill placement in floodplains. Approved projects cannot adversely impact floodplain elevations and thereby, create a hazard in a floodplain. Development proposed in the Parkway's floodplains requires review by the County DWR as described above. The preparation of accompanying technical studies may be required.

### Sacramento County General Plan 2030

The Sacramento County Board of Supervisors adopted an updated General Plan in 2011 that has a planning horizon extending to 2030. Some of the County of Sacramento's General Plan goals and policies pertain to its rivers. Some of the key goals are summarized below:

*Overlooking Bushy Lake from levee in the Cal Expo Area. Photo taken April 19, 2018. Photo Credit: Wildlife Conservation Board*

- Manage water supply to protect valuable water-supported ecosystems.
- Manage the quality and quantity of urban runoff to protect the beneficial uses of surface water and groundwater.
- Establish and manage a preserve system with large core and landscape level preserves connected by wildlife corridors throughout Sacramento County to protect ecological functions and species populations.
- Protect and maintain habitat for special status species.
- Manage riparian corridors to protect natural, recreational, economic, agricultural, and cultural resources.

- Maintain levee protection, riparian vegetation, function, and topographic diversity by stream channel and bank stabilization projects.
- Stabilize riverbanks to protect levees, water conveyance and riparian functions, water quality, supply and conveyance.
- Conserve and protect the Sacramento, Cosumnes, Mokelumne, and American Rivers to preserve natural habitat and recreational opportunities.
- Make land uses within and development adjacent to stream corridors consistent with natural values.
- Provide and protect high-quality in-stream habitat, water quality, and water flows to support fisheries propagation, development, and migration.
- Preserve and protect heritage and landmark tree resources for their historic, economic, and environmental functions.

## City of Sacramento General Plan 2035

The portion of the Parkway within the City of Sacramento is considered "Open Space" that is unlikely to undergo any major development through the General Plan's 2035 timeline. Many of the City of Sacramento's General Plan goals and policies pertain to its rivers. The NRMP will be consistent with all City of Sacramento General Plan 2035 Goals and Policies pertaining to the Parkway. The General Plan goals relate to the following:

- Waterway Conservation
- Open Space System
- American River Parkway Plan: *The City recognizes the Parkway Plan as an important State land use and policy document prepared through the Urban American River Parkway Preservation Act.*
- Open Space Preservation / Connected Open Space Program / Open Space Buffers
- Waterway Recreation and Access / River Parkways
- Conservation of Open Space Areas / Resource Preservation / Conservation of Open Space
- Natural Lands Management / Retention of Habitat Areas / Riparian Habitat Integrity
- Wetland Protection
- Annual Grasslands / Oak Woodlands
- Wildlife Corridors
- Habitat Assessments
- Urban Forest Management Plan
- Management and Enhancement of the City's Tree Canopy / Trees of Significance
- Scenic Resources at River Crossings
- Floodplain Capacity

## City of Rancho Cordova General Plan

The City of Rancho Cordova describes the portion of the American River and its associated Parkway as a "significant natural feature" in its General Plan, adopted in 2006. Many of the City of Rancho Cordova's General Plan Goals and Policies are applicable to natural resources management in the Parkway. The NRMP will be consistent with all City of Rancho Cordova's General Plan Goals and Policies applicable to the Parkway. Some of the General Plan Goals related to natural resources are listed below:

- Protect and preserve diverse wildlife and plant habitats, including habitat for special status species.
- Preserve the City's rich and diverse natural wetlands.

**TOP** *Red sesbania plants on river island in the Arden Bar Area. Photo Credit: Regional Parks*

- Preserve and maintain creek corridors and wetland preserves with useable buffer zones throughout the new development areas, as feasible.
- Encourage the planting and reservation of high-quality trees throughout the City
- Protect the quantity and quality of the City's water resources.
- Reduce the possibility of a flooding or drainage issue causing damage to urban land uses within the City.

# 3.3 LAND USE

Early human use of what is now the Parkway dates to the prehistoric period. The Nisenan Maidu, a subgroup of the Maidu Native Americans, occupied the lands adjacent to the American River and utilized the area's resources for shelter, water, food, and toolmaking (Kroeber 1925). Nisenan use of land included controlled burns to maximize plant diversity, limit dry fuel loads, and remove vegetation for basket weaving, shelters, food, and firewood, among other practices (Anderson and Moratto 1996). The Nisenan people essentially disappeared from the waterfront areas of the LAR at the onset of the Gold Rush in the mid-nineteenth century as a result of land appropriation and mass death attributed to disease and violent conflict (Wilson and Towne 1978).

The establishment of European settlements in the early nineteenth century led to the development of agricultural production areas along the LAR. In 1839, Juan Bautista Alvarado, Mexican governor of Alta California, granted the responsibility of colonizing the Sacramento Valley to John Augustus Sutter, who subsequently established Sutter's Fort and the settlement at the Rancho Nueva Helvetia. The establishment of Sutter's Fort and Rancho Nueva Helvetia was a catalyst for flourishing agricultural use of the LAR floodplain (Owens 1991).

The California Gold Rush era sparked growth of the waterfront area along the American River. The Gold Rush era was marked by increasingly destructive land use practices (Sacramento County 2008a). Mid- to late nineteenth century hydraulic mining upstream in the Sierra Nevada mountain range and its foothills involved the use of high-powered jets to blast through the terrain and obtain gold embedded in hillsides. Gold mining in and adjacent to the LAR began in the late nineteenth century and drastically altered the river basin. Mining activities left behind extensive dredge tailings, deposited mining debris into the river, and degraded habitat and agricultural areas. What are now the Mississippi Bar, Sailor Bar, Sacramento Bar, and Arden Bar Areas were significantly impacted by gold mining operations. Aggregate mining and similar gravel extraction activities began in the early twentieth century, but no longer occur in the Parkway. Currently, resource agencies may, with authorization, use aggregate materials from past extraction activities for habitat restoration initiatives and State Parks may potentially permit the use of aggregate materials for dam operations and safety needs (Sacramento County 2008a).

*Preservation site at Northgate and Del Paso in the Discovery Park Area. Photo Credit: Wildlife Conservation Board*

Industrialization of the LAR floodplain began with the growth of the City of Sacramento in the early twentieth century and led to the development of railroads, bridges, and utility buildings. Dam and levee construction in the mid-twentieth century dramatically altered the fluvial geomorphology of the river system (Sacramento County 2008a). Recently, urbanization has continued the overall trend of human-induced alteration of the Parkway setting. As a result, the Parkway is currently surrounded by core metropolitan areas along its lower reaches and suburban sprawl along the upper reaches.

## 3.3.1 Existing Land Use Conditions

Land use in the Parkway is guided by six land use designations. Regional Parks and County Planning and Community Development refer to the land use designations in review of proposed projects, including new facilities and structures, events, improvements, maintenance operations, and ecological resource initiatives. The land uses of each Parkway Area reflect land use policy directives made in assessment of the environmental condition, size, location, and additional characteristics of each Area. While some areas of the Parkway are heavily disturbed, other areas have been altered less by human uses. An Area may contain multiple land use designations; however, a single tract of land can be assigned only one land use designation and there is no overlap. The land use designations guide Regional Parks in assessing whether a proposed or existing use, including recreational activities, is appropriate and consistent with the Parkway Plan. Certain activities, such as walking and fishing, take place throughout the Parkway, while others, such as barbequing and overnight camping, occur in limited locations. The six land use designations are as follows:

### OPEN SPACE PRESERVE

Lands designated as Open Space Preserve are meant to remain undeveloped and maintained in a way that minimizes human activity and impact. These areas are categorized as such due to topography, inaccessibility, and other factors. Limited development and facilities, such as fences, sprinkler systems, and gates, are allowed solely for the purposes of restoring habitat and ensuring public safety (Sacramento County 2008a). Open Space Preserve lands do not support recreational use because of topography, accessibility, and/or private ownership conditions (Sacramento County 2008a). Recreational activities under this land use designation are prohibited. Open Space Preserve areas are located in the San Juan Bluffs, Sacramento Bar, Sunrise Bluffs, and Sailor Bar Areas.

### NATURE STUDY AREA

Lands designated as Nature Study Areas are the most environmentally sensitive areas of the Parkway. Special environmental characteristics make these areas suitable only for passive recreation and facilities that would not degrade the natural features of the land. Nature Study Areas allow for the establishment and maintenance of minor structures and improvements, such as drinking fountains, portable restrooms, interpretive signage, and trail repairs (Sacramento County 2008a). Permitted recreational activities include nature appreciation, pedestrian use (including walking, running, and hiking), picnicking in the Cal Expo Area, boating in the Discovery Park Pond, and interpretive programming in certain areas (Sacramento County 2008a).

### PROTECTED AREA

Lands designated as Protected Area are suitable for general public access. These are typically large areas that can reasonably withstand moderate levels of public use and recreation without degrading substantially. However, heavy use of these lands is prohibited, as they are mostly intended to be protected or restored. These areas allow for the development of facilities and improvements (including trails, picnic tables, and restrooms) necessary for facilitating the public enjoyment of nature. (Sacramento County 2008a). Recreational activities allowed in Protected Areas include nature appreciation, picnicking along designated trails, day camping, pedestrian use (walking, running, and hiking), equestrian activities, bicycling, and aquatic recreation excluding motorized boating (Sacramento County 2008a).

### LIMITED RECREATION

Limited Recreation areas allow for active recreational activities limited in scope by size of land, lack of access, and other conditions. Non-recreational human uses such as agriculture and certain commercial activities are also allowed. Signage, picnic areas, and trails (and their supplementary features) are consistent with this land use designation (Sacramento County 2008a). Recreational activities allowed in these lands include nature appreciation, pedestrian use (walking, running, and hiking), equestrian activities, picnicking, day camping, and aquatic recreation (Sacramento County 2008a).

### DEVELOPED RECREATION

The Developed Recreation land use designation is assigned to lands that can support heavy use. Developed Recreation areas allow for all the facilities and activities permitted in the more restrictive land use designations, and support additional features such as interpretive centers, play apparatuses, and game fields (Sacramento County 2008a). All activities allowed within the previous land use designations are allowed in Developed Recreation areas. Additional permitted activities include team sports, archery in the Discovery Park Area, golfing in the Campus Commons and Ancil Hoffman County Park Areas, and group overnight camping for educational and youth group purposes (Sacramento County 2008a).

### RECREATION RESERVE

Lands designated as Recreation Reserve areas are intended for potential future recreational development, habitat restoration, or interpretive programming. These lands are meant to be converted to other land use designations in the future. Recreation Reserve areas can be used for agricultural activities, nurseries, caretaker quarters, public

utility facilities, and emergency access facilities (Sacramento County 2008a). While nature appreciation, pedestrian use (walking, running, and hiking), and aquatic recreation are allowed, currently the only Recreation Reserve area in the Parkway is the Regional Sanitation District's parcel in Arden Bar; the parcel is leased to the Sacramento County Sheriff's Office (Sacramento County 2008a).

Land uses adjacent to the Parkway include residential, commercial, infrastructure, park, and institutional uses. Several parks, such as Sutter's Landing Park in Sacramento and Hagan Community Park in Rancho Cordova, share boundaries with the Parkway. Adjacent open space uses increase the buffer between the Parkway and developed areas and create or bolster wildlife corridors that traverse the Parkway and provide access for native species. The California State University-Sacramento (CSUS), Rio Americano High School, and Sacramento Waldorf School campuses are institutional uses that border the Parkway. The CSUS campus is adjacent to the Campus Commons Area along the southern bank of the river. The Rio Americano High School campus borders the SARA Park Area to the north. The Waldorf School borders Sacramento Bar immediately to the north.

### RESIDENTIAL

Residential neighborhoods abut a substantial portion of the Parkway. Most residences are separated from the interior of the Parkway by roadways, bicycle trails, and other linear transportation features. Occupants of residences lining the Parkway are permitted to clear brush within 50 feet of private property lines for fire prevention purposes with a Fuel Break Encroachment Permit (Regional Parks 2019). Residential uses adjacent to and encroaching upon the Parkway are managed predominantly through enforcement of County of Sacramento and City of Rancho Cordova zoning regulations. Regional Parks also conducts routine Parkway monitoring activities (Sacramento County 2008a).

### COMMERCIAL/RETAIL USES

Commercial uses in the Parkway are typically operated by concessionaires (private parties that conduct business on public lands and waters with approval from the proper authority). Concessions in the Parkway can be categorized as either service-based or sales-based, though there is some overlap. They include raft and kayak rentals, non-recreational activities associated with the Ancil Hoffman Golf Course, Campus Commons Golf Course, and Effie Yeaw Nature Center, garbage pickup services, and special events (Sacramento County 2008a). Indeed, most commercial uses in the Parkway supplement recreational uses.

### AGRICULTURAL

In the past, the Parkway contained agricultural fields and settlements. Currently, agricultural land uses are allowed within areas with the Limited Recreation land use designation. Agricultural production occurs in the Parkway only at Soil Born Farms at the American River Ranch in River Bend Park. Operation of the farm, per the American River Ranch Master Plan, is consistent with the Parkway Plan.

### UTILITIES AND INFRASTRUCTURE

The Parkway is a hub of utility infrastructure, including electrical power transmission towers and poles, power lines, human made drainage mains, stormwater runoff outfall structures, wastewater and water supply pipelines, and additional public facilities.

Electrical power infrastructure in and near the Parkway is owned and maintained by the Pacific Gas and Electric Company (PG&E), the Sacramento Municipal Utility District (SMUD), or the Western Area Power Authority (WAPA). Over 150 electrical power transmission towers and poles are located throughout the Parkway, predominantly within the Discovery Park, Woodlake, and Cal Expo Areas.

Stormwater infrastructure, including tributaries, culverts, mains, and outfalls, transport surface runoff from surrounding urban and suburban areas into the LAR and adjacent Parkway lands. The Parkway contains portions of over 40 drainage mains, segments of approximately 15 natural and human made drainage courses, and over 40 outfall structures. Sacramento County, along with several cities in the County, are permittees under a NPDES MS4 (municipal separate storm sewer system) permit administered through Central Valley RWQCB. NPDES MS4 permits require permittees to adhere to runoff discharge requirements within their jurisdictions. As a result, preventing the pollution of runoff entering the Parkway can and should be managed by these municipal jurisdictions (Sacramento County DWR 2019).

Over 20 water purveyors supply potable and recycled water to communities in the greater Sacramento area (Sacramento County DWR 2019). Parkway facilities use potable water for drinking fountains and restroom facilities. Infrastructure in the Parkway includes underground pipelines and water intake structures, such as the E.A. Fairbairn Intake Structure in the Campus Commons Area, which pumps surface water from the LAR and treats it at the E.A. Fairbairn Water Treatment Plant adjacent to the CSUS campus. In addition, the Carmichael Water District owns and operates several water collection structures in the Rossmoor Bar Area (Sacramento County 2008a). Water supply and conveyance easements limit the activities that can take place within the bounds of the easement to protect the underground infrastructure and to ensure utility companies have unimpeded access. Water companies may be required to mitigate for land and vegetation that were initially disturbed

during infrastructure construction. As a result, areas adjacent to water supply utility easements may be set aside for use by the responsible company or district, thereby limiting Regional Parks' potential use of those areas.

Wastewater infrastructure in the Parkway includes conveyance infrastructure, such as sewer mains and interceptors, and facilities such as pump stations. The Regional Sanitation District operates and maintains wastewater facilities in the Campus Commons Area (Arden & Force Mains), SARA Park Area (Northeast Interceptor and associated facilities), Arden Bar Area (Northeast Interceptor and associated facilities), and the River Bend Park Area (Cordova Sewage Pumping Station & Force Main) (Regional San 2013). In addition, the Sacramento Area Sewer District (SASD) maintains and operates sewer pipelines and pump stations throughout the Parkway. The River Bend Park, Ancil Hoffman County Park, Rossmoor Bar, San Juan Bluffs, Sacramento Bar, Lower Sunrise, Sunrise Bluffs, Upper Sunrise, and Sailor Bar Areas all contain SASD wastewater pipelines. SASD pump stations are located in the River Bend Park, Ancil Hoffman County Park, San Juan Bluffs, Sunrise Bluffs, and Sailor Bar Areas. Miles of sewer pipelines convey wastewater from residences and businesses around Sacramento to the Sacramento Regional Wastewater Treatment Plant in Elk Grove to be treated and then discharged into the Sacramento River (Sacramento County 2019). Rights-of-way (ROWs) are maintained to ensure wastewater utility companies have safe and practical access to sewer infrastructure, and to prevent tree and plant roots from damaging pipelines.

Roads in the Parkway mainly facilitate access, whether that be for the public, maintenance, or emergency purposes. They can be categorized as either public access roads or maintenance/service roads accessed only by Regional Parks and emergency vehicles (Sacramento County 2008a). Roads serve the additional purpose of providing fire breaks by fragmenting vegetated areas that may act as fuel breaks for wildland fires. There are 18 bridges, ranging from pedestrian/bicycle to train to freeway bridges, in the Parkway (Sacramento County 2008a). The Parkway Plan advises against development of new bridges in the Parkway and recommends expanding existing bridge capacity where possible, and only if necessary (Sacramento County 2008a).

The NRMP is intended to guide Regional Parks in managing, maintaining, and enhancing Parkway resources in concert with the provision of recreation opportunities. Because all projects must be reviewed for land use consistency, applicable land use policy plays a role in determining what Regional Parks and other agencies can and cannot do when implementing natural resource management projects. The NRMP does not dictate land use decisions, but rather provides important resource information to support sound land use decisions and natural resource management.

All uses proposed within the Parkway require review for consistency with the Parkway Plan and Area-specific policies by Regional Parks. Actions proposed to occur on, and adjacent to, Parkway lands under the jurisdiction of the City of Sacramento or the City of Rancho Cordova are initially reviewed by City planning staff for consistency with either the Sacramento City Zoning Code or the City of Rancho Cordova Zoning Code (Sacramento County 2008a). Both City's Zoning Codes contain special requirements for proposed uses in and adjacent to the Parkway. For example, the City of Sacramento designates an American River Parkway-Floodplain (ARP-F) overlay zone to regulate uses within its municipal boundaries in the Parkway. The City of Rancho Cordova has incorporated the County's PC (Parkway Corridor) Combining Zone requirements into its Zoning Code (Sacramento County 2008a). All County and City ordinance requirements applicable to uses within Parkway boundaries were developed to ensure approved activities are consistent with the Parkway Plan. Depending on the scope and scale of a proposed use, approval by the County Board of Supervisors and additional governing bodies, such as the County Recreation and Parks Commission, may be required (Sacramento County 2008a).

Depending on the scope of a proposed use, environmental review may be required. Routine maintenance activities and administrative activities generally do not require environmental review. However, potential future actions determined to be "projects" under CEQA or the National Environmental Policy Act (NEPA) would be subject to environmental review. Sacramento County, the City of Sacramento, or the City of Rancho Cordova planning and environmental review staff would determine whether an action proposed to occur in or adjacent to the Parkway requires environmental review under CEQA or NEPA.

State or federal permits may be required for activities that would affect a Parkway area or feature, such as federally maintained levees, under the primary management responsibility of a state or federal agency. The County involves appropriate regulatory agencies in planning processes to obtain any necessary local, state, and federal permits and concurrences. The County accomplishes its legal requirements (for permits, consultations, and authorizations) under the ESA, CESA, CWA, and CEQA, and other laws and regulations, while considering compatibility between recreational uses of the Parkway and natural and cultural resource conservation.

Figure 3-1 shows the Parkway land use designations. See Figure 8-5 in Chapter 8 for the distribution of these land use designations.

Table 3-1 includes the amount of land under each land use designation in each Area of the Parkway.

**TABLE 3-1. LAND USE DESIGNATIONS BY AREA**

| AREAS | LAND USE DESIGNATIONS (ACRES)* | | | | | | OPEN WATER** | TOTAL ACRES* |
|---|---|---|---|---|---|---|---|---|
| | Open Space Preserve | Nature Study Area | Protected Area | Limited Recreation | Developed Recreation | Recreation Reserve | | |
| Discovery Park | - | 54 | 333 | 53 | 130 | - | 168 | 738 |
| Woodlake | - | - | 317 | 28 | 25 | - | 95 | 465 |
| Cal Expo | - | 66 | 294 | 30 | - | - | 29 | 419 |
| Paradise Beach | - | - | 109 | 4 | 3 | - | - | 116 |
| Campus Commons | - | - | 103 | - | 49 | - | 45 | 197 |
| Howe Avenue | - | - | 56 | 34 | 16 | - | 42 | 148 |
| Watt Avenue | - | - | 48 | 27 | 23 | - | 46 | 144 |
| SARA Park | - | - | 158 | 82 | 24 | - | 104 | 368 |
| Arden Bar | - | - | 128 | 43 | 62 | 36 | 34 | 303 |
| River Bend Park | - | 117 | 186 | 72 | 74 | - | - | 449 |
| Sarah Court Access | - | - | 2 | - | | - | 2 | 4 |
| Ancil Hoffman County Park | - | 103 | 35 | - | 247 | - | 2 | 387 |
| Rossmoor Bar | <1 | <1 | 398 | 51 | 103 | 1 | 1 | 554 |
| San Juan Bluffs | 22 | - | 0.1 | - | - | - | <1 | 23 |
| Sacramento Bar | 20 | 30 | 212 | - | 27 | - | 13 | 302 |
| Lower Sunrise | - | - | 103 | 1 | 66 | - | 1 | 171 |
| Sunrise Bluffs | 22 | - | 4 | - | <1 | - | <1 | 27 |
| Upper Sunrise | <1 | - | 124 | 94 | 88 | - | - | 306 |
| Sailor Bar | 15 | 37 | 189 | 21 | 110 | - | 2 | 374 |
| **TOTAL** | **79** | **407** | **2,799** | **540** | **1047** | **37** | **584** | **5,495** |

**Undesignated areas include open waters that are not located in the LAR channel.*

**Total acres may not equal the sum of the columns due to rounding.*

***Open water includes waters located in the Parkway that are not in the main LAR channel.*

# 3.4 PARKWAY AREAS

The Parkway Plan divides the Parkway into 19 Areas and the NRMP uses these same Areas for consistency. The locations and arrangement of the 19 Parkway Areas are shown in Figure 3-1 American River Parkway. Each Area has a Plan Map (included in Chapter 8.0 Management, Monitoring, and Implementation) that highlights and delineates natural resources, restoration areas, invasive species, inundation extents, and proposed management actions. One additional Area, Lake Natoma, is included in this chapter for reference and context only as it is managed by State Parks. The NRMP does not dictate land use decisions, as outlined in the Parkway Plan. Rather, the NRMP provides important resource information to support and inform decisions and natural resource management in each Area.

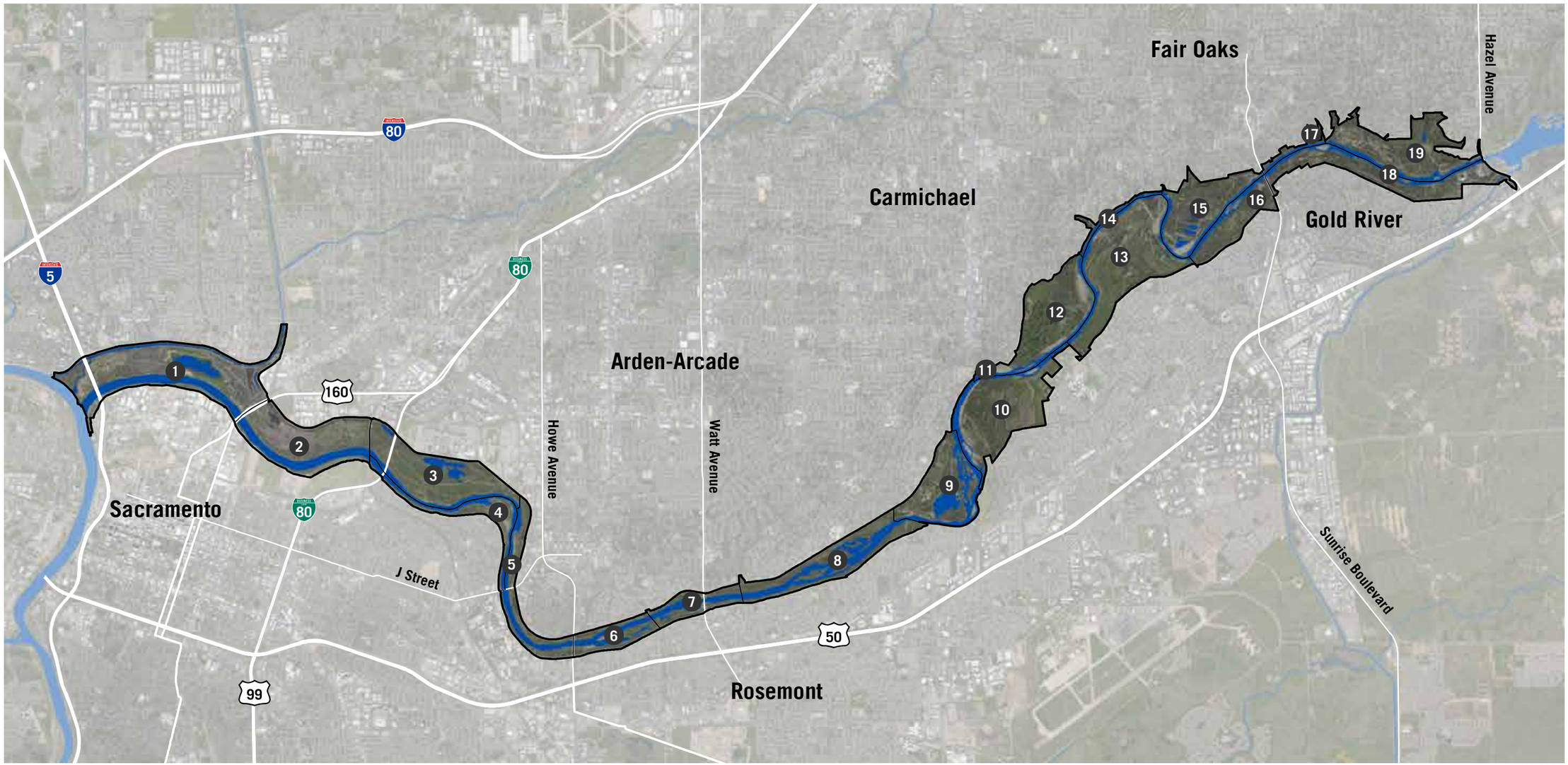
*The Jibboom Street Bridge in the Discovery Park Area. Photo Credit: MIG*

The Parkway Plan provides a comprehensive description of the Parkway. It contains a description of existing (as of 2008) and proposed future activities, location of natural and human made features, facilities, and opportunities and constraints. Unless facilities are specifically designated on an Area map of the Parkway Plan, they may not be constructed or installed. Area-specific policies are used to indicate what facilities, activities, and uses may be permitted or encouraged for a given Area.

The natural resource management maps refine the Parkway Area Plan maps with respect to preserving, protecting, and managing sensitive natural and cultural resources. The Parkway Plan Area Plan maps, along with the NRMP maps, will be reviewed when a physical change is proposed in the Parkway to determine the appropriateness of the change. An amendment to Parkway Plan Area-specific policies requires the approval of the County Board of Supervisors. The vegetation communities listed in each of the following Area descriptions are discussed in depth and shown in Figure 4-1 Vegetation Communities in Chapter 4 Biological Resources of the NRMP. Map sets, which include facilities, land use, inundation, vegetation communities, and level of physical alteration maps, for each of the Parkway Areas are included in Chapter 8 Management, Implementation, and Monitoring.

## 3.4.1 Discovery Park Area

The Discovery Park Area, one of the most developed and most frequented areas of the Parkway, is suitable for expanded connectivity and recreational amenities, augmented interpretive facilities, and focused management of pockets of high-quality natural habitat (Sacramento County 2008a). The Area is located between the confluence of the American River and Sacramento River to the west and Highway 160 to the east. In addition to Discovery Park proper, this Area is comprised of three subareas: Discovery Park East, Tiscornia Park, and Jibboom Street East. Notable locations in this Area are Camp Pollock, which is managed by the Sacramento Valley Conservancy (SVC), and the Urrutia Site (also known as the former Gardenland Sand and Gravel Mine), which is a former mining site with graded soils, a large water-bearing pit, stockpiles of soil and debris, and ruderal weed species.




ESRI 2021

0 1 2 Miles

**AREAS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Discovery Park | 5 | Campus Commons | 10 | River Bend Park | 15 | Sacramento Bar |
| 2 | Woodlake | 6 | Howe Avenue | 11 | Sarah Court Access | 16 | Lower Sunrise |
| 3 | Cal Expo | 7 | Watt Avenue | 12 | Ancil Hoffman County Park | 17 | Sunrise Bluffs |
| 4 | Paradise Beach | 9 | Arden Bar | 13 | Rossmorr Bar | 18 | Upper Sunrise |
| | | | | 14 | San Juan Bluffs | 19 | Sailor Bar |

# Figure 3-1
# American River Parkway

Tiscornia Park is largely a sandy beach bounded to the south by a levee (Sacramento County 2008a) and Jibboom Street to the east. Tiscornia Park is a long, narrow band of land with sandy beaches and slow moving river flows. Development of the Discovery Park Area is constrained by yearly flooding (Sacramento Country 2008a).

Vegetation communities in the Area include developed, open water, riparian woodland/forest, riparian scrub, turf/turf with trees, unvegetated, and valley foothill grassland.

Sections of Discovery Park have been disturbed by facilities development, fires, vegetation management activities, and the establishment of transmission towers and power lines. The Area contains several restoration areas for the federally-threatened Valley Elderberry Longhorn Beetle (VELB). An additional natural feature in the Area is Steelhead Creek, which enters Discovery Park at El Camino Avenue and becomes Bannon Slough where it runs westward through the Area until it discharges into the Sacramento River (Sacramento County DWR 2019).

The Discovery Park Area supports boating, fishing, pedestrian, biking, equestrian, picnicking, camping, and nature-appreciation activities. It also supports archery, field sports, and both small and large special events. It contains multiple and single use trails for hiking, biking, and equestrian activities, as well as car-top boat launches and boat ramps, an archery range, picnic areas with picnic tables, restrooms, and public parking (Sacramento County 2008a). Camp Pollock, a multi-purpose facility in the Discovery Park Area, supports picnicking, camping, special events, and interpretive and nature-appreciation activities. Recreational facilities include outdoor classrooms, camping areas, planned car top boat launches, picnic areas with picnic tables, equestrian staging areas, restrooms, and public parking.

Electrical power transmission towers dot the landscape to the east of the Urrutia Site and parallel to the Area's northern boundary. A portion of the Sacramento County Regional Sanitation District's (Regional San) Mode 2 Pipeline conveys wastewater from City of Sacramento-owned and -operated pumping stations north of the Parkway to the City of Sacramento Sewer System south of the Parkway through Discovery Park East and the Woodlake Area (Regional San 2013). In addition, Regional San maintains sanitary sewer overflow infrastructure, including pipelines and manholes, in the western half of Discovery Park.

Additional infrastructure in the Discovery Park Area includes three bridges, all of which cross the river. These bridges include Jibboom Street Bridge (a two-lane vehicle, pedestrian, and bicycle bridge), the I-5 American River Bridge, and the North Highway 160 Bridge (Sacramento County 2008a).

### 3.4.2 Woodlake Area

The Woodlake Area is comparatively less developed than other Parkway areas and supports minimal recreational activity (Sacramento County 2008a). The Area is located between Highway 160 to the northwest and Southern Pacific Railroad (S.P.R.R.) to the east. Woodlake contains an extensive floodplain situated significantly higher than the river throughout most of the year. Steep banks are located along both sides of the river, narrow beaches are interspersed along the north bank, and an urban drainage channel runs parallel to the levee on the north bank (Sacramento County 2008a). As with Discovery Park, the Woodlake Area is highly impacted by homeless encampments. In addition, swaths of vegetation in the Area have been cleared around electrical power infrastructure to reduce wildland fire risk.

**TOP** *Tiscornia Beach at the confluence of the American River and Sacramento River in the Discovery Park Area. Photo Credit: MIG*
**BOTTOM** *Archery field at Discovery Park. Photo Credit: MIG*

Vegetation communities in the Area include developed, elderberry scrub, open water, riparian woodland/forest, riparian scrub, turf/turf with trees, unvegetated, and valley foothill grassland.

The Woodlake Area supports pedestrian, biking, equestrian, fishing, swimming, and nature appreciation activities. It contains various recreational facilities, including multiple and single use trails for hiking, biking, and equestrian activities, as well as restrooms and public parking (Sacramento County 2008a). Part of Sutter's Landing Park, which is located along the south bank of the river, is included within the Area and supports pedestrian and biking activities on the Two Rivers Trail (Sacramento County 2008a). From 2017 to 2020, Regional Parks conducted an Off-Paved Trail Cycling Pilot Program (the Program), an initiative allowing bikers to use six miles of unpaved maintenance and fire roads in the Woodlake and Cal Expo Areas. The Program assessed the viability of off-paved trail cycling in the Parkway (Regional Parks 2019). In 2020, the County Recreation and Parks Commission voted to extend the Program indefinitely, and Regional Parks may now pursue permanent off-paved trail cycling in approved locations in the Woodlake and Cal Expo Areas.

As with the Discovery Park and Cal Expo Areas, easements have been established for electrical power infrastructure, including transmission towers and power lines (Sacramento County 2008a). The Area contains four bridges, including the South Highway 160 Bridge, the Sacramento Northern Bikeway Bridge, the Western Pacific Railroad Bridge, and the S.P.R.R. Bridge, which forms the Area's upstream boundary (Sacramento County 2008a; Google Maps 2019).

### 3.4.3 Cal Expo Area

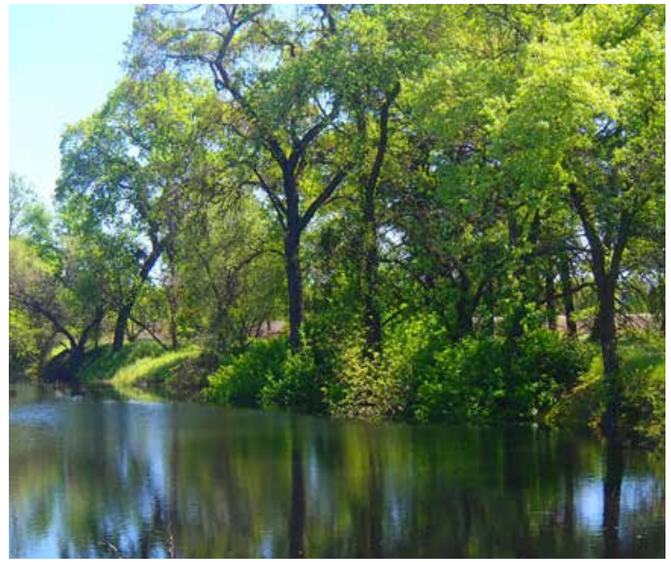
The Cal Expo Area is a floodplain adjacent to the heavily-used Cal Expo fairgrounds located to the north of the Parkway. The Area on the north bank of the LAR is state-owned Cal Expo land managed by Regional Parks in agreement between Cal Expo and Regional Parks. The Area must be maintained consistent with requirements for a State Park for preserving natural and cultural resources. Bushy Lake, a human made lake supplied with pumped groundwater, is the dominant natural feature in this Area.

Vegetation communities in the Area include developed, elderberry scrub, fresh emergent wetland, gravel bar chaparral, open water, riparian woodland/forest, riparian scrub, turf/tur with trees, and valley foothill grassland.

As with the Discovery Park and Woodlake Areas, electrical power infrastructure vegetation management activities have cleared extensive swaths of vegetation. Historical agricultural activities also contributed to the removal of riparian vegetation in the Area. The Cal Expo floodplain is a key area for habitat and resource restoration because it must be maintained as a State Natural Preserve (Sacramento County 2008a).

The Cal Expo Area supports pedestrian, biking, equestrian, fishing, swimming, picnicking, and nature appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, as well as public parking (Sacramento County 2008a). The Woodlake and Cal Expo Areas hosted an Off-Paved Trail Cycling Pilot Program from 2017 to 2020. Off-paved trail cycling in the Woodlake and Cal Expo Areas is now approved as a permanent use in the Parkway.

Electrical power transmission towers and power lines traverse the Area. The Capital City Freeway runs north-south through the Area and crosses the river at the Capital City Freeway Bridge, approximately one quarter mile east of the Area boundary (Sacramento County 2008a).



**TOP** *Native vegetation on the banks of levee borrow pit in the Woodlake Area. Photo Credit: Wildlife Conservation Board*
**BOTTOM** *Off-Paved Trail Cycling Pilot Program signage in the Cal Expo Area. Photo Credit: MIG*

### 3.4.4 Paradise Beach Area

The Paradise Beach Area is characterized by its long, contiguous habitat protection areas and popularity for beach activities. The Area is located on the south bank of the river, south of the Cal Expo floodplain, between the S.P.R.R. Bridge to the west and "H" Street Bridge to the southeast. Though most of the Area is maintained as natural habitat, the large, sandy beach located at a bend in the river has made Paradise Beach an informal recreation area. Annual flooding and unstable sandy soil limit development opportunities in this Area (Sacramento County 2008a).

Vegetation communities in the Area include developed, elderberry scrub, gravel bar chaparral, open water, riparian woodland/forest, riparian scrub, and unvegetated.

Paradise Beach does not contain permanent structures aside from the Capital City Freeway Bridge. A parking lot located outside the Parkway marks the single formal access point into the Area. Additional facilities include portable restrooms and trash cans. Despite its limited facilities and access points, the Area is visited frequently and allows for pedestrian, nature appreciation, fishing, swimming, and other beach-related activities (Sacramento County 2008a).

The Capital City Freeway Bridge crosses over a narrow strip of land about 900 feet in from the Area's downstream boundary (Sacramento County 2008a; Google Maps 2019). A small portion of a SASD pipeline crosses through Paradise Beach between the S.P.R.R. Bridge and the Capital City Freeway Bridge before continuing south.

*Aerial view of the E.A. Fairbairn Water Intake Station and Guy West Bridge in the Campus Commons Area. Photo Credit: Regional Parks*

### 3.4.5 Campus Commons Area

The Campus Commons Area is notable for its popular, yet limited recreational areas interspersed among areas of abundant, dense riparian vegetation. The Area includes the north bank of the river from the extension of Ethan Way to Howe Avenue and the south bank of the river from the "H" Street Bridge to Howe Avenue. The main features of this Area are the Campus Commons Golf Course, the Guy West Bridge connecting the north and south banks, the CSUS Alumni Grove (a meeting space with picnic tables, barbecues, and turf areas that is maintained by the CSUS Alumni Association), and a City of Sacramento water intake and pumping station (Sacramento County 2008a).

Vegetation communities in the Area include developed, elderberry scrub, open water, riparian woodland/forest, riparian scrub, turf/turf with trees, unvegetated, and valley foothill grassland.

The Campus Commons Area supports recreational activities such as golfing, pedestrian use, biking, equestrianism, picnicking, fishing, and nature appreciation. It contains multiple and single use trails for hiking, biking, and

equestrian activities, as well as picnic tables and barbeque facilities (Sacramento County 2008a). Annual flooding impedes recreational activity in the low-lying areas during the winter.

Regional San maintains the Arden Force Main, a sewage force main interceptor that traverses the Area and exits the Parkway near the City of Sacramento water intake and pumping station adjacent to Alumni Grove (Regional San 2013). During installation of the force main, native vegetation in the area was disrupted. Subsequently, a Native Plant Restoration Area was established in between the Guy West Bridge and "H" Street Bridge to mitigate for impacts to the previously natural habitat area (Sacramento County 2008a). The existing sewer easement in Campus Commons limits activities that Regional Parks and other agencies can undertake in proximity to sewer infrastructure.

The "H" Street Bridge, which provides pedestrian, bicycle, and vehicle passage, connects Fair Oaks Boulevard to the east with J Street and H Street to the west. The Guy West Bridge, a pedestrian and bicycle bridge, crosses over the Area and the river northwest of Alumni Grove. The Howe Avenue Bridge acts as the upstream Area boundary and provides pedestrian, bicycle, and vehicle passage over the river (Sacramento County 2008a).

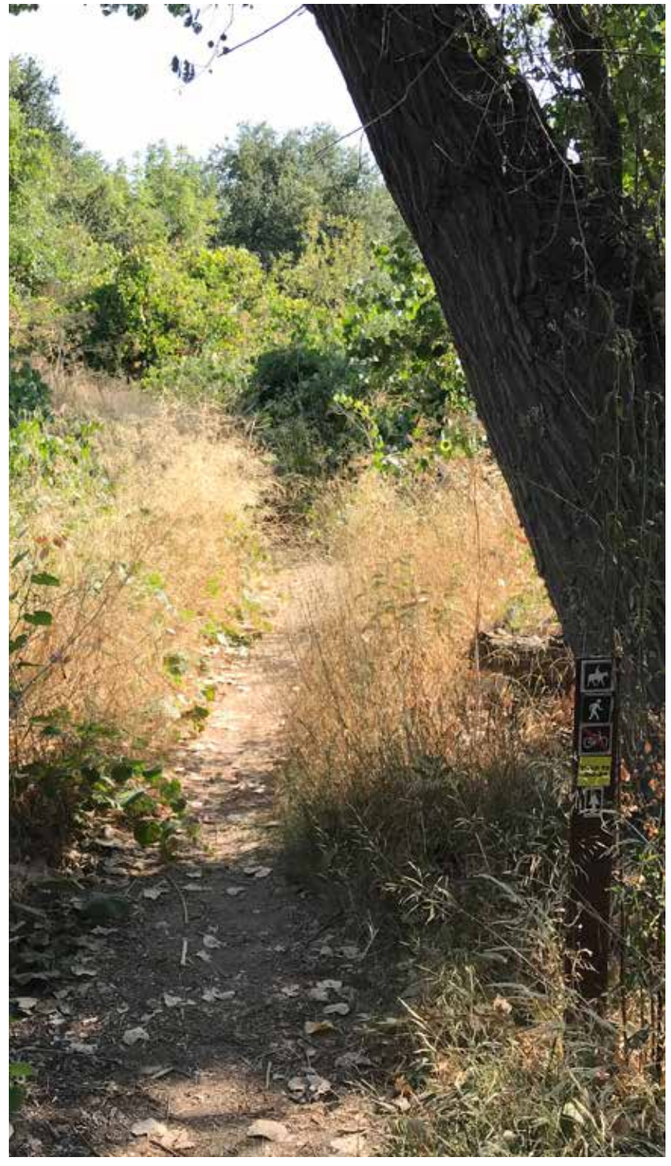
### 3.4.6 Howe Avenue Area

The Howe Avenue Area is located between the Howe Avenue Bridge on the west and an extension of Occidental Drive on the east. The eastern portion of the south bank and the entire stretch of the north bank are mostly undeveloped and are anticipated to remain undisturbed aside from visitor use of designated trails (Sacramento County 2008a).

Vegetation communities in the Area include developed, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, riparian scrub, turf/turf with trees, and unvegetated.

The Howe Avenue Area supports boating, swimming, fishing, pedestrian, biking, equestrian, and nature-appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, as well as car-top boat launches and boat ramps, equestrian staging, restrooms, drinking fountains, and public parking (Sacramento County 2008a).

Howe Avenue contains two clusters of electrical power transmission towers, one on the north bank and one on the south bank adjacent to the Howe Avenue Bridge. The Howe Avenue Bridge (a vehicle, pedestrian, and bicycle bridge) forms the Area's western boundary (Sacramento County 2008a).



*Equestrian trail and trailhead in the Howe Avenue Area.*
*Photo Credit: Regional Parks*

### 3.4.7 Watt Avenue Area

The Watt Avenue Area is a popular and heavily-used recreation-centered area in the Parkway (Regional Parks 2019). It includes the north and south riverbanks between the Howe Avenue Area to the west and the SARA Park Area to the east. The Watt Avenue Bridge centrally traverses the Area.

Vegetation communities in the Area include developed, gravel bar chaparral, open water, riparian woodland/forest, riparian scrub, turf/turf with trees, and unvegetated.

The Area supports pedestrian, biking, equestrian, boating, swimming, fishing, and nature-appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, as well as car-top boat launches, boat ramps, restrooms, and public parking (Sacramento County 2008a).

The Watt Avenue Bridge runs in the north-south direction and provides for pedestrian, bicycle, and vehicle travel over the Area (Sacramento County 2008a). A stormwater drainage main discharges into the river via an outfall structure on the north bank several hundred feet from the Area's downstream boundary.

### 3.4.8 SARA Park Area

The SARA Park Area is partially developed due to dense habitat composition and terrain limitations (Sacramento County 2008a). It is bounded by a drainage sump and pumping plant drainages to the west and the Harrington access road and a private property line to the east. The SARA Park Area, in addition to SARA Park proper, is comprised of two subareas: Gristmill and Rio Americano.

The original SARA Park site, located along the south bank of the river, contains small beaches and dense riparian vegetation. The Gristmill access area is adjacent to and east of the SARA Park site, and contains a bluff, a cobblestone bar, and numerous secluded waterfront areas (Sacramento County 2008a). The Rio Americano subarea is located north of the river and is characterized by islands, side channels, and wetland areas (Sacramento County 2008a).

Vegetation communities in the Area include developed, elderberry scrub, open water, riparian woodland/forest, riparian scrub, unvegetated, and valley foothill grassland.

The SARA Park Area supports boating, fishing, picnicking, pedestrian, biking, equestrian, and nature-appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, as well as car-top boat launches and picnic tables (Sacramento County 2008a).

The Regional San Northeast Interceptor, a sewer gravity interceptor, crosses from Arden Bar into the SARA Park Area underneath the river and then exits the SARA Park Area south toward Folsom Boulevard (Regional San 2013). SARA Park contains considerable stormwater infrastructure, including terminal portions of approximately one dozen drainage mains and accompanying outfall structures. Several of these structures discharge directly into the river.

**TOP** *Aerial view of the Watt Avenue Area. Photo Credit: John Hannon*
**BOTTOM** *Parkway users taking in the river scenery in the SARA Park Area. Photo Credit: Wildlife Conservation Board*

### 3.4.9 Arden Bar Area

The Arden Bar Area supports relatively high recreational use (Sacramento County 2008a). Arden Bar is located between the SARA Park Area to the west and the river to the south and east. This Area is comprised of two subareas: the Harrington Access area and the William B. Pond Recreation area.

The Harrington Access area is located on the north bank directly adjacent to the Rio Americano area. It is popular with boaters and rafters, as it contains a relatively large parking area, accessible beaches, and easily navigable river currents. The William B. Pond Recreation area is located on the site of a former gravel mine quarry. Historical dredging activities created a large pond that provides habitat for warm-water fish and a northeastern area with intermittent backwater depressions. The western part of the subarea contains popular recreational facilities and a parcel that was formerly occupied by a Regional San sewer treatment plant that is currently leased to the Sacramento County Sheriff's Department.

Vegetation communities in the Area include developed, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, riparian scrub, turf/turf with trees, and valley foothill grassland.

The Arden Bar Area supports boating, fishing, pedestrian, biking, equestrian, and nature-appreciation activities. It supports field sports and small special events with multiple and single use trails for hiking, biking, and equestrian activities, car-top boat launches, picnic areas with picnic tables, barbeque facilities, equestrian staging areas, restrooms, and public parking (Sacramento County 2008a).

*Emergent vegetation in Arden Bar pond in the Arden Bar Area. Photo Credit: MIG*

Arden Bar contains multiple power transmission poles and accompanying power lines. Several wastewater intake structures are in the Arden Bar Area, both at and outside of the former site of the sewer treatment plant. Wastewater is transported from the Arden Bar Area to the SARA Park Area and then south toward Folsom Boulevard through the Regional San-maintained Northeast Interceptor (Regional San 2013). A drainage main discharges runoff from an outfall structure near the Area's turf game fields.

The Harold Richey Memorial Bicycle Bridge connects the Arden Bar and River Bend Park Areas, and provides a pedestrian and bicycle crossing over the river (Sacramento County 2008a).

### 3.4.10 River Bend Park Area

The River Bend Park Area's central location in the Parkway, numerous recreational amenities, important natural features (including federally-designated critical VELB habitat), and interpretive/educational facilities make it one of the most diverse Areas in terms of land uses (Sacramento County 2008a). Notable facilities include Soil Born Farms, an urban agriculture and education farm and center located at the American River Ranch, and the River Bend Outdoor Education Site, which provides an outdoor classroom with an amphitheater, picnic tables, shade structures, and a campfire pit. Additional features in the River Bend Park Area include a large sand bar, a native plant nursery, and resource mitigation sites (American River Parkway Foundation (ARPF) 2019). River Bend Park proper is located between Arden Bar and the river to the west, and the river and a residential community to the east.

Vegetation communities in the Area include agriculture, developed, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, riparian scrub, turf/turf with trees, unvegetated, and valley foothill grassland.

Most of the western portion of the Area is federally-designated VELB habitat (Sacramento County 2008a). Much of the eastern portion of the Area is former farmland that has since been repurposed. Cordova Creek, a former concrete stormwater outfall channel, has been partially restored to a riparian corridor (Sacramento County DWR 2019).

River Bend Park supports boating, fishing, picnicking, camping, pedestrian, biking, equestrian, interpretive, small special event, and nature-appreciation activities. Recreational facilities include multiple and single use trails for hiking, biking, and equestrian activities, as well as car-top boat launches, interpretive centers, outdoor classrooms, amphitheater structures, day camping areas, picnic areas with picnic tables, barbeque facilities, equestrian staging areas, restrooms, and public parking (Sacramento County 2008a; Regional Parks 2019).

Regional San operates a pump station in River Bend Park adjacent to Hagan Park, a Rancho Cordova city park (Sacramento County 2008a). Several power transmission poles, along with ancillary power lines, are located along a bicycle path north of the pump station. Several stormwater outfall structures discharge runoff into the Area near the river.

The Harold Richey Memorial Bicycle Bridge provides pedestrian and bicycle passage over the river between the Arden Bar and River Bend Park Areas (Sacramento County 2008a).

### 3.4.11 Sarah Court Access Area

The Sarah Court Access Area provides a contained gathering space and access point for Parkway visitors. It is located across the river north of River Bend Park and to the southwest of Ancil Hoffman County Park.

Vegetation communities in the Area include developed, open water, and turf/turf with trees.

The Sarah Court Access Area contains a beach with an access ramp. It supports pedestrian, picnicking, nature appreciation, fishing, and beach-related recreational activities, such as swimming. Recreational facilities include picnic tables and a seasonal public parking area (Sacramento County 2008a).

**TOP** *California Native Plant Society Elderberry Farms Native Plant Nursery at Soil Born Farms in the River Bend Park Area. Photo Credit: Wildlife Conservation Board*
**BOTTOM** *Cordova Creek and adjacent plantings associated with the American River Ranch in the River Bend Park Area. Photo Credit: Regional Parks*

### 3.4.12 Ancil Hoffman County Park Area

The Ancil Hoffman County Park serves as a focal point for interpretive programming and provides plentiful, varied recreational amenities (Sacramento County 2008a). The Park is located on the river's north bank to the northeast of River Bend Park. It resides in an alluvial floodplain historically used for farming and now occupied by the Ancil Hoffman Golf Course, Effie Yeaw Nature Center, and other facilities. The Area contains bluffs that front the river, a natural drainage course named Carmichael Creek, and several graveled beaches.

Vegetation communities in the Area include developed, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, riparian scrub, turf/turf with trees, unvegetated, and valley foothill grassland.

The westernmost area of the Park contains critical VELB habitat (Sacramento County 2008a). Carmichael Creek runs through the Area in between the golf course and the Effie Yeaw Nature Center's Nature Study Area lands and empties into the river (Sacramento County DWR 2019). The Nature Study Area contains a small pond that is maintained by Regional Parks and supplied with pumped water.

Ancil Hoffman County Park supports numerous recreational activities, including golfing, boating, fishing, pedestrian, biking, equestrian, picnicking, field sport, small special event, and nature-appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, car-top boat launches, golf courses, game fields, interpretive centers, interpretive areas (including cultural demonstration areas), picnic areas with picnic tables, barbeque facilities, equestrian staging areas, restrooms, and public parking (Sacramento County 2008a).

The Area contains several electrical power poles and accompanying power lines near its southern boundary. A drainage main runs through the northwestern portion of the golf course and discharges into an area containing riparian vegetation. The Area also contains a SASD pumping station and sewer pipelines that run along the northern Area boundary, through the golf course, and around the golf course's ancillary buildings.

### 3.4.13 Rossmoor Bar Area

Rossmoor Bar is located between Ancil Hoffman County Park to the west and the Lower Sunrise Area to the east. Notable natural features in the Area are the John C. Mullaney Grove--where native oaks have grown in previously dredged areas and densely vegetated pools provide unique wildlife habitat with clay banks near the Area's eastern end and a large oak woodland restoration area. In addition, the Carmichael Irrigation District owns and maintains large water intake structures situated near the river in the northwest portion of the Area (Sacramento County 2008a).

Vegetation communities in the Area include developed, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, riparian scrub, turf/turf with trees, unvegetated, and valley foothill grassland.

Rossmoor Bar contains critical habitat for VELB along its western and eastern boundaries (Sacramento County 2008a).

The Rossmoor Bar Area supports boating, swimming, fishing, pedestrian, biking, equestrian, and nature-appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, car-top boat launches, restrooms, and public parking (Sacramento County 2008a).

**TOP** *Bridge over Carmichael Creek in the Ancil Hoffman County Park Area. Photo Credit: MIG*
**BOTTOM** *Car top boat launch located in the Rossmoor Bar Area. Photo Credit: MIG*

Several runoff drainage mains discharge into the southwestern portion of the Area. In addition, SASD sewer pipelines run almost parallel to the Area's southeast-southwest boundary. The pipelines eventually lead to the Regional San pump station in River Bend Park.

### 3.4.14 San Juan Bluffs Area

The San Juan Bluffs Area contains carefully maintained bluffs with average slopes of 70 percent. The bluffs are located across the river north of the Rossmoor Bar Area in between Ancil Hoffman County Park and the Sacramento Bar Area. Numerous private residences abut the Area along its northern boundary. Because the Area is particularly subject to erosion, development and recreational activities are prohibited and maintenance activities are closely monitored (Sacramento County 2008a).

Vegetation communities in the Area include developed, open water, and riparian woodland/forest.

The San Juan Bluffs Area contains a SASD pumping facility and sewer lines in an interior segment inland from the bluffs. In addition, several drainage mains discharge into the same interior segment.

### 3.4.15 Sacramento Bar Area

The Sacramento Bar Area's geomorphological features include multiple large fishing ponds formed from dredge tailings, making it a popular destination for fishing. The Area is situated on the north side of the river across from the Lower Sunrise Area. Much of the Area has been disturbed by historical gravel mining activities. Most of the Area's recreational facilities are concentrated in the eastern corner of the Area near the Jim Jones Bridge (Sacramento County 2008a). The Sacramento Waldorf School, a private use, borders Sacramento Bar to the northwest. Minnesota Creek extends into the Parkway near the Waldorf School adjacent to the Area's northern boundary.

Vegetation communities in the Area include developed, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, riparian scrub, and unvegetated.

The Sacramento Bar Area supports boating, swimming, fishing, picnicking, pedestrian, biking, equestrian, and nature-appreciation activities. Recreational facilities include multiple and single use trails for hiking, biking, and equestrian activities, car-top boat launches, equestrian staging areas, picnic areas with picnic tables, barbeque facilities, restrooms, and public parking (Sacramento County 2008a).

Sacramento Bar contains several SASD sewer pipelines that traverse the Area parallel to its northern boundary. Several drainage mains originating north of the Parkway discharge into Minnesota Creek. The Jim Jones Bridge provides pedestrian and cyclist passage over the river between the Sacramento Bar and Lower Sunrise Areas (Sacramento County 2008a).

**TOP** *The LAR channel and bluffs of the San Juan Bluffs Area. Photo Credit: MIG*
**BOTTOM** *Maintenance road in the Sacramento Bar Area. Photo Credit: Regional Parks*

### 3.4.16 Lower Sunrise Area

The Sunrise Recreation Area is divided into the Lower Sunrise and Upper Sunrise Areas and represents a largely developed area of the Parkway in which recreational facilities are a main source of attraction throughout the year. The Lower Sunrise Area comprises substantial valley oak habitat with a central picnicking area. It contains a combination of steeply and gently sloping riverbanks (Sacramento County 2008a).

Vegetation communities in the Lower Sunrise Area include developed, elderberry scrub, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, turf/turf with trees, and unvegetated.

The Lower Sunrise Area contains critical VELB habitat in its southwestern half, and supports boating, fishing, pedestrian, biking, equestrian, picnicking, and nature-appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, car-top boat launches, equestrian staging areas, picnic areas with picnic tables, restrooms, and public parking (Sacramento County 2008a).

The Jim Jones Bridge transports pedestrians and bicycles across the river between the Sacramento Bar and Lower Sunrise Areas. The Sunrise Boulevard Bridge, a vehicle, pedestrian, and bicycle bridge, forms the boundary between Lower Sunrise and Upper Sunrise (Sacramento County 2008a).

The Lower Sunrise Area contains six power poles along Sunrise Boulevard. Additional infrastructure includes two drainage mains that enter and discharge into the Area, one of which empties into the river, and SASD sewer lines.

*Valley oak trees and egret resting on in-channel island in the Lower Sunrise Area. Photo credit: Regional Parks*

### 3.4.17 Sunrise Bluffs Area

The Sunrise Bluffs Area is a narrow band of bluffs to which very limited pedestrian access is allowed and where high erosion potential precludes development. The Area contains bluffs with 100 percent slopes located on the north side of the river opposite the westernmost portion of Upper Sunrise (Sacramento County 2008a). The Sunrise Bluffs provide viewing points where visitors can observe the natural, scenic beauty of the upper reaches of the Parkway.

Vegetation communities in the Area include developed, gravel bar chaparral, open water, and oak woodland/forest.

A foot trail beginning near the Fair Oaks Bridge provides access to the Area and connects it to Fair Oaks Bluff (Sacramento County 2008a). No other recreational facilities are supported.

Infrastructure in the Sunrise Bluffs Area includes a SASD pump station and small portions of SASD sewer lines within the Area's interior.

### 3.4.18 Upper Sunrise Area

The Upper Sunrise Area is developed with recreational facilities and public agency offices, and contains a combination of steeply and gently sloping riverbanks (Sacramento County 2008a).

Vegetation communities in the Upper Sunrise Area include developed, elderberry scrub, foothill pine, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, unvegetated, and valley foothill grassland.

The Upper Sunrise Area has garnered the attention of organizations and agencies with botanical interests as it is the only Area of the Parkway containing the botanically-diverse foothill pine (FP) vegetation community, which is distinct from other vegetation types in the Parkway. In addition, Buffalo Creek enters the Parkway in Upper Sunrise and discharges into the American River just east of the Sunrise Boulevard Bridge (Sacramento Country DWR 2019). This Area contains the CDFW Regional Headquarters, the Nimbus Fish Hatchery, and the American River Hatchery immediately southwest of Hazel Avenue (Sacramento County 2008a).

The Upper Sunrise Area supports boating, fishing, pedestrian, biking, equestrian, and nature-appreciation activities. It contains multiple and single use trails for hiking, biking, and equestrian activities, car-top boat launches, boat ramps, equestrian staging areas, restrooms, and public parking (Sacramento Country 2008a).

*Aerial view of the Upper Sunrise Area (photo right). Photo Credit: John Hannon*

The Sunrise Boulevard Bridge, a vehicle, pedestrian, and bicycle bridge, forms the boundary between Lower Sunrise and Upper Sunrise (Sacramento County 2008a). The Old Fair Oaks Bridge, a pedestrian and bicycle bridge, crosses over the river in the Upper Sunrise Area several hundred feet east of Sunrise Boulevard (Sacramento County 2008a). The Hazel Avenue Bridge forms part of the upstream boundary of Upper Sunrise and marks the boundary of the Parkway and the transition between the Regional Parks and State Parks-maintained segments of the Parkway (Sacramento County 2008a). It provides for vehicle, pedestrian, and bicycle passage over the river.

### 3.4.19 Sailor Bar

The Sailor Bar Area contains dredge tailings from historic gold mining operations, high bluffs in the north, and hundreds of acres of vegetated ravines (Sacramento County 2008a). The Area attracts visitors looking for fishing, small watercraft launching, and wildlife viewing spots. The Area is located on the north bank between the Sunrise Bluffs to the west and Hazel Avenue to the east.

Vegetation communities in the Area include developed, elderberry scrub, gravel bar chaparral, open water, oak woodland/forest, riparian woodland/forest, riparian scrub, unvegetated, and valley foothill grassland.

Three unnamed drainages enter the Area at different points along its northern boundary. One of these channels is a mapped, unnamed creek that runs along the western boundary of the Area and discharges into the river (Sacramento County DWR 2019). The second drainage enters the Area to the east of the unnamed creek and feeds into the creek. The third drainage channel discharges into a human made pond located in the northern portion of the Area.

The Sailor Bar Area supports boating, fishing, swimming, picnicking, pedestrian, equestrian, and nature-appreciation activities. Recreational facilities include multiple and single use trails for hiking and equestrian activities, as well as boat ramps, equestrian staging areas, picnic areas, restrooms, and public parking (Sacramento County 2008a).

A SASD sewer pump station is located adjacent to Olive Avenue near the Area's eastern boundary and SASD sewer pipelines traverse the northern half of the Area. Additional infrastructure includes a drainage main that discharges into one of the unnamed drainage channels identified above, and several other outfall structures.

Hazel Avenue, including the Hazel Avenue Bridge, a vehicle, pedestrian, and bicycle bridge, forms part of the upstream boundary of the Sailor Bar Area (Sacramento County 2008a).

### 3.4.20 Lake Natoma

The Lake Natoma Area is included within this section for reference only. It is federal land administered by USBR and managed through an agreement by State Parks. The Lake Natoma Area includes 1,600 acres of land and 500 acres of water located between Hazel Avenue and the Folsom Dam (Sacramento County 2008a). Lake Natoma is a narrow lake approximately 4.5 miles long. The Lake Natoma Area is managed according to a different set of land use designations than those of the rest of the Parkway; these land use "categories" include Recreation, Conservation, Preservation, and Administration. (Sacramento County 2008a).

Key recreational areas are the CSUS Aquatic Center, Black Miner's Bar (formerly Negro Bar), Nimbus Flat, Mississippi Bar, Lake Overlook, and Willow Creek. Depending on the management area, users can enjoy many of the same recreational activities supported throughout the rest of the Parkway, including boating, fishing, hiking, biking, horseback riding, picnicking, camping, and more (Sacramento County 2008a).

Though the Lake Natoma Area and the Regional Parks-managed Areas of the Parkway contain similar natural features and recreational facilities, the Lake Natoma Area is meant to accommodate the recreational enjoyment of regional and state travelers more so than that of the locals of the Sacramento area. Both the Lake Natoma Area and the Regional Parks-managed Parkway Areas balance the provision and development of recreation with the protection and enhancement of natural and cultural resources.

*Condominiums atop bluffs in the Sailor Bar Area. Photo Credit: MIG*

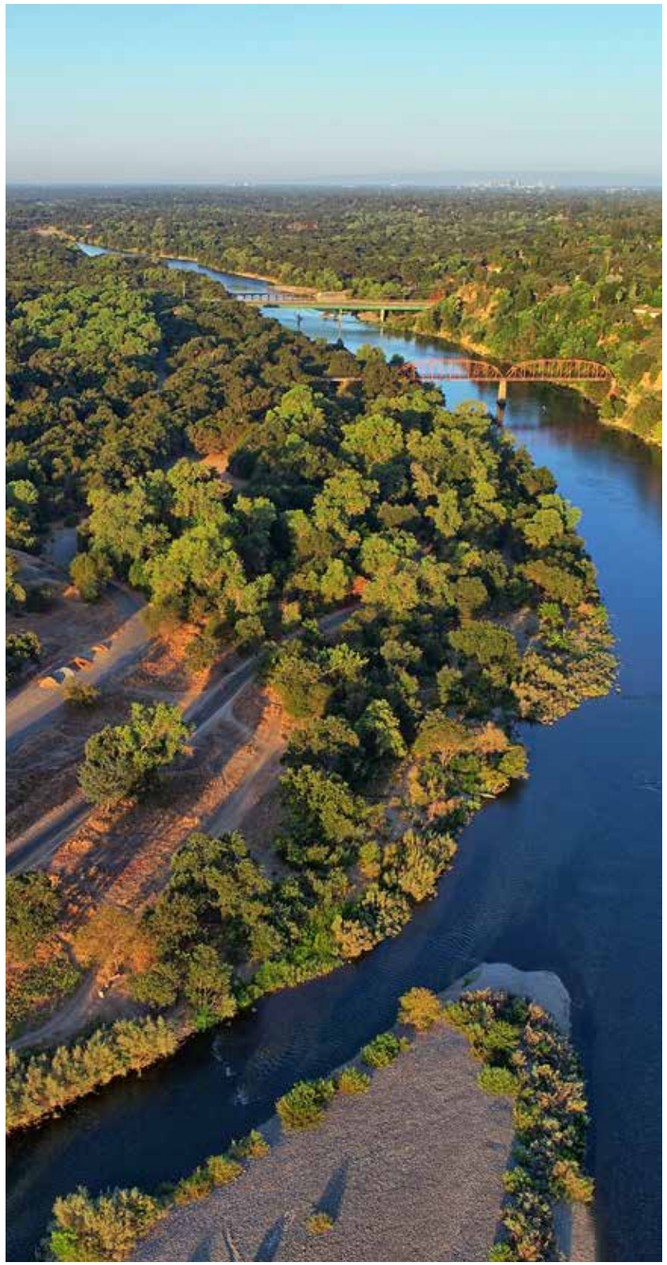
# 3.5 REGIONAL CONSERVATION CONTRIBUTION

The American River Parkway has been described as the "crown jewel" of the Sacramento County Park System (SARA 2019). Its aquatic, biological, edaphic, mineral, and cultural resources provide a wide array of services to the region, including fish and wildlife habitat, drinking water, scenic vistas, and recreational opportunities. The goals, policies, and objectives of the Conservation Element of the Sacramento County General Plan recognizes the need for effective conservation practices within the Parkway and are designed to manage and protect its natural resources for the use and enjoyment of present and future generations while maintaining the long-term ecological health and balance of the environment.

## 3.5.1 Conservation Plans

Although none occur within the Parkway boundary, four regional habitat conservation plans (HCPs) occur within the immediate vicinity of the Parkway. They include the 1) Natomas Basin Habitat Conservation Plan (HCP); 2) Yolo Natural Heritage Program Natural Community Conservation Plan (NCCP)/HCP; 3) Bay/Delta NCCP/HCP; and 4) South Sacramento HCP. These HCPs were developed and implemented to protect, conserve, and enhance natural resources such as soil, water, and air. In addition, they protect dozens of special status plant and animal species and their associated natural habitats. Guiding principles for these HCPs include minimizing habitat fragmentation, protecting watershed-level ecosystem functions, establishing preserves to protect irreplaceable and threatened resources, minimizing edge effects, employing setbacks between urban development and biological resources, encouraging heterogenous land uses to provide habitat diversity for shifting species needs in response to predicted climate change scenarios, and maintaining sufficient population distribution to sustain effective movement and genetic interchange of organisms between habitat areas. To accomplish these goals, conservation efforts typically focus on establishing a robust reserve system, restoring natural communities, and managing and enhancing the system of onsite reserves.

The California State Wildlife Action Plan (SWAP, CDFW 2015) is a statewide conservation plan developed to assess the health of California's wildlife and habitats, identify the problems they face, and outline the actions needed for long-term conservation of those resources. The Parkway resides in the Sacramento Valley subregion of the Central Valley and Sierra Nevada Province of the SWAP. Habitat conservation targets identified in the Parkway region include freshwater marsh and American southwest riparian forest and woodland. Within the Parkway, freshwater marsh habitats surround streams, rivers, lakes, and wet meadows in areas that are periodically saturated or flooded. Dominant species include rushes, reeds, grasses, and sedges. American southwest riparian forests and woodland habitats are found in permanently moist or riparian settings where sub-surface water is present throughout the year. Diagnostic species found in these forests and woodlands include Fremont cottonwood, black willow, red willow, California sycamore, California wild grape, narrow-leaf willow, button-bush, and spice bush. The Key Ecological Attributes (KEAs) identified for conservation targets within these habitats include the area and extent of the community, hydrological regime,



*Aerial view of the Upper Sunrise Area. Photo Credit: Josh Hannon*

habitat connectivity, successional dynamics, community structure and composition, soil quality and sediment deposition regime, and surface water flow regime.

SWAP outlines key pressures on conservation targets within the Sacramento Valley subregion. These pressures come from negative stressors associated with anthropogenic or natural drivers that strongly influence the health of the subregion. Stressors present within and adjacent to Parkway lands include climate change, commercial and industrial areas, housing and urban areas, dams and water management/use, household sewage and urban wastewater, invasive plants/animals, transportation corridors, and utility lines. SWAP proposes to reduce these pressures through a series of conservation strategies and goals, such as increasing acreage of functional and connected target habitats, improving natural hydrologic regimes, decreasing total dissolved solids in waters, encouraging population growth of target species, and more. To accomplish these goals, SWAP encourages public outreach and education, data collection, land acquisition, law and policy amendment, management plan development, and economic incentive opportunities.

### 3.5.2 Special-Status Species and Natural Communities

Five special-status plant species and forty-one special-status animal species identified by the US Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and California Native Plant Society (CNPS) have the potential to occur within natural communities found in the Parkway and certain adjacent lands. See Appendix C for the protection status, geographic distribution, habitat requirements, and documented and potential for occurrences in the Parkway for these special-status species. Natural vegetation communities include all Parkway habitats except for 'developed', 'agriculture', and 'turf' communities. The Discovery Park, Woodlake, Cal Expo (notably, Bushy Lake), and Rossmoor Bar Area Plans contain the largest extent of natural communities and sensitive species habitat. The Parkway also contains USFWS Critical Habitat for valley elderberry longhorn beetle (VELB), chinook salmon, and steelhead.

*Interpretive panel along restored Cordova Creek in the River Bend Park Area. Photo Credit: Wildlife Conservation Board*

### 3.5.3 Habitat Connectivity

Habitat connectivity refers to the extent to which separate patches of habitat are in contact and able to exchange genes and other crucial biological information throughout the region. Figure 4-3 Regional Wildlife Connectivity in Chapter 4 of the NRMP shows habitat connectivity in the Parkway and surrounding region. For example, the American River provides National Oceanic and Atmospheric Administration (NOAA) Fisheries Essential Fish Habitat (EFH) for Chinook salmon as the river waters and substrate are necessary for spawning, breeding, feeding, and growth. Protecting and restoring EFH helps to maintain productive fisheries and rebuild depleted fish stocks.

Northern Sierra Nevada foothills wildlife linkages and landscape blocks occur within the Parkway, according to the CDFW Northern Sierra Nevada foothills wildlife connectivity model and California Essential Habitat Connectivity (CEHC) project (CDFW 2012; CDFW 2010). The lands upstream of the Lower Sunrise and Sacramento Bar Area Plans form a portion of wildlife linkage B66_B16, which represents an ecologically significant wildlife movement pathway for acorn woodpecker, California ground squirrel, California quail, Cooper's hawk, pallid bat, wood duck, and yellow-billed magpie. Similarly, the Campus Commons Area Plan, and large portions of the Parkway upstream of the Watt Avenue Area Plan, are part of American River Parkway landscape block. Landscape blocks are those areas that act as corridors for potential wildlife movement between habitat areas.

# 3.6 CLIMATE CHANGE

Climate change is caused by the accumulation of greenhouse gases in the atmosphere (CACC 2019). When greenhouse gas emissions generated by human activities combine with water vapor, this prevents some of the sun's energy from escaping the atmosphere. This process traps heat and creates a warming effect referred to as the enhanced greenhouse effect (NAP 2001). Warming temperatures can affect the balance of the Earth's natural systems, resulting in warmer oceans, sea-level rise, extreme weather events, and increased occurrence of drought and wildfires (NASA 2019). As a result, climate change has the potential to dramatically alter riverine ecosystems mainly due to their connection to the hydrological cycle. In California, about 75 to 80 percent of the freshwater supply comes from the Sierra Nevada snowpack. Normally, the snowpack melts at a gradual rate; however, rising temperatures could cause the snowpack to melt earlier or all at once. This, in combination with infrequent or earlier occurrences of precipitation, could result in increased flooding and/or drought during certain seasons and warmer water temperatures (CFCC 2019). As such, it is likely that water flows will increase in the spring as Folsom Dam conducts water releases to ensure adequate capacity for flood management. In addition, early snowmelt could result in minimal flows by late-summer and fall and warmer water temperatures.

Extreme flooding may erode sediment and vegetation within the river channel, resulting in increased areas of bare ground with less habitat value and unsuited to support various sensitive species (Geological Society of America 2018).

The early loss of snowpack and the removal of riparian vegetation shading the water impacts water temperatures. Species that require colder water temperatures will continue to seek out deeper, colder areas upstream; however, if these areas are fragmented (e.g., by a dam) some species may be unable to migrate to cooler temperatures, resulting in changes in species and habitat use dynamics (Pletterbauer, Melcher, and Graf 2018).

Terrestrial species will likely face challenges from rising temperatures. In general, warming temperatures alter ecosystem functions and may result in the forced departure of certain native species and the proliferation of more opportunistic species (Environmental Protection Agency (EPA) 2017). In addition, many wildlife and plant species have life cycles directly linked to seasonality. Shifts in the duration of seasons, such as shorter and warmer winters, could impact the migration, blooming, and reproduction periods of certain species and, ultimately, food web dynamics (EPA 2017).

Changes in weather patterns may also impact park use dynamics. The Sacramento Valley is likely to experience increased severe hot weather conditions. In addition, milder winter temperatures may contribute to an extended "summer" season and, consequently, an increase in recreational use during wintertime (Dolesh 2017). Milder winter temperatures would result in warmer waters, which in turn would be conducive to increased water-oriented recreational activity, such as swimming and river rafting.

Climate change is a significant issue both locally in the Parkway and internationally. Increased global temperatures are expected over time as a result of an increase in carbon dioxide and other greenhouse gases in the atmosphere (United Nations 2019). The anticipated increase in global temperatures would have varying effects throughout the world. Although it is impossible to predict with great precision what would occur in the Parkway, it is anticipated that there will be an increase in extreme weather events and likely warmer summers and milder winters.

The NRMP addresses the uncertainties associated with climate change by first and foremost utilizing an adaptive management approach. This approach is responsive to changed conditions and helps to inform future actions. Many of the actions proposed in the NRMP contribute to a proactive approach that leads to ecosystem resilience in the Parkway. These include reducing human use impacts, restoring, enhancing, and expanding multiple habitat types, removing invasive plant species, looking for opportunities to expand/improve wildlife connectivity.

However, additional measures to be considered include the following:

1. Regularly review current climate change literature with a specific focus on the Central Valley, the Sacramento region, and the Parkway.

2. Regularly review Folsom Dam reservoir operations and collaborate on proposed changes.

3. Prioritize actions, especially actions that provide multiple benefits, based on potential opportunities to reduce climate change risks for the Parkway and the Sacramento region (including opportunities to promote aquifer recharge).

4. Design projects and actions to accommodate future changes to ensure ecosystem resilience by incorporating variability and buffer zones (including focused approaches to consider the requirements of target species).

5. Regularly report on the risks of climate change in the Parkway and the opportunities that have been identified and prioritized to reduce those risks.

6. Where appropriate and feasible provide interpretive information on how projects are addressing risks associated with climate change.

# 4 BIOLOGICAL RESOURCES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CHAPTER 4

# INTRODUCTION AND OVERVIEW

The Parkway is a 29-mile riparian corridor home to abundant biological resources, the living organisms that inhabit Parkway today. Historically, what is now the Parkway and its surrounding lands contained an extensive landscape of riparian and upland habitat in sprawling floodplains influenced by recurring seasonal flooding of the American River.

Natural processes determined the composition and dynamics of the river valley's mosaic of habitats and the vegetation and wildlife species of the valley.

Historic land uses have substantially affected Parkway vegetation, resulting in fragmented and oftentimes degraded habitats. Much of the floodplain upstream of the Sailor Bar and Upper Sunrise Area Plans consists of dredge tailings and mining debris created over an approximate 100-year period from the 1860s to the 1970s. With the construction of Folsom Dam in 1955, the hydrology of the river changed dramatically. As a result, the river currently supports limited regeneration of early successional riparian species (e.g., willows and cottonwood) on much of the floodplain, except on the river channel edges, lower point bar surfaces, and in-channel islands (ESA 2018).

The riparian forest and woodland of the LAR is a type of vegetation community, or collection of vegetation attributes across the landscape, that has declined dramatically in California in recent history. Grasslands, savannas, and freshwater marshes are similarly reduced across many of the landscapes in which they historically occurred in California, including the Parkway. Still, the Parkway provides a contiguous naturalized environment unlike any other area in metropolitan Sacramento. A variety of plants and wildlife native to California rely upon the continued functionality of the habitat types found within the Parkway for survival.

The Parkway's biological resources are significant not only for the ecological functions they serve, but also as a main source of attraction to Parkway users. Nature-viewing, citizen science, interpretive programming, and volunteer restoration activities in the Parkway all depend highly on the continued health and integrity of its biological resources.

While most of the historical human uses that permanently altered the ecological makeup of the Parkway are no longer present, continued encroachment and increasing intensity of human uses in and adjacent to the Parkway may further adversely impact the biological resources of the Parkway. Active and adaptive management is needed to ensure continued human use of the Parkway complements its habitats, plants, and wildlife. The NRMP provides an important opportunity to protect, improve, and restore the Parkway's biological resources in conjunction with preserving its flood control capacity and recreational features.

This chapter provides an overview of the biological resources of the Parkway. Section 4.1 Vegetation Communities and Wildlife Habitats lists and describes the Parkway's vegetation communities. Section 4.2 Sensitive Habitat provides an overview of the four types of sensitive habitat, or habitat containing sensitive vegetation communities or is critical for special-status wildlife, in the Parkway. Section 4.3 Habitat Connectivity defines the components of habitat connectivity and describes the status of connectivity across the Parkway landscape. Section 4.4 Special-Status Species give detail on the special-status plants and wildlife species that are known to occur in the Parkway. Section 4.5 Invasive Species describes the dominant, non-native plant and wildlife species that adversely impact native plants and wildlife in the Parkway. Section 4.6 Wildfire summarizes wildfire's impacts on natural resources, describes conditions that influence the prevalence of wildfire in the Parkway, and provides a history of wildfire activity in the Parkway.

*Native vegetation on the banks of levee borrow pit in the Woodlake Area. Photo Credit: Wildlife Conservation Board*

Nomenclature used throughout the document follows Jones et al. (1992) for mammals, American Ornithologists' Union (1996) for birds, Jennings (1983) for reptiles and amphibians, and Baldwin et al. (2012) for plants. Vegetation communities were classified according to the *Manual of California Vegetation (MCV), 2nd Edition* (Sawyer et al. 2009) and/or *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).

# 4.1 VEGETATION COMMUNITIES AND WILDLIFE HABITATS

Vegetation community structure and composition gradually transitions from low elevation Sierra Nevada Mountain foothills between Folsom Dam and Nimbus Dam, to the Sacramento River valley floor downstream of Nimbus Dam, and then to the LAR confluence with the Sacramento River. Between Nimbus Dam and the Sacramento River, valley floor riparian habitats occur within a narrow band along the banks of the LAR. Here, topographically variable uplands support mainly hardwood forests and grasslands (Figure 4-1 Vegetation Communities). At the lower end of the river corridor, near the confluence with the Sacramento River, the flat valley floor supports a structurally diverse complex of grassland, elderberry savanna, freshwater marsh, riparian scrub and woodland, and deciduous hardwood forest. Parkway vegetation is intrinsically tied to channel dynamics, topography, elevation, distance from the river, and frequency of inundation (Watson 1985).

A mosaic of vegetation communities has been mapped within the Parkway (Figure 4-1 Vegetation Communities). The Parkway contains 10 vegetation communities and two land cover types: developed land and unvegetated areas. The following vegetation community and land cover descriptions were derived from data provided by Regional Parks' natural resource management staff, the River Corridor Management Plan (RCMP) (Jones & Stokes 2002), and the American River Parkway Floodway Vegetation Management Plan (FVMP) (EDAW 2009). Existing communities are defined by vegetation attributes and characteristics, such as structure, growth form, floristic composition, and canopy cover. In some instances, physical factors, such as successional relationships and landform type, were used to distinguish vegetation types across the Parkway.

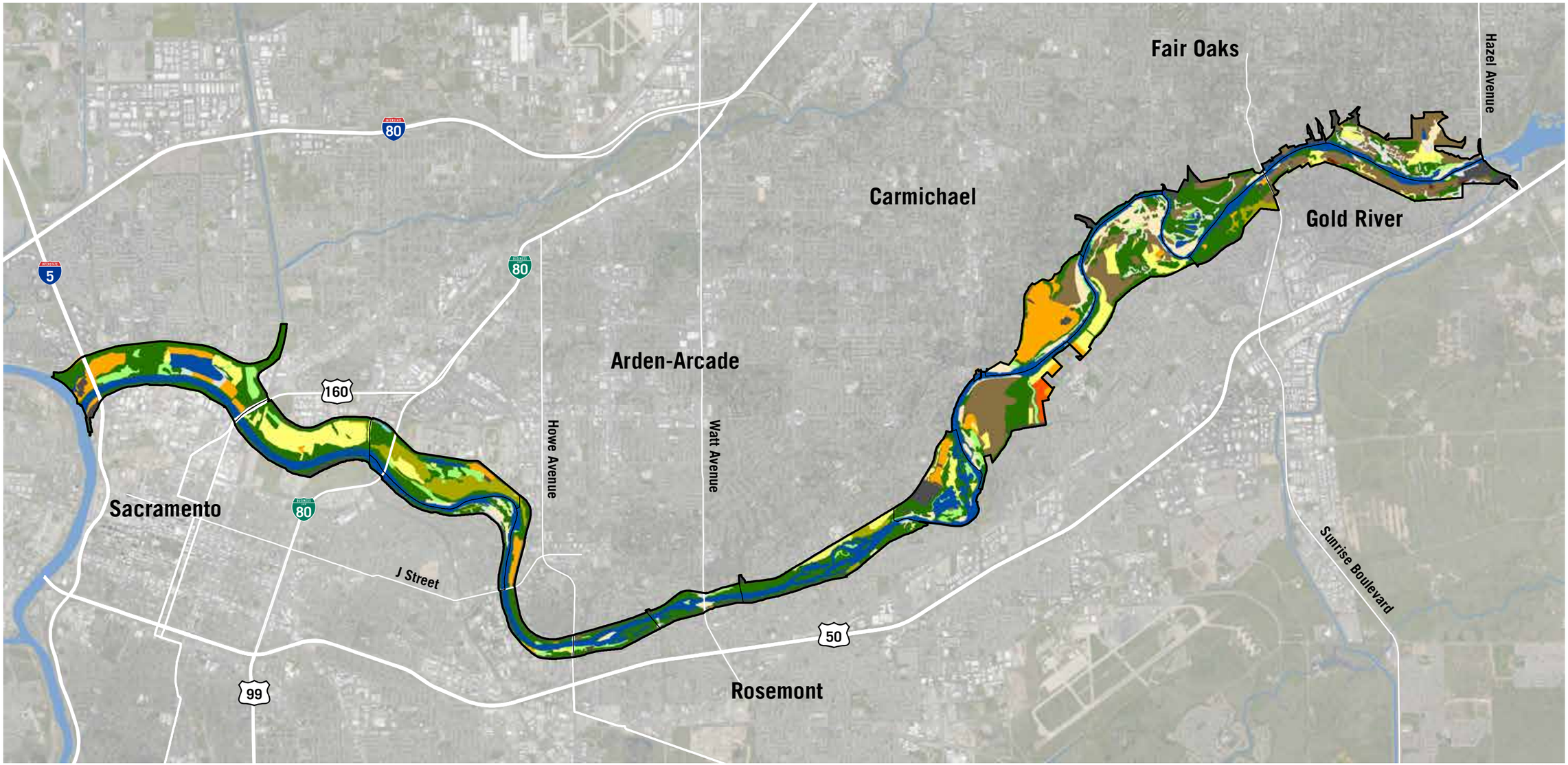
Where possible, vegetation communities were classified according to the *MCV* (Sawyer et al. 2009). Successional shifts in vegetative cover and composition due to hydrogeomorphic changes, vegetation management, fire, and other factors make it difficult to define the limits of all-natural communities according to the *MCV* classification system, which relies solely on the dominant species to define plant associations and alliances. As such, it does not accurately characterize the hydrogeomorphic components that influence plant communities in the Parkway. In these instances, vegetation classifications are based on the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).

## 4.1.1 Valley and Foothill Grassland

The Parkway contains 525 acres of valley and foothill grasslands (Holland 1986). The largest contiguous area of valley and foothills grasslands occurs in the Woodlake Area, although other notable grasslands are present in the Rossmoor Bar, Discovery Park East, River Bend, Upper Sunrise, and Sailor Bar Areas. These communities provide habitat for pollinators and opportunities for raptor and other bird species' foraging and ground nesting. However, decades of anthropogenic impacts have facilitated the spread of non-native species and restricted the establishment of native perennial grasses and forbs. Extensive areas are dominated by invasive species such as yellow star thistle (*Centaurea solstitialis*), vetch (*Vicia* spp.), Bermuda grass (*Cynodon dactylon*), and pepperweed (*Lepidium latifolium*). It is important to emphasize that grasslands infested with invasive plant species provide limited habitat value for native plant and wildlife species. However, they could provide opportunities for future habitat restoration efforts that would support native species.

Other common non-native grass species observed within the valley and foothill grassland community include wild oats (*Avena* spp.), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), and foxtail barley (*Hordeum murimum*). Native grass species are occasional and include creeping wildrye (*Elymus triticoides*) and needlegrass (*Nassella* spp.). A variable mix of native and non-native forbs are common in these areas and include bur clover (*Medicago polymorpha*), filaree (*Erodium* spp.), California poppy (*Eschscholzia californica*), frying pan poppy (*Eschscholzia lobbii*), narrow tarplant (*Holocarpha virgata*), common madia (*Madia elegans*), telegraph weed (*Heterotheca grandiflora*), perennial mustard (*Hirschfeldia incana*), fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), common sunflower (*Helianthus annuus*), common fiddleneck (*Amasinckia menziesii var. intermedia)*, wild radish (*Raphanus sativus*), yellow star thistle (*Centaurea solstitialis*), winter vetch (*Vicia* spp.), and manroot (*Marah fabacea* and *M. watsonii*).

Figure 4-1 Vegetation Communities shows the mosaic of vegetation communities in the Parkway.




- Agricultural (27 ac)
- Developed (453 ac)
- Elderberry Savannah (227 ac)
- Freshwater Emergent Wetland (3 ac)
- Foothill Pine (6 ac)
- Gravel Bar Chaparral (277 ac)
- Open Water (1,131 ac)
- Oak Woodland/Forest (729 ac)
- Riparian Woodland/Forest (1,813 ac)
- Riparian Scrub (218 ac)
- Turf/Turf with Trees (422 ac)
- Unvegetated (174 ac)
- Valley Foothill Grassland (525 ac)

*ESRI 2021*

0 1 2 Miles

# Figure 4-1
# Vegetation Communities

### Valley and Foothill Grassland (Native Component)

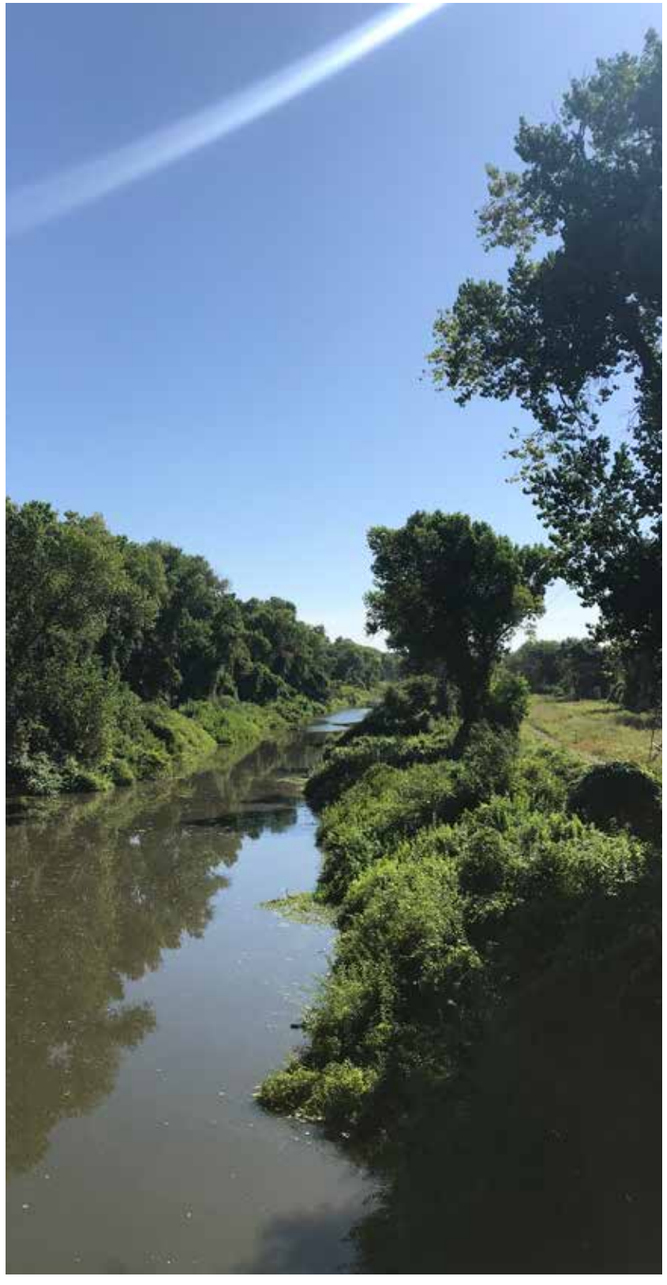
Within the Parkway, 179 acres of valley and foothill grassland support a significant component of native grasses and forbs, such as wildrye, needlegrass, poppies, and tarplant. Areas that support the highest proportion of native forbs include Sailor Bar, Upper Sunrise, and the El Manto portion of Rossmoor Bar. Similarly, portions of Cal Expo and restored portions of SARA Park and Arden Bar have high-quality native grass components. These areas can be distinguished from other grasslands mapped along the Parkway by the presence of thinner, rockier soils and reduced competition from annual grasses and weedy invasive forbs. They often occur on tailings at previously mined sites.

Native valley and foothill grassland habitats provide essential elements for the survival of many wildlife species, including upland refugia during flood events, foraging, resting, breeding, and shelter from predators. Common wildlife species associated with this habitat type include western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), western rattlesnake (*Crotalus oreganus*), California ground squirrel (*Otospermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), broad-footed mole (*Scapanus latimanus*), Botta's pocket gopher (*Thomomys bottae*), and meadow vole (*Microtus pennsylvanicus*). Grassland habitat provides important foraging habitat for coyote (*Canis latrans*) and a variety of raptors, including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and several species of owls (Jones & Stokes 2002).

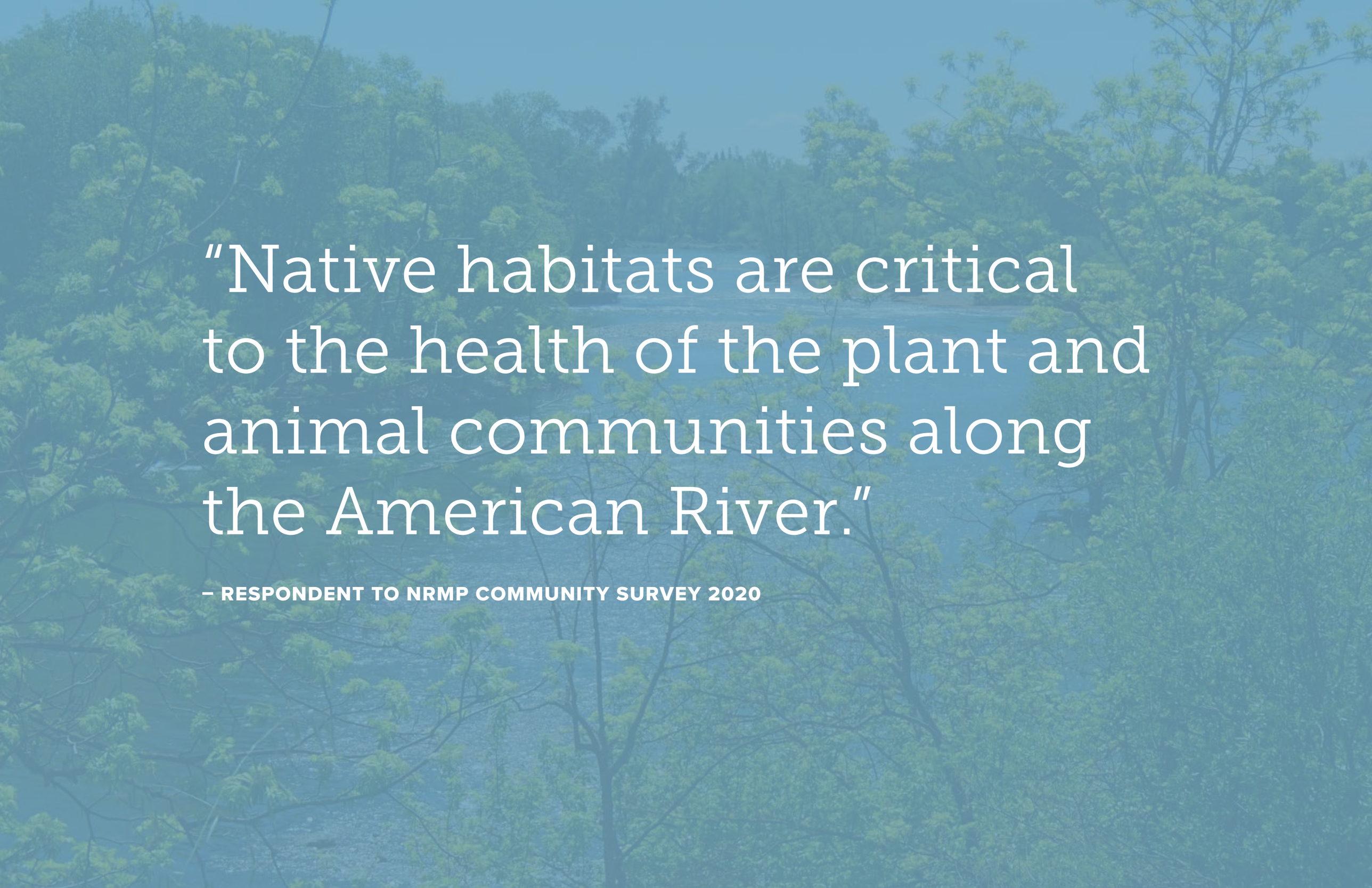
## 4.1.2 Riparian Forest and Woodland

Riparian habitat are found throughout the valleys and lower foothills of the Cascades, as well as in the Sierra Nevada and Coast Ranges. In general, these communities occur in broad, gently sloped valleys associated with current or historic riverine systems. Within the Parkway, riparian forest and woodland communities persist on stable upper terraces, channel bars, islands, and engineered embankments that rarely flood, but maintain shallow depths to perennially available groundwater (Jones & Stokes 2002). The vegetation structure of riparian forest and woodland habitat consists of an upper layer of winter deciduous trees and a multi-layered subcanopy of riparian shrubs and tree saplings that can tolerate winter flooding and/or a year-round high-water table. The shaded understory is usually sparse, consisting of coarse woody debris, fallen branches, and leaf litter.

Riparian habitats play a critical role in providing food, water, wildlife corridors, protection from predators, nesting, and thermal cover for a multitude of species. Riparian habitats support the greatest diversity of wildlife because they contain a wider diversity of plant species and vegetative structure. Consequently, they provide a greater number of habitat niches and food resources for wildlife than other habitats in the Parkway. Riparian habitats support large numbers of insects and attract passerine (perching) birds, including several species of woodpeckers, warblers, and hummingbirds. In addition, several species of raptor, including red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), Cooper's hawk (*Accipiter cooperii*), and great horned owl (*Bubo virginianus*), build their nests in the crowns of Fremont cottonwood, valley oak, and other large trees. Great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), and black-crowned night heron



*Bannon Slough in the Discovery Park Area. Photo Credit: MIG*



"Native habitats are critical to the health of the plant and animal communities along the American River."

**– RESPONDENT TO NRMP COMMUNITY SURVEY 2020**

*Blue oak trees on slopes near pond in the Sailor Bar Area. Photo Credit: Regional Parks*

(*Nycticorax nycticorax*) nest in rookeries in large trees along the Parkway. Natural cavities and woodpecker holes provide nesting sites for cavity-nesting species, including wood duck (*Aix sponsa*), common merganser (*Mergus merganser*), American kestrel, tree swallow (*Tachycineta bicolor*), and western screech owl (*Megascops kennicottii*) (Jones & Stokes 2002).

Mammals associated with these riparian habitats include spotted and striped skunks (*Mephitis mephitis*), raccoon (*Procyon lotor*), North American beaver, coyote, and mule deer (*Odocoileus hemionus*) (USACE 1996). In addition, several bat species likely roost in snags, crevices, cavities, and foliage of mature trees and forage for insects over the river. Riparian forest and woodland habitat provides foraging and breeding territory for several species of aquatic reptiles and amphibians, including western pond turtle (*Actinemys marmorata*), common garter snake, western skink (*Plestiodon skiltonianus*), western toad (*Anaxyrus boreas*), Pacific tree frog (*Pseudacris regilla*), and American bullfrog (*Lithobates catesbeianus*) (Jones & Stokes 2002).

A total of 1,813 acres of riparian forest and woodland habitats exist within the Parkway. The MCV (Sawyer et al. 2009) identifies several riparian forest alliances of the Central Valley that adequately describe riparian communities found in the Parkway. Other plant communities included here have a highly variable composition of dominant and associated species that are classified according to the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Regional Parks' natural resource management staff mapped the following riparian alliances and vegetation community types according to dominant tree species in the canopy layer. Several riparian communities discussed below and depicted on the Parkway vegetation map (Figure 4.1 Vegetation Communities) represent an aggregation of smaller areas mapped in the field by Regional Parks.

### White Alder

A total of 20 acres of naturally occurring white alder (*Alnus rhombifolia*) alliance (Sawyer et al. 2009) occurs in small stands, primarily on islands and riverbanks within the Arden Bar, Paradise Beach, Campus Commons, and Ancil Hoffman County Park Areas. The understory of these communities typically includes sandbar willow (*Salix exigua*), Goodding's black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), and infrequent white alder and Fremont cottonwood (*Populus fremontii*) saplings. Non-native eucalyptus (*Eucalyptus* spp.) trees are encroaching into white alder riparian areas in the Arden Bar and River Bend Park Areas.

### Hind's Walnut

Hind's walnut (also known as California Black Walnut) (*Juglans hindsii*) alliance (Sawyer et al. 2009) occurs as small, isolated stands that occupy 83 acres of Parkway between the Woodlake and Rossmoor Bar Areas. In Woodlake (17 acres), the largest stand has been partially damaged by fire. The tree canopy of these communities is dominated by Hind's walnut, with smaller, declining components of valley oak (*Quercus lobata*) and Fremont cottonwood. Mid-story species include Hind's walnut saplings, blue elderberry (*Sambucus nigra* ssp. *caerulea*), sandbar willow, California blackberry (*Rubus ursinus*), and Himalayan blackberry (*Rubus armeniacus*). Common understory species include California grape (*Vitis californica*) and manroot.

## Fremont Cottonwood

Approximately 583 acres of Fremont cottonwood alliance (Sawyer et al. 2009) is distributed intermittently along the length of the Parkway, with more than half located on broad floodplains downstream of the Campus Commons Area. Fremont cottonwood forests also is present in narrow bands along the edges of confined LAR channel segments, and in portions of the Sailor Bar, Upper Sunrise, and Sacramento Bar Areas. Small patches of Fremont cottonwood woodland, characterized by a more open canopy, persist from the Paradise Beach to Sailor Bar Areas, with more than half of these patches concentrated in the Sacramento Bar and Upper Sunrise Areas. The Discovery Park Area contains the largest contiguous stand of cottonwood woodland in the Parkway.

Other canopy components in this community include Goodding's black willow, interior live oak (*Quercus wislizeni*), valley oak, and Hind's walnut. Typical mid-story species include willows, boxelder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), and blue elderberry. The understory tends to be sparse in areas with dense tree cover that is heavily shaded and periodically flooded. Canopy openings support California wild rose (*Rosa californica*), California and Himalayan blackberry, blue elderberry, poison oak (*Toxicodendron diversiloba*), mugwort (*Artemisia douglasiana*), and various annual forbs. In some stands, particularly in portions of the Discovery Park Area, trees are draped with California wild grape. Upright wood snags are often present in the understory.

The gradual decline in the health and extent of Fremont cottonwood forests and woodlands in the Parkway can be attributed to several environmental factors. Fire is the largest immediate threat, as the Parkway has lost many acres of cottonwood forest and woodlands to wildland fire over the last decade. Changes in flood regimes also pose a threat because cottonwoods rely on spring flooding and sediment deposition for successful reproduction. Many stands are not reproducing and are transitioning to valley oak and/or Hind's walnut woodland communities. In addition, black locust (*Robinia pseudoacacia*) is invading some areas of cottonwood forest. Within powerline easements at the Cal Expo and Campus Commons Areas, cottonwood trees are regularly removed by utility companies as part of ongoing vegetation management programs. In locales where habitat restoration efforts have been attempted, North American beaver (*Castor canadensis*) activity tends to limit the successful establishment of newly planted cottonwood saplings. The healthiest cottonwood stands in the Parkway that receive periodic flooding occur in small stands in the Discovery Park, Woodlake, Upper Sunrise, Paradise Beach, and Sailor Bar Areas, as well as around the Bushy Lake area of Cal Expo.

## Valley Oak

The valley oak alliance (Sawyer et al. 2009) is a transitional woodland and forest type that integrates with riparian habitats and upland oak woodlands and forests. A total of 407 acres have been mapped, with the largest contiguous stand occurring within the Discovery Park Area on Bannon Island. A second smaller, but scenic and high-quality example, can be found in the Lower Sunrise Area. This community has dense tree canopy dominated by valley oak and occasional interior live oak with other riparian trees, such as white alder, Oregon ash, Fremont cottonwood, box elder, Goodding's black willow, and Hind's walnut. Areas of valley oak woodland along the narrow section of the middle LAR are co-dominated by cottonwood. Riparian tree species can be found reproducing in the understory, with poison oak and blackberry species providing additional ground cover.

**TOP** *Fremont cottonwood trees in the Discovery Park Area. Photo Credit: Regional Parks*
**BOTTOM** *Valley oak trees in the Ancil Hoffman County Park Area. Photo Credit: Regional Parks*

### Great Valley Mixed Riparian Forest

Great Valley mixed riparian forest (Holland 1986) is distributed throughout 674 acres of the Parkway. This community has a highly variable species composition with deciduous hardwood forest co-dominated by three or more tree species, including white alder, valley oak, Fremont cottonwood, Hind's walnut, California sycamore (*Platanus racemosa*), box elder, Oregon ash, and various willow species. Interior live oak is also a common component of mixed riparian forests upstream of Arden Bar, particularly in the Upper Sunrise and Sailor Bar Areas. Many of these deciduous hardwood riparian species are reproducing in the understory. The understory to mid-story contains occasional standing snags, saplings, California wild rose, blackberry, wild grape, and blue elderberry. Black locust and tree of heaven are invading areas of mixed riparian forest and woodland throughout the Parkway. Mixed riparian stands trending toward a more open canopy (25 – 50 percent cover) occur in heavily mined areas of the Rossmoor Bar and Sacramento Bar Areas, with smaller stands distributed downstream to the Discovery Park Area. In mixed riparian stands that support a large component of both valley oak and cottonwood trees, the cottonwood component is shifting toward interior live oak dominance.

### Non-Native Introduced Trees and Shrubs

Non-native tree and shrub species occupy 46 acres within the riparian vegetation community and include several areas dominated by black locust and tree of heaven, and other small areas dominated by eucalyptus trees.

## 4.1.3 Riparian Scrub

The Parkway contains 218 acres of riparian scrub (Holland 1996), with large patches located in the Discovery Park, Cal Expo, River Bend Park, and Sailor Bar Areas. Riparian scrub habitats consist of mid- to early successional shrubs and small trees that grow on sand bars, gravel bars, and recent alluvial sediment deposits, as well as near the edge of the low-flow channel and pond margins that are adjacent to abandoned riverine terraces. The stature of trees and shrubs is usually low-growing and sparse due to frequent or recent scouring or flooding. Dominant species include sandbar willow, arroyo willow, Goodding's black willow, white alder, box elder, and cottonwood and ash saplings. Common overstory species on drier stream terraces and islands that are subject to less frequent flooding include valley oak, Fremont cottonwood, and California sycamore. Common understory species include mugwort and other herbaceous species such as non-native perennial and annual grasses and perennial mustard.

The largest areas of early successional riparian scrub communities are located on high flow-scoured gravel bars and islands in the eastern Cal Expo and Paradise Beach Areas. Small patches also occur regularly along the river and high-flow channels upstream of the Sailor Bar Area. Mid-successional riparian scrub with variable species composition is found in small, 1- to 3-acre patches at Discovery Park. Other larger areas include the low-lying flood-prone areas and islands found in the Arden Bar and River Bend Park Areas. Mid-successional riparian scrub dominated by willows grows in disturbed areas along utility easements in the vicinity of Bushy Lake within the Cal Expo Area. Many small 1- to 3-acre patches are also scattered upstream as far as the Sacramento Bar Area.

**TOP** *Riparian woodland/forest and grazed vegetation in the Sailor Bar Area. Photo Credit: Regional Parks*
**BOTTOM** *Valley foothill grassland and riparian woodland/forest in the Cal Expo Area. Photo Credit: Regional Parks*

Like other riparian habitat types discussed in this section, riparian scrub habitat plays a critical role in the support of numerous wildlife species by providing food, water, and shelter that is stream- or river-dependent.

### 4.1.4 Oak Woodland and Forest

The Parkway contains 729 acres of oak woodland and forest vegetation communities (Holland 1986). The overstory is dominated by a variety of hardwood species including interior live oak, California buckeye (*Aesculus californica*), valley oak, and blue oak (*Quercus douglasii*). Oak woodland and forest communities provide the largest patches of contiguous natural habitat, with the most extensive area situated within the River Bend Park Area. The following oak woodland alliances and mixed oak woodland types were mapped and characterized by Regional Parks' natural resource management staff.

*Pond and blue oak trees in the Sailor Bar Area. Photo Credit: Regional Parks*

#### Interior Live Oak

A total of 583 acres of interior live oak alliance (Sawyer et al. 2009) grows along elevated floodplains in the upper reaches of the LAR. Approximately half of this acreage occurs within the River Bend Park Area, with other large areas found in the Ancil Hoffman County Park, Rossmoor Bar, Sacramento Bar, and Upper Sunrise Areas. The overstory of this vegetation alliance is dominated by interior live oak with occasional valley oak and Hind's walnut. Very few snags (typically valley oak) are present in this community. Blue elderberry, coyote brush (*Baccharis pilularis*), California coffeeberry (*Frangula californica*), California buckeye, toyon (*Heteromeles arbutifolia*), and poison oak are common in the mid-story, with Dutchman's pipevine (*Aristolochia californica*) occurring in the canopy driplines. In general, interior live oak forest is a stable ecosystem, with live oak saplings well represented in the understory, indicating the species is regenerating well. The health of individual, older valley oaks and cottonwoods is in decline, but the forest canopy is generally in good health.

#### Blue Oak

A total of 80 acres of blue oak alliance (Sawyer et al. 2009) occurs mainly within the Sailor Bar Area, along with small areas mapped at Ancil Hoffman County Park and Sunrise Bluffs. The canopy of this community is dominated by blue oak with occasional interior live oak and valley oak. Blue elderberry, toyon, poison oak, and blue oak saplings are common in the mid-story. The understory supports annual grasses and several native forbs, including harvest brodiaea (*Brodiaea elegans* ssp. *elegans*), soap root (*Chlorogalum* sp.), California poppy, lupines (*Lupinus* spp.), and common madia. Occasional non-native and invasive plant species occurring in the understory include yellow star thistle, Himalayan blackberry, periwinkle (*Vinca minor*), Chinese tallow, and Italian thistle (*Carduus pycnocephalus*). The blue oak ecosystem is stable within the Sailor Bar Area, with healthy mature trees, as well as saplings. There are heritage blue oak trees at Sailor Bar and most trees are in good health. At Ancil Hoffman County Park, there are patches of heritage blue oak forest, with both healthy and declining oaks observed on the bluffs.

### Mixed Oak Forest

A total of 65 acres of mixed oak forest (Holland 1986) occurs in the Nature Study Area of the Ancil Hoffman County Park Area, upstream of the Rossmoor Bar Area, and in the Upper Sunrise Area. The overstory is co-dominated by valley oak and interior live oak, often with a minor component of Fremont cottonwood and Hind's walnut. The mid-story includes blue elderberry, coyote brush, poison oak, and blackberry, and exhibits natural recruitment of interior live oak and Hind's walnut saplings. The understory supports annual grasses, creeping wild rye (*Leymus triticoides*), fennel, poison hemlock, and Dutchman's pipevine. Heritage trees and snags are present in some locations. Species dominance transitions to interior live oak at Sailor Bar. A majority of overstory trees in this community are in good health. However, a portion of mixed oak forest in Ancil Hoffman County Park near the Effie Yeaw Nature Center is in decline.

Oak woodlands and forests are of great ecological importance because of their relative scarcity in the region and their high value to wildlife. These communities provide critical breeding habitat for a range of wildlife species. Many bird species nest in tree limb cavities. A wide variety of mammals use oak woodland and forest habitat, including mule deer, black-tailed jackrabbit, western gray squirrel (*Melanerpes formicivorus*), and California ground squirrel. Common bird species in this community include several species of owls, woodpeckers, Western scrub jay (*Aphelocoma californica*), California quail (*Callipepla californica*), wild turkey (*Meleagris gallopavo*), and numerous passerine (perching) species. Reptile and amphibian species found here include southern alligator lizard (*Elgaria multicarinata*), western fence lizard, western rattlesnake, California kingsnake (*Lampropeltis californiae*), and common gopher snake (*Pituophis catenifer*).

## 4.1.5 Foothill Pine

A total of six acres of foothill pine alliance (Sawyer et al. 2009) occurs within the Upper Sunrise Area. This woodland community is botanically diverse and distinct from other vegetation types in the Parkway. Foothill pine forms the overstory with interior live oak saplings in the understory. Common shrubs and small trees in the understory include sticky monkeyflower (*Diplacus aurantiacus*), buckbrush (*Ceanothus cuneatus*), mock orange (*Philadelphus lewisii*), toyon, coyote brush, and poison oak. The understory also contains native forbs and grasses in canopy openings.

Many of the common wildlife species in adjacent oak woodland habitats discussed above also occur in foothill pine habitat.

## 4.1.6 Gravel Bar Chaparral

Chaparral communities are characterized by small- to medium-sized shrubs with semi-woody, flexible stems and branches (Holland 1986). A total of 274 acres of chaparral occurs within the Parkway in small, interspersed stands that often intergrade with riparian woodland and forest habitat along high floodplain benches and terraces of the LAR. Widely scattered patches of chaparral also appear on cobble gravel bars at the Rossmoor Bar, Ancil Hoffman County Park, River Bend Park, and Sacramento Bar Areas. Characteristic chaparral shrub species include deerweed (*Acmispon glaber*), lupine, coyote brush, California brickellbush (*Brickellia californica*), and California coffeeberry. In shrub canopy openings, this community supports a sparse to intermittent herbaceous understory of native grasses and forbs including western goldenrod (*Euthamia occidentalis*),

*Valley foothill grassland in the Cal Expo Area. Photo Credit: Regional Parks*

pearly everlasting (*Anaphalis margaritacea*), lupine, California poppy, clarkia (*Clarkia* sp.), and rayless golden aster (*Hetherotheca oregano*). Invasive species, such as Spanish broom (*Spartium junceum*), are common in this habitat type.

Many of the common wildlife species in adjacent oak woodland habitat discussed above also occur in chaparral habitat.

### 4.1.7 Elderberry Savanna

A total of 227 acres of elderberry savanna (Holland 1986) occurs within the Parkway, with the highest concentration at the Cal Expo Area. Naturally-occurring elderberry savanna is open grassland with low-growing, scattered shrubs. Common species in the shrub layer include blue elderberry and coyote brush, with occasional valley oak saplings and patches of sandbar willow. This community tends to support a patchy understory of annual grasses, creeping wildrye, yellow star thistle, vetch, fennel, and poison hemlock. Elderberry savannas have been planted as mitigation for the valley elderberry longhorn beetle in the Cal Expo, Discovery Park, SARA Park, River Bend Park, Lower Sunrise, and Sailor Bar Areas. These restored sites were also planted with a variety of riparian species and are expected to transition into Great Valley mixed riparian forest (Holland 1986).

Many of the common wildlife species in adjacent riparian forest, woodland, and oak woodland habitats discussed above also occur in elderberry savanna. Elderberry plants with stems greater than one inch diameter are host to the valley elderberry longhorn beetle (VELB), as the VELB larvae are entirely dependent on the interior pith of elderberry stems for both food and shelter.

### 4.1.8 Freshwater Emergent Wetland

Freshwater emergent wetland communities (Holland 1986) are one of the most productive habitats in California. This habitat type occurs on low-lying topographic areas such as ponds, depressions, and urban drainages on terrace floodplains, as well as on low stream terraces that are frequently saturated or flooded. The Parkway contains up to 20 acres of freshwater emergent wetland habitat within the Cal Expo Area. Unmapped freshwater emergent wetland occurs as an understory component to areas mapped as riparian woodland and forest within secondary channels, point bars, in-channel bars, active floodplains, and low-lying topographic areas, such as ponds and depressions, that are frequently inundated or saturated.

Freshwater emergent wetland vegetation is composed of upright, rooted hydrophytic monocots (grass-like plants) and forbs, as well as floating emergent aquatic plants. Vegetation composition within this habitat type varies according to the amount and duration of soil saturation associated with subtle elevation gradients. Common species include sedges (*Carex* spp.), rushes (*Juncus* spp.), horsetail (*Equisetum hyemale*), tall cyperus (*Cyperus eragrostis*), spike rush (*Eleocharis* spp.), cocklebur (*Xanthium strumarium*), and invasive species such as perennial pepperweed and poison hemlock on intermittently saturated soils; broadleaf cattail (*Typha latifolia*), bulrush (*Schoenoplectus* spp.), seep monkeyflower (*Erythranthe guttata*), smartweed (*Persicaria punctata* and *P. lapathifolia*), watercress (*Rorippa* spp.), and marsh purslane (*Ludwigia peploides*) on permanently saturated soils; and mosquito fern (*Azolla filiculoides* and *A. mexicana*) and other floating emergent aquatic plants in permanently inundated areas of the Parkway.

**TOP** *Gravel bar chaparral in the Ancil Hoffman County Park Area. Photo Credit: Regional Parks*
**BOTTOM** *Blue elderberry shrub. Photo Credit: Jim Wadsworth*

*Canada geese flying over river in the SARA Park Area. Photo Credit: Wildlife Conservation Board*

Freshwater emergent wetlands provide food, cover, and water for numerous bird, mammal, reptile, and amphibian species. Many wildlife species require emergent wetlands throughout their entire life cycles. Freshwater emergent wetlands are associated with ponds and backwaters, and provide resting and foraging areas for waterfowl, shorebirds, wading birds, red-winged blackbirds, and swallows (USACE 1996). Marshes are also used by aquatic mammals, such as muskrat (*Ondatra zibethicus*), mink (*Neovison vion*), North American river otter (*Lontra canadensis*), and North American beaver. Reptiles and amphibians, including western pond turtle, common garter snake, Pacific treefrog, Western toad, and American bullfrog, use the marsh for foraging and breeding (USFWS 1991). Freshwater marshes provide important habitat for wood duck, great blue heron, American bittern (*Botaurus lentiginosus*), shorebirds, owls, and hawks. Upland species, like California quail and black-tailed hare, take cover and forage at the margins of freshwater marshes. Freshwater emergent wetland habitats closest to residential and suburban areas are occupied by a variety of bird species adapted to urban environments, such as rock pigeons, scrub jay (*Aphelocoma californica*), mockingbird (*Mimus polyglottos*), and house finch (*Haemorhous mexicanus*), as well as mammals such as raccoons and skunks.

### 4.1.9 Open Water

A total of 597 acres of the Parkway is characterized as open water. This includes both riverine habitats within primary and secondary channels of the LAR, as well as off-channel ponds. Riverine habitats are defined by intermittent or continually running water, including rivers and streams. The open water of riverine habitat, including the river, unvegetated shoreline, gravel bars adjacent to the river channel, and off-channel ponds, provide resting and foraging areas for waterfowl, shorebirds, wading birds, belted kingfisher (*Ceryl alcyon*), black phoebe (*Sayornis nigricans*), and tree swallow. Aquatic mammals, including North American beaver, muskrat, and river otter use open water as movement corridors and for foraging on submerged plants and invertebrates (USFWS 1991, USACE 1996). Open water also provides habitat for numerous resident and anadromous fish species, including chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), and American shad (*Alosa sapidissima*).

Habitats associated with lakes are also considered open water habitat and are characterized by depressions filled with standing water. This habitat type can vary in size, from small ponds to large areas such as flooded lakes or reservoirs. The primary lacustrine features are Urrutia/ Gardenland Pond, Bushy Lake, Arden Pond, Sailor Bar pond, and the series of mining ponds at Sacramento Bar. Lacustrine habitat typically supports species of plankton, as well as other microorganisms in the still, open water. Lacustrine habitats are important for reproduction, food, water, and cover requirements for the western pond turtle, as well as many mammals, birds, other reptiles, and amphibians. Lacustrine habitats exist throughout California, and often occur alongside riverine and freshwater water emergent wetland habitats.

*Turf with trees in the Discovery Park Area. Photo Credit: MIG*

*Nature interpretive area at the Effie Yeaw Nature Center in the Ancil Hoffman County Park Area. Photo Credit: MIG*

### 4.1.10 Unvegetated Areas

A total of 174 acres of the Parkway consists of unvegetated land, which is characterized as areas with less than two percent herbaceous cover and less than 10 percent tree or shrub cover. Within the Parkway, unvegetated land cover types include disturbed areas (both via anthropogenic and riverine processes), mine tailings, and gravel bars. Many wildlife species use unvegetated areas. For example, some raptors nest in exposed ledges, certain bird species such as bank swallows (*Riparia riparia*) construct nests or take cover in sand or gravel areas, and bats forage along riverbank walls.

### 4.1.11 Developed Areas

A total of 453 acres of the Parkway is developed with parking lots, recreation trails, structures, bridges, roadways, and levees. These areas are either devoid of vegetation or vegetated with non-native landscaping. Wildlife species found in these areas are adapted to disturbed conditions and include scrub jay, mockingbird, house finch, raccoon, Virginia opossum (*Didelphis virginiana*), western grey squirrel (*Sciurus griseus*), and skunk.

### 4.1.12 Agriculture

American River Ranch, located in the western portion of River Bend Park, is home to an organic farm and community education center, Soil Born Farms. The farm consists of orchards, irrigated field and row crops, the California Native Plant Society (CNPS) Elderberry Farms Native Plant Nursery, native wildlife friendly hedgerows, and native and edible landscaping, all contributing to wildlife and pollinator habitat.

### 4.1.13 Turf / Turf with Trees

Turf areas maintained for recreation and facility maintenance make up a large percentage of the Parkway. Turf habitat occurs on levees, overflow parking areas, the Ancil Hoffman game field and the Discovery Park archery range. Turf with trees habitat appears primarily within Ancil Hoffman County Park and Discovery Park. Due to regular mowing and other active landscape maintenance activities, trees do not tend to reproduce naturally in these habitats, and there are few saplings in the understory. Many picnic areas are shaded with heritage trees, which are declining and gradually being removed as they become hazardous. Planting new trees is a high priority for Regional Parks in these locales.

# 4.2 SENSITIVE HABITAT

The Parkway contains a wide variety of sensitive habitats used by common and special status species for foraging, breeding, and sheltering (Figure 4-2 Sensitive Habitat). Sensitive habitat includes designated special status vegetation communities, habitat that supports state and/or federally listed species, and habitat identified as critical for the recovery of federally listed species.

## 4.2.1 Critical Habitat

Critical habitat is a term defined in Section 3(5)A of the Endangered Species Act (ESA) as a specific geographic area that contains physical or biological features essential for the conservation and recovery of a threatened or endangered species, and that may require special management and protection. Figure 4-2 Sensitive Habitat depicts the location of critical habitat as designated by the U.S. Fish & Wildlife Services (USFWS). The Parkway contains critical habitat for steelhead, chinook salmon, and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*; VELB).

USFWS critical habitat for VELB exists just north of the Woodlake Area and within the River Bend Park, Ancil Hoffman County Park, Rossmoor Bar, and Lower Sunrise Areas.

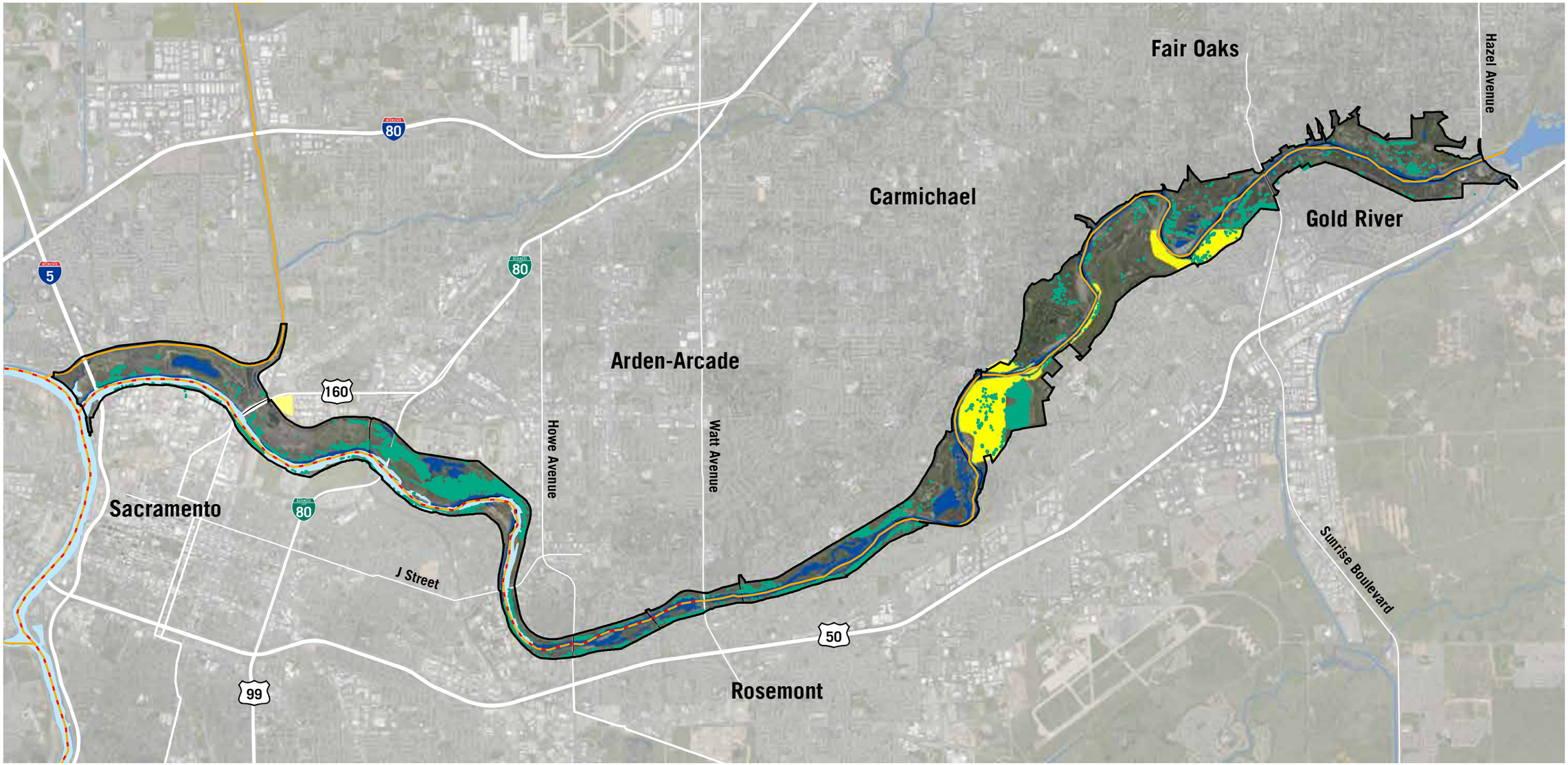
Chinook salmon Sacramento River winter-run Evolutionary Significant Unit (ESU) critical habitat is outside of the Parkway limits in the Sacramento River, immediately downstream of the confluence of the Sacramento and American Rivers. Chinook salmon Central Valley spring-run ESU has critical habitat extending through the LAR from the Watt Avenue overpass to its confluence with the Sacramento River. Critical habitat for steelhead Central Valley Distinct Population Segment (DPS) extends from the Nimbus Dam to the LAR's confluence with the Sacramento River. Critical habitat for green sturgeon extends from the LAR's confluence with the Sacramento River to the North Sacramento Freeway/Lincoln Highway overpass (NOAA Fisheries 2019; Figure 4-2).

*California poppies surrounding elderberry shrub in the Cal Expo Area. Photo Credit: Wildlife Conservation Board*

## 4.2.2 VELB Habitat

The federally threatened VELB is closely associated with blue elderberry and typically occurs in riparian forest and woodland habitats (See Section 4.1.2 for community description). Figure 4-2 Sensitive Habitat depicts those areas where elderberry have been identified and mapped by County and local groups (e.g., American River Parkway Foundation (ARPF)). Elderberry shrubs grow most frequently along higher-order riparian reaches and on higher terraces where plant roots have access to the water table, but are not frequently inundated (Talley 2005, Vaghti et al. 2009). It can also persist within current floodplains, historic floodplains, terraces, bluffs, and atop levees within savanna or woodland habitat. Elderberry habitat continues to be surveyed thoroughly at the River Bend Park, Ancil Hoffman County Park, Rossmoor Bar, and Lower Sunrise Areas, and included in USFWS-designated critical habitat for VELB (USFWS 2017)

Figure 4-2 shows the locations and types of sensitive habitats in the Parkway.




ESRI 2021, USFWS 2020, SCRP 2020, NOAA 2020

0 1 2 Miles

- Steelhead Critical Habitat
- Chinook Salmon Critical Habitat
- Valley Elderberry Longhorn Beetle Critical Habitat
- Valley Elderberry Longhorn Beetle Habitat (Mapped Elderberry Shrubs)
- Essential Fish Habitat

# Figure 4-2
# Sensitive Habitat

### 4.2.3 Essential Fish Habitat

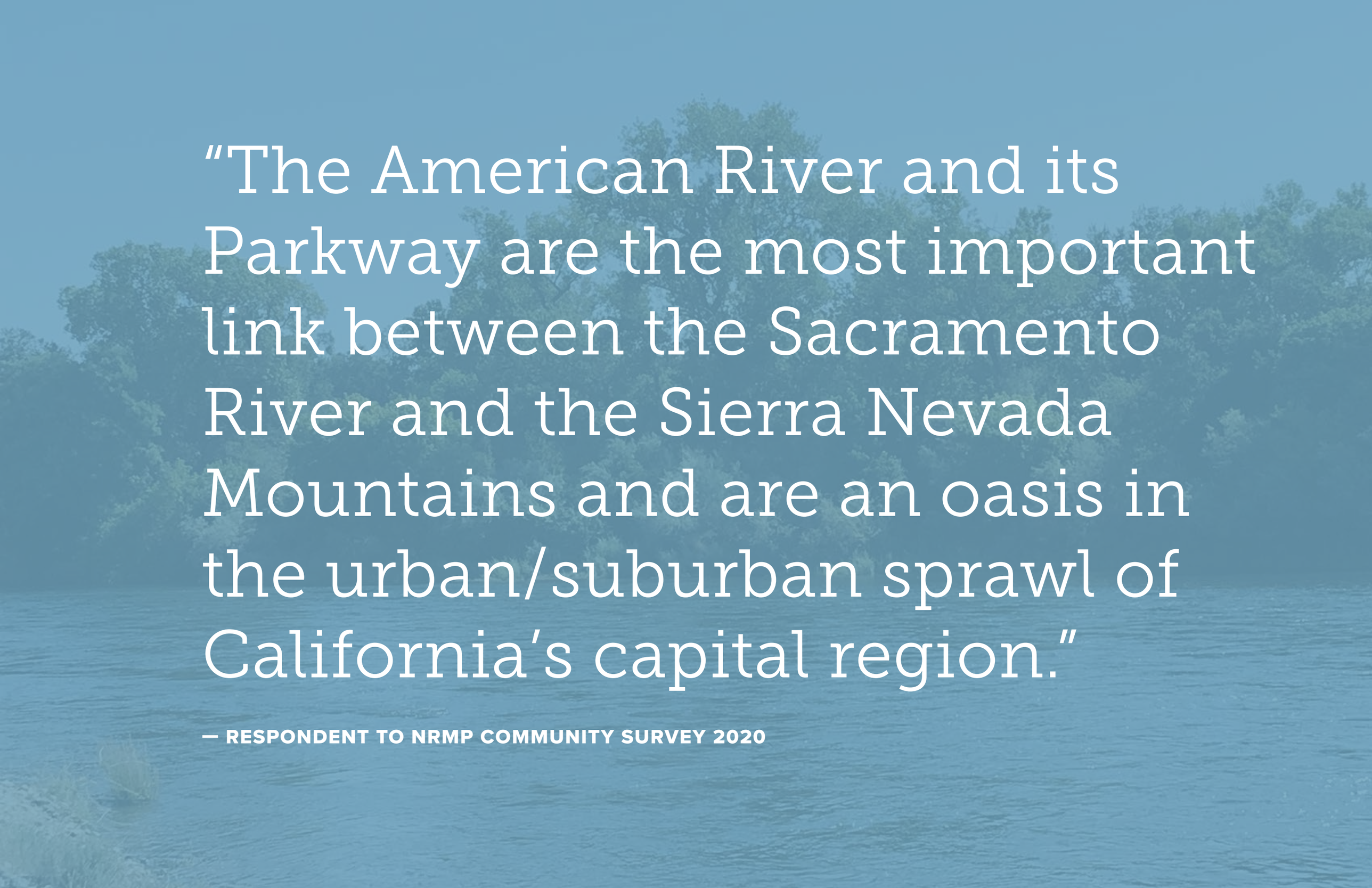
Beginning at Campus Commons and continuing downstream, the American River is designated as Essential Fish Habitat (EFH) (Figure 4-2 Sensitive Habitat). EFH is regulated by the National Oceanic and Atmospheric Association, National Marine Fisheries Service (NOAA NMFS). Protection of EFH is mandated through changes implemented in 1996 to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to protect against the loss of habitat necessary to maintain sustainable fisheries in the United States. The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" [16 USC 1802(10)]. NMFS further defines essential fish habitat as areas that "contain habitat essential to the long-term survival and health of our nation's fisheries." EFH can include the water column, certain bottom types such as sandy or rocky bottoms, vegetation such as eelgrass or kelp, or structurally complex coral or oyster reefs. Under regulatory guidelines issued by NMFS, any federal agency that authorizes, funds, or undertakes action that may affect EFH is required to consult with NMFS (50 CFR 600.920).

### 4.2.4 Shaded Riverine Aquatic (SRA) Habitat

Shaded Riverine Aquatic (SRA) habitat is defined as the nearshore aquatic area occurring at the interface between a river and adjacent woody riparian habitat. The principal attributes of this valuable cover type include: (a) adjacent banks composed of natural, eroding substrates supporting riparian vegetation that either overhangs or protrudes into the water, and (b) water containing variable amounts of woody debris, such as leaves, logs, branches, and roots, as well as variable depths, velocities, and currents (USFWS 1992). These attributes provide high-value feeding areas, burrowing substrates, escape cover, and reproductive cover for numerous regionally important fish and wildlife species.

SRA habitat is available for aquatic species in or adjacent to all Parkway Areas. SRA habitat is most abundant within or adjacent to the Discovery Park, Woodlake, Campus Commons, Howe Avenue, Watt Avenue, Sara Park, and Arden Bar Areas. The LAR experiences high temperatures in the summer months, and the dark and wide main channel is particularly vulnerable to heat absorption and conduction. Sensitive aquatic species use SRA habitat to shield themselves from extreme temperatures. This habitat also provides cover that protects spawning, juvenile, and/or small aquatic wildlife species from predation.

**TOP** *Shaded riverine aquatic habitat in the Howe Avenue Area. Photo Credit: Regional Parks*
**BOTTOM** *Tadpoles in restored area of Cordova Creek in the River Bend Park Area. Photo Credit: Wildlife Conservation Board*



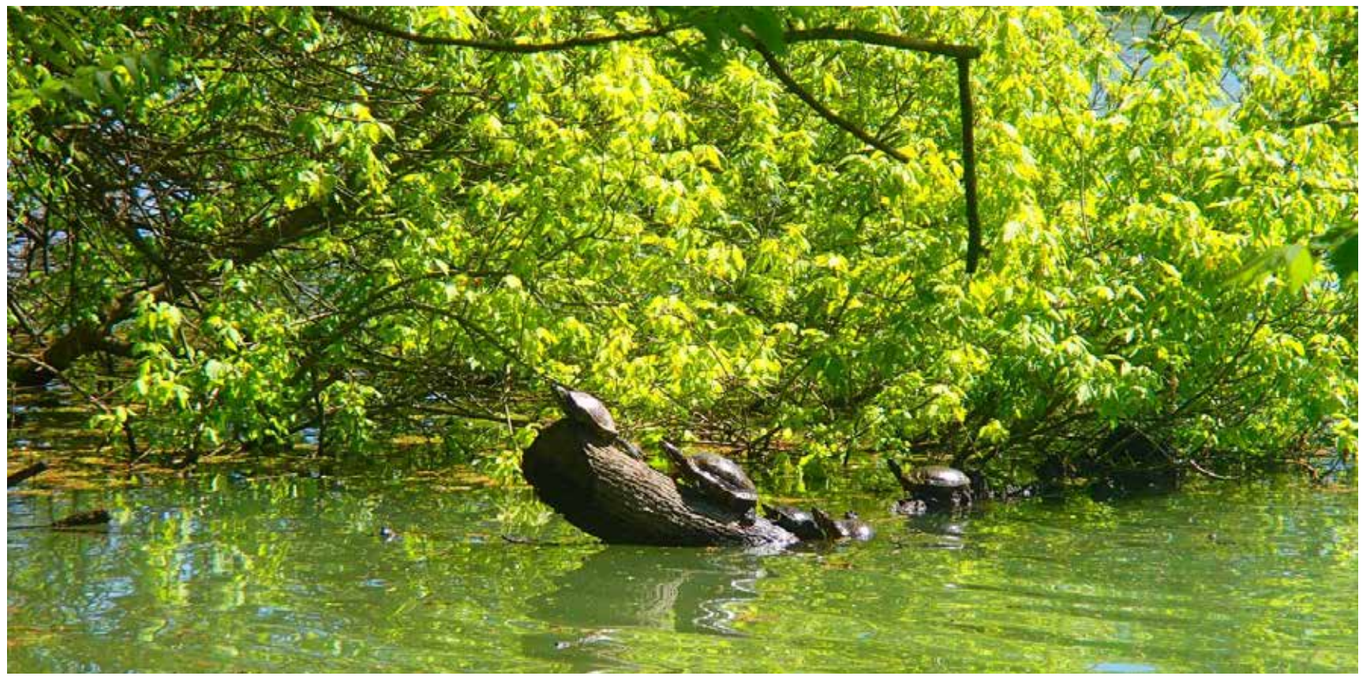
"The American River and its Parkway are the most important link between the Sacramento River and the Sierra Nevada Mountains and are an oasis in the urban/suburban sprawl of California's capital region."

— RESPONDENT TO NRMP COMMUNITY SURVEY 2020

# 4.3 HABITAT CONNECTIVITY

A mosaic of different habitat types (including, but not limited to: riparian forest, woodland, scrub, valley and foothill grassland, and freshwater marsh) provides essential diversity and areas for wildlife to complete multiple life cycle stages, while also providing corridors for dispersal. Likewise, the broad channel of the LAR provides nursery, foraging, and migration habitat for aquatic and semi-aquatic species through back and side channels, submerged vegetation, tree shading, undercut banks, and gravel deposits.

Habitat loss and fragmentation associated with urbanization pose a threat to biodiversity (McDonald et al. 2008). Connected landscapes are preferred over fragmented landscapes because they provide opportunities for species to maintain ecological processes and support wildlife populations (Beier and Noss 1998). Urban development resulting in habitat loss and fragmentation can impact resident and migratory wildlife by impeding movement, increasing risk of direct mortality, and exposing species to disease (Spencer et al. 2015). The following connectivity definitions and designations are consistent with those used in the development of the California Department of Fish and Wildlife's (CDFW's) northern Sierra Nevada foothills (NSNF) fine-scale connectivity modeling project (Krause et al. 2015). The Parkway is in the NSNF Region 2 South subsection. Figure 4-3 Regional Wildlife Connectivity and Figure 4-4 Parkway Wildlife Connectivity show connectivity in the Parkway at regional and local watershed scales (CDFW BIOS 2020).



*Turtles basking on log in off channel backwaters in the SARA Park Area. Photo Credit: Wildlife Conservation Board*

## 4.3.1 Landscape Blocks

Landscape blocks are continuous protected lands that form the basis of the NSNF Project analysis. Landscape blocks are designated as protected lands of 100 acres or more, including: a) areas managed for biodiversity conservation designated as United States Geological Survey (USGS) Gap Analysis Program (GAP) Status Code GAP 1 or 2; b) mixed-use public lands designated as USGS GAP Status Code GAP 3 that intersect with Large Intact Blocks identified by the California Essential Habitat Connectivity Project; and c) areas under conservation easement.

Landscape block coverage extends from SARA Park to the eastern boundary of the Parkway. Urban development to the north and south, as well as Hazel Avenue to the east, constrain the block. To the west, park lands continue, but they do not qualify as landscape blocks.

## 4.3.2 Wildlife Linkages

Wildlife linkages represent pathways for wildlife movement. Wildlife linkages were delineated by the NSNF Project using a least-cost corridor analysis for nine migratory species, in addition to suitable habitat and patch analyses

for 21 resident species. The species selected are diverse, yet representative of the region, and are sensitive to habitat fragmentation. Species-specific data and fine-scale vegetation mapping were used to model habitat suitability.

For migratory species included in the analysis (Table 4-1), least-cost corridors were modeled. Riparian corridors and land facet corridors were also analyzed; the latter providing data for suitability under different climate scenarios. For resident species included in the analysis, habitat patches within dispersal distance were modeled. Depending on the species, resident species could take many generations to travel a corridor.

The Parkway contains 863 acres of wildlife linkages (Figure 4-4 Parkway Wildlife Connectivity). The NSNF represents an important corridor for wildlife migration, connecting the Central Valley to the Sierra Nevada and encompassing corresponding wildlife corridors (Krause et al. 2015). The wildlife linkages in the Parkway are among the westernmost linkages in the NSNF region. The NSNF region is generally more urbanized in the west, including around the City of Sacramento and surrounding agricultural areas. Habitat linkages become more numerous to the east, oftentimes overlapping.

Wildlife linkage B66_B16 is in the eastern portion of the Parkway and includes the Rossmoor Bar, Sacramento Bar, Lower Sunrise, Sunrise Bluffs, Upper Sunrise, and Sailor Bar Areas. This wildlife linkage contains predicted suitable habitat for acorn woodpecker (*Melanerpes formicivorus*), California ground squirrel, California quail, Cooper's hawk, pallid bat (*Antrozous pallidus*), wood duck, and yellow-billed magpie (*Pica nuttalli*).

**TABLE 4-1 SPECIES INCLUDED IN THE WILDLIFE CORRIDOR ANALYSIS**

| COMMON NAME | SCIENTIFIC NAME |
|---|---|
| **Migratory Species** | |
| Black bear | Ursus americanus |
| Black-tailed jackrabbit | Lepus californicus |
| Bobcat | Lynx rufus |
| Dusky-footed woodrat | Neotoma fuscipes |
| Gray fox | Urocyon cinereoargenteus |
| Mountain lion | Puma concolor |
| Mule deer | Odocoileus hemionus |
| Western gray squirrel | Melanerpes formicivorus |
| Western pond turtle | Actinemys marmorata |
| **Resident Species** | |
| Acorn woodpecker | Melanerpes formicivorus |
| Arboreal salamander | Aneides lugubris |
| California ground squirrel | Otospermophilus beecheyi |
| California kangaroo rat | Dipodomys californicus |
| California quail | Callipepla californica |
| California thrasher | Toxostoma redivivum |
| Coast horned lizard | Phrynosoma coronatum |
| Cooper's Hawk | Accipiter cooperii |
| Foothill yellow-legged frog | Rana boylii |
| Gopher snake | Pituophis catenifer |
| Heermann's Kangaroo Rat | Dipodomys heermanni |
| Lark sparrow | Chondestes grammacus |
| Limestone salamander | Hydromantes brunus |
| Mountain quail | Oreotyx pictus |
| Northern pygmy owl | Glaucidium gnoma |
| Pallid bat | Antrozous pallidus |
| Racer | Coluber constrictor |
| Southern alligator lizard | Elgaria multicarinata |
| Spotted towhee | Pipilo maculatus |
| Wood duck | Aix sponsa |
| Yellow billed magpie | Pica nuttalli |

*Gravel bar chaparral, riparian scrub, and Fremont cottonwood trees in the Watt Avenue Area. Photo Credit: Regional Parks*

*Riparian woodland plantings at a mitigation site in the Rossmoor Bar Area. Photo Credit: Regional Parks*

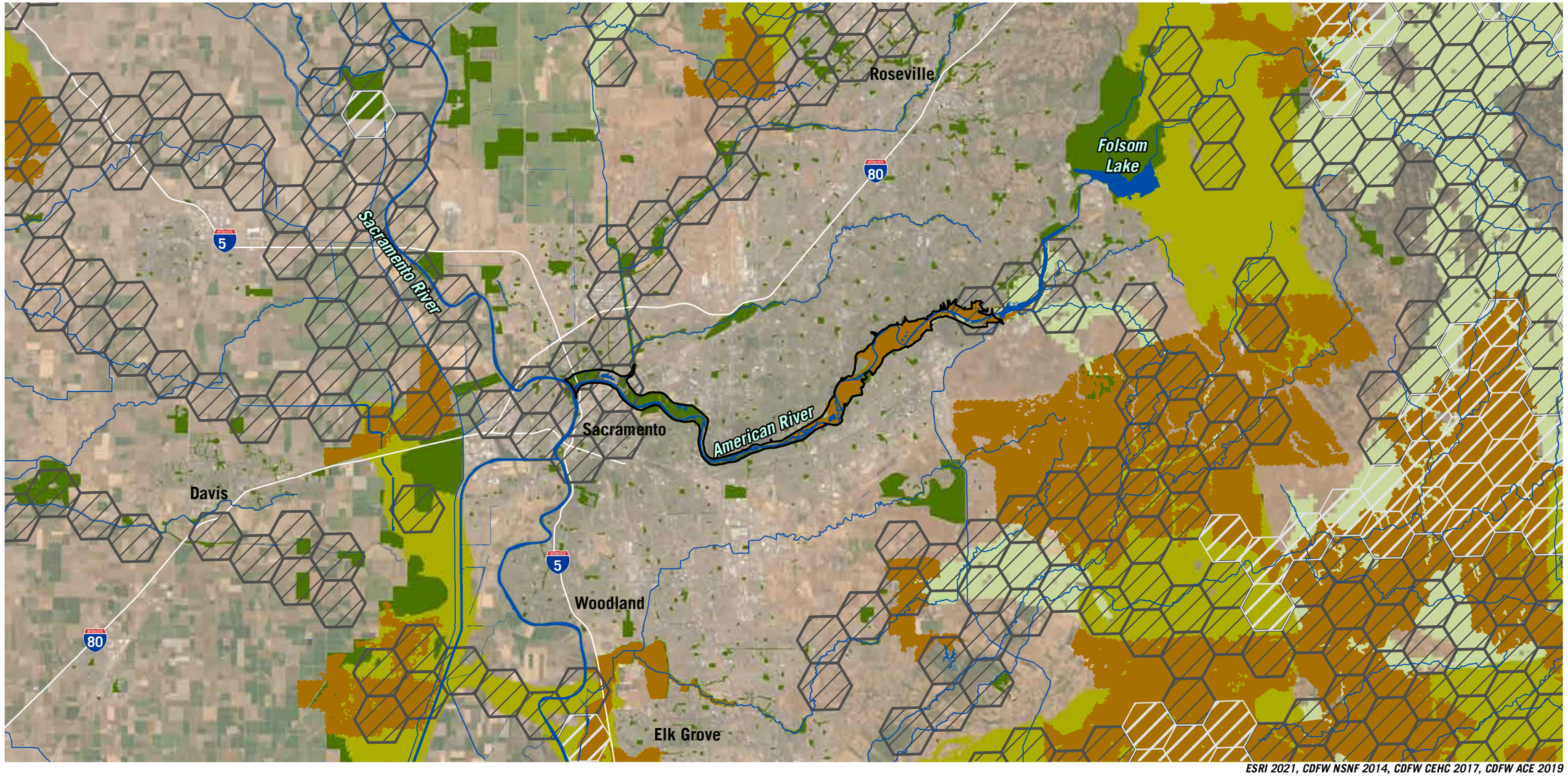
The B66_B16 wildlife linkage is primarily constrained to the LAR riparian corridor, roughly spanning the width of the Parkway, up to approximately 0.8 mile wide. Bluffs to the north of the river mark the boundary of the adjacent urbanized landscape. The linkage is limited by residential development in Fair Oaks to the north and residential and commercial development in Gold River, the City of Rancho Cordova, and the Nimbus Hatchery to the south. Though limited, connectivity is maintained under major roads including Sunrise Boulevard and Hazel Avenue. Bike and bridge crossings, including Fair Oaks Bridge and the Jim Jones Bridge, do not disrupt connectivity.

Figure 4-3 illustrates wildlife connectivity in the greater Sacramento area, and Figure 4-4 displays connectivity components in and adjacent to the Parkway.

### 4.3.3 Riparian Corridors

The entire LAR provides a continuous 22.6 mile (4,747 acres) riparian corridor through the Parkway, offering food, water, and cover to local wildlife species (Figure 4-3 Regional Wildlife Connectivity). Riparian corridors in the NSNF region run predominantly east-west and complement the north-south oriented wildlife linkages. The LAR riparian corridor is one of just three locations that offer habitat connectivity across Capital City Freeway/Highway 80, a major barrier to regional connectivity. Capital City Freeway intersects the riparian corridor in the Cal Expo and Paradise Beach Areas.

In addition to terrestrial connectivity, the LAR riparian corridor offers aquatic connectivity for local and migratory fish species. However, many aquatic species, including anadromous salmonids, are limited in their upstream runs due to a number of fish passage barriers such as the Nimbus Dam upstream of the Parkway. Historically, salmonids had access to an abundance of streams

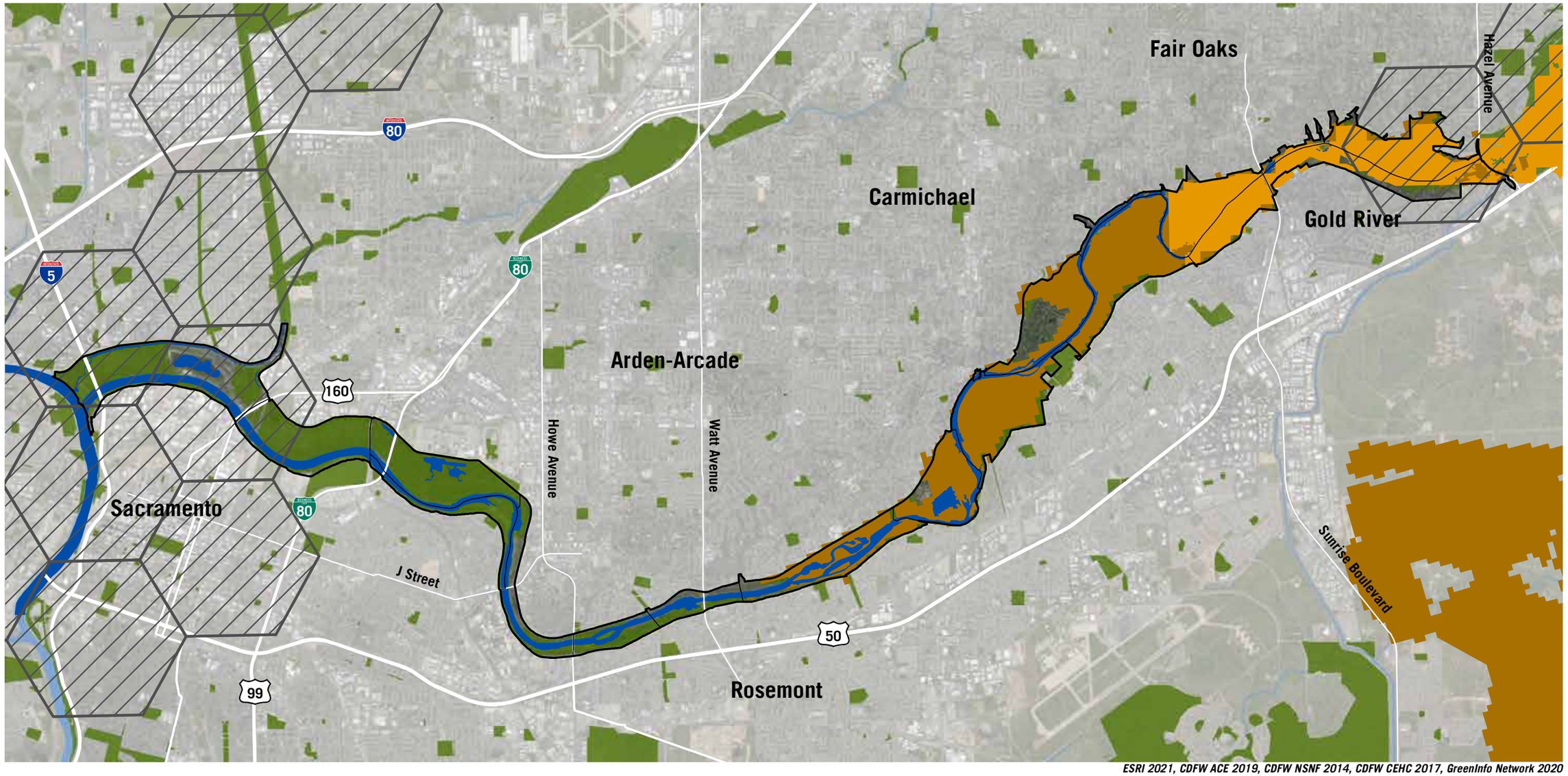



ESRI 2021, CDFW NSNF 2014, CDFW CEHC 2017, CDFW ACE 2019

0 3 6 Miles

- Irreplaceable and Essential
- Corridor Conservation Planning
- Linkage Natural Landscape Blocks
- Essential Connectivity Area
- Wildlife Linkages
- California Protected Area

# Figure 4-3
# Regional Wildlife Connectivity




Conservation Planning Linkages
Wildlife Linkages
Natural Landscape Blocks
California Protected Area

*ESRI 2021, CDFW ACE 2019, CDFW NSNF 2014, CDFW CEHC 2017, GreenInfo Network 2020*

0 1 2 Miles

# Figure 4-4
# Parkway Wildlife Connectivity

*Interior live oak trees in the River Bend Park Area. Photo Credit: Regional Parks*

*Gravel bar chaparral in the Sacramento Bar Area. Photo Credit: Regional Parks*

reaching into the Sierra Nevada. Currently, chinook salmon and steelhead trout are captured and spawned at the Nimbus Hatchery, located just upstream of the eastern terminus of the Parkway. Several fish passage projects are being considered in the American River watershed. The Cordova Creek Corridor Naturalization Plan, for example, with provide for adult and juvenile fish passage to the lower, previously naturalized reach of Cordova Creek. The North Fork, Middle Fork, and South Fork of the American River are tributaries to the main stem American River, upstream of the Parkway. Their headwaters lie in the Sierra Crest in Tahoe and Eldorado National Forests. The western terminus of the Parkway area is the confluence of the American River with the Sacramento River, which then flows south to the Sacramento-San Joaquin River Delta and into the Pacific Ocean.

### 4.3.4 Areas of Conservation Emphasis (ACE)

CDFW maintains an Areas of Conservation (ACE) database that presents coarse-level information for conservation planning and wildlife connectivity. The Parkway contains ACE Conservation Planning Linkages at both the upstream (Sailor Bar and Upper Sunrise) and downstream (Discovery Park and Woodlake) extents (Figure 4-4 Parkway Wildlife Connectivity). These linkages represent the preferred connections between core natural areas and are important in maintaining habitat connectivity.

### 4.3.5 California Protected Areas

The California Protected Areas Database (CPAD) represents those lands identified by public agencies and nonprofit organizations as protected open space. It includes national, state, and regional parks, forests, preserves, wildlife areas, land trust preserves, and open space parks and lands. The majority of the Parkway is included in the database as a California Protected Area (Figure 4-4 Parkway Wildlife Connectivity).

# 4.4 SPECIAL-STATUS SPECIES

The Parkway provides important habitat for many special status species. Appendix C Special-Status and Invasive Species in the Parkway contains a list of special-status species that occur in or have the potential to occur in the Parkway. Special-status species are defined as:

- Plants and animals listed, proposed, or candidates for listing as threatened or endangered under the California Endangered Species Act (CESA) or ESA;
- Animals designated as Species of Special Concern (SSC) by CDFW;
- Animal species that are "Fully Protected" (CFP) in California (Fish and Game Codes 3511, 4700, 5050, and 5515);
- All nesting bird species and bat species protected under California Fish and Game Code sections 3503, 3503.5, 3512, and 4150-4155;
- Bat species designated on the Western Bat Working Group's (WBWG) Regional Bat Species Priority Matrix as: "RED OR HIGH." This priority is justified by the WBWG as follows: "Based on available information on distribution, status, ecology, and known threats, this designation should result in these bat species being considered the highest priority for funding, planning, and conservation actions. Information about status and threats to most species could result in effective conservation actions being implemented should a commitment to management exist. These species are imperiled or are at high risk of imperilment";

*Interior live oak trees in the River Bend Park Area. Photo Credit: Regional Parks*

- Species protected by the goals and policies of local plans such as the Parkway Plan, which include anadromous and resident fishes, as well as migratory and resident wildlife; and
- Plants occurring on the California Native Plant Society (CNPS) electronic Rare Plant Inventory. This inventory has four lists of plants with varying rarity. These lists are: Rank 1, Rank 2, Rank 3, and Rank 4. Although plants on these lists have no formal legal protection (unless they are also state or federally listed species), CDFW requests the inclusion of Rank 1 and 2 species in environmental documents. In addition, other state and local agencies may request the inclusion of species on other lists as well. The Rank 1 and 2 species are defined below:
  - Rank 1A: Presumed extinct in California;
  - Rank 1B: Rare, threatened, or endangered in California and elsewhere;
  - Rank 2A: Plants presumed extirpated in California, but more common elsewhere; and
  - Rank 2B: Rare, threatened, or endangered in California, but more common elsewhere.

*Valley elderberry longhorn beetle. Photo Credit: Jon Katz, USFWS*

*Least Bell's vireo Photo Credit: USFWS*

*Bank swallow. Photo Credit: David M. Bell*

*Swainson's hawk Photo Credit: Brian Rusnica*

*Western pond turtle Photo Credit: CDFW*

*Steelhead – Central Valley CPS Photo Credit: NOAA Fisheries*

*Sanford's arrowhead. Photo Credit: Natomas Basin Habitat Conservation Plan & the Metro Air Park Habitat Conservation Plan*

Additionally, CNPS updated its lists in 2006 to include "threat code extensions" for each list. For example, Rank 1B species would now be categorized as Rank 1B.1, Rank 1B.2, or Rank 1B.3. These threat codes are defined as follows:

- .1 is considered "seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)";
- .2 is "fairly endangered in California (20-80 percent of occurrences threatened)"; and
- .3 is "not very endangered in California (less than 20 percent of occurrences threatened or no current threats known)."

CDFW's Biogeographic Data Branch maintains the California Natural Diversity Database (CNDDB), a computerized inventory of information on California's rare plants, animals, and natural communities. The CNDDB maintains a "Special Animals List" which contains "...all the animal species tracked by the Department of Fish and Wildlife's CNDDB, regardless of their legal or protection status". The Special Animals list includes species, subspecies, or ESU where at least one of the following conditions applies:

- Officially listed or proposed for listing under the State and/or Federal Endangered Species Acts;
- Taxa considered by the CDFW as SSC;
- Taxa that meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range, but not currently threatened with extirpation;
- Population(s) in California that may be peripheral to the major portion of a taxon's range, but are threatened with extirpation in California;
- Taxa closely associated with a habitat that is declining in California at a significant rate (e.g., wetlands, riparian, vernal pools, old growth forests, desert aquatic systems, native grasslands, valley shrubland habitats, etc.); and
- Taxa designated as a special-status, sensitive, or declining species by other state or federal agencies, or a non-governmental organization (NGO) and determined by the CNDDB to be rare, restricted, declining, or threatened across their range in California."

VELB is the most common federally listed (threatened) terrestrial species known to occur in the Parkway. VELB is found only in association with its host plant, blue elderberry, which grows in several habitats throughout the Parkway. The Recovery Plan for the VELB identifies acreages of habitat conserved for the VELB as a recovery action. Least Bell's vireo (*Vireo bellii pusilus*; federal and state endangered) occurs in limited areas of the Parkway, particularly at the confluence of the American and Sacramento Rivers. Western yellow-billed cuckoo (*Coccyzus americanus*; federal and state threatened) is infrequently observed migrating through the Parkway, but suitable nesting habitat is not present.

Nesting colonies of bank swallow, a state threatened species, have been observed on steep, unvegetated banks at the River Bend Park, Sailor Bar, and Cal Expo

Areas. But they have not been found within the Parkway in recent years and are considered locally extirpated. State threatened Swainson's hawks (*Buteo swainsoni*) are also known to nest in riparian woodland and forest habitat in the Parkway. State endangered and CFP bald eagles (*Haliaeetus leucocephalus*) nest at Lake Natoma and are observed in spring while foraging, during migration, and occasionally in the winter months. Several state SSC birds are known to nest in the Parkway, including white-tailed kite (*Elanus leucurus*), Cooper's hawk, burrowing owl (*Athene cunicularia*), great blue heron, and great egret. Other SSC are occasionally observed foraging in or migrating through the Parkway.

The Western pond turtle has been observed at Bushy Lake and the Nature Study Area in Ancil Hoffman County Park, and the species occurs along the length of the Parkway where desired habitat is available. The Western pond turtle is a focal species for the LAR watershed, as it is California's only native freshwater turtle species. Western pond turtles face significant risk from human activity adjacent to Bushy Lake. Monitoring and understanding the critical habitat needs of the Western pond turtle can help determine what biological conditions occur at Bushy Lake and along the Parkway that optimize Western pond turtle habitat.

Chinook salmon Central Valley spring-run ESU population 6, Central Valley fall-run and late fall-run ESU population 13, and Sacramento River winter- run ESU population 7 have potential to occur within the reach of the American River that flows through the Parkway. These ESU populations are listed under CESA and/or ESA or are otherwise considered special status. In addition, steelhead of the Central Valley DPS population 11 are listed as federally threatened and have potential to occur within the Parkway.

The only sensitive plant species currently identified is Sanford's arrowhead (*Sagittaria sanfordii*) (CNPS Rare Plant Rank 1B.2). Suitable habitat for this low-lying, creeping perennial herb includes standing or slow-moving freshwater ponds, marshes, and ditches.

Appendix C of the NRMP contains a list of special-status species that occur in or have the potential to occur in the Parkway.

*Fremont cottonwood trees in the Discovery Park Area.*
*Photo Credit: Regional Parks*

# 4.5 INVASIVE SPECIES

Non-native invasive plant and wildlife species occur throughout the Parkway in every vegetation community type. Where dominant, non-native species prevent native plants and wildlife from establishing, disturb hydrologic and sediment transport processes, increase risk of wildland fires, and discourage some recreational uses. In addition, non-native invasive species can be toxic to, transmit disease to, or predate upon native wildlife.

## 4.5.1 Plants

Numerous infestations of non-native and invasive plants have dominated or currently dominate large portions of Parkway habitats. For the purposes of the NRMP, non-native plant species refer to those species introduced to California after European settlement. Invasive species refers to those non-native species that have spread into wildland areas through human activity, adversely affecting native habitats and ecosystem processes. The incursion of non-native and invasive plant species has reduced the overall abundance and diversity of native plant communities, impaired wildlife habitat quality, altered floodplain geomorphology, and discouraged some recreational uses along the Parkway.

There are over 250 non-native plant species that occur in the Parkway, but only a small number are considered invasive (CAL-IPC 2020, SCRP 2008). Regional Parks has ranked non-native invasive species according to how severely they affect localized ecosystem processes, triggering the need for management action. The following six species have been ranked as the highest priority species: yellow star thistle (*Centaurea solstitalis*), Chinese tallow tree, red sesbania, giant reed (*Arundo donax*), Spanish broom, French broom, Scotch broom, and pampas grass. These target species meet one or more of the following criteria:

- Are highly invasive or aggressive colonizers;
- Prevent native species from regenerating;
- Are toxic or provide low-quality habitat values for wildlife;
- Reduce water yields;
- Obstruct passage of floodwaters;
- Reduce streambank stability; and
- Are highly flammable (Eva Butler and Associates et al. 2000).

The single largest noxious weed infestation in the Parkway is yellow star thistle, covering nearly half (an estimated 548 acres) of the agricultural fields and annual grasslands.

*Pampas grass in the Ancil Hoffman County Park Area. Photo Credit: Regional Parks*

Yellow star thistle is a small annual herb that is not included on Figure 4-5. This is because it does not lend itself to mapping at a Parkway-wide scale due to its widely varying population density within each community, varying distribution throughout the year due to seedbank dynamics, and general ubiquity throughout the Parkway. Yellow star thistle is intolerant of flooding and generally restricted to upland settings, but it can quickly reinvade and dominate sites within several years following a flood event due to its extensive seed bank. Populations are generated from seed, so long-term management goals are focused on vegetation type conversion, which involves removing the invasive plants and seed bank and replacing them with native species. As the native plants establish and consume more resources,

the seed bank will be reduced due to lack of suitable germination conditions (SCRP 2008).

Several other invasive species populations had been identified as rapidly expanding in the riparian vegetation of the LAR (Eva Butler and Associates et al. 2000) and have been addressed by the Invasive Plant Management Plan. Red sesbania had been expanding along shorelines of streams and ponds and was brought under control through the IPMP efforts. During the 2017 floods, red sesbania seed banks flourished and populations rapidly expanded once more, but they were brought under control. Volunteers and staff were able to remove dense stands and herbicide contractors treated more difficult areas. Chinese tallow tree, giant reed, Spanish broom, and tamarisk had also been expanding in riparian habitats and were controlled through the IPMP program. Maintaining control of these invasive plant species is important because larger populations may strongly affect hydraulic roughness during high-flow events and can affect erosion and sedimentation processes. Moreover, infestations crowd out native riparian trees and shrubs and decrease habitat diversity for wildlife.

As shown through the success of the IPMP, invasive species removal and management can be beneficial economically and ecologically. Although it is nearly impossible to completely eradicate certain invasive species, management efforts help to prevent environmental degradation in the Parkway. For most perennial, woody tree, and shrub species, it is possible to drastically reduce the population by removing all mature plants and new growth; thereby decreasing the seed bank and reducing regrowth. Performing continuous management reduces the environmental impacts of invasive species and reduces maintenance costs in the long term (SCRP 2008).

The ARPF maps and manages exotic plant species populations as part of the Invasive Plant Management Plan (IPMP) (SCRP 2008) to guide management decisions related to invasive species (Figure 4-5 Invasive Plant Species). Established in 1997, the IPMP program has been implemented for Phase I and Phase II, and is now in the maintenance phase. Phase I of the IPMP began with background studies, mapping, and data compilation; completing localized removal projects; and monitoring and mapping invasive plant populations throughout the Parkway (Eva Butler and Associates et al. 2000). Since partnering with the ARPF, volunteer stewardship has been very successful in controlling and managing priority invasive species without the extensive use of herbicides (SCRP 2008).

The second phase of the IPMP focused on eradicating all mature target weeds while controlling seedlings, re-sprouts, and new colonies to reduce the seed bank and prevent re-infestation. Other Phase II goals included removing yellow star thistle and further establishing the volunteer stewardship program for long-term invasive control (Eva Butler and Associates et al. 2000). The Parkway's integrated pest management program includes hand removal, cut and paint herbicide application, and targeted backpack spray application. Use of herbicides is limited to minimize damage to surrounding species and encourage native seed germination. The goal of the program is to use contractors and volunteers to eradicate mature invasive species and control regrowth.

Early stages of the IPMP implementation included biomass removal of mature target weeds. Invasive plant removal focused on mapping and eradicating incipient stands of giant reed, tree of heaven, Spanish broom, yellow star thistle, red sesbania, and Chinese tallow tree (Eva Butler

**TOP** *Perennial pepperweed in the Woodlake Area. Photo Credit: Regional Parks*
**BOTTOM** *Red sesbania. Photo Credit: Regional Parks*

and Associates et al. 2000). These were considered high priority for removal because they colonize rapidly and spread along streams. Phase 3 priorities (Eva Butler and Associates et al. 2000) have not been funded and implemented. These Phase 3 species include perennial pepperweed, tree of heaven, black locust, Himalayan blackberry, vinca (*Vinca major*), yellow flag iris (*Iris pseudoacorus*), Chinese pistache (*Pistache chinensis*), and cherry plum (*Prunus dulcis*) (Eva Butler and Associates et al. 2000).

The maintenance phase of the IPMP includes the removal and timing of treatments as determined by plant blooming periods, aquatic species dynamics, and accessibility of river flows. Non-invasive methods (e.g., hand pulling) are employed by staff and volunteers when possible. The volunteer program continues to be an important resource for the program. Information from the pilot program is being gathered to determine the most effective methods for removing target species from the Parkway. In general, most large shrubs and trees, including Spanish broom and Chinese tallow tree, can be completely removed with annual or bi-annual efforts. Native species revegetation is recommended in these areas to stabilize soil and discourage invasive seedling germination (SCRP 2008). The number of species to be targeted ultimately depends on available funding, impacts to recreation, and ecosystem and flood control infrastructure (SCRP 2008).

## 4.5.2 Fish and Wildlife

The LAR and its associated riparian corridors represent major regional waterway and travel routes for exotic fish and wildlife species movement. As with plants, the increasing urbanization, anthropogenic changes to hydrology, and general change in land use within the LAR vicinity has resulted in the increase of non-native wildlife species. Changes to vegetation described above have decreased habitat availability for native wildlife species, while simultaneously increasing habitat availability for non-native wildlife species. Within Sacramento County, there are 98 documented occurrences in the USGS Nonindigenous Aquatic Species (NAS) database. The NAS definition of "nonindigenous aquatic species" includes those species that enter a body of water or aquatic ecosystem outside of the historic or native range (USGS 2021). Like plants, USGS reports that most of the nonindigenous introductions are due to "human activities since the European colonization of North America" (2021) While many species are introduced from countries outside of North America, several are also native to North America, but are classified as nonindigenous as they have been introduced to drainages outside their native drainages within North America.

For the purposes of this document, the term "invasive" also encapsulates NAS included in the USGS database. Invasive species threaten native wildlife through predation, parasitism, competition, and introduction of disease. In addition, some species, including nutria (not included in the NAS database), have severe negative environmental and agricultural impacts. The following invasive wildlife species have been ranked as the highest priority species for management: Mute Swan (*Cygnus olor*), Brown-headed Cowbird (*Molothrus ater*), southern watersnake (*Nerodia fasciata*), northern watersnake (*Nerodia sipedon*), red-eared slider (*Trachemys scripta elegans*), and American bullfrog (*Lithobates catesbeianus*).

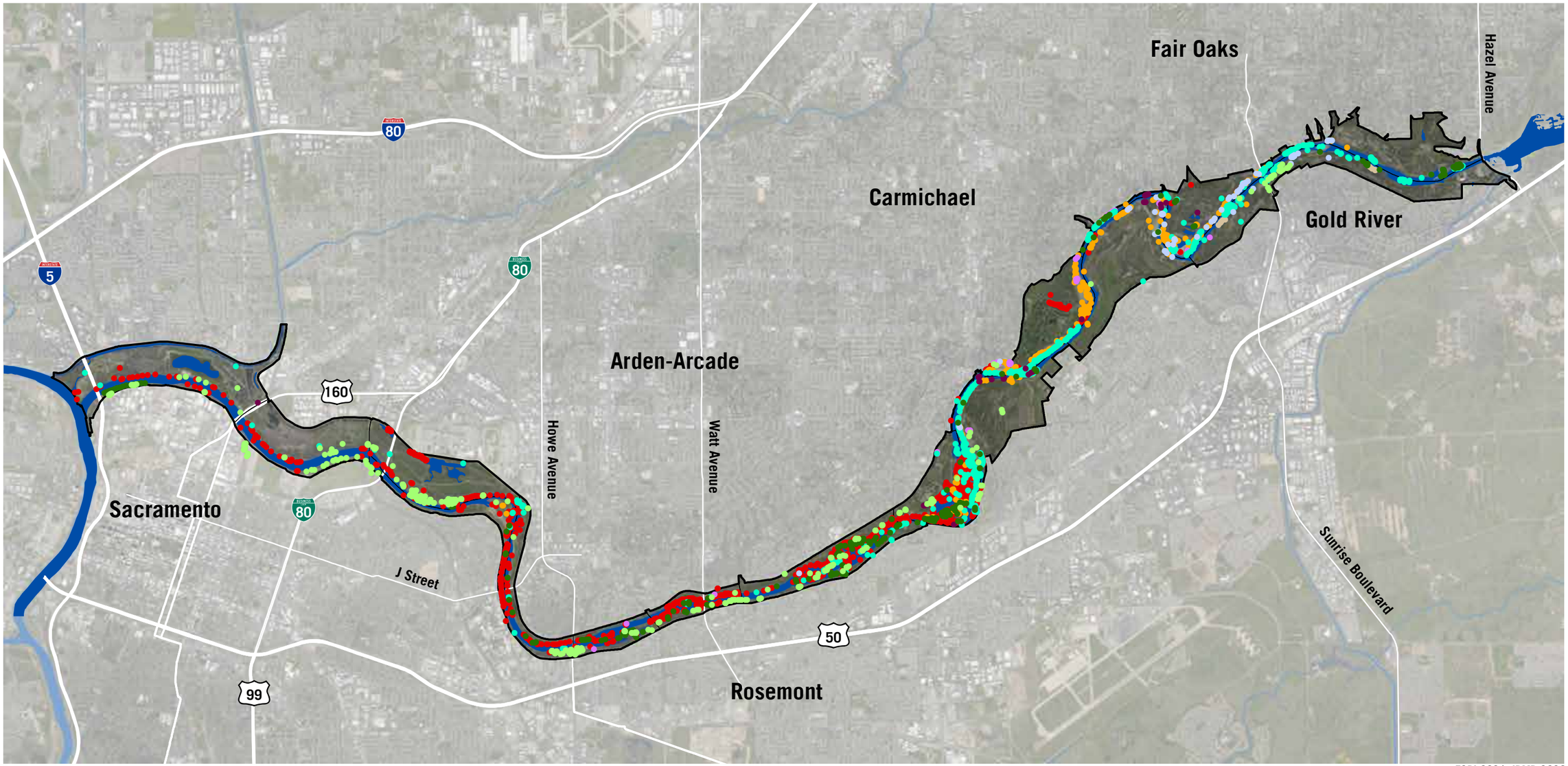
The Invasive Species Program at CDFW manages the detection and eradication/reduction efforts of the invasive wildlife species of highest priority. A brief description of these species and their potential impact to the Parkway is provided below. Appendix C Special-Status and Invasive Species in the Parkway contains more information on invasive species of concern in the Parkway.

### MUTE SWAN

Native to northern and central Eurasia, mute swans arrived in the United States in captivity for use by private breeders in zoos, parks, and as ornamental livestock (CDFW 2021a). Adult mute swans are solid white, with a black patch attached to their bright orange beaks. Adults can measure 4-5.5 feet in length and weigh 25-30 pounds (CDFW 2021a). Mute swans are aggressive and consume large amounts of submerged aquatic vegetation, so they have been used in parks and open space to reduce waterfowl populations and algal growth. However, within the Parkway, mute swans can harm native waterfowl and reduce aquatic vegetation required for multiple life stages of native fish and wildlife. There are unconfirmed observations of mute swans along the Parkway (iNaturalist 2021a).

### BROWN-HEADED COWBIRD

Brown-headed cowbird is in the blackbird family and is relatively nondescript, with males having a glossy black body with mild green iridescence and a dark brown head. Females are drab, with a grayish-brown body and lighter coloration on the head, breast, and underside of the body (CDFW 2021b). Adults range in size from 6-8.5 inches in length and have a wingspan of 12-15 inches. Originally native to the Great Plains region of the United States, the




ESRI 2021, IPMP 2020

0 1 2 Miles

- Arundo Donax
- Chinese Tallow
- French Broom
- Oleander
- Pampas Grass
- Pyracantha
- Red Sesbania
- Scotch Broom
- Spanish Broom
- Yellow Star Thistle*

* Yellow star thistle is a small annual herb that is not individually mapped due to its ubiquity throughout the parkway, widely varying population density, and varying distribution throughout the year due to seedbank dynamics.

# Figure 4-5
# Invasive Plant Species

range of brown-headed cowbird has vastly expanded through human habitat modification and introduction of non-native livestock grazing. This species is now present year-round throughout much of California (CDFW 2021b). Brown-headed cowbirds are co-adapted with herding mammals, and feed on insects attracted to cattle and other grazers such as deer, elk, and bison. Due to the grazing herds' nomadic travel patterns, brown-headed cowbirds adapted by becoming nest parasites—laying their eggs in the nests of other birds and leaving them to rear the cowbird young, often at the expense and/or death of their own due to the voracious appetite and quick growth of the cowbird chicks. Adult brown-headed cowbirds will also remove the eggs of the host nest. For this reason, brown-headed cowbirds represent a large threat to native bird species within the Parkway.

### SOUTHERN WATERSNAKE

Believed to be introduced through the pet trade and subsequent release, aquatic southern watersnakes within California are likely derived from the native Florida subpopulation (*N. f. picitiventris*). Adults are broad in stature and can reach up to 5 feet in length, with highly variable body colors (brown, black, yellow-brown, tan, gray, or red; CDFW 2021d). Southern watersnakes have established populations in multiple locations within Sacramento County, including directly east of the Parkway near Lake Natoma (CDFW 2021d). Southern watersnakes are a predator of native wildlife in California, including many threatened and endangered amphibians, fish, reptiles, and birds.

### NORTHERN WATERSNAKE

Believed to be introduced through the pet trade and subsequent release, aquatic northern watersnakes within California were introduced from one of four original subpopulations: Lake Erie, midland, common, and Carolina (CDFWe 2021). Adults are broad in stature and can reach from 2-4.5 feet in length. They have black, dark brown, or reddish crossbands toward the head; rows of blotches towards the tail; and their bellies can be white, yellow, or orange, commonly with dark half-moon shaped spots (CDFWe 2021). Northern watersnakes are known to occur in Roseville, north of Sacramento. Northern watersnakes may be a predator of native wildlife in California, including many threatened and endangered amphibians, fish, reptiles, and birds.

### RED-EARED SLIDER

Red-eared sliders are medium-sized turtles that are native in the Mississippi Valley, from Illinois south to the Gulf of Mexico, and from New Mexico east to West Virginia. Adults range in size from 3.5-14.5 inches in length and are typically identified by their red "ear," a short red stripe extending behind the eyes, although this may be less apparent in older individuals. The shells are olive to brown in color with yellow stripes and the plastrons are typically yellow or brownish orange, with dark spots in the center of each scute (shell plate). Red-eared sliders were, and continue to be, introduced globally, primarily through the domestic pet trade. Red-eared sliders typically outcompete the native western pond turtle because of their quicker sexual maturity, more frequent and larger clutch sizes, larger adult size (and subsequent larger caloric demand and space occupied at basking sites), and very general habitat preference. This out-competition further exacerbates the already steady loss of the western pond turtle's native habitat along the West Coast of the United States. Red-eared sliders are also disease vectors, spreading bacteria, including Salmonella spp., to native wildlife, including western pond turtle. There are many observations of red-eared slider along the Parkway (EDDMapS, 2021; iNaturalist 2021b).

### AMERICAN BULLFROG

The American bullfrog is the largest North American frog, with adults reaching 3.5-8 inches in length, and identified by their characteristic large, noticeable tympanum (earlike membrane). The bullfrog is native to the central and eastern United States. It was first accidentally introduced to the western United States in the early 20th century via stocking lakes with fish. Further introductions of the species took place via the exotic pet trade and other unmanaged imports for a variety of purposes. They are now widespread throughout California but are notably absent from the Sierra Nevada. Bullfrogs are notorious for eating "anything they can fit into their mouths" (CDFW 2021g). For this reason, they are an enormous conservation issue to endemic California wildlife. Adult bullfrogs are a predator of western pond turtle and other native wildlife species at various stages of life. Larval bullfrogs eat algae, aquatic vegetation, and invertebrates but also consume larvae and hatchlings of other amphibians and reptiles. There are numerous observations of American bullfrog along the Parkway (iNaturalist 2021c).

# 4.6 WILDLAND FIRE

Wildland fire is a term that includes any non-structure fire originating in an area of wildland vegetation, aside from prescribed fires ignited for management purposes (NPS and USFS 2020). It includes wildfires that may be caused by lightning, volcanic activity, accidental human activities (including sparks from vehicles or equipment, fireworks, escaped prescribed fires, campfires), and arson (USFS 2020).

## 4.6.1 Fuel, Weather, and Topography in the Parkway

Fire behavior is dependent upon the location-specific characteristics of three factors, including fuels, weather, and topography, as described below and shown in Figure 4-6 Fire Behavior Triangle.

*Fuels* – The combustible materials that allow for the ignition and spread of a fire.

*Weather* – Temporary atmospheric conditions, including wind, rain, temperature, and humidity.

*Topography* – The physical features of land, including slope, elevation, and aspect (the direction a slope faces).

### Fuels

A key consideration in wildland fire prevention is the reduction of fuels. Fuels are characterized in terms of quantity, size, moisture content, flammability, and location/arrangement, all of which contribute to the intensity and severity of a wildland fire (Nunamaker et al. 2007). Large quantities of fuels will contribute to more intense fires.

Physically small fuels, such as dry grasses and twigs, tend to ignite faster and burn quicker, while large fuels, such as downed wood greater than 4 inches in diameter, may take longer to ignite and will likely burn for extended periods of time. Dry fuels ignite easier than those with higher moisture content. Fuel moisture is usually determined by a combination of the life stage of the fuel, season, and recent weather events. Finally, the location of fuels contributes to the type of fire produced. Groundcover fuels (e.g., grasses, fallen wood, and organic litter) produce surface fires. Fuels located 6 to 15 feet in elevation (e.g., small trees, low-hanging branches, shrubs, and vines) may act as ladder fuels that allow fire to spread into the crowns of trees in the overstory. Figure 4-7 Fuel Profile depicts the fuel profile of a fire-suppressed forest with accumulated groundcover/surface fuels and ladder fuels.

### Invasive Vegetation

Several invasive plant species increase wildland risk during fire season. Most plant species pose a heightened risk of ignition in summer and fall. However, giant reed, pampas grass, Spanish broom, French broom, Scotch broom, and yellow star thistle are of particular concern because of their significant fuel loads, height, density, and flammability in comparison to native riparian forest species. The role of invasive species in increasing wildland fire risk in the Parkway highlights the need for continued and strategic management of non-native invasive plants, both to improve overall ecosystem health and for wildland fire prevention.

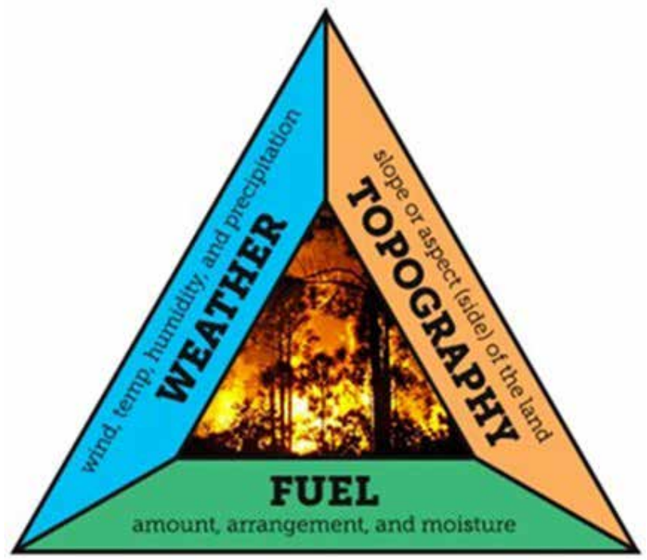



**FIGURE 4-6 FIRE BEHAVIOR TRIANGLE**

*(Source: Google Images)*

Giant reed, a grass that can grow up to 30 feet tall, is distributed along forested riparian areas in the Parkway in small patches as it has largely been brought under control through the IPMP. Pampas grass is a large grass species that can reach 6 to 13 feet in height and invades the Parkway's inland riparian and floodplain areas. Pampas grass has also been treated as part of the IPMP and will require continued maintenance for ongoing control. Giant reed and pampas grass will be important to continue to control because they produce significant quantities of dry biomass that increase fuel loads in native vegetation communities (CAL IPC 2020a; CAL IPC 2020b). Spanish broom, French broom, and Scotch broom are large shrubs that have been

treated as part of the IPMP but when left unmaintained can grow in dense stands (USFS 2020). Spanish broom grows 10 to 15 feet in height in riparian areas and sandbars. French broom grows to up to 10 feet high and has been observed in the Rossmoor Bar, Sacramento Bar, and Lower Sunrise Areas. Scotch broom grows 6 to 10 feet and exists as a controlled IPMP species in isolated areas in the upper Parkway. These species ignite readily and may act as ladder fuels, facilitating the spread of surface fires into ladder fuels, and subsequently to the tree crowns.

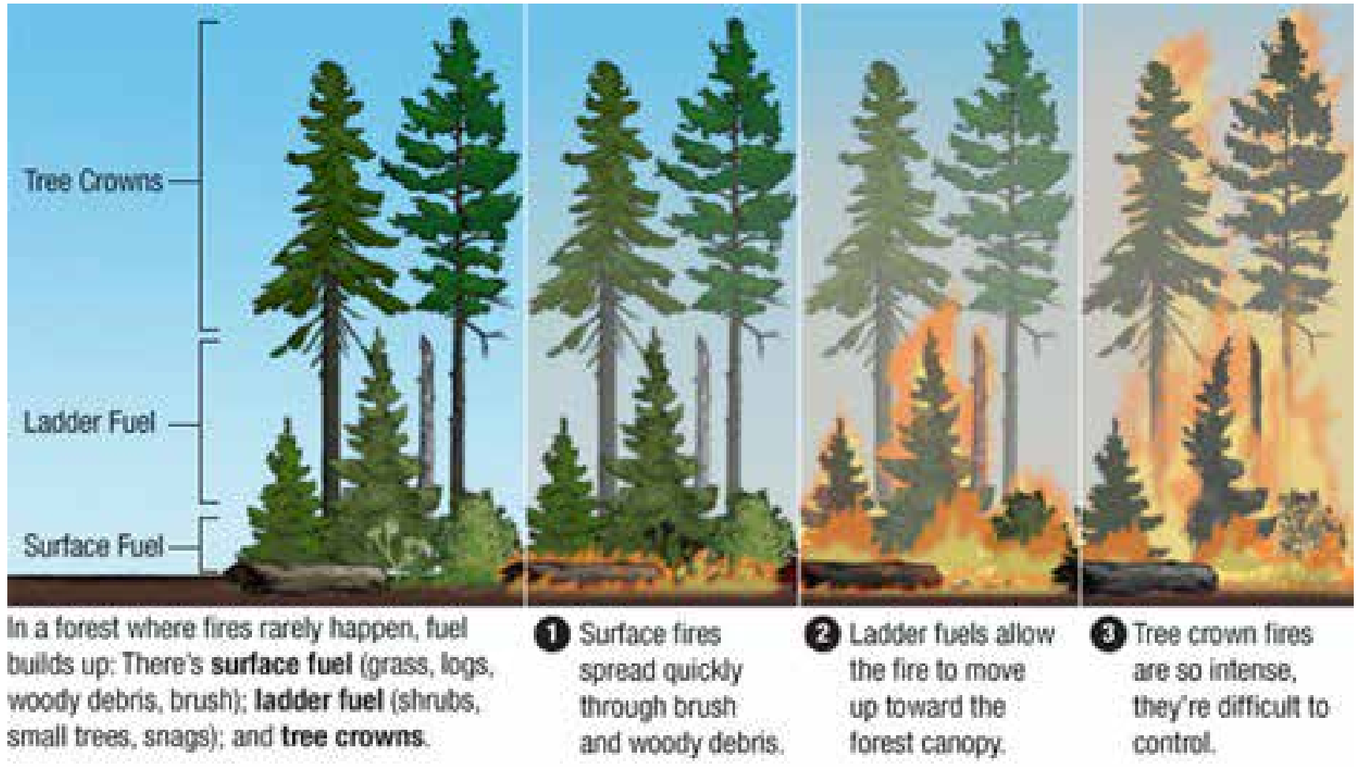
### Weather

Weather conditions, such as air temperature, humidity, and wind speed, have considerable influence over the ignition, intensity, and movement of wildland fires. High temperatures heat fuels and allow faster ignition than low temperatures. Low humidity levels indicate less water vapor in the air, which dries fuels and allows them to ignite and burn more quickly. High wind speeds supply existing fires with more oxygen and push flames toward unburnt fuels (NPS 2017). In general, these weather conditions that contribute to increased fire risk span from May through November, though wildfires can occur any time during the year, especially during droughts.

As discussed in Chapter 3.0 Parkway Setting, climate change may significantly alter weather patterns in the Sacramento Valley and the Parkway in the future. Changing climatic conditions may result in consistently higher temperatures and altered precipitation patterns, resulting in more extreme weather conditions, such as extreme droughts punctuated by extreme flood events (Houlton 2018).

**FIGURE 4-7 FUEL PROFILE**

*(Source: USFS)*




### Topography

The Parkway is quite flat, though the bluffs in the LAR's upper reaches represent steeply sloped areas. Steep slopes enable fire to travel rapidly uphill as hot air rises and heats the vegetation further upslope. Flat and gently sloping areas do not increase wildfire intensity or severity, but steep bluff areas may increase flame lengths and wildfire spread uphill (NPS 2017).

## 4.6.2 Wildland Fire Impacts

Wildland fire affects biological resources in both the short- and long-term. It can revitalize or degrade these resources to varying degrees based on site-specific natural resource characteristics (including floral and faunal species composition and soils composition), fire characteristics (including intensity and severity), and recent weather events (Agee 2006).

## Vegetation

Vegetation mortality and recovery in burned areas depends on the characteristics of plant species, moisture content, and fire severity. An individual plant's resistance to fire mortality depends partly on the location of its growth tissues. Trees with thicker bark, such as oak trees, are more likely to survive scorching than trees with thinner bark, such as cottonwoods. Rhizomatous species (with underground stems), such as Santa Barbara sedge, are also likely to resprout and recover following wildfire (Miller 2000). Shrubs such as elderberry, coyote brush, and willow will produce post-fire sprouts from their roots, aiding in an area's post-fire recovery.

Vegetation recovery in burned areas is heavily influenced by species reproduction dynamics. A species capable of regeneration may be able to produce post-fire sprouts if adequate growth tissues are retained. Seed banks usually germinate and reestablish following a ground-clearing fire, although severe fires may produce lethal heat to the soil that destroys even the seed bank (Miller 2000).

## Soils

Fire can potentially impact the physical, chemical, and biological characteristics of soil. The most important effect of fire on the physical properties of soil is loss of organic matter on or near the surface. This weakens soil structure and may reduce soil productivity. The transfer of heat from the litter and duff layers of soil through the surface layer and deeper can increase the hydrophobicity (i.e., water repellence) of soils. Both loss of soil structure and increased hydrophobicity increases post fire water runoff and erosion potential. The degree to which the physical properties of soil are impacted by fire is largely dependent on the severity of the event and the temperature threshold of the soils (Neary et al. 2005).

Wildfire can alter the chemical properties of soils. Organic matter plays an important role in nutrient cycling (the process in which organic and inorganic matter is removed and introduced back into the production of living matter) and water retention in soils. The combustion of soil organic matter may either volatilize (evaporate or disperse in vapor) nutrients or make the nutrients stored within the organic matter more readily available to plants and other organisms. Important nutrients, particularly nitrogen, are often transferred away from a site by water runoff and erosion. Ultimately, the intensity and severity of a fire determine the degree of change in soil chemical characteristics.

Fire may impact the biological properties of soil, including the microorganisms responsible for decomposition and mineralization processes. While microorganisms are generally resilient to fire and eventually recover to pre-fire levels, fire may completely eradicate the microorganisms found in the litter and duff soil layers. The degree to which a fire impacts soil biology is dependent on fire intensity, severity, and soil microbial composition (Neary et al. 2005).

## Water

Wildfire may affect the infiltration of water into soils; the storage of water in plants and organic litter; and the quantity of water travelling in surface waters and via overland flow. Decreased infiltration of water into soils and elimination of surface organic matter can induce flooding events resulting from increased erosion and runoff.

*Burned cottonwood tree in the Howe Avenue Area.*
*Photo Credit: Regional Parks*

Wildfire affects water quality by introducing sediment to surface waters through flooding and erosion, increasing nutrient loading in surface waters, introducing heavy metals (e.g., mercury, arsenic, and selenium) from surrounding soils, and conveying fire retardant chemicals into surface waters (Neary et al. 2005).

### Wildlife

The impacts of wildland fire on wildlife can be direct or indirect. Direct impacts include injury and mortality from flames and smoke inhalation. Indirect impacts include both short-term and long-term wildlife movement in response to the fire and changes in the food supplies of a habitat area (Smith 2000).

Overall, wildland fires do not typically injure or kill large proportions of wildlife populations. However, fires that are large, intense, fast-moving, and uniform can be devastating to wildlife, regardless of species. Small mammals, such as voles, that nest underground have a higher likelihood of surviving a wildland fire than do rabbits and mice. Wildfires that occur during the nesting season increase the fire-induced mortality rates of nesting birds. Fledglings nesting closer to the ground, such as red-winged blackbirds and California quail, are most vulnerable though tree nests are also vulnerable during crown fires. Mortality rates in large mammal species, such as deer and coyotes, are typically low due to their high mobility. Western pond turtles are vulnerable to fire during nesting season, while other reptiles and amphibians are most vulnerable during molting phases and as juveniles. Though there is comparatively less research on fire-related mortality and injury to insects and other invertebrates, individuals in immature or immobile life stages, including the valley elderberry longhorn beetle larvae in elderberry shrubs, are most vulnerable (Smith 2000).

*Burned trees in the Howe Avenue Area. Photo Credit: Regional Parks*

Across many wildlife populations, most emigration from an active fire is temporary. Most populations return to the burned area after varying periods of time depending on the extent of damage and recovery of their habitats. Some wildlife species, including some raptors, are attracted to recently burned areas because there is a lack of substantial cover, and it is easier to find prey.

## 4.6.3 The Wildland-Urban Interface

Wildland fires impact human development most frequently in the wildland-urban interface (WUI). The Sacramento Metropolitan Fire District (Metro Fire) serves unincorporated Sacramento County and the incorporated cities of Rancho Cordova and Citrus Heights. Metro Fire's Community Wildfire Protection Plan (CWPP) defines and explores local wildfire risks and priorities (Wildland Res Mgt et al. 2014). Metro Fire's CWPP identifies WUI areas within its District boundaries using the following parameters:

*Grazed (photo left) versus ungrazed (photo right) vegetation. Photo Credit: Regional Parks*

Using a set of spatially defined data that characterizes vegetation and parcel boundaries, the following set of decision rules were established to determine which properties should be included within the WUI:

1. The boundary of the WUI will fall on the parcel boundary;
2. All parcels are greater or equal to one-half acre;
3. Any parcel where the total percentage of all fuel types is greater than one-half acre;
4. Any parcel where surface fuels are present;
5. Any parcel greater than 80 acres; and
6. Any parcel with a 1,000-foot buffer around wildlands that are greater than 80 acres. (p. 4-1)

The Parkway between Watt Avenue and Folsom Dam is included in Metro Fire's service area. The CWPP places most of the Parkway (within District boundaries) and adjacent communities within a District-designated WUI (Figure 4-8 Wildfire). The CWPP states that areas located within the District's mapped WUI are, "targeted for increased levels of fire prevention, preparedness, response, and recovery plans. Parcels in this designation are typically subject to more stringent regulations regarding ignition-resistant construction, defensible space creation and maintenance, and heightened levels of education regarding fire prevention" (Wildland Res Mgt et al. 2014, p. 4-1). The Parkway and surrounding communities are a locally designated high fire risk zone in which fire risk and hazard management are prioritized.

The City of Sacramento Fire Department (Sacramento City Fire) is responsible for fire response and fire-related vegetation management activities in the Parkway from the confluence of the Sacramento River and American River to Watt Avenue. Though Sacramento City Fire does not have a CWPP, its Fire Prevention Division conducts fire prevention activities, including vegetation management, in the Parkway (Sacramento City Fire 2017).

Over the last decade, Regional Parks has enlisted outside expertise to identify wildfire hazard conditions and recommend methods and locations to reduce these hazards. This has been conducted at a broad scale and focused, site-specific locations in the Parkway. Resulting actions emphasize prevention (e.g., signage, education, enforcement), fuel management (e.g., trimming, grazing, fire break maintenance), and preparedness/response. Regional Parks relies on Metro Fire and Sacramento City Fire not only to extinguish fires in the Parkway, but also as partners in reducing fuels through training burns, prescribing fire breaks, and recommending fuel reduction priorities. Regional Parks' 2018 Fire Fuel Reduction Action Plan includes prescribed burns in partnership with both Metro Fire and Sacramento City Fire (Regional Parks 2020). Metro Fire's CWPP identifies and maps planned fire fuel and risk reduction projects, including prescribed burn areas, fuel reduction maintenance, burn area rehabilitation, sprinkler system updates, fire break management, and access route improvements in the Parkway.

As drought conditions have persisted and the number of annual fires continues to be high, Regional Parks partnered with the American River Parkway Foundation and a number of other agencies to form the American River Parkway Fire Safe Council in July 2021. The American River Parkway Fire Safe Council consists of numerous Sacramento area

agencies, including fire protection services, utilities, water, wastewater, and flood protection agencies, conservation organizations, and other infrastructure owners, operators, and area nonprofits. The founding goals are to develop wildfire risk reduction plans for each Area Plan within the Parkway, protect the infrastructure that exists on the Parkway, address the safety concerns of Parkway users, develop a prescribed wildland fire hazard reduction plan, identify other high fire risk issues, and engage the public in support of fire management activities.

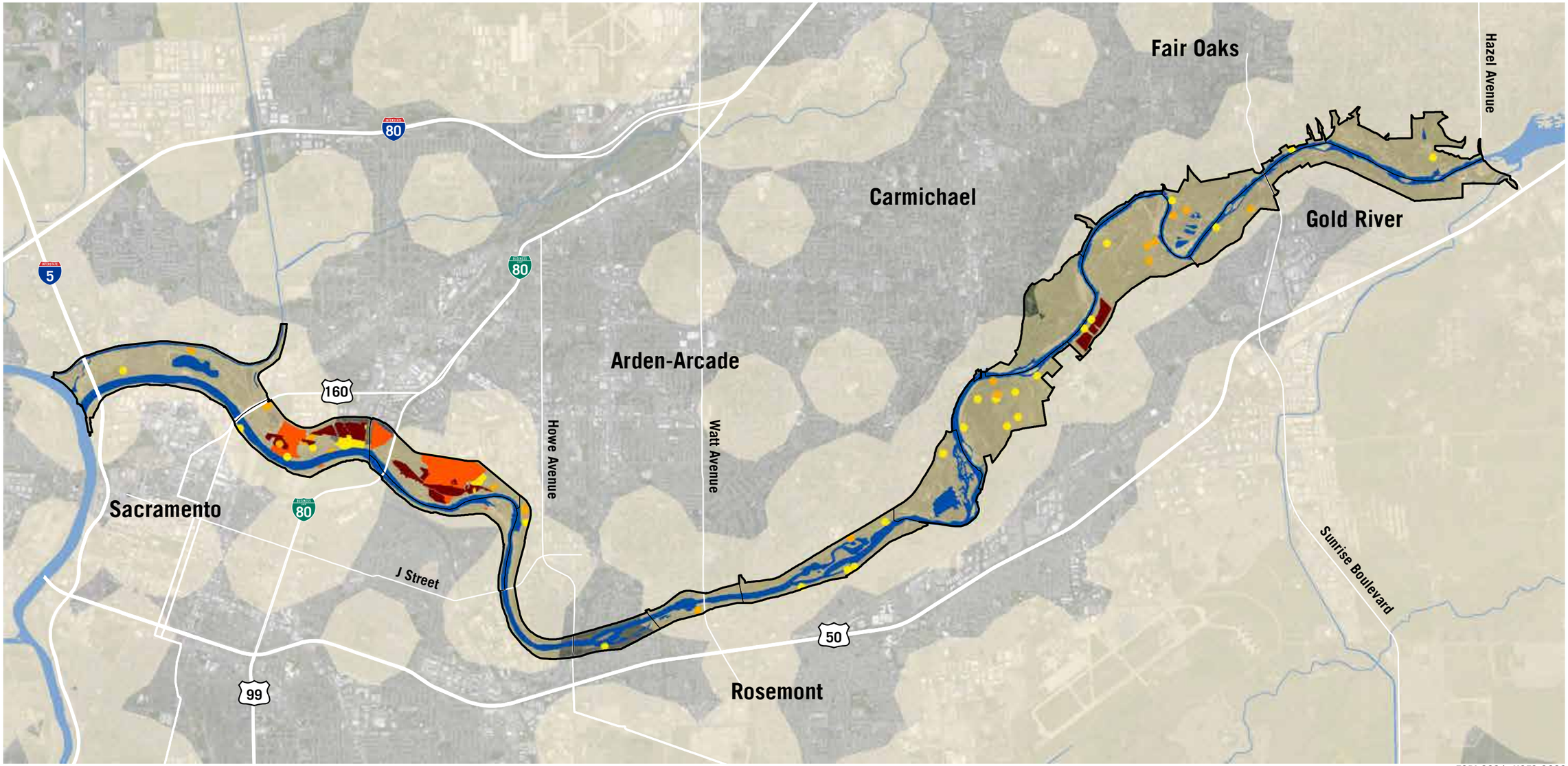
### 4.6.4 Parkway Wildland Fire History

In 1998, County natural resources staff began maintaining annual records of wildland fire in the Parkway. Data was collected by a variety of sources, including County natural resources staff (1998 – 2008), Regional Parks rangers' 311 reports (2016 and 2017), and Sacramento City Fire and Metro Fire (2018). Several notable issues exist with the data. First, there is inconsistency in the details included in annual records, likely because different entities that contributed the data do not report wildland fire data in the same way. In addition, records from the Regional Parks rangers may be incomplete in cases where Sacramento City Fire and Metro Fire responded to Parkway fires but did not contact a Parkway ranger.

Despite the noted issues with the data, when analyzed as a whole, the records illustrate several potential patterns in the Parkway's recent wildland fire history. Wildland fires in the Parkway have impacted mostly wildland vegetation (grasses and shrubs in particular). The majority of wildland fires in the Parkway have occurred in the Discovery Park, Woodlake, Cal Expo, Rossmoor Bar, and River Bend Park Areas. Finally, most wildland fires in the Parkway can be attributed to human activity, though the type of human activity is not always known. Human activity known to have caused wildland fires in the Parkway includes accidental fires started by campfires, arson, and reignition of wildfires that smolder after having been put out.

Figure 4-8 Wildfire shows the locations of wildfires and controlled and training burns in the Parkway from 1998 – 2015, and the portions of the Parkway and surrounding lands designated as WUI by Metro Fire and Sacramento City Fire.

*Mowed firebreak between planted oak trees.*
*Photo Credit: Regional Parks*




Fire: 2010 - 2015
Fire: 2004 - 2009
Fire: 1998 - 2003
Controlled and Training Burns
Wildland Urban Intermix

*ESRI 2021, USFS 2006*

0 1 2 Miles

# Figure 4-8
# Wildfire

# 5 PHYSICAL RESOURCES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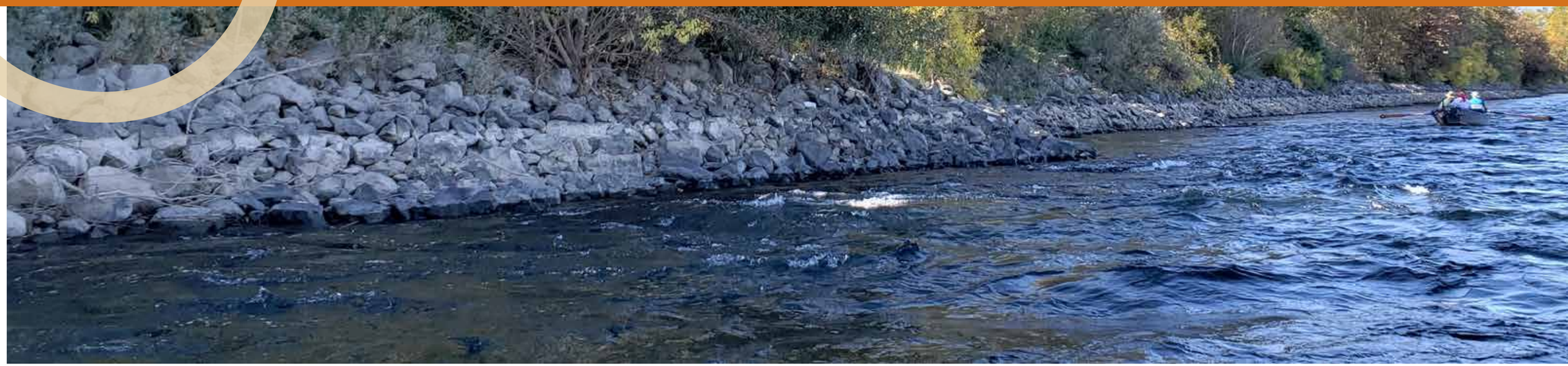
5.2 PARKWAY SEGMENTS ..... 5-10
5.3 SUMMARY OF PHYSICAL RESOURCE CHARACTERISTICS ..... 5-22

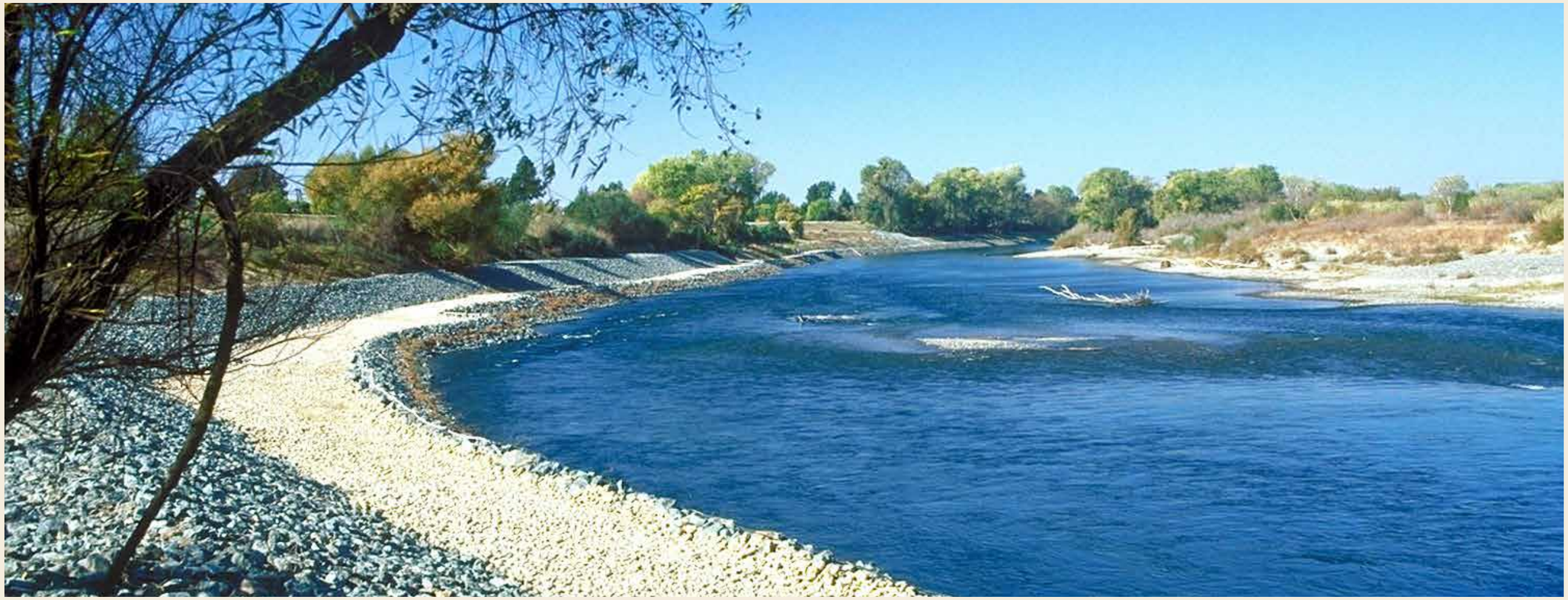
CHAPTER 5

# INTRODUCTION AND OVERVIEW

The physical features and characteristics of the Parkway reflect the significant direct and indirect changes brought about by human activities reaching back several hundred years.

Past human interactions with the Lower American River (LAR) corridor, including in-channel gold and aggregate mining, sediment deposition from upstream hydraulic mining, channel realignment, the construction of the Folsom and Nimbus Dams, bank enhancements for flood protection, and installation of infrastructure, have altered natural landforms and river processes in a way that has had cascading effects on the natural resources and human use of the Parkway. Today, alterations of the Parkway for flood protection, habitat enhancement, operations, and related purposes continue to transform the Parkway's physical features. As a result, the Parkway's physical resources show the effects of both the historical and present-day human development that has resulted in an altered, but still dynamic river system.

The LAR is part of a highly regulated river system fed by the American River basin that extends from Carson Pass on the south to Donner Pass on the north, and from the crest of the Sierra on the east to its confluence with the Sacramento River on the west. In the upper watershed, there are many notable reservoirs, including French Meadows, Hell Hole, Union Valley, Ice House, and Stumpy Meadows. The North and Middle forks of the American River



*Riverbank revetment site pre-planting. Photo Credit: Regional Parks*

come to a confluence near the City of Auburn, CA before flowing on to Folsom Lake, the largest reservoir in the American River basin, dammed in 1955. The South Fork American River discharges into Folsom Lake after flowing along the US Highway 50 corridor from Echo Summit. Discharge from Folsom Dam is controlled to balance

the water resource needs and flood risk control of the greater Sacramento area, while maintaining the ecological integrity of the LAR. It also provides hydroelectric power generation (USBR 2016). The furthest downstream dam and reservoir, about seven miles downstream of the Folsom Dam is Nimbus Dam and Lake Natoma. Lake Natoma acts as a regulating reservoir for the Folsom Dam, generates hydroelectric power and diverts water to the Folsom South Canal. After discharge from Lake Natoma, the LAR flows through the cities of Folsom, Fair Oaks, Carmichael, Rancho Cordova, and Sacramento before joining the Sacramento River.

This chapter discusses the Parkway's physical resources; the section supplements and summarizes the data included in the Physical Resources technical appendix (Appendix B). First, the Geomorphological Setting (5.1) of the LAR is presented, followed by a discussion of the various Parkway river segments (5.2). The river segments are discussed from the confluence upstream towards Lake Natoma.

# 5.1 GEOMORPHOLOGICAL SETTING

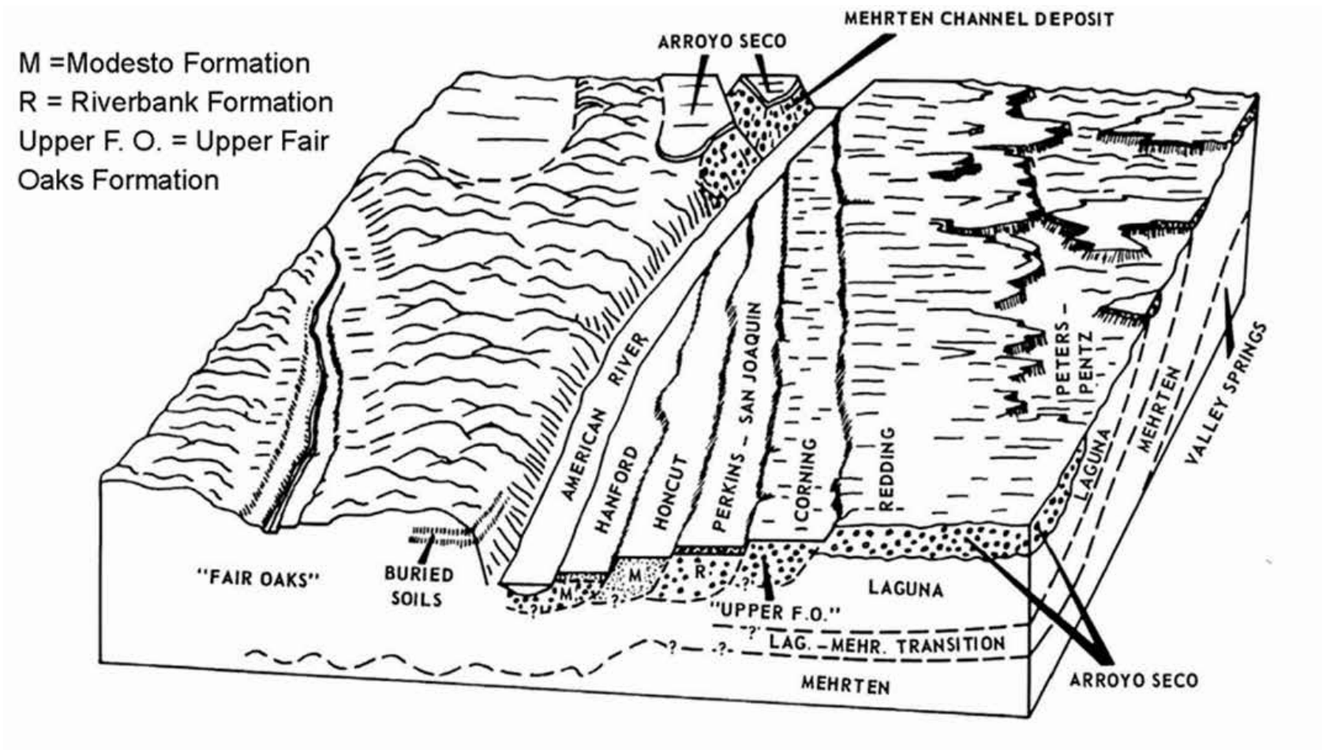
The geomorphology and present behavior of the LAR are intricately related to the area's geology, hydrology, and fluvial geomorphic history. Geomorphic development over the geologic time scale, including terrace sequences and associated fluvial deposits, plays a significant role in channel stability. The underlying geologic and geomorphic setting is key to understanding the river's current state, as well as the type and extent of restoration or mitigation that can ultimately be achieved within the confines of the physical setting. Descriptions of the LAR's underlying geologic units are given in Figure 5-1, and Figure 5-2 depicts the geologic and geomorphic setting of the LAR corridor and surrounding landforms.

The LAR and its floodplain are situated in Plio-Pleistocene-age geologic units (5.3 million years ago to 11.7 thousand years ago) and primarily composed of deposits from the ancestral river system as the ancestral channels were cut and then filled, shifting in location during repeated glaciations. Throughout the Pleistocene, periods of glaciation introduced large volumes of coarse sediments within valley channels; during periods of deglaciation, fine sediments (i.e., sands and silts) would wash down from the foothills, bury the braided channels, and coalesce into large alluvial fans (Shlemon 2000). From oldest to youngest, these formations are called Laguna, Arroyo Seco Gravel, Fair Oaks, Riverbank, and Modesto respectively (Shlemon 1976). The Fair Oaks formation is a locally-recognized geologic unit that correlates to the Laguna and Turlock Lake formations and forms the steep and relatively stable bluffs along the north side of the Lower American River (LAR). This erosion resistant layer is exposed intermittently along the channel bed and banks.

**FIGURE 5-1 GEOLOGIC UNIT DESCRIPTIONS**

| | | |
|---|---|---|
| PLEISTOCENE | Qmu | Modesto Formation; upper member; unconsolidated gravel, sand, silt, and clay. |
| | Qml | Modesto Formation; lower member; unconsolidated to semi-consolidated gravel, sand, silt and clay. |
| | Qru | Riverbank Formation; upper member, semi-consolidated to consolidated gravel, sand, silt and minor clay. |
| | Qrl | Riverbank Formation; lower member; consolidated gravel, sand, silt, and clay, generally associated with strong duripan horizon. |
| | Qtl | Turlock Lake formation; chiefly well consolidated sand with some silt and minor gravel. |

**FIGURE 5-2 GEOLOGIC SURFACE (ADAPTED FROM SHELMON 1967)**



Understanding the formation and location of these geologic units is important for assessing the capacity for erosion-resistant layers to resist scour and to help achieve levee stability under high flood flows (Fugro 2012). Fair Oaks-aged gravel deposits can also be found on terraces aged between the later formations encountered (Shlemon 1976).

The younger Riverbank and Modesto formations comprise progressively younger, topographically lower alluvial deposits nested within the older geologic formations that were formed as the river migrated northward. Roughly twice as old as the Modesto Formation, the Riverbank Formation has undergone more physical and chemical weathering, reflected in its greater degree of soil horizon development relative to soils formed on the Modesto. The youngest Pleistocene alluvium, the Modesto Formation is mostly manifested on distinct alluvial terraces, but also formed alluvial fans and some remnant, mid-river ridges (Helley and Harwood 1985). These formations make up most of the surficial and shallow subsurface geology of the LAR.

## Regional Watershed and Local Tributaries

The current LAR is part of a highly regulated river system fed by the American River basin that originates on the west side of the Sierra Nevada (Figure 5-3a and 5-3b) and encompasses portions of the Sierra high country, foothills, and central valley of California (Streamstats 2019). Several upper watershed reservoirs and tributaries collect, store, and convey water from the west slopes of the Sierra Nevada down to Folsom Lake, a reservoir created by Folsom Dam. From there the water continues down to Lake Natoma regulated by Nimbus Dam, the upstream end of the LAR Parkway. While tributaries exist along the LAR, their flow is negligible; however, their outfalls pose an erosion risk.

**FIGURE 5-3A UPPER AMERICAN RIVER WATERSHED (ADAPTED FROM SRWP 2010)**

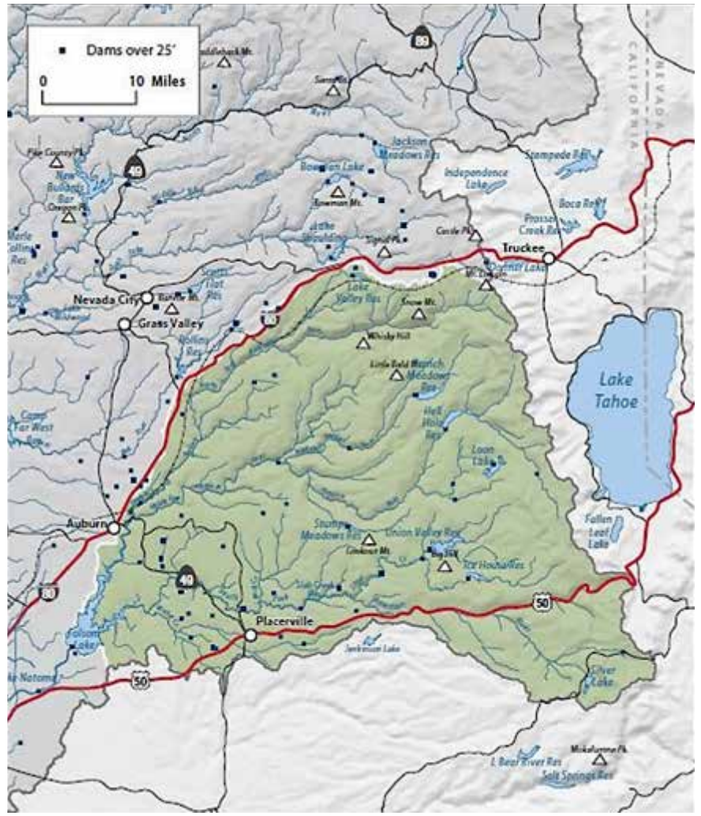



**FIGURE 5-3B LAR WATERSHED (ADAPTED FROM SRWP 2010)**

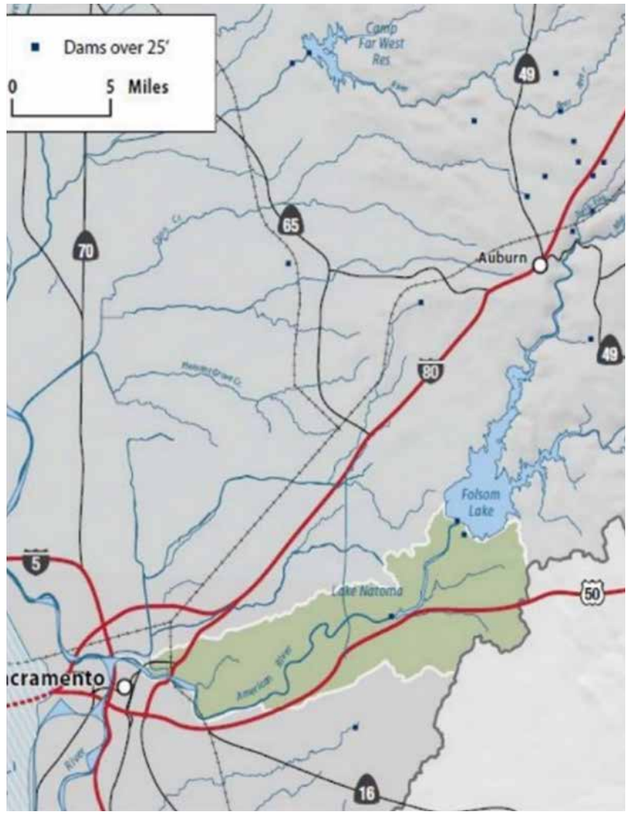


**FIGURE 5-4 HISTORIC TIMELINE LAR**

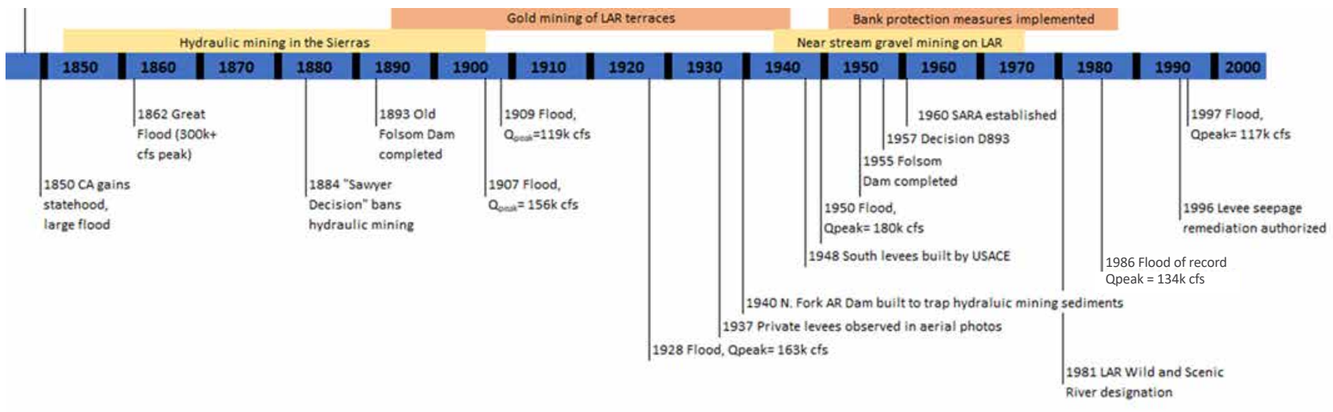
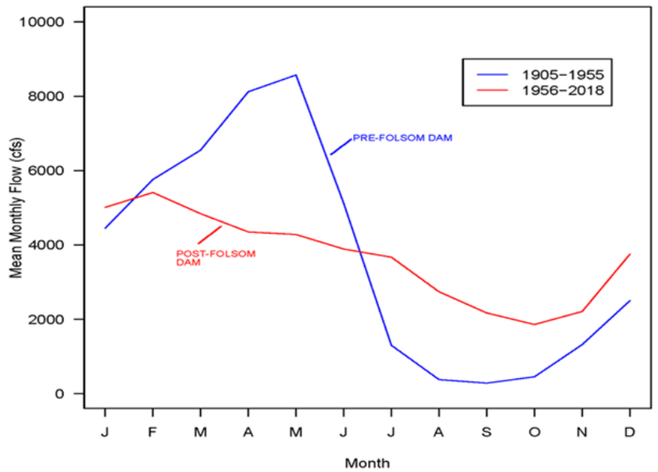



**FIGURE 5-5 PRE-FOLSOM DAM VERSUS POST-FOLSOM DAM FLOW REGIME**




## Historic Use and Disturbance

The LAR evolved under a seasonal flood disturbance regime until recent historic human impacts caused considerable disturbance and resultant changes to channel form and condition. Gold and gravel mining in the nineteenth and twentieth centuries had major detrimental geomorphic effects. During the twentieth century and up to present, the Sacramento metropolitan area has expanded and currently occupies the historic floodplain. As a result of urban development within the floodplain, flooding of the LAR has been mitigated by the City of Sacramento. Figure 5-4 gives a historical timeline of events that resulted in significant physical changes along the LAR.

### Upstream Gold Mining and Debris

In 1848 gold was discovered in the Sierra Nevada foothills, leading to the start of hydraulic mining in 1853. Hydraulic mining was incredibly destructive, turning clear mountain streams into thick yellow mud (Sierra College 2009). So much sediment was washed downstream that the lower reaches of the river aggraded, causing streams to avulse and forcing farmers to build levees to protect their farmland (James 1994). In 1884 hydraulic mining was outlawed (Vigars 2016) but this did not stop the continual transport of loosened debris from flowing toward the valley. In 1886 the lower two miles of the LAR were purposely straightened to increase flow velocities and move the accumulated sediments downstream. This effort had the dramatic result of moving the confluence with the Sacramento River about a mile northward (USBR 2006). The North Fork Dam and Lake Clementine were constructed in the upper watershed around 1940 in an effort to contain hydraulic mining debris and were reported to have held back roughly 70 percent of the material from the North Fork basin (Ayers 1997, James 1997).

### Flow Regime and Dam Construction

Historically, and prior to the implementation of several dam control measures, the hydrology of the American River was similar to other large river systems that drain the western slopes of the Sierra Nevada. Annual flows typically resulted from spring snowmelt and peaked in April or May, followed by a receding hydrograph to the annual minimum base flow in September and October. Flooding often resulted from warm winter storms called “atmospheric rivers,” which brought heavy precipitation to the Sierras and produced large floods from rain-on-snow events. As seen in Figure 5-5, prior to dam control there was a much greater seasonal fluctuation in flow regime, with greater changes in average flows moving from the spring to summer and fall months and from fall to the winter and spring months. Prior to dam control (and other human disturbances described in the following section), the LAR channel and associated riparian vegetation was directly tied to the more varied unimpeded flow regime and accompanying sediment inputs from the upper watershed.

Large floods throughout the recent history of the LAR spurred numerous flood control measures. More than one

million dollars were spent between 1850 and 1861 to build and improve levees in and around Sacramento (Null and Hulbert 2007). Following the Flood of 1862, thousands of cubic yards of fill were hauled in by wagons, and the city streets were raised almost ten feet. The original street level can still be seen in Old Sacramento basements and under boardwalks (City of Sacramento 2018).

In 1940, the U.S. Congress approved the American River Basin Development Project. Its scope included constructing the Folsom and Nimbus Dams for flood control, hydroelectric power generation, and water storage/diversion. Construction of the Folsom and Nimbus Dams by the US Army Corps of Engineers started in 1948 and was completed in 1955 (Figure 5-6). At the end of 1955, the dams were functionally storing full capacity and producing electricity. The dams have been continuously operated and maintained by the US Bureau of Reclamation (USBR). The dams essentially cut off the spawning and rearing habitat along the American River, so as part of the Folsom-Nimbus Dam construction, USBR also constructed the Nimbus Hatchery (overseen by CDFW) to replace the salmon and steelhead runs (CDFW 2019).

The construction of these and other dams and reservoirs within the American River Basin has resulted in the delay of the annual peak discharge from snowmelt and substantially reduced the peak flood discharges from the occasional large winter floods, although they did not always prevent flooding, such as during the Flood of Record in 1986 (Figure 5-7). Conversely, under a more subdued seasonal hydrograph, the low flows that typically occur in the late summer and early fall saw a general increase compared to the pre-dam condition (Figure 5-5). The completion of Folsom Dam cut off sediment inputs to the LAR, and the channel began to incise into the mining deposits (Fairman 2007, James 2012). This lowered the channel bottom by up to 30 feet in the lower few miles of the LAR and changed channel alignment to its current location (Fairman 2007). During this period, localized bed and bank sand, gravel, and cobbles became the only erosional sources under low rates of sediment transport, creating a sediment-starved system with incision continuing into the upper reaches until the channel meets resistance from older alluvial layers.

Maximum allowable discharges from Folsom Dam are dictated by the capacity of the LAR channel and levee system (CRS 2006, USACE 2015). The maximum allowable release from Folsom Dam during this time was 115,000 cfs, acknowledging that significantly higher releases would likely cause levee damage and/or flooding in the City of Sacramento (USACE 2015, 2017). During flood events, there are also regulations dictating the rate of change of discharge through Folsom and Nimbus Dams (USACE 2017). As of 2006, studies suggested that the City of Sacramento flood protection capacity was below the 100-year precedent (1% probability of annual occurrence), the standard for considering building permits and flood insurance requirements under the National Flood Insurance Program (CRS 2006).

From 1958 to 2006, California State Water Rights Board Decision (CASWRB) D 893 regulated- low-flow releases from Nimbus Dam (CASWRB 1958). This 1958 decision marked the first time the CASWRB set a flow threshold for the benefit of fisheries (Water Forum 2015). In addition to protecting fisheries, the minimum flow policies on the LAR were instituted to ensure delivery of allocated water rights to the Delta and LAR and to promote salinity repulsion from the Sacramento-San Joaquin River Delta.

**FIGURE 5-6 FOLSOM DAM CONSTRUCTION, 1953 (SOURCE: MY FOLSOM.COM 2019)**

**FIGURE 5-7 1986 FLOOD PHOTO (SOURCE: SAC BEE 2012)**

**FIGURE 5-8 RECENT LAR TIMELINE**

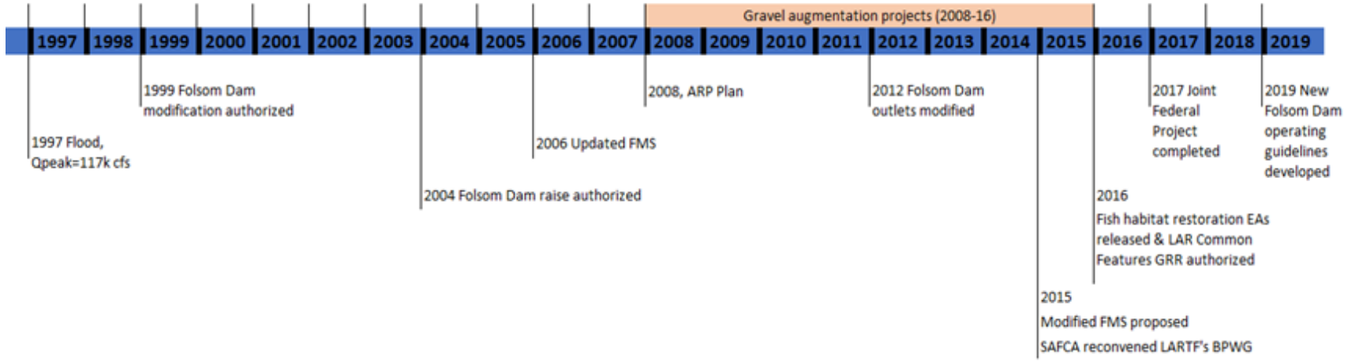
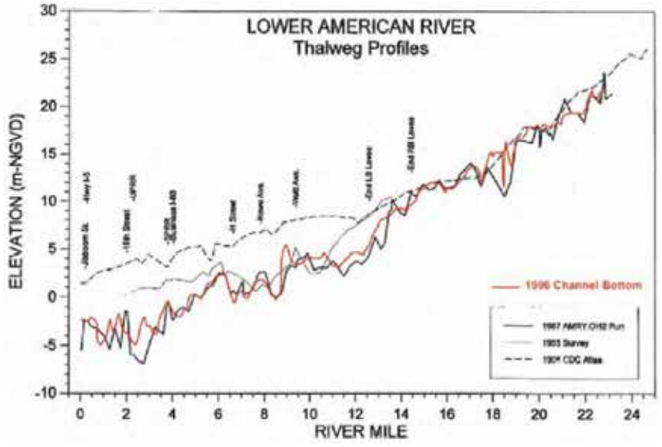



**FIGURE 5-9 HISTORICAL CHANNEL THALWEG PROFILES (NHC 2016)**




Since 2008, continued improvements to Folsom Dam and spillway and operational procedures have reduced flood risk in the Sacramento Metropolitan Area (USACE 2019). These procedures include facilitating the release of more water from the reservoir earlier in a storm event and operating in a manner to maintain more flood volume capacity in Folsom Lake.

Figure 5-8 gives a timeline of recent events and developments that have influenced the physical resources of the LAR.

New dam operation rules were recently developed that include the following (USACE 2019):

- Pass the Probable Maximum Flood (PMF) with at least three feet of freeboard below top of dam
- Control a 100-year flood with max release of 115,000 cfs
- Control a 200-year flood with max release of 160,000 cfs; and
- Incorporate improved forecasting capabilities

## Levee System

An extensive system of federal levees protects the Sacramento Valley from flood risk. In response to the 1986 flood event (Figure 5-7), several levee assessment and upgrade efforts were put into motion in the 1990s and continue today to mitigate potential damage to the existing levee system, particularly if the allowable 200-year Folsom Dam release discharge of 160,000 cfs were to occur. (USACE 2017). The ongoing bank protection projects are implemented through USACE, Central Valley Flood Protection Board (CVFPB), and Sacramento Area Flood Control Agency (SAFCA). The primary projects driving levee improvements are the Sacramento River Bank Protection Project originally authorized under the Flood Control Act of 1960 (USACE 2020) to provide long term flood risk management, and the American River Common Features Project (ARCF) approved by Congress to provide levee and dam improvements following the 1986 flood.

## Geomorphic Functional Surfaces

The geomorphic processes and channel conditions within the Parkway have been modified extensively by the historical impacts, natural system responses, and continuing operations and management introduced earlier. The relationships between geology, topography, soils, vegetation, and the active river channel vary somewhat throughout the LAR reach. Take for example the LAR plan and profile, where mineral extraction and sedimentation, dam, and levee construction; rising tides; and flooding on the Sacramento and American rivers has exacerbated large swings in sediment supply, changed the degree and type of lateral and vertical confinement, and altered downstream base water levels and backwaters. Severe aggradation from hydraulic mining debris raised the riverbed and floodplain surfaces along the American River in the late 1800s. The termination of impactful mining practices, capture of debris upstream, and closures via Folsom and Nimbus Dams led

to gradual lowering of the channel over several decades, with the largest vertical fluctuations of the channel bed in the lowermost reaches (Figure 5-9). The resultant lowering of the channel bed while the adjacent banks remained generally at their post-aggradation elevations, particularly in the lower reaches has resulted in artificially high banks where overbanking of floodwaters is significantly reduced and opportunities for willow and cottonwood regeneration extremely diminished. The end result is that the height of the overbank area is artificially high compared to the channel bed. It is therefore not inundated as often and this has limited riparian regeneration (e.g. cottonwoods and willows) on these now higher floodplains. This is a major ecological issue driven by the geomorphic history.

In order to reflect the combined effects of natural and human factors on present river corridor condition and to help guide decision-making, we divided the LAR into Parkway Segments based on Geomorphic Functional Surfaces (Table 5-1). Existing topography and flood inundation zones indicated by recent hydraulic modeling are the primary basis for grouping landscape features into functional surfaces. Additionally, the relationship of current topographic and hydraulic conditions to the surficial geology and soil series informs the functional surface boundaries.

**TABLE 5-1 GEOMORPHIC FUNCTIONAL SURFACE BREAKOUT**

| FUNCTIONAL GEOMORPHIC SURFACE | INUNDATION ZONE | PRINCIPAL GEOLOGIC UNIT(S) | TYPICAL SOIL SERIES |
|---|---|---|---|
| **Active Channel** | Area inundated by the 20,500 cfs (~2-year event) flow | Recent Alluvium and Basin Deposits; Holocene Alluvium; isolated outcrops Fair Oaks Formation (Upper) | Riverwash; Sailboat; Laugenour; Columbia; Xerofluvents |
| **Floodplain** | Area inundated by flows greater than 20,500 cfs and less than 115,000 cfs | Recent Aluvium, Holocene Alluvium and Modesto Formation, upper member | Xerofluvents; Riverwash; Rossmoor |
| **High Floodplain / Low Terrace** | Area between the 115,000 cfs and 160,000 cfs inundation boundaries | Modesto Formation, upper member | Rossmoor; Xerofluvents; Xerorthents, dredge tailings; Urban Land |
| **Terrace(s)** | N/A | Modesto Formation (upper and lower members); Riverbank Formation | Xerarents; Xerorthents, dredge tailings; San Joaquin; Urban Land |
| **Bluffs and Hills** | N/A | Fair Oaks Formation (Upper); Arroyo Seco Gravels; Laguna Formation; Mehrten Formation | Xerarents; Xerolls; Red Bluff; Americanos; Urban Land |

# 5.2 PARKWAY SEGMENTS

The Parkway Segments described in the following sections are designed to provide a management tool to help decision makers understand the geomorphic processes that are dominant in each reach. The segments start at the confluence with the Sacramento River and move upstream. These segments are based on river channel and corridor-wide geomorphic conditions and processes, historic uses and disturbances, natural system responses, and trends. In addition, each segment considers Plan Area boundaries, recreation use, water supply, storm drainage infrastructure, flood protection infrastructure, and operations. The Parkway Segment pages that follow should be consulted before any decision is made pertaining to in-channel and bank improvements.

## Soils and Sediment

There is a clear gradation in bed material starting at the furthest upstream Parkway Segment 5, with a coarse bed of cobbles transitioning to smaller cobbles and gravels and some new bars forming from local erosional sources or gravel augmentation in Parkway Segments 3 and 4, transitioning to smaller gravels and eventually sand and sediment in Parkway Segments 1 and 2.

### 5.2.1 Parkway Segment 1

**CHARACTERISTICS:** Channel Sinuosity 1.0, Channel Slope 0.02%, 40% Active Channel 60% Floodplain with backwater floodplain basins (Figure 5-10)

**Figure 5-10**
**Lower American River Functional Geomorphic Surfaces Map - Segment 1**

*Figure 5-10 River Mile (RM) 0 to 6.5, Discovery Park, Woodlake, Cal Expo, Paradise Beach, Campus Commons*

**RIVER CORRIDOR AND CHANNEL TOPOGRAPHY:** The River continues along the lowlands of the Central Valley until it meets the Sacramento River in Parkway Segment 1. In this area, the surrounding topography and that of the LAR is nearly level, featuring secondary and relic channel swales, backwaters, and off-channel basins. In the highly urbanized areas throughout Parkway Segments 1 and 2, the channel is laterally constrained by flood control levees. For roughly three miles upstream of the confluence, the LAR River is extremely flat and slow moving as it is largely influenced by tidal backwater from the Sacramento River. Historic LAR profiles show that this segment experienced large vertical fluctuations in riverbed elevation (Figure 5-9), most likely due to aggradation from the high sediment load produced by mining and subsequent scour during high flow events that occurred without the extensive flow control experienced by the current river system.

**GEOMORPHIC FUNCTIONAL SURFACES:** Consistent with geologic and topographic conditions and hydraulic context, floodplain and active channels are the only geomorphic surfaces in Parkway Segment 1. With a wider channel encompassed by a narrower levee corridor, particularly in the Discovery Park area, the proportion of active channel to floodplain in Parkway Segment 1 is greater than the Parkway as a whole, roughly 40 percent compared to 30 percent. A few channel features such as backwaters, alcoves, mid-channel bars, and disconnected low flow threads, indicated by the ecological flow modeling and the recent imagery, occur in Parkway Segment 1 and Segments 2 and 3 discussed later. Limited only by levees, the floodplain areas are increasingly inundated as flows begin to exceed the 2-year peak flood event, particularly along Discovery Park, Woodlake and Cal Expo where the floodplain is wide and expansive in Segment 1.

**INUNDATION SURFACES:** The modeled ecological or "Eco flow" of 2,000 cfs is largely confined to the main channel in the lower portion of the reach (Parkway Segment 1). As expected, the approximate 2-year flow of 20,500 cfs is required for wetted areas to occur beyond the main channel in Segment 1 or along the south (left bank looking downstream) side of the Paradise Beach bend. Given the levee and topographic confinement, the 115,000 cfs flow covers the entire river corridor in lower Parkway Segments 1 and 2.

**MOBILIZATION AND TRANSPORT:** Modeling indicates that the lower third of the river corresponds with lower shear stresses. This result was not surprising given that the decreasing slope and increasing width in the lower reach of the LAR significantly reduces velocities in Parkway Segment 1. In addition, the lower reach is the most impacted by backwatering from the confluence of the LAR with the Sacramento River. The bed material in this reach is dominated by fine grained sediments and sand.

**TERRACE GRAVEL MINING:** From about the turn of the twentieth century until the 1970s, aggregates and gravels were procured by mining active bars, terraces, and in-channel areas (Watson 1985). While most mining occurred upstream of River Mile (RM) 8, aerial photos from 1968 identified some sites in Segment 1: RM 1.1-1.4 LB, 2.5-3.1 RB, and 4.2-5.0 RB.

**BED AND BANK TYPES:** In the lower LAR reaches (Parkway Segment 1), the most common banks are earthen side slope banks with varying amounts of native and non-native vegetation. Adjacent to a sediment-laden stream with slow moving water, these banks are stable and relatively homogenous, with little to no floodplain variability (Figure 5-11). In the high use Parkway areas, banks are often heavily compacted or crisscrossed with social trails. A few scattered locations vulnerable to erosion within Parkway Segment 1 are armored with cobble/gravel toe protection, primarily for levee protection. At Paradise Beach, a well-vegetated bar along the left bank was reportedly cleared during the 1997 flood flows of 115,000 cfs. As seen in Figure 5-12, the vegetation grew back in essentially the same footprint, exhibiting a "scour and sprout" phenomenon as opposed to a meandering floodplain channel with point bars and downed woody debris (Watson 2019). Further downstream along Parkway Segment 1 there is a shift to more intermittent vertical banks.

**FIGURE 5-11 MATURE OAKS LINE UPPER PORTION OF MOSTLY BARE EARTHEN LEFT BANK NEAR CONFLUENCE (~RM0.2)**

**FIGURE 5-12 LEFT BANK VEGETATED BAR AT PARADISE BEACH (~RM 5.6)**

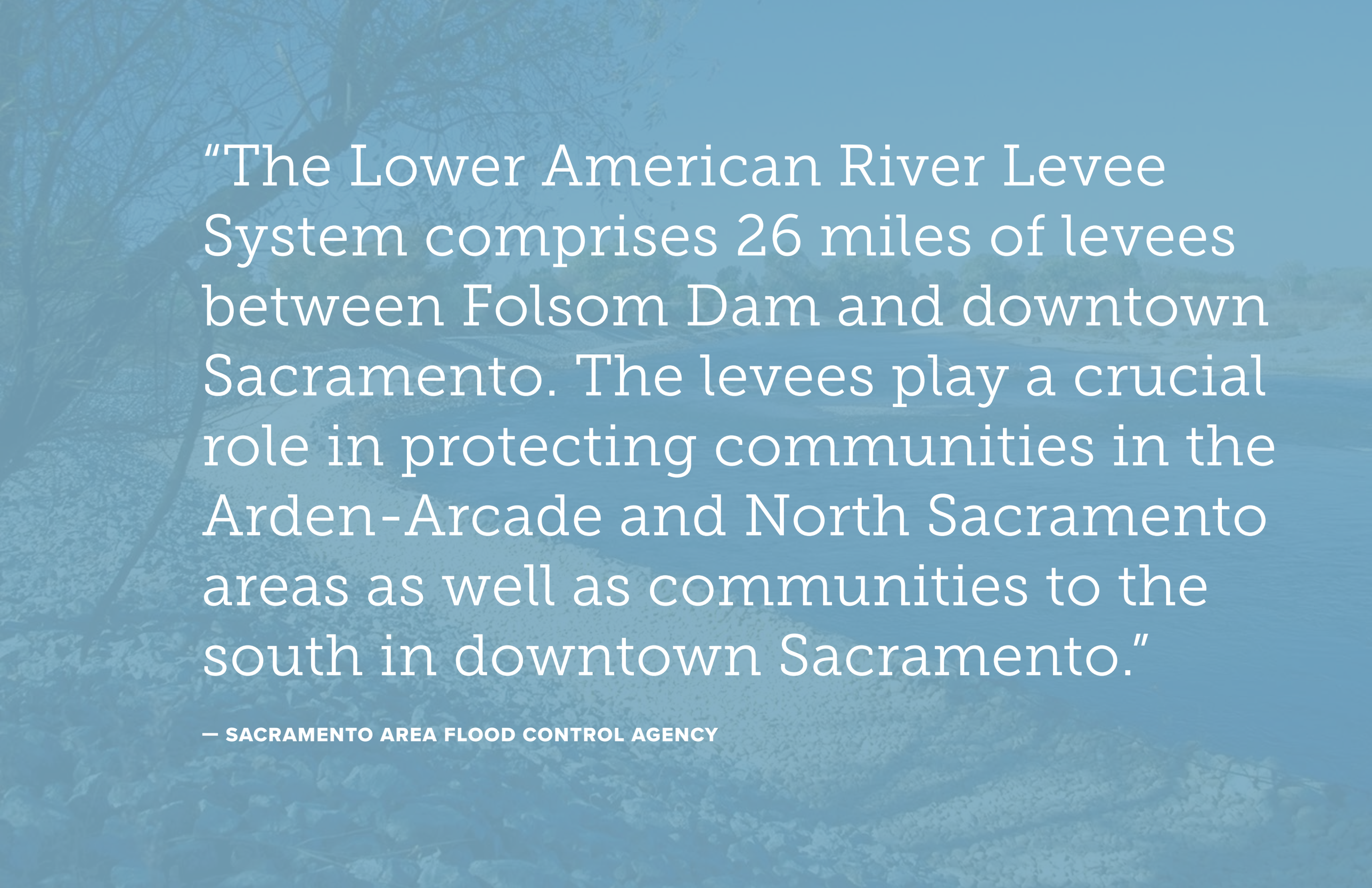
**BANK STABILITY:** As discussed, spatial distribution of geologic layers with varying degrees of resistance along the LAR define where bed and bank migration are largely impeded. For example, the younger, less-resistant Modesto formation that occurs more frequently in the lower reaches appears to be restricting river migration in some locations and is eroding elsewhere. An analysis of bank retreat using aerial imagery showed no significant degree of change from 1957 to 2010 (Ayers 2004, nhc 2012).

**LEVEE PROTECTIVE REVETMENTS:** While bank protection in Segment 1 has existed since 1948, it has continued to be developed over the years and most recently was upgraded to withstand the 200-yr flood (160,000 cfs) as part of the American River Common Features (ARCF) Project. As of fall of 2018 extensive work has been done to reassess geomorphology of the leveed section (RM 0 to 14) and identify erosion risks (nhc 2018). Site identification, prioritization and improvement designs for levee stability are ongoing.

**OUTFALLS:** Many of the outfalls along Parkway Segment 1 are associated with large stormwater drainages from the urban areas and often pose point sources for pollutants and infrastructure needs and erosion risks along the bank edge (Figure 5-13).

**FUTURE TRENDS:** Analysis by nhc (2018) predicted future morphology of the channel over the next 50 to 100 years with a focus on the leveed reach of the LAR between RM 0 and RM 14.5 (Segments 1, 2 and 3). Sediment transport modeling of the system indicates a continuation of the post-Folsom dam trends with net deposition in the downstream reaches. Parkway Segment 1 is projected to continue to receive and generally accumulate sediment, given the supply from upstream reaches, the typically low-energy environment of Sacramento River backwater, and rising sea level. In response to net aggradation, channel adjustments are expected to result in local bank erosion and/or channel shifts. At Paradise Beach the channel could shift due to the interplay between aggradation in the main channel along the outside bend as a result of historic modifications and degradation/incision of the overflow channel that flows around the left side of the left bar. This could result in a "cut off" of the meander and head cut up the deepening overflow channel, causing the overflow channel to become the main channel and slope through the area to increase. This possible channel cut off at Paradise Beach could increase local bed slope and bed erosion. Projected channel dynamics in this segment could increase the risk of erosion to levees.

**FIGURE 5-13 LARGE URBAN STORMWATER OUTFALL WITH BROKEN APRON (~RM 5.3)**



"The Lower American River Levee System comprises 26 miles of levees between Folsom Dam and downtown Sacramento. The levees play a crucial role in protecting communities in the Arden-Arcade and North Sacramento areas as well as communities to the south in downtown Sacramento."

**— SACRAMENTO AREA FLOOD CONTROL AGENCY**

## 5.2.2 Parkway Segment 2

**CHARACTERISTICS:** Channel sinuosity 1.0, Channel slope 0.07%, 51% Active Channel, 46% Floodplain, 3% High Floodplain/Low Terrace (Figure 5-14)

**RIVER CORRIDOR AND CHANNEL TOPOGRAPHY:** In Parkway Segment 2, rolling hills and bluffs transition to the vast lowlands of the Central Valley. Moving westward downstream, the topographic relief decreases gradually within and adjacent to Segment 2. Similar to Parkway Segment 1, modern lateral constraints are primarily the constructed and maintained levees. Streambed surface irregularities, an overall low channel slope, and exposures of erosion resistant geologic units are evident in the channel bed profile through Parkway Segment 2 (RM 6.5 to RM 11.5).

**GEOMORPHIC FUNCTIONAL SURFACES:** The active channel occupies roughly 30.4% of the entire Parkway, but 51% is in Parkway Segment 2 where the levee corridor is narrower. Review of the 2-year inundation pattern, 2017 imagery, and local topography supports a description of the dominant channel form as single thread throughout the LAR including Parkway Segment 2. Additional channel features such as backwaters, alcoves, mid-channel bars, and disconnected low flow threads, indicated by the ecological flow modeling and the recent imagery, occur in Segments 1, 2, and 3.

**INUNDATION AREAS:** In Parkway Segment 2, the 2,000 cfs low flow enters split flow channels around the Howe Avenue, Watt Avenue, and SARA Park Areas. Given the levee and topographic confinement, the 115,000 cfs flow covers the entire river corridor in Parkway Segment 2.

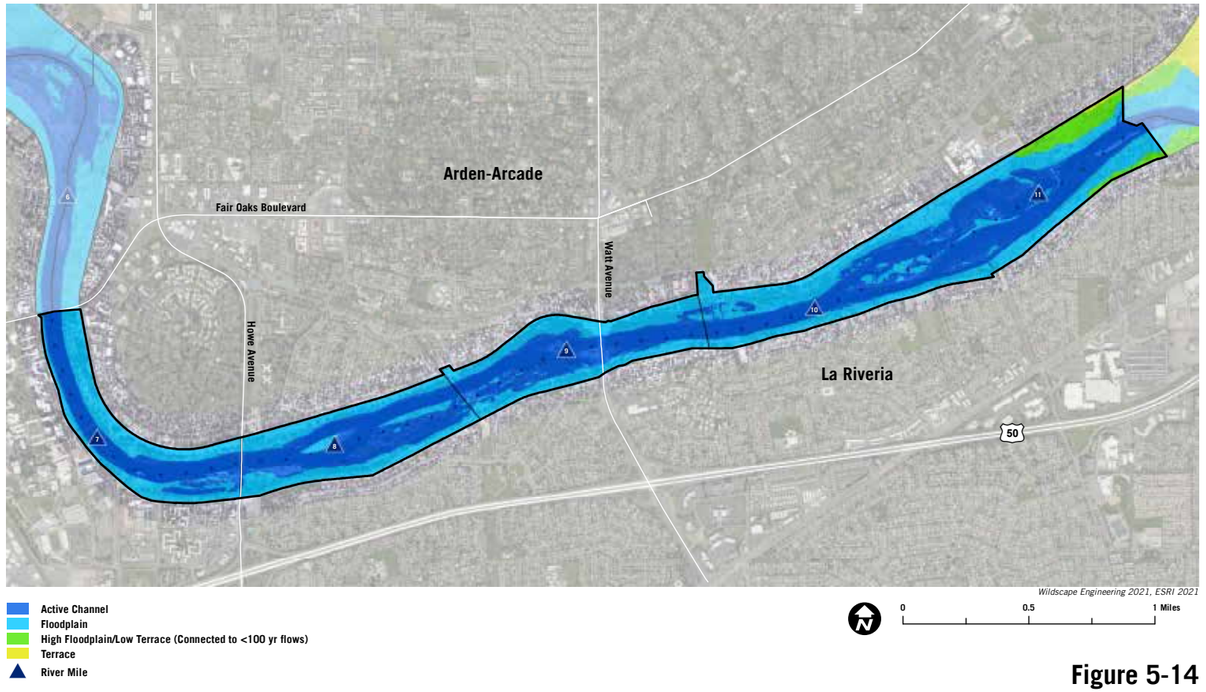



**Figure 5-14**
**Lower American River Functional Geomorphic Surfaces Map - Segment 2**

*Figure 5-14 RM 6.5-11.5, Campus Commons, Howe Avenue, Watt Avenue, SARA Park*

**TERRACE GRAVEL MINING:** Past hydraulic mining practices caused channel instability and sediment displacement on the LAR, particularly in the upper reaches. Along the upstream portion of Parkway Segment 2, hydraulic mining activities prior to 1970 widened the river from approximate RM 10 to RM 11.5 with the left bank bar first lowered to roughly the main channel bed elevation at the erosion resistant layer, followed by lowering of the right bank floodplain (nhc 2018). Channel areas that have been over-widened experience reduced velocities and sediment transport and are likely to continue to aggrade and become shallower (Figure 5-15).

**BED AND BANK TYPES:** Parkway Segment 2 is roughly at the terminus of gravel movement and deposition from the upstream reaches. However, in this reach there is little visible alluvial material. Most banks are earthen and vegetated with localized exceptions where the channel

has been directly manipulated by human activity. On the upstream side of Howe Avenue Bridge and the downstream side of Watt Avenue Bridge, old mining excavations lowered the left banks of the river, widening the channel and forming in-channel islands with alluvium surfaces. Parkway facilities and recreational access often coincide with these artificially lowered banks due to their accessibility to the river, such as the boat ramp southwest of Watt Avenue Bridge (Figure 5-15).

**BANK STABILITY:** Within Parkway Segment 2 the Riverbank formation (alluvial deposit) is exposed and holding in the bed of LAR at RM 7 to 7.3, 9.4 to 10.9, and 11.6. With the Riverbank and Fair Oaks (Turlock) layers preventing continued channel incision in the upper reaches, the potential for channel widening could continue to pose an erosional risk to banks and nearby levees. In the lower reaches, there is still some bed degradation risk that could eventually impact levee integrity via toe scour. Using aerial imagery, an analysis of bank retreat showed no significant degree of change from 1957 to 2010 (Ayers 2004, nhc 2012).

**LEVEE PROTECTIVE REVETMENTS:** Several of the proposed and ongoing levee revetment projects are located in the upper portion of Parkway Segment 1 and into Segment 2. From RM 5 to RM 11 levees closely parallel the channel at a distance of 700 to 1500 feet. Overbank velocities and applied shear stresses at a flow of 160,000 cfs range from 2 to 5 ft/s and 0 to 0.5 psf, respectively (Ayres 2004). Between RM 9.5 and RM 15 about 5,760 linear feet (or about 9 percent of total bank length) of bank protection has been installed. As of fall 2018, extensive work has been done to reassess the geomorphology of the leveed section (RM 0-14) and identify erosion risks in Subreach 2 (nhc 2018). Site identification, prioritization and improvement design are ongoing.

**FIGURE 5-15 MINED LEFT BANK WIDENED RIVER, FORMED IN CHANNEL BAR SEEN FROM BOAT RAMP (~RM 9).**

**FUTURE TRENDS:** Parkway Segment 2 remains within the depositional reach of the LAR according to sediment transport modeling. Parkway Segment 2 has erosion-resistant geologic materials exposed in the channel bed or at shallow depths that restrict the ability of the river to incise in the future. This Parkway Segment will continue to receive coarse sediment input from Parkway Segment 3 but would not be hydraulically capable of transporting further downstream, so coarse material would be deposited near its upstream end. The channel bed would be expected to remain stable in other portions of Segment 2, but channel widening, and local bank erosion are predicted and currently being addressed as part of the levee flood protection efforts being done by others.

## 5.2.3 Parkway Segment 3

**CHARACTERISTICS:** Channel sinuosity 1.4, Channel slope 0.15%, 29% Active Channel, 27% Floodplain, 17% High Floodplain/Low Terrace, and 27% Terrace, a few alcoves, and disconnected threads (Figure 5-16)

**RIVER CORRIDOR AND CHANNEL TOPOGRAPHY:** Rolling hills underlie the neighboring communities of Fair Oaks and Carmichael to the north of Parkway Segments 3 and are expressed in bluffs that border the river corridor. The gently sloping terraces south of the river in Rancho Cordova, like the terraces in Parkway Segments 3 have been directly modified by historic mining (as well as urban development). The modern lateral constraints on river dynamics and overbank flow along the LAR corridor in the upstream half (Parkway Segments 3, 4, and 5) are formed by natural geologic materials and topography that is exaggerated by post-Folsom Dam channel bed lowering. Based on several studies (Fairman 2007, Ayres 2004 and nhc 2012), modern (post-Folsom Dam) channel migration of the LAR has largely been absent and notable only in the Arden Bar and River Bend Park Areas (Parkway Segment 3). This portion of the river has a sinuous channel pattern and the highest modern bed slope. Parkway Segment 3 coincides with the section of channel between RM 12 and RM 15 that appears to have had a locally steeper channel slope since the 1860s although the bed experienced temporary burial by hydraulic mining sediment (nhc 2018).

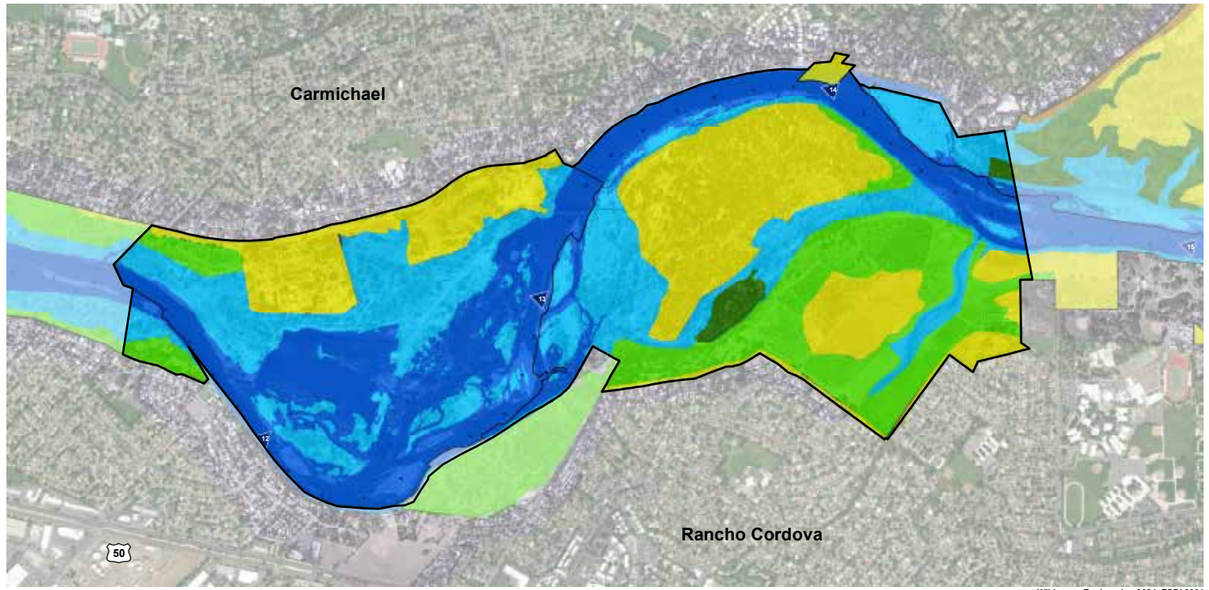



**Figure 5-16**
**Lower American River Functional Geomorphic Surfaces Map - Segment 3**

*Figure 5-16 RM 11.5 to 14.6, Arden Bar, Riverbend Park, Ancil Hoffman County Park*

**GEOMORPHIC FUNCTIONAL SURFACES:** Parkway Segments 3 and 4, particularly around the River Bend Park, Rossmoor Bar, and Sacramento Bar Areas, show more variability under the 115,000 cfs flow. There are only slight increases in inundated areas between the 115,000 and 160,000 cfs; however, it is notable that the 200-year flow goes beyond the Parkway boundary on the south side of Arden Bar in Parkway Segment 3. A variety of channel features occur in Segment 3, such as backwaters, alcoves, mid-channel bars, and disconnected low flow threads, indicated by the ecological flow modeling and recent imagery. Intermediate areas of high floodplain/low terrace surfaces are delineated and are an important component. While most of these surfaces are not subject to flood inundation for events smaller than the 100-year peak flow, the disturbed topography from past mining operations creates a complex pattern of partially connected ridges and swales that foster surface and/or groundwater-supported saturation or inundation potential.

**INUNDATION AREAS:** In Parkway Segment 3, the 2,000 cfs flow enters split flow channels in the Arden Bar Areas. The River Bend Park Area is inundated around the approximate 2-year, 20,500 cfs flow. At Arden Bar, the 2,000 cfs low flow surprisingly shows up within the existing pond

**FIGURE 5-17 COBBLE SPOILS ALONG ARDEN BAR, EVIDENCE OF PAST GRAVEL MINING**

**FIGURE 5-18 HEAVILY USED RIGHT BANK AT CAR TOP BOAT LAUNCH (~RM 11.6)**

**FIGURE 5-19 RIVER RIGHT BANK GRAVEL SIDE BAR (~ RM 12.1)**

**FIGURE 5-20 EXPOSED FAIR OAKS FORMATION ALONG RIVER RIGHT BANK.**

and the 20,500 cfs flow goes through the pond and beyond the spillway. During the 1997 event, flows through the ponds made their way to a remnant swale and onto the Harrington Way parking lot access road before returning to the main channel, rather than through the pond's spillway (Watson 2019). Given the extent of inundation in this area at 20,500 cfs, this occurrence may become more common. The 20,500 cfs flow also enters and carries through the existing north ponds at Arden Bar in Parkway Segment 3.

**MOBILIZATION AND TRANSPORT:** With steeper slopes and higher velocities, smaller cobbles and gravels make up the channel bed substrate and form side bars from local erosional sources and in a few cases introduce gravels. Relatively high shear stress and scour potential was observed at sharp bends, including at Arden Bar.

**TERRACE GRAVEL MINING:** As introduced earlier, the majority of hydraulic mining that ended in the 1970s took place upstream of RM 8. Cobble spoil piles left behind are scattered throughout the terraces of Arden Bar from roughly RM 12 to 13 at William B. Pond Recreation Area (Figure 5-17) and could provide some local source material for future restoration efforts.

**BED AND BANK TYPES:** In Parkway Segment 3, the frequency of bare ground and exposed alluvial material increases in contrast to relatively undisturbed vegetated banks. Some of these areas are heavily compacted in high use areas such as boat launches (Figure 5-18). Other banks appear to be increasing in height due to overbank deposition (Figure 5-19). Locally, the more resistant Fair Oaks formation is exposed along some bank margins (Figure 5-20). Cobble spoil piles, remnants from hydraulic mining, are scattered throughout the terraces of Arden Bar from roughly RM 12 to 13 at William B. Pond Recreation Area.

**BANK STABILITY:** Within Parkway Segment 3 the Riverbank formation (alluvial deposit) is exposed and holding in the bed of LAR at RM 11.6 and from 13.8 to 14. With the Riverbank and Fair Oaks (Turlock) layers preventing continued channel incision in the upper reaches, the potential for channel widening could continue to pose an erosional risk to banks and nearby levees. In the lower reaches, there is still some bed degradation risk that could eventually impact levee integrity via toe scour.

**FUTURE TRENDS:** Sediment transport modeling of the system downstream of Nimbus Dam indicates net erosion upstream of RM 14 and net deposition in the downstream reaches, continuing recent (post-Folsom Dam) trends. Upper Parkway Segment 3 coincides with the beginning of the net erosion reaches and would potentially experience incision at its upstream end, lowering slopes and prompting continued deposition, except where the channel bed elevation is supported by erosion-resistant geologic materials at shallow depth. The discontinuous connections between active channel and overbank areas with irregular topography and over-wide and over-deep mining remnants suggest that a variety of processes and conditions may occur in this section of the LAR. Local aggradation may induce channel shifts and increase erosion of above grade fill and terrace soils. Channel shifts and increased overbank flow frequencies may deliver additional fine and/or coarse materials to existing pits and swales. Net transport of sediment to downstream reaches would also occur.

## 5.2.4 Parkway Segment 4

**CHARACTERISTICS:** Channel sinuosity 1.5, Channel slope 0.07%, 15% Active Channel, 12% Floodplain, 27% High Floodplain/Low Terrace, 43% Terrace (Figure 5-21)

**RIVER CORRIDOR AND CHANNEL TOPOGRAPHY:** The underlying natural geologic materials and topography in Parkway Segments 3, 4 and 5, amplified over time by post-Folsom Dam channel bed lowering, continue to constrain the river laterally in these areas. Rolling hills underlie the neighboring communities of Fair Oaks and Carmichael to the north of Parkway Segments 3, 4, and 5 and are expressed in bluffs that border the river corridor. The gently sloping terraces south of the river in Rancho Cordova, similar to the terraces in Parkway Segments 3, 4, and 5, have been directly modified by historic mining (as well as urban development). The modern lateral constraints on river dynamics and overbank flow along the LAR corridor in the upstream half (Parkway Segments 3, 4, and 5) are formed by natural geologic materials and topography that is exaggerated by post-Folsom Dam channel bed lowering.

**GEOMORPHIC FUNCTION SURFACES:** The channel is comparatively narrow and simple in Segments 4 and 5 while bluffs and hills are a small but important surface that only occurs in Parkway Segments 4 and 5. Terraces form the natural and modified surfaces that are generally above the 200-year inundation zone (160,000 cfs) under present conditions, although some terrace locations may have disturbed topography with isolated low spots. These broad uplands occupy approximately 40 percent of the Parkway in Segments 4 and 5. Intermediate areas of high floodplain/low terrace surfaces are delineated and are an important component of Segments 3 and 4. While most of these surfaces are not subject to flood inundation for events smaller than the 100-year peak flow, the disturbed topography creates a complex pattern of partially connected ridges and swales that foster surface and/or groundwater-supported saturation or inundation potential. The floodplain area is much more limited in Segments 4 and 5, as compared to Segments 1 and 2 where it was only limited by the levees. The areas mapped as floodplain surfaces emphasize locations that are functionally connected to the main channel or local tributaries and subject to overbanking, rather than areas of extensive topographic disturbance that complicates flow routing. Accordingly, areas of uncertain surface flow connectivity within the 115,000 cfs inundation areas are grouped in the high floodplain / low terrace surface.

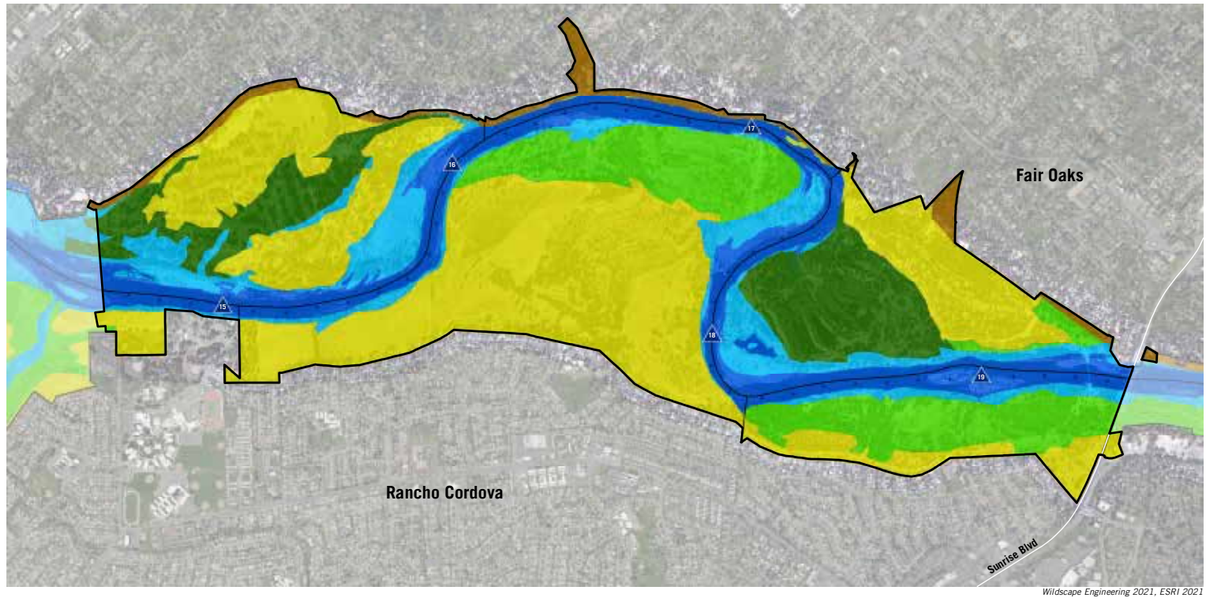



**Figure 5-21**
**Lower American River Functional Geomorphic Surfaces Map - Segment 4**

*Figure 5-21 RM 14.5-19.5, Ancil Hoffman County Park, Rossmoor Bar, Sacramento Bar, Lower Sunrise*

**FIGURE 5-22 EXPOSED EROSION RESISTANT BANK TOE (~RM 15.3)**

**FIGURE 5-23 EROSION ALONG CLAY SHELF (~RM 16.7)**

**FIGURE 5-24 ACTIVELY ERODING BANK ALONG CLAY SHELF (~RM 17.8)**

**FIGURE 5-25 ROCK RIP-RAP PLACED AT CORDOVA CREEK OUTFALL (~RM 14.5)**

**INUNDATION AREAS:** The low 2,000 cfs flow is contained within the main channel in the upper reaches through Parkway Segments 4 and 5 with more of the margins activated under the approximate 2-year, 20,500 cfs flow. Parkway Segments 3 and 4, particularly around the River Bend Park, Rossmoor Bar, and Sacramento Bar Areas, show more variability under the 115,000 cfs flow.

**MOBILIZATION AND TRANSPORT:** Relatively high shear stress was observed at the sharp bends between the Upper and Lower Sunrise Areas. Following the trend of net erosion in the upper reaches and moving towards deposition in the lower reaches, bedload sorting from Parkway Segment 5 through Parkway Segment 4 transitions from larger, coarser cobbles to smaller cobbles and gravels.

**BED AND BANK TYPES:** The channel bed in Parkway Segment 4 is holding grade due to the underlying Fair Oaks formation (Figure 5-22) and cobble size armoring, particularly in the upper portions. The hardened bed through this area applies increased pressure on the earthen banks during higher flow events, often causing accelerated erosion on sparsely vegetated or unprotected outer banks (Figure 5-23). While some well-vegetated banks with a small amount of woody material at the toe were observed in Parkway Segment 4, there is limited evidence of downed wood along the river margins, giving further evidence to a limited active floodplain and little to no natural channel migration (Figure 5-24).

**BLUFFS:** In the upper reach of Parkway Segment 4 and into Parkway Segment 5, the resistant Fair Oaks formation has been more fully exposed and there are a number of nearly vertical but relatively stable bluffs, often with a clay shelf forming along the toe. However, the cliff banks can be destabilized by activities from above, including loading the upper surface via irrigation or stormwater runoff, and from below via trail encroachment, road maintenance, or channel overflow events impinging on the face of the bank. These events could produce mass wasting due to slumps, slides or surface erosion that could threaten private property and cause a large sediment influx to the river, impacting water quality, fish spawning grounds, or other sensitive resources.

**FUTURE TRENDS:** With minimal upstream sediment and the impact of managed flow releases, Reaches 4 and 5 can expect further disconnection from surrounding surfaces, reducing the already small active floodplain, unless erosion-resistant geologic materials limit channel bed incision. A net discharge of sediment to downstream segments is forecast as the dominant trend. However, sediment delivery to the channel from streambanks and side slopes could increase locally as bed erosion occurs (increasing bank heights and instability). Whether such sediment could form sustained channel depositional features (e.g., riffles and bars) would depend on the volume, grain size distribution, and timing of sediment inputs relative to high flushing flows and vegetation establishment.

**OUTFALLS:** Stormwater and creek armored outfalls are interspersed throughout the Parkway segments, two of the larger tributaries between Nimbus Dam and the confluence with the Sacramento River, Cordova Creek (Figure 5-25) and Carmichael Creek outlet near the downstream end of Parkway Segment 4.

## 5.2.5 Parkway Segment 5

**CHARACTERISTICS:** Channel sinuosity 1.1, Channel slope 0.06 %, 30% Active Channel, 34% Floodplain, 12% High Floodplain/Low Terrace, 21% Terrace, 20% Bluffs and Hills (Figure 5-26)

**RIVER CORRIDOR AND CHANNEL TOPOGRAPHY:** As discussed earlier, the ancient geologic materials form lateral and sometimes vertical checks on these upstream non-leveed reaches. Several studies have examined the extent, elevation and location of these erosion-resistant materials including a study in 2007 that mapped the bedrock outcrops in Reaches 4 and 5 (Figure 5-27), noting more than ten along the channel bottom. Steep bluffs and high terraces continue to encompass the river through Parkway Segment 5 and impacts from hydraulic mining and urban development continue to be evident through this reach. The modern lateral constraints on river dynamics and overbank flow along the LAR corridor in the upstream half (Parkway Segments 3, 4, and 5) are formed by natural geologic materials and topography that is exaggerated by post-Folsom Dam channel bed lowering.

**GEOMORPHIC FUNCTIONAL SURFACES:** The channel is comparatively narrow and simple in Segments 4 and 5 while bluffs and hills compose a small, but important surface. Terrace(s) form the natural and modified surfaces that are generally above the 200-year inundation zone (160,000 cfs) under present conditions, although some terrace locations may have disturbed topography with isolated low spots. These broad uplands occupy approximately 40 percent of the Parkway in Segments 4 and 5. The floodplain area in Segments 5 is very narrow.

**INUNDATION AREAS:** The low 2,000 cfs flow is contained within the main channel in the upper reaches

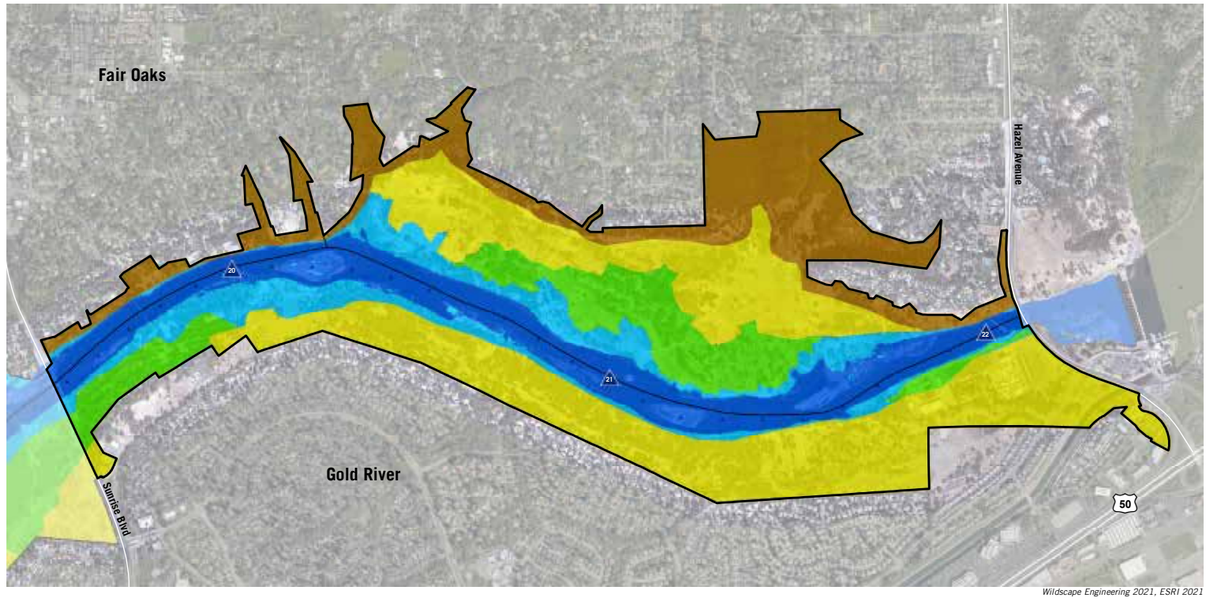



**Figure 5-26**
**Lower American River Functional Geomorphic Surfaces Map - Segment 5**

*Figure 5-26 RM 19.5-22.1, Sailor Bar, Upper Sunrise*

through Parkway Segments 4 and 5 with more of the margins activated under the approximate 2-year, 20,500 cfs flow.

**HYDRAULIC MINING:** Slow-moving mid-channel bars thought to be sourced from the destabilizing hydraulic mining efforts appeared in the upper reaches between Sailor Bar and SARA Park post 1949 and likely induced short-term aggradation followed by bank scour setting up a feedback cycle of channel widening and aggradation (Watson 1985, Church and Jones 1982) in these reaches.

**BLUFFS:** In the upper reach of Parkway Segment 4 and into Parkway Segment 5, the resistant Fair Oaks formation has been more fully exposed and there are a number of nearly vertical, but relatively stable bluffs often with a clay shelf forming along the toe (Figure 5-28). The cliff banks can however be destabilized by activities from above, including

**FIGURE 5-27 BEDROCK OUTCROPS ON UPPER LAR (FAIRMAN 2007)**

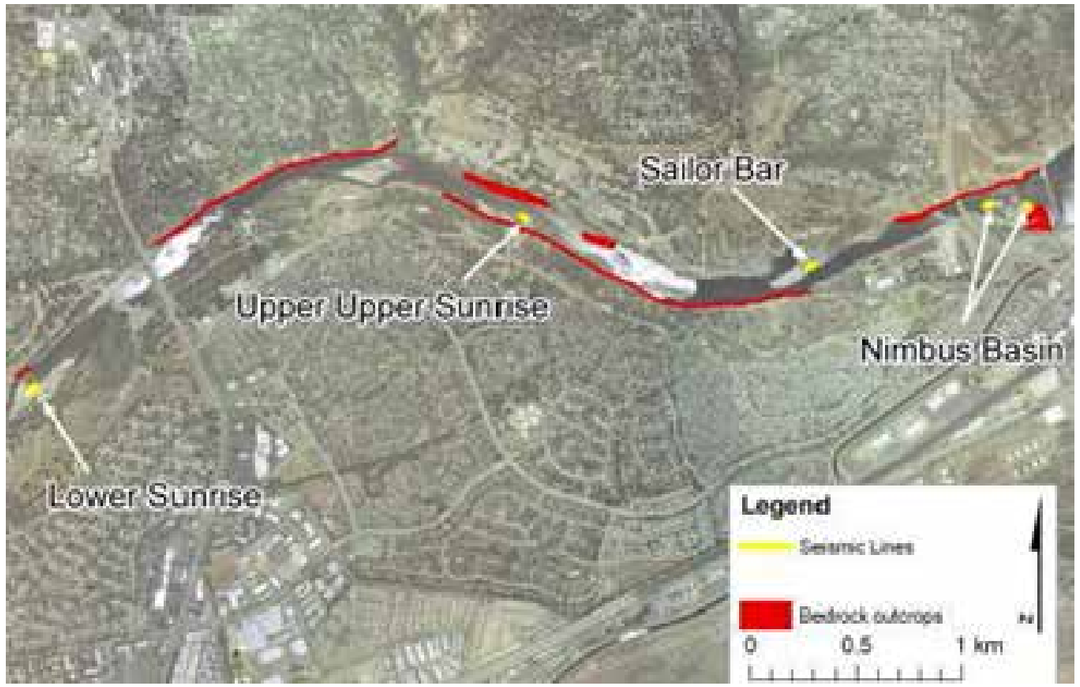



**FIGURE 5-28 STEEP BLUFFS ALONG RIGHT BANK (~RM 19.4)**

loading the upper surface via irrigation or stormwater runoff, and below from trail encroachment, road maintenance, or channel overflow events impinging on the face of the bank. These events could produce mass wasting via slumps, slides or surface erosion that could threaten private property and cause a large sediment influx to the river impacting water quality, fish spawning grounds or other sensitive resources.

**OUTFALLS:** Along with stormwater outfalls, one of the larger tributaries to LAR, Buffalo Creek outfalls in Parkway Segment 5 (Figure 5-29).

**FUTURE LAR MORPHOLOGY TRENDS:** Parkway Segments 4 and 5 are expected to experience channel slope decreases due to lack of sediment inputs and managed flow releases. Expected conditions will result in further disconnection from surrounding surfaces, reducing the already small active floodplain, unless erosion-resistant geologic materials limit channel bed incision. A net discharge of sediment to downstream segments is forecast as the dominant trend. However, sediment delivery to the channel from streambanks and side slopes could increase locally as bed erosion occurs (increasing bank heights and instability). Whether such sediment could form sustained channel depositional features (e.g., riffles and bars) would depend on the volume, grain size distribution, and timing of sediment inputs relative to high flushing flows and vegetation establishment.

**FIGURE 5-29 BUFFALO CREEK OUTFALL (~RM 19.5)**

# 5.3 SUMMARY OF PHYSICAL RESOURCE CHARACTERISTICS

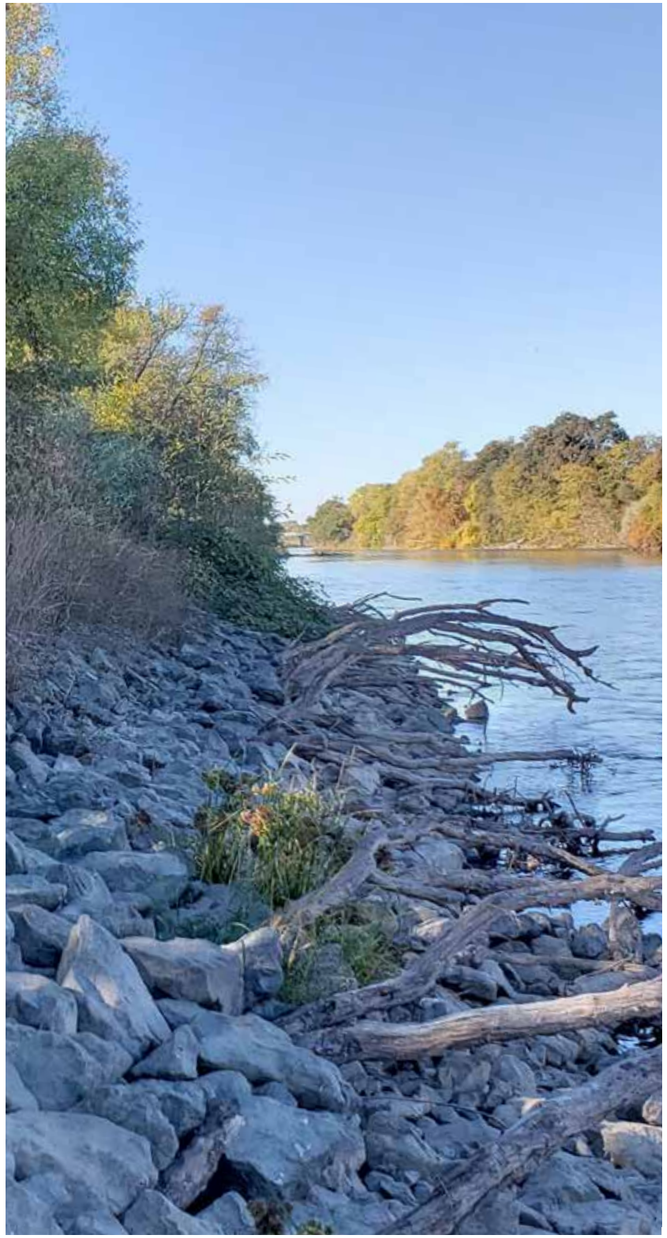
The current LAR geomorphic condition is a culmination of its pre-historic geologic formation, historic human impacts and ongoing dam and levee controls. In many ways these aspects limit the ability to achieve a balanced and more natural channel form and function. Such factors, along with changing climate and recreational access and use, need to be taken into consideration when evaluating proposed projects within the LAR riparian and floodplain margins.

The LAR condition is not consistent throughout the entire Parkway. From Parkway Segment 1 at the confluence with the Sacramento River upstream to Parkway Segment 5 just below Nimbus Dam, the river condition and behavior varies, most notably as follows from downstream to upstream:

**GRADIENT:** The streambed is essentially flat (0.02%) within Parkway Segment 1 near the confluence and gradually rises to its steepest gradient, 0.15% within Parkway Segment 3 then flattens some to a slope around 0.07% through Parkway Segments 4 and 5. The lowermost reaches are considered to be depositional reaches that are likely to continue to aggrade. While the upper reaches (Parkway Segments 3 through 5) are in an erosional state, however they continue to hold grade due to the underlying older and erosion resistant geologic formations resulting in more outward forces on the banks.

**CHANNEL BED SUBSTRATE:** Flatter gradient and slower moving waters have produced a channel bottom primarily composed of fine sediments and sands in Parkway Segment 1 and most of Parkway Segment 2. Gravel and smaller cobbles are found on the channel bed and in channel bars within Parkway Segment 3 and the materials continue to increase in size moving up through Parkway Segments 4 and 5.

**CHANNEL PLANFORM:** Laterally constrained by flood control levees, Parkway Segments 1 and 2 have the greatest proportion of active channel to floodplain than the Parkway as a whole and little floodplain variability. In other words, larger floods are predominantly conveyed within the main channel rather than overbanking and spreading onto floodplain areas beyond the channel. Parkway Segment 3 has the highest sinuosity, 1.4, of all the Parkway segments, the steepest gradient and consequently higher energy. In addition, it has a variety of channel and floodplain features including backwaters, alcoves, mid-channel bars, and disconnected low flow threads. In Parkway Segments 4 and 5 the channel returns to a narrower, simpler planform with high terraces and bluffs. The relative absence of channel migration and floodplain connectivity reach wide as a result of geologic and human imposed controls significantly reduces planform variability and more importantly overbanking opportunities that in turn limits riparian vegetation development and perpetuation, particularly in the overbank areas.



*Revetment and riparian plantings along riverbank.*
*Photo Credit: KC Sorgen*

**BANKS:** Parkway Segments 1 and 2 are characterized by earthen side slopes with varying densities of native and non-native vegetation. The younger and less resistant Modesto formation occurs more frequently in Parkway Segments 1 and 2, sometimes holding the banks and sometimes giving way to erosion. The terrace features, in addition to active channel and floodplain features, first appear in Parkway Segment 3 and a variety of bank types emerge, including exposed bare ground and alluvial deposits intermingled with undisturbed, vegetated banks. Parkway Segment 3 also includes the more resistant Fair Oaks formation exposed along some bank margins, while remnants of hydraulic mining, such as cobble spoil piles, are scattered in places. The less prominent but characteristic high Terrace/Bluff features are only present in Parkway Segments 4 and 5. Also visible in Segments 4 and 5 are the Fair Oaks formation and cobble armoring on the channel bed which redirect the flow forces outward and cause accelerated erosion and bank retreat where there are sparsely vegetated or unprotected earthen banks.

## Project Opportunities and Limitations of the LAR:

**LEVEES:** Levee controls will continue to persist in the Parkway but limiting the extent of floodplain restoration or overbank relief that can be achieved. This does not mean that localized inset floodplain or similar opportunities cannot be considered within the corridor held by the levees.

**DAM CONTROL:** Flow regulation is necessary to minimize flood risk to heavily populated areas and infrastructure and maintain base flows for salmonids and other aquatic species in the LAR. Understanding the operational flows and how they translate into inundation areas, velocities, and shears by location will be key to designing restoration elements such as: increased floodplain (where achievable), enhanced riparian zones, target elevations and saturation conditions for native plant species, sizes and configurations for stable and effective bank protection measures and instream habitat enhancement structures.

**ACTIVATED FLOODPLAIN CHARACTERISTICS:** The LAR has little in common with a meandering channel system as it is fixed within the naturally and artificially hardened banks and its flow regime variability is drastically reduced with lesser extreme but more high flow events and consistently higher volume late season flows. This makes it difficult to introduce meanders to increase planform variability and sinuosity or promote floodplain overbank opportunities that will have persistent high-value riparian vegetation and woody debris throughout the Parkway. However, there may still be site specific, localized opportunities to integrate some of these channel features, particularly as extensions of existing features, such as those in Parkway 3.

**HYDRODYNAMIC MODEL:** The inundation extents, velocities and shears within the Parkway boundaries produced by the model should be taken into consideration when planning recreation, geomorphic or habitat improvements within the river corridor. These data may be key to determining location, configuration or composition of certain facilities based on where inundation areas intersect and to what degree of energy they impose. This data can also be useful to park planners highlighting where velocities are higher or lower and where sediments, gravels or cobbles may move or deposit impacting the long-term functionality of in-channel features such as boat ramps, outfall armoring, and proposed biotechnical features.

**TOP** *High water at the Jibboom Bridge in the Discovery Park Area in 2006. Photo Credit: Regional Parks*
**BOTTOM** *Boat launch in the Howe Avenue Area following June 2017 flood. Photo Credit: Regional Parks*

*Revetment and riparian plantings along riverbank. Photo Credit: KC Sorgen*

**RECREATIONAL TRAILS:** There are ample opportunities to address redundant and heavily compacted social trails, particularly in the high use Parkway areas. New or upgraded trail designs should look at the hydraulic model inundation extents and shear results by location to make sure any new or preserved trails will not be impacted or pose a safety hazard by fast moving high waters. Surface treatments could be integrated in low risk, floodplain areas to stabilize the trails in the event they are inundated.

**RECREATIONAL INFRASTRUCTURE:** New or improved boat ramps, piers, and similar park infrastructure should consider the current and trending channel condition in the respective Parkway Segment. Parkway facilities and recreational access often coincide with the artificially lowered banks due to their accessibility to the river, such as the boat ramp southwest of Watt Avenue Bridge. In some cases, Parkway infrastructure may become compromised as the slow-moving water in widened reaches drops material out of suspension and fills the channel. Monitoring of this location may be warranted in order to plan for when boat access may soon become infeasible or require a suite of permits to dredge and remove deposited material as the river becomes too shallow in the vicinity of the boat ramp. If and when new or updated river access infrastructure is planned for, both the inundation extents and velocities as predicted by the hydrodynamic model and sediment transport potential should be considered so as not to install infrastructure that could become inadequate or in-operational over time.

**AQUATIC HABITAT IMPROVEMENTS:** When considering enhancement projects in urban, high-use areas it is important to consider the cost, long-term ecological benefit, and potential recreational implications of the projects. Secondarily, when gravel augmentation projects are proposed, Regional Parks should consider if there is potential for any imported material to migrate downstream and if so, the distance and resulting potential impacts to any sensitive or restored habitat or recreational infrastructure.

**OUTFALLS:** An inventory of all existing outfalls within the Parkway is recommended as a first step to properly inform and prioritize improvement efforts. The inventory should include outfall type, size, and condition and include photo documentation and GPS mapped locations. Following the inventory, a set of potential projects could be developed to rectify problems, improve outfall condition, and mitigate any impacts to the tributaries and where they outlet to the LAR. Outfalls that present the greatest risk for the most widespread adverse impact on LAR natural resources should be prioritized.

**ERODING BANKS:** Parkway Segment 4 exhibits a continuation of bank toes hardened with gravel surfaces or exposed erosion-resistant material interspersed between the heavily vegetated banks. Some banks within this segment show signs of erosion and are retreating to areas where banks have been fortified. The channel bed in Parkway Segment 4 is holding grade due to the underlying Fair Oaks formation and cobble size armoring, particularly in the upper portions. The hardened bed through this area applies increased pressure on the banks resulting in erosional areas where the banks are most vulnerable. These banks should be flagged for monitoring and changes recorded.

# 6 CULTURAL RESOURCES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CHAPTER 6

# INTRODUCTION AND OVERVIEW

Cultural resources in the Parkway can be categorized into three major groupings: prehistoric activity, gold rush activity, and industrial activity. Extensive prehistoric activity in the Parkway consisted of habitation and utilization of the natural environment by Native Americans prior to the arrival of European settlers.

Archaeological studies have identified a wealth of bedrock mortars, burials, middens, lithic scatter, ceramic scatter, dwelling remains, arrowheads, stone tools, and other isolated artifacts. Previous studies (Section 6.1) are discussed along with the results of the California Historical Resources Inventory System (CHRIS) database search (Section 6.2). Section 6.3 summarizes the sacred lands file searches followed by a brief description of additional haptoral and cultural resources (Section 6.4). Section 6.5 describes he setting as it relates to the Parkway followed by a discussion on the management of cultural resources (Section 6.5).

*Tule hut replica at the Effie Yeaw Nature Center. Photo Credit: MIG*

Gold rush activities in the Parkway were most rigorous between 1847 and 1859. Mine tailing and dredging remains characterize these resources, as well as remnant structures, foundations, walls, and placer mining materials. Industrial activities began in the Parkway in the mid-nineteenth century and related impacts continue to affect the Parkway today. Industrial resources include historic railroads, bridges, utilities, and major structures; as well as other historic period structures and residences that embody a past architectural style.

On September 14th, 2020, Regional Parks and MIG staff met with the Shingle Springs Band (Band) of Miwok to discuss the NRMP. In general, the Band expressed interest in partnering with Regional Parks to implement the NRMP, including being involved through the remainder of the process and the CEQA review. As a result of the meeting, a new Goal Area was established for the Plan to better incorporate cultural resources issues.

Given the sensitive nature of cultural resources data, the exact locations of cultural resources within the Parkway are not included in this report and are instead discussed more broadly. The cultural resources information will be included as a part of the data management system.

## 6.1 PREVIOUS STUDIES

There are 135 previous archaeological and/or historical reports within, or partially within, the Parkway on record within the North Central Information Center's California Historical Resources Information System (CHRIS) database. A Historical Resource Inventory (HRI) report, forming the basis of this summary, examines the findings of 31 previous written reports on record (Dames and Moore 1995). The HRI details the ethnographic and historical background of the Parkway and documents accounts of historic and prehistoric resources. The Dames and Moore HRI study area generally overlaps with the current Parkway boundary, although slight variations are present. The HRI identified 25 previously recorded archaeological sites within the Parkway. Landowner permission was granted to re-examine and update site records for 22 sites by Dames and Moore in 1995. It also resulted in the identification of 18 new archaeological sites (for a total of 43 known archaeological sites), comprised of 12 historic, four prehistoric, and two multi-component prehistoric/historic properties.

The remaining 103 reports have been filed with the North Central Information Center (NCIC) since the 1995 HRI was published. These remaining reports were taken from State Parks 523 forms, which are the current standard recordation documents for cultural resources in California.

## 6.2 CHRIS SEARCH RESULTS

On October 4, 2018, an updated California Historical Resources Information System (CHRIS) search (through NCIC) included all areas within a 0.25-mile buffer around the Parkway boundary with potential to overlap Parkway boundaries and to be affected by Parkway activities. The search results included all known historical and archaeological resources within and adjacent to the Parkway. The CHRIS search identified 62 resources within, or partially within, the Parkway: 19 prehistoric archaeological resources, six combined prehistoric/historic archaeological sites, 18 historic period archaeological resources, and 19 historic structures or buildings. Of note is the Folsom Mining District, listed as a historic archaeological resource comprising multiple sub-sites (i.e., foci) within a large area. The CHRIS search identified 18 archaeological resources fully outside the Parkway, but located within 0.25-mile of the Parkway boundary (eight are prehistoric archaeological resources, three are combined prehistoric/historic archaeological sites, and seven are historic period archaeological resources). A historic landmark resource (Five Mile House) in the study was also included in the CHRIS search from the NCIC.

*Acorn granary replica at the Effie Yeaw Nature Center. Photo Credit: MIG*

# 6.3 SACRED LANDS FILE SEARCH

A Sacred Lands Files (SLF) search was requested on November 5, 2018, through the Native American Heritage Commission (NAHC). The search was returned for the entire Parkway on November 19, 2018, with positive results. The NAHC provided contact details for 10 tribal representatives who were recommended as contacts. The United Auburn Indian Community was identified as a tribe with knowledge of tribal resources in the Parkway. Potential future projects in the Parkway require the lead agency to provide notification to the tribes per AB 52. Additionally, to identify potentially unknown tribal cultural resources, future CEQA projects should include tribal outreach (as recommended by the NAHC) to all tribes possessing information regarding cultural resources within the Parkway. This will occur as a part of environmental review and these future proposed projects.

# 6.4 ADDITIONAL HISTORIC AND CULTURAL RESOURCES

## 6.4.1 City of Sacramento Register of Historic and Cultural Resources

The City of Sacramento keeps a local register of archaeological resources and historic structures. Currently, no property within the Parkway boundary is listed on the register.

## 6.4.2 Previously Unidentified Potential Historic Resources

Six previously unrecorded historic resources with potential for eligibility in the California Register of Historical Resources (CRHR) or the National Register of Historic Places (NRHP) were identified within the Parkway. These sites were identified by systematically comparing current aerial imagery of the Parkway to historical aerial imagery of 45 years of age or older. Sites without prior recordation or evaluation that are 45 years of age or older include:

- Northeast Chlorination Station (N-18), 1000 River Walk Way, Constructed: 1960–1964
- 8164 Capitola Avenue, Constructed: 1962
- American River Ranch, 2140 Chase Drive, Rancho Cordova, Constructed: c. 1840
- Camp Pollock, Myrtle Johnston Lodge, 1501 Northgate Blvd, Sacramento, CA 95815, Constructed: 1923
- Jim Jones Pedestrian Bridge, Constructed: 1959
- Sunrise Boulevard Bridge, Constructed: 1955

These properties may be eligible for listing in the CRHR or NRHP based on their age. A historic evaluation of each building would be required prior to a determination of eligibility. The City of Sacramento may determine that one or more properties are eligible for inclusion on their local historic register, despite not meeting the criteria for inclusion on either the NRHP or CRHR registers.

**TOP** *Grinding rock replica at the Effie Yeaw Nature Center. Photo Credit: MIG*
**BOTTOM** *Interpretive grinding rock placard at the Effie Yeaw Nature Center. Photo Credit: MIG*

# 6.5 SETTING

## 6.5.1 Ethnographic Setting

The Parkway lies within the ethnographic territory of the indigenous group Nisenan Maidu, one of three Maiduan groups that inhabited the northeastern half of the Sacramento Valley and the adjoining western slopes of the Sierra Nevada (Kroeber 1925; Wilson and Towne 1978). Nisenan sites included villages, seasonal camps, quarries, ceremonial grounds, trading sites, fishing stations, cemeteries, and river crossings (Wilson and Towne 1978). Village sites located within the Sacramento Valley were situated on low rises near streams and rivers, and on gentle south-facing slopes. Important factors for the location of village sites included proximity to water, warmth in the winter, southern or southwestern exposure, and elevation. Permanent settlements were rarely situated above 3,500 feet (Beals 1933; Kroeber 1925).

*The California Indian Cultural Demonstration Area at the Effie Yeaw Center. Photo Credit: MIG*

Tools were fashioned from a variety of raw materials including stone, wood, bone, hide, shell, and plant fibers. Stone types commonly used included basalt, chalcedony, jasper, and steatite. Tools, such as projectile points, knives, scrapers, pestles, pipes, and charms, were made from stone using pressure and percussion techniques, grinding, and pecking. Valley peoples most likely received most of their flaked stone tools already manufactured, since little evidence of shatter or other reduction techniques occur in Valley Nisenan sites (Jerald J. Johnson, personal communication 1992). Wood was used to manufacture items such as bows, arrows, mortars, and digging sticks. Skins were tanned and used to make bags, quivers, and clothing. Plant stems, roots, and fibers were used to produce both twined and coiled basketry, mats, nets, ropes, and other items (Wilson and Towne 1978).

### Spanish Contact

The Nisenan had limited contact with the Spanish during the early historic period. Fur trappers of the American and Hudson's Bay companies began expeditions in Nisenan territory in the late 1820s. In 1832, an epidemic, possibly malaria, was introduced into the Sacramento Valley, decimating entire Valley Nisenan villages and forcing many people to retreat into the hills. The Hill Nisenan were greatly affected by the Euroamerican intrusion into the region during the Gold Rush period, ca. after 1848, which resulted in widespread killing and destruction of villages (Wilson and Towne 1978).

## 6.5.2 Historic Setting

The historic period in interior Central California began relatively late by comparison to much of North America, with little or no Euroamerican activity occurring until early in the nineteenth century. Although occasional Spanish exploratory expeditions toured the California coast as early as the middle sixteenth century, most Spanish activity in the New World concentrated on colonizing and missionizing in Sonora, the Southwest, and Baja California for over 200 years. Little attention was paid to Alta California until the middle eighteenth century (Chapman 1923).

While Spanish Californians never attempted to settle inland, several exploring parties did penetrate the interior. In 1811, a party under the command of Jose Antonio Sanchez proceeded by boat across San Francisco and San Pablo bays to ascend the west branch of the San Joaquin as far as Stockton. Returning to the mouth of the river, they then ascended a short distance up the Sacramento, the first recorded navigation of that river (Chapman 1923).

In the beginning of the nineteenth century, Spain found itself engaged in struggles for independence with many of its colonies. While Alta California remained largely loyal, it also was neglected by Spain. As Spanish expeditions to the interior began to slow, American and British expeditions increased in frequency. In 1828, the Americans started fur trapping the lower tributaries of the San Joaquin, working their way north again to the American River (Morgan 1964). By 1837, the American River was given its present name, Rio de los Americanos (A.L. Bancroft & Company 1886). One of the Hudson's Bay Company's expeditions (1832-1833) was infected with malaria, which spread rapidly to the native California inhabitants of the Sacramento and San Joaquin valleys. The death rate reached 75 percent or greater (Cook 1976).

Europeans and Americans soon began to establish more permanent settlements, acquiring land grants from the Mexican governors of California. John Sutter arrived in California in 1839, and he received title to a large grant on the American and Sacramento rivers that he named New Helvetia in 1841. By 1844, Sutter had finished construction of his fort, located in present Sacramento (Owens 1991). In 1844, William Leidesdorff received the 35,521-acre Rancho Rio de los Americanos land grant from the Mexican Government. The grant originally consisted of eight square leagues (about 54 square miles) and extended four leagues (about 12 square miles) from the eastern border of John Sutter's New Helvetia (east of Sacramento) along the south bank of the American River, to the eastern end of present-day Folsom, including the present-day cities of Rancho Cordova and Folsom (United States District Court 1840).

As Sacramento began to attract more settlers, industries began to develop in the surrounding area. Much of this early industry was dependent upon waterpower generated by the American River. The first major effort to harness this power occurred in 1847, when Sutter began construction of a large grist mill on the South Fork of the American River. Discovery of gold at Coloma interrupted this construction (Dillinger 1991) as attempts to keep the discovery silent were unsuccessful (Kyle 1990). Population of the state jumped from 14,000 in 1848, to nearly 100,000 as the gold rush began in late 1849. By the close of 1852, the population had more than doubled to over 220,000 (Paul 1965).

The relative isolation and sparse settlement of the Sacramento Valley ended with the discovery of gold. Sacramento soon became a central trading and market city because of its proximity to mining areas and as the farthest point navigable upstream by ocean-going vessels. Named after the river on which it was located, Sacramento had only four houses in April 1849. By November of the same year, it was a city of almost 10,000 (Hoover et al. 1953). Soon after, the City of Sacramento was incorporated in 1850. The City became a major commercial center and distribution point for northern California, serving as the terminus for the Pony Express and the First Transcontinental Railroad.

Throughout these years of development, gold remained an important focus of activities along the American River. During the earliest years of the Gold Rush, from 1848 until about 1851, gold miners flocked to the placer deposits of

**TOP** *Tule hut replica at the Effie Yeaw Nature Center. Photo Credit: MIG*
**BOTTOM** *Interpretive tule hut placard at the Effie Yeaw Nature Center. Photo Credit: MIG*

the California foothills. After these first flush days, when gold became more difficult to collect, interest shifted to the exploitation of riverbeds, deep gravels, and quartz veins. River mining was a far more complex technique, requiring the use of dams, ditches, and flumes to divert streams from their natural beds. The older, simpler methods of working bars, banks, and gulches were not immediately abandoned, but by the late 1850s, were largely left to Chinese miners. The origin and most important center of early river mining was on several forks of the American River. Many companies went to work along its course, one directly below another. By 1859, the yield from the overworked riverbed had declined and most miners had all but abandoned the American River (Paul 1965).

Sacramento has historically been inundated by periodic flooding, primarily from the American River. The record of flooding dates back to 1805, according to early Native American sources, with later episodes reported by Jedediah Smith in the winter of 1825-1826 and by Sutter in 1846-1847. The first major, well-documented flood in historic times occurred in January 1850, when heavy rains raised the levels of both the American and Sacramento Rivers, flooding the City of Sacramento.

The flood led to the establishment of the Levee Committee and the passage of a bond to fund construction of levees along the American and Sacramento Rivers. Levee construction began at the community of Sutterville, about two miles south of Sutter's Fort, ran north on the east bank of the Sacramento River to the mouth of the American River and continued east on the south bank of the American River for 2.5 miles. The levee broke in 1852 and 1853. The levee system was widened and strengthened later in 1853 and again in 1854, but was breeched in 1860. In December 1861 and January 1862, Sacramento was subjected to four major floods. The levees east of the city gave way and both bridges and railroad lines were swept away. Water levels reached five feet in some parts of the city, with sand and silt piled as high as eight feet in some areas.

Following the floods of 1862, the Board of City Levees Commission was created to look at different alternatives for flood protection. One of these, straightening the American River at Rabel's Tannery at the north end of 28th Street where the levee continually collapsed, was initiated by City Engineers in 1868. The river then flowed into Sutter or China Slough, a few hundred feet from the river's mouth, and then into the Sacramento River. This slough often overflowed. A minor slough, however, also connected the two rivers north of the point where the river entered Sutter Slough. This slough was deepened and became the new main channel, eliminating the tight curve that caused much of the problem. The former channel through Sutter Slough was blocked off and reclaimed by 1905 (Dillinger 1991). Despite these efforts, flooding continued to remain a threat.

With the emergence of agriculture in the Sacramento Valley after 1868, concern developed for the reclamation of swamp lands that flooded annually. Concerns included flood protection for farms, elimination of debris from hydraulic mining operations, and the development of irrigation systems. Until 1900, most flooded lands were reclaimed piecemeal by individual farmers and communities. Ironically, flooding worsened with the initiation of reclamation projects and the construction of levees. Hydraulic mining upstream sent large quantities of silt and sediment down the river, resulting in sediment-filled riverbeds that decreased their water-holding capacity. During heavy rains, excess water and silt breached the levees and resulted in progressively higher flood levels.

**TOP** *Fire pit replica at the Effie Yeaw Nature Center. Photo Credit: MIG*
**BOTTOM** *Interpretive Nisenan kitchen placard at the Effie Yeaw Nature Center. Photo Credit: MIG*

The first dredging activities began in March 1898, which led to a resurgence of mining along the American River. Gold dredges (essentially large barges) would occupy settling ponds on the river bars; excavate rock, gravel, and sediments in bucket line dredges; process and sift for gold; and send the tailings out the stern. By 1899, the only steam-powered dredge in the district, Pacific No. 1 (manufactured by Risdon Ironworks), and the first of the electric dredges, Ashburton No. 1 (manufactured by Bueyrus Company), were in operation (Aubury 1910). Over time, other electric dredges became the norm, powered by the new Folsom Powerhouse power plant, which had been constructed in 1895 (Bell 2020).

The peak of dredging operations on the American River appears to have occurred during World War I, declining thereafter. Dredging was suspended in 1942 due to the war, but resumed in 1943. In 1962, dredging was terminated. By the time dredging ceased in the American River district, the dredged area extended from the town of Folsom southwest along the south side of the American River to Fair Oaks, south through Natoma to Nimbus, and west to Mather Air Force Base. The dredged area measures approximately 10 miles long and up to seven miles wide. One of the largest dredging fields in the world, approximately one billion cubic yards of gravel were dredged by the Natomas Company (Clark 1980).

Plans for a park along the American River date back to as early as 1915, when the Board of Directors submitted a plan to the City Commissioners of Sacramento for an extensive park system referred to as the “American River Parkway.” This plan was not instituted, but in 1929, the first state park bond act was passed. In 1949, the River Beautification Commission was created to plan and design development of recreational areas on the American River. The State Park

*Entrance signage at the Effie Yeaw Nature Center. Photo Credit: MIG*

Commission had set aside funds for acquisition of lands along the Sacramento and American rivers, available if local organizations could provide matching funds. Taking advantage of this situation, the City of Sacramento became active in park acquisitions. Ten years later, in 1959, the Sacramento County Board of Supervisors established a County Department of Parks and Recreation and began planning for development of a park system. By 1962, a master plan that included a Parkway stretching from Nimbus Dam to the Sacramento River was conceptualized. Land purchases were expensive, however, and acquisitions were slow. In 1961, the County Planning Commission approved plans for a subdivision within 125 feet of the river. This spurred Parkway forces to action, and within a short time, the Save the American River Association (SARA) was established. The activities of this group demonstrated the community support behind preservation of the river and the County began to set aside more funds for land acquisitions. Major land purchases were made between 1961 and 1965, with smaller purchases continuing up to the present. Plans were adopted and revised several times into the 1970s and 1980s. The current Parkway Plan was last updated in 2008.

# 6.6 MANAGEMENT OF CULTURAL RESOURCES

Cultural Resources are non-replaceable, although some level of damage to built environment structures can be repaired using defined standards (i.e., Secretary of the Interior's Standards for the Treatment of Historic Properties 2017). Damage or degradation to archaeological resources is permanent and cannot be reversed. Therefore, the preservation of existing resources, and protection of potential resources, is the prime strategy for managing cultural resources.

Knowledge of the current state of cultural resources in the Parkway is essential for effective management, as over time the sites or structures may have degraded since they were last recorded. To that end, it is recommended that the County perform an update to the existing Historic Resource Inventory (HRI) of the Parkway (Dames and Moore 1995). This update would consist of archaeological and architectural surveys by qualified professionals meeting the Secretary of the Interior's Professional Standards, who would analyze resources with potential for inclusion in a historic register. The findings would be summarized in State Parks 523 continuation forms and analyzed for their current eligibility in the National Register of Historic Places (NRHP) and the California Register of Historic Resources (CRHR). The Department of Parks and Recreation (DPR) forms would be included in an updated report that could draw heavily from the existing report in terms of cultural setting and historic background.

A number of cultural resources in the Parkway are threatened by natural processes, such as erosion and human-induced ground-disturbing activities, including tailings from the Gold Rush era dredging, archaeological sites, and other historic resources. Providing information on resources in the Parkway through signage and other educational information is an effective tool to inform and engage the public in the preservation process. Although signage and information cannot protect cultural resources against human and natural processes, they can help preserve cultural history, as well as act as incentives for preservation of cultural resources to current and future generations.

Regional Parks should ensure that all future projects minimize both direct and indirect impacts on cultural resources. Indirect impacts can be as damaging as direct impacts, and less obvious. For example, direct impacts might involve the alteration of a historic building or ground disturbance at an archaeological site. Potential indirect impacts are those that generally happen after the completion of a project or at a location proximal to the project site, such as erosion caused by new structures, or ground disturbance impacting cultural resources downstream. Another example of an indirect impact on cultural resources includes vibration impacts resulting in structural damage to a historic structure from increased traffic or construction noise adjacent to that structure.

In general terms, known archaeological sites should be isolated, fenced off, and disturbed as little as possible. Prior to approval, individual projects in the Parkway should be assessed by a qualified archaeologist to ensure that projects are not situated in or near an area that contains known archaeological resources. If these resources are present, care must be taken to ensure that proper archaeological investigation and mitigation occurs. Further, Regional Parks should maintain partnerships with tribal representatives as official policy for managing the cultural resources of the Parkway.

Historic structures should be kept on a list that is maintained by the Sacramento County Office of Planning and Environmental Review Department to ensure that potential historic structures (such as those older than 50 years) undergo the proper historic evaluation, and that alteration or demolition of these structures is avoided or minimized and fully mitigated.

# 7 HUMAN USE IMPACT REDUCTION


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CHAPTER 7

# INTRODUCTION AND OVERVIEW

The Parkway is a multi-faceted public facility serving as a significant ecological area in the California Central Valley, the ancestral home of the Nisenan Maidu, a highly altered flood-protection facility, and, perhaps most notable to visitors, a regional recreation destination. The segment of the LAR that flows through the Parkway is the most heavily used recreation river in California (USFWS et al. 2021).

As a river listed under the State and National Wild and Scenic Rivers System for its outstanding fishery and recreation values, the LAR and corridor's recreational features are significant, and the provision of recreation in the Parkway must be maintained as a condition for the continued protection of the river system. The Parkway is known for its trail facilities, including the famous Jedediah Smith Memorial Trail, and the various water-based recreational opportunities it provides to visitors. The Parkway is also a hub of utilities infrastructure that supports surrounding communities and land uses. The Parkway contains important electrical power transmission corridors and sanitary sewer infrastructure owned and maintained by various power and wastewater service providers, and the river itself provides potable water to approximately 2 million people (The Water Forum 2019). While recreational features may be the most significant aspect of the

Parkway to the average user, the Parkway serves an equally important role in the utilities systems of the Sacramento metropolitan area.

The residents of Sacramento County obtain numerous benefits from the Parkway due its status as a protected open space. There are four types of human use benefits that can accrue from protecting open space: personal, social, economic, and environmental. Personal benefits include those that a Parkway visitor may obtain while recreating; examples of these benefits include improved health or stress reduction. Social benefits include those obtained by groups, such as social or family bonding. Economic benefits can include both direct spending for activities that occur in the Parkway as well as indirect spending (known as a multiplier) as money spent on and at the Parkway continues to circulate in the local economy. A study by the Dangermond Group (2006) concluded that the Parkway had a greater than $360 million economic impact. Finally, environmental benefits provided by the Parkway include the protection of open space and subsequent habitat protection.

These benefits, derived from human uses, may result in impacts to natural resources in the Parkway. Human uses are one of the key natural resource issues in the Parkway. Thoughtful management is needed to ensure human use of the Parkway is balanced with protection of natural resources.

*Festival goers at the Aftershock Festival, a special event held in the Discovery Park Area. Photo Credit: Scott Webb*

This chapter addresses the reduction of specific human use impacts in the Parkway. First, a background on recreation use in the Parkway is provided along with regional and social context (Section 7.1); a plan for reducing recreation use impacts while maintaining recreation use is provided. The goal is to influence recreation uses and behavior in a manner that minimizes impacts on natural resources. Managing the impacts of special events (Section 7.2) and homelessness (Section 7.3) are discussed, respectively. This is followed by a discussion of ambient light (Section 7.4) and ends with a discussion on enhancing vegetation along electrical utility rights-of-way (Section 7.5).

# 7.1 RECREATIONAL USE IMPACT REDUCTION

Recreational uses are embedded as a key aspect of the Parkway Plan; the purpose of the NRMP is to not reduce recreation use, but to reduce the impacts associated with these activities. Chapter 1 of the Parkway Plan states:

The Parkway Concept can be summarized as follows: The American River Parkway is a unique regional facility which shall be managed to balance the goals of: a) preserving naturalistic open space and protecting environmental quality within the urban environment, and b) contributing to the provision of recreational opportunities in the Sacramento area. (Sacramento County 2008a, p. 10).

*Picnic tables in the River Bend Park Area. Photo Credit: Regional Parks*

## Recreational Use in the Parkway

According to County estimates, the Parkway receives approximately 8 million visitors annually (as of 2009). The Parkway contains approximately 82 miles of single-use and multi-use paved and unpaved trails (Regional Parks 2009). The Jedediah Smith Memorial Trail, a paved bicycle/pedestrian trail, spans the entire length of the Parkway. The Two Rivers Trail runs non-contiguously along the south bank of the Parkway from Discovery Park to the Capital City Freeway. The Parkway has beaches and boating access areas that facilitate swimming and boating activities. The Arden Rapids and San Juan Rapids attract kayakers and rafters. Fishing is permitted throughout the year in most areas and occurs along the riverbanks from boats in the river channel, and at fishing ponds.

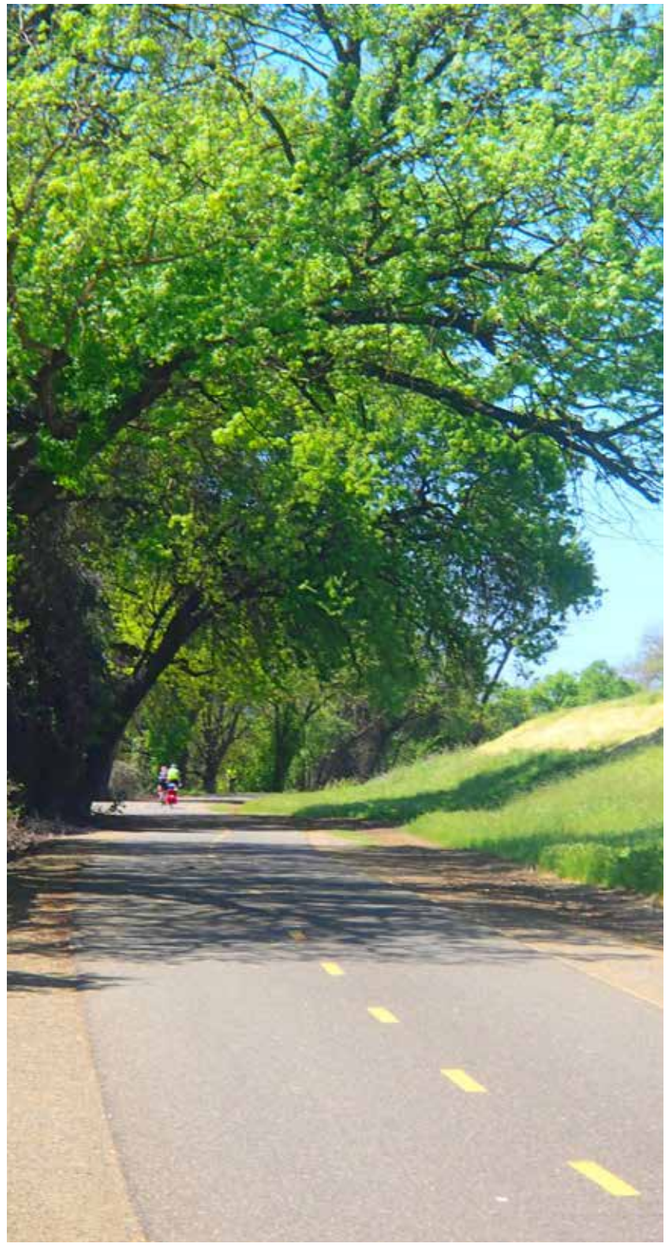
Individual picnic tables are scattered throughout the Parkway, often adjacent to trails. Picnic areas for family units and small- and medium-sized groups contain clusters of tables and barbeque grills. Large shade structure picnic areas are available for reservation at Discovery Park, Ancil Hoffman County Park, River Bend Park, and the William B. Pond Recreation Area. The Effie Yeaw Nature Center is the Parkway's headquarters for interpretive programming and hosts a number of interpretive exhibits and displays. Interpretive placards and bulletin boards are located along Parkway trails and near notable natural resources. Overnight camping is permitted, at Regional Parks' discretion, for educational and youth group purposes at Camp Pollock, River Bend Park, and in association with interpretive programming. Most existing recreation facilities and infrastructure in the Parkway support passive recreation and include pedestrian use (i.e., walking, jogging, and running), bicycling, equestrian activity, non-motorized boating, swimming, fishing, nature appreciation, picnicking, barbequing, overnight camping, and interpretation.

The Parkway's active recreational facilities include the Discovery Park archery range, the Campus Commons Golf Course, and the Ancil Hoffman Golf Course. These are recognized as incompatible uses under the Parkway Plan. Unstructured field sports are allowed on the turf fields located in Discovery Park, Ancil Hoffman County Park, and River Bend Park. Additional recreational activities include periodic special events and organized group activities, such as races, festivals, and concerts; these activities are permitted dependent upon issuance of County recreation permit(s).

The American River Parkway Foundation (ARPF) conducted an in-field Parkway community survey on December 4–17, 2018 to determine user awareness, perception, value, and usage of the Parkway. The survey had a sample size of 610 individuals, 400 of which reside in Sacramento County and 210 of which reside in either Placer, El Dorado, or Yolo Counties. The survey's key findings, produced in a 2019 report, are summarized below:

- 83 percent of respondents had visited the Parkway at some point in the past, and 43 percent of respondents had visited the Parkway in the preceding year.
- 20 percent of respondents were aware of the Parkway or one of its affiliated parks and 42 percent of respondents were aware that all parks, recreation areas, and educational centers in the Parkway.
- Respondents reported being most aware of the American River Bike Trail, Discovery Park, and the Nimbus Fish Hatchery when asked about Parkway parks, recreation areas, and educational centers.
- Respondents also listed the American River Bike Trail and Discovery Park as their most visited places along the Parkway.
- The respondents most often used the Parkway for the following activities: walking (67 percent); taking nature walks (51 percent); picnicking, barbecuing, or having a party (39 percent); and biking (36 percent).
- When asked what amenities they would like to see added or improved, respondents selected bathrooms (68 percent), walking/hiking trails (45 percent), and informational or educational signage (28 percent) as the top choices.
- 79 percent of respondents changed their perception, visitation, or usage of the Parkway by visiting less, avoiding specific parts of the Parkway, and/or volunteering less because of homelessness.
- Conflict between pedestrians and bikers was a key point of concern noted by respondents. Respondents most often attributed conflicts to fast biking speeds, pedestrians congregating in groups on trails, and lack of signage indicating the accepted uses of trails.
- Respondents most often described the Parkway as "wilderness in the city," "scenic," and "valuable."

The survey results indicate Parkway visitors predominantly use the Parkway for passive recreational activities, and users recognize the natural and scenic value of the Parkway. In addition, the survey suggests respondent awareness and knowledge of the Parkway and its features is somewhat low, perhaps indicating a need for increased interpretation and education to inform and educate users about the Parkway and its resources.



*Paved bike trail in the Woodlake Area.*
*Photo Credit: Wildlife Conservation Board*

## Population Growth in Sacramento County

A key indicator of increased recreation use in an area is regional population growth; therefore, associated projections should be considered when determining what policy and management actions are necessary to properly manage ecological resources (Cordell et al. 1999). Overall, Sacramento County has grown substantially over the past half-century and continued growth is expected through 2060. According to U.S. Census Bureau data, the population of Sacramento County has tripled over the past 50 years (Table 7-1). Although the rate of population growth is expected to slow in future decades, the County is still anticipated to increase in population by approximately 700,000 people by 2060. As the County's population continues to grow, the Parkway will likely experience more demand from local users, particularly because there are currently no developed regional facilities or areas that would provide alternative recreational opportunities at the same scale. As such, it is important to maintain recreational access to the area to meet future population growth in the region. Further, Regional Parks will plan to minimize the impacts associated with recreation use while maintaining access.

**TABLE 7-1 SACRAMENTO COUNTY POPULATION DATA (1960 – 2060)**

| PAST CENSUS YEAR | POPULATION COUNTS | PERCENTAGE INCREASE FROM DECADE PRIOR |
|---|---|---|
| 1960 | 502,778 | --------- |
| 1970 | 631,498 | 25.6% |
| 1980 | 783,381 | 24.1% |
| 1990 | 1,041,219 | 32.9% |
| 2000 | 1,223,499 | 17.5% |
| 2010 | 1,418,788 | 16.0% |
| 2018 | 1,540,975 | 8.6% |
| Future Census Year | Projected Population Estimates | Projected Percentage Increase from Decade Prior |
| 2020 | 1,572,195 | 10.8% |
| 2030 | 1,758,565 | 11.9% |
| 2040 | 1,938,889 | 10.3% |
| 2050 | 2,104,947 | 8.6% |
| 2060 | 2,264,603 | 7.6% |

*Sources: Forstall 1996, California Department of Finance 2019*

## Trends in Outdoor Recreation

Outdoor recreation is one of the largest industries in both California and the United States. The outdoor recreation research and advocacy organization, Outdoor Foundation, prepared the 2018 Outdoor Participation Report and reported that approximately 146.1 million Americans (49% of the U.S. population in 2017) participated in any of 42 outdoor activities at least once in 2017. This data shows a trend of slight yearly increases in the percentage of the U.S. population participating in outdoor recreation since 2015.

The Outdoor Foundation's 2016, 2017, and 2018 Outdoor Participation Reports further indicated the most popular activities by participation rate and by frequency of participation were running/jogging, fishing, biking, hiking, and camping in both categories all three years. In addition, most of these activities were among the top five most popular and favorite activities from 2010 – 2015. The Parkway supports all five of these activities. To adequately serve a growing population that continues to enjoy these activities, the County and advocates of the Parkway will need to ensure its trail and aquatic facilities remain sufficient.

The U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. Department of Commerce, and U.S. Census Bureau's 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation-California underscores the economic value of wildlife-watching activities in California. The survey found 6.7 million state residents and non-residents aged 16 years and older participated in wildlife-watching activities, which include observing, feeding, and photographing wildlife, in California in 2011. In 2011, wildlife-watching expenditures in California totaled $3.8 billion from trip-related, equipment, and other expenses.

The California Natural Resources Agency and State Parks indicated in their *Outdoor Recreation in California's Regions 2013* report that the 14-county Central Valley Region, including Sacramento County, was their highest priority region for serving residents' recreational needs (State Parks 2013). The report determined that the Central Valley Region would experience the largest overall population growth (in absolute numbers and percentage) of the seven regions and providing adequate recreation facilities in the Central Valley is a notable concern. This report's conclusions emphasize the importance of the Parkway as a prominent outdoor recreation opportunity in the region and maintaining access for the growing population.

## Carrying Capacity

Recreational carrying capacity (or visitor capacity) refers to the level of recreational use an area can receive without substantially impacting facilities, ecological resources, and/or visitor experience. For example, facility capacity could be exceeded based on an overflowing parking lot. Another example would be erosion caused by too many social trails. It may also be the case that a capacity could be exceeded if a visitor's experience is negatively impacted by seeing more people in an area than they expect; this is particularly true for visitors who seek solitude or wilderness experiences. Calculating a facility capacity may be as simple as counting the number of parking spaces but calculating an exact number of visitors where a social or ecological impact may occur is difficult. Indeed, developing a carrying capacity for the Parkway is difficult due to multiple access points, differences in impacts based on recreation activity (biking vs. hiking), the ability of individuals to access the Parkway without parking lots, and seasonality.

From an ecological perspective, quantifying the impact of recreational activities is highly variable. Bicycles and horses impact soils more than foot traffic. Paved surfaces tolerate very high levels of recreation use without showing impacts or signs of wear relative to dirt roads, trails, or open space. Seasonality is an important factor as well; trails that are wet and muddy during the winter or spring are much more susceptible to impact than dry trails.

**TOP** *Eppie's Great Race, a special event held annually in the Parkway. Photo Credit: Scott Webb*
**BOTTOM** *Large parking lot in the Parkway. Photo Credit: Scott Webb*

From a social perspective, setting a carrying capacity or use limit is also challenging as the number of people that recreationists prefer to see is subjective. For example, people who attend large special events do not expect to experience solitude. However, there are areas in the Parkway where visitors are sparse, and some semblance of solitude is attainable. Visitor motives also matter; if an individual's goal is to be with family (at a picnic, for example) or exercise before work, they may not be very concerned about the number of visitors they encounter. This is different than someone who may be visiting the Parkway to view wildlife and would prefer seeing few other visitors. As such, it is challenging to quantify the number of visits that an area can accommodate.

As a practical matter, limiting recreational use in the Parkway is difficult. The Parkway has numerous access points and controlling the number of people entering the Parkway is not realistic. This is particularly challenging due to the Parkway's location in an urban and suburban area. Limiting the number of parking spaces can indirectly limit or lower recreation use. However, the Parkway is visited by many people that access the Parkway by biking or walking from home. It should also be noted that the Parkway is used as a commuting route and there is no effort to limit the number of bike (or pedestrian) commuters. When considering the appropriateness of recreation uses and/or activity types in an area, the best approach is to consider the land use designation and its local management goals. Further, equity decisions must be considered to ensure that underserved populations are not disadvantaged by such a policy.

## Regional Context

Nestled between the Sierra Nevada Mountains and the Sacramento – San Joaquin Delta, the greater Sacramento area contains numerous parks and trails that provide recreational opportunities to the area's population. While there are numerous recreation areas in the region, few of these resources provide so much access to a natural environment proximate to such a diverse population.

The Parkway is a unique recreational resource considering its size, location, and linear nature, along with the breadth of recreational activities it supports. The 5,000-acre Parkway is larger than most recreational resources in the region. However, the Parkway's physical size and length, in combination with its geographic context, set it apart from other areas. Unlike other recreational resource areas in the region, the Parkway traverses two incorporated cities, two unincorporated towns, and numerous unincorporated communities. It serves as a connector between the urban center of the City of Sacramento and the suburban communities of Fair Oaks, Folsom, and more. As a result, it facilitates alternative forms of transportation between local communities. In addition, while many of the recreation areas located within five miles of the Parkway are in urban or suburban locations, none of these resources supports as extensive a range of recreational activities nor as many visitors as the Parkway does. Every attempt should be made to maintain access to the Parkway as it is proximate to underserved communities in the County. Although the region has numerous other recreational opportunities, these other opportunities are at a distance that may present a barrier to underserved populations.

## Recreational Use Impact Reduction

Recreational use can result in disturbance to natural resources and managing these impacts is of prime importance. One of the key concepts related to recreational impacts is the use-impact relationship. As a general rule, initial or early recreation use in a non-disturbed area has disproportionately more impact than subsequent use on a per-use basis. As an example, it is preferable to have visitors use the same trail rather than each visitor develop their own trail and impact a larger area. This is especially true when recreation use is as high as it is in the Parkway. It is preferable to have recreation users use areas that are already impacted (existing trails) than spread the impact from thousands of visitors throughout the Parkway. Notably, this points to strategies that maintain recreational access while promoting natural resource protection such as removing duplicative social trails.

Recreation can result in the reduction of vegetation density and extent. For example, consider the impact of walking through an undisturbed meadow. Initial footsteps may result in trampled vegetation even after one pass. Over time, a social trail may develop, and subsequent use may not result in the same level of impact as compared to initial use. The loss of vegetation exposes soils and roots and increases the potential for erosion. Exposed roots typically result in diminished health or plant death.

Like vegetation, soil may be impacted by trampling from foot traffic, bicycles, and horses, which leads to increased soil compaction or soil displacement in wet conditions, and soil density. The increase in soil density decreases the amount of water that infiltrates the soil and thereby, increases

surface water runoff; subsequently leading to increased soil erosion, particularly during the wet season. Specific to the Parkway, increased erosion is of greater concern along social trails, bluffs, and near water. The Parkway contains networks of social trails created by users who venture off designated trails to reach popular fishing, swimming, and scenic spots (Sacramento County 2008a). Marion (2016) suggests the trail siting process should incorporate a human behavior analysis to anticipate what routes visitors would take to access recreational and scenic areas. Regional Parks should map and analyze Area-specific social trail networks to determine the sites that users want to visit. The remaining duplicative social trails would be permanently closed, using signage and/or barriers to discourage future use. Doing so would reduce the number of social trails in the Parkway and decrease the probability that users will create more social trails in the future. A social trail network mapping survey is recommended as the first step in rehabilitating areas with social trails. This is consistent with keeping existing recreation use on developed trails that have been hardened and/or managed to tolerate relatively high levels of recreation use. As described above, soil erosion can result from outdoor recreation use, causing sediment and nutrient runoff to flow from impacted areas into nearby water sources. Improperly disposed solid waste often ends up in aquatic environments and creates both an aesthetic impact and harm to local fish and wildlife populations. As such, locating recreational facilities away from water sources is beneficial; however, this would not be possible for some water-based facilities such as a boat ramp.

*Foot trail in the SARA Park Area. Photo Credit: Wildlife Conservation Board*

Solid waste management challenges in the Parkway include improper litter disposal. Though most improperly disposed of waste originates from homeless encampments and illegal dumping, special events, concessions, and day use of the Parkway. As with other Parkway natural resource management issues, a combination of visitor management, site management, oversight, and monitoring are needed to manage solid waste disposal throughout the Parkway. Regional Parks may consider increasing persuasive signage near frequented dumping sites and high use areas as a part of an interpretation plan. Strategic patrolling may further influence visitors to dispose of their waste properly, as would-be illegal dumpers may be deterred by the presence of uniformed Parkway staff. Signage should be installed near popular swimming holes and boating access areas to educate visitors (particularly, visitors with children) on the adverse impacts of improper waste disposal in and near water systems. Regional Parks should continue to monitor concessionaire waste management practices and, if warranted, require concessionaires to improve their customer education on Leave No Trace waste disposal practices. In addition, Regional Parks may consider requiring raft and kayak concessionaires to provide mesh litter bags with each vessel rental, as this has proved an effective tool to manage solid waste along other recreational rivers.

Augmenting and improving informative media in protected natural areas has been proven to prevent non-compliance across a variety of users (Marion 2016). The Parkway contains signage geared toward informing visitors of the ecological and cultural importance of the Parkway and of site-specific use restrictions and trail etiquette (primarily in Discovery Park and at the Effie Yeaw Nature Center).

Increasing strategically placed signage, brochures, and bulletin boards crafted with persuasive language would likely improve overall rates of compliance in the Parkway. Signage and bulletin boards may be installed at formal Parkway access points. Signage should be installed as close as physically possible to areas impacted by non-compliance, such as areas with numerous social trails (Johnson and Vande Kamp 1996). In addition, persuasive messages should be conveyed to Parkway visitors who participate in large group activities and attend special events through event materials, such as brochures, signs, posters, and emails. Increasing the presence of uniformed employees near resource areas adversely impacted by non-compliance is another visitor management strategy that can deter off-trail hiking and other non-compliant activities (Johnson and Vande Kamp 1996). Additionally, providing educational information to visitors discussing areas to avoid and reasons they should be avoided is another method to keep visitors on designated trails (Knight and Gutzwiller 1995). Parkway users are more likely to respect trail closures and areas with restricted access if the reasoning behind them is clear. Informing and encouraging visitors about maintaining safe distances from wildlife, the importance of staying on designated trails, keeping pets on leash, and disposing of trash at waste facilities can help to reduce human impacts (Duerksen et al. 1997). Education and outreach efforts can encourage recreationists to have minimal impact during visits. These factors should be considered as Regional Parks develops an interpretation plan that both informs visitors about the Parkway and also encourages appropriate behavior. The interpretation plan should address the need for more signage throughout the Parkway, particularly in the seven Nature Study Areas, which are considered the most environmentally sensitive areas of the Parkway.

The key to minimizing recreation-related impacts in the Parkway while maintaining access is to make recreational facilities more environmentally friendly over time without reducing recreational opportunities. Additionally, interpretation and education are appropriate tools to inform people about the Parkway as well as encourage appropriate behavior. Future recreational developments and/or upgrades of existing facilities should incorporate design features that allow for continued recreation access while minimizing the impacts. Some future potential considerations include siting recreational facilities away from environmentally sensitive areas, incorporating erosion control features, and setting natural boundaries (such as trees and shrubs) to developed recreation areas.

Other recreational use issues have been noted as potential health and safety issues and require continued enforcement including: (1) mountain biking on non-designated trails, (2) dogs off-leash in the Parkway, and (3) recreationists starting illegal campfires. First, mountain biking is allowed in the Parkway on designated trails and roads; however, there is cyclist use of trails not designated for biking. Next, off-leash dogs is an issue throughout the Parkway which can potentially frighten other park users who have a fear of dogs and are a nuisance to wildlife. There are also numerous illegal campfire pits in the Parkway that present a fire risk. Regional Parks will continue enforcement of these issues. The trail mapping process to identify and potentially eliminate duplicative social trails should also note where mountain biking on non-permitted trails is occurring.

*No dumping signage in the Discovery Park Area. Photo Credit: MIG*

"While the importance of recreational opportunities is recognized, preserving the natural qualities of the Parkway is essential."

**– AMERICAN RIVER PARKWAY PLAN, 2008**

## 7.2 SPECIAL EVENTS

Regional Parks manages special events (e.g., group activities and special trail events) in the Parkway through review and issuance of recreation permits. Recreation permit requirements include adherence to Park Regulations included in the Sacramento County Ordinance and conditions of approval specific to the event and proposed site within the Parkway. The Parkway Plan includes additional requirements for special events in the Parkway, such as restricting large special events to Developed Recreation areas within Discovery Park and trails events to designated trails. While Parkway Plan special event policies and the recreation permit review process work to limit impacts to natural resources, robust site and event-specific monitoring is needed to properly analyze related impacts on natural resources in the Parkway. There were approximately 475 special events/group activities held in the Parkway in 2018, and an estimated 130,000 people attended these events (Personal Communication, Amber Veselka, Recreation Supervisor, Regional Parks 2019). Special events held in the Parkway include concerts, campouts, festivals, and runs. Some events are held annually. Special events may be held at a single location, in the case of a festival held on a turf field, or over multiple areas, in the case of runs and biking competitions spanning multiple Parkway Areas.

Special events in the Parkway could potentially impact vegetation, wildlife, soil and water quality, and adjacent uses. While the number of people attending special events makes up a small proportion of Parkway visitors, the impacts of special events on ecological resources are still important to consider. Events involving user groups of greater than several people are more of a concern when the event spans large areas or is held in a fragile environment (Hammitt, Cole, and Monz 2015). As a result, the anticipated resource impacts of the more common individual (one to two persons) and family (three to ten persons) user groups (as indicated in the Parkway Plan) include soil and water quality degradation caused by improper waste disposal, soil compaction and ground cover alteration caused by trampling, and noise and artificial light disturbances to wildlife (which may decrease the nesting success of sensitive wildlife populations).

*Concert stage at the Aftershock Festival, a special event held in the Discovery Park Area. Photo Credit: Scott Webb*

The Parkway Plan specifies that special events may be held only in areas with the Limited Recreation or Developed Recreation land use designations. In addition, special events are permitted only in a small number of Areas, including Discovery Park, Ancil Hoffman County Park, River Bend Park, and the William B. Pond Recreation Area in Arden Bar (Sacramento County 2008a). These restrictions minimize the impacts of concentrated use on fragile environments by limiting use to more developed locations that can better support large user groups. Regional Parks' role in managing special events in the Parkway is largely oversight-based, as it is responsible for issuing recreation permits and ensuring special events adhere to permit requirements. Regional Parks should continue to ensure events do not violate recreation permit requirements while still providing these events for the public. Further, Regional Parks should continue to consider the appropriateness of an event based on its compatibility with the proposed site's land use designation and the natural resource characteristics of the site itself.

# 7.3 HOMELESSNESS IN THE PARKWAY

Homelessness is a wide-reaching and significant socioeconomic phenomenon affecting numerous individuals throughout the United States. The phenomenon is associated with a lack of affordable housing, mental health issues, and drug abuse. Open spaces have become increasingly occupied by homeless individuals looking for safe and secure locations to shelter (Thrush 2017), resulting in adverse environmental impacts on parks, riparian zones, and natural areas.

## Homelessness in Sacramento County – Point-in-Time Counts

CSUS and the Institute for Social Research, in collaboration with Sacramento Steps Forward, conducted 2017 and 2019 point-in-time (PIT) counts on homelessness in Sacramento County. The 2019 PIT Count rallied over 900 community volunteers who canvassed the County and surveyed individuals experiencing homelessness. The 2019 Count concluded an estimated 5,570 individuals experienced homelessness in the County on the night of the count. This represents an estimated 19 percent increase from the 2017 PIT Count in which an estimated 3,665 individuals experienced homelessness[1]. The 2019 PIT Count found that 70 percent of the individuals experiencing homelessness in the County are sleeping outdoors, in vehicles, or in other locations unsuitable for human habitation. Both the 2017 and 2019 PIT Counts concluded that individuals are experiencing homelessness in the County predominantly due to a lack of affordable housing. Michael Doane, Chief Ranger, estimates that there are between 500 and 700 homeless people in the Parkway on a nightly basis (Personal Communication 2019).

PIT Counts indicate that homelessness in the County is growing. With a continuously increasing homeless population, the Parkway will likely continue to face natural resource management issues related to or caused by homeless encampments. In addition, because the 2019 PIT Count found that a majority of the County's homeless are unsheltered, Regional Parks can reasonably anticipate increasing numbers of individuals seeking out Parkway open spaces for shelter. As researchers have determined a lack of affordable housing is one of the main drivers of the homelessness crisis in Sacramento County and elsewhere, Regional Parks will not be able to address the root causes of the homelessness impacting the Parkway.

## Impacts on Ecological Resources

Across the United States, public parks and open space areas are subject to natural resource impacts from homeless encampments. Homelessness occurs throughout the Parkway, but the majority of encampments are downstream of Watt Avenue and concentrated in the Discovery Park, Woodlake, and Cal Expo Areas (Chief Ranger Doane, Personal Communication 2019). Encampments can be found in riparian zones and woodlands that provide ample vegetative cover and shield encampments from public view. Because many of the Parkway's riparian forest habitat areas lie along the banks of the river, encampments are typically located on banks and slopes near the water. Encampments may contain belongings such as blankets, tarps, clothing, shopping carts, plastics, cardboard, woody materials, food packaging, pharmaceuticals, personal care products, drug paraphernalia, and human and animal fecal waste (White

**TOP** *Aerial view of encampments along the Jedediah Smith memorial Trail in the Discovery Park Area. Photo Credit: John Hannon*
**BOTTOM** *Solid waste disposed of in the Parkway. Photo Credit: Scott Webb*

[1]*The raw totals from 2017 and 2019 cannot be directly compared because of changes in count methodology; as a result, the estimated 19 percent increase in growth is a real (adjusted) increase.*

2013). Nearly 1,400 tons of solid waste were removed from the Parkway in 2019; much of which was associated with homeless encampments.

The impacts of homeless encampments on natural resources are varied and compounding. Trash located in and spilling out from encampments lowers the scenic value of the Parkway's natural resources, alters the chemical composition of habitat features, and may harm wildlife. Trash left behind often consists of plastics (including microplastics) and household products such as cleaning agents and batteries. Plastics contain chemical compounds such as phthalates from polyvinyl chloride (PVC), bisphenol A (BPA) from polycarbonate, and nonylphenol compounds from polyolefins. When absorbed into soils, these are absorbed by and damage plant life. When leached into aquatic habitats, they may disrupt endocrine production and functions in aquatic wildlife, and perhaps humans, that ingest waters and soils contaminated by toxic chemical compounds (Engler 2012). Plastics are also deadly to wildlife when ingested and are known for entangling aquatic lifeforms. Needles, pharmaceuticals, cleaning products, and batteries often contain similarly toxic compounds that produce similar effects (White 2013).

Human and animal (mostly pet) fecal waste left in and near homeless encampments have an impact on natural resources. Fecal matter contains disease-causing pathogens that, when ingested, inflict illnesses and threaten environmental and public health (Santo-Domingo and Ashbolt 2008). Food, soils, air, and water can all transmit dangerous fecal pathogens. As most homeless encampments in the Parkway occur adjacent to the river, the degradation of water quality is of particular concern. Visible fecal waste is also a deterrent to recreational activity as the sight, smell, and overall presence of feces turns park users away.

Similar to the outdoor recreation impacts discussed above, encampments associated with homelessness can result in soil compaction, vegetation loss, erosion, and wildlife disturbances. Soil compaction related to encampments can increase the volume of human debris, including toxic substances, entering the LAR and impede plant establishment. In addition, camping on and near the riverbanks of the Parkway contributes to increased levels of sediment offload into the river as a result of riparian vegetation removal. Removal of riparian vegetation also increases the occurrence of erosion as the trees and plants that stabilize riverbanks are cut or removed for use in campfires and shelter. Sediment offload into waterways is associated with detrimental changes in river temperatures that may affect fish birthing and rearing success (Poole and Berman 2001). Human activity in occupied encampments may also scare away animals that otherwise inhabit areas where camps are established.

Finally, homeless encampments may increase the incidence of wildland fire. Campfires that may be left unattended for extended periods of time and improperly disposed of cigarettes have the potential to start fires, particularly when campfires burn in areas with dry, dead vegetation. Fires have considerable impacts on natural resources, including burning vegetation, displacement or death of wildlife, reduction of soil nutrient pools, and damage to park facilities and structures, which may in turn temporarily decrease volumes of park visitors.

## The Law and Homelessness in Public Spaces - *Martin vs. City of Boise*

The Martin vs City of Boise (2009) case recently impacted how public agencies manage homeless individuals in public spaces. The case originated when six City of Boise residents filed a lawsuit in the United States District Court for Idaho against the City for its Camping and Disorderly Conduct Ordinances. The ordinance allowed the City to issue citations to people for sleeping or camping overnight in public spaces, such as parks and sidewalks. The plaintiffs argued that such laws and ordinances violate the Cruel and Unusual Punishments Clause of the Eighth Amendment. In 2014, the District Court sided with the plaintiffs and ordered the City to amend its anti-camping ordinances and bar the authorities, including police officers, from enforcing the City's Camping and Disorderly Camping Ordinances on nights when none of the shelters in the City had overnight bed spaces (United States Court of Appeals of the Ninth Court 2018).

On September 4, 2018, the Ninth Circuit Court of Appeals heard an appeal filed by the City of Boise and upheld the District Court's decision that governments cannot criminalize people sleeping in public places when there is no access to alternative shelter: "The panel held that, as long as there is no option of sleeping indoors, the government cannot criminalize indigent, homeless people for sleeping outdoors, on public property, on the false premise they had a choice in the matter." – Order and Amended Opinion by Judges of the Ninth Court of Appeals in *Martin vs. City of Boise* (United States Court of Appeal for the Ninth Circuit 2019).

Subsequently, on April 1, 2019, the Ninth Circuit Court of Appeals denied a petition to rehear the case, and on December 16, 2019, the Supreme Court of the United States declined to hear an appeal from the City of Boise. As such,

the September 4, 2018 ruling stands and sets a precedent in which municipalities cannot criminalize homeless people sleeping in public spaces on any night when shelters in a jurisdiction do not have available spaces. The *Martin vs. City of Boise* case and decision are relevant to Parkway natural resource management because Regional Parks can no longer, at risk of violating judicial precedent, use camping citations and require individuals experiencing homelessness to leave the Parkway.

## Management of Impacts Associated with Homelessness in the Parkway

As stated above, the Martin vs. City of Boise decision prohibits the County from criminally prosecuting people who are sleeping, sitting, or lying outside on public property when those people have no home or shelter available. The Sacramento County Counsel has provided the following interpretation of the decision:

However, the decision [Martin vs. City of Boise] does not permit a person experiencing homelessness to indefinitely reside at a single location on public property, and the decision does not preclude County enforcement to avoid or mitigate detrimental consequences associated with homeless encampments, such as: accumulated debris; environmental degradation; and health and public safety issues including the degradation of public infrastructure, such as levees.

Cities, counties, and parks agencies throughout the United States are employing a variety of strategies to manage homelessness in parks and public open spaces. The strategies range from direct actions (e.g., police officers or park rangers issuing citations) to indirect and assistance-based (e.g., training staff to inform and assist people experiencing homelessness). Most actions attempt to empower people experiencing homelessness to permanently vacate public property.

*Trash collected from the Parkway by Regional Parks staff. Photo Credit: Regional Parks*

At the time of this report, the County is exploring options to manage homelessness in the Parkway to reduce negative impacts. The following list includes several strategies that could be considered by Regional Parks and/or partner agencies:

- Collaborating with social services agencies and nonprofit organizations combatting homelessness to provide drop-in services for housing assistance, mental health and drug abuse rehabilitation services, career skills development, and education/training (National Recreation and Park Association 2017);
- Rehabilitate areas impacted by human encampments when opportunities are presented;
- Design future potential park infrastructure to discourage people from staying overnight in parks. This may involve strategic park bench design, vegetation management, and the provision of fencing, lighting, and security cameras (National Recreation and Park Association 2017); and
- Most importantly, Regional Parks should continue its coordination with other County or local agencies, along with nonprofit organizations, to allow services to be delivered to the people experiencing homelessness in the Parkway.

*Aerial view of commercial and industrial uses adjacent to the Discovery Park Area. Photo Credit: John Hannon*

*The I-5 American River Bridge in the Discovery Park Area. Photo Credit: MIG*

# 7.4 AMBIENT LIGHT

Artificial ambient light, generated from built environments, may have an impact on natural resources. Ambient light is the overall light conditions present in an environment. The ambient light of a location may include direct light from natural sources such as the sun, lightning, or fire; direct artificial light from vehicles, buildings, or free-standing light fixtures; and indirect natural and artificial light reflected off physical surfaces and matter in the air. Ambient light may include direct light originating from the immediate vicinity and indirect light from beyond the immediate vicinity, including sky glow, a phenomenon caused by the reflection and scattering of light by particles in the atmosphere (Kyba et al. 2015). Artificial ambient light at nighttime may affect wildlife species in the Parkway.

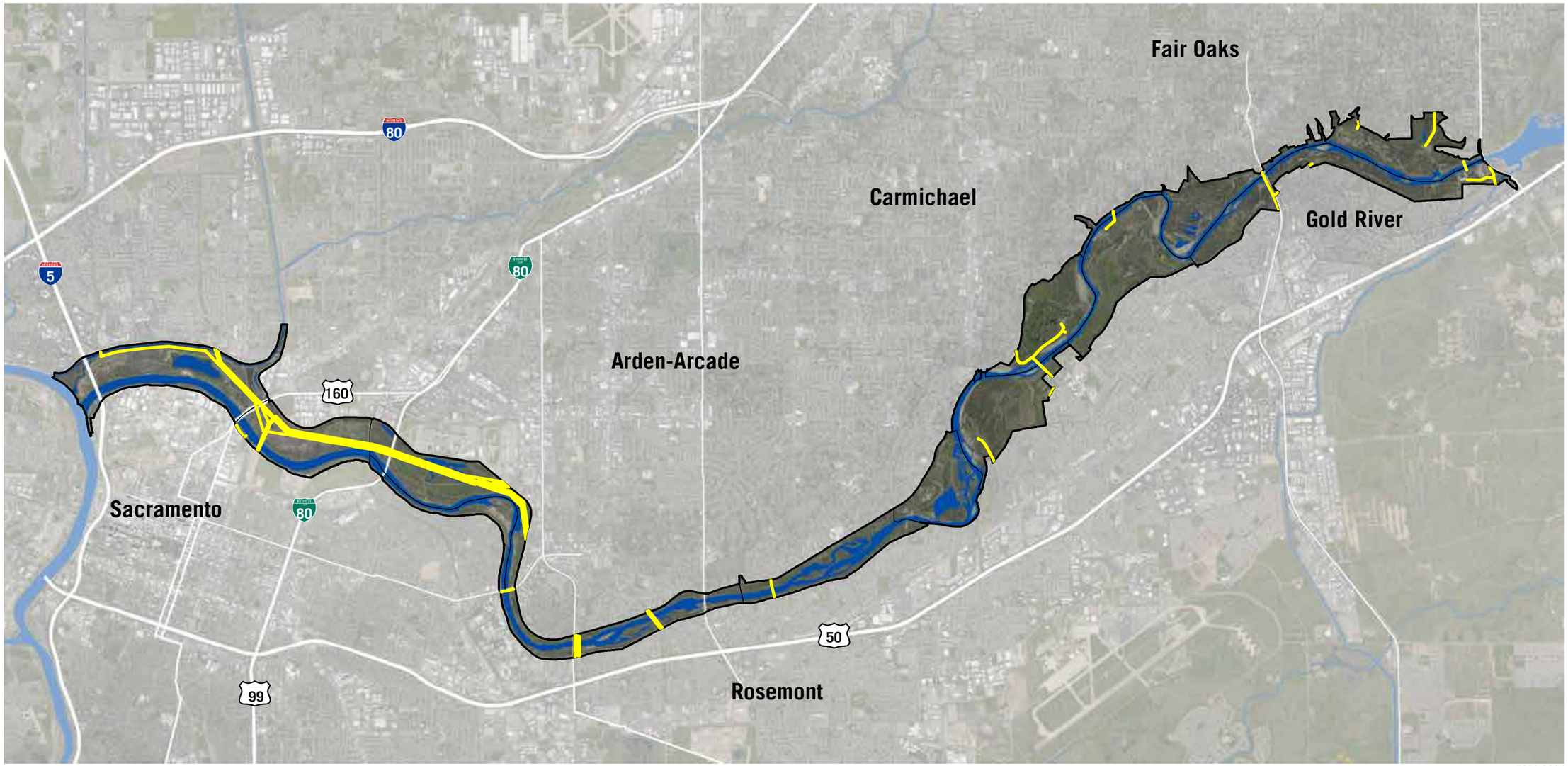
Many wildlife species, both terrestrial and aquatic, function according to long-standing, dependable day-night lighting conditions. At the physiological level, artificial nighttime light may disrupt natural biological rhythms, alter hormone production, impair vision, and impact other bodily functions (Gaston, Visser, and Franz 2015). Recently, managing the amount of artificial ambient light in natural environments has become of interest to land management agencies. For example, the NPS has implemented the “Night Sky” program to decrease the amount of artificial light impacting the park units. In the Parkway, wildlife populations may be impacted by artificial light originating from fixtures lining Parkway roads, bridges and parking lots; lights from special events; exterior light fixtures associated with adjacent residential and commercial uses; vehicle lights; and skyglow. However, it is not known where in the Parkway ambient light is an issue. Regional Parks will identify areas in the Parkway where this may be a concern and then develop a plan to reduce the unnecessary light while maintaining lighting necessary for safety, consistent with the goals of the Parkway Plan.

*Electrical power transmission towers in the Cal Expo Area. Photo Credit: MIG*

*Vegetation clearing activities under WAPA powerlines in the Cal Expo Area. Photo Credit: Regional Parks*

# 7.5 USE OF UTILITY RIGHTS-OF-WAY FOR VEGETATION ENHANCEMENT

Electrical power infrastructure in and near the Parkway is owned and maintained by the Pacific Gas and Electric Company (PG&E), the Sacramento Municipal Utility District (SMUD), or the Western Area Power Authority (WAPA). Over 150 electrical power transmission towers and poles are located in powerline easements throughout the Parkway, predominantly within the Discovery Park, Woodlake, and Cal Expo Areas (see Figure 7-2 Electrical Power Infrastructure). These facilities require vegetation management, which is an important wildland fire risk management activity that involves clearing tree limbs and branches, brush, and grasses near transmission towers, poles, and lines. PG&E, SMUD, and WAPA conduct State and federally-mandated vegetation management activities around electric power infrastructure in the Parkway. While mandated vegetation removal near electrical power infrastructure is important to public safety, there is a benefit in enhancing vegetation in these rights-of-way. These areas could also potentially provide pathways for walking or other recreational activities. Regional Parks will work with the utilities to develop a plan to better utilize these areas within the Parkway. The plan will consider how to appropriately balance the needs for vegetation enhancement with regulation related to wildfire risk. If feasible, Regional Parks should work with utility companies to transition to underground utility lines.




# Figure 7-1
# Electrical Power Infrastructure

# 8 MANAGEMENT, IMPLEMENTATION, AND MONITORING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CHAPTER 8

# INTRODUCTION AND OVERVIEW

The NRMP applies an adaptive management framework that incorporates tools to address natural resource impacts. Adaptive management is based on the idea that flexible, iterative management allows decision makers to develop goals, objectives, and implementable actions informed by existing knowledge, technology, and research to address uncertainties in ecosystem and natural resource management planning (Stankey et al. 2005).

Using the adaptive management framework, natural resource managers develop hypotheses for specific actions to produce desired outcomes and then test those hypotheses, monitor the results, analyze the data, and compare the results to anticipated outcomes. These efforts inform future changes to natural resource management whereby parks managers can assess successes and failures and alter future management accordingly. Adaptive management links lessons learned with policy and implementation through a cyclical process that mimics the scientific method. It enables jurisdictions and agencies to be more responsive to knowledge gained from past management as well as through the scientific community and the public. Adaptive management is particularly useful when an agency's ability to conduct extensive studies and collect data prior to implementing management actions is limited by tight deadlines, budgets, staff resources, or other factors (Stankey et al. 2005).

The NRMP's adaptive management approach is dual-faceted. First, it will allow Regional Parks to adjust management decisions based on knowledge gained from monitoring previous management actions, as discussed above. Second, the system will allow Regional Parks to update its monitoring strategy (and management actions) to address unexpected modifications to the natural setting (e.g., climate change), the introduction of new species of concern (e.g., newly-listed threatened or endangered species), evolving understanding of resource processes and dynamics, and new resource management techniques and technology. The NRMP review and update process will involve partners, stakeholders, resource agencies, and the public to ensure the updated document is inclusive and considers knowledge and input acquired from a variety of sources. The NRMP formalizes this approach through the goals and objectives shown in Chapter 2. Additionally, the NRMP will undergo a formal comprehensive review five years after its adoption, and there are interim points for evaluation (specifically after two years). The NRMP categorizes the lands within the parkway into three area types: conservation, restoration, and naturalization. The area plan maps included in this chapter show how these areas are mapped throughout the Parkway. Another category, rehabilitation, applies to areas in the Parkway that may be impacted by future disturbance.

*Restoration site in the Discovery Park Area. Photo Credit: Regional Parks*

This chapter first describes key management indicators including land use, inundation, vegetation community, and level of alteration (Section 8.1). Next, the chapter provides a description of the natural resource management categories (Section 8.2), followed by Area mapping (Section 8.3). Section 8.4 discusses potential mitigation areas and natural resources management. Section 8.5 includes a discussion of how potential projects in the Parkway would be prioritized. Section 8.6 identifies key potential funding sources, and the final section (Section 8.7) introduces implementation and monitoring. The draft Monitoring Plan is included as Appendix D of the NRMP. The Monitoring Plan will be finalized and approved by the County Recreation & Park Commission (RPC) in 2023.

# 8.1 KEY INDICATORS USED FOR ANALYSIS

Four key indicators were used to help develop the natural resource management categories and guide potential future management actions. These include level of alteration, inundation, vegetation communities, and land use; these indicators are described below. Each indicator is accompanied by a map showing the Parkway as a whole and a map for each of the three hydrogeomorphically distinct reaches within the Parkway: lower, middle, and upper.

The levels of alteration were derived from a variety of sources including historic maps, historic aerial photographs, Regional Parks' records, studies and reports documenting American River resources, best available Google Earth aerial imagery, and field investigations. Inundation extents are derived from 2D and 3D hydrodynamic flood flow models (CBEC 2019). Vegetation communities are categorized by stand structure, growth form, floristic composition, and canopy coverage as determined by Regional Parks' staff, the River Corridor Management Plan (RCMP) (Jones & Stokes 2002), and the American River Parkway Floodway Vegetation Management Plan (FVMP) (EDAW 2009). Land uses reflect policy directives made to assess environmental condition, size, location, purpose, and other characteristics for areas within the Parkway (Sacramento County 2008a). The information regarding level of alteration, inundation, vegetation communities, and land use, was used to understand the existing conditions, anticipated trends, and future Parkway uses that will influence the implementation of management categories and potential management actions. The information was also used to identify those communities and/or areas that should be classified as conservation, restoration, or naturalization.

*Sheep grazing for fire fuel reduction. Photo Credit: Regional Parks*

KEY INDICATOR 1

# LEVEL OF ALTERATION

The level of alteration of a given area was identified as an important factor for planning purposes given that the history of an area often informs its current condition and what may influence its future condition. As described in Chapter 5.0, Physical Resources, there are geologic, hydrologic, and geomorphic conditions that greatly influence the overall physical conditions in the Parkway. But it also describes the many changes, or alterations, that have taken place which have had a lasting impact on the river channel and surrounding Parkway landscape. These include hydraulic mining in the upper watershed, dredger and aggregate mining within the Parkway, construction of Folsom and Nimbus dams, construction of levees, agricultural activity on the floodplain, and construction of infrastructure such as water intakes, electric transmission lines, and bridges. All of these activities, whether or not they are obvious to the casual observer today, have a strong influence on the physical condition of the Parkway and are important to informing the ongoing management of the Parkway's natural resources. Three categories were used:

- Intentionally Altered: Footprints of physical changes resulting from human actions (e.g., areas within the Parkway that were dredger mined for gold).

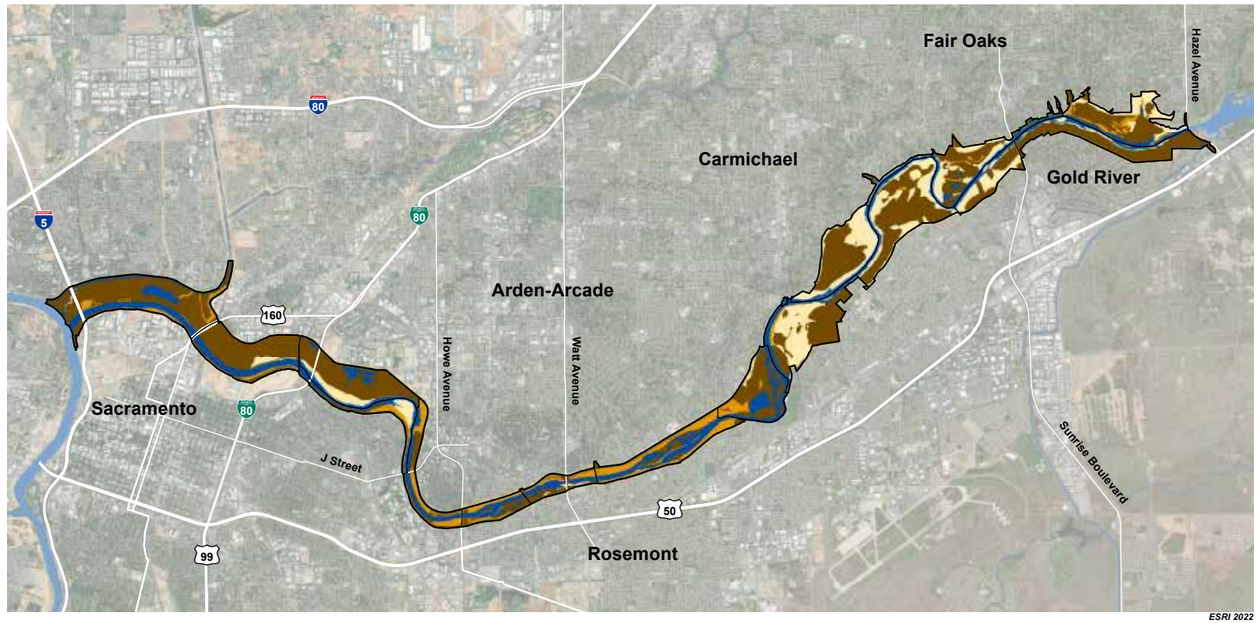



Figure 8-1
Parkway Alteration

- Unintentionally Altered: Areas affected by off-site human actions due to intentional alterations elsewhere (e.g., sediment flowing to a site as a result of hydraulic mining in the upper watershed).
- Unaltered: Areas without any definitive evidence of alteration from direct or indirect actions aside from the effects of the regulated hydrology.

Following are additional examples of the types of conditions that led to intentionally altered, unintentionally altered, or unaltered classifications:

- Examples of areas that were identified as intentionally altered include those that were directly subject to: levee construction, bank protection, channel realignment, mining or mining materials handling and processing, construction of infrastructure, gravel augmentation, agriculture, developed recreation facilities, and formal mitigation sites.
- Examples of areas that were identified as unintentionally altered include those that were indirectly subject to: river channel aggradation or degradation as a result of upstream influences (e.g., Folsom Dam or mining activities changing sediment supply), additions of sediment upstream, induced bank erosion due to adjacent levees, changes in surface water inundation or drainage patterns, and changes in groundwater availability.
- Examples of areas that were identified as unaltered include those that are without any definitive evidence of direct or indirect physical alteration (though some areas may have been affected by regulated hydrology).
- Understanding an areas level of alteration can help explain a site's current topography, inundation regime, vegetation patterns, etc. It can also help to better understand ongoing trends and what might be expected in the future. The high floodplains in the lower reach of the river serve as a good example, in that the past inundation regime allowed for the natural regeneration of cottonwood trees. However, since the riverbed lowered as the hydraulic mining debris was flushed out, while the adjacent overbank areas remained high, the cottonwoods no longer naturally regenerate in several overbank areas. This has resulted in the transition of vegetation in these areas from willows and cottonwoods to species better suited for drier conditions, like oaks. This trend is expected to continue and is important to inform future management actions.

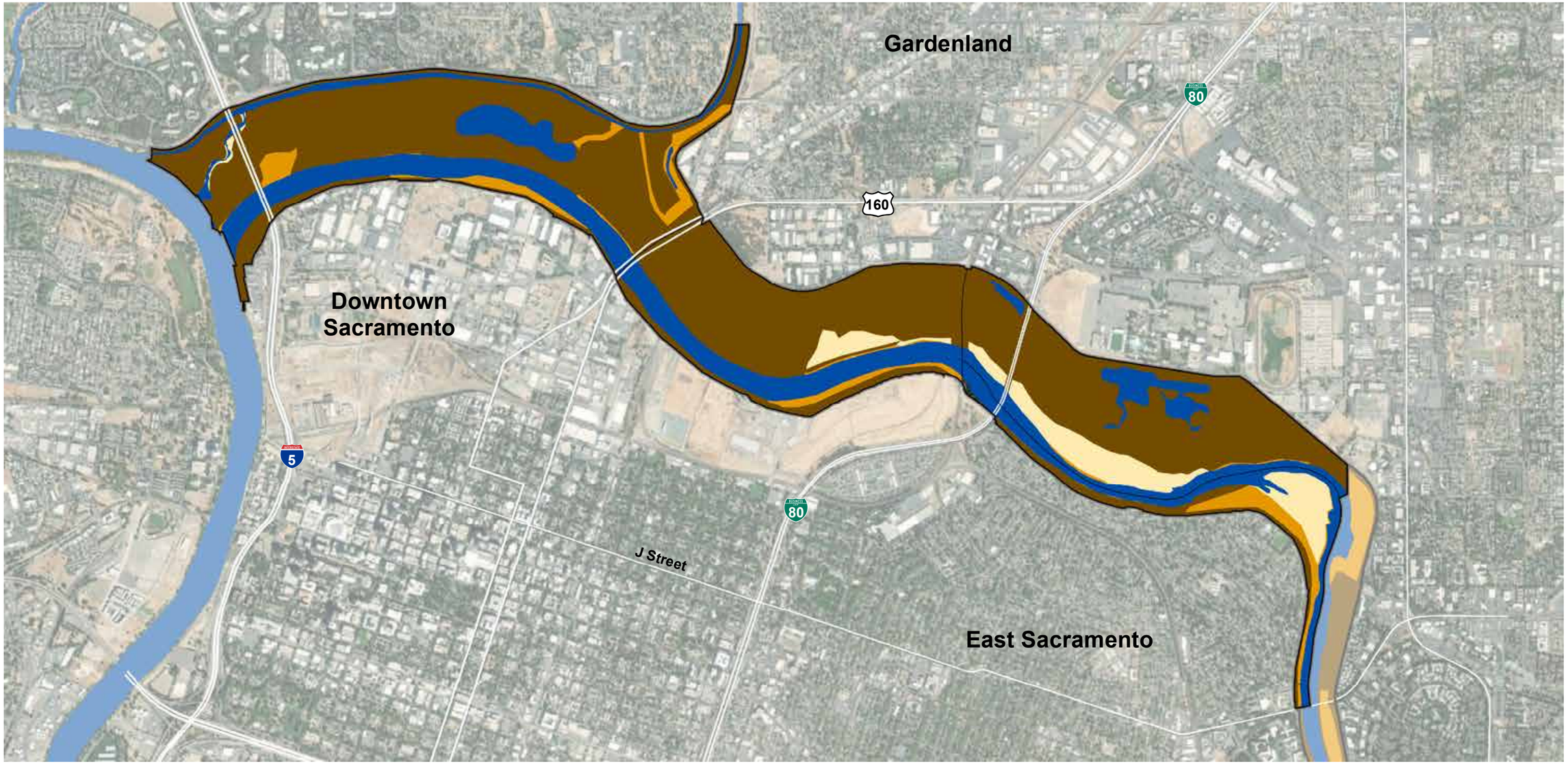



Figure 8-2
Lower Reach Alteration

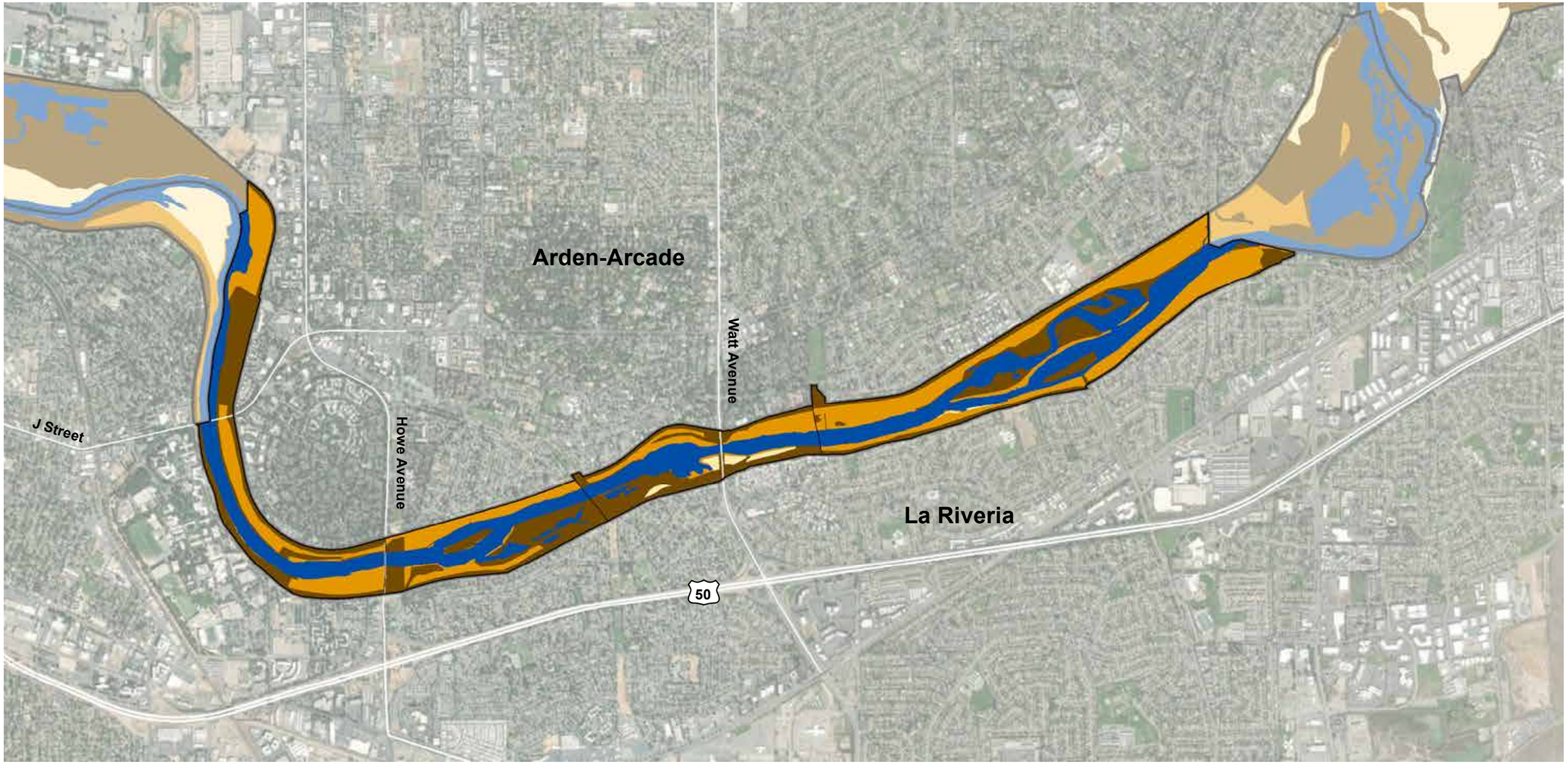
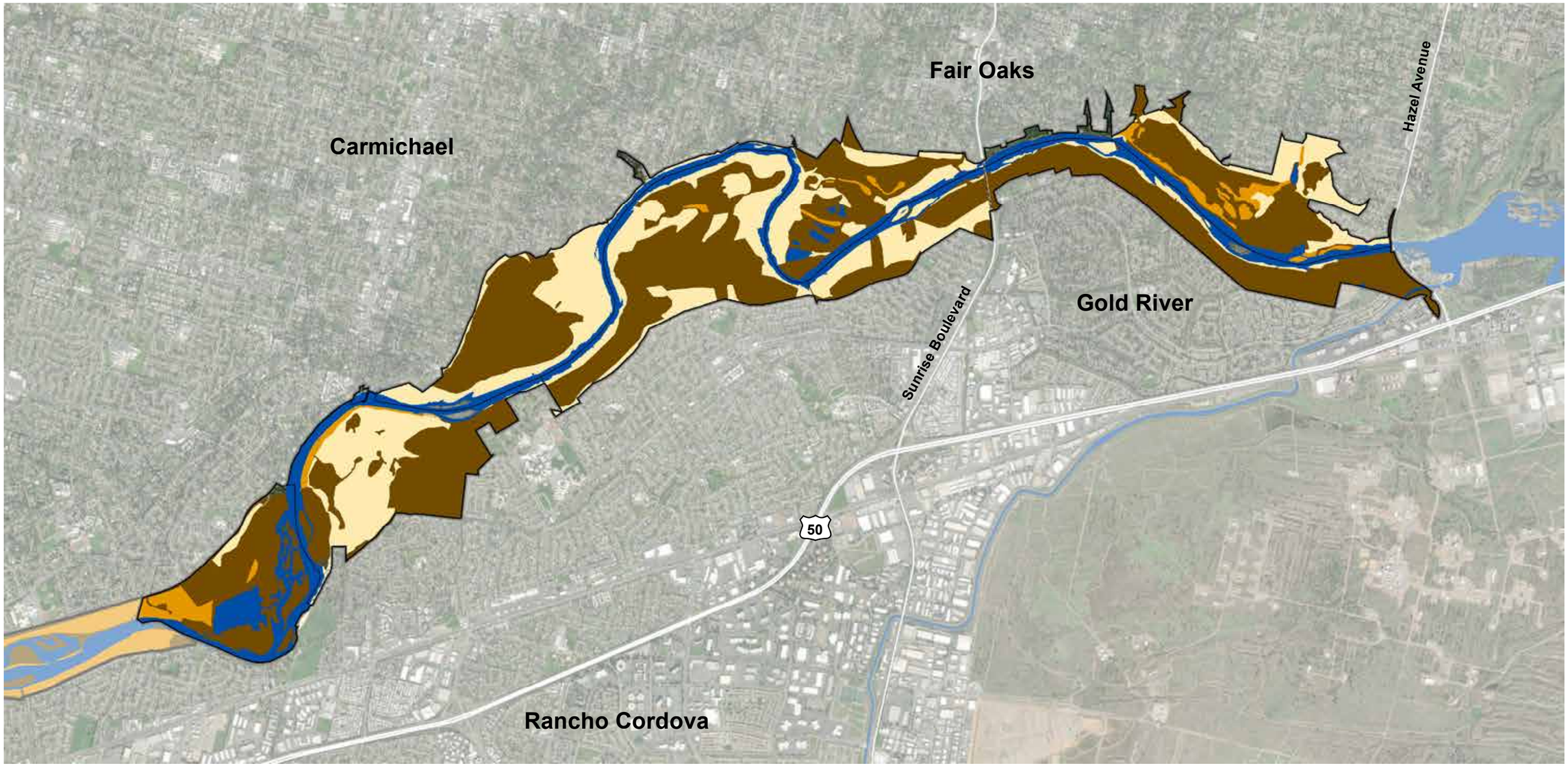



Figure 8-3
Middle Reach Alteration




ESRI 2022

Parkway Area Plan Boundary
Intentionally Altered
Unintentionally Altered
Unaltered

0 0.5 1 Miles

Figure 8-4
Upper Reach Alteration

KEY INDICATOR 2

# INUNDATION

The distribution of Parkway land potentially suitable for various types of vegetation communities relates to the frequency and duration of inundation as a result of river hydrology. The inundation maps serve as a planning tool that highlights the relationship between a given land area and its probable surface and subsurface moisture conditions as they relate to river flows and periodic inundation. The inundation maps provide a few key flows that are relevant to different vegetation communities. For example, areas that are inundated under the 2-year recurrence interval typically support vegetation types that are tolerant of frequent inundation, periodic saturated soils, and potentially, high velocity flows. Examples of species suitable in these areas range from alder and willow riparian scrub to cottonwood and mixed riparian forest habitats. Riparian species do also occur above the areas inundated under the 2-year recurrence interval, but typically these habitats and species require periodic flooding for regeneration and maintenance.

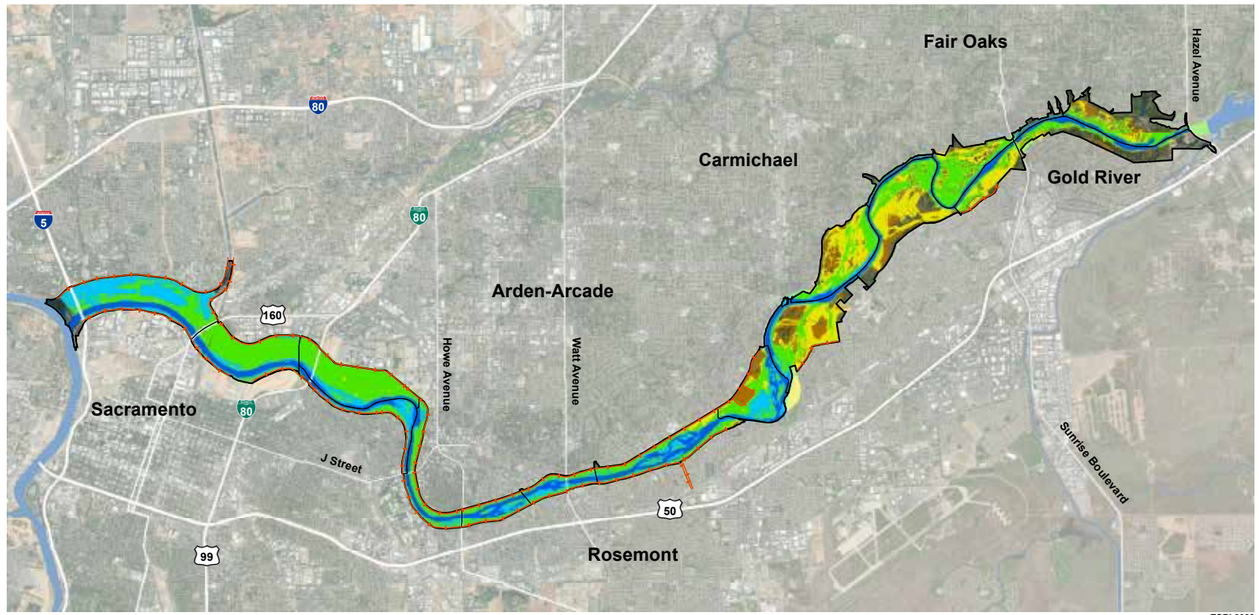
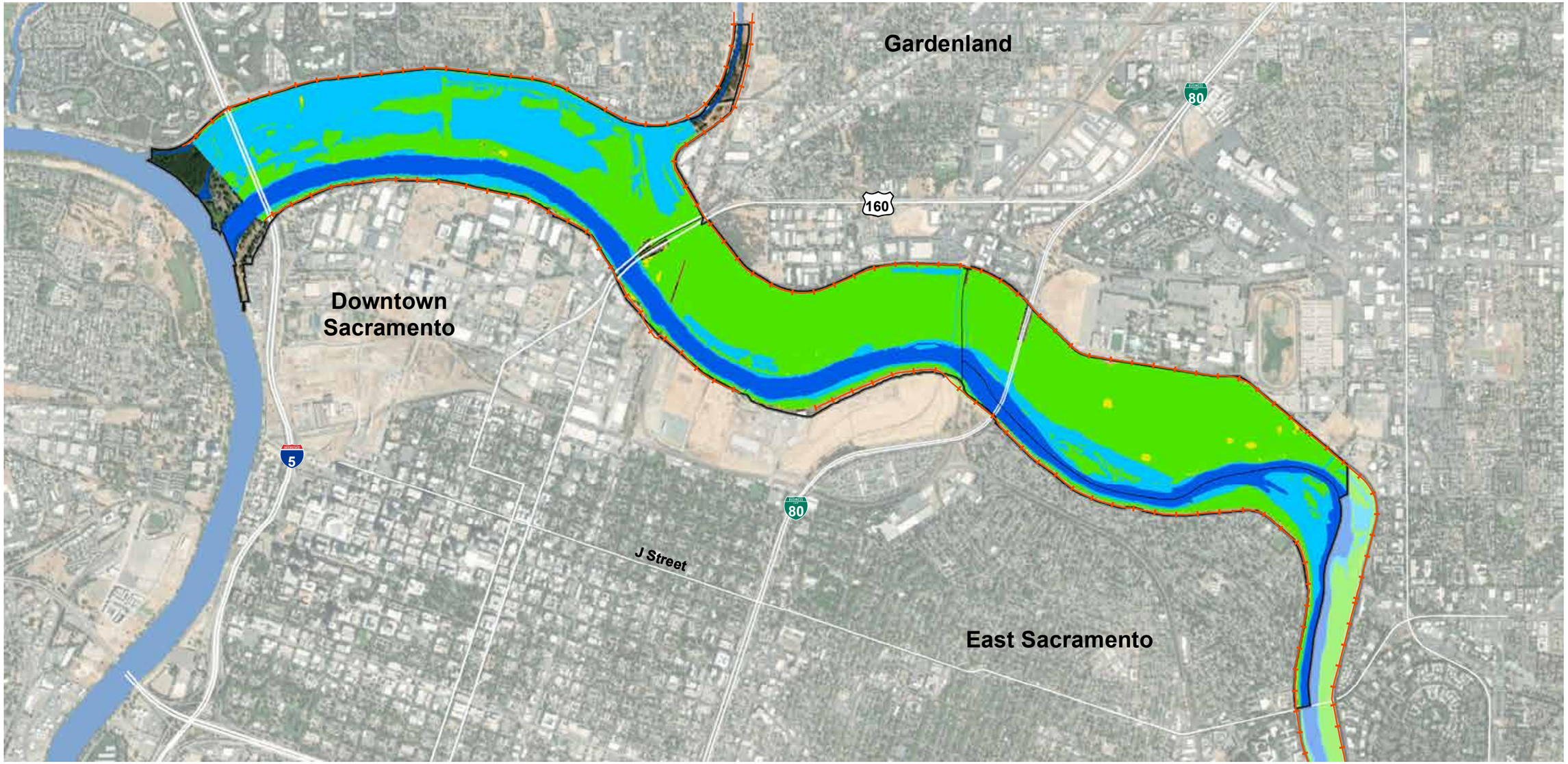



Figure 8-5
Parkway Inundation

Higher floodplain surfaces in the Parkway, represented on the maps by the 25-to-100-year recurrence intervals, are areas that are considered to be above most periodic flood events. Compatible vegetation types include valley oak riparian woodlands, mesic grasslands, and elderberry savanna. These types are tolerant of occasional or infrequent short-duration flooding and saturated or moist soils but do not require flooding for reproduction. Valley oak riparian woodlands, while tolerant of occasional flooding, consist of species that generally do not depend on flooding for regeneration. The areas between the 2-year and the 25-year recurrence interval tend to support a mosaic of riparian and upland species.

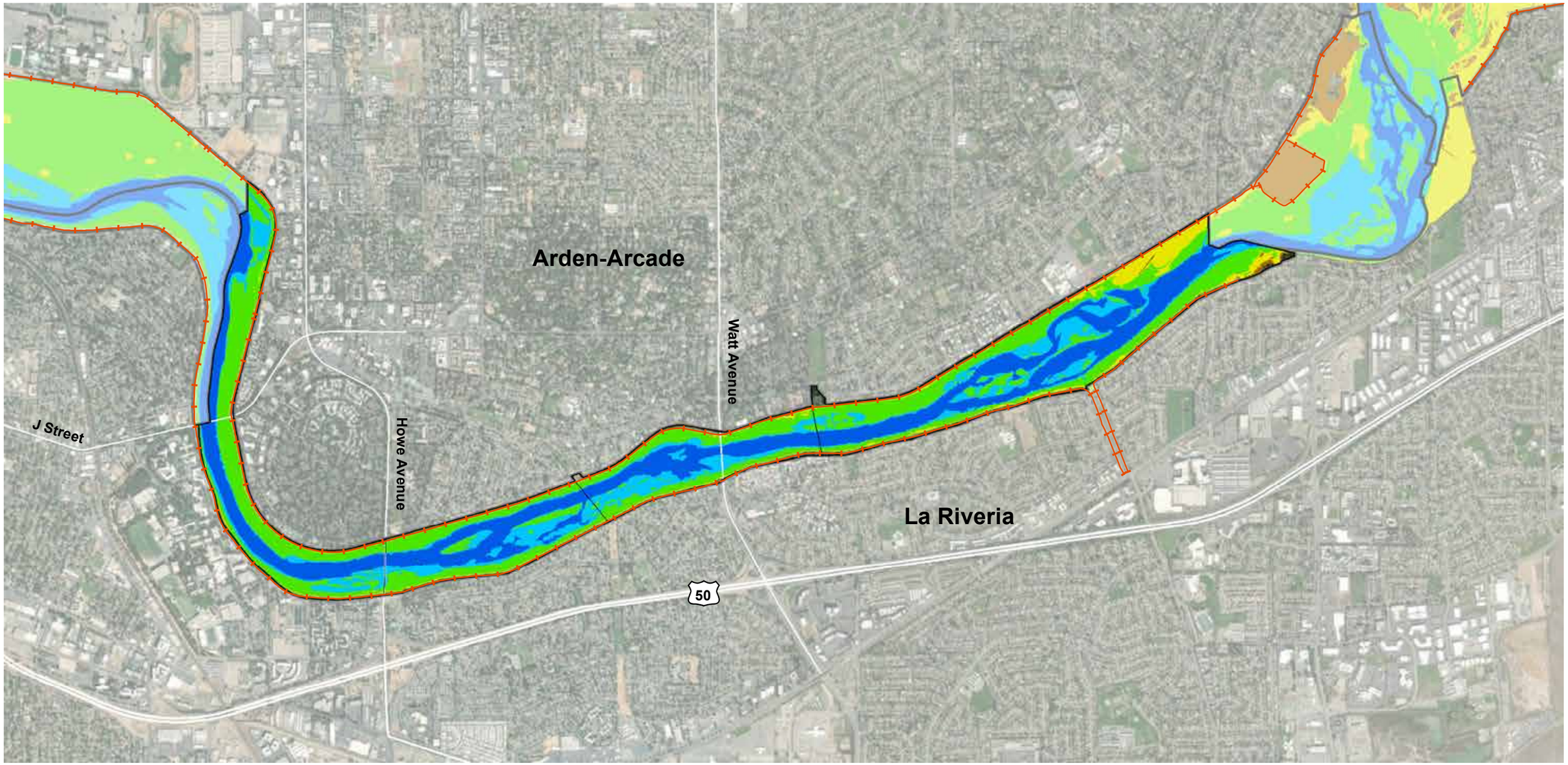



ESRI 2022

Parkway Area Plan Boundary
Main Channel (shown at typical late-summer or early-fall flow)
Recurrence Interval: 2-25 years
Recurrence Interval: 25-100 years
Recurrence Interval: 100-200 years
Recurrence Interval: >200 years
Levee
No Data

0 0.5 1 Miles

# Figure 8-6
# Lower Reach Inundation

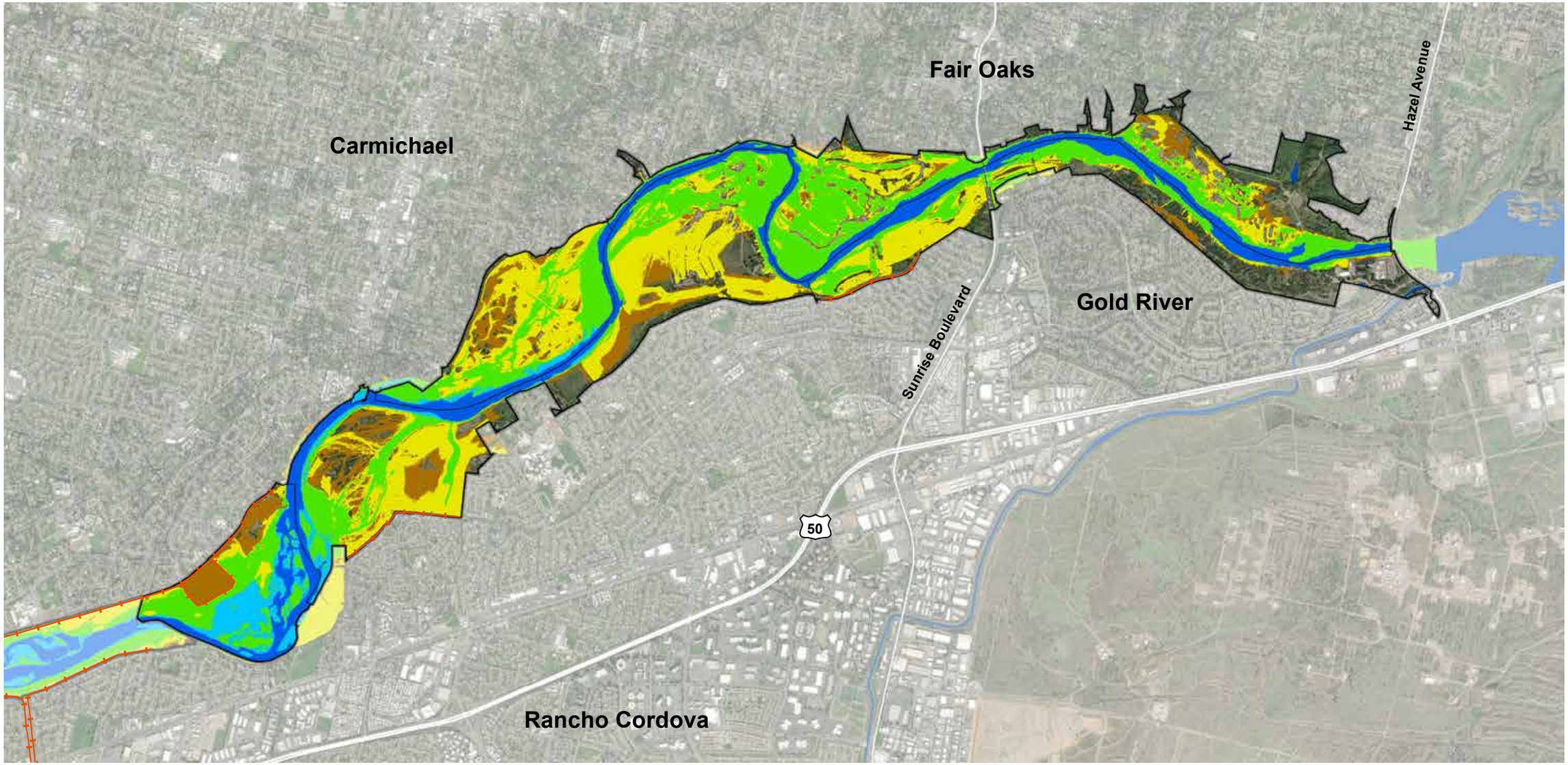



Parkway Area Plan Boundary
Main Channel (shown at typical late-summer or early-fall flow)
Recurrence Interval: 2-25 years
Recurrence Interval: 25-100 years
Recurrence Interval: 100-200 years
Recurrence Interval: >200 years
Levee
No Data

ESRI 2022

0 0.5 1 Miles

Figure 8-7
Middle Reach Inundation




ESRI 2022

Parkway Area Plan Boundary
Main Channel (shown at typical late-summer or early-fall flow)
Recurrence Interval: 2-25 years
Recurrence Interval: 25-100 years
Recurrence Interval: 100-200 years
Recurrence Interval: >200 years
Levee
No Data

0 0.5 1 Miles

Figure 8-8
Upper Reach Inundation

KEY INDICATOR 3

# VEGETATION COMMUNITIES

The vegetation community maps are based primarily on Regional Parks' 2009 mapping effort and represents the most recent and accurate Parkway-wide GIS data. This information is important to understand existing conditions and how these vegetation communities are contributing to habitat values that meet the identified goals and objectives, or where changes should occur in order to better meet the goals and objectives. For example, areas with existing native riparian woodland or native grassland could be identified as vegetation communities to retain because of their value to desirable wildlife species. Opportunities to expand and/or connect disjunct patches of these habitat types could also be identified, as could areas that are not contributing to desirable habitat values and therefore should be managed differently (e.g., removal of nonnative invasive species).

The vegetation community data allows an assessment of conditions within each area plan, as well as within the Parkway as a whole. It is important to be able to assess habitat conditions at both spatial scales. For example, many raptors or other bird species require large trees or forests for nesting and roosting but open fields for foraging. These maps provide this varying scale of assessment to determine the overall suitability of conditions in relation to the goals and objectives, even if the desirable mix of habitats is not within an individual area plan.

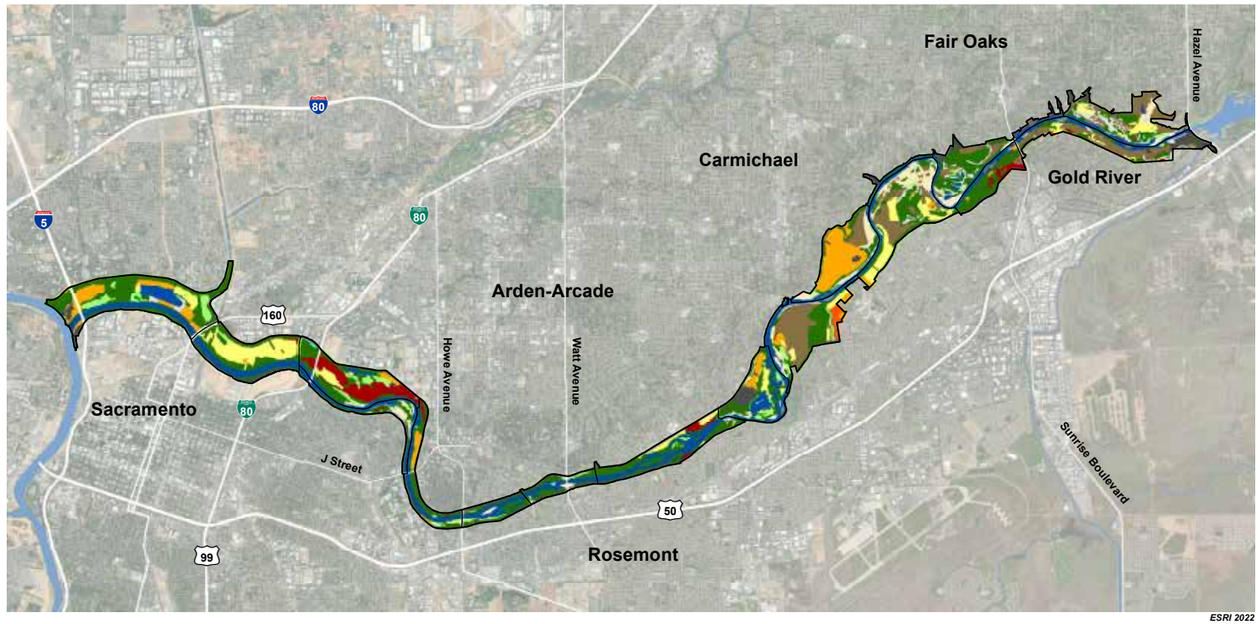
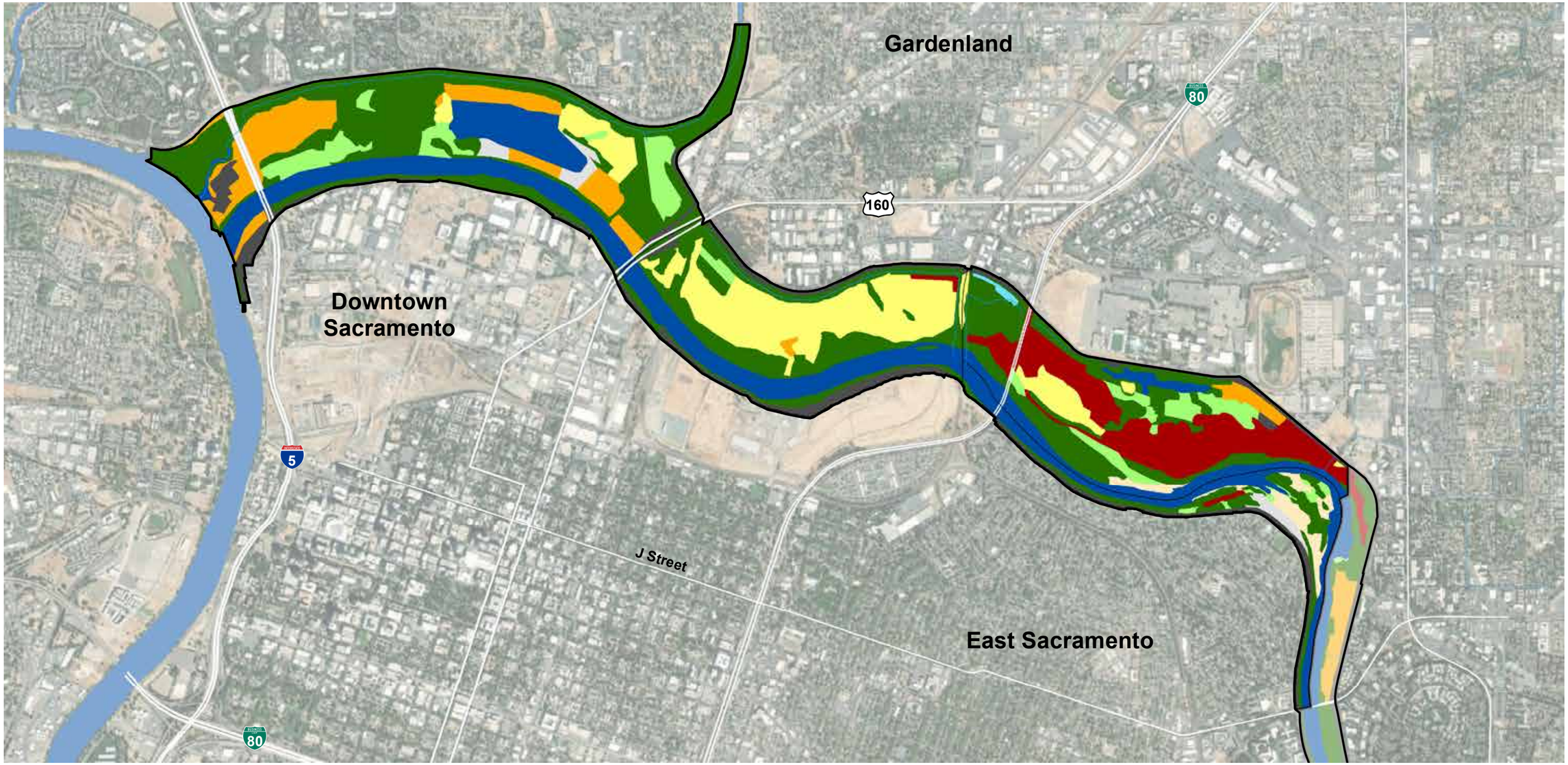



Figure 8-9
Parkway Vegetation Communities

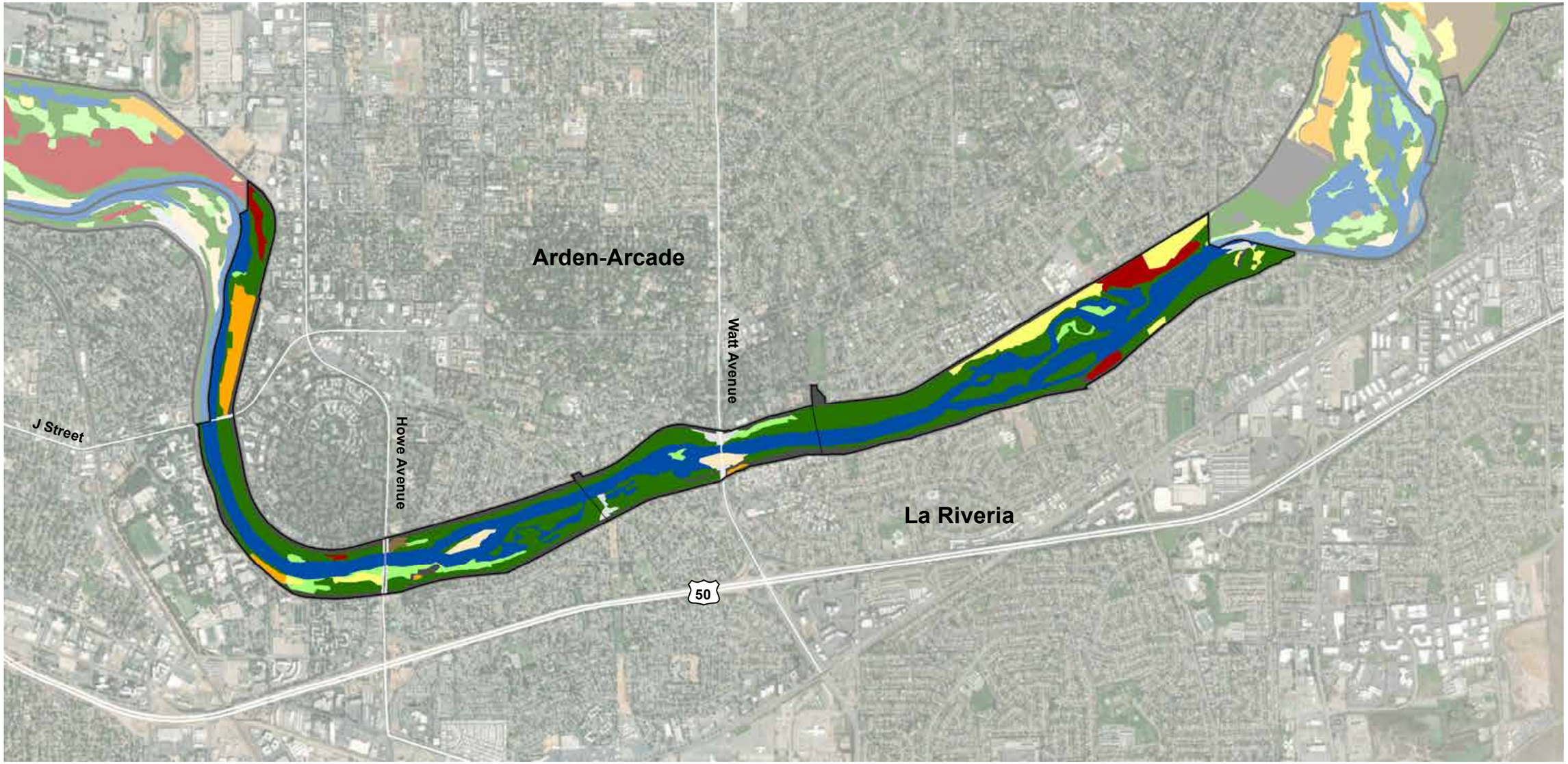



**Parkway Area Plan Boundary**
Developed (453 ac)
Elderberry Savannah (227 ac)
Freshwater Emergent Wetland (3 ac)
Gravel Bar Chaparral (277 ac)
Open Water (1,131 ac)
Riparian Woodland/Forest (1,813 ac)
Riparian Scrub (218 ac)
Turf/Turf with Trees (422 ac)
Unvegetated (174 ac)
Valley Foothill Grassland (525 ac)

ESRI 2022

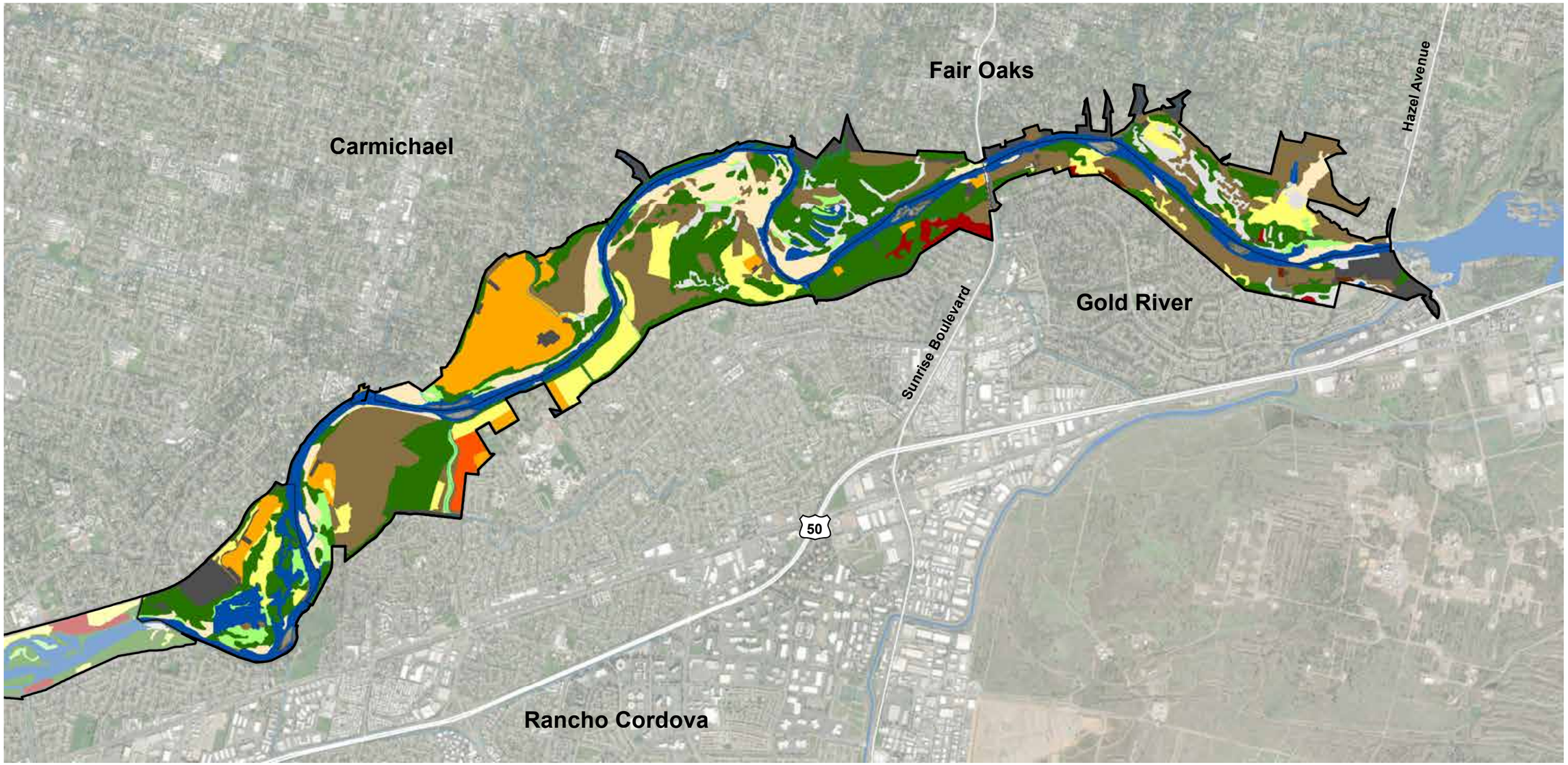
0 0.5 1 Miles

# Figure 8-10
# Lower Reach Vegetation Communities




**Parkway Area Plan Boundary**
Developed (453 ac)
Elderberry Savannah (227 ac)
Gravel Bar Chaparral (277 ac)
Open Water (1,131 ac)
Oak Woodland/Forest (729 ac)
Riparian Woodland/Forest (1,813 ac)
Riparian Scrub (218 ac)
Turf/Turf with Trees (422 ac)
Unvegetated (174 ac)
Valley Foothill Grassland (525 ac)

# Figure 8-11
# Middle Reach Vegetation Communities




ESRI 2022

0 0.5 1 Miles

**Parkway Area Plan Boundary**
Agricultural (27 ac)
Developed (453 ac)
Elderberry Savannah (227 ac)
Foothill Pine (6 ac)
Gravel Bar Chaparral (277 ac)
Open Water (1,131 ac)
Oak Woodland/Forest (729 ac)
Riparian Woodland/Forest (1,813 ac)
Riparian Scrub (218 ac)
Turf/Turf with Trees (422 ac)
Unvegetated (174 ac)
Valley Foothill Grassland (525 ac)

# Figure 8-12
# Upper Reach Vegetation Communities

KEY INDICATOR 4

# LAND USE

There are several land use and infrastructure parameters that potentially influence natural resource management within the Parkway. These range from formal land use designations in the American River Parkway Plan to those associated with specific infrastructure, such as flood control levees, roads and bridges, and electric transmission lines. The land use maps included in the figures represent the formal land use designations in the American River Parkway Plan.

The purpose of the American River Parkway Plan is to provide a guide for land use decisions affecting the Parkway, and the Parkway Plan specifically addresses the preservation, use, development and administration of the Parkway. Knowledge and awareness of these land use designations is fundamental to planning for the management of natural resources in the Parkway. It is important to understand what uses are permissible within a given land use designation in order to understand their compatibility with specific natural resources and to plan accordingly for those existing or potential uses as consideration is given to meeting the goals and objectives of the NRMP.

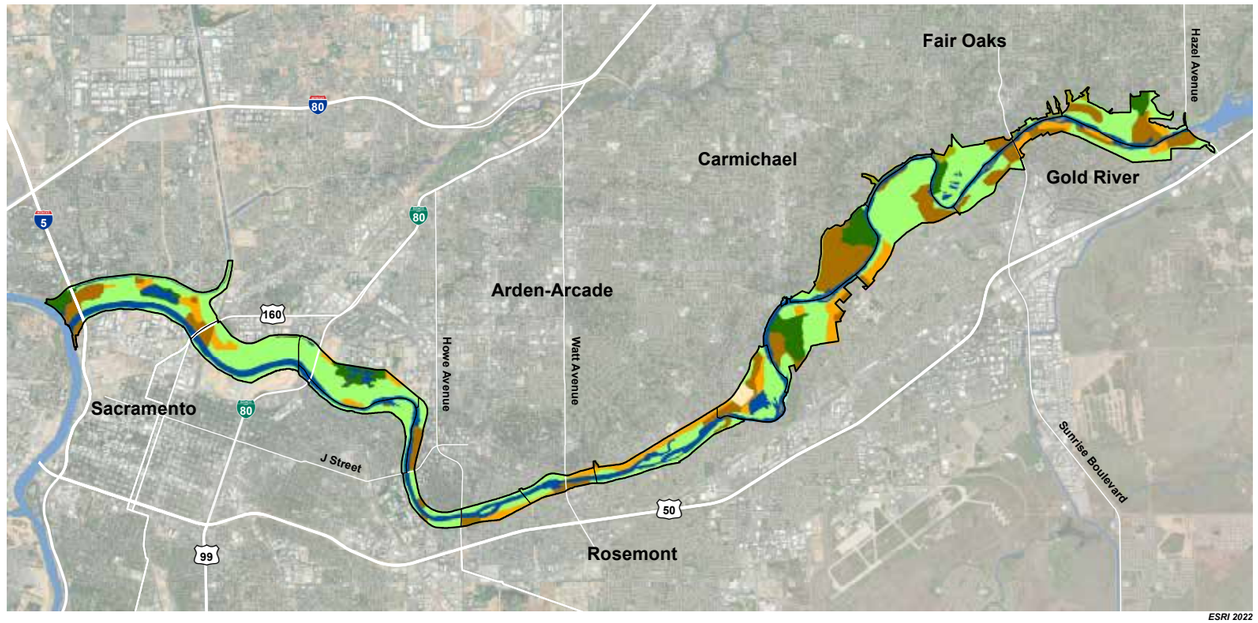
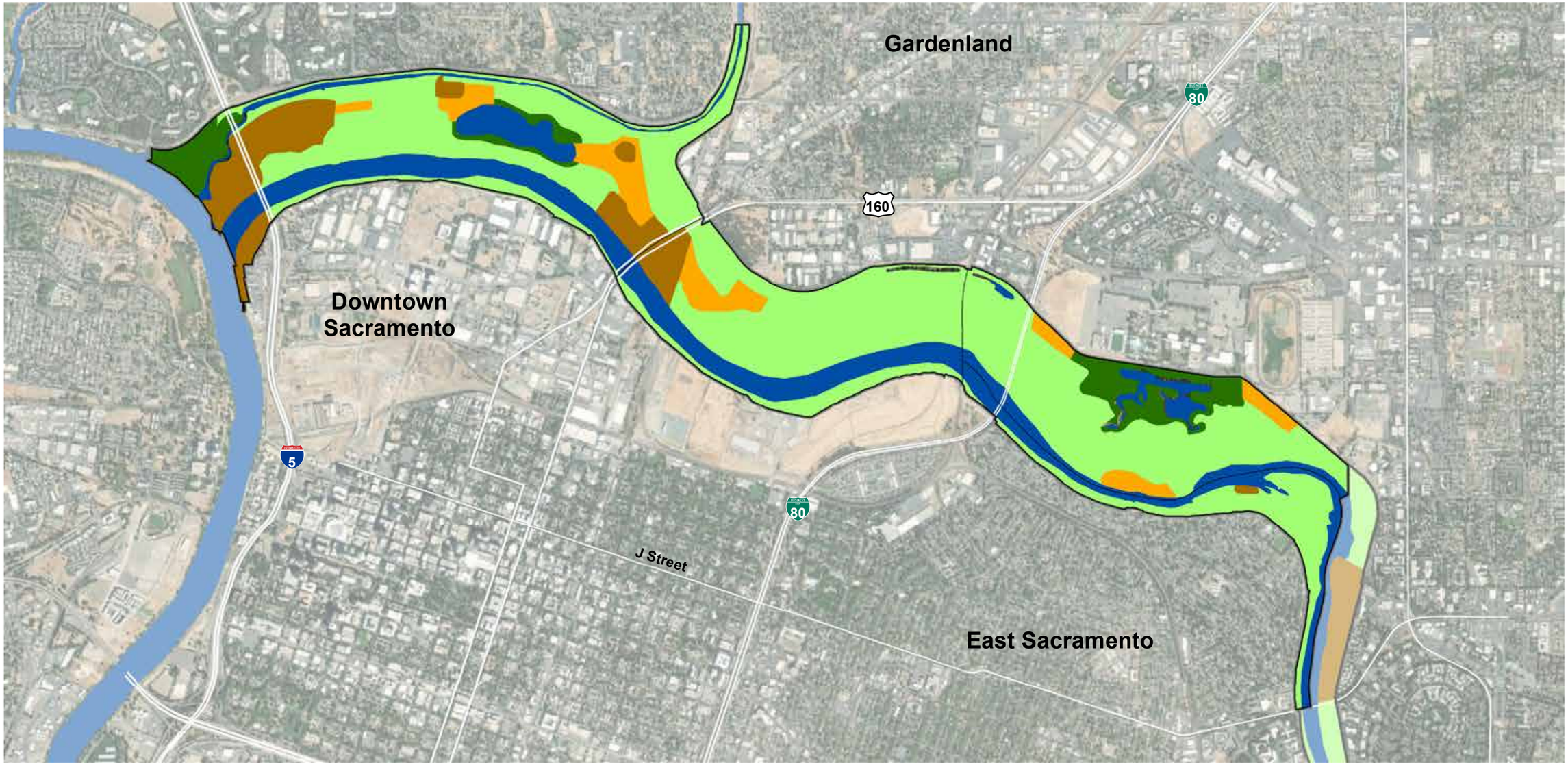



Figure 8-13
Parkway Land Use




ESRI 2022

Lower Reach Land Use
Nature Study Area
Protected Area
Open Space Preserve
Recreation Reserve
Limited Recreation Area
Developed Recreation Area
Other
Open Water

0 0.5 1 Miles

Figure 8-14
Lower Reach Land Use

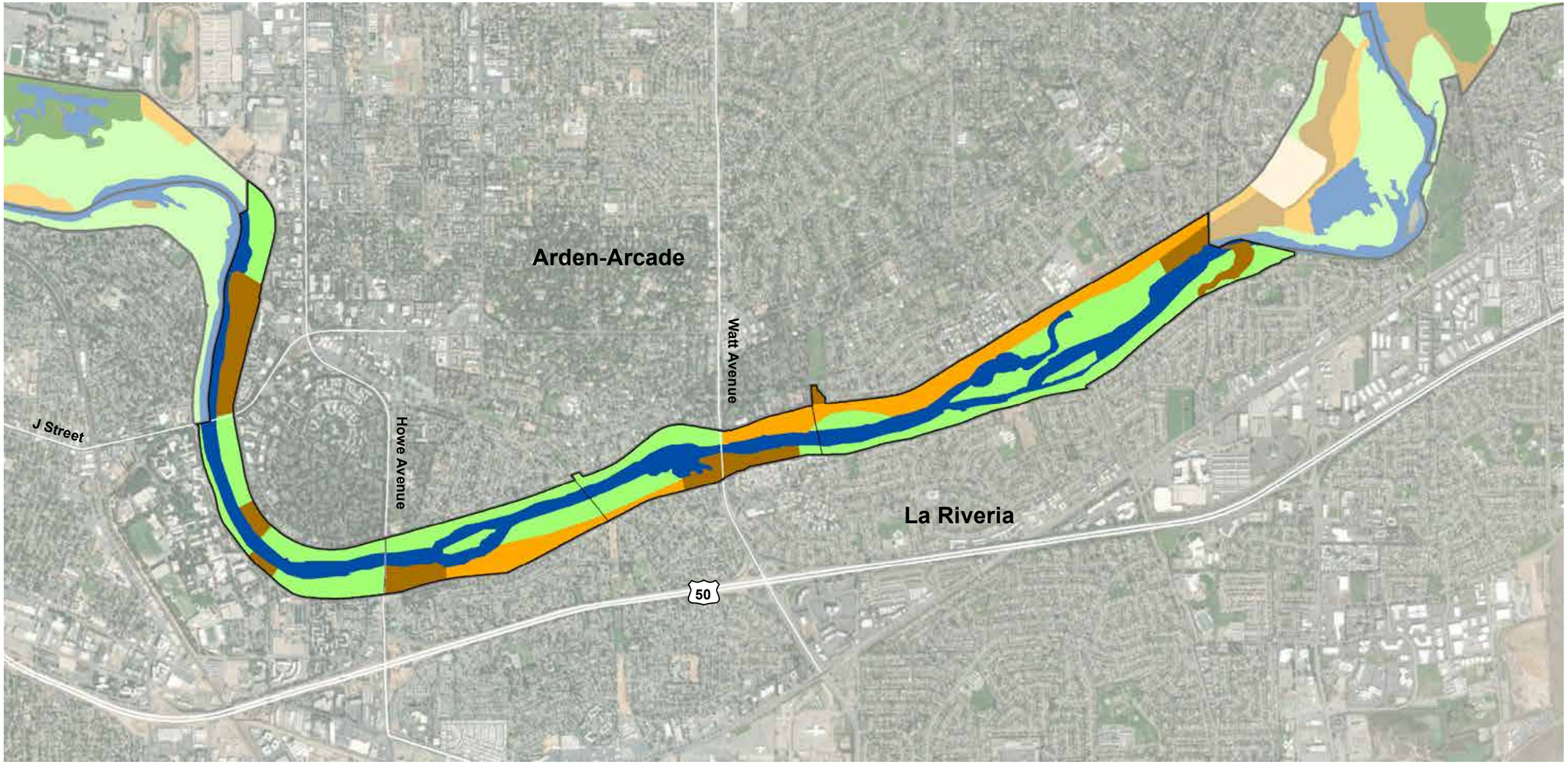
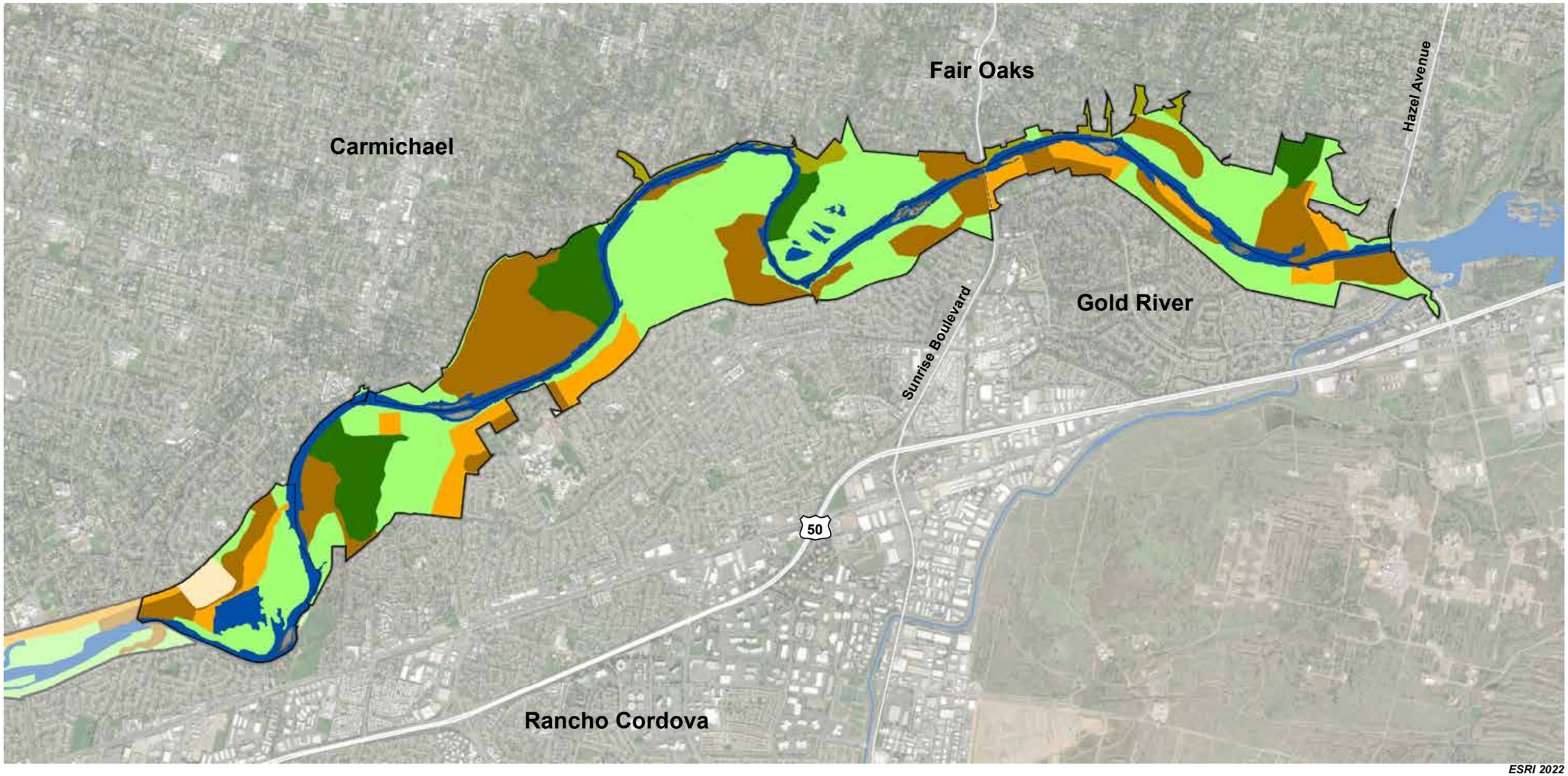



Figure 8-15
Middle Reach Land Use




ESRI 2022

- Parkway Area Plan Boundary
- Nature Study Area
- Protected Area
- Open Space Preserve
- Recreation Reserve
- Limited Recreation Area
- Developed Recreation Area
- Other
- Open Water

0 0.5 1 Miles

Figure 8-16
Upper Reach Land Use

# 8.2 NATURAL RESOURCES MANAGEMENT CATEGORIES

A key aspect of this NRMP is classifying areas in the Parkway by various management categories. The management categories guide management decisions throughout the Parkway. The management categories are shown in detail on the area plan maps and are based on current conditions at the time of plan preparation. These geographic classifications are expected to change over time as management actions are implemented and conditions are improved. Regional Parks will periodically update mapping of the management categories to reflect changed conditions. The management categories are described below:

- **CONSERVATION** reflects the lowest level of management intensity. Areas designated as conservation currently meet most applicable natural resource goals and those values will be conserved. This includes existing mitigation sites that require protection in perpetuity, as well as non-mitigation sites that meet desired conditions and provide high quality habitat. Considering the dynamic nature of all natural habitats, additional actions (e.g., restoration/enhancement) may be deemed suitable in Conservation areas in order to maximize suitable habitat values. Implementing restoration/enhancement actions within existing formal mitigation sites should be consistent with existing regulatory agreements/commitments. Federal mitigation sites, which have long-term commitments to protect habitat values, are mapped as a unique subset of the conservation category.
    - **Examples of Management Actions:** Includes routine O&M activities such as:
        - » Weed management (e.g., mowing and herbicide application)
        - » Small-scale invasive plant removal (e.g., hand-pulling)
        - » Vegetation management for fire prevention
        - » Management of illegal camping sites consistent with County policies
    - **Example Project:** Protecting Valley Elderberry Longhorn Beetle (VELB) mitigation sites at River Bend Park or SRA/riparian mitigation at various bank protection sites to ensure they continue to provide good quality habitat and meet regulatory commitments.
- **RESTORATION** reflects a moderate level of management intensity. Areas designated as restoration generally meet desired conditions in their current form but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved (e.g., habitat restoration/enhancement) to meet goals. The need for ongoing restoration of degraded areas is expected.
    - **Example Management Actions:** May include the activities above under Conservation, plus:
        - » Invasive plant removal
        - » Planting native vegetation
        - » Management of social trails
        - » Redesign or relocation of facilities

*Signage directing proper trail use in the River Bend Park Area. Photo Credit: MIG*

  - **Example Project:** Replanting areas that have recently burned at Discovery Park, replanting understory along Steelhead Creek damaged by camping, removing invasive plants that are intermixed with native plants at the Howe Avenue access point, consolidating social trails to reduce the overall number/footprint on the lower bank at Cal Expo, etc.

- **NATURALIZATION** reflects the highest level of management intensity. Areas designated as naturalization were substantially altered in the past and should be modified in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP and NRMP. This applies to areas previously altered and outcomes are generally native habitat types that would typically be expected to occur in the Parkway.

  Naturalization also includes converting areas that have not been altered by past actions (unaltered) to heighten, intensify, or improve highly valued resource functions that may have been lost or degraded over time. Generally, this entails conversion of land cover type.

  - **Example Management Actions:** May include the activities above under Restoration, plus these types of actions in previously altered areas:
    - » Substantial earthwork to restore or create more natural hydrology and site features
    - » Material removal (e.g., cobble and dredge tailings)
    - » Replacement/amendment/modification of substrate for planting
    - » Removal of material (e.g., channel bed and bank)
    - » Addition of material (e.g., gravel)
  - **Example Project:** Major modifications to areas previously altered in order to create more natural conditions, including potential projects at Discovery Park (Urrutia property), Woodlake and Cal Expo/Bushy Lake (Corps ecosystem restoration), Arden Bar, etc. Rearing habitat projects located in areas previously unaltered, typically lowering native surfaces to lower elevations [channel features or floodplain elevations] to make areas available to fish more often, creating side channels, etc.

- **REHABILITATION:** Rehabilitation is applicable to any area, whether it be Conservation, Restoration, or Naturalization, could be degraded or damaged in the future and require action to improve their condition. Rehabilitation is suitable in any of the other categories and can happen anywhere in the Parkway, just as all areas in the Parkway are subject to degradation or damage.

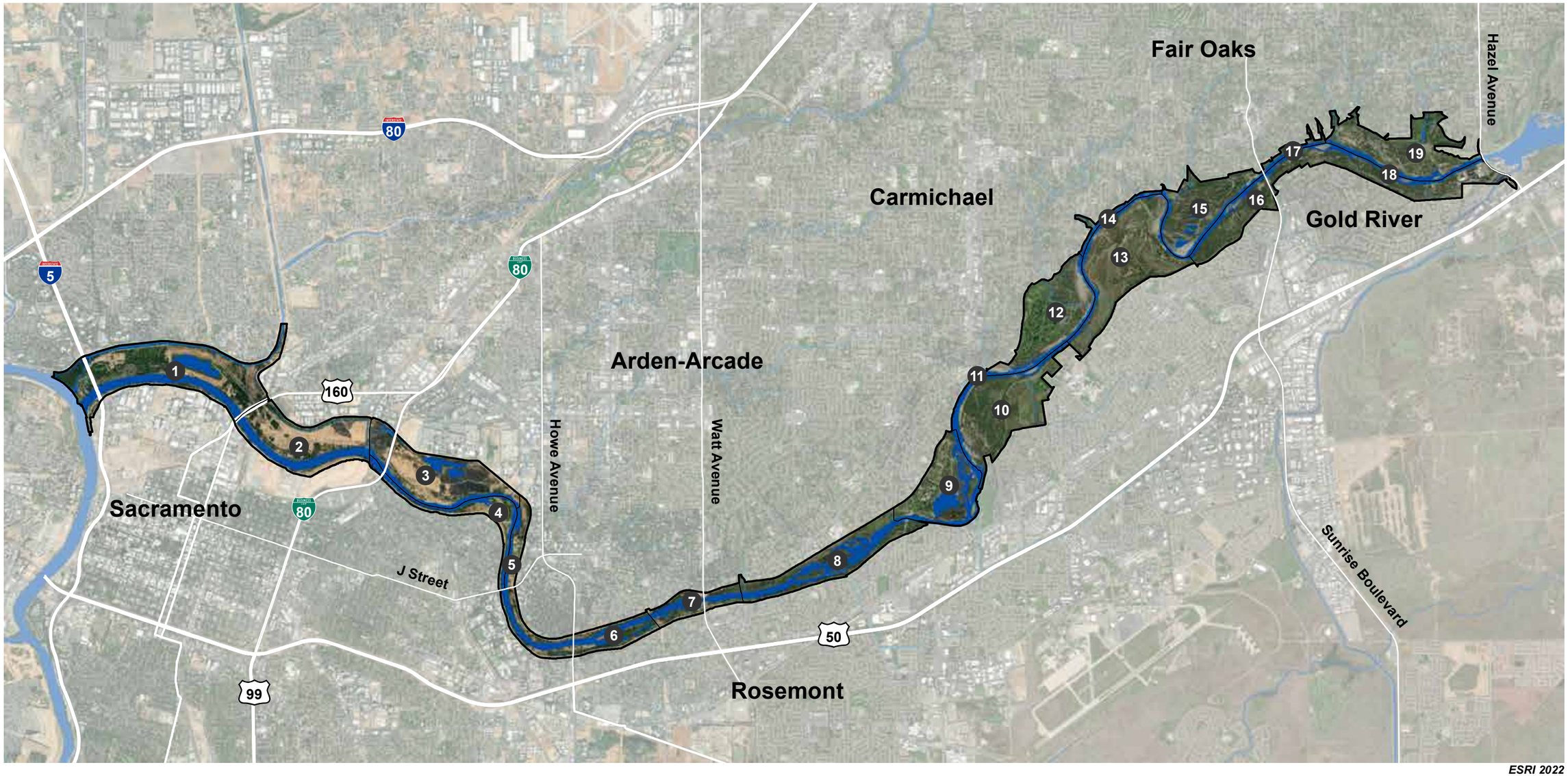
  - **Example Management Actions:** Generally may include those activities necessary to bring the site back to conditions prior to recent damage, which may include:
    - » Temporarily limiting public access
    - » Debris removal
    - » Post-fire cleanup
    - » Minor surface grading to address damaged conditions
    - » Large-scale planting of appropriate native vegetation
    - » Large-scale invasive plant removal (e.g., with mechanized equipment)
  - **Example Project:** Applies to existing conditions or any of the projects in aforementioned categories that are degraded or damaged in the future and require action to improve their condition.

*Vegetation management park closure signage.*
*Photo Credit: Regional Parks*

# 8.3 AREA PLAN MAPPING

In order to present management actions in the Parkway, a two-sided 11x17 area plan map is provided for each of the 19 areas. On the first side, existing and desired conditions are provided for every area plan; side one also includes thumbnail maps of the four Key Indicators that include land use designations, the extent of flood inundation (including recurrence intervals for 2-year, 25-100 year, and 200 years), vegetation communities, and level of alteration (how much an area has been changed by human activity). Side two of each map set shows recommended management actions and management categories. A key aspect of guiding management actions in the Parkway is use of the management categories presented in each of the 19 Area Plan maps. Each of the map sets is preceded by a description of the specific Area. Figure 8-17 shows the Parkway as a whole with each Area Plan labeled numerically.

*The Stanfield Marsh Boardwalk, located in the Stanfield Marsh and Waterfowl Preserve near Big Bear, Calfiornia, is an example of environmentally-friendly raised platform trail design. Photo Credit: MIG*




ESRI 2022

0 1 2 Miles

**AREAS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Discovery Park | 5 | Campus Commons | 10 | River Bend Park | 15 | Sacramento Bar |
| 2 | Woodlake | 6 | Howe Avenue | 11 | Sarah Court Access | 16 | Lower Sunrise |
| 3 | Cal Expo | 7 | Watt Avenue | 12 | Ancil Hoffman County Park | 17 | Sunrise Bluffs |
| 4 | Paradise Beach | 9 | Arden Bar | 13 | Rossmoor Bar | 18 | Upper Sunrise |
| | | | | 14 | San Juan Bluffs | 19 | Sailor Bar |

# Figure 8-17
# American River Parkway

AREA PLAN 1

# DISCOVERY PARK

## Discovery Park Area Plan

### Historic Physical and Biological Conditions

Well before the time of European settlement, the lower reach of the LAR featured a deep channel with a relatively steep gradient flanked by high floodplains to the north and south. A subsequent rise in the bed of the Sacramento River created a back-water condition at the confluence of the two rivers, flattening the gradient and introducing tidal conditions along the lower five miles of the LAR. Reduced gradients led to an outbreak flood pattern and distributary sloughs, resulting in a greater reduction of LAR channel capacities. This landscape supported a complex upland and riparian forest, with abundant wildlife.

### Impact of European Settlement

The California Gold Rush of the mid-1800's brought miners, city dwellers and farmers to the American River and inaugurated a century and a half of changes to the landscape that greatly altered the lower reach of the LAR. Placer mining quickly ran its course, giving way to decades of hydraulic mining activity in the upper American River Basin that accelerated the aggradation of the historic LAR channel. The LAR was realigned northward, leaving the bed elevation of the LAR perched well above that of the Sacramento River, and filling in the tributaries and a portion of the southern floodplain where railyards were subsequently constructed. Farmers cleared portions of the northern floodplain and the Natomas Consolidated Company, the region's biggest dredge mining operator, used its capital and equipment to encircle a majority of the American Basin with levees creating the modern-day Natomas Basin. This necessitated the construction of the Natomas East Main Drainage Canal (often referred to as the NEMDC or, more recently, Steelhead Creek) that redirects the foothill tributaries north of the LAR to Bannon Slough, which begins at Northgate Boulevard and drains into the Sacramento River just north of the LAR confluence. Creation of the Natomas Basin greatly influenced the ability of high flows to spread across the floodplain. More levee construction along the north side of the LAR, followed by the construction of Folsom Dam, reversed the aggradation of the channel bed to long-term degradation in the lower reach of the river, which increased the separation of the channel from its remaining floodplains. The levees also contributed to greater flows and flow depths in the channel and remaining overbank areas for any given overbank LAR discharge.

All of Discovery Park was altered in some fashion as a result of these actions. Much of the riparian vegetation that had been established on top of the hydraulic mining debris was cleared to make way for agriculture, persisting into the mid-20th century, including what would later become an open pit sand and gravel mine. Other areas were utilized for recreational and industrial uses, including a camp facility and a mobile home park. Newly-installed electric transmission lines ran generally east-west through the area, with the vegetation underneath maintained in a manner that limited woody vegetation. Several roadways crossed the area as well, including Interstate 5, Highway 160, and Northgate and Del Paso Boulevards.

### Present Conditions

As the river channel and overbank areas have adjusted to past modifications (including the northern overbank area rising 3 to 6 feet due to hydraulic mining debris), riparian vegetation has reestablished itself in much of the area. Except for localized erosion, the channel is presently stable and has a very low gradient with a sand bed. The steep bank on river right (RR) is a natural configuration driven by the relatively erosion-resistant older floodplain materials, while the bank on river left (RL) is composed of looser materials and protected by intermittent bank erosion protection features. The overbank area on RR is relatively wide, while there is very little overbank area on RL – the river channel almost abuts the flood control levee. The river channel is tidally influenced throughout this Area Plan, and near-channel vegetation is controlled by high-stage tidal prism elevations.

Vegetation has not reestablished around the open pit mine, and woody vegetation is heavily managed under electric transmission lines. Managed recreation areas support landscaped vegetation, and the dominant vegetation communities in the remaining areas include cottonwood and mixed riparian forest. There is limited regeneration of cottonwood as a result of the artificially high overbank elevations. Projects designed to lower the floodplain and enhance cottonwood/riparian forest have been implemented in two locations along the RR bank, as well as another site east of Northgate Boulevard that was initially utilized for soil borrow to enhance levees along the NEMDC. The Urrutia Property, which includes an open pit mine that fills with water and matches the river elevation, provides a body of water that serves as habitat for various waterfowl, but also likely serves as a fish stranding issue for native fish species.

Like much of the American River Parkway, Discovery Park is a birding "hotspot," with more than 130 bird species recorded over the last 5 years (2016 through 2021, as recorded on eBird). Discovery Park has several attributes that are uniquely important on the American River Parkway for avian wildlife. The tall landscape trees over the picnic and parking areas support the largest nesting population of Yellow-billed magpies in the Sacramento region (87 nesting pairs as counted in a 2020 survey). The large quarry pond in east Discovery Park hosts thousands of Canvasback ducks each winter, in addition to a variety of other waterfowl, along with the occasional Peregrine Falcon hunting the pond. American Kestrel, Swainson's Hawk, White-tailed Kite, Red-shouldered Hawk and Red-tailed Hawk have all been found nesting in this park. Very recently Bald eagles have been observed utilizing the area. In addition to birds, dozens of feral cats live in Discovery Park.

Discovery Park is the first area to flood when river waters rise, and the floodplain site is defined by a classic Valley Riparian "grapevine jungle" of cottonwood, valley oak and box elder trees, with an almost tropical appearance. Discovery Park also contains the largest contiguous Cottonwood Riparian Forest on the Parkway. However, with increasing drought and wildfires, many of the tall cottonwood trees have died over the years. Furthermore, electrical utility companies—following court orders and state/federal mandates—are removing cottonwood trees and other vegetation near the power lines. These various factors are gradually, but continually, reducing the numbers of tall cottonwood trees and other tall overstory trees in Discovery Park, leaving the wild grape to dominate and suppress the natural development of a native woodland.

Homeless encampments are interspersed throughout much of the area, severely degrading the understory vegetation and likely deterring use by wildlife. Specific areas include the dense oak forests on "Bannon Island" north of the boat ramp across Bannon Slough, which has the potential to provide high-quality habitat but is currently degraded as a result of the encampments.

Fires have burned valuable vegetation, including mature cottonwoods that are not expected to regenerate as a result of the high floodplains and subsequent dominance of wild grape or conversion to more upland species like oak, causing the gradual loss of overstory tree canopy. Invasive plant species are also present throughout, including perennial pepperweed, Bermuda grass, Himalayan blackberry, and poison hemlock. Red sesbania, giant reed, Chinese tallow (and a small population of tamarisk), have been controlled as part of the Invasive Plant Management Plan (IPMP) along the American River bank and wetland areas. These high priority invasive species will continue to need monitoring and ongoing removal to maintain successful

*Aerial view of Discovery Park with Camp Pollock (photo foreground) and the Urrutia mining pit (photo background). Photo Credit: John Hannon*

management. Overall, much of the vegetation in the area is in good to moderate condition, but is subject to substantial and persistent degradation due to regular wildfires and encampments, which significantly reduces the value as wildlife habitat. Activities leading to the degradation (e.g., encampments and wildfire) are also a deterrent to wildlife. Areas of recreation improvements (turfed and parking areas) often have reduced habitat values but still provide important habitat for several target species. For example, the tall shade trees within the Discovery Park parking and picnic areas provide an important regional nesting area for the Yellow-billed Magpie.

## Expected Future Trends

The river channel is expected to continue to be sand-bed dominated as upstream sources appear sufficient to supply sand for the foreseeable future. The two recent floodplain lowering projects on RR, which entailed the excavation and lowering of banks to provide improved settings for riparian species, could be altered by the existing sand load of the LAR as the sand and sediment settles out in these lowered areas and rebuilds higher surfaces to some extent. As the levees concentrate flows through the area, we can expect slow rates of RR bank retreat, along with a progressive loss of sand material on the looser RL bank. The ongoing erosion on the RL bank could lead the Corps to propose additional bank protection projects in the foreseeable future. The overall extent and types of vegetation are generally expected to remain constant. However, cottonwoods that were established during a period when the channel had aggraded and the overbank area was inundated more frequently are not expected to regenerate. These areas will likely transition to other riparian vegetation more tolerant of drier conditions.

While the ongoing rate of sea level rise is unknown, it is expected to increase in the foreseeable future, affecting the tidal prism in this Area Plan. The implications could include a change in near-channel plant distribution as a result of higher high tide elevations and a slight increase in overbank inundation. The channel bed itself is not expected to change as a result of sea level rise in the foreseeable future due to its artificially-perched elevation and the low likelihood that ongoing LAR channel processes could result in down cutting.

The greatest factors influencing future vegetation are encampments degrading the understory, fires destroying the tall overstory, and the spread of invasive species.

## Desired Conditions

Desired conditions are based on maintaining general channel processes and accommodating expected foreseeable future trends and conditions. These would include limiting future bank and levee protection projects to those required for public safety, protection of property outside of the Parkway, and protection for existing substantial, unmovable non-Parkway infrastructure within the Parkway. Future infrastructure should be designed in a manner that does not necessitate additional bank protection. Restoration and naturalization projects should be located and designed in a manner to avoid impediments to, and constraints on, appropriate future channel management actions (e.g., bank protection, bank recontouring, floodplain lowering) that may be necessary.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. It is also important to accommodate the mature London Plain trees shading the parking and picnic areas that function similarly to native sycamore trees that provide valuable habitat for target wildlife species. Wildfires should be reduced and controlled to limit loss of riparian woodlands especially the tree overstory. Invasive species, such as yellow star-thistle, that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled, with a focus on invasive species within woodland areas and grassland areas northeast of the pond on Urrutia Property. It is also beneficial to naturalize areas that have been substantially altered in the past and could provide improved habitat for native woodlands, particularly tall overstory trees and target wildlife species. Managing human use can help reduce the frequency of wildfires. It is also important to conserve and enhance open grassland areas for wildlife, including pollinators by enhancing the area with native forbs.

## Site-Specific Potential Resource Management Actions (Figures 8-18 and 8-19)

1. **Establish low-growing native vegetation under powerlines:** Develop a formal vegetation management agreement with electrical utilities for transmission line Right of Ways, including establishment of appropriate and compatible forbs, grasses and shrubs to maximize potential habitat for wildlife (including pollinators). Depending on species utilized it may also be possible to provide fuel breaks to protect adjacent wildlife habitat. Control of invasive plant proliferation and aesthetics is key to improving the natural resources in the area. Consideration should also be given to establishing hedgerows that could provide a buffer and screen of the power corridor. Encourage the undergrounding of utility lines whenever feasible.
2. **Purchase and naturalize Urrutia property:** Develop a Conceptual Naturalization Plan for the Urrutia Property if it is brought into public ownership. This should include the removal of rubble and restoration of the bank line in consideration of current and future conditions. Refer to the Parkway Plan.

3. **Purchase and naturalize Riverdale mobile home park:** Identify appropriate use for the former Riverdale mobile home park if it is brought into public ownership. Refer to the Parkway Plan.
4. **Establish native riparian species/remove non-natives:** Improve and expand riparian forest habitat along Bannon Slough and Steelhead Creek, including managing for growth and retention of tall overstory trees. Actions may include removal of nonnative invasive species, managing the density of wild grape, expanding the riparian corridor along the southern edge of Bannon Slough where conditions allow, and enhancing the understory with appropriate native species. Particular attention should be given to the point where Steelhead Creek enters the Parkway at El Camino Avenue; encampments and associated degradation are hampering wildlife connectivity to the stream corridors and associated wildlife habitat to the north.
5. **Improve/expand wildlife connectivity opportunities:** If future improvements are made to Northgate or Del Paso Boulevards, which pass through the eastern end of the Discovery Park area, identify opportunities to improve or accommodate wildlife movement.
6. **Improve habitat at Camp Pollock:** Continue to coordinate with Camp Pollock land managers to further integrate native habitat improvements, interpretive designs, and public access.
7. **Develop conceptual restoration plans for burned areas:** Develop a wildfire rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing undesirable wildfire impacts.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Discovery Area should include efforts to continue to remove red sesbania and giant reed, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Recreational facilities management and habitat: Identify opportunities to manage recreation improvement areas to protect or enhance wildlife habitat. This may include specifying types of vegetation and/or timing of maintenance activities.
- Maintain tall tree over-story in parking and picnic area for nesting birds: Non-native mature London plain trees within this area provides a similar function as native sycamore for wildlife habitat and should be maintained.

*Aerial view of the Discovery Park Area looking toward the confluence of the American River and Sacramento River. Photo Credit: John Hannon*

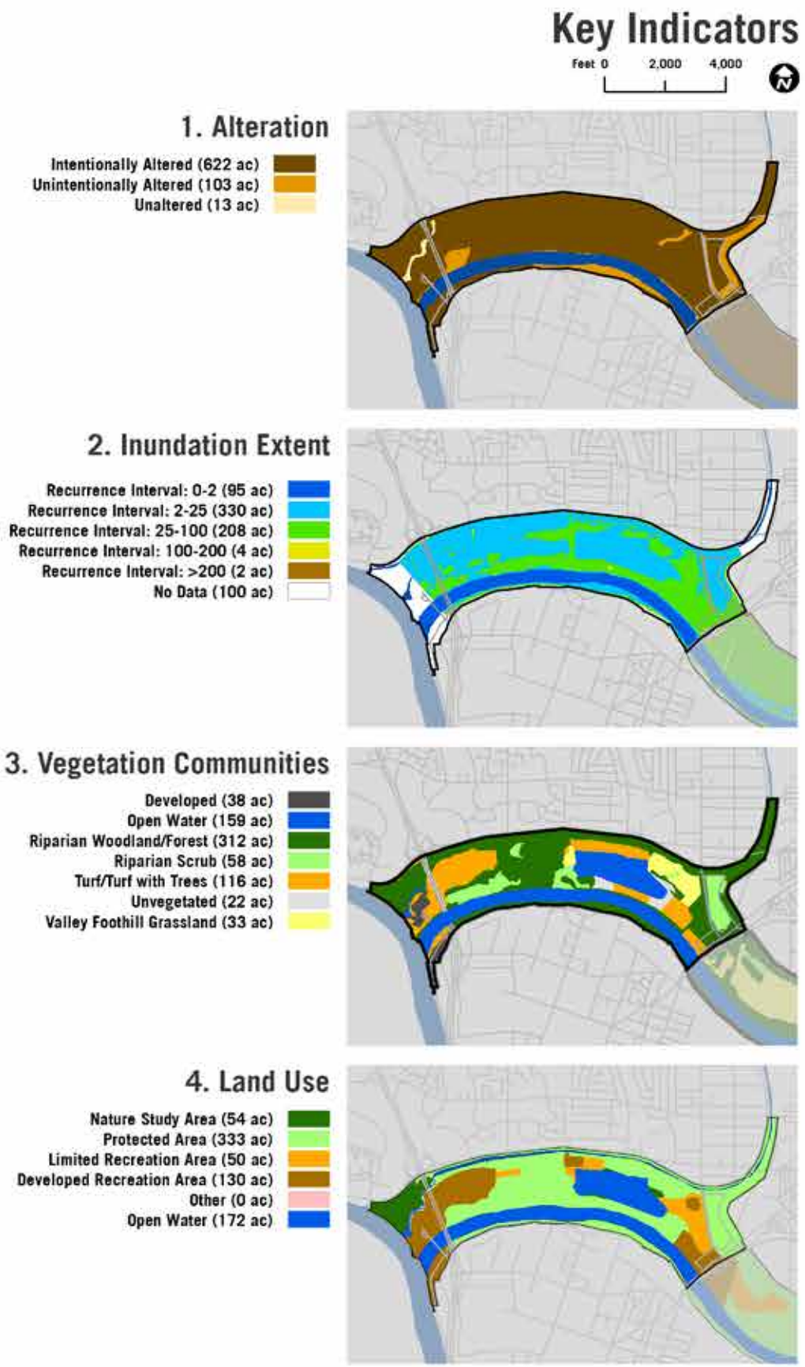


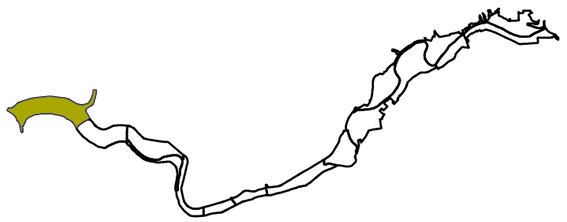

Figure 8-18
Area Plan 1 Discovery Park A

## Potential Management Actions

1. Establish low-growing native vegetation under power lines
2. Purchase and naturalize Urrutia property
3. Purchase and naturalize Riverdale mobile home park
4. Establish native riparian species / remove non-natives
5. Improve/Expand wildlife connectivity opportunities
6. Improve habitat at Camp Pollack
7. Develop Conceptual restoration plans for burned areas

- Existing Lowered Floodplain**
- Parkway Boundary
- Powerline Easement
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Pedestrian Trail
- Levee
- Boat ramp, Trailer boat
- Picnic Area
- Car Top Boat Launch
- Equestrian Staging
- Parking
- Restroom
- River Mile
- Federally Protected Mitigation Area

Management Category
- Conservation
- Restoration
- Naturalization
- No Data/Private Property



0 500 1,000 2,000 Feet

Figure 8-19
Area Plan 1 Discovery Park B

* Camp Pollock is managed by Sacramento Valley Conservancy
** Existing lowered floodplain created rearing habitat

AREA PLAN 2

# WOODLAKE

## Woodlake Area Plan

### Historic Physical and Biological Conditions

Similar to Discovery Park, well before European settlement, the lower reach of the LAR featured a deep channel with a relatively steep gradient flanked by high floodplains to the north and south. A subsequent rise in the bed of the Sacramento River created a back-water condition at the confluence of the two rivers, flattening the gradient and introducing tidal conditions along the lower five miles of the LAR. Reduced gradients led to an outbreak flood pattern and distributary sloughs which resulted in much-reduced LAR channel capacities. This landscape supported a complex upland and riparian forest with abundant wildlife.

### Impact of European Settlement

The Gold Rush brought miners, city dwellers and farmers to the American River, inaugurating a century and a half of landscape changes that have greatly altered the lower reach of the LAR. Placer mining quickly ran its course, giving way to decades of hydraulic mining activity in the upper American River Basin that accelerated the aggradation of the historic LAR channel. Farmers cleared portions of the northern floodplain. Levee construction along the north side of the river, followed by the construction of Folsom Dam, reversed the aggradation of the channel bed and inaugurated a long-term process of channel degradation in the lower reach of the river. This channel lowering increased the separation of the river channel from its elevated floodplains. The levees also constricted flow, contributing to greater flows and flow depths for any given overbank LAR discharge.

All of Woodlake was altered in some fashion as described below. Agricultural operations, which persisted into the 1950's, cleared the riparian forest established on top of the hydraulic mining debris (elevated floodplain). The river channel (which once curved further through what is now known as Sutter's Landing Park) was realigned to its current more northerly location. Some areas on RR were dug out during overbank mining, leaving remnant pits on RR. The northern levee cut off tributary streams and drainage channels, redirecting the tributary waters into a constructed slough (the borrow source for the levee). This slough parallels the levee until it turns south at the eastern boundary of the Area Plan, where it empties into the river.

Woodlake has been impacted by significant infrastructure. A set of four electric transmission lines run mostly east-west through the area, with the vegetation underneath maintained to limit woody vegetation. In addition to transmission line towers, several radio towers also occur here, located in the center of the northern overbank area. Highway 160 crosses the river at the western boundary. Just upstream of Highway 160, an abandoned rail bridge (now serving as a pedestrian bridge) and an active rail bridge also cross the river. A fourth bridge, (another active rail bridge) crosses the river at the eastern boundary. On RL, a privately-owned aggregate and concrete recycling facility extends to the edge of the river channel. Sutter's Landing Park, a City of Sacramento park located predominately outside but adjacent to the Parkway on a former landfill, lies just upstream of the recycling facility, providing public access to the Parkway.

### Present Conditions

The channel is presently stable, and has a very low gradient, with a sand bed that transitions in the upstream end to a coarse (gravel) material bed. The RL bank consists of stratified sands and silts that makes the RL bank susceptible to erosion. The steep bank on portions of RR is a natural configuration that comprises erosion-resistant older floodplain materials. The overbank area on RR is relatively wide, while the area on RL is narrow (where the river channel almost abuts the flood control levee leaving an overbank area), with room for only a narrow band of riparian vegetation. The City of Sacramento's Sutter's Landing Park is adjacent to the Parkway along RL and provides additional open space and important opportunities for habitat protection and restoration. The river channel is tidally

influenced throughout this Area Plan and near-channel vegetation is controlled by high-tide river elevations.

Riparian vegetation has reestablished in portions of the Woodlake area, including portions of the northern overbank area that is now elevated 2 to 4 feet with hydraulic mining debris. Nonetheless, woody vegetation has not reestablished in much of the previously farmed areas and is heavily managed under the electric transmission lines. The dominant woody vegetation communities include cottonwood and mixed riparian forest, with some good quality patches of mature vegetation growing along the naturalized RR drainage canal and the narrow overbank area along the RL. There is limited regeneration of cottonwood (as a result of the artificially high overbank elevations,) except along the naturalized drainage canal. There is an area planted with elderberry shrubs in the northwest corner of the Area Plan that was established specifically to support VELB. Red sesbania along the river bank and stands of giant reed in the upstream riparian forest (both river left and right) have been managed as part of the IPMP but this effort will need to continue to maintain control of these high priority invasive species.

Encampments interspersed throughout much of the area, including both banks of the river, severely degrade the understory vegetation, causing wildfires, and likely deterring use by wildlife. Other areas have experienced recent fires that burned mature cottonwoods that are not expected to regenerate. Invasive plant species are also present throughout, including dominant yellow star-thistle and perennial pepperweed in the central, previously farmed portions. Overall, some of the vegetation in the area is in moderate to poor condition, and subject to substantial ongoing degradation. Degradation of the vegetation, the understory in particular, reduces its value as wildlife habitat.

*Aerial view of the Two Rivers Trail (photo left), LAR channel (photo center), and floodplain (photo right) of the Woodlake Area. Photo Credit: John Hannon*

The activities leading to increased degradation (e.g., encampments, rampant social trails, etc.) are also a deterrent to wildlife. Off-paved trail bicycling has recently been approved on existing maintenance roads through the area.

The avian diversity at Woodlake Area is best represented by birding surveys of Sutter's Landing Park (on the south bank) with 141 bird species recorded over the last 5 years (2016 through 2021 from eBird). The open grasslands on north bank-Woodlake area, (although not as well-documented by local birders due to more difficult access) is an important foraging area for many raptors, including Swainson's Hawk, which also nests in this area.

UC Davis maintains a 40+ year butterfly monitoring transect dataset that runs among the western portion of Woodlake and extends into eastern Discovery Park (more information can be found at https://ucdavis.github.io/butterfly.ucdavis.edu/).

## Expected Future Trends

The river channel is expected to continue to be sand-bed dominated (as upstream sources appear sufficient to supply sand for the foreseeable future.) The erosion resistant RR bank is expected to have a slow rate of bank retreat. However, the looser RL is expected to progressively lose sandy material, potentially leading USACE to propose additional bank protection projects in the foreseeable future.

Cottonwood trees are likely to continue to be lost to wildfire, and are not expected to regenerate because the high terrace is not frequently inundated. These areas will likely transition to oak-dominated woodlands. The other overall extent and types of vegetation are generally expected to remain constant.

While the ongoing rate of sea level rise is unknown, it is expected to increase in the foreseeable future, affecting the tidal prism in this Area Plan. The implications could include a retreat in near-channel plant distribution, as a result of the higher high tides (and a slight increase in overbank inundation). The channel bed itself is not expected to change in the foreseeable future due to the artificially-perched channel elevation in downstream Discovery Park, and the low likelihood of channel down cutting.

The greatest factors influencing future vegetation are encampments degrading the understory, wildfires, and the spread of invasive species including yellow star-thistle and perennial pepperweed.

## Desired Conditions

Desired conditions are based on maintaining general channel processes and accommodating expected foreseeable future trends and conditions. This would include limiting future bank and levee protection projects to those required for public safety, protection of property outside of the Parkway, and protection for existing substantial, unmovable infrastructure within the Parkway. Future infrastructure should be designed in a manner to avoid the need for additional bank protection. Restoration and naturalization projects should be located and designed in a manner to avoid impediments to, and constraints on, appropriate future channel management actions that may be necessary.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled, with a focus on invasive species within woodland areas and grassland areas throughout the central portion of the RR overbank area that are dominated by yellow star-thistle and perennial pepperweed. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation. Managing for a healthy understory with limited degradation from human uses would improve habitat values.

While the area supports suitable roosting and foraging habitat for raptors, the former agriculture area (most recently used to grow hay) is now dominated by yellow star-thistle and perennial pepperweed, which provide poor quality foraging habitat. This field, much of it within the transmission line easements, could be converted to better foraging habitat and, outside of the utility easement, planted with trees for oak woodland or oak savanna. Consistent with this desired condition, a conceptual ecosystem restoration concept was developed by USACE and its partners and authorized by Congress in 2002. The conceptual restoration plan includes managing nonnative invasive plant species; grading to restore the hydrologic interaction between the river and portions of the floodplain; seeding to establish native grasslands; and planting some areas with riparian forest oak woodland and oak savanna plant species. This approach would improve conditions for foraging raptors and other wildlife.

Along the narrow RL overbank area, there are some opportunities to establish or enhance riparian vegetation, particularly understory vegetation that has been degraded by camping or overuse. Given the potential for erosion of this narrow area, use of biotechnical treatments of other bank protection strategies to promote accretion of materials would be positive. Integrating habitat conservation and restoration efforts with the adjacent Sutter's Landing Park would provide additional benefit to both areas.

## Site-Specific Potential Resource Management Actions (Figures 8-20 and 8-21)

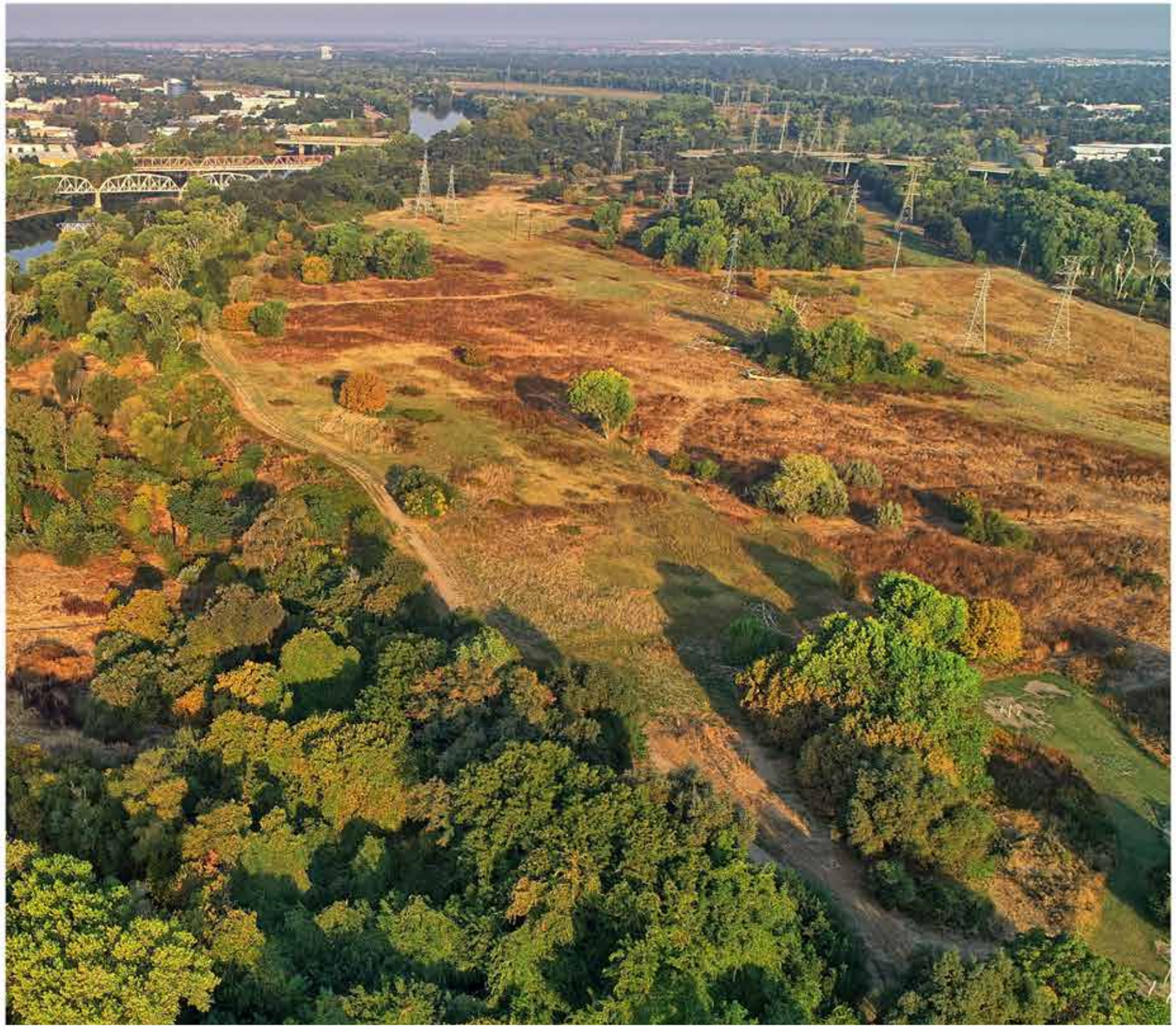
1. **Establish low-growing native vegetation under powerlines:** Develop a formal vegetation management agreement with electrical utilities for transmission line Right of Ways, including establishment of appropriate and compatible forbs, grasses and shrubs to maximize potential habitat for wildlife (including pollinators). Depending on species utilized it may also be possible to provide fuel breaks to protect adjacent wildlife habitat. Control of invasive plant proliferation and aesthetics is key to improving the natural resources in the area. Consideration should also be given to establishing hedgerows that could provide a buffer and screen of the power corridor. Encourage the undergrounding of utility lines whenever feasible.
2. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
3. **Implement USACE ecosystem restoration project:** Refine the existing USACE Ecosystem Restoration concept for Woodlake, which currently includes non-native invasive plant species eradication, planting native grassland, grading to improve floodplain connectivity (including removal of a berm that would allow remnant mining pits to be inundated more often and provide positive drainage to the LAR, seasonal wetlands, and fish-rearing habitat), grading and planting riparian forest,

planting oak savanna and planting oak woodland. The goal is to naturalize the site to provide habitat for target species, including forage habitat for raptors and other avian species that rely on grasslands.

4. **Expand riparian corridor:** Beyond the footprint of the USACE Ecosystem Restoration concept, improve and expand riparian forest habitat along the western-most portion of the naturalized canal, including managing for growth and retention of tall overstory riparian trees. Actions may include removal of nonnative invasive species, expanding the riparian corridor toward the south where conditions allow, enhancing the understory with appropriate native species, and enhancing the canal itself to increase wildlife values. In addition, remove "natural" levee at the top of RR bank, resulting from elevated hydraulic mining debris aggradation, to re-connect a moderately large area of high value riparian forest.
5. **Improve/expand wildlife connectivity opportunities:** If future improvements are made to Highway 160 or the railroad trestles, which pass through the west and east ends of the Woodlake area, identify opportunities to improve or accommodate wildlife movement. In addition, considering the likelihood of a future bridge widening (referred to as the Third Track Project) at the eastern/upstream end of the Area Plan, anticipate potential vegetation impacts and locations for suitable mitigation. Ensure that wildlife connectivity issues are addressed during detailed design. And considering the possibility of future developed recreation improvements at the western end of the Woodlake area, anticipate potential strategies for integration into the more natural areas. Ensure that wildlife connectivity issues are addressed during detailed design.
6. **Develop a Conceptual Naturalization Plan for stormwater runoff channel:** Develop a plan to improve aquatic and riparian habitat within and along the channels that also may help improve water quality that flows into the river. Consideration should also be given to properly integrating the unpaved trail crossing through the area.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Woodlake Area should include efforts to continue to remove red sesbania and giant reed, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks. Integrate this effort with the off-paved trail bicycle trails and maintenance impacts.
- Removal of bridge debris: Identify a process to have old bridge debris removed as a part of future associated projects.



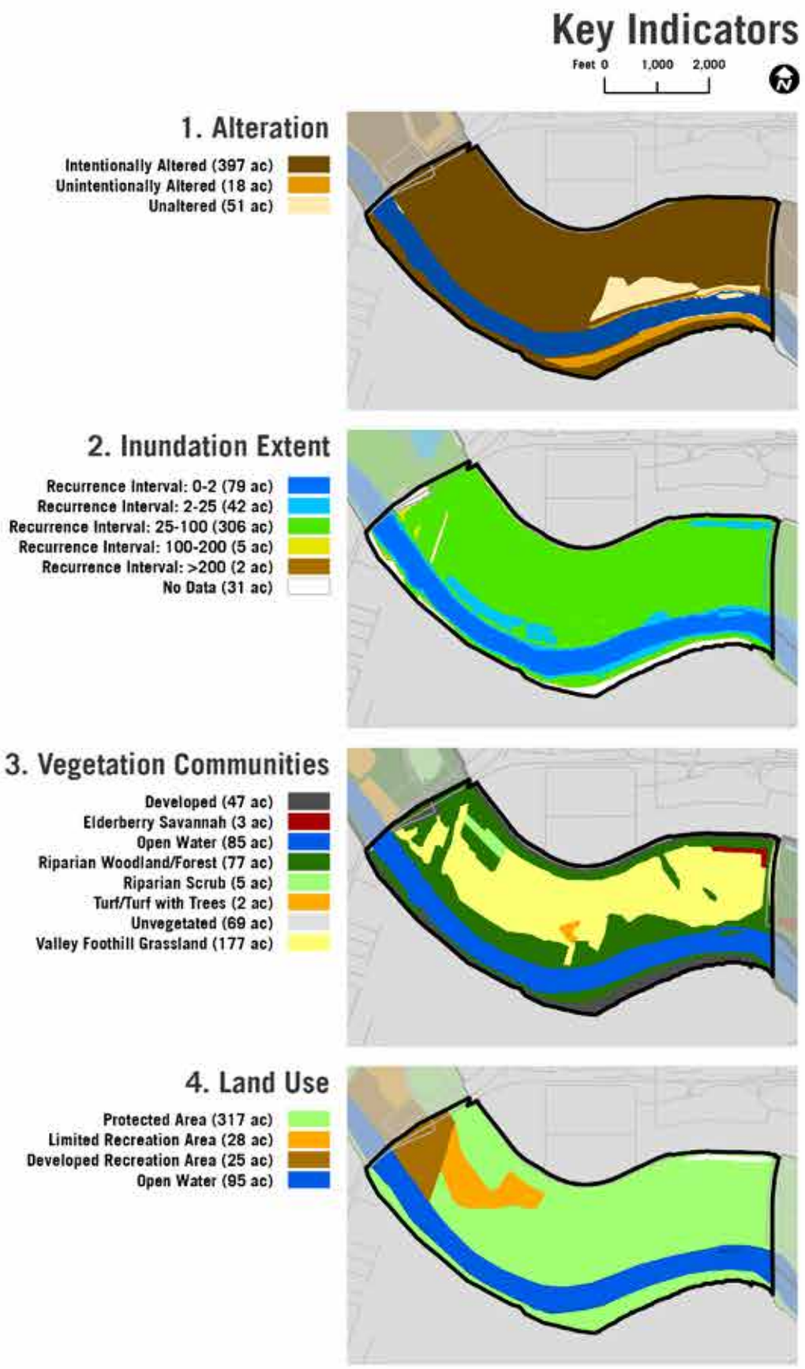
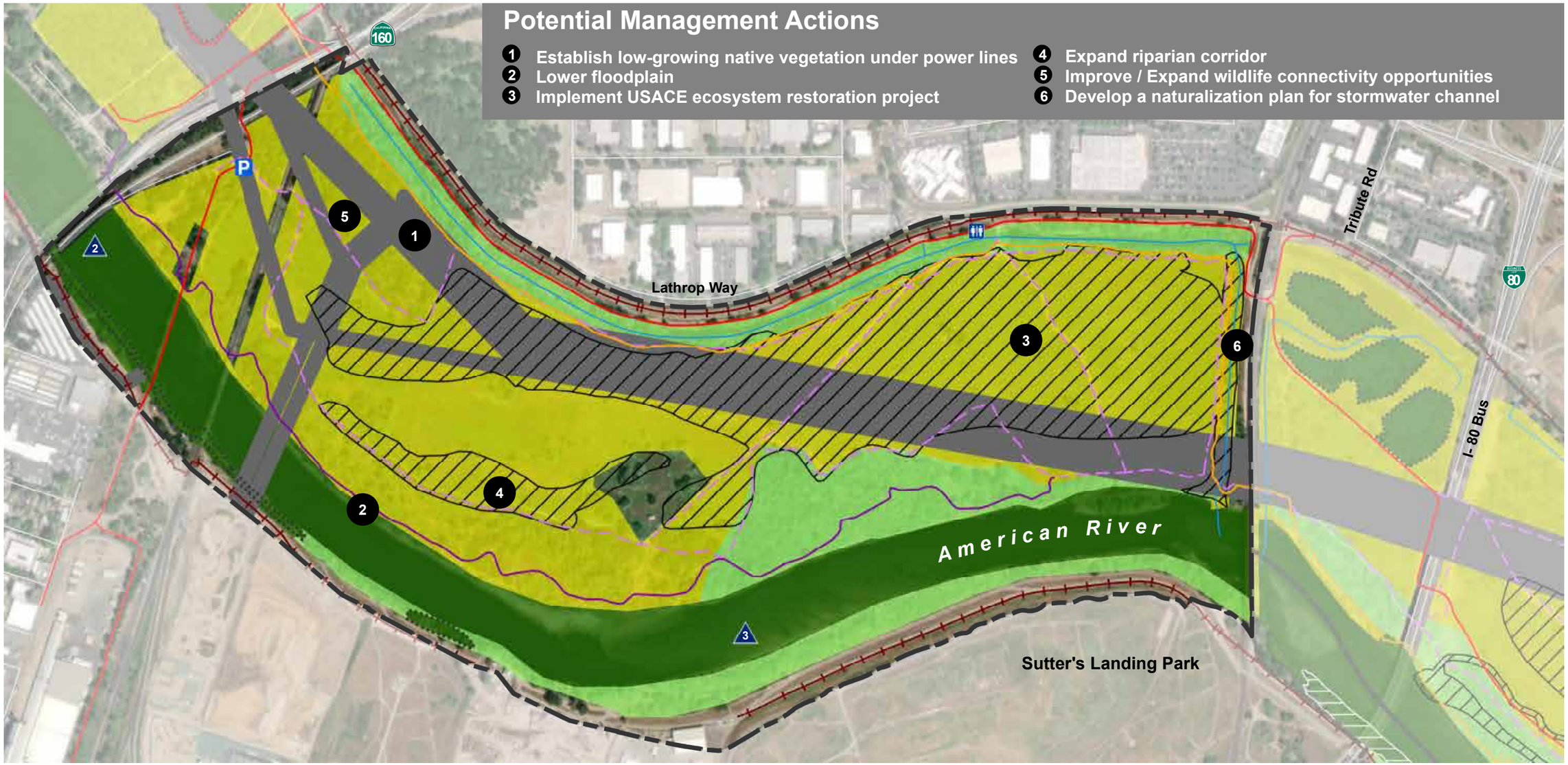



Figure 8-20
Area Plan 2 Woodlake A

## Potential Management Actions

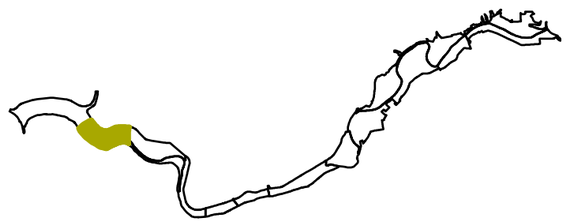
1. Establish low-growing native vegetation under power lines
2. Lower floodplain
3. Implement USACE ecosystem restoration project
4. Expand riparian corridor
5. Improve / Expand wildlife connectivity opportunities
6. Develop a naturalization plan for stormwater channel




- Parkway Boundary
- Powerline Easement
- Equestrian/Hiking Trail
- Pedestrian Trail
- Bicycle/Pedestrian Trail
- Lower Tributaries
- Off Paved Bicycle Trail
- Levee
- Parking
- Restroom
- River Mile
- Federally Protected Mitigation Area
- Proposed USACE Bank Protection
- Proposed USACE Ecosystem Restoration

Management Category
- Conservation
- Restoration
- Naturalization

- No Data/Private Property



0 500 1,000 Feet

Figure 8-21
Area Plan 2 Woodlake B

AREA PLAN 3

# CAL EXPO

## Cal Expo Area Plan

### Historic Physical and Biological Conditions

As described for Discovery Park, well before the arrival of European settlers, the lower reach of the LAR featured a deep channel with a relatively steep gradient flanked by high floodplains to the north and south. A subsequent rise in the bed of the Sacramento River created a back-water condition at the confluence of the two rivers, flattening the gradient and introducing tidal conditions along the lower five miles of the LAR. Reduced gradients led to an outbreak flood pattern and distributary sloughs which resulted in much-reduced LAR channel capacities. This landscape supported a complex upland and riparian forest and abundant wildlife.

### Impact of European Settlement

The Gold Rush brought miners, city dwellers and farmers to the American River, inaugurating 150 years of landscape changes that greatly altered the lower reach of the LAR. Placer mining quickly ran its course, transitioning to decades of hydraulic mining activity in the upper American River Basin that accelerated the aggradation of the historic LAR channel. Farmers cleared portions of the northern floodplain. Levee construction along the north side of the river, followed eventually by the construction of Folsom Dam, reversed the aggradation of the channel bed and inaugurated a long-term process of channel degradation in the lower reach of the river which increased the separation of the channel from its remaining floodplains. New levees constricted flows and increased flow velocities and flow depths in the channel and remaining overbank areas. After hydraulic mining ceased, flows flushed away the channel sediments and by the 1960's degradation had fully exposed the native channel bed in this reach.

Levee construction constricted high flows from flooding large areas and restricted inflow from tributary streams. Prior to levee construction, high flows would leave the channel and flow north beyond the adjacent floodplain into the American Basin (what is today the Natomas area). Some flows also historically left the channel to the south, flowing toward downtown Sacramento. In addition to the river flowing out of the floodplain, local tributary streams entered the un-leveed river primarily from the north. These tributaries were channelized and consolidated to concrete storm drains after levee construction.

A majority of Cal Expo has been altered in some fashion as a result of farming, grading, and infrastructure. Farmers cleared the woody vegetation (that had established on top of the hydraulic mining debris) for agriculture, which persisted into the mid-20th century. Much of the area was later graded for a golf course (that was never completed), featuring a shallow, open water body that is now Bushy Lake, and several golf tee mounds. Electric transmission lines run generally east-west through the area, simplifying the vegetation underneath and limiting the growth of woody vegetation. Several bridges, including The Capital City Freeway (Business 80/State Route 51) and two railroad bridges, cross the downstream Cal Expo area.

### Present Conditions

The river at Cal Expo is a gravel to sand transition zone: The upstream area is a gravel/cobble transport dominated regime, while the downstream is a sand/gravel transport dominated regime. The gradient of the river channel area is steeper than in either the upstream or downstream areas. Overall, the reach is in a long-term river bed aggradation regime, although this aggradation is limited by the rate of incoming course sediments. The channel is stable, and while the upstream bank slope is very steep (sometimes near vertical), it is composed of erosion-resistant older floodplain materials and erosion is not expected to progress noticeably.

Cal Expo and Paradise Beach are the farthest upstream areas of the tidally-influenced river channel, thus near-channel vegetation is controlled by river stage at high tide. Lower elevation overbank areas contain some high-quality early successional to mid-successional alder and willow riparian scrub, as well as cottonwood and mixed riparian

forest. There is limited regeneration of cottonwood on much of the overbank areas as a result of the lack of spring flooding and artificially high elevations above the river channel.

Higher elevation areas at Cal Expo have been elevated 2-4 feet with hydraulic mining debris, and are dominated by elderberry savannah (important habitat for federally-listed VELB), open fields, and riparian forest associated with Bushy Lake. Additionally, to the west of the Capital City Freeway there are area that were intentionally planted as mitigation for impacts to VELB habitat associated with projects constructed elsewhere in the Parkway.

The 300-400 foot wide transmission line corridor is a major feature crossing east to west over Bushy Lake and through Cal Expo. Woody vegetation is heavily managed under these electric transmission lines, especially where they cross Bushy Lake and surrounding wetlands. There is limited regeneration of cottonwood on much of the overbank areas as a result of the artificially high elevations above the river channel.

The Cal Expo area has been impacted by several large wildfires since 2014, which burned much of the area, including many tall trees. Although many oaks, willows, elderberry and other shrubby species and herbaceous species have survived, much of the cottonwood overstory, especially around Bushy Lake, has not recovered. Prior to 2014, the thick vegetation along Bushy Lake generally obscured views of the wetland area. Currently, natural regeneration is sparse, allowing for unimpeded views of Bushy Lake. Approximately 140 bird species have been documented in the Cal Expo Area (2016 - 2021 as documented on eBird), including nesting Red-Tailed hawks and Great Horned Owls.

The Cal Expo Area has three prominent wildlife areas, including the elderberry savannah, the lower river floodplain, and Bushy Lake. The elderberry savannah is an important for VELB and grasslands are important for foraging raptors. The lower floodplain, due to its closer connection to the river, provides better support for survival and natural regeneration of cottonwood trees. Additionally, this area allows for more natural processes to play out along the river bank. Some of the eroding banks in Cal Expo were formerly used by bank swallows (now extant), and these bank-nesting cavities are now occupied by Rough-Winged swallows.

The Bushy Lake area is an important shallow water habitat and wetland for many species, including western pond turtles (listed as a California species of special concern), beaver, and river otters, as well as a variety of birds. Bushy Lake supports over 115 species of birds, with nesting by at least 36 different species. To date, restoration efforts have reintroduced culturally significant species such as white root (*Carex barbarae*), creeping wildrye (*Elymus triticoides*), mugwort (*Artemisia douglasiana*), Yarrow (*Achillea millefolium*), and milkweeds. Currently, California State University, Sacramento (CSUS) is preparing a five-year adaptive restoration plan that focuses on native plants and wildlife including western pond turtles and pollinators. To inform the Bushy Lake Conceptual Restoration Plan CSUS is conducting studies and designs for pond turtle population restoration, fire-resilient vegetation, and eco-cultural restoration. Water levels at Bushy Lake are maintained by Cal Expo through groundwater pumping, as dictated by the Bushy Lake Preservation Act. Additional water to the west of Bushy Lake is pumped in as part of the City of Sacramento storm drain system.

Encampments are interspersed through much of the area, severely degrading the woodland vegetation and reducing core habitat available to wildlife. Much of this area has also burned in recent wildfires resulting in the loss of tall overstory canopy, including mature cottonwoods. Invasive plant species are also present throughout, including dominant yellow star-thistle, vetch, and mustards in the open fields. Large stands of giant reed, as well as red sesbania, have been managed as part of the IPMP but this effort will need to continue to maintain control of these high priority invasive species.

Overall, much of the vegetation in the area is in moderate to fair condition, and subject to substantial ongoing degradation. Degradation of the vegetation, the understory in particular, reduces its value as wildlife habitat. The activities leading to the degradation (e.g., encampments, rampant social trails) are also reducing the habitat values for wildlife.

Chicken Ranch and Strong Ranch sloughs, which drain large urban watersheds to the north east, enter the Parkway at the upstream end of the Cal Expo area through a low flow channel and a bank of pumps used when the river is high. The concrete aprons at these outfalls are eroding.

*Firebreak and maintenance road located in the Cal Expo Area. Photo Credit: Regional Parks*

## Expected Future Trends

Aggradation of the river channel in the Cal Expo Area Plan is likely to continue, albeit at a reduced rate compared to historic conditions (this trend reflects the effects of significant in-channel and channel margin aggregate mining in upstream reaches of the river which interrupted the natural coarse sediment transport regime that historically characterized this reach, thereby slowing but not reversing the deposition). As the levees concentrate flows through the area, significantly slow rates of RR bank retreat are to be expected. (The RL bank is not within the Cal Expo Area Plan and is therefore addressed separately in the Paradise Beach Area Plan.)

The overall extent and types of vegetation are generally expected to remain constant, with some notable exceptions. The remaining cottonwoods that were established during a period when the overbank area was inundated more frequently are not expected to regenerate except in low lying areas or areas near perennial surface water (e.g., Bushy Lake). Also, some vegetation in the higher areas will likely transition to oak-dominated woodlands.

While the future rate of sea level rise is unknown, it is expected to increase in the foreseeable future, affecting the tidal river elevation up to River Mile 4.8. The implications could include a change in near-channel plant distribution as a result of increased high tide elevations and a slight increase in overbank inundation. The channel bed itself is artificially perched downstream and not expected to change or downcut as a result of future sea level rise.

The greatest factors influencing future vegetation are encampments and fires, as well as the often associated spread of invasive species including yellow star-thistle and milk thistle. Giant reed and red sesbania populations have been significantly reduced in this area due to the success of the IPMP. The widening of the Capital City Freeway will impact to vegetation within the new footprint.

## Desired Conditions

Desired conditions are based on maintaining general channel processes and accommodating expected foreseeable future trends and conditions. These processes include limiting future bank and levee protection projects to those required for public safety, protection of property outside of the Parkway, and protection for existing substantial, unmovable infrastructure within the Parkway.

Future infrastructure should be designed in a manner to not necessitate additional bank protection. Restoration and naturalization projects should be located and designed in a manner to avoid impediments to, and constraints on, appropriate future channel management actions that may be necessary.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled, with a focus on invasive species within woodland areas and grassland areas throughout that are dominated by yellow star-thistle. These annual grassland/yellow star-thistle areas, much of it within the transmission line easements, could be restored as grassland habitat and, outside of the utility easement, to oak woodland or oak savanna. Consistent with this desired condition, a conceptual ecosystem restoration concept was developed by USACE and its partners and approved by Congress in 2002. The conceptual restoration plan includes controlling non-native invasive plant species, grading and planting riparian forest, constructing a side channel, grading to create seasonal wetlands, terracing steep banks and planting riparian vegetation, restoring emergent wetlands, and planting oak savanna. (The current concept also includes pumping water from Chicken and Strong Ranch sloughs into a treatment wetland. However, given several complexities associated with the pumping and treatment wetland elements, they are not likely to be advanced for implementation.) The overall goal is to naturalize the site to provide habitat for target species, including conservation of Bushy Lake and its associated habitats. Refinement of the USACE Ecosystem Restoration concept should be closely coordinated with efforts being undertaken by CSUS and the Wildlife Conservation Board to develop a Bushy Lake Conceptual Restoration Plan, as the efforts overlap and are generally consistent with one another. This approach would improve conditions for pollinators, foraging raptors, western pond turtle, and other wildlife. Managing for a healthy understory and overstory with limited degradation from human uses would improve habitat values.

## Site-Specific Potential Resource Management Actions (Figures 8-22 and 8-23)

1. **Establish low-growing native vegetation under powerlines:** Develop a formal vegetation management agreement with electrical utilities for transmission line Right of Ways, including establishment of appropriate and compatible forbs, grasses and shrubs to maximize potential habitat for wildlife (including pollinators). Depending on species utilized it may also be possible to provide fuel breaks to protect adjacent wildlife habitat. Control of invasive plant proliferation and aesthetics is key to improving the natural resources in the area. Consideration should also be given to establishing hedgerows that could provide a buffer and screen of the power corridor. Encourage the undergrounding of utility lines whenever feasible.

2. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
3. **Implement USACE ecosystem restoration project:** Refine the existing USACE Ecosystem Restoration concept for Cal Expo/Bushy Lake, which currently includes non-native invasive plant species eradication, grading and planting riparian forest, constructing a side channel, grading to create seasonal wetlands, terracing steep banks and planting riparian vegetation, restoring emergent wetlands, and planting oak savanna. The current concept also includes routing water from Chicken and Strong Ranch sloughs via pump into a treatment wetland. However, given several complexities associated with the pumping and treatment wetland elements, they are not likely to be advanced for implementation. The overall goal is to naturalize the site to provide habitat for target species, including conservation of Bushy Lake and its associated habitats.
4. **Improve/expand wildlife connectivity opportunities:** As future improvements are made to State Route 51/ Capital City Freeway or the railroad trestle, which pass through the western end of the Cal Expo area, identify opportunities to improve or accommodate wildlife movement.
5. **Continue CSUS research and habitat development:** Refinement of the USACE Ecosystem Restoration concept should be closely coordinated with efforts being undertaken by CSU Sacramento and the Wildlife Conservation Board to develop a Bushy Lake Conceptual Restoration Plan, as the efforts overlap and are generally consistent with one another. Consider methods to properly integrate the off-paved trail bicycle trails within the footprint of the ecosystem restoration concept.
6. **Develop conceptual restoration plans for burned areas:** To rehabilitate areas that have been damaged by previous fires and have not shown signs of recovery to pre-burn conditions.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Cal Expo Area should include efforts to continue to remove red sesbania and giant reed, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks. Integrate this effort with the off-paved trail bicycle trails and maintenance impacts.
- Identify a process to have old bridge debris removed as a part of future associated projects.
- Develop a conceptual plan to address deteriorating outfalls: Re-construct the engineered concrete drainage outfall aprons for Chicken Ranch and Strong Ranch sloughs to protect against ongoing and progressive bank erosion due to undercutting using a design approach and materials that can adjust to bank line changes without aggravating bank erosion; suggest removing the broken and undercut concrete members and replacing with large angular rock.

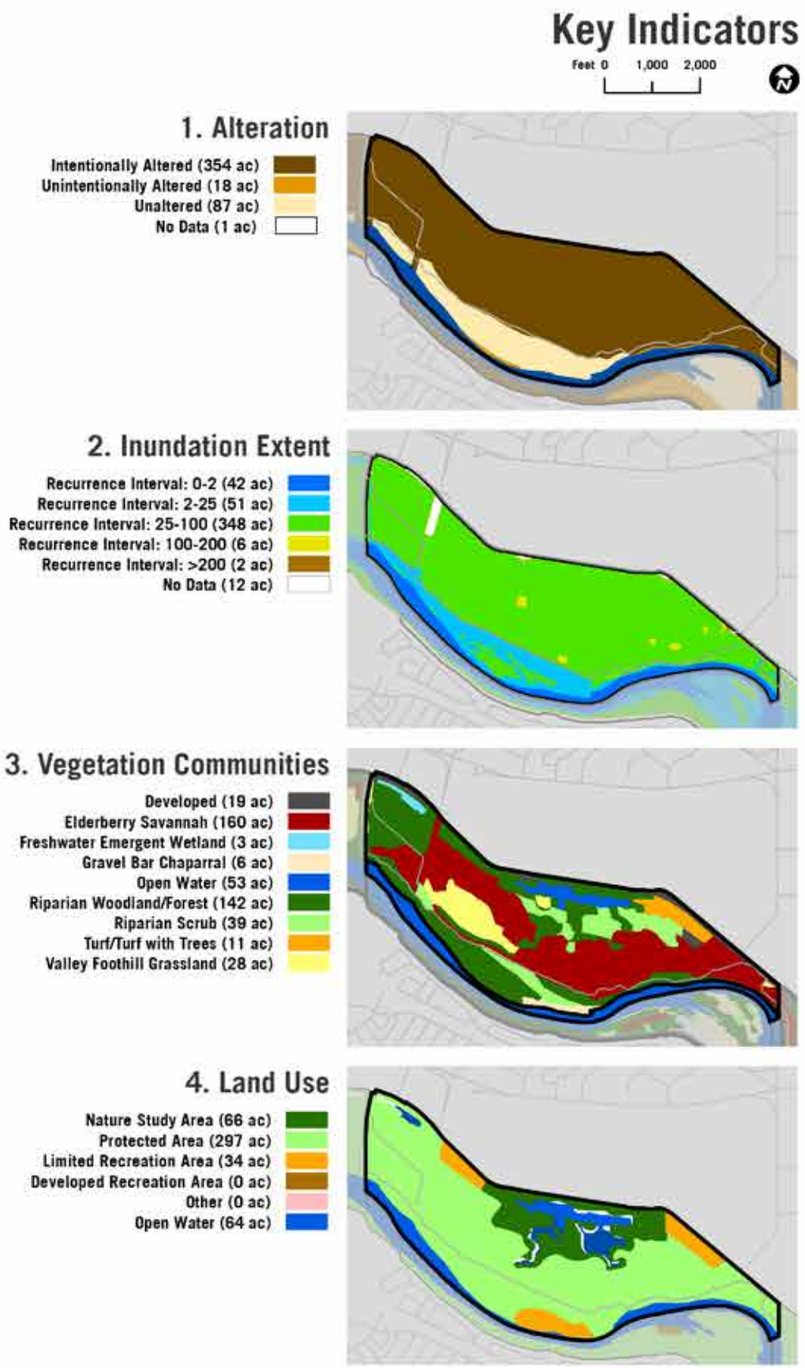
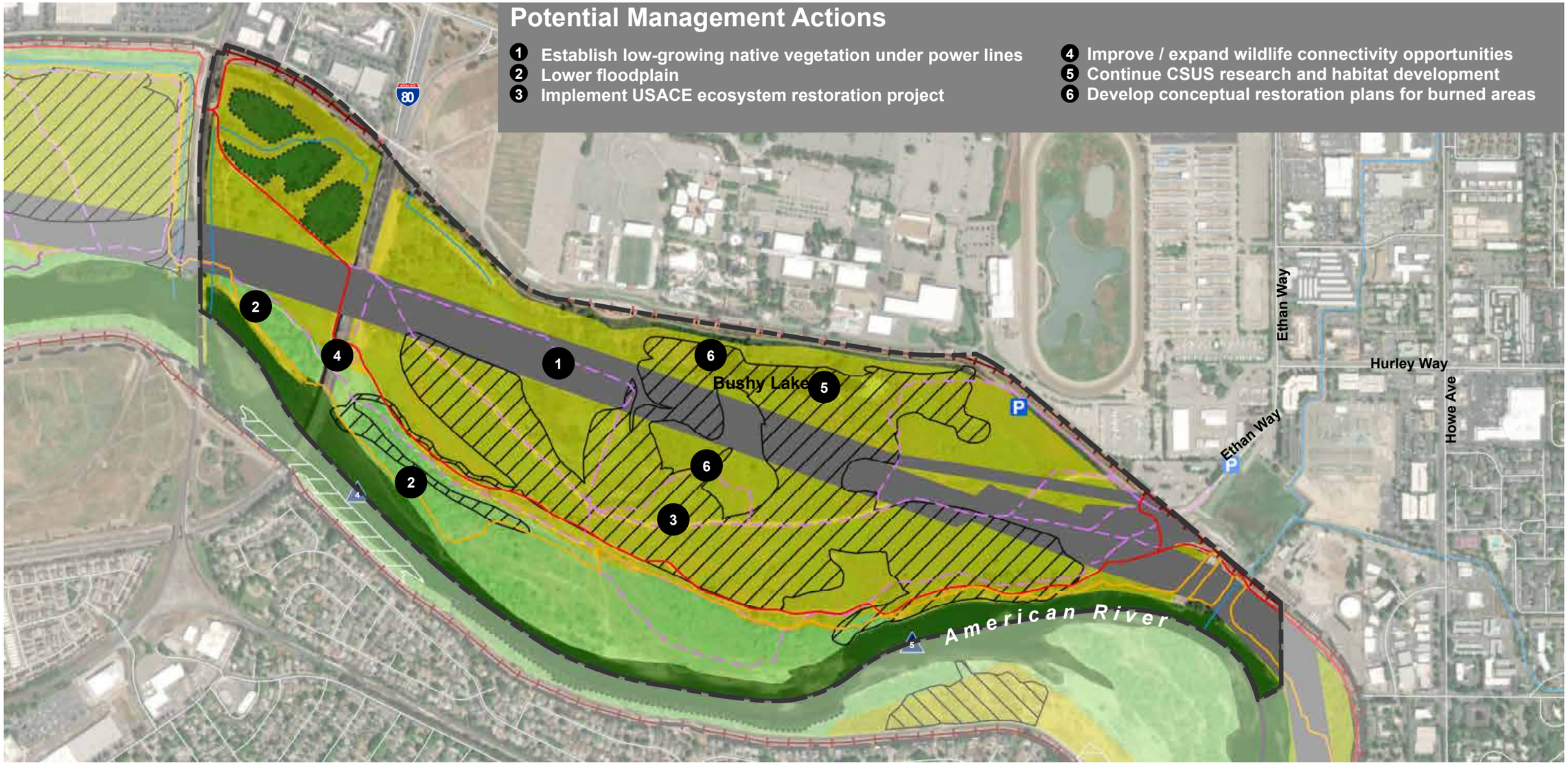



Figure 8-22
Area Plan 3 Cal Expo A

## Potential Management Actions

1. Establish low-growing native vegetation under power lines
2. Lower floodplain
3. Implement USACE ecosystem restoration project
4. Improve / expand wildlife connectivity opportunities
5. Continue CSUS research and habitat development
6. Develop conceptual restoration plans for burned areas




- Parkway Boundary
- Powerline Easement
- Equestrian/Hiking Trail
- Pedestrian Trail
- Bicycle/Pedestrian Trail
- Lower Tributaries
- Off Paved Bicycle Trail
- Levee
- Parking
- River Mile
- Proposed USACE Bank Protection Mitigation
- Proposed USACE Bank Protection
- Proposed USACE Ecosystem Restoration
- Federally Protected Mitigation Area

Management Category

- Conservation
- Restoration
- Naturalization
- No Data/Private Property

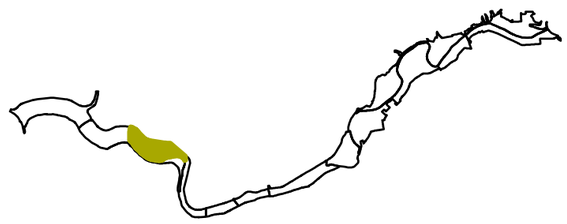


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Figure 8-23
Area Plan 3 Cal Expo B

AREA PLAN 4

# PARADISE BEACH

## Paradise Beach Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the lower reach of the LAR featured a deep channel with a relatively steep gradient flanked by high floodplains to the north and south. A subsequent rise in the bed of the Sacramento River created a back-water condition at the confluence of the two rivers, flattening the gradient and introducing tidal conditions along the lower five miles of the LAR. These conditions led to an outbreak flood pattern and distributary sloughs which resulted in much-reduced LAR channel capacities. This landscape supported a complex upland and riparian forest and abundant wildlife. The Paradise Beach Area Plan consists solely of the RL area, with the prominent Paradise Beach itself in the middle of the area.

As a result of long-term and ongoing sea level rise and channel backstepping process responses, Paradise Beach became a gravel-sand transition zone, where a notable change in gradient resulted in a change from an upstream gravel transport dominated regime, to a downstream sand transport dominated regime, with a flood chute as a natural feature of the aggradational bed form. The gradient is steeper than reaches both upstream and downstream, and the active bed material size distribution ranges from gravel and cobble upstream to sand and gravel downstream. The reach is in a long-term bed aggradation regime, limited by the rate of incoming course material.

### Impact of European Settlement

The Gold Rush brought miners, city dwellers and farmers to the American River inaugurating a century and a half of landscape changes that have greatly altered the lower reach of the LAR. Placer mining quickly ran its course giving way to decades of hydraulic mining activity in the upper American River Basin that accelerated the aggradation of the historic LAR channel. Farmers cleared portions of the southern floodplain, but it was disconnected from the river channel by levee construction near the channel edge. Levee construction was followed by the construction of Folsom Dam, reversing the aggradation of the channel bed to long-term degradation in the lower reach of the river, which increased the separation of the channel from its remaining floodplains. By 1940s, the river had flushed enough mining debris to expose the pre-mining channel. The levees also created greater flows and flow depths for any given overbank LAR discharge. The southern levee along RL blocked high flows from leaving the channel and concentrated flows south toward downtown.

Portions of Paradise Beach were altered as a result of the influx of Sierra Nevada hydraulic mining debris. The height of mining debris aggradation occurred around 1900 when and the entire area of the present flood chute was buried by 15-20 feet of mining debris, confining the channel to its present low flow alignment. By the late 1940's (following the cessation of Sierra Nevada hydraulic mining), the river had washed out much of the mobile sand mining debris from the channels exposing the flood chute across the bar once again. Ongoing erosion of the mining debris continued on RL.

Levee construction concentrated flows by eliminating the outbreak flood pattern upstream of Paradise Beach, and confined LAR flows to a narrow floodplain area. These concentrated flows increased erosion potential, especially in areas with already erosive soils. Nonetheless, the present channel alignment has remained stable but continues to aggrade at a reduced rate because upstream mining activities have captured much of the material before it makes it to the Paradise Beach area.) While hydraulic scouring processes have controlled the distribution and character of riparian vegetation, reliable higher summer-season flows have recently experienced enhanced vegetation vigor in protected areas. Infrastructure includes the Capital City Freeway (Business 80/State Route 51) crossing at the downstream end, and the H Street Bridge crossing at the upstream end.

*Aerial view of the Paradise Beach Area, looking upstream. Photo credit: John Hannon*

## Present Conditions

The Paradise Beach Area Plan can be best understood as being composed of a relatively narrow upstream portion, followed by a transitional wide floodplain middle portion with a relatively wide active channel, and a downstream portion with a wide floodplain on RR (in the Cal Expo Area Plan) but a very narrow RL overbank area and a narrow active channel. The upstream portion of the Paradise Beach area (from the H Street Bridge downstream to Paradise Beach itself) is characterized as a narrow, gravel-cobble bed channel with a narrow overbank. The mid-channel island and downstream bars are naturally occurring features and are slowly aggrading.

The river channel is tidally influenced to about midway through the Paradise Beach area, where the tidal changes can affect vegetation growth. The overall hydraulic regime of the narrow upper portion of the Paradise Beach area is characterized by periodic concentrated high velocity flows – some of the highest in the LAR. While the RL bank is narrow and contains erosive soils, only some of this bank has rocked bank protection, and much of RL is either un-rocked or is inadequately protected with existing rock. In order to protect the levee from further bank erosion, a bank protection project is being planned that will install additional rock revetments along the edge of the channel and incorporate riparian vegetation into the re-constructed river bank. The bank protection is planned to extend from upstream of H Street to the Glenn Hall access and from downstream of the Capital City Freeway to connect to the previously constructed bank protection site.

The wide middle portion of Paradise Beach contains an overbank flood chute, which flows through when dam releases are 15,000 cfs or higher, bisecting Paradise Beach and uprooting naturally sparse vegetation in the chute, which will re-sprout. Downstream of Paradise Beach proper, the RL overbank area narrows again and is protected by modern bank protection including a riparian planting bench supporting a dense assemblage of mature riparian vegetation.

Paradise Beach is a heavily used recreation area with many social trails. There are some opportunities for naturalization in areas where the Sierra Nevada hydraulic mining debris persists.

Like much of the American Parkway, Paradise Beach it is a local birding “hotspot” with 146 bird species recorded over the last 5 years (2016 through 2021, as recorded on eBird). Paradise Beach features a cottonwood forest, open gravel bar, and a backwater area, as well as a long river frontage. In years past tall cottonwood trees along the narrow downstream end served as rookery for black crowned night herons, until abandoned during extended levee strengthening and bank protection projects in the early 2000’s. A portion of the beach area contains a large stand of mature non-native black locust trees that are slated for removal and replacement with native trees as part of an off-site mitigation for USACE bank protection projects. Red sesbania, Chinese tallow tree, and Spanish broom have been removed from Paradise Beach, as part of the IPMP but this effort will need to continue to maintain control of these high priority invasive species.

Paradise Beach does have some encampments, which leads to degradation of habitat. Overall, much of the habitat in the area is in good to moderate condition, but subject to substantial decline because of ongoing activities (e.g., wildfire, encampments, social trails).

## Expected Future Trends

Paradise Beach should have a reduced rate of bed aggradation over the foreseeable future. However, as the levee system continues to concentrate flows through the area, bank protection will need to be expanded throughout the narrow overbank areas of Paradise Beach and riparian vegetation will persist as planted design elements of these projects. Paradise Beach itself is expected to aggrade very slowly, but the residual bodies of elevated Sierra Nevada mining debris are expected to be gradually lost due to ongoing material loss by lateral erosion. Vegetation at Paradise Beach is expected to continue to persist through a scour and sprout regime.

While the future rate of sea level rise is unknown, it is expected to increase in the foreseeable future, affecting the tidal prism in the downstream portion of this Area Plan up to River Mile 4.8. However, the existing bank protection and associated riparian bench will likely limit any influence from tidal changes on near-channel plant distribution. The channel bed itself is not expected to change as a result of sea level rise in the foreseeable future (due to the artificially perched elevation of the downstream channel and the very low likelihood that ongoing LAR channel processes in the downstream reaches could result in downcutting.) The greatest factors influencing future vegetation are wildfire, encampments degrading the understory, and the spread of invasive species.

## Desired Conditions

Desired conditions are based on maintaining general channel processes and accommodating expected foreseeable future trends and conditions. This would include limiting future bank and levee protection projects to those required for public safety, protection of property

outside of the Parkway, and protection for existing substantial, unmovable infrastructure within the Parkway. Future infrastructure should be designed in a manner to not necessitate additional bank protection beyond that already existing or planned. Conservation and naturalization projects should be located and designed in a manner to avoid impediments to, and constraints on, appropriate future channel management actions that may be necessary.

The flood chute at Paradise Beach, in its current configuration, does not serve as the main channel and is only inundated under moderate to high flows, which is the desired condition. However, continued deposition in the main channel may slowly change this balance to have more flow pass through the flood chute. Proactively modifying the configuration of the flood chute to encourage the main river channel to cut through Paradise Beach could lead to increased hydraulic pressure on the RL and changed recreational opportunities as a result of the modified landform.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled, with a focus on invasive species within woodland areas. It is also desired to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation. Managing for a healthy understory with limited degradation from human uses would improve habitat values.

## Site-Specific Potential Resource Management Actions (Figures 8-24 and 8-25)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Conceptual naturalization plan:** Develop a conceptual naturalization plan for the area of Paradise Beach adjacent to the levee. The naturalization plan may include elements to improve and expand riparian forest habitat in the area between the levee and river channel.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Paradise Beach Area should include efforts to continue to remove red sesbania, Chinese tallow, and Spanish broom, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Identify a process to have old bridge debris removed as a part of future associated projects.
- As the remainder of the Two Rivers Trail is implemented, identify opportunities for onsite planting to the extent consistent with flood control considerations and hydraulic limitations.

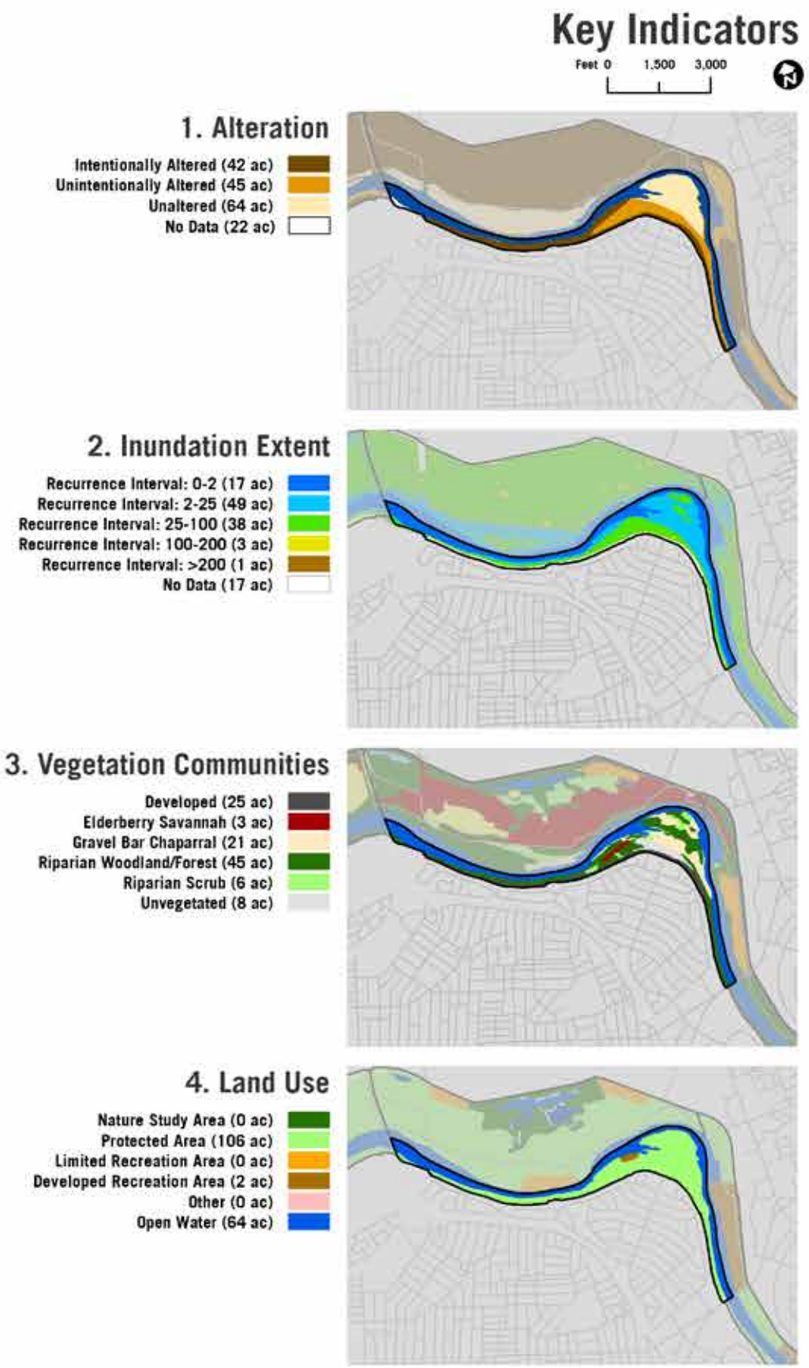


Figure 8-24
Area Plan 4 Paradise Beach A

Parkway Boundary
Powerline Easement
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Lower Tributaries
Levee
River Mile

Proposed USACE Bank Protection Mitigation
Proposed USACE Bank Protection
Proposed USACE Ecosystem Restoration
Federally Protected Mitigation Area

Management Category
Conservation
Restoration
Naturalization
No Data/Private Property

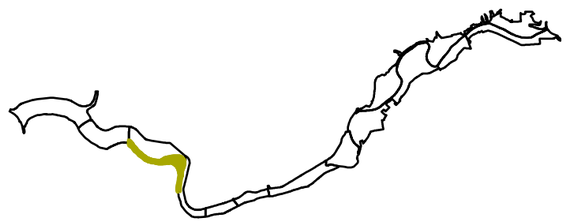

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Figure 8-25
Area Plan 4 Paradise Beach B

AREA PLAN 5

# CAMPUS COMMONS

## Campus Commons Area Plan

### Historic Physical and Biological Conditions

Well before European settlement the lower reach of the LAR featured a deep channel with a relatively steep gradient flanked by high floodplains to the north and south. A subsequent rise in the bed of the Sacramento River created a back-water condition at the confluence of the two rivers, flattening the gradient and introducing tidal conditions along the lower five miles of the LAR. Reduced gradients led to an outbreak flood pattern and distributary sloughs which resulted in much reduced LAR channel capacities. This landscape supported a complex upland and riparian forest and abundant wildlife.

### Impact of European Settlement

The Gold Rush brought miners, city dwellers and farmers to the American River, inaugurating a century and a half of landscape changes that have greatly altered the lower reach of the LAR. Placer mining quickly ran its course, giving way to decades of hydraulic mining activity in the upper American River Basin that accelerated the aggradation of the historic LAR channel. Farmers cleared portions of the northern and southern floodplains, and both the north and south floodplains were disconnected from the river channel by levee construction. The RL levee was built first, near the channel edge. After construction of the Folsom Dam, the RR levee was built, slightly farther away from the river channel than its RL counterpart. After the hydraulic mining era, the aggraded channel bed in the lower reach of the river reverted to long-term degradation (lowering), which increased the separation of the channel from its remaining higher floodplains. Levees on both sides of the river contained the high flows (that once were able to leave the channel and occupy the floodplain on the north or flow south) into a narrow space as they flowed toward downtown Sacramento. These levees increased flows and flow depths in the channel and narrowed floodplains, resulting in some of the highest river velocities compared to anywhere else along the LAR.

The gravel-to-sand channel bed transition begins downstream of the H Street Bridge with a notable change in gradient. The channel gradient here is steeper than in other areas upstream or downstream. The upstream gravel transport-dominated regime changes to a downstream sand transport-dominated regime. The active bed material size distribution ranges from gravel and cobble upstream to sand and gravel downstream.

Upstream of H Street, the channel is a bank-attached scour pool, characterized by the resistant bed material of the Fair Oaks formation on RL. This reach had been gravel and cobble-bedded, but these gravels and cobbles have been washed out by high flows and not replenished due to upstream areas capturing available material. The RL overbank area just downstream of Howe Avenue supports a mix of riparian vegetation on its modest width, along with a natural depressional feature that is seasonally wet. Downstream of the City of Sacramento's Fairbairn Water Intake Structure, the RL bank supports a narrow band of mature riparian vegetation planted within existing bank protection. The RR overbank area is characterized by steep banks composed of a combination of erosion resistant materials and hydraulic mining debris that supports patches of riparian vegetation and oak savanna.

The Campus Commons area extends below the H Street Bridge on RR only, where the Campus Commons Golf Course is located. Similar to upstream, the golf course is bordered by steep banks along the channel with a mid-channel bar. Downstream of the golf course, the vegetation becomes denser and the overbank area topography is altered by the Chicken Ranch Slough and Strong Ranch Slough outfall structures at its downstream end. This raised feature created an area of ponding at the downstream end of the Campus Commons area during higher flows. Electric transmission lines pass through this same area, with the maintenance of these line limiting woody vegetation

beneath. There is some gravel bed just downstream of Howe Ave, but it too could wash out because of a lack of gravel input from upstream.

## Present Conditions

The Campus Commons river channel and overbank areas are approximately 3 feet higher on the northern overbank area due to hydraulic mining and the subsequent import of material for golf course construction. As a result, riparian vegetation has reestablished in portions of the area. The RL overbank area is somewhat narrow upstream of the Fairbairn intake, transitioning to a very narrow bank with existing bank protection downstream of the intake. The wider portion is eroding very slowly, but this erosion does not appear to threaten the stability of the adjacent levee. There is an outfall structure that extends out into the channel as a result of this erosion and there is also an old, graded road along the overbank that causes ponding.

The moderately wide overbank along RR is subject to a variety of influencing conditions. Beginning upstream near Howe Avenue, there are signs of bank failure (sloughing) and a bank protection design is underway. The bank transitions to an area of past erosion and subsequent protection associated with an abandoned sewer line crossing. The remaining overbank area extending to the downstream extent of the golf course can be characterized by high and steep banks subject to an uncertain extent and rate of erosion, given the amalgamation of erosion-resistant materials and hydraulic mining debris. A sewer force main is located within this overbank area and running parallel to the levee with limited vegetation along its route. In combination with the design of bank protection for the opposite bank (RL), a design is underway for RR to lay back the steep slope to a more stable slope, incorporate buried rock groins to protect against future erosion, and revegetate the area with riparian vegetation. The concept is intended to protect against the high velocities experienced in this reach so that the existing overbank is not lost in future episodic erosion events, while also providing for some hydraulic relief and allowing for a somewhat dynamic channel edge ultimately held in place by the buried rock groins.

*Aerial view of the Campus Commons Area, including the Campus Commons Golf Course. Photo Credit: John Hannon*

This narrow, levee-bounded area of Campus Commons is heavily impacted by infrastructure. Paved multi-use trails run the length of both RL and RR. Vehicle bridges flank both the upstream and downstream borders, with the Guy West pedestrian bridge bisecting roughly through the middle. The Fairbairn Water Intake structure and the developed Alumni Grove are located on RL adjacent to the CSUS campus (with its tall buildings overlooking the river). The somewhat wider overbank section in downstream RR contains both a nine-hole golf course and an adjacent, mined (and naturally revegetated) area with a 300-foot-wide electrical transmission line corridor overhead. Ongoing maintenance of both the golf course and the transmission lines limit woody vegetation on this somewhat wider overbank area. However, the bank line adjacent to the golf course will be laid back to provide a gentler slope and will be planted with a riparian woodland as a result of the bank protection project being implemented in 2022. This will provide increased wildlife habitat and a wildlife corridor along the golf course. Additionally, the golf course is also being redesigned and the landscaping will also consist of native species. Two parallel sewer force mains run along much of the RR area, entering the park at the golf course, and crossing the river upstream

*Aerial view of the E.A. Fairbairn Water Intake Station and Guy West Bridge in the Campus Commons Area. Photo Credit: Regional Parks*

(and out of the Parkway) near the Fairbairn Water Intake structure.

Most wildlife viewing in the Campus Commons area is focused on the transmission line corridor area downstream of the golf course (Spanos Court access). 129 bird species have been documented from this area from 2016 to 2021 (eBird). A population of locally rare broomrape has also been documented near the Spanos Court access, likely parasitic on the elderberry plants growing in this area, but this elusive species has not been seen in recent years. Although there are portions of areas that have vegetated naturally, much of the woody vegetation in the upland Campus Commons area has been planted as part of construction projects.

Encampments interspersed through portions of the area (e.g., near Howe Avenue and downstream of the golf course) severely degrade the habitat in those areas, likely deter use by wildlife, and have caused wildfires. Invasive plant species have been reduced, but some are still present. Red sesbania, giant reed, and Chinese tallow tree have been removed along the river bank and islands as part of the IPMP but this effort will need to continue to maintain control of these high priority invasive species. Overall, much of the vegetation in the area is in good to moderate condition, but is subject to substantial ongoing decline associate with certain activities (e.g., encampments, social trails, etc.).

## Expected Future Trends

The river channel is expected to continue to be gravel-bed dominated, with gravel declining in the upstream reach as it is washed away with minimal upstream replenishment. Downstream of H Street, the river channel is expected to slowly aggrade as available materials settle out in this gravel-to-sand transition zone. Planned bank protection projects on the remaining riverbank areas that are currently not hardened will help protect levees and preserve remaining overbank areas. The overall extent and types of vegetation are generally expected to remain constant. However, some vegetation will be temporarily lost as a result of bank protection projects, to be replaced onsite to the extent feasible, with the remainder being mitigated offsite but within the Parkway. The RR project that will lay the steep bank back to a gentler slope is being designed to provide for substantial willow and cottonwood forest. Additionally, the golf course will also be redesigned with a narrower footprint and landscaped with native species to accommodate the increased habitat footprint along the bank line.

The greatest factors influencing future vegetation are the bank protection projects, encampments degrading the understory, fires destroying woodlands, and the spread of invasive species. Invasive species are expected to be most successful in areas degraded as a result of human activity (e.g., camping or fire) and then not rehabilitated in a timely manner. Bank protection projects will incorporate native vegetation into the design and/or provide offsite mitigation within the Parkway.

## Desired Conditions

Desired conditions are based on maintaining general channel processes and accommodating expected foreseeable future trends and conditions. This would include limiting future bank

and levee protection projects to those required for public safety, protection of property outside of the Parkway, and protection for existing substantial, unmovable non-Parkway infrastructure within the Parkway. Future infrastructure should be designed in a manner to not necessitate additional bank protection. Restoration and naturalization projects should be located and designed in a manner to avoid impediments to, and constraints on, appropriate future channel management actions that maybe necessary.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area and to replace, and improve where feasible, vegetation impacted by bank protection projects. Maintaining habitat for wildlife through this relatively narrow reach is also a priority. Invasive species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled. It is also desired to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation. Managing for healthy woodlands with limited degradation from human uses would improve habitat values, as would conserving some area of open grassland suitable for other wildlife (including raptors and pollinators).

### Site-Specific Potential Resource Management Actions (Figures 8-26 and 8-27)

1. **Establish low-growing native vegetation under powerlines:** Develop a formal vegetation management agreement with electrical utilities for transmission line Right of Ways, including establishment of appropriate and compatible forbs, grasses and shrubs to maximize potential habitat for wildlife (including pollinators). Depending on species utilized it may also be possible to provide fuel breaks to protect adjacent wildlife habitat. Control of invasive plant proliferation and aesthetics is key to improving the natural resources in the area. Consideration should also be given to establishing hedgerows that could provide a buffer and screen of the power corridor. Encourage the undergrounding of utility lines whenever feasible.
2. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
3. **Improve floodplain connectivity to reduce fish stranding:** Develop a plan to improve floodplain connectivity and minimize fish stranding at the downstream end of the plan area.

### General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Campus Commons Area should include efforts to continue to remove red sesbania, Chinese tallow, and giant reed, as well as other noxious weeds prioritized in an upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds. Additionally, the declining black locust trees at Alumni Grove should be replaced with native trees, such as Valley oak or California Sycamore.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation, and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Recreational facilities management and habitat: Identify opportunities to manage recreation improvement areas to protect or enhance wildlife habitat. This may include specifying types of vegetation and/or timing of maintenance activities.

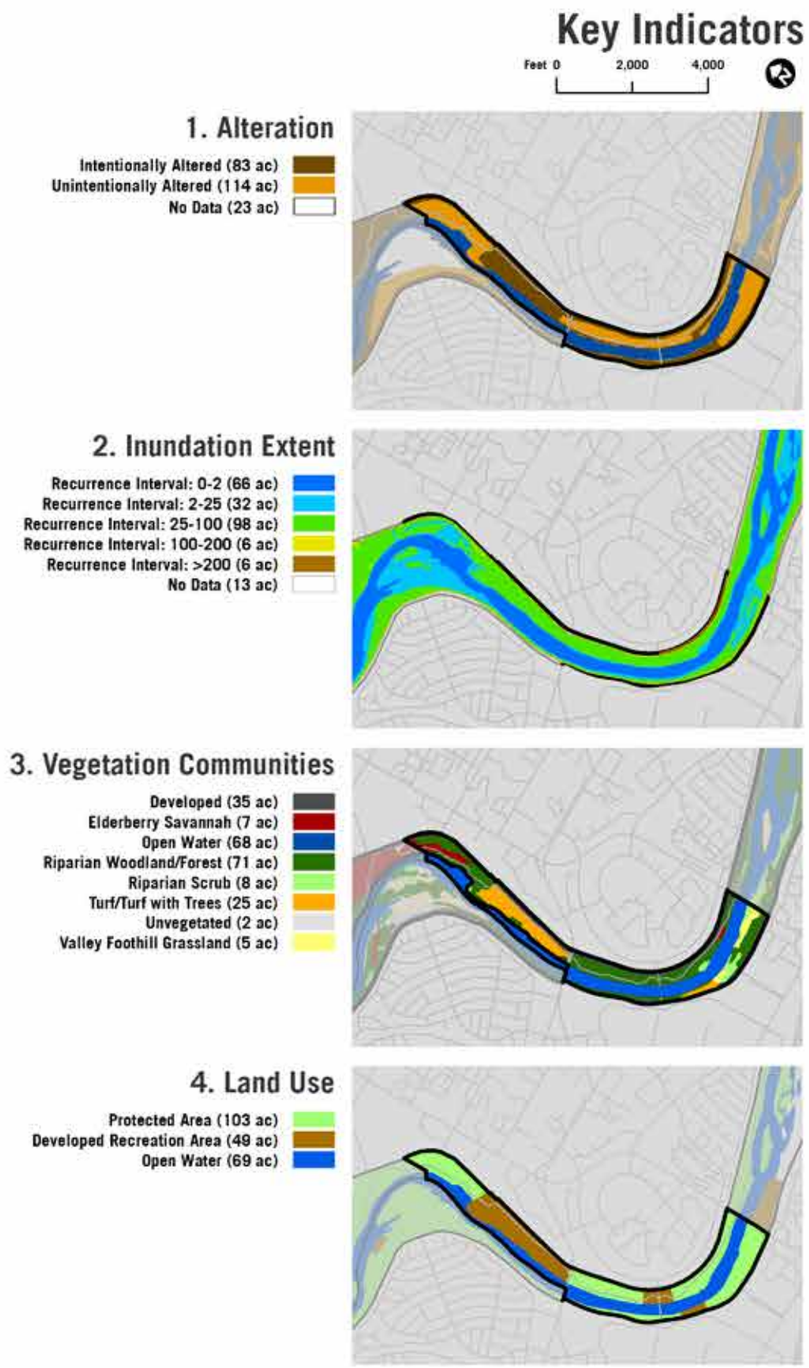



Figure 8-26
Area Plan 5 Campus Commons A

## Potential Management Actions

1. Establish low-growing native vegetation under power lines
2. Lower floodplain
3. Improve floodplain connectivity to reduce fish stranding

Campus Commons Golf Course
Howe Ave
Fair Oaks Blvd
University Ave
American River
Guy West Bridge
H St
E.A. Fairbairn Water Intake

Parkway Boundary
Powerline Easement
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Lower Tributaries
Levee

Boat ramp, Trailer boat
Picnic Area
Car Top Boat Launch
Parking
Restroom
River Mile

Federally Protected Mitigation Area
Proposed USACE Bank Protection

Management Category
Conservation
Restoration
Naturalization
No Data/Private Property

0 500 1,000 Feet

Figure 8-27
Area Plan 5 Campus Commons B

AREA PLAN 6

# HOWE AVENUE

## Howe Avenue Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the Howe Avenue area featured a semi-confined, relatively steep channel limited by steep banks on RR and RL. The channel bed was composed of gravel and cobble, while the banks consisted of relatively erosion-resistant materials of varying degrees. Portions of the channel and overbank areas were composed of the very resistant Fair Oaks formation, overlain by more recent overbank deposition. The area's steep banks either resisted erosion or experienced cycles of erosion, retreat, deposition and accretion. Seasonal low-flows were in the 200-400 cfs range for protracted periods in the summer and fall. These conditions produced a scour and sprout vegetation regime which likely narrowed the riparian canopy to the toe of the bank and its lower slopes and created very limited SRA habitat during low flows.

### Impact of European Settlement

The hydraulic mining activity affecting other areas downstream also affected the Howe Avenue area. The channel and overbank areas both aggraded equally and stayed connected. However, post-Sierra Nevada hydraulic mining river flows flushed the excess material out of the river channel but left hydraulic mining deposits on the overbank floodplains. This process resulted in a net increase of several feet in overbank and floodplain elevation relative to the channel bed.

Farmers cleared vegetation almost to the river's edge for a variety of agricultural needs beginning in the late 1800s. Remaining riparian vegetation occupied a narrow band along the channel margin, likely replicating pre-settlement conditions.

Construction of levees along both banks blocked outbreak flooding that previously allowed peak flows to escape the channel. This change concentrated flows to the space between the levees, increasing flow velocities and depths and encouraging channel enlargement and bank erosion.

From the late 1950s to early 1970s the Howe Area was intensively mined in the channel and on the channel-margins. In-channel mining significantly deepened channel sections and substantially lowered "native" bed elevations, resulting in substantial channel flattening (e.g., reducing the gradient of the channel). Channel-margin mining widened the channel by up to several hundred feet in places and resulted in off-channel ponds on RL that were intermittently connected to the main channel. In the late 1960s, flood flows breached the separation berm in the area just south of the existing island and captured the mining pond. This captured mining pond on RL became the main river channel, moving the river to the south of the island, through the captured mining pond.

Farther upstream on RL, the channel margin mining has left a series of backwater ponds and channels that are interconnected at moderate flows and are surrounded by dense riparian vegetation.

This reach is gravel bedded and could aggrade due to its over-deepened condition from mining, but any aggradation will be very slow due to upstream areas capturing available material (e.g., mining pits and over widened channels) before they can reach the Howe area. However, loads of sand are also present in the channel as it runs through the Howe Avenue area, which could aggrade the backwater areas. Although most of this sand is temporarily stored on the channel bed before being conveyed downstream, some sand goes into long-term storage in the off-channel ponds and overbank area.

These channel and channel-margin conditions have enlarged the extent of riparian habitat in area, and on RL have expanded aquatic and channel edge habitat complexity. However, the channel configuration on RL may be contributing to degraded salmonid water temperature conditions and may provide suitable conditions for predator fish species.

The RR overbank area is characterized by steep banks composed of a combination of erosion-resistant materials and hydraulic mining debris that supports patches of riparian vegetation and oak savanna. A bank protection project was installed on the RR bank in the early 2000s to protect the levee from erosion. Electric transmission lines cross the Parkway immediately upstream of Howe Avenue, with the maintenance of these lines limiting woody vegetation beneath.

## Present Conditions

All of the Howe Avenue area was either intentionally or unintentionally altered by the previously described mining and agricultural activities. These activities removed much of the riparian vegetation throughout the area. In recent decades, however, riparian vegetation has regenerated.

The river channel remains over-deepened from past mining activities, and the upstream areas retain most incoming sediment. During over-bank flows the RL channel-margin mining pit area, sand deposition causes ongoing surface aggradation. Ongoing sand deposition contributes to the shallowing of backwater areas and developing emergent habitat conditions, which will expand the vegetation growth on the overbank area, limit hydraulic efficiency of the area, and eventually concentrate flows into the main channel, exacerbating erosional pressures on the RR bank.

The RR overbank area varies in width but is quite narrow upstream, widening somewhat just upstream of Howe Avenue. Bank protection is planned for all areas on RR that do not have existing bank protection, given the risk that very high velocity flows could destabilize the area's steep banks and threaten erosion into the levee. The bank protection design includes moving the existing island and a portion of the RL overbank to widen the narrowest portion of the RR overbank area and planting native riparian vegetation.

*Aerial view of the Howe Avenue Area. Photo Credit: John Hannon*

Vegetation on the overbank areas is in good condition, reflecting a mix of species dominated by oaks with some grassland understory on RR and a dense mix of riparian species on RL. Much of the area has relatively high-quality wildlife habitat, especially the dense willow riparian scrub and cottonwood and mixed riparian forests along the banks and abandoned mining pits. Where trees overhang the water surface, they provide good cover for aquatic species and perch and roost sites for bird species. The captured gravel pits create slow-moving warm-water habitat under some conditions that can favor nonnative fish that prey on rearing juvenile salmon. Invasive nonnative plants are a management issue throughout.

The Howe Access has had 120 bird species recorded over the past 5 years (as documented in eBird). This is a relatively narrow section of the parkway, with tall cottonwoods, oaks and some non-native black locust with willow brush, a native understory, and flooded backwaters. The Howe Bridge is used for nesting Cliff swallows and a green heron rookery occurs adjacent to, just outside of the Howe Area.

Interspersed through portions of the area (e.g. near Howe Avenue, the island, and along the RL overbank) are encampments, which are severely degrading the woodlands in those areas and likely deterring use by wildlife. Invasive plant species are also present throughout. Large stands of giant reed on the river bank, as well as red sesbania, Chinese tallow, and an island population of Spanish broom have been removed as part of the IPMP but this effort will

*Levee roads in the Howe Avenue Area. Photo Credit: Regional Parks*

need to continue to maintain control of these high priority invasive species.

Overall, much of the vegetation in the area is in good condition, but subject to substantial ongoing degradation. Degradation of the vegetation, the understory in particular, reduces its value as wildlife habitat. And the activities leading to the degradation (e.g., encampments, rampant social trails) are also a deterrent to wildlife.

## Expected Future Trends

The river channel is expected to continue to be gravel-bed dominated with the upstream portion slowly aggrading due to its over-deepened condition, and the downstream end continuing to degrade as available gravel moves through. As the levees concentrate high velocity flows through the area, the continued threat of erosion (primarily on RR) is expected on unprotected bank areas. Planned bank protection projects on RR are intended to halt erosion while preserving remaining overbank areas. The RL channel margin surface is expected to slowly increase in elevation with ongoing sand deposition, slowly filling in the ponds and channels. The overall extent and types of vegetation are generally expected to remain constant. However, some will be lost as a result of bank protection projects, to be replaced onsite to the extent feasible. Additional mitigation that also accounts for temporal impacts above the original impacts will be mitigated offsite and within the Parkway. In addition to protecting the flood control levee, the RR project is intended to conserve the existing overbank area and the existing vegetation it supports.

The greatest factors influencing future vegetation are bank protection projects, illegal camping degrading the understory, wildfire, and the spread of invasive species. Bank protection projects will incorporate native vegetation into the design and/or provide offsite mitigation within the Parkway.

## Desired Conditions

Desired conditions are based on maintaining general channel processes and accommodating expected foreseeable future trends and conditions. This would include limiting future bank and levee protection projects to those required for public safety, protection of property outside of the Parkway, and protection for existing substantial, unmovable non-Parkway infrastructure within the Parkway. Future infrastructure should be designed in a manner to not necessitate additional bank protection. Restoration and naturalization projects should be located and designed in a manner to avoid impediments to, and constraints on, appropriate future channel management actions that maybe necessary.

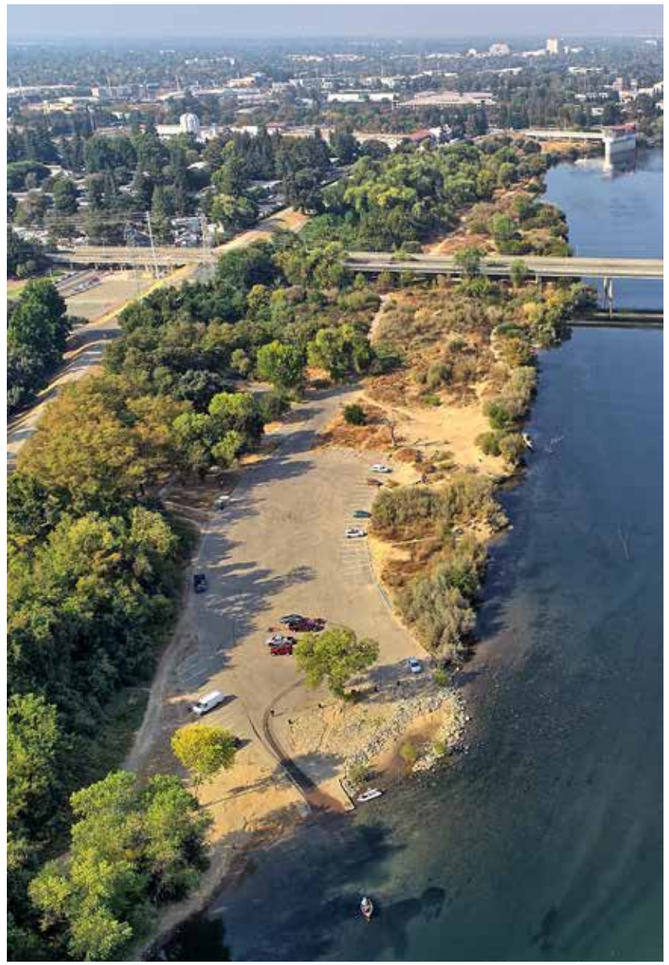
The desired condition for habitat is to conserve existing native vegetation that occurs throughout much of the area and to restore and enhance, where feasible, impacted vegetation. Invasive species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation, in a manner consistent with ongoing processes. Managing for a healthy woodlands with limited degradation from human uses would improve habitat values.

## Site-Specific Potential Resource Management Actions (Figures 8-28 and 8-29)

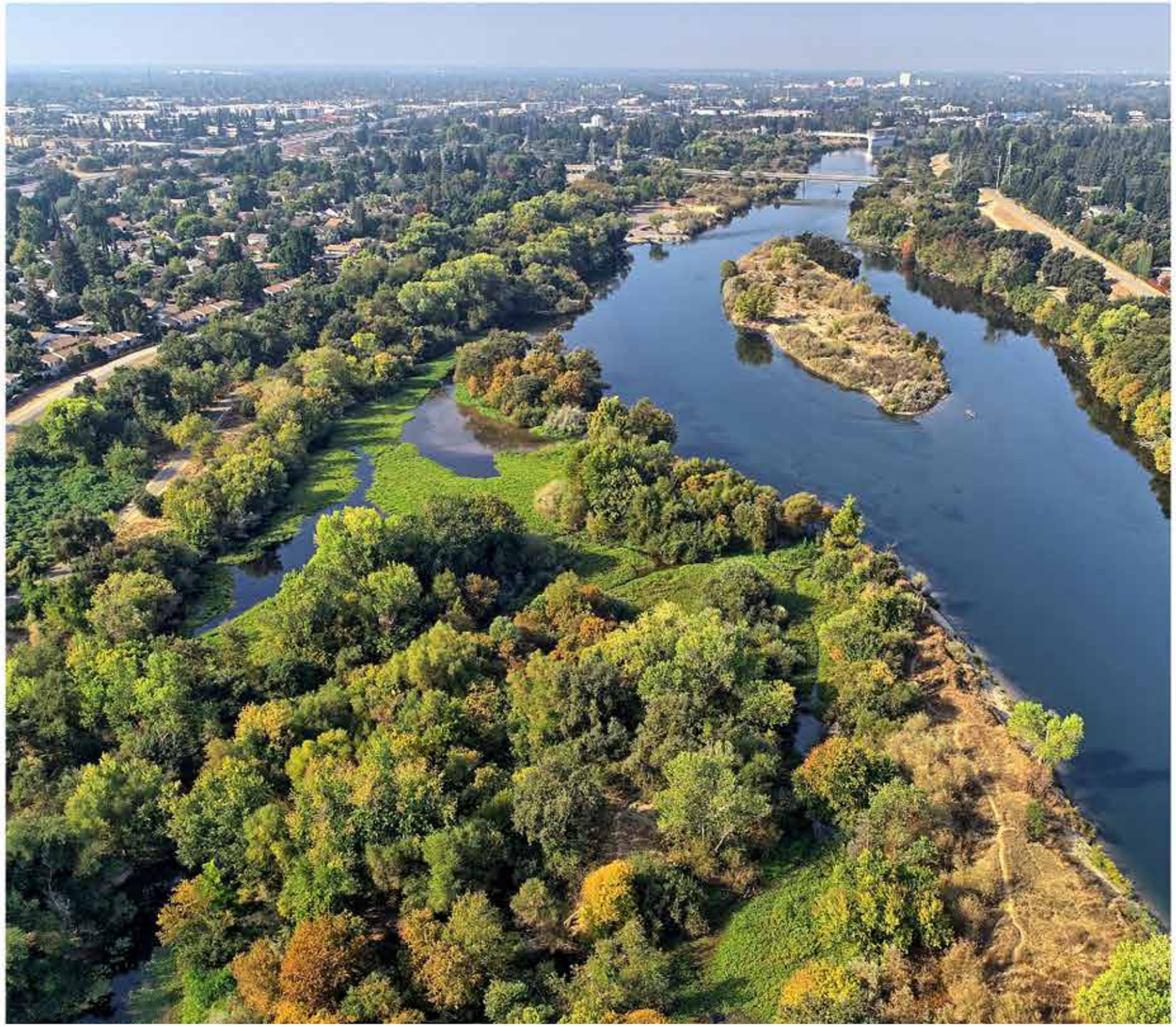
1. **Establish low-growing native vegetation under powerlines:** Develop a formal vegetation management agreement with electrical utilities for transmission line Right of Ways, including establishment of appropriate and compatible forbs, grasses and shrubs to maximize potential habitat for wildlife (including pollinators). Depending on species utilized it may also be possible to provide fuel breaks to protect adjacent wildlife habitat. Control of invasive plant proliferation and aesthetics is key to improving the natural resources in the area. Consideration should also be given to establishing hedgerows that could provide a buffer and screen of the power corridor. Encourage the undergrounding of utility lines whenever feasible.
2. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Howe Area should include efforts to continue to remove red sesbania, Chinese tallow, and the island population of Spanish broom, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation, and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Recreational facilities management and habitat: Identify opportunities to manage recreation improvement areas to protect or enhance wildlife habitat. This may include specifying types of vegetation and/or timing of maintenance activities.



*Aerial view of a parking lot and the Howe Avenue Bridge in the Howe Avenue Area. Photo Credit: John Hannon*



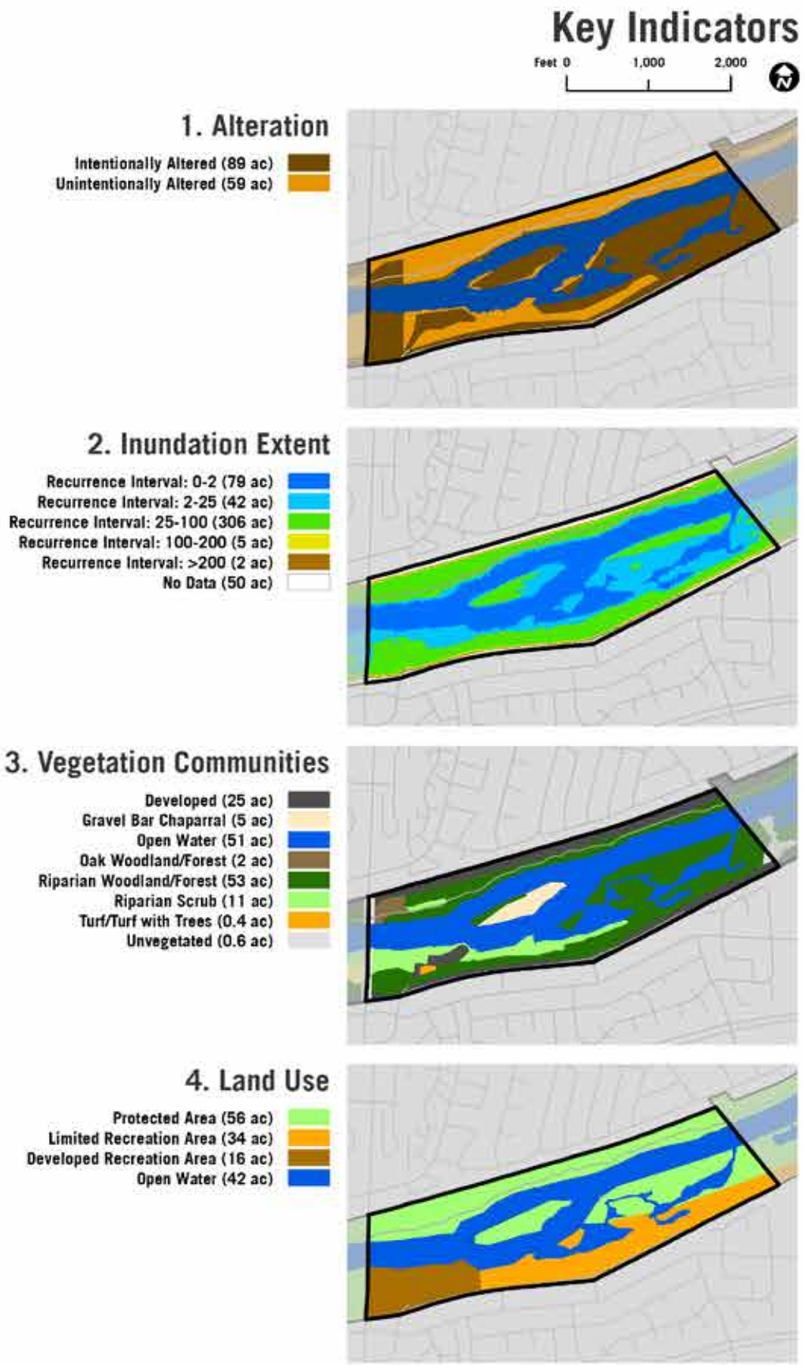



Figure 8-28
Area Plan 6 Howe Avenue A

## Potential Management Actions

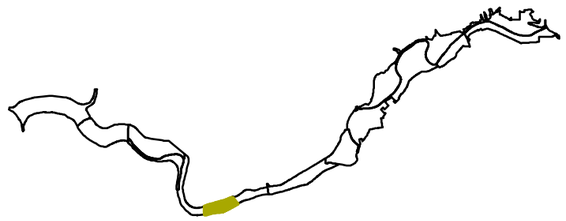
1. Establish low-growing native vegetation under power lines
2. Lower floodplain

Parkway Boundary
Powerline Easement
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Lower Tributaries
Levee

Boat ramp, Trailer boat
Car Top Boat Launch
Parking
Restroom
River Mile

Federally Protected Mitigation Area
Proposed USACE Bank Protection

Management Category
Conservation
Restoration
No Data/Private Property



0 500 1,000 Feet

Figure 8-29
Area Plan 6 Howe Avenue B

AREA PLAN 7

# WATT AVENUE

## Watt Avenue Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the reach of the LAR that includes Watt Avenue featured a semi-confined relatively steep channel limited by steep banks on RR and RL. The channel bed was composed of gravel and cobble while the banks consisted of relatively erosion-resistant materials of varying degrees. Portions of the channel and overbank areas were composed of the very resistant Fair Oaks formation, overlain by more recent overbank deposition. The area's steep banks either resisted erosion or experienced cycles of erosion, retreat, deposition and accretion. Summer and fall low-flows were in the 200-400 cfs range for protracted periods. These conditions produced a scour and sprout vegetation regime which likely narrowed the riparian canopy to a thin band from the toe of the bank and its lower slopes and created very limited areas of SRA habitat during low flows.

### Impact of European Settlement

The hydraulic mining activity affecting other Area Plans downstream also affected the Watt Avenue area. While the hydraulic mining debris caused substantial aggradation of the river channel, the floodplain only aggraded several feet. After the hydraulic mining era, the post-mining river flows washed out the excess material from the LAR channel, but not from the overbank floodplain. This process resulted in a net increase in overbank and floodplain elevation relative to the channel bed of several feet. In other words, the distance from the river channel to the overbank area was now several feet higher than it was pre-settlement.

Agricultural operations begun in the late 1800's cleared riparian vegetation from the river floodplain, extending almost to the river's edge. The remaining riparian vegetation only existed as a narrow band along the channel margin.

Construction of levees along both banks stopped the outbreak flooding that previously occurred in this area when peak flows escaped the channel. This change narrowed the effective width of floodplain inundation during overbank flows, increasing flow velocities and depths in the levee confined floodway and encouraging channel enlargement and bank erosion.

From the late 1950s to early 1970s, intensive in-channel and channel-margin mining in the Watt Avenue area overly deepened channel sections and substantially lowered "native" bed elevations, resulting in substantial channel flattening. The portion of the channel bed upstream of Watt Avenue Bridge was stripped of material that could be mobilized, a condition that subsequently persisted and is not expected to change. Downstream of Watt Avenue Bridge, channel-margin mining has widened the channel by up to several hundred feet, leaving behind a gravel bed area that captures sediments flowing into it. However, due to the limited sediment supply flowing into this area (most having already been captured upstream by similarly over-widened channels and abandoned mining pits) the area downstream of the Watt Avenue Bridge is aggrading at a much slower rate.

A mid-channel bar located just downstream of the bridge consists of gravels captured in this area. This "island" formation is stable under most flows, but its presence increases erosional pressure on the RR bank. The channel also moves sand through the Watt Avenue area. Most sand flowing into the Watt area is temporarily stored on the channel bed before being conveyed downstream. But some sand stays in long-term storage in the off-channel ponds and overbank floodplain. The gravel mining and sand deposition resulted in larger stands of riparian habitat in area, especially on RL where the mining expanded aquatic and channel edge habitat complexity. The resulting mined channel conditions may be detrimental to salmonids due to warmer water temperatures and suitable conditions for predator fish species.

At the downstream end of the Watt Avenue area, electric transmission lines cross the Parkway, with the maintenance of these lines limiting woody vegetation beneath.

## Present Conditions

Much of the Watt Avenue area was either intentionally or unintentionally altered by the previously described mining and agricultural activity. However, there are some areas on both banks considered unaltered (RR overbank areas and RL overbank area upstream of the bridge and extending just downstream of the bridge). Although much of the vegetation had been removed in altered areas, substantial riparian regeneration has occurred over the decades. The river channel remains over-deepened from past mining activities and most incoming sediment is retained in the areas upstream of Watt Avenue. The backwater mining pits on RL are gradually filling up with sand deposition during over-bank floods, causing this backwater area to become increasingly shallow and filling in and allowing for emergent and riparian vegetation growth. This progressive vegetation growth on both RR and RL may limit the hydraulic efficiency of the area and concentrate flows into the main channel. At the same time, the riverbank is vulnerable to erosional forces downstream of the bridge on RR and upstream of the bridge on RL.

Bank protection is planned in two locations in the Watt Avenue area to protect the high risk bank erosion areas comprising a mix of erosion resistant materials and hydraulic mining debris. The RR bank protection area begins downstream of the island and continues into the Howe Avenue area with rock protection along the channel toe and extending up the bank. The RL bank protection area begins upstream of the bridge and continues upstream into the SARA Park area with a rock trench outside of the low flow river channel along the toe of the flood control levee. Both project areas will be revegetated, to some extent, with riparian vegetation.

*Levee and Parkway-adjacent office use in the Watt Avenue Area. Photo Credit: Regional Parks*

Vegetation on the overbank areas is in good condition, reflecting a mix of species dominated by mixed riparian forests and oaks on RR and a dense mix of riparian species on RL. Much of the area has relatively high-quality wildlife habitat, especially the dense willow riparian scrub and cottonwood and mixed riparian forests along the banks and abandoned mining pit. Where trees overhang the water surface, they provide good cover for aquatic species and perch and roost sites for bird species. The captured gravel pit creates a slow-moving warm-water habitat under some conditions that can favor nonnative fish, such as striped bass, that prey on rearing juvenile salmon. Invasive nonnative plants, such as black locust trees and red sesbania, are a management issue throughout. Red sesbania, giant reed, and Chinese tallow tree have been removed along the river bank and river island as part of the IPMP but this effort will need to continue to maintain control of these high priority invasive species.

Like much of the American Parkway, Watt access is a birding “hotspot” with 119 bird species recorded over the last 5 years (2016 through 2021, as recorded on eBird). It is similar to the Howe Access, with flooded backwaters on the south side, but features a much wider north bank area, with cottonwoods and valley oaks dominating the overstory. A backwater area just upstream of the Watt bridge on the south bank supports the rare Sanford’s arrowhead plant.

*Access gate and paved path in the Watt Avenue Area. Photo Credit: Regional Parks*

Many of the larger oak trees in the thin band of south bank vegetation downstream of Watt Bridge are slated for removal for a USACE levee protection project.

Encampments interspersed through portions of the area are severely degrading the woodlands in those areas, likely deterring use by wildlife, and are also sometimes responsible for wildfires. Overall, much of the vegetation in the area is in good to moderate condition, but subject to substantial ongoing decline.

## Expected Future Trends

The river channel is expected to continue to be gravel and cobble bed dominated, but any continued aggradation downstream of the bridge will be very slow as there is minimal available supply upstream. As the levees and expanding riparian vegetation concentrate high velocity flows through the area, the threat of erosion to the identified sites is expected to continue unless hardened with bank protection. The planned bank protection project on RR is intended to halt erosion while preserving remaining overbank areas, and the bank protection project on RL is intended to protect the levee if erosion reaches a buried rock trench. However, this bank protection will not protect the overbank from erosion or the existing vegetation it supports. Sand deposition will slowly fill in the ponds and channels on RL downstream of the bridge, allowing riparian forest to expand. RL bank retreat may occur slowly, but the bank material is resistant enough that the rate of retreat is not expected to be an issue. The overall extent and types of vegetation are generally expected to remain constant, although some vegetation will be lost as a result of bank protection projects and replaced onsite to the extent feasible. Mitigation will also be provided offsite and within the Parkway. Many of the tall overstory trees between RL Watt bridge and upstream to the Mayhew drain are expected to be lost and not replanted due to the bank protection project. Deposition will continue in the RL embayment just downstream of the bridge, possibly creating an off-channel pond as sediment accumulates on the channel edge.

The greatest factors influencing future vegetation are bank protection projects, encampments degrading woodlands, wildfires that can kill overstory cottonwoods and weaken other overstory trees, and the spread of invasive species.

## Desired Conditions

Desired conditions are based on maintaining general channel processes and accommodating expected foreseeable future trends and conditions. This would include limiting future bank and levee protection projects to those required for public safety, protection of property outside of the Parkway, and protection for existing substantial, unmovable infrastructure within the Parkway. Future infrastructure should be designed in a manner to not necessitate additional bank protection. Restoration and naturalization projects should be located and designed in a manner to avoid impediments to, and constraints on, appropriate future channel management actions that maybe necessary.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation.

## Site-Specific Potential Resource Management Actions (Figures 8-30 and 8-31)

1. **Establish low-growing native vegetation under powerlines:** Develop a formal vegetation management agreement with electrical utilities for transmission line Right of Ways, including establishment of appropriate and compatible forbs, grasses and shrubs to maximize potential habitat for wildlife (including pollinators). Depending on species utilized it may also be possible to provide fuel breaks to protect adjacent wildlife habitat. Control of invasive plant proliferation and aesthetics is key to improving the natural resources in the area. Consideration should also be given to establishing hedgerows that could provide a buffer and screen of the power corridor. Encourage the undergrounding of utility lines whenever feasible.
2. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Watt Area should include efforts to continue to remove red sesbania, Chinese tallow, and giant reed, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation, and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Recreational facilities management and habitat: Identify opportunities to manage recreation improvement areas to protect or enhance wildlife habitat. This may include specifying types of vegetation and/or timing of maintenance activities.

*Flood waters near the Watt Avenue Bridge during the 2017 flood. Photo Credit: Scott Webb*

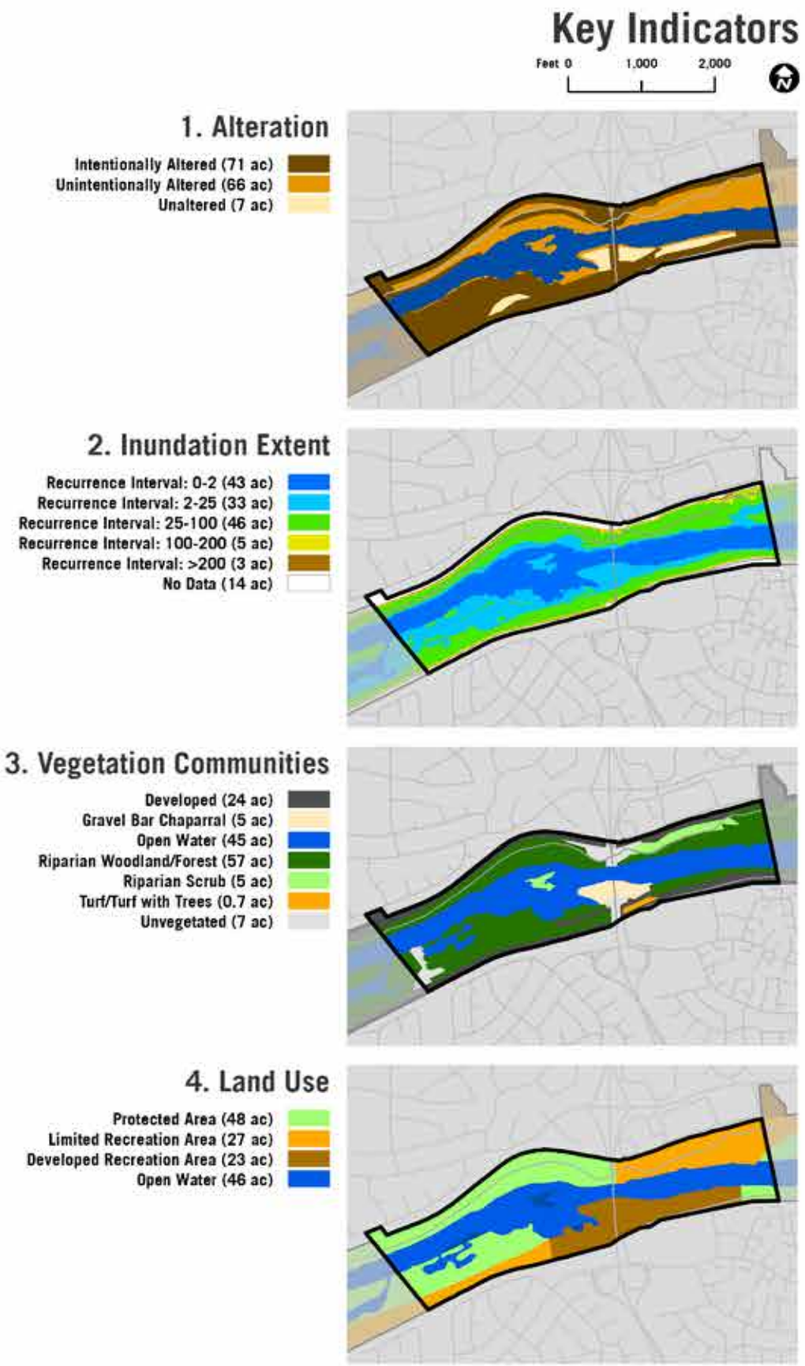



Figure 8-30
Area Plan 7 Watt Avenue A

## Potential Management Actions

1. Establish low-growing native vegetation under power lines
2. Lower floodplain

Parkway Boundary
Powerline Easement
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Lower Tributaries
Levee

Boat ramp, Trailer boat
Car Top Boat Launch
Parking
Restroom
River Mile

Proposed USACE Bank Protection

Management Category
Conservation
Restoration

No Data/Private Property

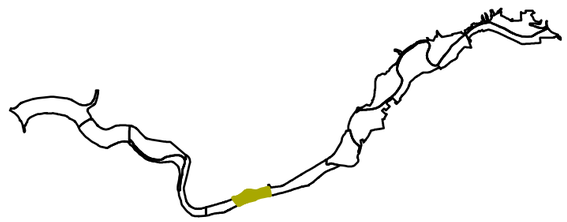


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Figure 8-31
Area Plan 7 Watt Avenue B

AREA PLAN 8

# SARA PARK

## SARA Park Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the reach of the LAR that includes SARA Park featured a semi-confined, relatively steep channel, limited by steep banks on RR and RL. The channel bed was composed of gravel and cobble while the banks consisted of relatively erosion-resistant materials, including portions with the very resistant Fair Oaks formation, overlain by more recent overbank deposition. The area's steep banks either resisted erosion or experienced cycles of erosion, retreat, deposition and accretion. Given these conditions, the riparian dynamic was a scour and sprout regime with the riparian canopy occupying the toe edge of the bank and lower bank slopes. The width of the historic riparian forest in this location is unknown.

Seasonal low flows were in the 200-400 cfs range for protracted periods in the summer and fall. This flow regime limited the interface of riparian vegetation with the river and there was likely limited SRA habitat during low flows.

### Impact of European Settlement

The hydraulic mining activity (affecting other Area Plans downstream of about RM 10) also affected SARA Park Area Plan. While the hydraulic mining debris caused substantial aggradation of the river channel, the floodplain only aggraded several feet. However, after the hydraulic mining era, the post-mining river flows washed out the excess material from the LAR channel, but not from the overbank floodplain. This process resulted in a net increase in overbank and floodplain elevation relative to the channel bed of several feet. In other words, the distance from the river channel to the overbank area was now several feet higher than it was pre-settlement.

Agricultural operation begun in the late 1800's cleared the riparian vegetation from the river floodplain, extending almost to the river's edge. The remaining riparian vegetation only existed as a narrow band along the channel margin.

Levee construction along both banks blocked the outbreak flooding that previously exported portions of peak flows from the LAR both north and south. This levee blockage narrowed the effective width of floodplain during overbank flows, increasing river flow velocities and depths while increasing rates of channel widening and bank erosion in SARA Park.

From the late 1950s to the early 1970s, intensive gravel mining in the river and on the banks of SARA Park overly deepened portions of the river channel and substantially lowered "native" bed elevations, resulting in substantial channel flattening (e.g., decreasing the gradient of the channel bed from upstream to downstream). Channel-margin mining widened the channel by up to several hundred feet and left ponds isolated from the main channel by a narrow separation berm (the residual RR bank line). By the late 1960s, flood flows had breached the separation berm at several locations, allowing the LAR to capture these ponds. Sand deposition and subsequent flood flow greatly enlarged the remaining separation berms, and turned them into long sand islands, standing about 8 feet above the area's low flow water surface elevations, supporting the growth of well-developed riparian communities.

During the gravel mining era, the overall channel width increased from approximately 300 feet to as much as ~1,200 feet, further reducing the capacity of this already over-flattened waterway to convey sediment through the reach to downstream areas. Eventually, all of the course sediment entering this area goes into long-term storage in the form of river bed aggradation in the upstream reach; it appears that only the smallest material, such as sand and small gravels, may pass through to downstream areas. Most sand is likely conveyed downstream, but some goes into long-term storage in the off-channel ponds and overbank areas, while the sand in the channel bed is only in transient storage. These gravel-mined conditions have greatly enlarged and expanded opportunities for riparian habitat

and have increased the complexity of aquatic and channel edge habitat. However, the channel configuration may also have contributed to warmer water temperatures that are less suitable for salmonids and may have also provided enhanced conditions for predator fish species, such as striped bass.

In areas where mining has not widened the channel, ongoing bank erosion has resulted in several bank protection projects on the RL bank to protect public safety. These projects have diminished bank line resources such as riparian communities and recreational opportunities and over time could contribute to further bank erosion at the upstream and downstream ends of the existing protection.

## Present Conditions

All of SARA Park is either intentionally or unintentionally altered by the previously described actions. However, riparian vegetation has regenerated over much of the previously cleared areas. The river channel remains over-deepened from past mining activities, retaining almost all incoming sediment that has not already been retained in the upstream Arden Bar Area Plan. River islands are aggrading from sand deposition during over-bank flow events. At the same time, the edges of existing bank lines (particularly the north bank abutting the captured ponds) are eroding, with up to 6 feet of bank retreat over the past 10 years. Sand eroding from the islands and upstream sources is shallowing backwater areas and developing emergent wetlands. The RL overbank berm is narrow and vulnerable to bank erosion at the downstream end. Growing and expanding riparian vegetation on the overbank area may reduce the area's hydraulic efficiency and concentrate flows back into the main channel.

*The LAR at high flow in the SARA Park Area. Photo Credit: Wildlife Conservation Board*

Vegetation on the overbank areas is in good condition, reflecting mix of species dominated by oaks with some grasslands. Much of the area has relatively high-quality wildlife habitat, especially the dense willow riparian scrub and cottonwood and mixed riparian forests along the banks and abandoned mining pits as well as some planted elderberry shrubs. Trees overhanging the water surface provide excellent cover for aquatic species and perch and roost sites for bird species.

The captured gravel pits create slow-moving warm-water habitat under some conditions that can favor nonnative predator fish that prey on juvenile salmon. Large populations of red sesbania and Chinese tallow tree, as well as giant reed, pampas grass and Spanish broom have been removed and controlled in along the river bank and the many inlets and island areas. These high priority invasive species will continue to need monitoring and on-going removal to maintain successful management. The parkway road to the Harrington Access is vulnerable to ongoing headcutting erosion from the nearby drainage outfall, most susceptible under high flow conditions which would eventually damage the access road.

SARA Park, like most of the American River Parkway, is a local birding favorite with 160 species recorded in eBird over the last 5 years (2016 to 2021). Several locations are well-documented including the river islands, the Gristmill area, the north bank, with the highest bird counts noted on the south bank near the Mayhew Drain tributary. The Gristmill area includes many locally maintained nesting boxes, occupied each year by Wood Ducks, Screech Owls, and other cavity

*Aerial view of the SARA Park Area. Photo Credit: Regional Parks*

nesting birds. Many species of warblers nest in the large non-native black locust trees in the Gristmill area. Open grassland areas are used for raptor foraging and sometimes ground nesting birds. The rare Sanford's arrowhead plant can be found on the river islands.

## Expected Future Trends

Over an extended period, it is expected that the channel will progressively reconfigure back toward pre-mining conditions. Upstream sand and coarse sediments will gradually refill the captured mining pit area, recreating a single thread channel through the area. In the foreseeable future, the rate of aggradation will depend on the sequence of high flows capable of transporting sediments and the availability of transportable sediment from upstream areas. Riparian habitats are expected to progressively transition from island edges to open water, from open water to emergent vegetation, and from emergent vegetation to riparian terrestrial habitat. Higher elevation overbank areas are expected to continue to support oak woodlands, and lower elevation areas will continue to support a mix of riparian species. The channel is expected to remain a coarse sediment sink, interrupting the transport of coarse sediment, such as gravels, to downstream reaches.

## Desired Conditions

Desired Conditions provide for and accommodate expected foreseeable future natural processes and channel adjustment trends to past human actions. This would include limiting future bank and levee protection projects to those required for public safety and protection of property outside of the Parkway. Future infrastructure, if any, should be designed in a manner that does not necessitate additional bank protection. Restoration and naturalization projects should be located and designed in a manner compatible with ongoing processes and have an expected durability to provide long-term benefits.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. It is also acceptable to allow the mature non-native black locust trees at the Gristmill area to complete their lifecycle since they have been observed to provide habitat for target wildlife species, but it should be controlled from further propagation and spread and ultimately replaced with native vegetation. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native species should be reduced and/or controlled. There are opportunities on the RR overbank, where the channel has been over-widened, to expand woodland and elderberry habitat. Managing for a healthy woodlands with

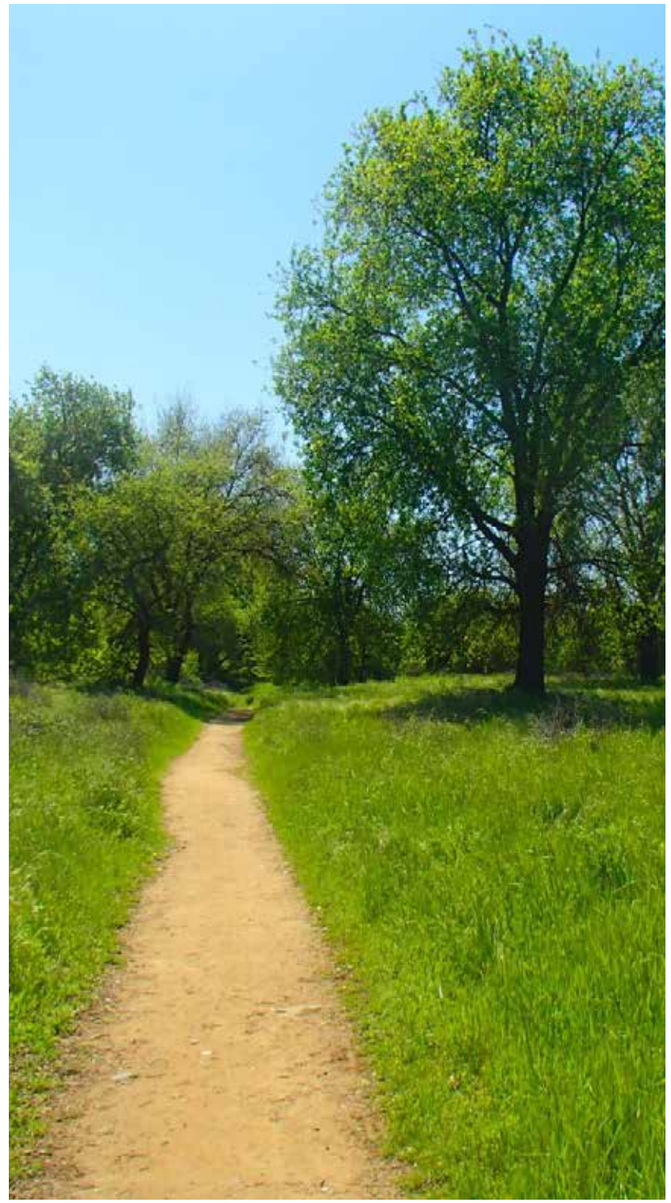
limited degradation from human uses would improve habitat values, as would providing a diversity of habitats to the extent possible.

## Site-Specific Potential Resource Management Actions (Figures 8-32 and 8-33)

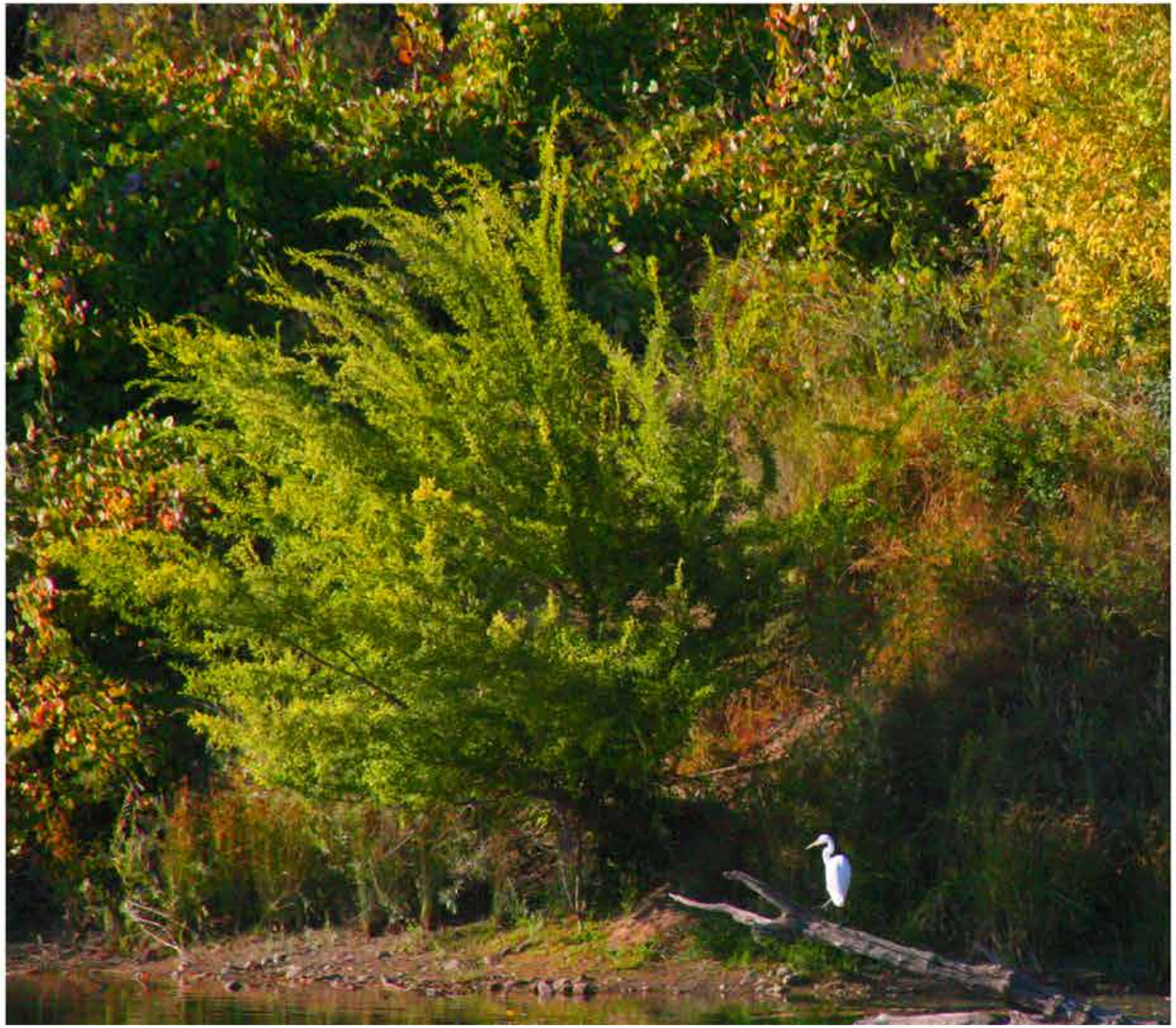
1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Establish valley oak riparian woodland:** Expand target habitats on the right bank upper berm by establishing valley oak riparian woodland and elderberry.
3. **Maintain flow through the drainage slough:** Consistent with managing invasive weeds, identify opportunities to maintain water flow through the drainage slough.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the SARA Park Area should include efforts to continue to remove red sesbania, Chinese tallow, giant reed, pampas grass, and Spanish broom, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation, and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Consider reconfiguring the drain outfall at RM 11.4 RR by extending the pipe to a position near the channel edge and to cover the existing drainage channel with fill material suitable for re-vegetation to reduce the potential for headcutting into the Harrington Access Road during future high-water events.



*Foot trail through oak woodland in the SARA Park Area.*
*Photo Credit: Wildlife Conservation Board*



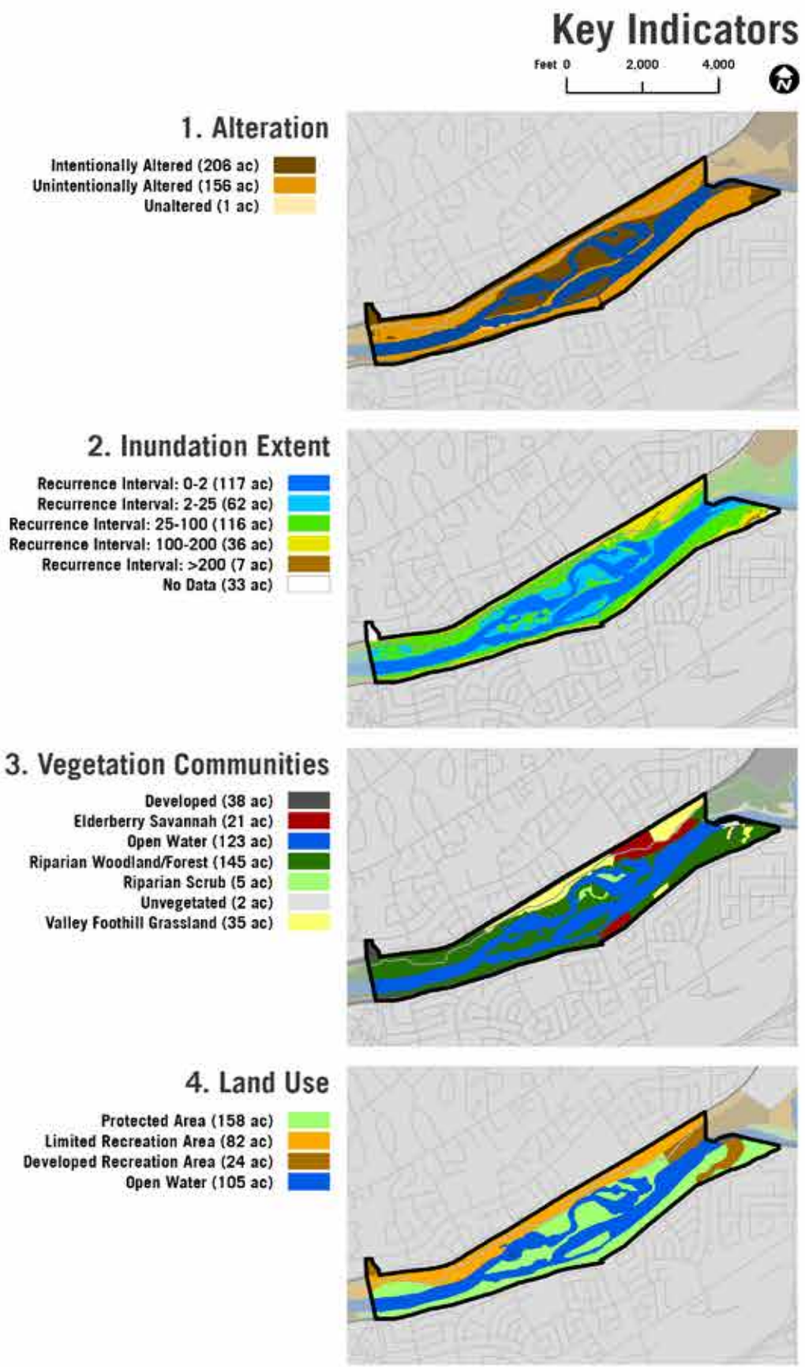



Figure 8-32
Area Plan 8 SARA Park A

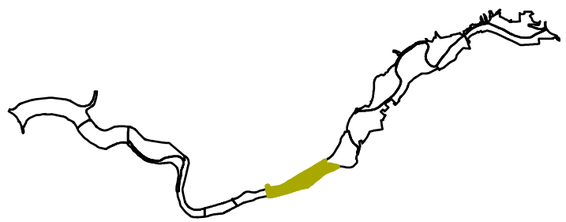
## Potential Management Actions

1. Lower floodplain
2. Establish valley oak riparian woodland
3. Maintain flow through drainage slough

Federally Protected Mitigation Area
Parkway Boundary
Powerline Easement
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Lower Tributaries
Levee

Car Top Boat Launch
Parking
Restroom
River Mile
Proposed USACE Bank Protection
Proposed USACE Bank Protection Mitigation

Management Category
Conservation
Restoration
Naturalization
No Data/Private Property



0 1,000 2,000 Feet

Figure 8-33
Area Plan 8 SARA Park B

AREA PLAN 9

# ARDEN BAR

## Arden Bar Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the reach of the LAR that includes Arden Bar featured a cobble bedded channel confined by steep erosion resistant banks on RL and by a high stable bar on RR. Similar to the modern-day River Bend area, this configuration featured an efficient single threaded channel and a high-flow bypass channel capable of conveying sand and gravel downstream under a wide range of flows.

Overbank areas consisted of a variety of surfaces formed over geologic time, resulting in areas of variable overbank deposition occasionally underlain by the impermeable erosion-resistant Fair Oaks formation. In most higher elevation areas, this impermeable material isolated surfaces from river-fed shallow groundwater, thereby limiting the amount of groundwater available to vegetation and significantly influencing the types and amounts of vegetation able to survive. Vegetation cover near the channel was likely limited by a scour and sprout regime that transitioned to more dense and mature vegetation farther from the channel.

### Impact of European Settlement

Most of Arden bar, including the park, riverbanks, and river channel, was substantially altered by gravel mining operation. The mining stripped vegetation and soil from much of the area, excavated an area that is now a large pond, and left an island complex in the river. The river islands were formed when mining pits along the river's edge were ultimately captured by the river (and are now a coarse sediment sink). These mining pits capture coarse sediments so effectively that essentially all but the finest gravels flowing into this reach go into long term storage, creating bars and closing secondary channels. A portion of the sand load that is captured by these vegetating bars has led to increased bar stability. Mining activities also left wide-haul roads and material handling areas on the bar, which blocked the pre-existing bypass channel along the northern edge of the bar, leaving high, dry, un-vegetated areas. Channel excavation also steepened the gradient of the main river channel within this reach and the downstream reach.

The construction and operation of Folsom Dam and Nimbus Dam changed the flow regime and sediment regime in the LAR but there is no known evidence that this has changed the channel configuration in the Arden Bar area. However, the change in seasonal flows such as higher flows in the low-flow period, may have contributed to some enhanced riparian vegetation extent and vigor and increased the extent of SRA habitat at this location under these flow circumstances. In particular, well-developed riparian communities have established within the island complex resulting from the mining activity.

The northern portion of Arden Bar is separated by a secondary levee and was once a wastewater treatment facility, which has since been decommissioned. There are also highly popular developed recreation areas with mowed turf and picnic facilities in the William B. Pond park area.

Construction of levees, continuously along the north bank and only where there is low ground on the south bank, have stopped the overbank flooding that historically may have occurred in this area, exporting portions of peak flows from the LAR both north and south. This change narrowed the effective width of floodplain inundation during overbank flows, increasing flow velocities and depths in the lower portion of Arden Bar and downstream.

## Present Conditions

Almost all of Arden Bar was either intentionally or unintentionally altered by the previously described actions, with one small area along the northeast edge that is considered unaltered. These actions resulted in the removal of any existing upland or riparian vegetation. In recent decades, substantial riparian regeneration has occurred in some locations where there was enough soil remaining from the mining. There are other areas where regeneration was severely limited due to lack of soil in the post-mining landscape. The river channel remains over-widened and over-steepened from past mining activities, creating a sediment deposition zone that effectively retains all coarse sediment entering the area. In the captured channel-margin mining pit area, which essentially functions as a multi-threaded channel at this time, the bars experience ongoing surface aggradation by sand deposition during over-bank flow events, and some portions support riparian vegetation. These bars serve as important wildlife habitat including a heron rookery. Ongoing additional sediment influx from upstream sources, both naturally occurring and as a result of gravel augmentation projects, is resulting in the shallowing and closing of secondary channels and backwater areas.

Low to moderate flows remain in the main channel, but the Arden Pond feature receives flows over the bar and through the pond during most flow events. The pond is a popular recreation spot and provides habitat for wildlife and waterfowl that prefer still or slow-moving water. The connection with the main channel at the downstream end of the pond is slowly degrading as flows continue to pass through.

Vegetation on some of the overbank areas is in good condition, but much of the area remains scarred by mining. The area with the best relatively high-quality wildlife habitat is within the multi-threaded channel area and at the outermost tip of the bar (behind the pond), comprised of dense willow riparian scrub and cottonwood and mixed riparian forests. The Arden Bar area has been the site of the highest concentrations of red sesbania on the river and has been successfully managed as part of the IPMP. In addition to red sesbania, other high priority IPMP species including giant reed, Spanish broom, and pampas grass have been removed along the river bank and river islands. These areas will need continued monitoring and on-going removal to maintain successful management. Trees overhanging the water surface provide excellent cover for aquatic species and perch and roost sites for bird species. USACE has proposed mitigation project at Arden Bar that would naturalize a portion of Arden Pond to create a bypass channel intended to provide inundated floodplain habitat/SRA for rearing salmonids and would reduce the size of the remaining pond.

*Gazebo and picnic tables in the Arden Bar Area. Photo Credit: MIG*

Arden Bar is a birding “hotspot” (second only to Sailor Bar for avian diversity) on the American River Parkway with 189 species recorded in eBird over the last 5 years (2016 to 2021). Of particular importance is a large heron/egret rookery (16 nests counted in 2020) in a cottonwood grove, currently isolated, (and somewhat protected) on a river island. Cottonwoods and other tall trees in Arden Bar (including eucalyptus) have served as nests sites for White-tailed kites, Red-tailed hawks and Red-shouldered hawks. The fishing pond (former mining pit) attracts a variety of diving ducks and other waterfowl. The pond features two large islands that are dominated in the spring and summer by nesting Canada Geese. Botanically, Arden Bar has areas

*Pond in the Arden Bar Area. Photo Credit: Regional Parks*

with established native bunchgrasses (planted), naturally occurring deer weed, and the pungent vinegar weed on bare soil of mined areas.

## Expected Future Trends

Over an extended period, it is expected that the channel will gradually reconfigure back toward pre-mining conditions and a single threaded channel with a lower gradient. In the foreseeable future, the rate of aggradation will depend on the sequence of high flows capable of transporting material and the availability of transportable material in upstream areas. Habitats are expected to progressively change, including ongoing transition of open water to emergent, and of emergent to riparian vegetation. Higher overbank areas are expected to continue to support oak woodland habitats and lower areas to support a mix of riparian species. The channel is expected to remain a coarse sediment sink, interrupting coarse sediment to downstream reaches.

## Desired Conditions

Provide for and accommodate expected foreseeable future natural processes and channel adjustment trends to past human actions. This would include limiting future bank and levee protection projects to those required for public safety and protection of property outside of the Parkway. Future infrastructure, if any, should be designed in a manner that does not necessitate additional bank protection. Restoration and naturalization projects should be located and designed in a manner compatible with ongoing processes and have an expected durability and provide long-term benefits.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Areas that currently do not support native vegetation due to past mining activities or are in a degraded condition should be considered for naturalization to improve habitat values. Invasive non-native species that are capable of outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled (especially red sesbania at Arden Pond).

## Site-Specific Potential Resource Management Actions (Figures 8-34 and 8-35)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Develop naturalization plan for Arden Pond:** To address ongoing processes and preserve existing habitat values while incorporating rearing salmonid habitat.
3. **Improve native riparian and oak woodland communities:** In other areas identified for Naturalization, develop concepts for increasing oak riparian woodland, live oak/blue oak woodland, or where feasible grading areas to support willow riparian scrub/forest.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Arden Area should include efforts to continue to remove red sesbania, giant reed, Spanish broom, and pampas grass, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation, and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Maintain created spawning habitat: Previously constructed gravel augmentation site will be periodically replenished with additional gravel to maintain suitable habitat for salmonids.

*Eucalyptus trees in the Arden Bar Area. Photo Credit: Scott Webb*

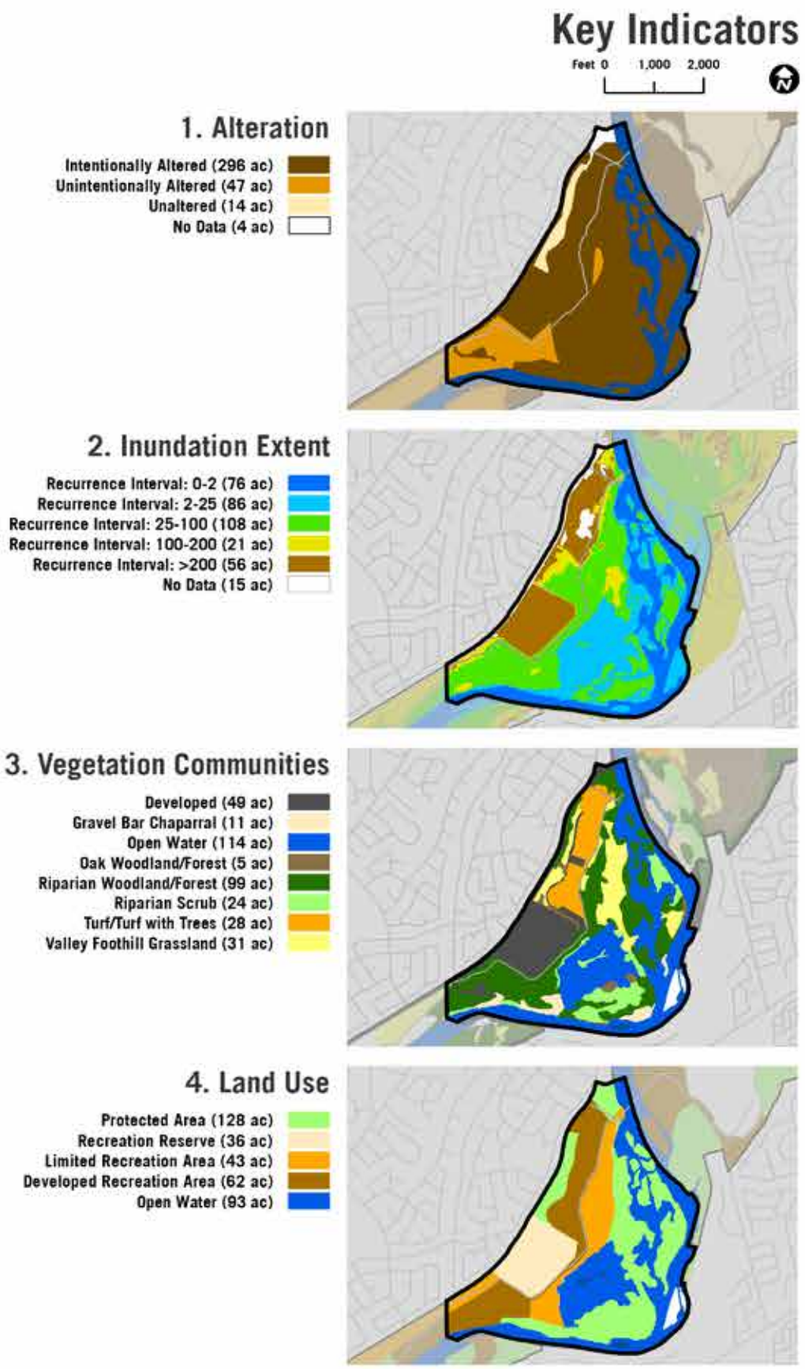
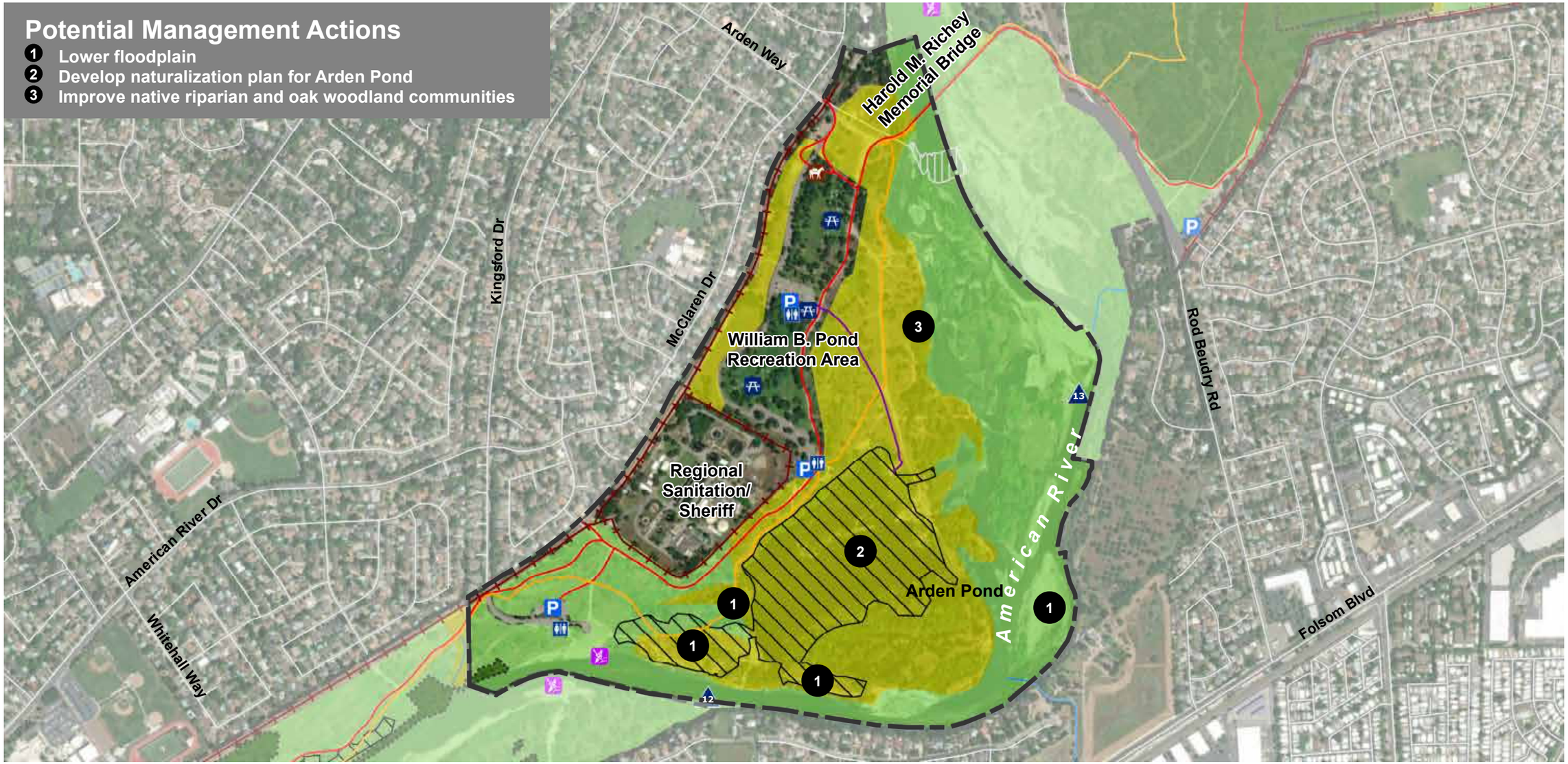



Figure 8-34
Area Plan 9 Arden Bar A

## Potential Management Actions

1. Lower floodplain
2. Develop naturalization plan for Arden Pond
3. Improve native riparian and oak woodland communities




Parkway Boundary
Powerline Easement
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Pedestrian Trail
Lower Tributaries
Levee

Picnic Area
Car Top Boat Launch
Equestrian Staging
Parking
Restroom
River Mile

Federally Protected Mitigation Area
Existing Salmonid Habitat Enhancement
Proposed USACE Bank Protection Mitigation

Management Category
Conservation
Restoration
Naturalization
No Data/Private Property

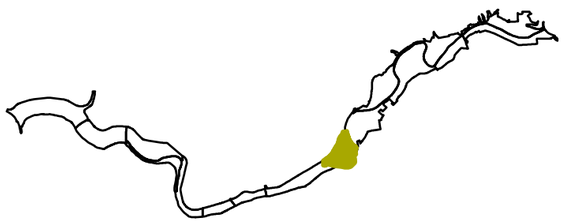


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Figure 8-35
Area Plan 9 Arden Bar B

AREA PLAN 10

# RIVER BEND PARK

## River Bend Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the River Bend area cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials as it migrated north into the Carmichael Bluffs. Along the way it deposited the floodplain materials comprising River Bend. The river channel was largely single-threaded except for a small mid-channel bar that grew smaller or larger with sequences of flood flow scouring and sediment transport events. Riparian vegetation along the channel was driven by a scour and sprout dynamic, with vegetated areas being periodically scoured during higher flows and then reestablishing by root and stem sprouts, with irrigation stress during summer and fall low flows. What is now known as Cordova Creek (previously referred to as Clifton's Drain) ran westward along the backside of the River Bend area and joined the LAR at the downstream end of the River Bend area.

Overbank areas consisted of a variety of surfaces formed over geologic time resulting in areas with and without overbank deposition and variably underlain by the impermeable erosion-resistant Fair Oaks formation. In most higher elevation areas, this impermeable material isolated surfaces from river-fed shallow groundwater, thereby limiting the amount of groundwater available to vegetation and significantly influencing the types and amounts of vegetation able to survive. A major bypass channel carried flows out of the main channel and through River Bend at moderate to high flows, further defining the landscape (which can still be seen today). Bypass channel flows cut across the southern edge of the bar After entering this bypass channel at the upstream end of River Bend and reentering the main channel at the downstream end.

### Impact of European Settlement

Although much of River Bend has been unaltered, large areas have been cleared for agriculture. Neighborhoods grew up around the area, and a concrete-lined storm water runoff channel, which has recently been naturalized as Cordova Creek, was cut though the agricultural fields.

The channel and near-channel areas were altered during a series of flood flows in the mid-1960's that triggered upstream erosion and deposited a substantial amount of coarse material in this area. Since then the channel has undergone progressive internal adjustments, including development of a mid-channel bar/island. Later erosion control, including rocked bank protection and rock groins, were installed at the upstream end of the channel.

The downstream portion of the channel adjacent to the Arden Bar area was mined for gravel, as part of the gravel mining operation at Arden Bar. Capture of the channel margin mining pits on RR created the modern multi-threaded channel as described in the Arden Bar area plan. On RL, in Arden Bar, the mining pits filled in with sediment, creating the bar feature that exists now. More recently, this area has been improved for salmonids with augmented gravel and a side channel project cutting through the existing bar. Some mining also occurred in the upland areas, leaving behind cleared low areas and elevated mounds of mine tailings with limited soil and barren of high-quality vegetation communities.

While large areas of River Bend were generally left unaltered, in-channel and channel-margin aggregate mining activities in the western portion, small areas of excavation mining in the central portion, and agricultural activities in the southeastern portion significantly altered the landscape in these areas of River Bend. The mining removed the sparse vegetation that may have been present in those locations and altered the topography and composition of the surface, leaving behind lowered and modified surfaces. The areas south of the historic bypass channel were cleared of vegetation, and some were leveled, for agricultural use.

## Present Conditions

River Bend Park area today contains the largest patch of contiguous forest or woodland anywhere in the Parkway. This live oak woodland area provides excellent wildlife habitat, with substantial portions of interior habitat.

Most of the former agricultural areas have been planted with VELB habitat mitigation to offset impacts elsewhere on the Parkway. Additionally, the former concrete lined canal now referred to as Cordova Creek has been naturalized into a meandering willow-lined creek surrounded by native plant communities in the uplands. Adjacent to the creek, Soil Born Farms leases the American River Ranch for organic farming and community education.

The most upstream portion of River Bend is extremely narrow and may pose a limitation for wildlife passage.

The river channel within the upstream portion of River Bend continues to undergo progressive adjustments and higher flows impact the erosive RL bank. As the channel continues its sweeping arc around River Bend, the channel is relatively stable but with erosive pressure along the outside bend. The downstream multi-threaded channel continues to be depositional, retaining material that enters from upstream.

A scour and sprout riparian vegetation regime has persisted along channel margins, evidenced by some areas presently bare of well-developed riparian vegetation. This is considered a result of ongoing scour during flood flow events and in balance with the present LAR streamflow dynamics.

River Bend Park, like most of the American River Parkway, is a birding “hot-spot”, with 141 recorded species over the last 5 years (eBird 2016 to 2021). River Bend’s birds are attracted by the largest contiguous live oak forest in the Parkway, the riverfront, and the open grassy areas, as well as the recently naturalized Cordova Creek tributary. Soil Born Farms also incorporates hedgerows and other habitat friendly features into its organic farming operations. Red-tailed hawks, Red-shouldered hawks, Great Horned owls, and American kestrels are known to nest in the larger trees within this park, including the eucalyptus trees. The naturalized Cordova Creek has attracted more wildlife as it matures, including California king snakes (and their prey, the western rattlesnake), kingbirds, Coopers hawks and nesting Red-winged blackbirds. A series of about 25 nest-boxes installed on the nearby VELB mitigation sites are filled each year with nesting Western bluebirds, Tree swallows, and the occasional Ash-throated Flycatcher.

*Equestrians crossing bridge in the River Bend Park Area. Photo Credit: MIG*

Botanically, River Bend Park contains many interesting plants. The interior live oak forest hosts the only population of hoptree in the Parkway, as well as a large specimen of the locally California bay laurel, along with more common Dutchman pipevine (host to the pipevine swallowtail butterfly) and the occasional clematis vine. The overflow channel contains with a variety of scattered locally rare chaparral species such as chamise, buckwheats, yerba santa, foothill penstemon, and coyote mint. As part of the IPMP large stands of pampas grass have been successfully removed from the gravel bar and river bank, giant reed, invasive brooms (Spanish, French, and Scotch), and Chinese tallow have also been removed but this effort will need to continue to maintain control of these high priority invasive species.

*View of the LAR channel over a field over yellow starthistle in the River Bend Park Area. Photo Credit: MIG*

An unimproved parking facility is located near the park entrance and adjacent to the picnic areas. There is another unimproved parking facility located near the day and overnight group camping area. River Bend Park consists of two distinct areas, the western portion, which is heavily vegetated, and the area to the east, which is presently being leased for agricultural uses. The two areas are divided by the existing bicycle trail. A variety of activities take place in the western portion of the park, including picnicking, day camps and overnight group camping, fishing and equestrian use. In addition, the area is a popular take-out point for rafters.

The Camp Fire Day Camp Area is located at the northern end of the park and has a layout for day and overnight camping programs. All of the structures on the property shall be made of natural materials, natural-looking materials, or painted to blend with the surrounding environment, consistent with the Parkway Plan's policies.

Soil Born Farms leases American River Ranch, which includes the Elderberry Farms Native Plant Nursery and demonstration farm using organic farming methods. The demonstration farm encourages organic farming to protect the habitat and waters of the American River. A primary purpose of the native plant nursery is to provide a supply of native plants for the Parkway, which are grown in climate and conditions equivalent to that of their final planting site. These facilities provide a site for school age children and adults throughout the region to learn the techniques of plant cultivation and care, tree pruning, organic farming and other horticultural techniques.

## Expected Future Trends

Physical changes in the River Bend landform and river channel should not change substantially in the foreseeable future, although it is possible that the effects of Folsom Dam on LAR hydrology and sediment supply could eventually lead to physical channel changes in the River Bend reach. This conforms with observed rates of change on other gravel-bed rivers.

Ongoing channel processes and adjustments indicate several potential trends, starting with slow erosion in the upstream due to natural channel entrenchment patterns in the narrow portion of the Parkway. In the middle reaches, bank erosion during high flows (e.g., greater than 100,000 cfs) would likely result in slope relaxation rather than channel migration. Ongoing deposition will occur on the attached and mid-channel bar in the downstream reaches due to the over-widened channel condition. Finally, RL bank erosion may take place in the downstream reaches due to the growth of midchannel bars as a result of deposition. Ongoing channel processes will influence the ability of riparian vegetation to take hold, following the existing scour and sprout regime.

Vegetation beyond the channel margins is expected to persist in its current types and configurations. However, the patterns and composition are subject to threats from invasive non-native species, fires, off-trail hiking and biking activity that has produced extensive social trails. Existing mitigation areas consisting of primarily oak woodlands and elderberry shrubs are expected to mature and provide increasingly valuable wildlife habitat. Additional mitigation/naturalization is being contemplated and has the potential to improve habitat connectivity throughout the area.

## Desired Conditions

Maintain ongoing channel processes and accommodate expected foreseeable natural process adjustments in channel conditions. This calls for limiting future bank protection projects to those required for public safety, protection of property outside of the Parkway, and protection for substantial, unmovable infrastructure within the Parkway. There is no need for such projects now or in the foreseeable future. New infrastructure that may be placed in the area should be designed to anticipate ongoing channel processes

so as not to necessitate additional bank protection. Similarly, restoration and naturalization projects should be located and designed to accommodate these processes.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled, with a focus on invasive species within woodland areas, and grassland areas being infiltrated by yellow star-thistle. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation. Managing for a healthy understory with limited degradation from human uses (e.g., social trails and unauthorized off-trail cycling) would improve habitat values, as would conserving some area of open grassland suitable for pollinators and wildlife.

### Site-Specific Potential Resource Management Actions (Figures 8-36 and 8-37)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Improve spawning riffle:** Construct gravel augmentation site to create suitable spawning habitat for salmonids.
3. **Develop conceptual naturalization plan for Cordova Creek confluence area:** The plan should focus on providing improved connectivity and enhance wildlife conditions to the upstream naturalized portion of Cordova Creek. It should also address the narrow bridge crossing and identify interpretive opportunities.
4. **Develop conceptual naturalization plans for areas identified for naturalization:** The plan for the central naturalization areas of River Bend should consider enhancement of woodland savanna and/or native grasslands and forbs. The plan in the upstream area adjacent to Hagan Park should consider providing improved native grasslands and forb habitat, as well as maintaining the narrow corridor to upstream areas and expanding it if opportunities arise. Collaborate with potential project partners (e.g., UC Davis) to incorporate suitable pollinator/butterfly habitat into naturalization plans, where appropriate.

### General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the River Bend Area should include efforts to continue to remove giant reed, invasive brooms (Spanish, French, and Scotch), Chinese tallow, and pampas grass, as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory. Specific consideration should be given to the issue of off-trail bicycling, which is currently contributing to measurable disturbance of the landscape.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable levee freeboard.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation, and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Allow for ongoing channel reconfiguration in the upstream reach as the channel progressively and naturally adjusts to long-term channel trends.
- Consideration: When considering proposals to transform channel conditions in the middle reach, consider ongoing natural processes and the effects of ongoing scour as a result of natural processes.

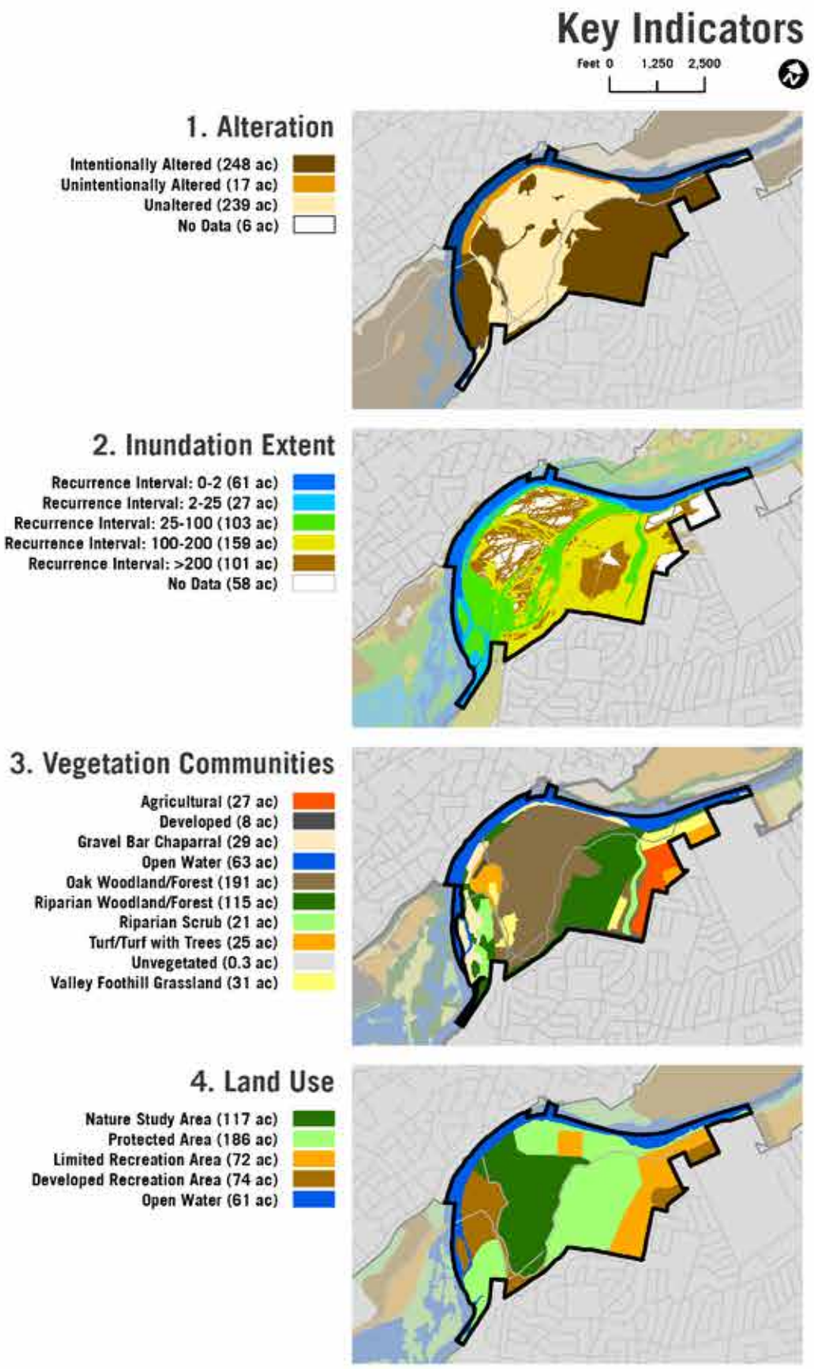
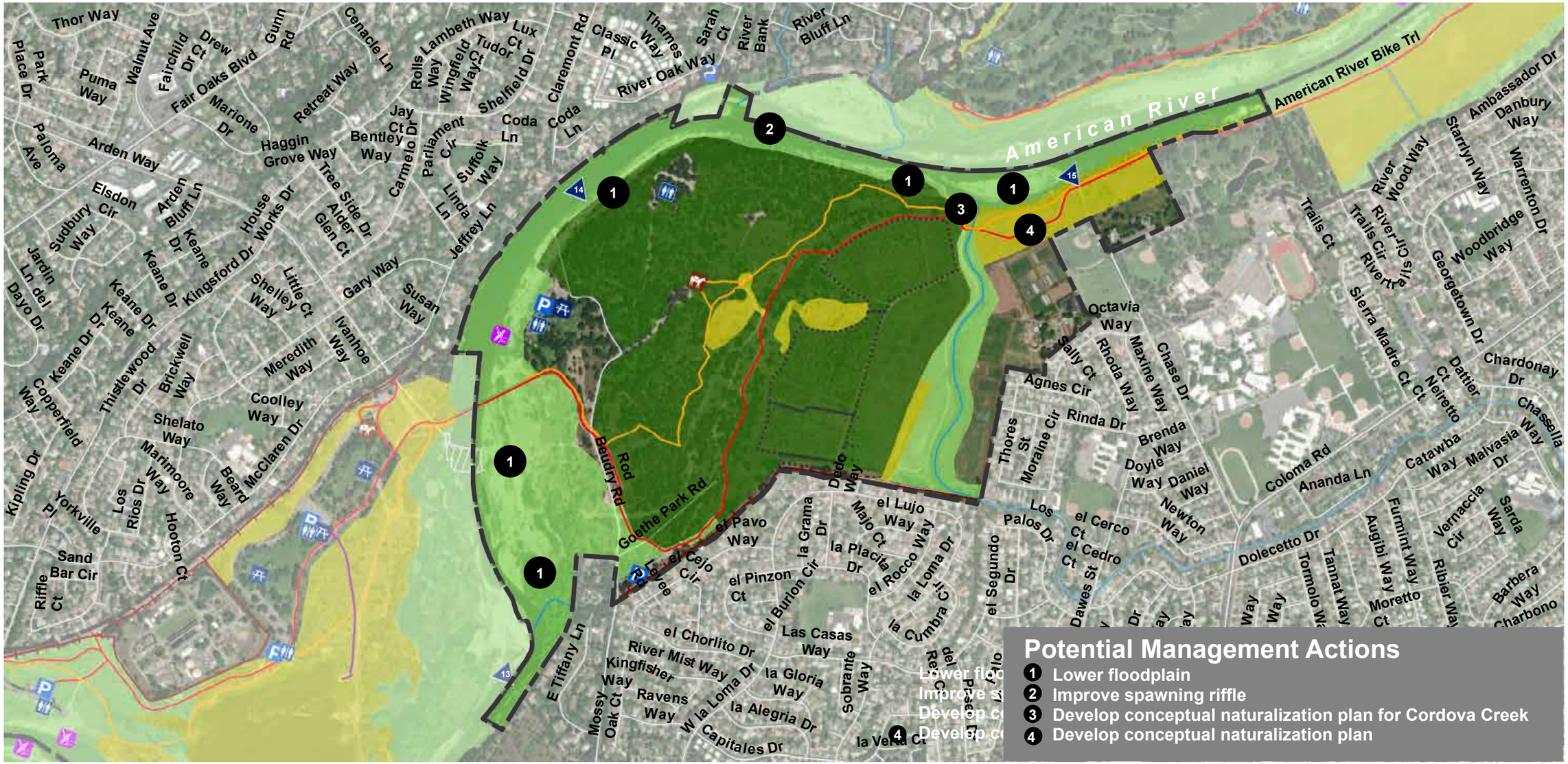



Figure 8-36
Area Plan 10 River Bend Park A




## Potential Management Actions

1. Lower floodplain
2. Improve spawning riffle
3. Develop conceptual naturalization plan for Cordova Creek
4. Develop conceptual naturalization plan

- Parkway Boundary
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Pedestrian Trail
- Lower Tributaries
- Levee
- Picnic Area
- Car Top Boat Launch
- Equestrian Staging
- Parking
- Restroom
- River Mile
- Federally Protected Mitigation Area
- Existing Salmonid Habitat Enhancement

Management Category
- Conservation
- Restoration
- Naturalization
- No Data/Private Property

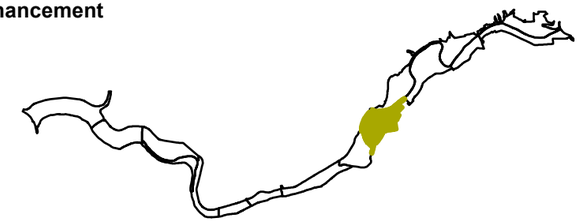


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Figure 8-37
Area Plan 10 River Bend Park B

AREA PLAN 11

# SARAH COURT ACCESS

## Sarah Court Access Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the Sarah Court Area Plan cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials as it migrated north into the Carmichael Bluffs. The river channel was largely single-threaded, and the resistant geology along the RR bank confined the channel. Riparian vegetation along the channel was limited by the Fair Oaks formation, but where present was driven by a scour and sprout dynamic, with vegetated areas being periodically scoured during higher flows and then reestablishing by root and stem sprouts.

Overbank areas consisted of a variety of surfaces formed over a geologic timescale resulting in areas with and without overbank deposition and variably underlain by the impermeable erosion-resistant Fair Oaks formation.

### Impact of European Settlement

The river channel at Sarah Court has not been mined, and although the river channel has been altered as described in the Ancil Hoffman Area Plan, the area's erosion resistant bank line is geologically unchanged.

### Present Conditions

Sarah Court is small (about the size of a residential lot) and is bordered upstream and downstream by a residential neighborhood. The river channel is relatively stable but with erosive pressure along the outside bend; the bank's resistant geology holds the channel in place. There is mowed turf, non-native landscape trees, a parking lot and picnic tables, and an access ramp leading down to the river channel where oak trees grow over clay banks.

### Expected Future Trends

Conditions at Sarah Court are expected to remain stable, and vegetation beyond the channel margins is expected to persist in its current types and configurations.

### Desired Conditions

The desired condition is to conserve existing native vegetation that occurs in the area and maintain recreation facilities in a manner that supports good habitat for wildlife.

### Site-Specific Potential Resource Management Actions (Figures 8-38 and 8-39)

1. **Improve degraded riparian habitats:** Restore existing habitats in areas identified for Restoration. Restoration may include removal of non-native invasive species, managing social trails, improving riparian vegetation in areas where it has been degraded, and improving the understory with appropriate native species.

### General Area Plan Potential Resource Management Actions

- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.

*Clay banks and in-channel gravel bars in the Sarah Court Access Area. Photo credit: Regional Parks*

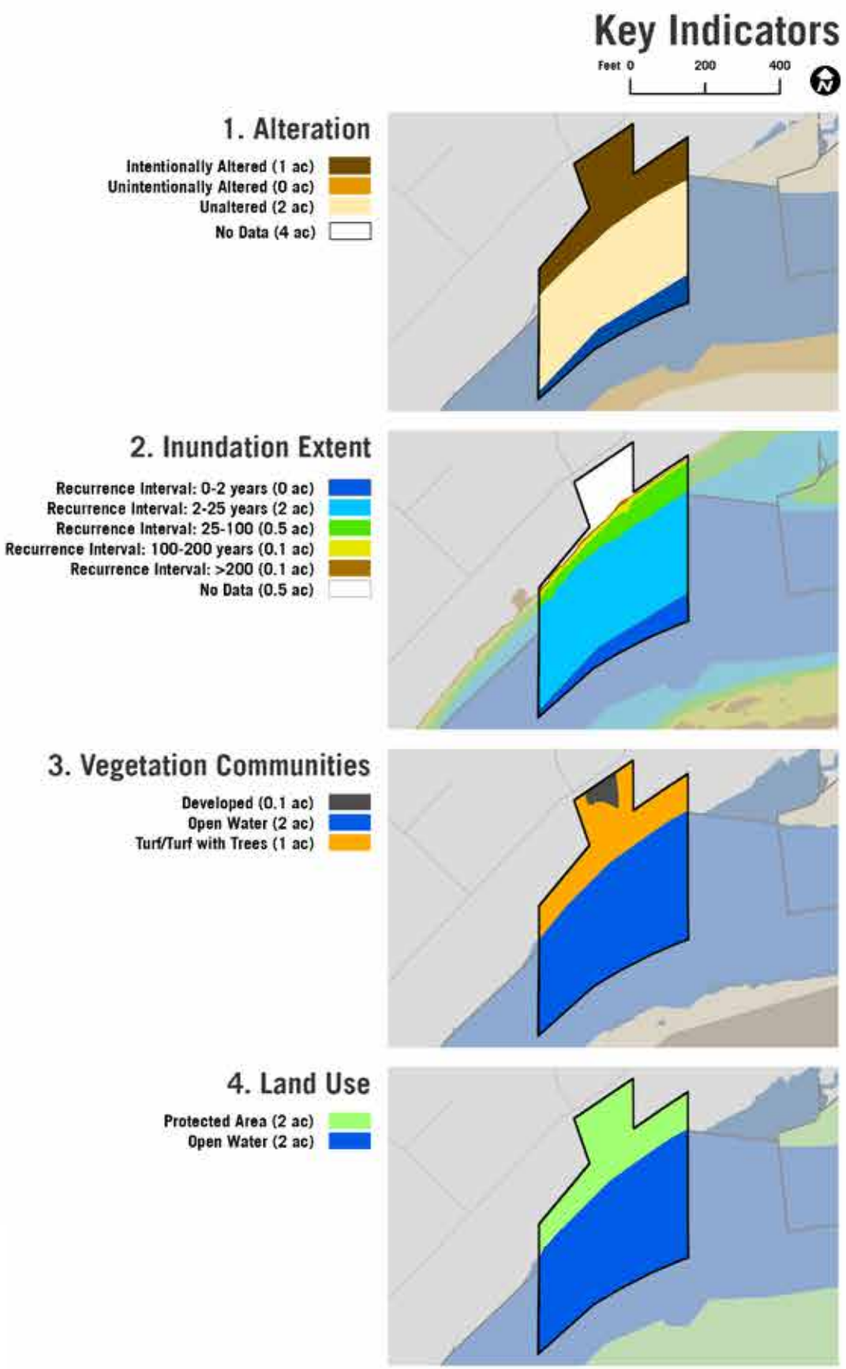



Figure 8-38
Area Plan 11 Sarah Court Access A

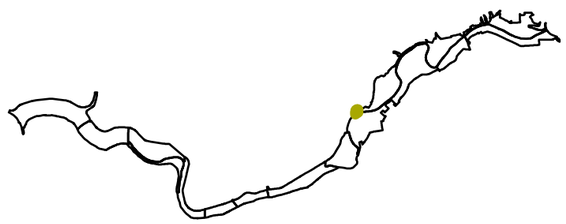
## Potential Management Actions

1 Improve degraded riparian habitats

Parkway Boundary
Lower Tributaries

P Parking

Management Category
Conservation
Restoration
No Data/Private Property



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0 245 490 Feet

Figure 8-39
Area Plan 11 Sarah Court Access B

AREA PLAN 12

# ANCIL HOFFMAN COUNTY PARK

## Ancil Hoffman County Park Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the Ancil Hoffman Area Plan cut through older floodplain material and into the erosion-resistant Fair Oaks formation as it migrated south into the older Modesto formation and along the way deposited the floodplain materials that composed Ancil Hoffman Park. The river channel was single-threaded, and riparian vegetation along the channel was driven by a scour and sprout dynamic, with vegetated areas being periodically scoured during higher flows and then reestablishing by root and stem sprouts, with irrigation stress during lower flows in summer and fall.

Overbank areas consisted of a variety of surfaces formed over a geologic timescale resulting in areas with and without overbank deposition and variably underlain by the impermeable erosion-resistant Fair Oaks formation. In most higher elevation areas, this impermeable material isolated surfaces from river fed shallow groundwater, significantly influencing vegetation patterns.

### Impact of European Settlement

The river channel along Ancil Hoffman has not been mined, leaving its channel features and processes intact. However, a mid-1960's flood event deposited a substantial volume of coarse material in the downstream area of Ancil Hoffman, enlarging and reconfiguring the area's downstream gravel bar. Since then, the downstream channel has formed a mid-channel bar (due to progressive internal adjustments via natural river processes).

Unlike some other areas, Ancil Hoffman and its river channel has not been mined. However, large areas, predominantly in the northwestern portion, were cleared for agricultural activities. Most of this farmed area was converted into a golf course, game fields, and picnic grounds. Carmichael Creek, which likely ran across the bar in a southwest direction, was rerouted and shortened to run southeast along the eastern edge of the golf course. Channel margin features in the upstream portion, including attached bars, are in place and support sparse riparian vegetation subject to a scour and sprout regime.

The construction and operation of Folsom Dam and Nimbus Dam have changed the flow regime and sediment regime in the LAR but there is no known evidence that this has changed the channel configuration in the Ancil Hoffman area. However, the change in seasonal flows, such as higher flows from dam releases during the summer and fall, may have contributed to some enhanced amounts of riparian vegetation and SRA habitat along the banks.

### Present Conditions

The river channel is currently unstable and adjusting at three locations. On the upstream end, the large gravel bar is growing as materials deposit during high flows, pushing the channel toward RL and causing bank erosion in the Rossmoor Bar area. Secondly, the long gravel bar adjacent to the golf course and downstream of the abandoned water tower is the result of substantial deposition of sand and gravel during the mid-1960's when an area at the upstream end of River Bend eroded and caused a channel shift to RL and deposition of sand and gravel on RR. Lastly, the downstream gravel bar, which was once separated from the bank, is actively aggrading and becoming fully attached to the base of the bluffs.

A scour and sprout riparian vegetation regime has persisted in many of these active areas, leaving most of the gravel bar areas with well-spaced low growing shrubs. This gravel bar vegetation is considered a result of ongoing scour during flood-flow events and in balance with the present LAR streamflow dynamics.

The golf course and picnic areas are primarily landscaped with turf grass and ornamental shade trees. All roadways and parking areas are lined with street lights. An area adjacent to the park entrance was previously cleared for a caretaker's residence (now removed) and is currently maintained as an unirrigated mowed field.

Carmichael Creek is channelized for much of its course parallel to the roadways through the area, eventually emptying into a seasonal pond. It only reaches the river channel during high flow creek events, usually during winter storms. Two interpretive water features are maintained by municipal water supplies.

A narrow band of native vegetation along the northern bluffs contains declining mature blue oak trees and other upland vegetation. The Effie Yeaw Nature Center in the northeast corner includes a large area of primarily live oak woodland. This area contains many snags and declining valley oak trees among the healthier live oak canopy.

Ancil Hoffman Park is a well-documented local wildlife viewing favorite with 178 bird species (documented in eBird from 2016 to 2021), including a variety of songbirds, waterfowl, and raptors seen each year. Popular birding areas include the woodlands near the Effie Yeaw Nature Center, featuring raucous flocks of its iconic Acorn woodpeckers that are attracted to the many valley oak snags for acorn storage and nesting holes. Large populations of black-tailed deer, Wild turkeys, and Yellow-billed magpies are attracted to this park for its oak forests adjacent to irrigated turfed picnic and golf course areas. The larger oaks are commonly used by nesting Red-shouldered hawks, Great Horned owls, and Screech owls. The nature study pond is sheltered with cattails and tules, for more secretive waterfowl such as Wood ducks.

*Fremont cottonwood trees in the Ancil Hoffman County Park Area. Photo Credit: Regional Parks*

Botanically, Ancil Hoffman features one of the two known large populations of showy milkweed on the Parkway, specifically in the Nature Study Area, along with scattered populations of the more common narrow- leaved milkweed. The area is also known for Dutchman's pipevine in the live oak understory, which attracts many pipevine swallow-tail butterflies each spring. A large specimen of one of the only California bay laurels grows near the picnic area.

## Expected Future Trends

Physical changes in the Ancil Hoffman landform and river channel should not change substantially in the foreseeable future although it is possible that the effects of Folsom Dam on LAR hydrology and sediment supply could eventually lead to physical channel changes in the Ancil Hoffman reach. This conforms to observed rates of change on other gravel-bed rivers. The recent upstream gravel augmentation projects to improve salmonid spawning are also unlikely to affect the channel in this reach given apparent slow rates of downstream gravel migration. Additional gravel augmentation projects are planned, including channel locations within the Ancil Hoffman area.

*Turf field in the Ancil Hoffman County Park Area. Photo Credit: MIG*

Ongoing channel processes and adjustments indicate several potential trends as described in Present Conditions. These include a growing upstream gravel bar, river channel incision and entrenchment, enlarging channel banks in the mid-section, and an enlarging downstream gravel bar.

The oak woodlands in Ancil Hoffman have been gradually losing mature valley oaks and blue oaks, leaving many areas, particularly near the Effie Yeaw Nature Center, with large snags that eventually fall down. Vegetation beyond the channel margins is expected to persist in its current types and configurations. The once abundant Spanish broom has been removed and is currently being maintained as part of the IPMP, leaving a variety of native gravel bar shrubs. Other high priority IPMP species including French broom, Chinese tallow, and a small population of red sesbania (on Carmichael Creek) are currently controlled but will continue to need monitoring and on-going removal to maintain successful management. This area contains many snags and declining valley oak trees among the healthier live oak canopy. Dead wood where abundant is a fire fuel load concern.

## Desired Conditions

Maintain ongoing channel processes and accommodate expected foreseeable natural process adjustments in channel conditions. Restoration and naturalization projects should be located and designed to accommodate these processes.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled. It is also desirable to naturalize areas that have been substantially altered in

the past and could provide better habitat for target species. Managing for a healthy woodlands with limited degradation from human uses (e.g., social trails) would improve habitat values, as would conserving grassland suitable for wildlife (including pollinators).

## Site-Specific Potential Resource Management Actions (Figures 8-40 and 8-41)

1. **Lower floodplain:** Develop a plan to the lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat.
2. **Enhance native woodlands and grasslands:** The area adjacent to the entrance should be considered for additional plantings, whether it be woodland savanna or enhancement of existing grasses and forbs.
3. **Improve habitat values on Carmichael Creek:** Consideration should be given to naturalizing and realigning Carmichael Creek if a modified alignment is feasible and would provide additional habitat values beyond what is possible within the current alignment.
4. **Support interpretive uses at Effie Yeaw Nature Center:** Specific consideration should be given to conservation actions that support and balance ongoing interpretive uses at Effie Yeaw nature center.
5. **Improve degraded riparian habitats:** When considering proposals to transform channel conditions in this area, consider ongoing natural processes and the durability of proposed designs in light of natural processes.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Ancil Hoffman Area should include efforts to continue to remove French broom, Chinese tallow, and red sesbania. Additionally, previously removed Spanish broom and pampas grass should be monitored and removed if necessary. Other noxious weeds as prioritized in the upcoming IPMP update should also be targeted. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable conveyance.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks. Develop a plan to lessen the fuel load particularly in the northeast corner where there are many snags and declining valley oak trees.
- Maintain created spawning and rearing habitat: Conduct routine maintenance of previously constructed salmonid habitat including periodic replenishment of gravel to maintain suitable spawning habitat for salmonids.
- Develop a Conceptual Naturalization Plan for the areas identified for Naturalization.

*Valley oaks trees and grapevine in the Ancil Hoffman County Park Area. Photo Credit: Regional Parks*

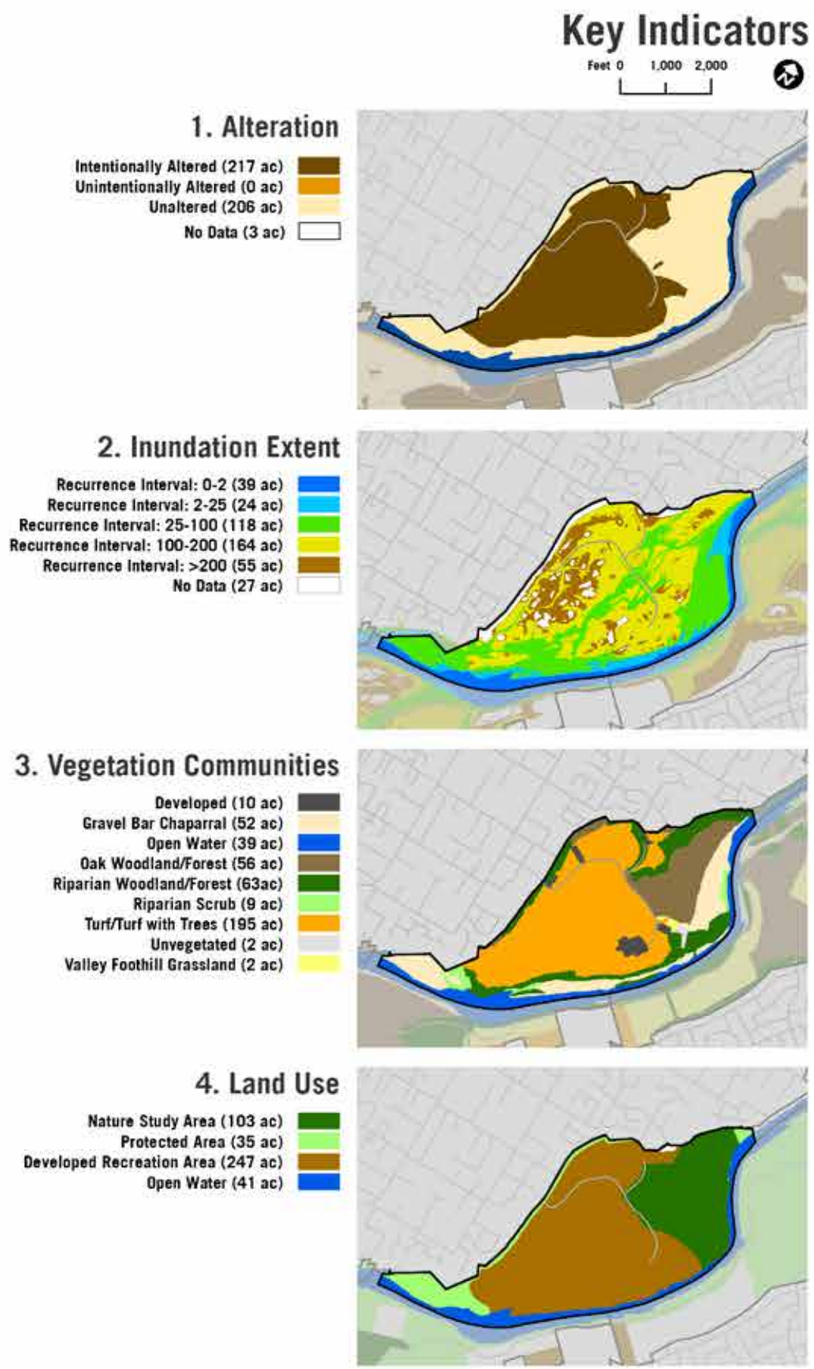


Figure 8-40
Area Plan 12 Ancil Hoffman County Park A

## Potential Management Actions

1. Lower floodplain
2. Enhance native woodlands and grasslands
3. Improve habitat values in Carmichael Creek
4. Support interpretive uses at Effie Yeaw Nature Center
5. Improve degraded riparian habitats

**Management Category**
- Conservation
- Restoration
- Naturalization
- Parkway Boundary
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Lower Tributaries
- Unimproved Hiking Trail

- Car Top Boat Launch
- Equestrian Staging
- Parking
- Restroom
- River Mile

- Existing Salmonid Habitat Enhancement
- Federally Protected Mitigation Area

- No Data/Private Property

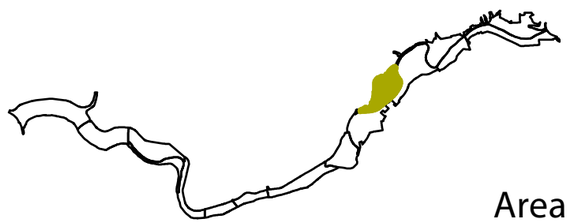

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Figure 8-41
Area Plan 12 Ancil Hoffman County Park B

AREA PLAN 13

# ROSSMOOR BAR

## Rossmoor Bar Area Plan

### Historic Physical and Biological Conditions

Rossmoor Bar was formed well before European settlement, as the LAR channel cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials (as it migrated north into the San Juan Bluffs) and deposited along the way the floodplain materials comprising Rossmoor Bar. The river channel was largely single-threaded except for a mid-channel bar. Riparian vegetation along the channel was driven by a scour and sprout dynamic, with vegetated areas being periodically scoured during higher flows and then reestablishing by root and stem sprouts during seasonally lower flows.

Overbank areas consisted of a variety of surfaces formed over geologic time, resulting in areas with and without overbank deposition and variably underlain by the impermeable erosion-resistant Fair Oaks formation. In most higher elevation areas, this impermeable material isolated surfaces from river fed shallow groundwater, thereby limiting the amount of groundwater available to vegetation, and significantly influencing the types and amounts of vegetation able to survive. There were many bypass channels that carried flows out of the main channel and through Rossmoor Bar at moderate to high flows, further defining the landscape.

### Impact of European Settlement

Substantial mining activities, both dredger gold mining and subsequent aggregate mining of the dredger tailing piles, significantly altered the landscape of much of Rossmoor Bar. The dredger mining removed any vegetation present and altered the topography and composition of the surface, leaving behind large piles of un-vegetated cobble material (dredger tailing piles). Gravel mining of the tailing piles lowered the land surface often much lower than the original ground surface and, in many locations, allowing shallow groundwater to support off-channel mixed riparian forests. Dredger mine tailing piles persist and are often without soil or high-quality vegetation communities. The mining activities also disrupted many of the pre-existing bypass channels that carried water only at very high flows and created a new large and low bypass channel that now captures and strands coarse sediment in transport during high flows.

The construction and operation of Folsom Dam and Nimbus Dam have changed the flow regime and sediment regime in the LAR, but there is no known evidence that this has changed the channel configuration in the Rossmoor Bar area. However, the dams did change seasonal flows, such as releasing higher flows in the summer and fall, which may have contributed to the enhanced extent and vigor of some riparian vegetation, and increased the extent of SRA habitat.

Some areas at Rossmoor bar were graded for agricultural activities. Infrastructure, such as concrete lined channels, were added to improve drainage. These changes aggravated bank erosion at the canal's outfall into the river.

### Present Conditions

The river channel is presently quite stable but subject to ongoing scour during higher flows. The resulting landscape (as modified by mining and agriculture) provides some areas of high-quality vegetation and habitat, while others are highly disturbed and are of only modest value. Some of the areas lowered during aggregate mining support well-developed mixed riparian communities, although located well back from the channel. These "pocket forests" are often surrounded by dredger mine tailings that support very little vegetation.

A scour and sprout riparian vegetation regime has persisted, evidenced by some near channel areas presently bare of well-developed riparian vegetation. This is considered a result of ongoing scour during high flow events and in balance with the present LAR streamflow dynamics.

Many of the gold dredge and gravel mined areas remain unchanged from their post-mining condition. The pre-mining bypass channels continue to be disconnected under most flows and the large and low elevation artificial bypass channel remains, capturing coarse material in transit during

high flows. Some of the near-channel flood chutes in the north east portion of Rossmoor Bar are slowly reforming to pre-mining conditions. Vegetation in areas disturbed by mining and agriculture has been able to grow where a soil substrate is present but remains bare where there is no soil. Similarly, wildlife habitat is mixed, with some areas providing good habitat and others consisting of very degraded quality. The vegetation includes valley oak and live oak woodland patches. Invasive tree of heaven is common in the mine tailing areas, and Rossmoor Bar contains the highest concentrations of tree of heaven populations on the Parkway. The IPMP contributed to the successful reduction of Spanish broom cover on the gravel bars and requires annual maintenance for continued success. The remnant mining depressions (pocket forests) support small patches of alder and willow riparian scrub and cottonwood and mixed riparian forest.

Large areas previously used for agriculture (primarily hay and alfalfa) have been planted with oak trees and other native vegetation, often for mitigation purposes, and are in varying stages of establishment. Areas previously farmed and left fallow currently support annual grasses and/or non-native invasive plants such as yellow star-thistle.

Rossmoor Bar, like most of the Parkway is a birding "hot-spot," with 120 recorded species of birds over the past 5 years (documented in eBird from 2016 to 2021). The area used to have a now extant bank swallow colony from an eroding bank of the river, and the remaining area is now occupied by Northern Rough-winged swallows. The large cottonwood trees (that occur in the low mined areas among the tailing piles) are known for nesting raptors. Although some of the former agricultural fields have been planted with trees for habitat mitigation, Rossmoor Bar contains several areas of open fields that are used by foraging raptors and other bird species that frequent grasslands.

*Fremont cottonwood trees on riverbank in the Rossmoor Bar Area. Photo Credit: Regional Parks*

Botanically, Rossmoor Bar features some locally rare wildflowers. One of these fields (west of the El Manto Access road) contains locally rare narrow-leaved mules ears, and many native geophytes, such as brodeias and soaproot. In addition to these locally uncommon species, the gravel bar contains a large population of foothill penstemon, plus other interesting botanical finds such as coyote mint, and several buckwheats including the only known populations of both Wright's buckwheat and (one) sulfur buckwheat. In the springtime, the northern overflow channels flow purple with blooming sky lupine.

Rossmoor Bar is also the site of a 40+ year butterfly monitoring transect dataset maintained by UC Davis. Of the 23 butterfly species declining in the Central Valley based on UC Davis monitoring transects, 15 have been recorded along the 2-mile-long Rancho Cordova monitoring transect extending from the east end of Rossmoor Bar Area to the west end of the Lower Sunrise Area.

## Expected Future Trends

While it is possible that the effects of Folsom Dam on LAR hydrology and sediment supply could eventually lead to physical channel changes in the Rossmoor Bar reach, current information does not indicate tendencies toward substantial change in the foreseeable future. This conforms with observed rates of change on other gravel-bed rivers. Additionally, the recent addition of gravel to upstream areas to improve salmon spawning is unlikely to result in demonstrable channel changes in this reach given apparent slow rates of downstream migration. Ongoing bank erosion is expected to continue at the upstream end which may encroach on an existing outfall structure, and at the

*Fremont cottonwood trees in the Rossmoor Bar Area. Photo Credit: Regional Parks*

downstream end where ongoing channel processes and the localized influence of two outfall structures are causing channel adjustments. Moderate to high flows will likely continue to cause deposition and aggradation along the channel margins in the northern portions of Rossmoor Bar, as well as further reestablishment of the flood chutes on the northeast point bar. Additional coarse material is expected to deposit in the artificial bypass channel during high flow events. These channel processes will influence the ability of riparian vegetation to take hold, following the existing scour and sprout regime.

Vegetation beyond the channel margins is expected to persist in its current types and configurations. However, the patterns and composition are subject to threats from invasive non-native species, fires, and undesirable off-trail hiking and biking activity that has produced extensive social trails and bike paths. Existing mitigation areas consisting of primarily oak woodlands are expected to mature and provide increasingly valuable wildlife habitat. Additional mitigation/naturalization is being contemplated and has the potential to improve habitat connectivity throughout the area.

## Desired Conditions

Maintain ongoing channel processes and accommodate expected foreseeable natural process adjustments in channel conditions. This calls for limiting future bank protection projects to those required for public safety, protection of property outside of the Parkway, and protection for substantial, unmovable non-Parkway infrastructure within the Parkway. There is no need for such projects now or in the foreseeable future. New infrastructure that may be placed in the area should be designed to anticipate ongoing channel processes so as not to necessitate additional bank protection. Similarly, restoration and naturalization projects should be located and designed to accommodate these processes.

The desired condition for habitat is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled, with a focus on controlling tree of heaven, and maintaining Spanish broom, invasive species within woodland areas, and grassland areas being infiltrated by yellow star-thistle. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation. Managing for a healthy woodlands with limited degradation from human uses (e.g., social trails and off-trail bicycling) would improve habitat values, as would conserving some area of open grassland suitable for raptor foraging, pollinators and other wildlife.

## Site-Specific Potential Resource Management Actions (Figures 8-42 and 8-43)

1. **Improve spawning riffle:** Construct gravel augmentation site to create suitable spawning habitat for salmonids.
2. **Improve degraded riparian habitats:** Restore existing habitats in areas identified for Restoration. Restoration may include removal of non-native invasive species, managing social trails, improving riparian vegetation in areas where it has been degraded, and improving the understory with appropriate native species.
3. **Enhance woodland savanna and/or grasslands:** The areas in the southeast (along El Manto Drive) should be considered for additional plantings, whether it be woodland savanna or enhancement of existing grasses and forbs.

4. **Maintain historic mine tailings for interpretive purposes:** The central area consists of historic mine tailings and was identified in the ARPP as a location to maintain for interpretive purposes.
5. **Recontour and improve substrate to support woody vegetation:** Develop a Conceptual Naturalization Plan to address piles of aggregate material and lack of topsoil in a manner that would support native woody vegetation.
6. **Improve fallow agricultural area fields with woodland savanna and/or grassland:** Develop a Conceptual Naturalization Plan for the graded agricultural area in the RM 15.1—15.65 reach which incorporates native vegetation that is suited to the soils and geology in this reach.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Rossmoor Bar Area should include efforts to continue to remove Spanish Broom and identify measures for reducing tree of heaven. Other noxious weeds as prioritized in the upcoming IPMP update should also be targeted. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Hydraulic impact modeling: Determine the scope and design of desirable vegetation and habitat improvements on floodplain surfaces by using 2-D hydraulic modeling for x-sectional roughness values needed to maintain acceptable conveyance.
- Rehabilitate homeless encampment impacts: In accordance with and in support of regional and countywide efforts to reduce homelessness, as appropriate remove encampments in the Parkway and rehabilitate those areas where the understory has been damaged. Rehabilitation should include clean-up, soil preparation, and planting of appropriate native species.
- Suppress fire in mature vegetation stands: Develop a wildfire prevention, response, and rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing wildfire impacts. This includes evaluating the effectiveness of existing firebreaks and if necessary designating new and/or improved firebreaks.
- Maintain created spawning and rearing habitat: Conduct routine maintenance of previously constructed salmonid habitat including periodic replenishment of gravel to maintain suitable spawning habitat for salmonids.
- Explore the feasibility and resource value of relocating the lower engineered reaches of Buffalo Creek from its engineered outfall at RM 19.5, reconnecting it to its pre-altered course at about RM 18.7, and a newly constructed confluence in the vicinity of RM 18.3 or in conjunction with a re-engineered drain outfall at RM 18.25.
- Re-construct the engineered concrete drainage outfall apron at about RM 18.25 to protect against ongoing and progressive bank erosion due to undercutting using a design approach and materials that can adjust to bank line changes without aggravating bank erosion; suggest removing the broken concrete members and replacing with large angular rock infilled with fine coarse material.
- Develop a Conceptual Naturalization Plan for the mined area north of the bike trail in the graded agricultural area in the RM 16.0—16.65 reach which preserves identified high resource values and re-establishes connected higher bypass channels and fills the artificial bypass channel that is removing coarse bed material from the main channel.
- Develop a Conceptual Naturalization Plan for the areas identified for naturalization. Collaborate with potential project partners (e.g., UC Davis) to incorporate suitable pollinator/butterfly habitat into Naturalization plans, where appropriate.
- Allow for ongoing bank erosion and bank retreat in the RM 15.0—16.2 reach as the channel progressively and naturally adjusts to long-term channel entrenching trends in this reach and plan for potential facility relocation (e.g., bike trail and high-bank drain outfalls).
- Consideration: When considering proposals to transform channel conditions in the reach between RM 15.9 – 17.2, consider ongoing natural processes and the value of the flood chutes in this reach that are being re-constructed and developed by natural processes.

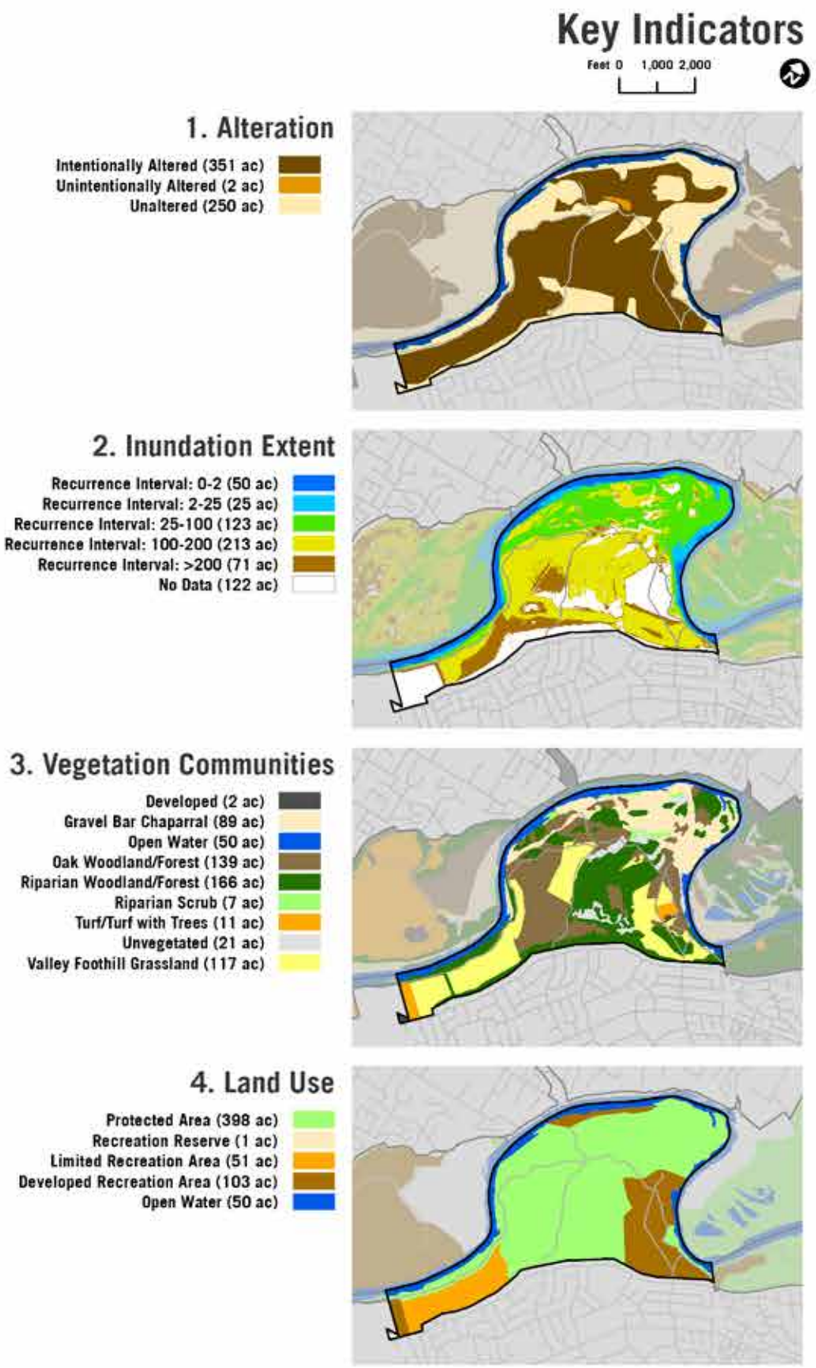
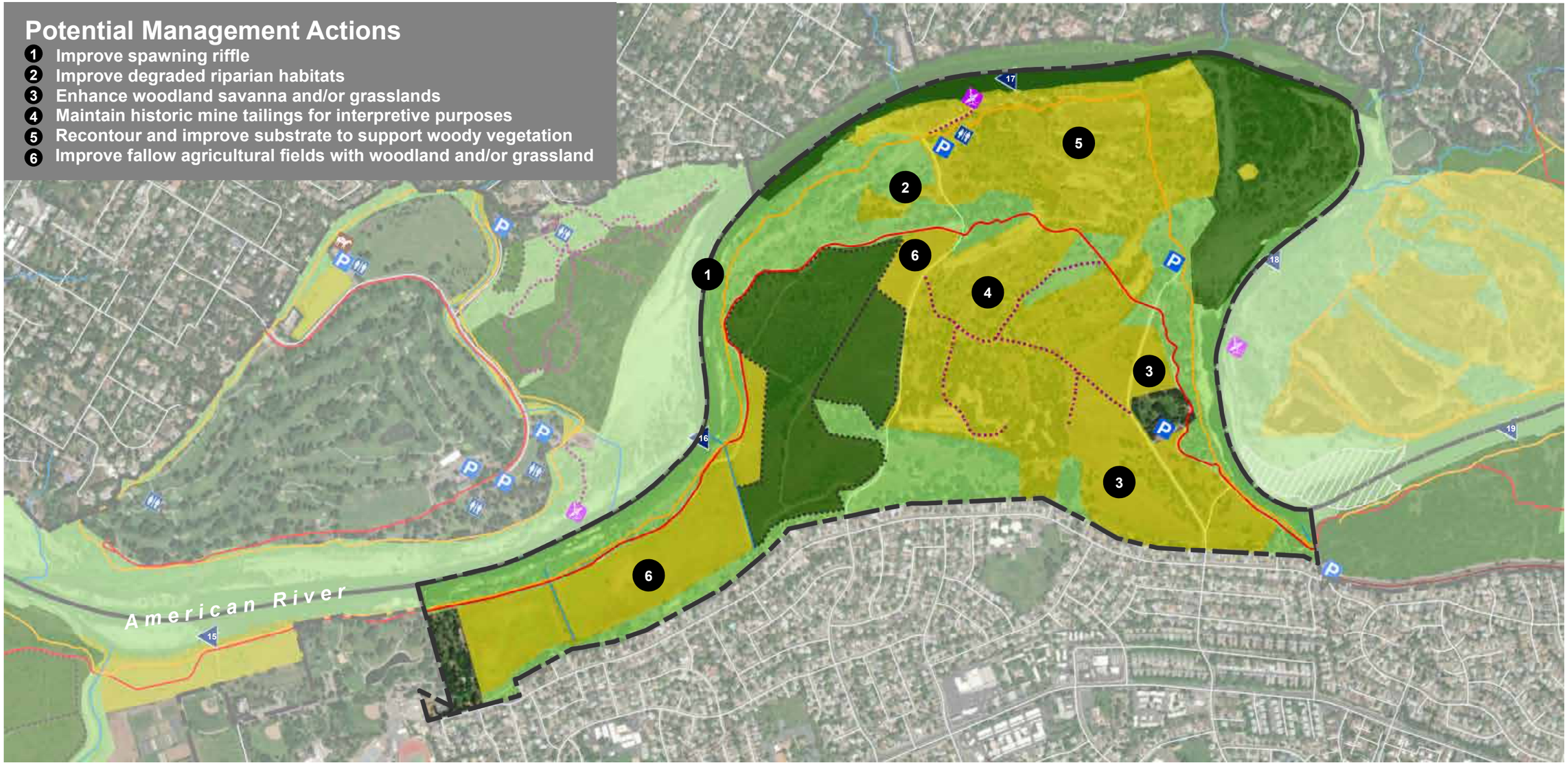



Figure 8-42
Area Plan 13 Rossmoor Bar A

## Potential Management Actions

1. Improve spawning riffle
2. Improve degraded riparian habitats
3. Enhance woodland savanna and/or grasslands
4. Maintain historic mine tailings for interpretive purposes
5. Recontour and improve substrate to support woody vegetation
6. Improve fallow agricultural fields with woodland and/or grassland




- Parkway Boundary
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Lower Tributaries
- Unimproved Hiking Trail
- Levee
- Car Top Boat Launch
- Equestrian Staging
- Parking
- Restroom
- River Mile
- Federally Protected Mitigation Area
- Existing Salmonid Habitat Enhancement

Management Category

- Conservation
- Restoration
- Naturalization
- No Data/Private Property

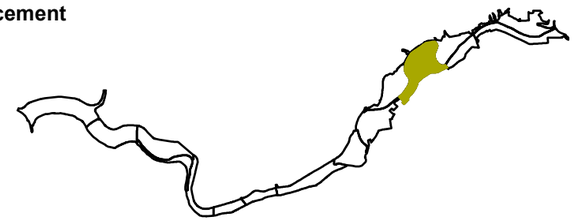


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Figure 8-43
Area Plan 13 Rossmoor Bar B

AREA PLAN 14

# SAN JUAN BLUFFS

## San Juan Bluffs Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the San Juan Bluffs Area Plan cut through older floodplain material and into the erosion-resistant Fair Oaks formation. This process created the steep San Juan Bluffs which confined the channel on RR and produced a scour pool. The bluffs supported a narrow band of patchy riparian vegetation intermixed with areas of exposed soil.

### Impact of European Settlement

The overbank above the bluffs initially housed agricultural activities before being converted to residential development. Bluff protection has been installed along the upper bank at a few private residences and at a Carmichael Water District facility. There is also a drainage outfall along the bluffs.

The construction and operation of Folsom Dam and Nimbus Dam have changed the flow regime and sediment regime in the LAR. This change in seasonal flows, such as higher flows from dam releases during the summer, may have contributed to enhanced amounts of riparian vegetation and SRA habitat in this area.

### Present Conditions

The river channel is presently quite stable but subject to ongoing scour during higher flows, and there is no evidence that dam operations have changed the channel configuration. The bluffs range in height from approximately 20 feet to 75 feet above the low flow water surface. There is a relatively continuous band of riparian vegetation, with areas of steep, exposed soil throughout. Although there is ongoing erosion in places, it is very slow due to the erosion resistant geology. Invasive species are present throughout the area. Spanish and French broom have been removed along this riverbank, as part of the IPMP but this effort will need to continue to maintain control of these high priority invasive species.

### Expected Future Trends

The existing channel configuration is expected to persist, including slow erosion of some bluff areas. Some episodic sloughing and installation of remedial residential bluff protection are possible. Vegetation is expected to persist in its current types and configurations, although non-native plant species could expand their presence in the area if not managed.

### Desired Conditions

Maintain ongoing channel processes and accommodate expected foreseeable natural process adjustments in channel conditions. This calls for limiting future bank protection projects to those required for public safety, protection of property outside of the Parkway, and protection for substantial, unmovable infrastructure within the Parkway. Bluff protection projects should be kept to a minimum. The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species should be controlled.

### Site-Specific Potential Resource Management Actions (Figures 8-44 and 8-45)

1. **Monitor bluff erosion:** Conduct periodic monitoring of bluff faces to assess any erosion.

### General Area Plan Potential Resource Management Actions

- Manage invasive vegetation: High priority weeds in the San Juan Bluff Area should include efforts to continue to remove invasive brooms (Spanish and French) as well as other noxious weeds prioritized in the upcoming IPMP update. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.

*Homes on the San Juan bluffs. Photo Credit: MIG*

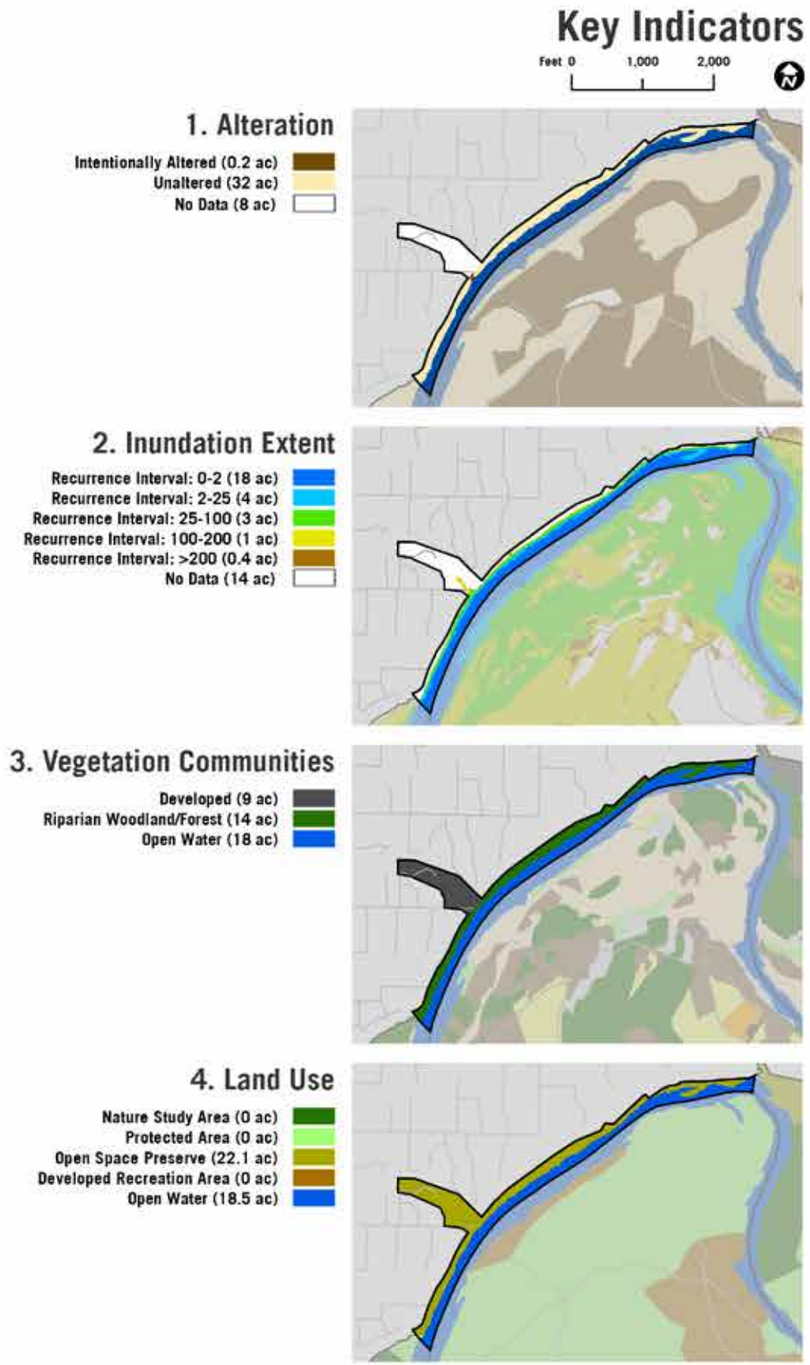
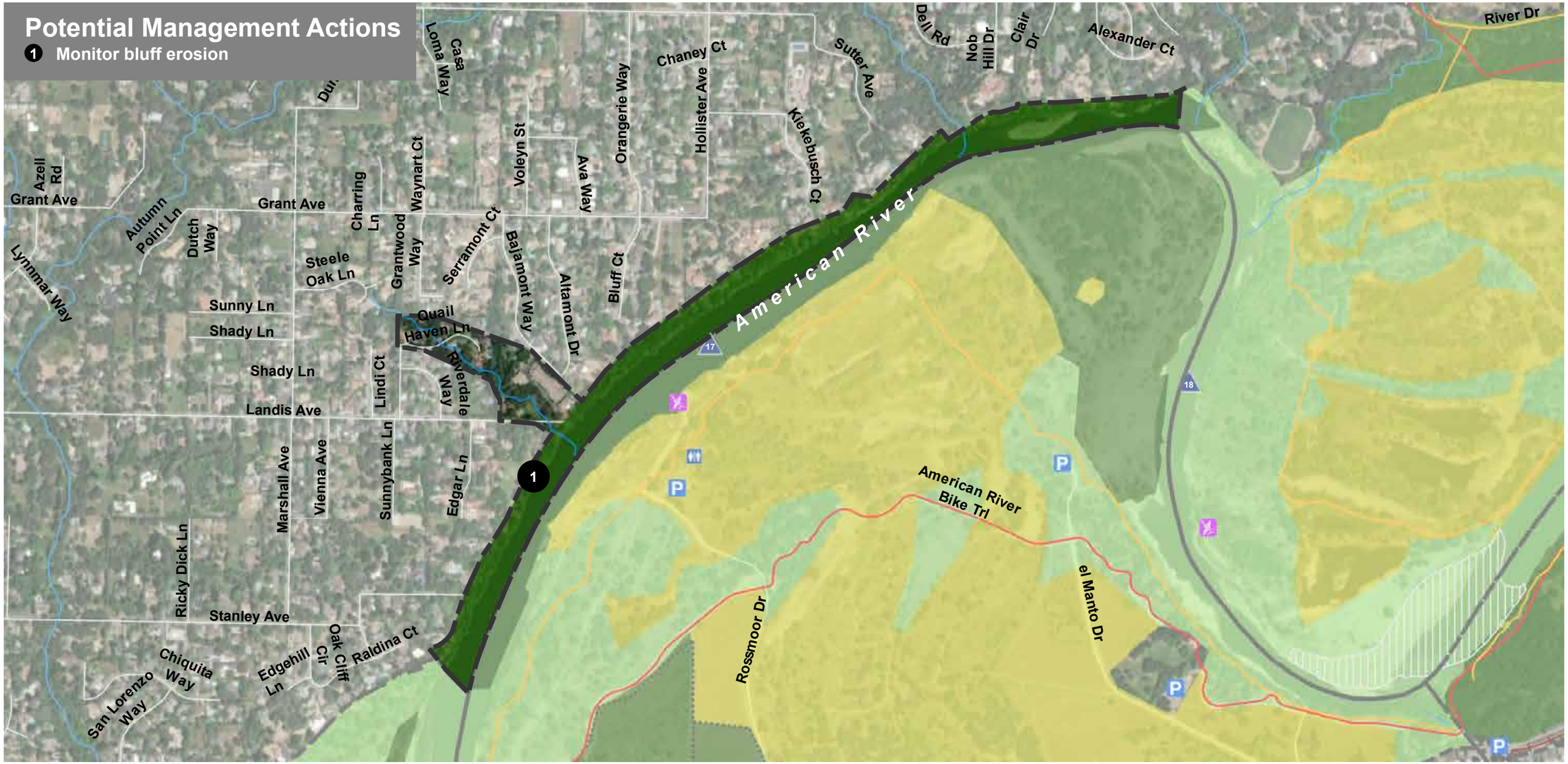



Figure 8-44
Area Plan 14 San Juan Bluffs A

## Potential Management Actions

❶ Monitor bluff erosion




- Parkway Boundary
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Lower Tributaries
- Levee
- Car Top Boat Launch
- Parking
- Restroom
- River Mile
- Existing Gravel Augmentation

Management Category

- Conservation
- Restoration
- Naturalization
- No Data/Private Property

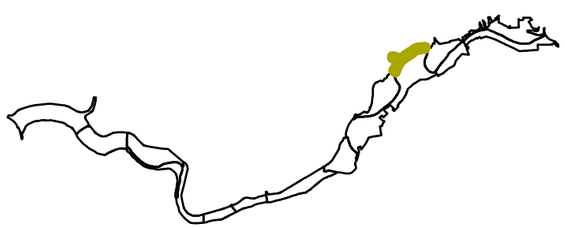


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Figure 8-45
Area Plan 14 San Juan Bluffs B

AREA PLAN 15

# SACRAMENTO BAR

## Sacramento Bar Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the Sacramento Bar area cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials as it migrated south, along the way depositing the floodplain materials comprising Sacramento Bar. The river channel was largely single-threaded save for two mid-channel bars, both of which varied in size and one which varied in persistence based on sequences of flood-flow scouring and sediment transport. Riparian vegetation along the channel was shaped by a scour and sprout regime featuring periodic thinning during flood flows followed by post-flood root and stem sprouting and growth limited by irrigation stress during seasonally low flows.

Overbank areas on Sacramento Bar consisted of a variety of surfaces formed over geologic time with deposition overlaying the impermeable erosion-resistant Fair Oaks formation except in the San Juan rapids area. The extent and types of vegetation supported by this deposition were likely influenced by the height of the bar above the river channel. The present distribution of plant communities in areas that were not mined suggests that pre-mining depositional areas were high enough and banks were steep enough that vegetation was dominated by upland species including live oak and valley oak except along the channel margins. There were many bypass channels that carried flows out of the main channel and through Sacramento Bar at moderate to high flows, and active flood chutes across the point bar at the sharp RR turn, further defining the landscape of this area.

### Impact of European Settlement

Substantial mining activities, both dredger gold mining and subsequent aggregate mining of the dredger mine tailings, significantly altered the landscape of much of Sacramento Bar. The dredger mining focused on the higher central areas of the bar, removing any vegetation present and altering the topography and composition of the surface. The dredger mining activity left the bypass channels essentially intact but separated from the river channel and created large mounds of unvegetated mine tailings at various locations across the bar. These piles of cobble supported a subsequent round of aggregate mining that lowered land surfaces to elevations often much lower than the original ground, and in some locations created deep pits and areas where shallow groundwater could support off-channel mixed riparian forests. The point bar feature at the southernmost end of Sacramento Bar was scraped for aggregate material, substantially lowering the surface and effectively widening the channel. Remnant mounds of dredger mine tailings remain scattered across the bar marked by limited soil and essentially barren of high-quality vegetation. High ground created to support access roads and keep mining areas dry still exist along the eastern edge of the bar.

Overly deep conditions in the channel between the mid-channel bar and point bar indicate the area may have been mined during dredger mining operations.

The construction and operation of Folsom Dam and Nimbus Dam have changed the flow regime and sediment regime in the LAR but there is no known evidence that this has so far changed the channel configuration in the Sacramento Bar area. Consistent with conditions observed in other gravel bedded rivers, this reflects a very slow structural response to dam related changes in flow and sediment regimes. On the other hand, reservoir-related changes in seasonal flows such as higher flows in the low-flow period, may have contributed to increasing the overall extent of riparian vegetation and SRA habitat at Sacramento Bar.

A recent fish habitat enhancement project was implemented at the point bar, including excavation of coarse material from the gravel bar and the creation of a side channel. Excavated material was used to augment spawning gravels in the channel immediately upstream. Subsequent moderate flows (e.g., 80,000 cfs) resulted in re-deposition of the gravel in the excavated area, filling of the side channel, and the loss of the in-channel augmented gravel.

## Present Conditions

As described, the majority of Sacramento Bar was both intentionally and unintentionally altered. However, there are some unaltered areas, primarily along the northern boundary, the northeastern boundary, and the Nature Study Area on the western boundary. Oak woodlands and riparian forest persist in these unaltered areas. Areas that were previously mined provide some high-quality vegetation and habitat, such as the ponds and “pocket forests”, while others are highly disturbed and of only modest value. Some of the areas lowered during aggregate mining support a range of mixed riparian communities of varying quality and composition, although located well back from the channel. These areas are often surrounded by remnant mounds of dredger mine tailings that support very little vegetation. Minnesota Creek enters the area in the northwest corner and supports a lush riparian corridor.

*Aerial view of the Sacramento Bar Area. Photo Credit: John Hannon*

Due to both long-term geologic processes and ongoing adjustments to human actions, the channel and banks in this area are dynamic. In the upstream reaches the channel appears overloaded with transportable coarse bed material, and continued aggradation is possible. The persistent mid-channel bar (in the Lower Sunrise Area Plan) has been a site of ongoing aggradation and enlargement resulting in about 50-250 feet of RR bank erosion and retreat since the late 1950s, with the loss of considerable low elevation riparian habitat area. Between the mid-channel bar and the riffle at the point bar, the channel appears artificially over-deepened (possibly due to gold era dredger mining activities), and a majority of easily transportable material (sands and gravels) appears to flush through this reach to downstream areas. The location of the point bar is within an artificially enlarged channel area as a result of past mining, and the point bar and nearest pond collect the smaller coarse sediment that passes through as flows slow in this widened area. Downstream of the point bar on RR, the channel continues to migrate toward RR, causing bank erosion in scattered locations, totaling approximately 75-175 feet of bank retreat since the late 1950s. A scour and sprout riparian vegetation regime has persisted along the channel edges, evidenced by some near channel areas presently bare of well-developed riparian vegetation. This is considered a result of ongoing scour during flood flow events and is in balance with the present LAR streamflow dynamics.

Many of the gold dredge and aggregate mined areas remain unchanged from their post-mining condition. The pre-mining bypass channels continue to be disconnected as a result of the artificially high ground that separates their upstream ends from the main channel. Vegetation in areas disturbed by mining has been able to grow where a soil substrate is present but remains nearly bare where there is no soil. Live oak woodland and other native vegetation can be found in patches throughout the upland areas. Large populations of Spanish broom, as well as French broom, pampas grass, Chinese tallow tree, and the most upstream population of red sesbania (at Minnesota creek), have been removed from the gravel bars and river bank. These high priority IPMP species will continue to need monitoring and on-going removal to maintain successful management. The interior of the bar features five large seasonal ponds and several smaller seasonal ponds. Many of these topographic depressions resulting from aggregate mining are low enough to be watered at times by shallow streamflow related groundwater. Informal measurements indicate their depths

*Mine tailings in the Sacramento Bar Area. Photo Credit: Regional Parks*

range from 6 – 16 feet when the river is at a flow of 4,000 cfs. The pond nearest the point bar has progressively filled in with deposition, cutting off the surface connection it once had with the river channel. It was substantially filled with an influx of material during the high flow event of 1986. When these depressions are seasonally watered, they support a wide variety of waterfowl and wildlife. Some support a fringe of cottonwood mixed riparian vegetation, but some areas are wetted too often to permit vegetation growth. In general, wildlife habitat at Sacramento Bar is mixed, with some areas providing good habitat and others of a very degraded quality.

## Expected Future Trends

Physical changes in the Sacramento Bar landform and river channel should not change substantially in the foreseeable future although it is possible that the effects of Folsom Dam on LAR hydrology and sediment supply could eventually lead to physical channel changes in the Sacramento Bar reach. This conforms with observed rates of change on other gravel-bed rivers. Additionally, the ongoing salmonid gravel augmentation projects in upstream areas is unlikely to result in demonstrable channel changes in this reach (given apparent slow rates of downstream gravel migration.) However, it is possible that the additional gravel could contribute to the ongoing growth of the mid-channel bar and RR bank erosion and retreat. Moderate to high flows will likely continue to cause deposition and aggradation along the southern point bar given the substantially lowered bar surface and over-widened channel cross-section. These channel processes will influence the ability of riparian vegetation to take hold.

There are several notable expected channel and bank trends. First, ongoing aggradation and growth of the existing mid-channel bar and subsequent RR bank erosion and retreat. Second, ongoing aggradation of smaller coarse material at the point bar and the progressive filling of the nearest pond - a trend that could ultimately result in the reestablishment of altered flood chutes across the point bar. And finally, ongoing RR bank erosion and retreat in areas downstream of the point bar as the LAR continues to migrate.

Vegetation beyond the channel margins is expected to persist in its current types and configurations. However, the patterns and composition are subject to threats from invasive non-native species and fires. Naturalization projects have the potential to improve aquatic pond habitat as well as riparian habitat connectivity throughout the area.

## Desired Conditions

The desired condition for the channel is to maintain the ongoing processes described above and accommodate expected foreseeable natural process adjustments in channel conditions. Restoration and naturalization projects should be located and designed to accommodate these processes.

The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation. Managing for a healthy understory with limited degradation from human uses (e.g., social trails

and off-trail bicycling) would improve habitat values, as would conserving some open canopy areas with understory grasses suitable for pollinators and wildlife.

## Site-Specific Potential Resource Management Actions (Figures 8-46 and 8-47)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Improve spawning riffle:** Construct gravel augmentation site to create suitable spawning habitat for salmonids.
3. **Improve degraded riparian habitats:** Consider recontouring some areas and/or removing cobble to create conditions that would better support riparian vegetation and natural processes. Plan should consider that during high flows the area has a propensity to be depositional due to the widened channel in the area.
4. **Develop conceptual naturalization plan for open mining pits/ponds:** Develop a Conceptual Naturalization Plan for the areas identified for Naturalization. A substantial portion of Sacramento Bar was highly altered for mining purposes. The remnant topography includes several open water pits, high ground created for mining access routes, and severing of high flow bypass channels. The naturalization plan should develop a concept that naturalizes these large areas in a manner that brings these elements together while improving habitat value. Material could be used to fill some ponds (e.g., the pond closest to the river channel which naturally wants to fill) while regrading and enhancing others. Recontouring and enhancing the substrate in mined areas would also provide areas to expand riparian and woodland habitats.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Sacramento Bar Area should include efforts to continue to maintain the area free of red sesbania, invasive brooms (Spanish and French), Chinese tallow, and pampass grass. Other noxious weeds as prioritized in the upcoming IPMP update should also be targeted. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Maintain created spawning and rearing habitat: Conduct routine maintenance of previously constructed salmonid habitat including periodic replenishment of gravel to maintain suitable spawning habitat for salmonids.

*Fremont cottonwood in the Sacramento Bar Area.*
*Photo Credit: Regional Parks*

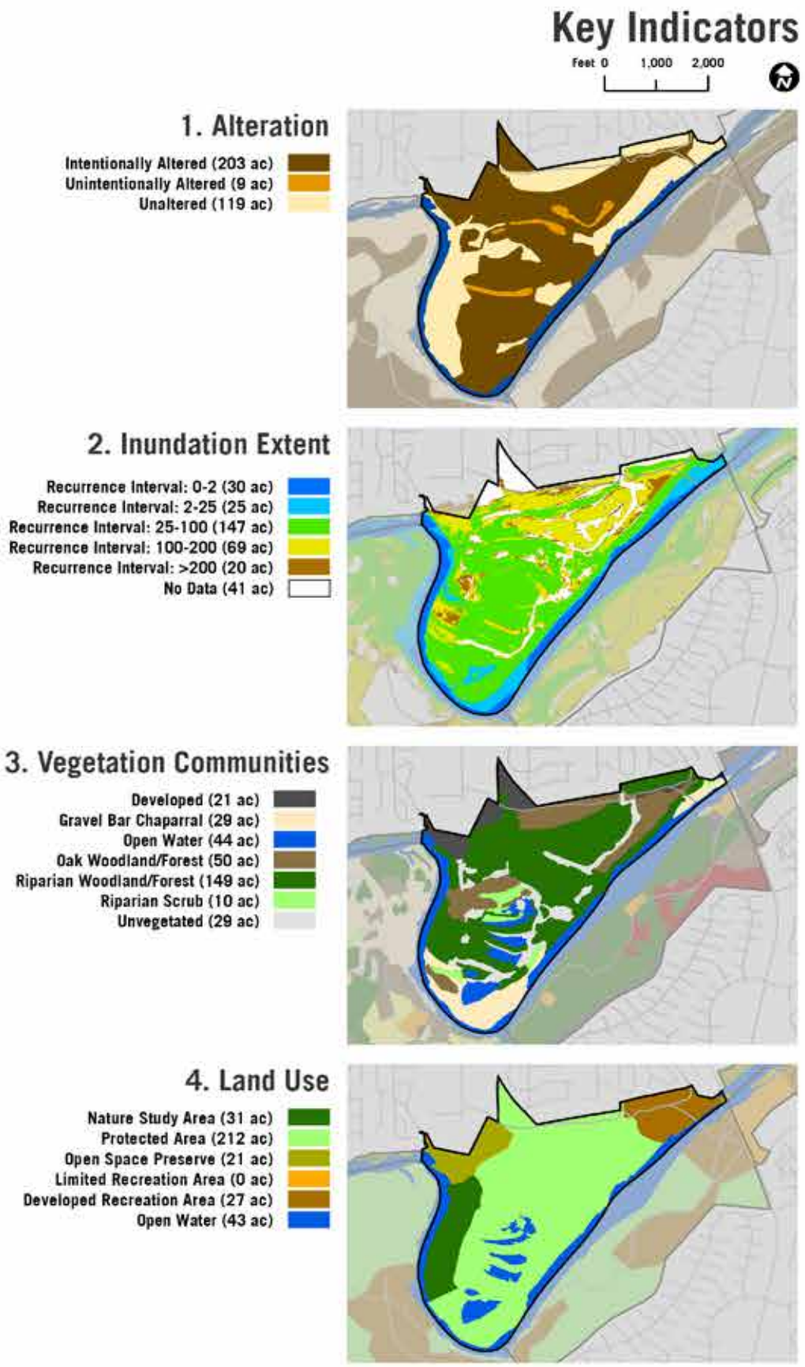
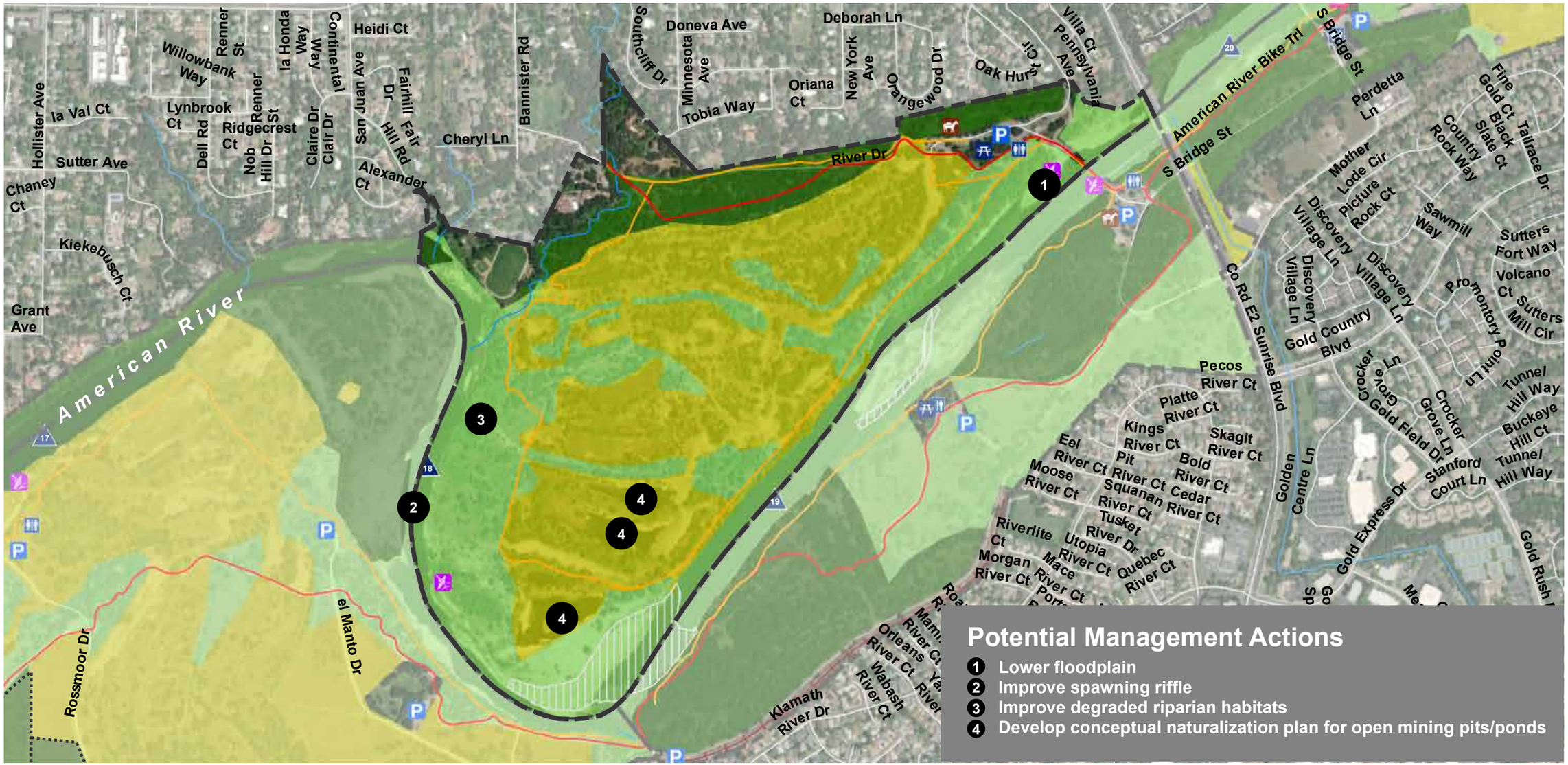



Figure 8-46
Area Plan 15 Sacramento Bar A




## Potential Management Actions

1. Lower floodplain
2. Improve spawning riffle
3. Improve degraded riparian habitats
4. Develop conceptual naturalization plan for open mining pits/ponds

Federally Protected Mitigation Area
Parkway Boundary
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Lower Tributaries
Levee

Boat ramp, Trailer boat
Picnic Area
Car Top Boat Launch
Equestrian Staging
Parking
Restroom
River Mile

Existing Salmonid Habitat Enhancment
Management Category
Conservation
Restoration
Naturalization

No Data/Private Property

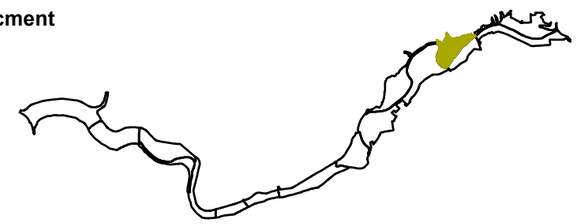


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Figure 8-47
Area Plan 15 Sacramento Bar B

AREA PLAN 16

# LOWER SUNRISE

## Lower Sunrise Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the Lower Sunrise Area Plan cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials as it migrated south into the Lower Sunrise area. The river channel was largely single-threaded except for two mid-channel bars – one persistent and the other variably present - which changed in size based on sequences of flood flow scouring and sediment transport. The non-resistant material along RL bank eroded very slowly. Riparian vegetation along the channel was driven by a scour and sprout dynamic with vegetated areas subject to periodic scour during higher flows followed by root and stem sprout re-establishment. Vegetation growth was limited by irrigation stress during seasonally lower flows.

Overbank areas consisted of a variety of surfaces formed over geologic time, resulting in areas with and without overbank deposition and variably underlain by the impermeable erosion-resistant Fair Oaks formation. In most higher elevation areas, this impermeable material isolated surfaces from river fed shallow groundwater, thereby limiting the amount of groundwater available to vegetation, and significantly influencing the types and amounts of vegetation able to survive. Buffalo Creek, a tributary to the LAR, followed a course beginning farther upstream and entered the river channel at the downstream end of the Lower Sunrise area.

### Impact of European Settlement

Substantial mining activities, both dredger gold mining and some subsequent aggregate mining of the dredger mine tailings, altered large areas of Lower Sunrise—little less than half of the land area. Dredger mining removed existing vegetation and altered the topography, leaving behind large mounds of unvegetated cobble material. Where subsequent aggregate mining occurred, the land surface was lowered to elevations close to the original ground elevation. Few elevated dredger mine tailing piles persist. Dredging equipment crossed the river between Lower Sunrise and Sacramento Bar. While the extent of in-channel mining in this area is unknown, overly deep conditions in the channel between the mid-channel bar and point bar indicate this area may have deepened during dredger mining.

The construction and operation of Folsom Dam and Nimbus Dam have changed the flow regime and sediment regime in the LAR but not the channel configuration in the Lower Sunrise area, consistent with observations of other gravel bedded rivers which show slow responses to dam-related changes in flow and sediment regimes. However, higher flows during the summer and fall may have contributed to increasing the extent of riparian vegetation and SRA habitat in this area. A side channel through the mid-channel bar with gravel augmentation at the downstream end was built recently to improve conditions for anadromous fish.

### Present Conditions

Approximately half of Lower Sunrise was intentionally altered, and the other half is unaltered. However, even in mined areas, a majority of the area supports valley oak riparian woodland and live oak woodland. Patches of annual grassland occur throughout the oak woodlands, and small areas of riparian scrub occur along the river channel. A large stand of pampas grass and Scotch broom have been controlled as part of the IPMP, and will need monitoring for additional treatment. Overall, the area provides high-quality vegetation and habitat.

Buffalo Creek, which used to run the full length of Lower Sunrise, no longer runs within the area; its new outfall is just upstream of Sunrise Boulevard. However, another storm drain empties into the middle of the lower Sunrise area, maintaining a dense willow thicket.

The Lower Sunrise Area has 129 bird species recorded from eBird over the last 5 years (2016 to 2021). Of interest are the many Acorn woodpeckers (among other woodpeckers) and their acorn cache trees in the area's rapidly declining large

valley oak trees. Botanically, Lower Sunrise contains one of the two large populations of showy milkweed (the other being at Ancil Hoffman Park) in the Parkway.

Due to both long-term geologic processes and ongoing adjustments to human actions, the channel and banks in this area are dynamic. In the upstream reaches the channel appears overloaded with transportable coarse bed material and continued aggradation is possible. The persistent mid-channel bar has been a site of ongoing aggradation and enlargement, resulting in about 50-250 feet of RR bank erosion and retreat since the late 1950s and the loss of considerable low elevation riparian habitat area. Between the mid-channel bar and the riffle at the point bar, the channel appears artificially over-deepened (possibly due to gold era dredger mining activities), and a majority of easily transportable material appears to flush through this reach to downstream areas. The point bar area has an artificially enlarged channel area and the point bar and nearest excavation pond on RR (Sacramento Bar area) collect the smaller coarse sediment that passes through.

## Expected Future Trends

Substantial changes in channel configuration within the Lower Sunrise Area are unlikely in the foreseeable future (conforming with observed rates of change on other gravel-bed rivers). Additionally, slow rates of downstream gravel migration indicate that recent gravel augmentation projects in upstream areas are unlikely to result in demonstrable changes to the channel in this reach. However, this additional gravel could contribute to ongoing processes such as the growth of the mid-channel bar and RR bank erosion and retreat. Moderate to high flows will likely continue to cause deposition and aggradation along the southern point bar (Sacramento Bar area at downstream end) given the substantially lowered bar surface and over-widened channel cross-section.

*Valley oak trees and field of yellow starthistle in the Lower Sunrise Area. Photo Credit: Regional Parks*

There are two notable expected channel and bank trends. The first trend is the ongoing aggradation and growth of the existing mid-channel bar and subsequent RR bank erosion and retreat. The second trend is the ongoing aggradation of smaller coarse material at the point bar on the opposite bank and the progressive filling of the nearest pond, which could ultimately result in the reestablishment of altered flood chutes across the point bar (at Sacramento Bar).

Vegetation beyond the channel margins is expected to persist in its current types and configurations. However, the patterns and composition are subject to threats from invasive non-native species and wildfires. Naturalization projects have the potential to improve habitat conditions in the limited areas where naturalization is needed.

## Desired Conditions

The desired condition for the channel is to maintain ongoing channel processes and accommodate expected foreseeable natural process adjustments in channel conditions. Restoration and naturalization projects should be located and designed to accommodate these processes.

The desired condition for habitat is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native species should be reduced/controlled. It is also desirable to naturalize areas that have been substantially altered in

*Valley oak trees and egret resting on in-channel island in the Lower Sunrise Area. Photo Credit: Regional Parks*

the past and could provide better habitat for target species following implementation, understanding that there is limited need for improvement in this area. Managing for a healthy understory with limited degradation from human uses (e.g., social trails and off-trail bicycling) would improve habitat values, as would conserving some area of open grassland suitable for pollinators and wildlife.

## Site-Specific Potential Resource Management Actions (Figures 8-48 and 8-49)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Enhance woodland savanna and/or grasslands:** Augment degraded native communities with plantings of woodland and grassland species to enhance habitat value.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Lower Sunrise Area should include efforts to continue to maintain the area free of pampas grass and Scotch broom. Other noxious weeds as prioritized in the upcoming IPMP update should be targeted. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Maintain created spawning and rearing habitat: Conduct routine maintenance of previously constructed salmonid habitat including periodic replenishment of gravel to maintain suitable spawning habitat for salmonids.
- Develop a Conceptual Naturalization Plan for the areas identified for Naturalization, including improvements to riparian forest.
- Consideration: Specific consideration should be given to the issue of off-trail bicycling, which is currently contributing to measurable disturbance of the landscape.
- Consideration: When considering proposals to transform channel conditions in the Lower Sunrise area, consider ongoing natural processes and the widened channel and its propensity toward deposition of materials as they are transported into the area during high flows.

*Aerial view of the Jim Jones Bridge, Sunrise Boulevard Bridge, Fair Oaks Bridge, and the Sunrise Access Parking Lot in the Lower Sunrise Area. Photo Credit: John Hannon*

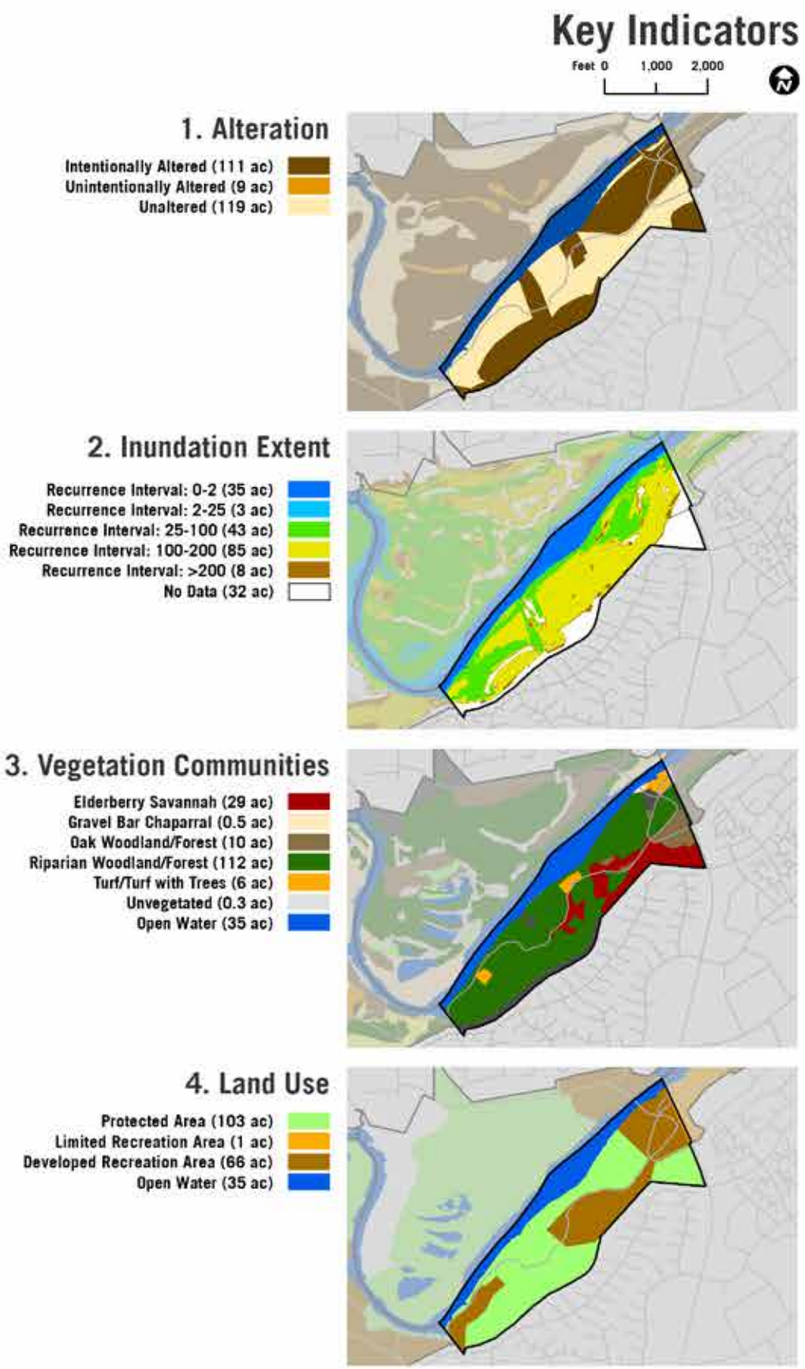
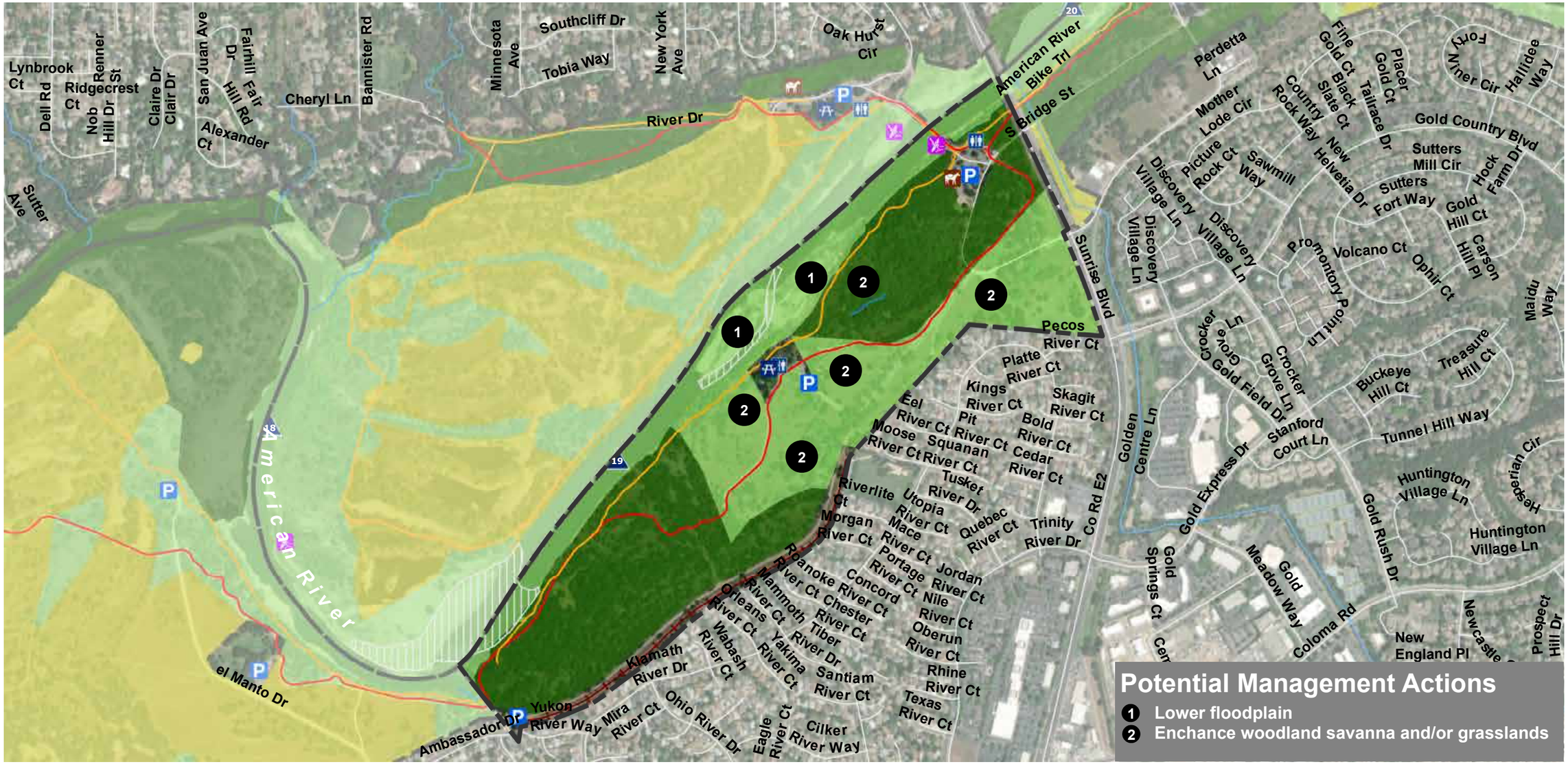



Figure 8-48
Area Plan 16 Lower Sunrise A




- Parkway Boundary
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Lower Tributaries
- Levee
- Picnic Area
- Car Top Boat Launch
- Equestrian Staging
- Parking
- Restroom
- River Mile
- Existing Salmonid Habitat Enhancement
- Management Category
  - Conservation
  - Restoration
  - Naturalization
- No Data/Private Property

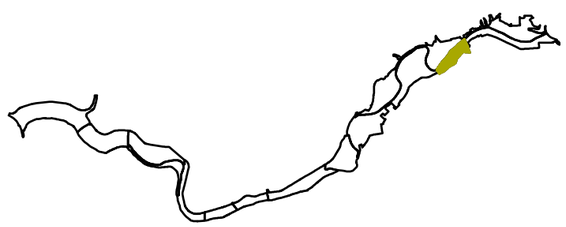


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Figure 8-49
Area Plan 16 Lower Sunrise B

AREA PLAN 17

# SUNRISE BLUFFS

## Sunrise Bluffs Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the Sunrise Bluffs Area Plan cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials. This process created the steep Sunrise Bluffs which confined the channel on RR and produced a scour pool. The bluffs supported a narrow band of patchy riparian vegetation intermixed with areas of exposed soil.

### Impact of European Settlement

Agricultural activities on portions of the overbank above the bluff eventually transitioned to residential development.

The construction and operation of Folsom Dam and Nimbus Dam changed the flow regime and sediment regime in the LAR, but there is no evidence that this has changed the channel configuration in the Sunrise Bluffs area. However, the change in seasonal flows, such as higher flows in the summer low-flow period, may have contributed to some enhanced riparian vegetation extent and vigor and increased the extent of SRA habitat in this area.

### Present Conditions

Most of this area is privately owned; however, Fair Oaks Bluff is publicly-owned Parkway land, immediately upstream of the Old Fair Oaks Bridge.

The river channel is presently quite stable but subject to ongoing scour during higher flows. The bluffs range in height from approximately 60 to 100 feet above the low flow water surface, with a relatively continuous band of riparian vegetation with areas of steep, exposed soil throughout. Ongoing erosion in locations is very slow as a result of the erosion resistant geology. Invasive species, such as pampas grass and Spanish broom, are present throughout the area. Some pampas grass and brooms been removed and managed as part of the IPMP, however, untreated populations continue to persist on inaccessible steep bluff areas. The Parkway parcel at the bridge is predominantly oak woodland and annual grasses.

### Expected Future Trends

The present condition is expected to persist, with a relatively stable channel and very slow erosion of some bluff areas. Some episodic losses of material and remedial residential bluff protection are possible. Vegetation is expected to persist in its current types and configurations, with the possibility that non-native plant species could expand their presence in the area.

### Desired Conditions

Maintain ongoing channel processes and accommodate expected foreseeable natural process adjustments in channel conditions. This calls for limiting future bank protection projects to those required for public safety, protection of property outside of the Parkway, and protection for substantial, unmovable infrastructure within the Parkway. Bluff protection projects should be kept to a minimum. The desired condition for vegetation is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species should be controlled.

### Site-Specific Potential Resource Management Actions (Figures 8-50 and 8-51)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Improve spawning riffle:** Construct gravel augmentation site to create suitable spawning habitat for salmonids.
3. **Improve degraded riparian habitat:** Augment degraded native communities with plantings of riparian species to enhance habitat value.
4. **Monitor bluff erosion:** Specific consideration should be given to managing invasive plants and monitoring bluff erosion.

*Aerial view of the Sunrise Bluffs Area (photo right). Photo Credit: John Hannon*

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Sunrise Bluffs Area should include efforts to continue to maintain the area free of pampas grass and brooms and consideration should be given to treating the populations on the inaccessible steep bluff areas without causing damage. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.

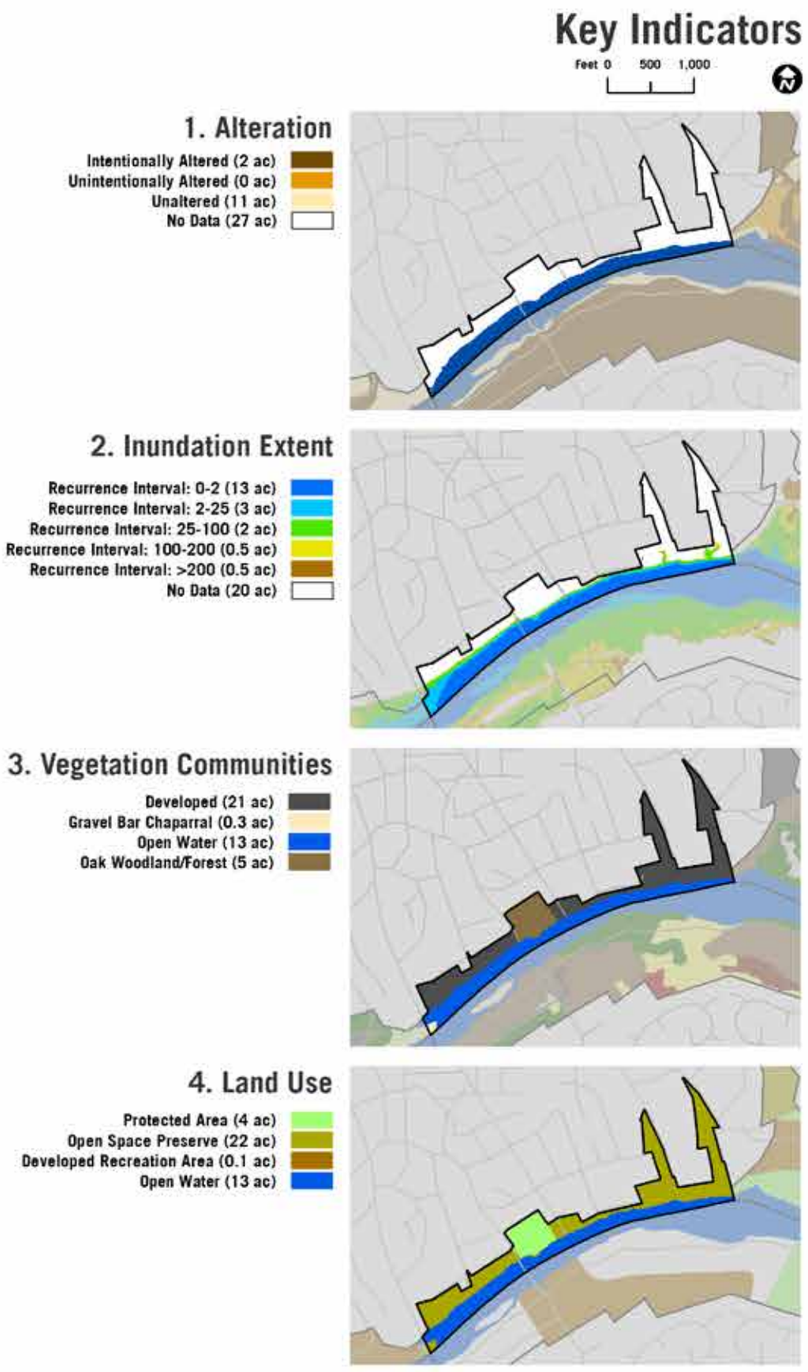


Figure 8-50
Area Plan 17 Sunrise Bluffs A

## Potential Management Actions

1. Lower floodplain
2. Improve spawning riffle
3. Monitor bluff erosion

### Management Category

**Management Category**

- Conservation
- Restoration
- Naturalization
- Parkway Boundary
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Lower Tributaries
- River Mile

- Boat ramp, Trailer boat
- Car Top Boat Launch
- Equestrian Staging
- Parking
- Restroom

- Existing Salmonid Habitat Enhancement
- No Data/Private Property

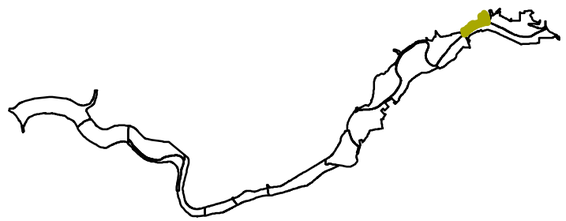

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Figure 8-51
Area Plan 17 Sunrise Bluffs B

AREA PLAN 18

# UPPER SUNRISE

## Upper Sunrise Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the Upper Sunrise Area Plan cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials as it migrated between relatively erosion-resistant bank materials on each side of the channel. The river channel was largely single-threaded, except for a single persistent mid-channel bar (and probably several transient mid-channel bars) which changed in size based on sequences of flood flow scouring and sediment transport. The RL bank was erosion resistant in its upstream portion, and somewhat more erodible, but still relatively stable, in its downstream portion. The channel was relatively straight and stable, similar to a bedrock confined channel. The bed comprised mobile material likely ranging from gravel/cobble to small boulders for some depth before reaching underlying bedrock. Riparian vegetation along the channel edge was driven by a scour and sprout dynamic, shedding mass during periodic higher flows and re-sprouting despite irrigation stress during seasonally lower flows.

Overbank areas consisted of a variety of surfaces formed over geologic time resulting in areas with and without overbank deposition and variably underlain by the impermeable erosion-resistant Mehrten, River Bank, and Modesto formations. In higher elevation areas, this impermeable material isolated surfaces from river fed shallow groundwater, significantly influencing vegetation growth patterns.

### Impact of European Settlement

The land area of Upper Sunrise has been heavily impacted by the several phases of mining conducted in the upper portion of the Parkway, including Placer mining which dominated in the latter half of the 19th Century; dredger mining which was carried out in the first half of the 20th Century; and aggregate mining which occurred in the last half of the 20th Century. Each of these modes of extraction left their mark on the Upper Sunrise area. Placer mining was conducted by hand cutting sluices into the natural hard surfaces of the area. While this activity left the landscape completely barren of vegetation, the resulting lowered land surface elevation may have facilitated the subsequent accumulation over 150 years of fines from various sources that in turn supported the development of a complex of high quality oak woodland communities and wildlife habitat. The areas of dredger mining left elevated tailing mounds of cobble which have remained essentially unvegetated. Some of these mounds were significantly altered or removed by aggregate mining, creating opportunities for revegetation. However, the most notable accomplishment of the aggregate mining era in the Upper Sunrise area was the conversion of an early gold processing site near the Old Fair Oaks Bridge into a large aggregate processing plant.

The construction and operation of Folsom Dam and Nimbus Dam changed the flow regime and sediment regime in the LAR, and there is evidence that channel impacts of these changes are present in portions of the Upper Sunrise area, particularly in the upstream half. At the upstream end and adjacent to the hatchery complex (which narrowed the channel and hardened the RL bank) there is evidence that the channel bed has lowered six to nine feet, largely due to both the interruption of coarse sediment influx from as a result of the construction of Folsom and Nimbus dams and the channel narrowing and bank hardening. It appears that flows of 100,000 cfs or greater are the primary cause of these changes. High flows have also altered non-resistant bank features in some upstream locations and caused the development of channel margin and mid-channel bars in others. The result has been a general channel widening and bed flattening in the reach below the hatchery extending down to the midpoint of Upper Sunrise. Conversely, in the downstream half there is little evidence of channel alteration due to the flow and sediment regimes inaugurated by Folsom and Nimbus Dams. This lower reach shows evidence of recent deposition and aggradation at some locations.

Additionally, changes in seasonal flows such as higher flows in the low-flow period, may have contributed to increasing the extent of riparian vegetation and SRA habitat in this area.

Recent efforts to improve conditions for anadromous fish have involved gravel augmentation at the upstream and middle portions, adding about 44 acre-feet of material to the channel. Some of the placed gravel has mobilized and rearranged locally. Side channels have also been cut at three locations including the enlargement and lowering of the naturally occurring RL secondary channel on the persistent mid-channel bar in the downstream half of the reach.

## Present Conditions

As noted, almost all of Upper Sunrise was intentionally altered by mining and materials handling activities. Despite this substantial alteration, a majority of the area supports valley oak riparian woodland and live oak woodland. Patches of annual grassland occur throughout the oak woodlands, and small areas of riparian scrub occur along the river channel. Overall, the area provides a substantial corridor of high-quality vegetation and habitat.

Due to both long-term geologic processes and ongoing adjustments to human actions, the channel and banks in this area are dynamic. The most upstream area near the hatchery is scoured and over-deepened, followed by a steep and somewhat confined channel down to the Sailor Bar boat ramp. Continuing downstream, the channel is over-widened as high flows from the dams have eroded bank features. This reach is quite shallow; as the channel extends beyond the influence of the dams it becomes relatively narrow and remains shallow, possibly due to gravel augmentation. The persistent mid-channel bar is causing erosion on the RL bank, followed by a generally stable section with signs of net deposition, likely contributed to by erosion and transported

*The Nimbus Fish Hatchery in the Upper Sunrise Area. Photo Credit: MIG*

gravel augmentation. A scour and sprout riparian vegetation regime persists along the channel edges, evidenced by some near channel areas presently bare of well-developed riparian vegetation. This is considered a result of ongoing scour during flood flow events and in balance with the present LAR streamflow dynamics.

Upper Sunrise (across the river from avian-rich Sailor Bar), has very high bird diversity, with 167 species recorded on Ebird over the last 5 years (2016 to 2021). The Nimbus Fish Hatchery, and proximity to Lake Natoma likely boost the avian diversity to this area, however, the vegetation in the Upper Sunrise is also transitioning to a foothills type vegetation, which likely also adds to birding diversity. The Hazel bridge provides nesting habitat for White-throated swifts in the drain holes under the bridge, while Cliff swallows build mud nests on the bridge's side.

As mentioned above, the Upper Sunrise area vegetation is transitioning to a more foothills community, with more toyon, gray pine, and California buckeye scattered among the oaks, making it one of the most botanically interesting and diverse areas on the Parkway. Local rarities, such as buckbrush, styrax, mock orange, mountain mahogany, holly leaved redberry, keckellia, and several locally rare wildflower species are all found in Upper Sunrise. Bush monkey flower is common in the open areas. Some of the previously mined areas of Upper Sunrise have naturalized into "fern canyons" dotted with the only population of California styrax found on the Parkway as well as several fern species. Several stands of giant reed were successfully removed as part of the IPMP.

*The Jedediah Smith Memorial Trail in the Upper Sunrise Area. Photo Credit: MIG*

Scotch broom continues to be removed and monitored and Chinese tallow tree is an ongoing target for removal in the Gold River drain and along the river bank.

## Expected Future Trends

The effects of Folsom Dam on LAR hydrology and sediment supply, resulting in a lack of sediment supply and areas of scour, are expected to continue. Depending on the incidence and duration of future flood flow events (approximately greater than 100,000 cfs), foreseeable future trends may include the progressive extension of the bed scour zone at the hatchery complex downstream toward the area of the Sailor Bar boat ramp. The erosional loss of bank attached bars and channel apron features, leading to channel widening in the area downstream of the Sailor Bar boat ramp is also likely. Given the apparent slow pace of change in the reach above the mid-channel bar as a result of dam-related changes, the lower portion is likely to remain unaltered by dam influence over a reasonable management timeframe. However, based on the observed apparent slow rate of spawning augmentation gravel export from this reach, it is expected that future augmentation efforts will contribute additional bed material and contribute to the shallow channel conditions. Finally, due to ongoing aggradation of the persistent mid-channel bar in the downstream reach, ongoing RL bank erosion and retreat is expected with the eventual loss of a short portion of the paved bike trail.

Vegetation beyond the channel margins is expected to persist in its current types and configurations. However, the patterns and composition are subject to threats from invasive non-native species and fires. Naturalization projects have the potential to improve habitat conditions in the limited areas where naturalization is needed.

## Desired Conditions

The desired condition for the channel is to maintain ongoing processes and accommodate expected foreseeable adjustments in channel conditions. Restoration and naturalization projects should be located and designed to accommodate these processes.

The desired condition for habitat is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native

species should be reduced/controlled. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species, understanding that there is limited need for improvement in this area. Managing for a healthy woodlands with limited degradation from human uses (e.g., social trails and off-trail bicycling) would improve habitat values, as would conserving some area of open grassland suitable for pollinators and wildlife.

### Site-Specific Potential Resource Management Actions (Figures 8-52 and 8-53)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Improve spawning riffle:** Construct gravel augmentation site to create suitable spawning habitat for salmonids.
3. **Develop conceptual naturalization plan for areas altered by mining:** Develop a Conceptual Naturalization Plan for the area identified for Naturalization. The area has been scraped clean in some manner and soils need to be assessed. These areas could ultimately support oak woodland/savanna or grassland with proper preparation.

### General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Upper Sunrise Area should include efforts to continue to remove Scotch broom and Chinese tallow, as well as maintaining the area free of giant reed. Other noxious weeds as prioritized in the upcoming IPMP update should be targeted. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Maintain created spawning and rearing habitat: Conduct routine maintenance of previously constructed salmonid habitat including periodic replenishment of gravel to maintain suitable spawning habitat for salmonids.
- In connection with proposals to naturalize channel conditions in the Upper Sunrise area, consider ongoing natural processes and the propensity of the widened channel to capture materials as they are transported through the area during high flows.

*Riverbank in the Upper Sunrise Area. Photo Credit: MIG*

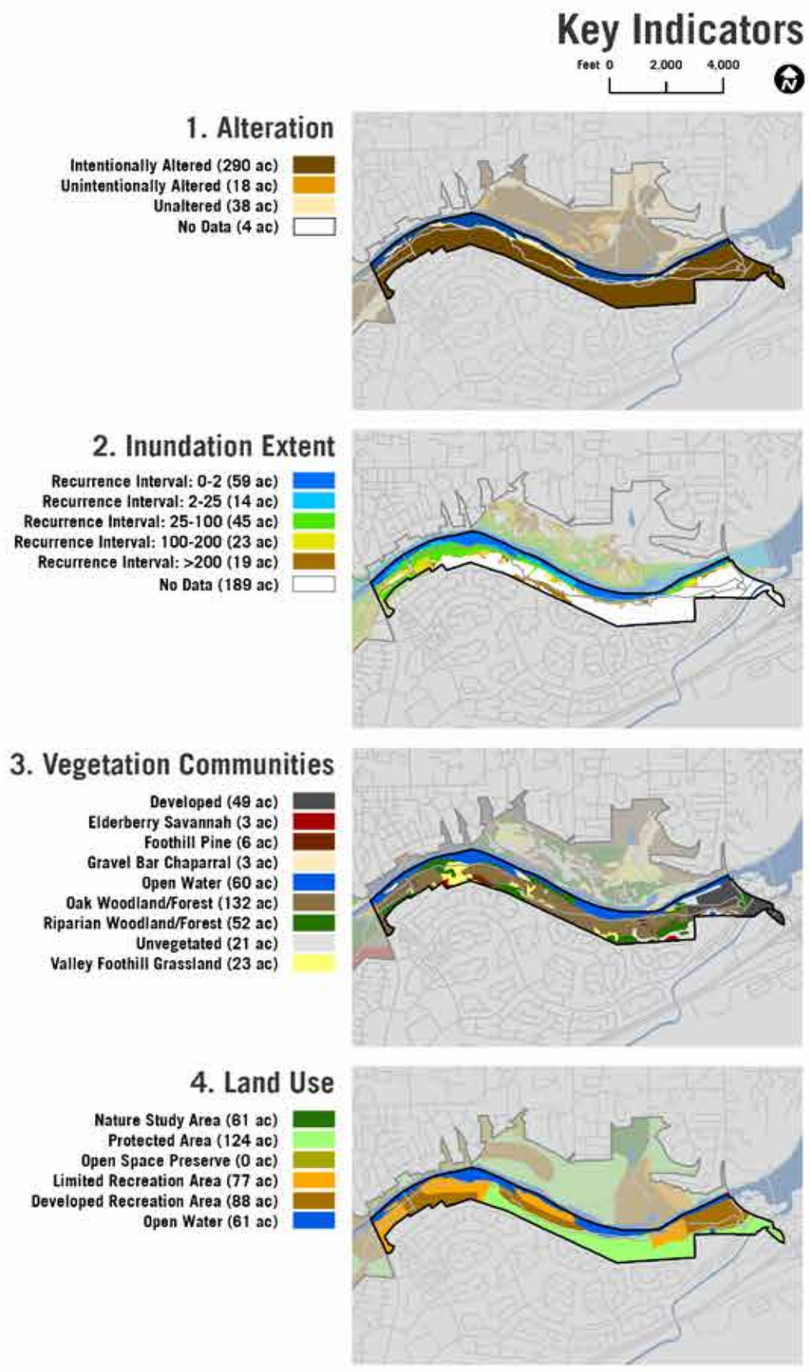
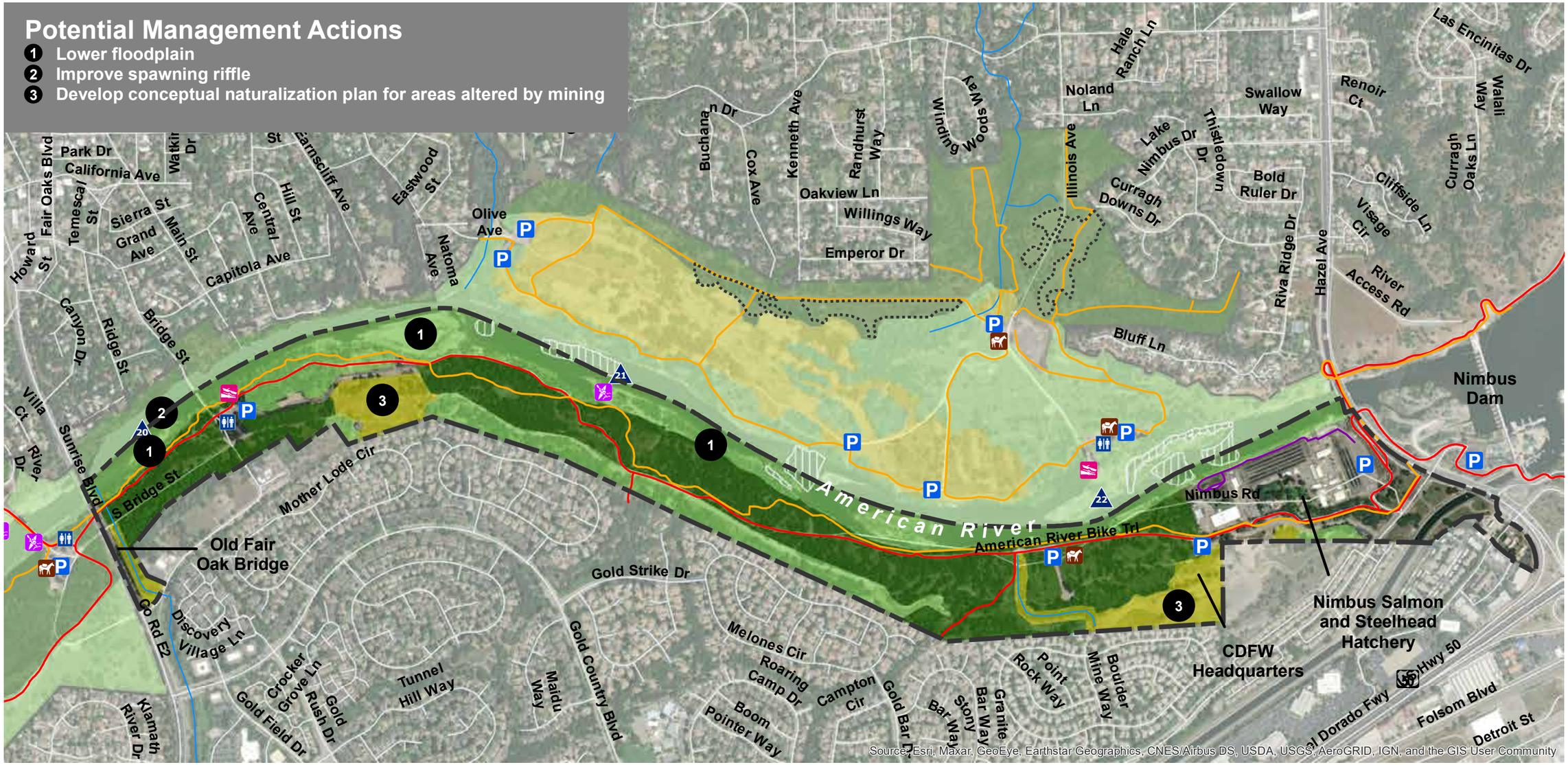



Figure 8-52
Area Plan 18 Upper Sunrise A

## Potential Management Actions

1. Lower floodplain
2. Improve spawning riffle
3. Develop conceptual naturalization plan for areas altered by mining




Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Parkway Boundary
- Federally Protected Mitigation Area
- Bicycle/Pedestrian Trail
- Equestrian/Hiking Trail
- Pedestrian Trail
- Lower Tributaries
- Boat ramp, Trailer boat
- Car Top Boat Launch
- Equestrian Staging
- Parking
- Restroom
- River Mile
- Existing Gravel Augmentation
- No Data/Private Property
- Existing Salmonid Habitat Enhancement

Management Category
- Conservation
- Restoration
- Naturalization

0 950 1,900 Feet

Figure 8-53
Area Plan 18 Upper Sunrise B

AREA PLAN 19

# SAILOR BAR

## Sailor Bar Area Plan

### Historic Physical and Biological Conditions

Well before European settlement, the LAR channel in the Upper Sailor Bar Area Plan cut through older floodplain material and into the erosion-resistant Fair Oaks formation materials as it migrated between relatively erosion-resistant bank materials on each side of the channel. The river channel was largely single-threaded except for a single persistent mid-channel bar (and probably several transient mid-channel bars) which changed in size based on sequences of flood flow scouring and sediment transport. The relatively stable RR bank comprises coarse and relatively erosion resistant floodplain material and is underlain by exposures of the erosion resistant Fair Oaks formation material. The channel through the area has remained relatively straight and stable. Similar to a bedrock confined channel, the channel bed was composed of mobile material ranging from gravel/cobble to small boulders for some depth before reaching bedrock. Riparian vegetation along the channel was driven by a scour and sprout dynamic, with vegetated areas being periodically scoured during higher flows and then reestablishing by root and stem sprouts with limited irrigation during seasonally lower flows.

Overbank areas consisting of a variety of surfaces formed over geologic time, resulting in areas with and without overbank deposition and variably underlain by the impermeable erosion-resistant Fair Oaks formation. Vegetation was likely patchy in much of the area due to hardpan conditions. Some of the bank slopes are relatively steep as they move north away from the river channel. Soil conditions across these slopes and the area's high elevation depositional bar likely limited vegetation to grasslands and scattered oaks. Several creeks flow into the area, most notably "Illinois Creek" near the upstream end which originally dissected the high bar as it flowed down to the river channel.

### Impact of European Settlement

Substantial mining activities, primarily dredger gold mining, covered a majority of the land area and significantly altered much of Sailor Bar. The dredger mining removed any existing vegetation and altered the topography and composition of the surface, leaving behind large piles of unvegetated cobble material. However, some of the surfaces that appear lower are natural surfaces supporting "pocket forests." Elevated mounds of dredger mine tailings persist in areas scattered throughout. Areas that were used for material handling but not mined are less damaged.

A small earthen dam was constructed on "Illinois Creek," creating a pond that exists today. A large concrete-lined wading pool feature was constructed at the downstream end of the area, but is not functional.

As described for Upper Sunrise, the construction and operation of Folsom Dam and Nimbus Dam have changed the flow regime and sediment regime in the LAR and there is evidence that channel impacts of these changes are present in portions of the Sailor Bar area, particularly in the upstream portion. At the upstream end and adjacent to the hatchery complex (which narrowed the channel and hardened the RL bank) there is evidence that the channel bed has lowered six to nine feet, largely due to both the interruption of coarse sediment influx from the closure of Folsom and Nimbus dams and the channel narrowing and bank hardening. It appears that flows 100,000 cfs or greater are the primary cause of this channel lowering. High flows have also contributed to other channel changes, such as erosion or loss of bank features in some locations and development of channel margin and mid-channel bars in others. The result has been a general channel widening and bed flattening in the reach below the hatchery extending down to the lower third of Sailor Bar. Conversely in the downstream portion, there is little evidence of channel alteration due to the flow

and sediment regimes associated with the operation of Folsom and Nimbus Dams. This lower reach shows evidence of recent deposition and aggradation at some locations. Additionally, higher flows in the summer and fall, may have contributed to increasing the extent of riparian vegetation and SRA habitat in this area.

Recent efforts to improve conditions for anadromous fish have involved gravel augmentation in several locations throughout the Sailor Bar area, adding about 44 acre-feet of material to the river channel. Some of the placed gravel has mobilized and rearranged locally. Side channels have also been cut at two locations.

## Present Conditions

A majority of Sailor Bar was intentionally altered by dredger mining and materials handling activities. There are some unaltered areas along the channel margin and along the northern boundary, where riparian vegetation and oak woodlands persist. The post-mining landscape provides areas of high-quality vegetation and habitat, while others are highly disturbed and of only modest value. Pockets of unaltered areas with high-quality vegetation are likely part of the original “Illinois Creek” channel. Some of the areas lowered during aggregate extraction support patches of mixed riparian communities and oak woodland, although located well back from the channel. These areas are often surrounded by dredger mine tailings that support very little vegetation. The areas likely used for materials handling are somewhat less degraded but still support limited vegetation. The upper slopes that remain unaltered support oak woodlands with a grass understory. Overall, the area provides some valuable habitat but there are several opportunities for improvement.

*Aerial view of the Sailor Bar Area, including mine tailings (photo foreground). Photo Credit: John Hannon*

Due to both long-term geologic processes and ongoing adjustments to human actions, the channel and banks in this area are dynamic. The most upstream area near the hatchery is scoured and over-deepened, followed by a steep and somewhat confined channel down to the Sailor Bar boat ramp. Continuing downstream, the channel is over-widened as high flows from the dams have eroded bank features. This reach is also quite shallow, possibly due to gravel augmentation. As the channel extends beyond the influence of the dams it becomes relatively narrow and remains shallow – again, possibly due to gravel augmentation. A scour and sprout riparian vegetation regime has persisted along the channel edges, evidenced by some near channel areas presently bare of well-developed riparian vegetation. This is considered a result of ongoing scour during flood flow events and in balance with the present LAR streamflow dynamics.

Sailor Bar has the highest recorded bird diversity in the American Parkway with 197 species recorded in eBird over the last 5 years (2016 to 2021). This park features bluffs, a pond, mine tailings (with “pocket forests” within the tailings), as well as river frontage, and is in close proximity to the Nimbus Fish Hatchery and Lake Natoma. Many intermittent creeks from the surrounding neighborhoods drain into Sailor Bar, forming damp brushy areas that further add to its habitat diversity.

Although blue oaks occur elsewhere on the Parkway, Sailor Bar has the only example of a blue oak dominated forest on the American River Parkway. Sailor Bars’ northern meadow

*Aerial view of the boat ramp in the Sailor Bar Area. Photo Credit: John Hannon*

and the open grassland areas east of the Illinois access road, support native bunchgrasses, geophytes (such as soaproot, brodeaias, and calorchortus), and summer blooming virgate tarweed. Much of the central mined area is fragrant with elegant Madia during the summer months. The gravel bars near the river showcase frying pan poppies in the spring. The northern portion of Sailor Bar has the largest populations of California maidenhair fern found on the Parkway as well as a ravine with many redbuds. Large stands of pampas grass have been successfully removed from the gravel bars, as part of the IPMP. A small amount of tamarisk persists near the boat launch parking and downstream near the Olive access populations of French and Spanish broom continue to be removed each year.

## Expected Future Trends

The effects of Folsom Dam on LAR hydrology and sediment supply, resulting in a lack of sediment supply and areas of scour, are expected to continue. Depending on the incidence and duration of future flood flow events (approximately greater than 100,000 cfs) foreseeable future trends may include the progressive extension of the bed scour zone at the hatchery complex downstream toward the area of the Sailor Bar boat ramp. The erosional loss of bank attached bars and channel apron features, leading to channel widening in the area downstream of the Sailor Bar boat ramp is also likely.

Vegetation beyond the channel margins is expected to persist in its current types and configurations. However, the patterns and composition are subject to threats from invasive non-native species and fires. Naturalization projects have the potential to improve habitat conditions in the limited areas where naturalization is needed.

## Desired Conditions

The desired condition for the channel is to maintain ongoing processes and accommodate expected foreseeable natural adjustments in channel conditions. Restoration and naturalization projects should be located and designed to accommodate these processes.

The desired condition for habitat is to conserve existing native vegetation that occurs throughout much of the area. Invasive non-native species that are outcompeting native species or inhibiting the regeneration of native

species should be reduced/controlled. It is also desirable to naturalize areas that have been substantially altered in the past and could provide better habitat for target species following implementation. Managing for a healthy woodlands with limited degradation from human uses (e.g., social trails) would improve habitat values, as would conserving some area of open grassland suitable for other wildlife (including pollinators).

## Site-Specific Potential Resource Management Actions (Figures 8-54 and 8-55)

1. **Lower floodplain:** Develop a plan to lower the floodplain to increase inundation frequency and improve rearing habitat for target fish species.
2. **Maintain water levels at Sailor Bar Pond for wildlife habitat:** Manage pond water levels to support native wildlife species and reduce risk of non-native species colonization.
3. **Improve degraded riparian habitats:** In connection with proposals to naturalize channel conditions in the Sailor Bar area, consider ongoing natural processes and the widened channel and its propensity toward deposition of materials as they are transported through the area during high flows.
4. **Expand oak habitats**: Enhance native oak woodland species plantings to enhance habitat value in restoration and naturalization areas.
5. **Recontour mined areas to support oak habitats:** Areas identified for naturalization have been highly disturbed from mining. Substantial effort is likely needed to grade, recontour, and supplement soils in order to support oak woodland and/or savanna. Specific consideration should be given to increasing woodland in the eastern end, not to high density, but could support more oaks. Areas recently used for gravel augmentation projects should be considered for further grading, contouring, and soil amendment prior to planting.
6. **Naturalize relict pools/remove gunite:** The former "pool" in the northwest corner could be naturalized into some type of lower elevation feature, but its low elevation doesn't seem to help retain moisture. Consideration should be given to removal of bentonite/gunite layer.

## General Area Plan Potential Resource Management Actions

- Invasive Plant Management Plan Update: Update the 2000 IPMP, including the invasive non-native plant inventory, management strategies, and target species for priority removals (Planning Phase Report for the American River Parkway Invasive Plant Management Plan, Eva Butler and Associates, 2000). The update should incorporate the success of Phase I and Phase II IPMP removals, changes to the Parkway plant communities, and new technologies for eradication and control measures.
- Manage invasive vegetation: High priority weeds in the Upper Sunrise Area should include efforts to continue to maintain the area free of pampas grass, to continue efforts to treat invasive brooms (Spanish and French), and to target a small amount of tamarisk near the boat launch. Other noxious weeds as prioritized in the upcoming IPMP update should be targeted. Treated areas should be planted with native species, if necessary, to prevent re-invasion of noxious weeds.
- Trail mapping and habitat management: Map the multi-use trail and trail spurs, equestrian/hiking trail, pedestrian trail, maintenance roads, and current social trails. After mapping is complete, determine which social trails should be actively closed and restored vs. actively monitored.
- Remediate social trail impacts and promote native vegetation growth: Manage social trails in a manner that consolidates trails and allows rehabilitation of vegetation understory.
- Maintain created spawning and rearing habitat: Conduct routine maintenance of previously constructed salmonid habitat including periodic replenishment of gravel to maintain suitable spawning habitat for salmonids.
- Develop a Conceptual Naturalization Plan for the areas identified for Naturalization. Consider opportunities to naturalize Illinois Creek.

*Bluffs in the Sailor Bar Area. Photo Credit: MIG*

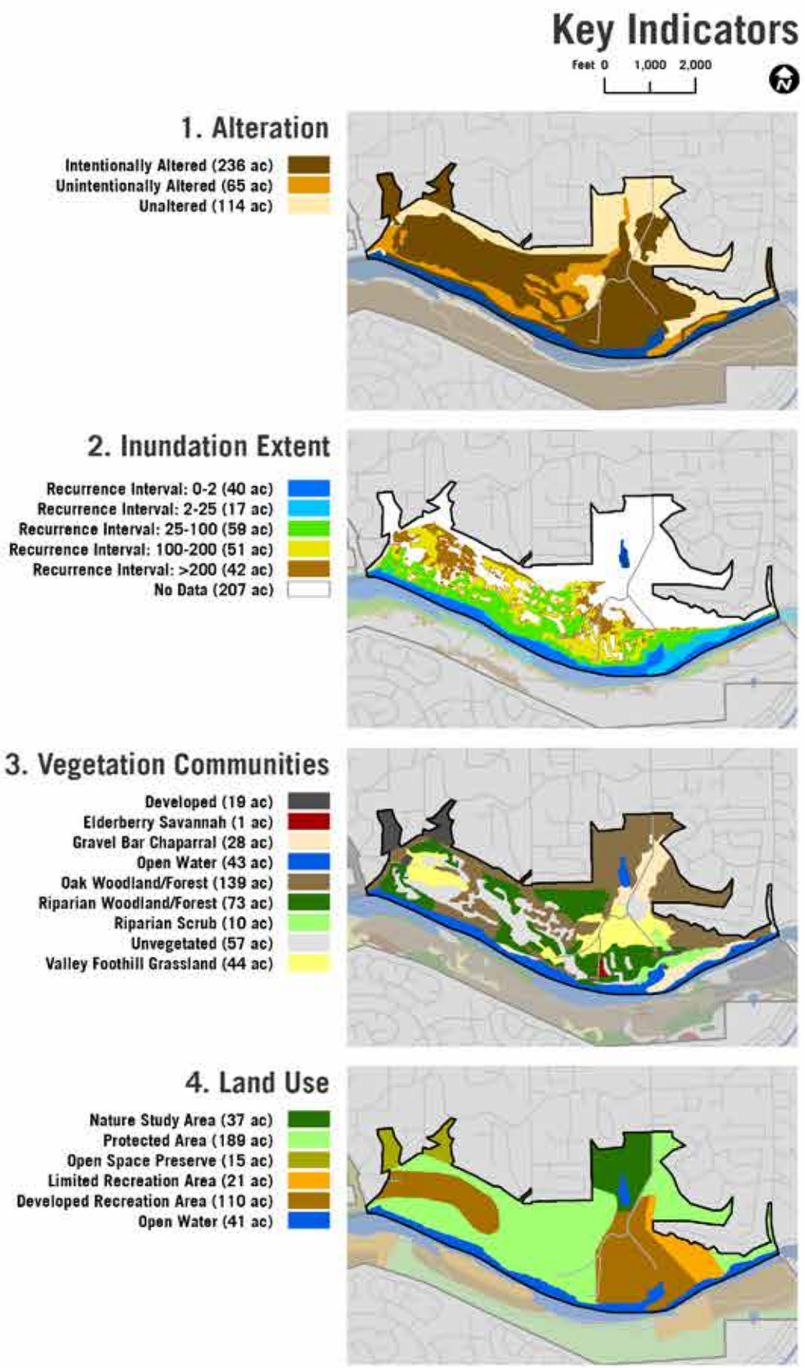



Figure 8-54
Area Plan 19 Sailor Bar A

## Potential Management Actions

1. Lower floodplain
2. Maintain water levels at Sailor Bar Pond for wildlife habitat
3. Improve degraded riparian habitats
4. Expand oak habitats
5. Recontour mined areas to support oak habitats
6. Naturalize relict pools / remove gunite

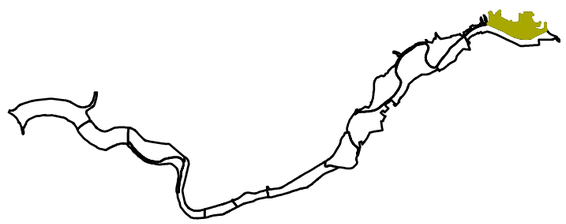
Parkway Boundary
Bicycle/Pedestrian Trail
Equestrian/Hiking Trail
Pedestrian Trail
Lower Tributaries

Boat ramp, Trailer boat
Car Top Boat Launch
Equestrian Staging
Parking
Restroom
River Mile

Existing Salmonid Habitat Enhancement
Federally Protected Mitigation Area

Management Category
Conservation
Restoration
Naturalization

No Data/Private Property



0 1,000 2,000 Feet

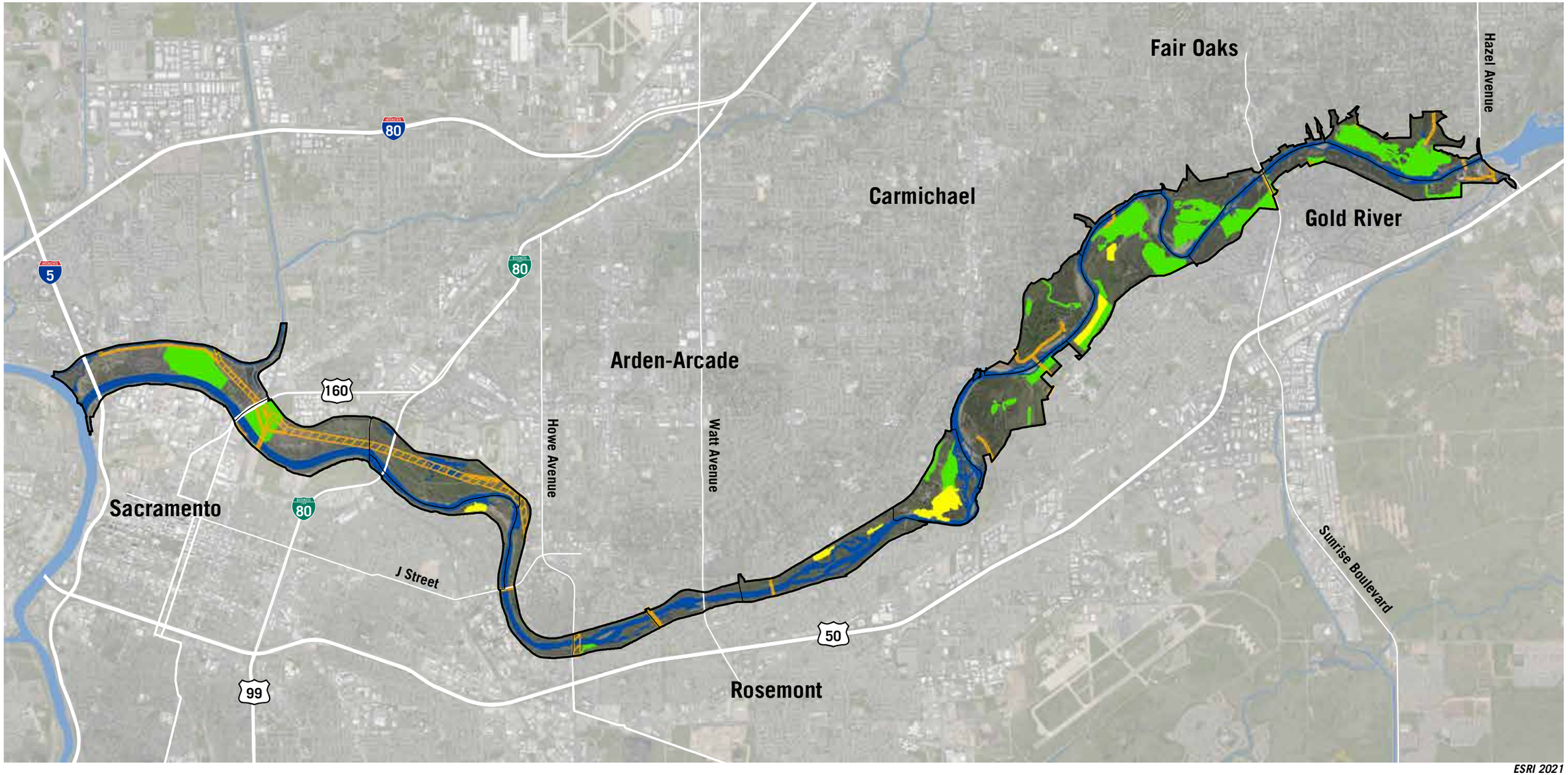
Figure 8-55
Area Plan 19 Sailor Bar B

# 8.4 MITIGATION AREAS

There are several past and future projects within the Parkway that require mitigation for their impacts to various Parkway resources. Example projects include flood control/bank protection projects, transportation/bridge projects, and utilities such as electric transmission and sewer. The aforementioned factors, including land use designations, level of alteration, frequency of inundation, existing vegetation communities, and wildlife habitat values, in combination with the assigned natural resource management categories (e.g., preservation, conservation, and naturalization) provide a framework for identifying locations in the Parkway that are likely suitable for mitigation purposes. Figures 8-56 through 8-59 show the Parkway-wide and by-reach locations of existing mitigation sites and potential mitigation areas. These areas and associated mitigation projects will require site-specific planning by project proponents and evaluation by Regional Parks. Additionally, other entities have previously identified several fish rearing habitat improvement projects that could potentially serve as mitigation projects. These projects involve actions such as lowering floodplains and increasing riparian vegetation and will require site-specific planning by project proponents and evaluation by Regional Parks and are shown in the Area Plan maps.

Site-specific planning activities for proposed projects shall include preparation of a long-term management plan for the site and or project sites, including a funding strategy for long-term maintenance. To facilitate Regional Parks evaluation and approval of proposed projects the project proponents should coordinate early and often with Regional Parks.

*View of in-channel island in the SARA Park Area. Photo Credit: Regional Parks*




ESRI 2021

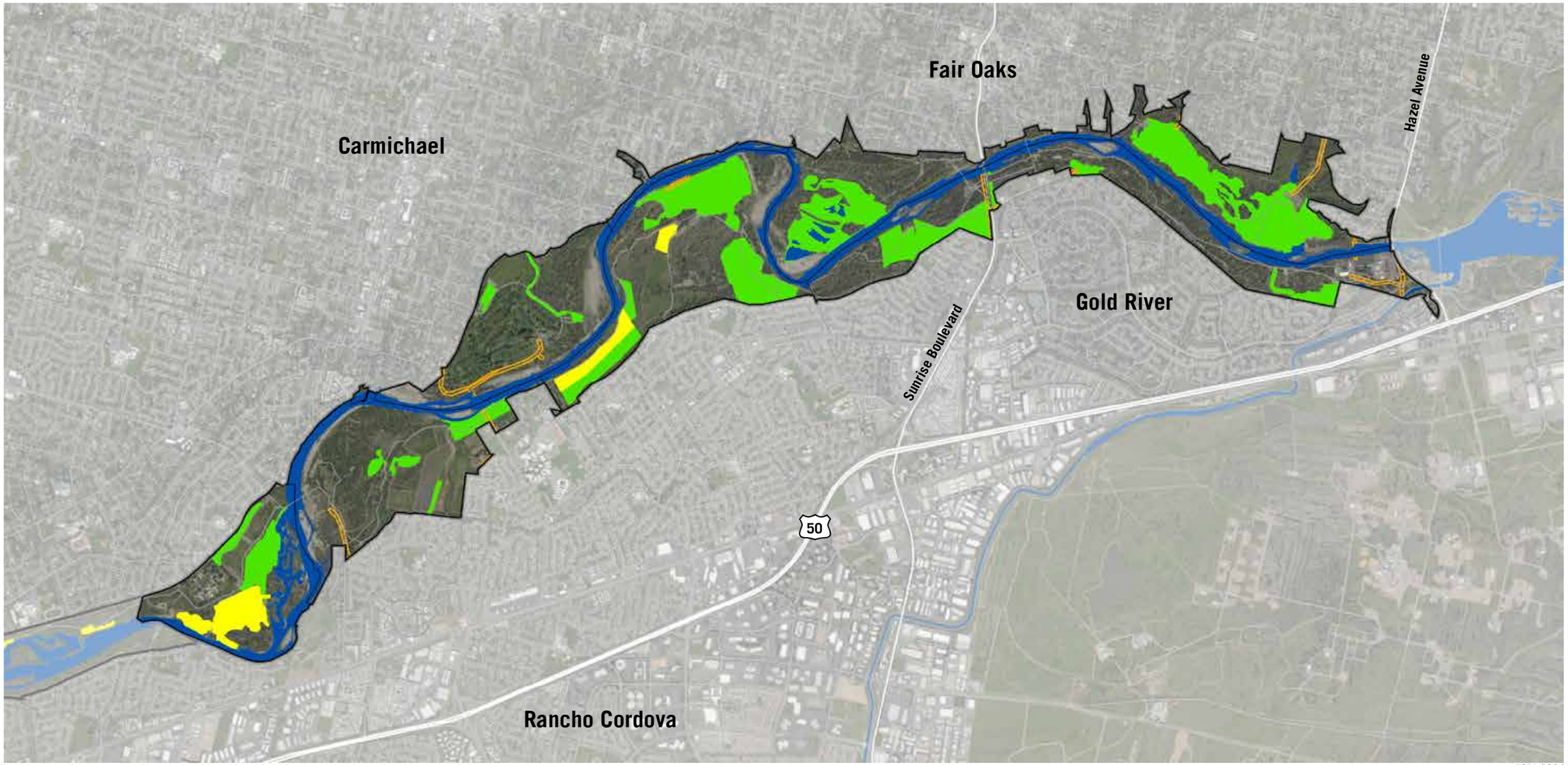
Powerline Easement
Proposed USACE Bank Protection Mitigation
Potential Key Mitigation Area

0 1 2 Miles

Figure 8-56
Parkway Potential Key Mitigation Areas

Figure 8-57
Lower Reach Potential Key Mitigation Areas

Figure 8-58
Middle Reach Potential Key Mitigation Areas




ESRI 2021

Powerline Easement
Proposed USACE Bank Protection Mitigation
Potential Key Mitigation Area

0 0.55 1.1 Miles

Figure 8-59
Upper Reach Potential Key Mitigation Areas

# 8.5 EVALUATION OF POTENTIAL PROJECTS

Projects varying in level of detail and refinement have been proposed for the Parkway, and future projects are anticipated. Regional Parks will need to make decisions about the acceptability of these projects for implementation. The following criteria are intended to assist Regional Parks in this effort. Similarly, project proponents can use these criteria to self-evaluate their projects and document their process and results for inclusion in their submittal to Regional Parks.

The level of detail required varies depending on the circumstances of the project. The degree of required evaluation varies depending on the previously defined management categories and level of prior landscape/channel alteration assigned to a given area. Regional Parks will consider this information in evaluating proposed projects. A determination will be made as to whether the project will:

- Contribute to meeting American River Parkway Plan and NRMP goals and objectives without unacceptable indirect or unintended adverse effects.
- Achieve specific goals and objectives stated in the American River Parkway Plan and NRMP.
- Resolve any potential indirect or unintended adverse effects.
- Be readily achieved and sustainable.
- Set reasonable expectations for success for the short- and long-term.
- Result in values substantially better than the values that would exist without the project, post construction, and after plants have established (3-5 years later).

Toward that end, project proponents should consider the following criteria:

- **NEED:** Describe and justify the need for the conditions intended by the proposed project.
- **EFFECTS:** Describe how the proposed project would affect ongoing Parkway uses and channel processes and trends. Describe the expected net long-term resource value changes considering a) pre-project conditions, b) post-project conditions, and c) installation resource impacts.
- **DURABILITY:** Describe how the proposed project is resistant to change from expected Parkway uses and hydraulic forces and/or channel processes. If the proposed project is not intended to be durable, describe why that is acceptable.
- **ALTERNATIVE SITES:** Describe alternative sites that have been considered and if they are more or less suitable given the above considerations.

## Projects and NRMP Implementation

A high priority is placed on projects that assist in the implementation of the NRMP. These potential efforts are reflected either from the goals and objectives and/or the area plan maps:

- Update vegetation community map;
- Development of frequently inundated floodplain (where SRA is found) habitat map;
- Mapping of trails (including social trails) in the Parkway;
- Systematic survey of sensitive species;
- Invasive species surveys and production of Invasive Species Management Plan Update;
- Map and evaluate all areas damaged or degraded by wildfire or encampments annually;
- Identification of areas in the Parkway impacted by excessive ambient light;
- Development and implementation of a plan for wildfire prevention, response, and recovery.
- Development of a tracking system for wildfires in the Parkway.
- Development of an Interpretation Plan for the Parkway; and
- Development of a citizen science program.

*Plant palette under transmission lines at the West San Gabriel River Parkway Nature Trail in Lakewood, CA. Photo Credit: MIG*

# 8.6 POTENTIAL FUNDING SOURCES

There are numerous potential funding sources to implement various aspects of the NRMP. Primary among these sources is the County's General Fund. However, these sources are often limited and are subject to variability due to year-to-year differences in tax receipts. Other sources come from partner agencies that are active in the Parkway including WCB, the flood management agencies including USACE and SAFCA, and the Water Forum. Furthermore, state grant opportunities, federal funding opportunities through the Natural Resources Conservation Service (NRCS), USFWS Section 6 grants, and NGO funding opportunities may be available.

## Sacramento County General Fund

The Sacramento County General Fund collects incoming revenue from property taxes, sales and other taxes, federal and state monies, fees, and other funds to support the majority of County services. Regional Parks, as a County department, receives a portion of its fiscal year budget from General Fund allocations. Historically, the Regional Parks budget receives revenues from General Fund Allocations, User Fees, Leases, and Reimbursements.

## Wildlife Conservation Board (WCB) Lower American River Conservancy Program (LARCP)

The LARCP provides a state partner to work cooperatively with local agencies to fund projects and provides grants to benefit public access and the Parkway's natural, recreational, educational, and cultural resources. WCB administers the LACRP. The 12-member Lower American River Conservancy Program Advisory Committee either denies or recommends for funding projects that have passed WCB Administrative Review and Sacramento County Review, and helps review and prioritize projects for funding.

The LARCP obtains monies from the Lower American River Conservancy Fund, and these funds are available for capital improvements, land acquisition, support for LACRP operations, and other purposes consistent with Assembly Bill 1716, the LARCP's enabling statute. WCB may also fund riparian zone restoration, land acquisition, and climate adaptation programs.

WCB awards grants for the following project purposes, per the Lower American River Conservancy Program Guidelines (2018):

- The acquisition, restoration, enhancement, and maintenance of fish and wildlife habitat and other natural resources, including resources impacted by wildfire, within and adjacent to the American River Parkway.
- The improvement and expansion of public access, recreational areas, and recreational facilities, including trails.
- The enhancement of interpretive and educational facilities related to the American River Parkway and its natural, cultural, and historic resources.
- The control and removal of invasive species and the propagation of native species.
- The improvement and enhancement of lands within and adjacent to the American River Parkway. Projects funded on adjacent lands shall contribute to the advancement of American River Parkway values.
- The design, implementation, and provision of grants for stormwater capture and treatment projects to improve the quality of water that flows within and into the American River Parkway and to increase habitat for fish and wildlife. Stormwater projects may include lands within and adjacent to the American River Parkway and its tributaries downstream of the Nimbus Dam and within Sacramento County.

WCB has several other conservation and public access funding programs that could help support projects in the Parkway. These include but are not limited to the Habitat Enhancement and Restoration Program (HERP), the California Riparian Habitat Conservation Program (CRHCP), the Oak Woodlands Conservation Program, and the Public Access Program. Visit www.wcb.ca.gov/programs for more information.

## U.S. Army Corps of Engineers (USACE), CA Central Valley Flood Protection Board (CVFPB) and Sacramento Area Flood Control Agency (SAFCA) Funds

USACE, CVFPB, and SAFCA fund off-site, in-kind mitigation projects that address the environmental impacts of levee improvement and bank protection projects through the replacement of affected habitats. These same agencies may also fund non-mitigation projects, such as the Ecosystem Restoration projects described for Woodlake and Cal Expo. To encourage implementation and ultimately funding of Ecosystem Restoration in Woodlake and Cal Expo it will be important to highlight how this would be an opportunity for the CVFPB to contribute the State's CVFPP Conservation Strategy.

### The Water Forum

As part of the Habitat Management Element (HME) of the Water Forum Agreement, the Water Forum leverages funding from the City of Sacramento, Sacramento County, the San Juan Water District, the City of Roseville, the City of Folsom, Placer County Water Agency SMUD, El Dorado County Water Agency, and Golden State Water company to implement ecosystem management efforts along the Lower American River. The HME addresses flow, temperature, physical habitat, and recreation issues. The Water Forum has planned and implemented multiple projects along the LAR, including gravel restoration projects, side channel restoration, the Cordova Creek Naturalization project, LARTF and FISH Working Group planning efforts, invasive plant removal, the Soil Born Farms Education Program, and Effie Yeaw Nature Center opportunities. Many of these projects were funded wholly or in part through state and federal grants (e.g. Proposition 68 and CVPIA).

*Mitigation site for the Valley elderberry longhorn beetle in the Ancil Hoffman County Park Area. Photo Credit: Regional Parks*

## 8.7 IMPLEMENTATION AND MONITORING PLAN

Monitoring is essential to natural resource management as it allows management staff to accurately determine the effectiveness of programs and to determine if Parkway goals have been met. Additionally, monitoring provides information on environmental and social changes over time (for example, an increase in the prevalence of invasive species, or the presence of a new recreation activity that may impact natural resources). Monitoring typically involves the collection of quantitative and qualitative data on the physical characteristics of a resource or area, but may also involve social characteristics, including observing whether design choices, signage, and other factors influence visitor behavior (Marion 2016). Regular monitoring activities can help adjust and/or adapt management actions to inform the management framework of a protected natural area and achieve desired results. For example, analysis of monitoring data collected from restoration sites over a multi-year period may show that a specific restoration technique is not working as anticipated. This may convince management staff to alter or discontinue the use of that technique. In addition, monitoring is important because it provides the evidence needed to demonstrate the success of a management strategy or restoration project to decision-makers, grantors, and the public. Monitoring also refers to regular testing or screening for certain resource impacts. The implementation of the NRMP is guided by the goals and objectives shown in Chapter 2. As such, this section is organized by goal area. Public input was incorporated into the NRMP and many of the items are reflected in the area plans and/or area plan write-ups presented earlier in this chapter.

A draft Monitoring Plan accompanies the NRMP as Appendix D. The Monitoring Plan will be completed in concert with the project's data management system. The data management system will allow Regional Parks and its partners to access, update, and share existing and updated data to facilitate project planning and/or monitoring. In this section, potential monitoring methods are discussed, while the final Monitoring Plan, as approved by the Recreation and Parks Commission, will formalize the monitoring approach.

The monitoring plan includes the following components:

- Adaptive management principles
- Target species for observation
- Monitoring interval and process
- Data collection protocol, storage, and access
- Accommodation for citizen science
- Responsible parties and partners
- Funding
- Success criteria
- Reporting requirements

Consistent with California environmental regulations, the NRMP will undergo CEQA review. It is anticipated that a Supplemental EIR (supplementing the Parkway Plan EIR) for the NRMP has been prepared to comply with these requirements. It is important to note some projects would undergo a separate environmental review and Regional Parks would not be the lead agency on all of the projects.

### 8.7.1 Biological Resources

The Parkway contains a diverse range of habitats and ecosystems that provide resources for both plant and wildlife species. In order to maintain a healthy, functioning ecosystem, there need to be varying levels of habitat protection activities in place throughout the Parkway. Habitat protection is a key management strategy used to protect, conserve, and restore habitats to prevent habitat loss or fragmentation and species extinction (CDFW 2020). Habitat loss occurs when natural environments are destroyed, divided, or degraded, usually due to human activities (EC 2014). Within the Parkway, there are many opportunities for habitat protection through enhancement and restoration, with a priority being the enhancement of key habitat areas, including sensitive riparian vegetation. Maintaining, managing, and protecting habitats throughout the Parkway will help provide diverse resources to a biodiverse range of species. In an active Parkway with multiple land uses occurring simultaneously, habitat protection and adaptive management strategies are vital to ensure a naturally balanced ecosystem.

Information gained through regular monitoring can indicate when adaptive management measures should be taken, so those measures can be reflected in updates to the NRMP to help ensure its success. Monitoring will compare future conditions against baseline data gathered early in the project to demonstrate the progress toward Plan goals. Monitoring provides quantitative and qualitative documentation to help determine if objectives are being met, particularly for biological resources. In some cases, monitoring will involve simple documentation that a task was completed, such as the completion and updating of resource maps. In other cases, it will involve the quantitative and/or qualitative assessment of field conditions.

Some monitoring methods will allow measurement of more than one goal area with the same data sampling. For example, vegetation samples in any given area can include species types addressed by multiple objectives and performance measures. Potential monitoring methods to quantify acreages stated in the goals include the following:

- GIS mapping via air photo, with ground-truthing.
- Drone mapping of vegetation types and post processing in GIS
- Field sampling of species type and percent cover present via:
  - Transect (line or wandering)
  - Quadrat
  - Random Sample
- Qualitative assessments in the field (e.g., ocular estimates of percent cover, plant density, health, recovery, etc.)

Monitoring for species, erosion, and water quality may include:

- Species-specific surveys
- Visual monitoring of erosion
- Cross-sections
- Gravel bar assessment
- Measurements of water quality and temperature

Other monitoring methods may include an inventory of efforts made to resolve impacts from encampments, and a list of fire or other impactful events with a statement about how they were resolved or could best be resolved in the future.

There are numerous biological resources activities associated with the implementation of the NRMP that both will help guide management and monitoring. These activities related to biological resources include the following:

- Completion of annual updates to vegetation community maps.
- Completion of frequently inundated floodplain (where SRA is found) habitat map.
- Completion of sensitive species and invasive species surveys, including updates to the existing IPMP mapping.
- Regularly documenting and updating a Parkway wildfire damage and recovery database.
- Regularly documenting and updating a homeless encampment locations, damage, and recovery database.

"Outreach and education are one of the most important aspects of a successful implementation of the plan."

**— RESPONDENT TO NRMP COMMUNITY SURVEY 2020**

*The California Indian Cultural Demonstration Area at the Effie Yeaw Center. Photo Credit: MIG*

## 8.7.2 Physical Resources

Physical resources, or abiotic characteristics, within the LAR impact every biological function within it. Globally, highly altered riparian systems have vastly impaired their ecological functions. Channelized regions have greatly increased flow speed, leading to the destruction of shaded and vegetated banks that provide protection to growing salmon smolts. Erosion forces also affect the sediment regime of the river, carving highly nutrient-rich floodplain materials from a geographic region and depositing them far downstream within the watershed. Additionally, less shaded reaches of rivers increase water temperature, making the reach less hospitable to native species adapted to cooler, slower reaches of riparian habitat and increasing the likelihood of generalist invasive species' colonization.

Combined with the urban runoff and other pollutants common within the Parkway, habitat quality may become diminished. However, the long reach of the LAR within the Parkway also presents many opportunities to combat these physical resource challenges.

Nonnative plant removal and subsequent plantings of natives will stabilize bank conditions throughout the Parkway. Stabilized banks will promote the colonization of shading vegetation that will reduce the overall temperature of the banks and create more protective habitat for salmonids and other aquatic wildlife. A stable bank will also increase the likelihood of natural flooding patterns, increasing habitat for wetland and/or side channel plant and wildlife species. Bank stabilization generally improves water quality through percolation of runoff. However, combating runoff, trash debris, fecal contamination, and other common urban river issues requires a more comprehensive plan aimed around education.

## 8.7.3 Cultural Resources

The Parkway encompasses an area rich with remnants of prehistoric, historic, and industrial activity. Cultural resources are important not only as evidence of prehistoric and historic activities, but also as tools for educating the public and also as a form of recreation. Balancing the multiple roles of cultural resources in the Parkway requires careful, strategic management. Cultural resources are valuable to indigenous successors and critical in informing our knowledge of historical peoples and events. Furthermore, identification of cultural resources instills in the public recognition of the Parkway as an epicenter of its rich cultural history. Interpretive areas and cultural centers attract users who enjoy forming a connection with the Parkway's history. As a result, cultural interpretive activities are and should remain centered on the creation of demonstration areas and strategically-placed signage that disseminates information on and provides replicas of target resources. In addition, strategic ecological resources management can contribute to the preservation of cultural resources. The designation of sensitive habitat areas that either contain a cultural resource or act as a buffer between a cultural resource and more heavily used areas is an ecological resource management tool that also works to preserve cultural resources.

CEQA review also plays a part in protecting cultural resources. When a project is proposed that could have significant impacts of natural resources, the lead local or state agency prepares an environmental document including project details, potential environmental impacts, and, if applicable, measures to avoid or reduce potential

impacts. The environmental document includes a review of both cultural resources and tribal cultural resources. California legislation AB 52 established that "a [project] with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" and requires a lead agency to notify California Native American tribes traditionally and culturally affiliated with an area early on in the CEQA environmental review process that it received a proposal for a project that may impact a tribal cultural resource. Following notification, a California Native American tribe may request consultation under AB 52. Consultation must occur prior to the public release of a negative declaration, mitigated negative declaration, or environment impact report for a project (OPR 2017). SB18 incorporates the protection of California traditional tribal cultural places into land use planning for cities, counties, and agencies by establishing responsibilities for local governments to contact, refer plans to, and consult with California Native American tribes as part of the adoption or amendment of any general plan. SB18 requires public notice to be sent to tribes listed on the Native American Heritage Commission's SB18 Tribal Consultation list within the geographical areas affected by the proposed changes. Tribes must respond to a local government notice within 90 days (unless a shorter time frame has been agreed upon by the tribe), indicating whether or not they want to consult with the local government. Consultations are for the purpose of preserving or mitigating impacts to places, features, and objects described in Sections 5097.9 and 5097.993 of the Public Resources Code that may be affected by the proposed adoption or amendment to a general or specific plan. Monitoring of cultural resources includes confidential mapping that is including in the data management set. It is important to protect these areas from human uses while maintaining the confidentiality of these sites. Additionally, any projects proposed in the Parkway that may be ground disturbing will require environmental review and appropriate mitigation strategies, as required by state and federal regulations. In order to best manage tribal cultural resources in the Parkway, Regional Parks will establish or attend annual meetings to discuss issues important to the tribal governments with an interest in the Parkway.

*Encampment cleanup. Photo Credit: Regional Parks*

## 8.7.4 Human Use Impact Reduction

Marion (2016) advises managers to implement a "management toolbox" to maintain the balance between human uses and protection of natural resources. The concept of employing a toolbox of various natural resource management actions and strategies applies to protected natural areas of all kinds. Management is most effective when it concentrates on avoiding or minimizing the impacts in the Parkway, addresses how context plays into creating impacts, and comprises multiple strategies or actions.

In the context of the NRMP, visitor management strategies focus on persuading or compelling visitors to behave in a manner that prevents or minimizes adverse natural resource impacts. An example of a desirable behavior would be a visitor staying on designated trails to minimize their impact on natural resources. Strategies may include decommissioning duplicative social trails or using interpreting and educational strategies. These actions may include use of signage, media, and interpretive programming to communicate rules and educate visitors, often with the underlying goals of promoting environmentally responsible

**BEFORE** *Clear cut transmission corridor at the West San Gabriel River Parkway in Lakewood, CA. Photo Credit: MIG*

**AFTER** *Replanted transmission corridor at the West San Gabriel River Parkway Nature Trail in Lakewood, CA. Photo Credit: MIG*

social behavior. These educational and interpretation strategies may be more desirable as they are often less expensive than enforcement and/or site management. As such, interpretation is an important activity to help manage Parkway natural resources.

Interpretation informs and educates the public about natural resources and also serves as an indirect management tool. Roggunbuck (1992) notes that persuasion through messaging may be used to influence visitors to behave in a manner that limits their impact on the natural environment. Azjen (1992) notes, "Persuasive communication involves the use of verbal messages to influence attitudes and behaviors...the verbal message must be designed to sway the hearts and minds of the receivers... Through a process of reasoning, the message exerts its influence by the force of its contained arguments" (p. 2). Research on non-compliant behavior has indicated that the most persuasive, effective messages are positive and encouraging. The messages: (1) advise visitors of what they should do rather than what they should not do; (2) highlight how compliance benefits visitors; (3) focus on conveying a few pieces of information at a time; and (4) persuade the visitor into believing most visitors act in accordance with established environmental and social norms (Hammitt et al. 2015, Johnson and Vande Kamp 1996). These ideas will be considered when developing an interpretation plan in the first two years of the project. Additionally, interpretive elements will be encouraged for incorporation into mitigation projects and other habitat restoration or enhancement projects in the Parkway.

Site management can also be useful as an interim strategy. Research at Acadia National Park has shown an effective practice is converting some social trails into designated trails while decommissioning others. Social trails that were more resistant to impacts and highly used by visitors were converted into designated trails. Park management staff then closed, using signage and other means, and actively restored the remaining social trails with positive results (Marion 2016).

The following summarizes some of the key implementation activities related to human use impact reduction:

- When recreation infrastructure, including trails, campsites, day use areas, and stock areas, are sustainably designed they are more resistant to human use impacts. As a result, natural resource impacts and maintenance costs are reduced in the long run (Marion 2016). As such, it is important to design potential future recreational facilities in a sustainable manner as to reduce human use impacts. When recreation developments are considered, these should be placed 100 feet away from a waterway (when feasible); this would not be feasible for a boat ramp, for example. However, the planning and design of future recreational terrestrial facilities should be planned with this buffer.
- Regional Parks will also map the location of trails (including user-defined social trails) in the Parkway. The mapping and documentation effort will allow for the targeting and removal of duplicative trails to allow for vegetation recovery in these areas. Mapping social trails will include details about width, substrate and adjacent habitat.
- Managing the homeless population is a challenge and can be seen as multi-tiered. Actions, by partner agencies, that may reduce the homeless population would have obvious benefits. However, these actions are outside the realm of Regional Parks. Actions taken will include continued enforcement and management of the impacts associated with homelessness. This includes mitigating impacts from: 1) accumulated debris; (2) environmental degradation (3) health and public safety issues including degradation of public infrastructure.
- In order to minimize the impacts of special events, Regional Parks will continue to only permit these events in Developed Recreation areas. These areas contain developed features that allow for additional recreation use while minimizing impacts; also, containing special events in these areas protects other areas that have sensitive natural and cultural resources.
- Regional Parks will collaborate with the electrical utilities to develop environmentally beneficial opportunities, such as establishing and maintaining native forbs that support pollinator species. It is understood that these areas are under strict regulations due to wildfire risk; this will be taken into consideration during plan development. Regional Parks will consult with the utilities on a case-by-case basis for potential vegetation enhancement or other multi-benefit projects within utility right of ways. Regional Parks and utilities may explore other compatible land uses within utility ROWs, including trails and agriculture (e.g., row crops of low stature).
- Regional Parks will determine areas in the Parkway where there is excessive ambient light. Regional Parks will work to reduce the amount of light in any identified areas.

### 8.7.5 Agency and Community Coordination and Collaboration

A key aspect of managing natural resources in the Parkway is coordinating and overseeing activities of other agencies and/or partners that perform activities that may have impacts on natural resources. There are numerous agencies and partners whose operations impact natural resources in the Parkway. Regional Parks coordinates with these organizations to track and mitigate impacts, where possible. Table 8-1 shows Regional Parks' partners in implementing the NRMP.

Coordination and oversight activities may include any or all of the following: (1) regular or periodic meetings; (2) data and/or report requirements; (3) regulatory document review; (4) permitting operations and adding conditions of approval; (5) requiring data reports and receiving data from other partner agencies/organizations; and (6) overseeing other agencies/organizations that may impact natural resources in the Parkway. These activities are an important aspect of managing natural resources in the Parkway given the number of agencies and organizations that engage in activities that impact the Parkway's natural resources.

The following summarizes the implementation activities related to coordination and collaboration:

- Regional Parks will develop a group to oversee the implementation of the NRMP. The group will be a subcommittee within the American River Parkway Advisory Committee. The group will meet, at least, one time per year to track the progress of the NRMP.
- Regional Parks will prepare a wildfire prevention, response, and recovery plan in coordination with fire departments and agencies, along with adjacent landowners and the American River Parkway Fire Safe Council.. Additionally, Regional Parks will develop a tracking system for wildfires in the Parkway.
- Regional Parks will formalize a partnership with regional universities and college to assist with scientific research, which may include monitoring. Additionally, Regional Parks will set up a citizen science program to assist monitoring efforts.
- Regional Parks will develop a monitoring plan (a draft is provided in Appendix D) to be finalized and implemented following approval by the RPC in early 2023.
- Regional Parks will continue outreach to educational institutions. After the adoption of the Plan, Regional Parks will work to develop one educational partnership per year to increase local and regional knowledge about the natural resources in the Parkway.

**TABLE 8-1 NRMP PARTNERS**

| AGENCY/ORGANIZATION | GOAL AREAS | | | | |
|---|---|---|---|---|---|
| | **GOAL AREA 1** Biological Resources | **GOAL AREA 2** Physical Resources | **GOAL AREA 3** Cultural Resources | **GOAL AREA 4** Human Use Impact Reduction | **GOAL AREA 5** Agency and Community Coordination and Collaboration |
| American River Natural History Association | ✓ | | ✓ | ✓ | ✓ |
| American River Parkway Advisory Committee | ✓ | ✓ | ✓ | ✓ | ✓ |
| American River Parkway Foundation | ✓ | | | ✓ | ✓ |
| Cal Expo | ✓ | ✓ | | | ✓ |
| California Native Plant Society | ✓ | | | | ✓ |
| California State University, Sacramento | ✓ | ✓ | ✓ | ✓ | ✓ |
| City of Sacramento | | ✓ | | ✓ | ✓ |
| City of Rancho Cordova | | ✓ | | ✓ | ✓ |
| Department of Water Resources | | ✓ | | | ✓ |
| Lower American River Conservancy | ✓ | ✓ | ✓ | ✓ | ✓ |
| Pacific Gas & Electric Company | ✓ | | | ✓ | ✓ |
| Reclamation Districts | | ✓ | | | ✓ |
| Recreation and Park Commission | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sacramento Area Flood Control Agency | ✓ | ✓ | | | ✓ |
| Sacramento City Fire | ✓ | | | ✓ | ✓ |
| Sacramento County Department of Health and Human Services | | | | ✓ | ✓ |
| Sacramento County Office of Education | | | | ✓ | ✓ |
| Sacramento Metro Fire | ✓ | | | ✓ | ✓ |
| Sacramento Municipal Utility District | ✓ | | | ✓ | ✓ |
| Sacramento Valley Conservancy | ✓ | | | | ✓ |
| Save the American River Association | ✓ | | | ✓ | ✓ |
| Soil Born Farms | ✓ | | | ✓ | ✓ |
| State Lands Commission | ✓ | | | | ✓ |
| State Water Resources Control Board | ✓ | ✓ | | | ✓ |
| University of California, Davis | ✓ | ✓ | ✓ | ✓ | ✓ |
| U.S. Army Corps of Engineers | ✓ | ✓ | | | ✓ |
| U.S. Bureau of Reclamation | ✓ | | | | ✓ |
| Utility Arborist Association | ✓ | | | ✓ | ✓ |
| The Water Forum | ✓ | ✓ | | | ✓ |
| Tribal Governments | | | ✓ | | ✓ |
| Western Area Power Administration | ✓ | | | ✓ | ✓ |
| Wildlife Conservation Board | ✓ | ✓ | ✓ | ✓ | ✓ |

# APPENDICES

*Available under separate cover*

**APPENDIX A: PUBLIC OUTREACH REPORT**

- Maptionnaire Results summary
- NRMP Public Workshops 2020 Summary Report
- NRMP Public Workshops 2021 Summary Report
- ARPAC NRMP Workshop 2020 Summary Report
- ARPAC NRMP Workshop 2021 Summary Report
- RPC NRMP Workshop 2020 Summary Report
- RPC NRMP Workshop 2021 Summary Report
- ARP Fisheries Stakeholders Meeting Summary Report
- ARP Terrestrial Stakeholders Meetings Summary Report

**APPENDIX B: PHYSICAL RESOURCES REPORT**

**APPENDIX C: SPECIAL-STATUS AND INVASIVE SPECIES IN THE PARKWAY**

- Special-Status Species in Parkway
- Invasive Species of Primary Concern in Parkway

**APPENDIX D: NRMP MONITORING PLAN**

# ACRONYMS AND ABBREVIATIONS

## Acronyms

AB – Assembly Bill
ACE – Areas of Conservation Emphasis
ACHP – Advisory Council on Historic Preservation
ARCF – American River Common Features
ARFCD – American River Flood Control District
ARNHA – American River Natural History Association
ARP – American River Parkway
ARPAC – American River Parkway Advisory Committee
ARPF – American River Parkway Foundation
ARPP – American River Parkway Plan
BMP – best management practice
BPA – bisphenol A
CAL-IPC – California Invasive Plant Council
CASWRB – California State Water Rights Board
CCR – California Code of Regulations
CDFA – California Department of Food and Agriculture
CDFW – California Department of Fish and Wildlife
CEHC – California Essential Habitat Connectivity
CEQA – California Environmental Quality Act
CESA – California Endangered Species Act
cfs – cubic feet per second
CFP – California Fully Protected
CHRIS – California Historical Resources Inventory System
CNDDB – California Natural Diversity Database
CNPS – California Native Plant Society
CPAD – California Protected Areas Database
CRHR – California Register of Historical Resources
CS – Conservation Strategy
CSUS – California State University, Sacramento
CVFPB – Central Valley Flood Protection Board
CVP – Central Valley Project
CVPIA – Central Valley Project Improvement Act
CWA – Clean Water Act
CWWP – Community Wildfire Protection Plan
DNA – Downtown-Natomas-Airport
DPS – Distinct Population Segment
DWR – California Department of Water Resources
EFH – Essential Fish Habitat
EIR – environmental impact report
EPA – Environmental Protection Agency
ESA – Endangered Species Act
ESU – Evolutionary Significant Unit
FEMA – Federal Emergency Management Agency
FESA – Federal Endangered Species Act
FISH – Fisheries and Instream Habitat
FRI – fire return interval
FVMP – Floodway Vegetation Management Plan
GAP – Gap Analysis Program
GRR – General Reevaluation Report
GIS – geographic information system
HCP – habitat conservation plan
HFRA – Healthy Forest Restoration Act
HME – Habitat Management Element
HRI – Historical Resource Inventory
IPMP – Invasive Plant Management Plan
KEA – Key Ecological Attributes
LAR – Lower American River
LARC – Lower American River Conservancy
LARCP – Lower American River Conservancy Program
LARTF – Lower American River Task Force
LSA – Lake and Streambed Alteration
MCV – Manual of California Vegetation
MND – mitigated negative declaration
MS4 – municipal separate storm sewer system
NAHC – Native American Heritage Commission
NAS – Nonindigenous Aquatic Species
NASA – National Aeronautics and Space Administration
NCCP – Natural Community Conservation Plan
NCIC – North Central Information Center
ND – negative declaration
NGO – non-governmental organization
NEPA – National Environmental Policy Act
NFWF – National Fish and Wildlife Foundation
NHO – Native Hawaiian Organizations
NHPA – National Historic Preservation Act
NMFS -- National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Association
NPDES – National Pollutant Discharge Elimination System
NPO – non-profit organization
NPS – National Park Service
NRHP – National Register of Historic Places
NRMP – Natural Resources Management Plan
NSNF – northern Sierra Nevada foothills
ORVs – outstandingly remarkable values
OPR – Governor's Office of Planning and Research
O&M – operations & maintenance
PC – Parkway Corridor
PG&E – Pacific Gas & Electric Company
PIT – point-in-time
PM – performance measure
PMF – probable maximum flood
PRC – Public Resources Code
PSTD – post-traumatic stress disorder
PVC – polyvinyl chloride
RCMP – River Corridor Management Plan
RL – river left
RM – river mile
RR – river right
RPC – Recreation and Park Commission
ROW – right-of-way
RWQCB – Regional Water Quality Control Board
SAFCA – Sacramento Area Flood Control Agency
SARA – Save the American River Association
SASD – Sacramento Area Sewer District
SCOE – Sacramento County Office of Education
SCRP – Sacramento County Regional Parks
SHPO – State Historic Preservation Officer
SLF – Sacred Lands File
SMART – Specific, Measurable, Attainable, Relevant, Time Oriented
SMUD – Sacramento Municipal Utility District
SOD – sudden oak death
SPRR – Southern Pacific Railroad
SRA – shaded riverine aquatic
SSC – Species of Special Concern
SVC – Sacramento Valley Conservancy
SWAP – California State Wildlife Action Plan
SWRCB – State Water Resources Control Board
THPO – Tribal Historic Preservation Officer
TMDL – total maximum daily load
USACE – U.S. Army Corps of Engineers
USBLM – Bureau of Land Management
USBR – U.S. Bureau of Reclamation
U.S.C. – United States Code
USFWS – United States Fish & Wildlife Service
USFS - United States Forest Service
USGS – United States Geological Survey
VELB – Valley Elderberry Longhorn Beetle
WAPA – Western Area Power Administration
WBWG – Western Bat Working Group
WCB – Wildlife Conservation Board
WSRA – Wild and Scenic Rivers Act
WUI – wildland urban interface
W&SR – Wild and Scenic River

## Abbreviations

Cal Expo – California Exposition and State Fair
CAL FIRE / Cal Fire – California Department of Forestry and Fire
Protection
Caltrans – California Department of Transportation
CSU, Sacramento – California State University, Sacramento
NRMP – Natural Resources Management Plan
Magnus-Stevens Act – Magnus-Stevens Fishery Conservation and
Management Act
Metro Fire – Sacramento Metropolitan Fire District
Parkway – American River Parkway
Parkway Plan – American River Parkway Plan
Regional San – Sacramento Regional County Sanitation District
Regional Parks – Sacramento County Department of Regional Parks
Sacramento City Fire – City of Sacramento Fire Department
Task Force – NRMP Task Force

# REFERENCES

## References


Advisory Council on Historic Preservation (ACHP). 2020. National Historic Preservation Act. Available at: https://www.achp.gov/protecting-historic-properties [Accessed March 2020].

Agee, J. K. 2006. *Fire in California's Ecosystems* (SUGIHARA N., VAN WAGTENDONK J., SHAFFER K., FITES-KAUFMAN J., & THODE A., Eds.). University of California Press. Available at: www.jstor.org/stable/10.1525/j.ctt1pnb25 [Accessed January 2020].

Ajzen, I. 1992. Persuasive Communication Theory in Social Psychology: A Historical Perspective. In M. J. Manfredo (Ed.), *Influencing human behavior: Theory and applications in recreation, tourism, and natural resources management* (pp. 29–50). Champaign, Illinois: Sagamore Publishing, Inc.

A.L. Bancroft & Company, publisher. 1886. The Works of Hubert Howe Bancroft (Vol. 21), History of California (Vol. 4): 131. Retrieved from: https://books.google.com/books?id=ltM1AAAAIAAJ&printsec=frontcover#v=onepage&q&f=false [Accessed January 2020].

American River Parkway Foundation (ARPF). 2019. "American River Parkway Foundation." Available at: http://arpf.org/newsletter/11November_2017/newsletter.html [Accessed October 2019].

———. 2019. "River Bend." Available at: https://arpf.org/what-we-do/programs/campfire-outdoor-educational-site/ [Accessed September 2019].

Anderson, M.K, and M. J. Moratto, M.J. 1996. *Native American Land Use Practices and Ecological Impacts*. Aspen Bibliography, Paper 1815. Available at: https://digitalcommons.usu.edu/aspen_bib/1815/ [Accessed December 2019].

Ascent Environmental, Inc. 2017. Climate Change Vulnerability Assessment for the Sacramento County Climate Action Plan: Communitywide Greenhouse Gas Reduction and Climate Change Adaptation. Available at: https://planning.saccounty.net/PlansandProjectsIn-Progress/Documents/Climate%20Action%20Plan/Climate%20Change%20Vulnerability%20Assessment.pdf [Accessed October 2019].

Aubury, L. E. 1910. *Gold Dredging in California*. Bulletin 57. California State Mining Bureau, Ferry Building, San Francisco, CA.

Ayers. 1997. Final Report, American and Sacramento River, California Project. Available at: http://www.safca.org/protection/NR_Documents/BPWG_Library_1997_Ayres_Geomorphic_Sediment_Engineering_Channel_Stability.pdf [Accessed October 2019].

———. 2004. Lower American River, Erosion Susceptibility Analysis for Infrequent Flood Events. Available at: http://www.safca.org/Protection/NR_Documents/BPWG_Library_2004_Ayres__Report.pdf. [Accessed October 2019].

Baiocchi, A., Wolf, J. P., Hodson, K., Barker, D.C., and M. Foy. 2017. "Homelessness in Sacramento County: Results from the 2017 Point-in-Time Count." Institute for Social Research and Sacramento Steps Forward, Sacramento, CA.

Baiocchi, A., Curry, S., Williams, S., Argüello, T., Wolf, J. P., and Morris, J. 2019. "Homelessness in Sacramento County: Results from the 2019 Point-in-Time Count." Institute for Social Research and Sacramento Steps Forward, Sacramento, CA.

Bartell, J. 2019. Forbidden Ruins of Folsom's Past. June 24, 2019. Updated June 25, 2019. Available at: https://www.abc10.com/article/entertainment/television/programs/backroads/forbidden-ruins-of-folsoms-past-bartells-backroads/103-968c108f-294c-4f26-bac0-f517fd09875e [Accessed November 2019].

Beals, R. L. 1933. Ethnology of the Nisenan. *University of California Publications in American Archaeology and Ethnology* 31(6): 335-414. Berkeley.

Bean. 2012. Physical and geochemical characteristics of the Lower Sailor Bar 2012, Upper Sunrise 2010/2011, Upper Sailor Bar 2009, and Upper Sailor Bar 2008 gravel additions. Available at: https://www.csus.edu/indiv/h/hornert/ [Accessed October 2019].

Begon, M., Townsend, C. R., and J. L. 2006. *Ecology: From Individuals to Ecosystems*. 4th edition. Blackwell Publishing, Malden, MA.

Bell, D. A. 2020. "The Folsom Powerhouse." California Department of Parks and Recreation. Available at: https://www.parks.ca.gov/?page_id=22909 [Accessed January 2020].

Berg, E., and E. Martinez. 2006. American River Parkway Use Survey 2005, Final Technical Report. Institute for Social Research at California State University, Sacramento. http://www.csus.edu/isr/reports.stm.

Bugwood, W. 2012. Species Included in Invasipedia. Available at: https://wiki.bugwood.org/Invasipedia. [Accessed February 2019].

California Department of Finance. 2019. "Projections: Total Population by County." Available at: http://dof.ca.gov/forecasting/demographics/Projections/ [Accessed July 2019].

California Department of Fish and Game (CDFG). 2005. Wildlife Habitat - California Wildlife Habitat Relationships System. Available at: https://www.wildlife.ca.gov/Data/CWHR/Wildlife-Habitats.

California Department of Fish and Wildlife California Natural Diversity Database (CDFW CNDDB). 2018. Special Animals List: November 2018. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406 [Accessed February 2019].

California Department of Fish and Wildlife (CDFW). 2010. California Essential Habitat Connectivity Project, A Strategy for Conserving a Connected California. Available at: https://wildlife.ca.gov/Conservation/Planning/Connectivity/CEHC [Accessed November 2019].

———. 2012. Northern Sierra Nevada foothills wildlife connectivity model. Available at: https://wildlife.ca.gov/Data/Analysis/Connectivity [Accessed November 2019].

———. 2015. California State Wildlife Action Plan 2015 Update, A Conservation Legacy for Californians, Volume I: Plan Update.

———. 2019. Sensitive Element Record Search for the Sacramento West, Sacramento East, Carmichael, Citrus Heights, and Folsom USGS Quadrangles. California Department of Fish and Wildlife. Sacramento, California. [Accessed November 2019].

———. 2019. History of Nimbus Hatchery. Available at: https://www.wildlife.ca.gov/Fishing/Hatcheries/Nimbus/History [Accessed November 2019].

———. 2019. American Peregrine Falcons in California. Available at: https://www.wildlife.ca.gov/Conservation/Birds/Peregrine-Falcon [Accessed March 2019].

———. 2019. Bald Eagles in California. Available at: https://www.wildlife.ca.gov/Conservation/Birds/Bald-Eagle [Accessed March 2019].

———. 2020. "Threatened and Endangered Species Protected Under the California Endangered Species Act." Available at: https://wildlife.ca.gov/Conservation/CESA [Accessed January 2020].

———. Habitat Conservation Planning Branch. 2020. "Habitat Conservation". Available at: https://wildlife.ca.gov/Explore/Organization/HCPB [Accessed February 2020].

———. 2020. Nutria Detection Map. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=155064&inline [Accessed January 2021].

———. 2021a. California's Invaders: Mute Swan. Available at: https://wildlife.ca.gov/Conservation/Invasives/Species/Mute-Swan [Accessed January 2021].

———. 2021b. California's Invaders: Brown-Headed Cowbird. Available at: https://wildlife.ca.gov/Conservation/Invasives/Species/Cowbird [Accessed January 2021].

———. 2021c. California's Invaders: Nutria. Available at: https://wildlife.ca.gov/Conservation/Invasives/Species/Nutria [Accessed January 2021].

———. 2021d. California's Invaders: Southern Watersnake. Available at: https://wildlife.ca.gov/Conservation/Invasives/Species/Southern-Watersnake [Accessed January 2021].

———. 2021e. California's Invaders: Northern Watersnake. Available at: https://wildlife.ca.gov/Conservation/Invasives/Species/Northern-Watersnake [Accessed January 2021].

California Department of Forestry and Fire Protection (CALFIRE). "Stats and Events." Available at: https://www.fire.ca.gov/stats-events/ [Accessed August 2019].

California Department of Parks and Recreation (State Parks). 2013. *Outdoor Recreation in California's Regions 2013: Issues, Strategies, Actions, and Supporting Research*. Available at: https://www.parks.ca.gov/?page_id=27894 [Accessed July 2019].

———. 2019. “Folsom Dam.” Available at: https://www.parks.ca.gov/?page_id=882 [Accessed October 2019].
———. 2019. “The First Folsom Dam.” Available at: https://www.parks.ca.gov/?page_id=1341 [Accessed November 2019].
California Department of Water Resources (DWR). 2020. Designated Floodway and Regulated Streams. Available at: https://gis.bam.water.ca.gov/bam/ [Accessed March 2020].
Cal Herps. 2019. A Guide to the Amphibians and Reptiles of California. Available at: www.californiaherps.com [Accessed March 2019].
California Invasive Plant Council (CAL IPC). 2004. The Weed Workers’ Handbook: A Guide to Techniques for Removing Bay Area Invasive Plants. Available at: https://www.cal-ipc.org/docs/ip/management/wwh/pdf/18601.pdf [Accessed December 2019].
———. 2020a. “IPCW Plant Report, *Arundo donax*.”Available at: https://www.cal-ipc.org/resources/library/publications/ipcw/report8/ [Accessed January 2020].
———. 2020b. “IPCW Plant Report, *Cortaderia selloana*.”Available at: https://www.cal-ipc.org/resources/library/publications/ipcw/report35/ [Accessed January 2020].
California State Water Resources Board (CASWRB). 1958. Decision No. D 893. Available at: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d0850_d0899/wrd893.pdf [Accessed October 2019].
Campaign Against Climate Change (CACC). 2019. “Climate change: An introduction.” Available at: https://www.campaigncc.org/climate_change/introduction [Accessed June 2019].
CBEC. 2018. LAR Current Condition DEM and 2D Model Development Project. [Accessed October 2019.
CBEC. 2019. LAR Current Condition DEM and 2D Model Development Project Flood Flow Hydrodynamic Modeling Report. March 2019.
Central Valley Bird Club. 2019. Sacramento County Breeding Bird Atlas. Available at: http://www.cvbirds.org/birding-resources/sacramento-county-breeding-bird-atlas/ [Accessed December 2019].
Central Valley Regional Water Quality Control Board (Central Valley RWQCB). 2019. Order R5-2015-0023, NPDES NO. CAS082597. Available at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/sacramento/r5-2015-0023.pdf [Accessed October 2019].
Chapman, C. E. 1923. *A History of California: The Spanish Period*. MacMillan Company, New York.
Cilimburg, A., Monz, C., and S. Kehoe. 2000. Wildland Recreation and Human Waste: A Review of Problems, Practice, and Concerns. *Environmental Management* 25(6): 587-598.
City of Sacramento. 2008. Mitigated Negative Declaration for the Urrutia Site Restoration and Enhancement Project.
———. 2018. History. Available at https://www.cityofsacramento.org/Fire/About/History [Accessed November 2019].
City of Sacramento Fire Department (Sacramento City Fire). 2017. “2017 Annual Report.” Available at: https://www.cityofsacramento.org/-/media/Fire/Sacramento-Fire-2017-Annual-Report.pdf?la=en [Accessed January 2020].
Clark, W. B. 1980. *Gold Districts of California*. Bulletin 193. California Division of Mines and Geology, Sacramento.
Cole, D. N. 2013. Long-Term Effectiveness of Restoration Treatments on Closed Wilderness Campsites. *Environmental Management* 51: 642-650.
Cook, S. F. 1976. *The Conflict Between the Califomia Indian and White Civilization*. University of California Press, Berkeley.
Cordell, K. H.; Betz, C.; Bowker, M. J.; English, D. B.K.; Mou, S. H.; Bergstrom, J. C.; Teasley, J. R.; Tarrant, M. A.; Loomis, J. 1999. Outdoor recreation in American life: a national assessment of demand and supply trends. Champaign, IL: Sagamore Publishing. xii, 449 p.
Cornell Lab of Ornithology. 2019. Birds of North America: Burrowing Owl. Available at: https://birdsna.org/Species-Account/bna/species/burowl/introduction?login [Accessed December 2019].
———. 2019. Bell’s Vireo. Available at: https://birdsna.org/Species-Account/bna/species/belvir/introduction [Accessed February 2019].
Congressional Research Service (CRS). 2006. Sacramento Flood Control and Folsom Dam: Recent Action and Current Issues. Available at: https://www.everycrsreport.com/files/20061006_RL33682_9c2bb046697fd7128dccd788c4a1243f64b6fbcf.pdf [Accessed October 2019].
Crain, P.K. and P. B. Moyle. 2011. Biology, History, Status and Conservation of Sacramento Perch, *Archoplites interruptus*. San Francisco Estuary and Watershed Science, 9(1).
Dames & Moore .1995. Archaeological Inventory Report Lower American River Locality. American River Watershed Investigation for the U.S. Army Corps of Engineers, Sacramento District, Sacramento, California.
The Dangermond Group. 2006. American River Parkway 2006 Financial Needs Study Update. Available at: https://regionalparks.saccounty.net/Parks/Documents/Parks/ARP-Financial-Needs-Study-Update-2006.pdf [Accessed January 2020].
Dettling M. D., Seavy N. E., Howell C. A., and T. Gardali. 2015. Current Status of Western Yellow-Billed Cuckoo along the Sacramento and Feather Rivers, California. PLOS ONE 10(4): e0125198. https://doi.org/10.1371/journal.pone.0125198 [Accessed February 2019].
Dillinger, W. C., ed. 1991. *A History of the Lower American River*. Rev. ed. American River Natural History Association, Sacramento. Originally published 1977 by Lucinda Woodward and Jesse M. Smith (editors).
Doane, M. 2019. Personal Communication. Sacramento County Department of Regional Parks (Regional Parks).
Dolesh, R.J. 2017. “Climate Change Is Changing the Face of Outdoor Recreation”. Available at: https://www.nrpa.org/parks-recreation-magazine/2017/october/climate-change-is-changing-the-face-of-outdoor-recreation/ [Accessed June 2019].
Dudek and ICF. 2012. Mammals: Western Mastiff Bat (*Eumops perotis*). Available at: https://www.drecp.org/documents/docs/baseline_biology_report/10_Appendix_B_Species_Profiles/10d_Mammal/Western%20Mastiff%20Bat.pdf [Accessed February 2019].
Duerksen, C. J., Elliott, D.L, Hobbs, N. T., Johnson, E., and J. R. Miller. 1997. Habitat Protection Planning: Where the Wild Things Are. *American Planning Association*.
eBird. 2019. Explore Species Map: Loggerhead Shrike. Available at: https://ebird.org/map/logshr?neg=true&env.minX=121.64691698948474&env.minY=38.40914777607951&env.maxX=120.85452807346911&env.maxY=38.73875558767793&zh=true&gp=false&ev=Z&mr=112&bmo=1&emo=12&yr=all&byr=1900&eyr=2019 [Accessed February 2019].
———. 2019. Explore Species Map: Northern Harrier. Available at: https://ebird.org/map/norhar2?env.minX=-178.2033694246 71&env.minY=3.13636909372268&env.maxX=175.73285251842&env.maxY=76.8918586145078 [Accessed February 2019].
———. 2019. Explore Species Map: Redhead. Available at: https://ebird.org/map/redhea?neg=true&env.minX=-121.56972500443771&env.minY=38.50238677640204&env.maxX=121.1735305464299&env.maxY=38.66716623391095&zh=true&gp=false&ev=Z&mr=1-12&bmo=1&emo=12&yr=all&byr=1900&eyr=2019 [Accessed February 2019].
———. 2019. Explore Species Map: Song Sparrow. Available at: https://ebird.org/map/sonspa?neg=true&env.minX=121.7147723336546&env.minY=38.40873348569485&env.maxX=120.922383417638 97&env.maxY=38.73834319373387&zh=true&gp=false&ev=Z&mr=112&bmo=1&emo=12&yr=all&byr=1900&eyr=2019 [Accessed February 2019].
———. 2019. Explore Species Map: Vesper Sparrow. Available at: https://ebird.org/map/vesspa?neg=true&env.minX=121.7147723336546&env.minY=38.40873348569485&env.maxX=120.922383417638 97&env.maxY=38.73834319373387&zh=true&gp=false&ev=Z&mr=112&bmo=1&emo=12&yr=all&byr=1900&eyr=2019 [Accessed February 2019].
EDAW. 2009. American River Parkway Floodway Management Plan.
EDDMapS. 2021. Early Detection & Distribution Mapping System: red-eared slider. Available at: https://www.eddmaps.org/distribution/viewmap.cfm?sub=72004 [Accessed January 2021].
Engler, R. E. 2012. “The Complex Interaction between Marine Debris and Toxic Chemicals in the Ocean.” *Marine Pollution Bulletin*, (46)22, pp. 12302-12315.

ESA. 2018. Lower American River Subreach 2 Draft Final Resource Assessment. Prepared for Sacramento Area Flood Control Agency. November 2018.

Eva Butler and Associates, California Native Plant Society (CNPS), U.S. Bureau of Reclamation (USBR), Sacramento Area Flood Control Agency (SAFCA), American River Flood Control District (ARFCD). 2000. American River Parkway Invasive Plant Management Plan.

Everything Connects (EC). 2014. Habitat Loss. Available at: https://www.everythingconnects.org/habitat-loss.html [Accessed February 2020].

Fairman, D. 2007. A Gravel Budget for the Lower American River. Available at: https://www.csus.edu/indiv/h/hornert/Dave%20Fairman%20thesis%20gravel%20budget%20American%20River.pdf [Accessed October 2019].

Federal Geographic Data Committee. 2008. National Vegetation Classification Standard (Version 2). Document # FGDC-STD-005. http://www.fgdc.gov/standards/projects/FGDC-standards-projects/vegetation. Accessed August 9, 2019.

Federal Emergency Management Agency (FEMA). 2016. Flood Insurance Study Sacramento County, California and incorporated areas. Flood Insurance Study Number 06067CV001C. [Accessed October 2019].

Federal Emergency Management Agency (FEMA). 2018. Federal Emergency Management Agency. Federal Regulations. Available athttps://www.fema.gov/media-library-data/20130726-1541-20490-8375/lv_section6510_0408.pdf. Accessed October 2019.

FISH Working Group (FWG). 2001. Initial Fisheries and In-stream Habitat Management and Restoration Plan for the Lower American River. Available at: http://www.waterforum.org/wp-content/uploads/2015/09/FIsh-Plan_Executive-Summary.pdf [Accessed October 2019].

Folsom Historic Photos. 2019. Available at http://www.myfolsom.com/resident-guide/folsom-history/folsom-historical-photos/ [Accessed November 2019].

Forstall, R. L., ed. 1996. "Population of States and Counties of the United States: 1790 – 1990." U.S. Department of Commerce, Bureau of the Census.

Fugro Consultants, Inc. (Fugro). 2012. Lower American River Stratigraphic and Geomorphic Mapping Report River Common Features, Sacramento to County, California. September 2012.

Gaston, K. J., Visser, Marcel E., and H. Franz. 2015. The biological impacts of artificial light at night: the research challenge. Philosophical Transactions of the Royal Society. Available at: http://doi.org/10.1098/rstb.2014.0133.

Gilbert, G. K. 1917. Hydraulic-Mining Debris in the Sierra Nevada. Available at: https://pubs.er.usgs.gov/publication/pp105 [Accessed October 2019].

Governor's Office of Planning and Research (OPR). 2017. "Technical Advisory: AB 52 and Tribal Cultural Resources in CEQA."

———. 2020. "CEQA: The California Environmental Quality Act." Available at https://wildlife.ca.gov/Conservation/CESA: http://opr.ca.gov/ceqa/ [Accessed January 2020].

Haas, G. 2001. Conserving Recreation Diversity: Collaborating Across Boundaries. *The George Wright Forum*, 18(3), 112-123.

Hammit, W. E., Cole, D. N., and C. A. Monz. 2015. *Wildland Recreation: Ecology and Management*. 3rd edition. Wiley Blackwell Publishing, Hoboken, NJ.

Haufler, J. B., Mehl, C. A., and Roloff, G. J. 1999. Using a coarse-filter approach with species assessment for ecosystem management. *Wildlife Society Bulletin* 1996, 24(2): 200-208.

Heisem, S. 2017. The History Behind the Walls of Folsom State Prison. 2017. Available at: https://www.kcra.com/article/the-history-behind-the-granite-walls-of-folsom-state-prison-1/13135305#. [Accessed November 2019].

Helley, H. 1985. Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California. Available at: https://www.csus.edu/indiv/h/hornert/Geologic%20maps%20and%20references/Helley%20and%20Harwood%201985%20maps/AR-M550U_20071026_141512.pdf [Accessed October 2019].

Hoover, M. B., Rensch, H. E., and E. G. Rensch. 1953. *Historic Spots in California*. Stanford University Press, Stanford.

Houlton, Benjamin Z. 2018. "State of Science: Role of Climate Change in California's Wildfires." Available at: http://www.nationalacademies.org/hmd/~/media/Files/Boards/HSP/MedPrep%20Forum/Houlton.pdf [Accessed January 2020].

iNaturalist. 2021a. Mute Swan (*Cygnus olor*). Available at: https://www.inaturalist.org/observations/35415666 [Accessed January 2021].

———. 2021b. Explore: red-eared slider. Available at: https://www.inaturalist.org/observations?place_id=any&taxon_id=51271 [Accessed January 2021].

———. 2021c. Explore: American bullfrog. Available at: https://www.inaturalist.org/observations?place_id=any&taxon_id=65979 [Accessed January 2021].

James, L. A. 1994. Channel Changes Wrought by Gold Mining: Northern Sierra Nevada, California. Available at: https://people.cas.sc.edu/ajames/Research/Pubs/1994%20James%20_AWRA.pdf [Accessed October 2019].

James, A. 2012. Hydraulic Mining Sediment Impacts on American River Channel Morphology and Flood Stages. Available at: https://cepsym.org/Sympro2012/James.pdf [Accessed October 2019].

Johnson, D. L. and M. E. Vande Kamp. 1996. Extent and Control of Resource Damage Due to Noncompliant Visitor Behavior: A Case Study from the U.S. National Parks. *Natural Areas Journal* 16(2): 134-141.

Johnson, J. J. 1992. Personal Communication.

Jones & Stokes. 2002. Flood Management Element of the River Corridor Management Plan for the Lower American River. Available at: http://www.safca.org/Protection/NR_Documents/RCMP_8_Appendix.CFlood-ManagementElement.pdf [Accessed October 2019].

Knight, R. L. and K. J. Gutzwiller. 1995. *Wildlife and Recreationists: Coexistence Through Management and Research*. Island Press.

Knisley, C. B., and M. S. Fenster. 2005. Apparent Extinction of the Tiger Beetle, *Cicindela hirticollis aburpta* (Coleoptera: Carabidae: Cicindelinae). The Coleopterists Bulletin, 59(4): 451-458.

Kohlhorst, D.W., Botsford, L.W., Brennan, J.S., and G. M. Cailliet. 1991. Aspects of the structure and dynamics of an exploited central California population of white sturgeon. In P. Williot (ed.). 1989. Proceedings of the First International Symposium on the Sturgeon. October 3-6, 1989, Bordeaux, France. Pp. 277-293.

Kroeber, A.L. 1925. *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Washington, D.C. Reprinted in 1976 by Dover Publications, Inc., New York, New York.

Kyba, C. M., Tong, K. P., Bennie, J. et al. 2015. Worldwide variations in artificial skyglow. *Sci Rep* 5, 8409. Available at: https://doi.org/10.1038/srep08409 [Accessed February 2020].

Kyle, D. E., ed. 1990. *Historic Spots in California*, by Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, and William N. Abeloe. Stanford University Press, Stanford.

Longcore, T. and C. Rich. 2004. Ecological light pollution. Frontiers in Ecology and the Environment, 2: 191-198. Available at: doi:10.1890/1540-9295(2004)002[0191:ELP]2.0.CO;2.

Lower American River Task Force (LARTF). 2002. River Corridor Management Plan for the Lower American River: January 2002. Available at: http://www.safca.org/Protection/Environmental_Collaboration_RCMP.html [Accessed December 2019].

———. 2015. Lower American River River Corridor Management Plan: Three Year Action Plan. [Accessed September 2019].

LSA Associates. 2003. NATURAL RESOURCES PLANT LIFE: Folsom Lake State Recreation Area. Available at: https://www.parks.ca.gov/pages/500/files/plantlife.pdf [Accessed December 2019].

Lucas, R. C. 1982. Recreation Regulations – When Are They Needed? *Journal of Forestry* 80(3): 148-151.

Maret, M. 2019. Personal Communication.

Marion, J. L. 2016. A Review and Synthesis of Recreation Ecology Research Supporting Carrying Capacity and Visitor Use Management Decisionmaking. *Journal of Forestry* 114(3): 339-351.

McCabe, G.T. and C. A. Tracy. 1994. Spawning and early life history of white sturgeon *Acipenser transmontanus*, in the lower Columbia River. Fishery Bulletin 92:760-72. Available at: https://www.nwfsc.noaa.gov/assets/2/6721_12142010_111235_McCabe.and.Tracy.1994-rev.pdf [Accessed December 2019].

McGough, M. 2019. Think this week's storm is bad? Here are 5 of the worst floods in Sacramento history. Sacramento Bee. Available at https://www.sacbee.com/news/weather-news/article226861949.html. [Accessed November 2019].

Miller, M. 2000. "Fire Autecology." Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pp. 9-34.

Monz, C. A., Pickering, C. M., and Hadwen, W. L. 2013. Recent advances in recreation ecology and the implications of different relationships between recreation use and ecological impacts. Frontiers in Ecology and the Environment. doi: 10.1890/120358

Morgan, D. L. 1964. *Jedediah Smith and the Opening of the West*. University of Nebraska Press, Lincoln.

Moritz, M.A., C. Topik, C.D. Allen, P.F. Hessburg, P. Morgan, D.C. Odion, T.T. Veblen, and I.M. McCullough. 2018. A Statement of Common Ground Regarding the Role of Wildfire in Forested Landscapes of the Western United States. Fire Research Consensus Working Group Final Report.

The National Academics of Sciences, Engineering, and Medicine (NAP). 2001. "Climate Change Science: An Analysis of Some Key Questions". Available at: https://www.nap.edu/read/10139/chapter/2 [Accessed June 2019].

National Aeronautics and Space Administration (NASA). 2019. "Climate Change: How Do We Know?" Available at: https://climate.nasa.gov/evidence/ [Accessed June 2019].

National Oceanic and Atmospheric Administration (NOAA). 2005. Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs. Available at: https://www.federalregister.gov/documents/2005/06/28/05-12351/endangered-and-threatened-species-final-listing-determinations-for-16-esus-of-west-coast-salmon-and [Accessed December 2019].

NatureServe. 2019. Explorer: *Cicindela hirticollis abrupta*-Casey, 1913. Available at: http://explorer.natureserve.org/servlet/NatureServe?-searchName=Cicindela+hirticollis+abrupta [Accessed March 2019].

Neary, Daniel G.; Ryan, Kevin C.; DeBano, Leonard F., eds. 2005. (revised 2008). Wildland fire in ecosystems: effects of fire on soils and water. Gen. Tech. Rep. RMRS-GTR-42-vol.4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 250

Northwest Hydraulic Consultants, Inc. (nhc). 2012. Revised Task 14 Draft Memo Report - Update of Lower American River Bank Migration Analysis (Contract No. W91238-07-D-0039). [Accessed October 2019].

———. 2016. Lower American River Task Force Bank Protection Working Group Lower American River Geomorphology Assessment: Draft Report. Prepared for Sacramento Area Flood Control Agency. [Accessed September 2019].

———. 2018. Attachment 1 to the Lower American River Subreach 2: Summary of Bank Protection Conceptual Design Process. [Accessed September 2019].

Nunamaker, C., de Lasaux, M., and G. Nakamura. 2007. Forest Stewardship Series 15: Wildfire and Fuel Management. University of California Agriculture and Natural Resources, Publication 8245.

NOAA Fisheries. 2019. NOAA Fisheries | West Coast Region: Endangered Species Act Critical Habitat. Available at: https://www.westcoast.fisheries.noaa.gov/maps_data/endangered_species_act_critical_habitat.html [Accessed March 2019].

National Park Service (NPS). 2017. "Wildland Fire Behavior." Series: Wildland Fire – Learning in Depth. Available at: https://www.nps.gov/articles/wildland-fire-behavior.htm [Accessed January 2020].

National Park Service (NPS) and U.S. Forest Service (USFS). 2020. "Fire Terminology." Available at: https://www.fs.fed.us/nwacfire/home/terminology.html#F [Accessed January 2020].

National Recreation and Park Association (NRPA). 2017. Homelessness in Parks, A summary of results from an NRPA membership survey. Available at: https://www.nrpa.org/contentassets/f768428a39aa4035ae-55b2aaff372617/homelessness-in-parks-survey-report.pdf [Accessed August 2019].

National Wild and Scenic Rivers System (NWSRS). 2019. Available at: https://www.rivers.gov/rivers/american-lower.php [Accessed October 2019].

O'Hara, K. 2017. City Parks and Homelessness. Available at: https://meetingoftheminds.org/city-parks-homelessness-21554 [Accessed August 2019].

The Outdoor Foundation. 2016. 2016 *Outdoor Participation Report*. Available at: https://outdoorindustry.org/wp-content/uploads/2017/05/2016-Outdoor-Participation-Report.pdf [Accessed July 2019].

———. 2017. 2017 *Outdoor Participation Report*. Available at: https://outdoorindustry.org/wp-content/uploads/2017/05/2017-Outdoor-Recreation-Participation-Report_FINAL.pdf [Accessed July 2019].

———. 2018. 2018 *Outdoor Participation Report*. Available at: https://outdoorindustry.org/resource/2018-outdoor-participation-report/ [Accessed July 2019].

Owens, K. N. 1991. Sacramento-San Joaquin Delta, California: Historical Resources Overview. Submitted to Department of the Army, Corps of Engineers, Sacramento.

Palmer, M.A., Bernhardt, E.S., Allan, J.D., Lake, P.S., Alexander, G., Brooks, S., Carr, J., Clayton, S., Dahm, C.N., Follstad Shah, J., Galat, D.L., Loss, S.G, Goodwin, P., Hart, D.D., Hassett, B., Jenkinson, R., Kondolf, G.M., Lave, R., Meyer, J.L., O'Donnell, T.K., Pagano, L., and Sudduth, E., 2005. Forum: Standards for ecologically successful river restoration. *Journal of Applied Ecology*, vol. 42, pp. 208-217

Parret, C. 2009. USGS Internal Document: Recommended revised estimate of Jan. 1862 peak discharge on American River at Fair Oaks gauge (USGS 11446500). Available at: https://cepsym.org/history/2009-Parrett-USGS.pdf [Accessed October 2019].

Pastor, M., Lester, T. W., and Scroggins, J. 2009. "Why Regions? Why Now? Who Cares?" *Journal of Urban Affairs* 31, no. 3: 269-96.

Paul, R. W. 1965. *California Gold: The Beginning of Mining in the Far West*. University of Nebraska Press, Lincoln.

Plant Society. Sacramento, CA.

Pletterbauer, F., Melcher, A., and W. Graf. 2018. "Climate Change Impacts in Riverine Ecosystems". *Aquatic Ecology: Climate Change Impacts in Riverine Ecosystems*. Available at: https://link.springer.com/chapter/10.1007/978-3-319-73250-3_11 [Accessed June 2019].

Point Blue Conservation Science (PBCS). 2014. Patterns of Distribution and Abundance of Breeding Colonies in the Interior of California, 2009-2012. Available at: http://www.prbo.org/refs/files/12321_Shuford2014.pdf [Accessed December 2019].

Poole, G. C. and C. H. Berman. 2001. "An Ecological Perspective on In-Stream Temperature: Natural Heat Dynamics and Mechanisms of Human-Caused Thermal Degradation. Environmental Management, 27(6), pp. 787-802.

Practical Guidebook to the Control of Invasive Aquatic and Wetland Plants of the San Francisco Bay-Delta Region. 1998. Available at: https://www.sfei.org/nis/pampasgrass.html. [Accessed February 2019].

Redmond, K. T. 1999. American River Flood Frequencies: A Climate-Society Interaction. Western Regional Climate Center: Desert Research Institute, Reno, Nevada.

Resnik, M. 2019. "Trash continues to pile up along American River Parkway." KCRA3. Available at: https://www.kcra.com/article/trash-continues-to-pile-up-along-american-river-parkway/26436535 [Accessed October 2019].

Roggenbuck, J. 1992. Use of Persuasion to Reduce Resource Impacts and Visitor Conflicts. In M. J. Manfredo (Ed.), *Influencing human behavior: Theory and applications in recreation, tourism, and natural resources management* (pp. 149–208). Champaign, Illinois: Sagamore Publishing, Inc.

Ryan, K. C., Jones, A. T., Koerner, C. L., and K. M. Lee, tech. eds. 2012. Wildland fire in ecosystems: effects of fire on cultural resources and archaeology. Gen. Tech. Rep. RMRS-GTR-42-vol. 3. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 224 p.

Sacramento Area Flood Control Agency (SAFCA). 2008. Policies and Legislation. Last updated 2008. Available at: http://www.safca.org/policies.html [Accessed September 2019].

———. 2020. "Mission Statement." Available at: http://www.safca.org/ [Accessed January 2020].

Sacramento Bee (Sac Bee). 2012. The 10 Biggest Sacramento Storms of the Past 100 Years. Available at: https://www.sacbee.com/news/databases/article4059618.html [Accessed October 2019].

Sacramento County. 2006. River Corridor Management Plan and the ARPPU.

———. 2008a. American River Parkway Plan 2008. Available at: https://regionalparks.saccounty.net/Parks/Documents/Parks/ARPP06-021909_sm.pdf [Accessed December 2019].

———. 2008b. Final Environmental Impact Report: American River Parkway Plan Update 2006.

———. 2019. Sacramento Regional County Sanitation District (Regional San) – Wastewater Treatment & Conveyance. Available at: https://www.saccounty.net/services/Pages/Sacramento-Regional-County-Sanitation-District-Regional-San-Wastewater-Treatment-Conveyance.aspx [Accessed October 2019].

Sacramento County Department of Regional Parks (Regional Parks). 2008. American River Parkway Invasive Plant Management Project Phase II: 2004-2009. Prepared by Hauge Brueck Associates (HBA).

———. 2009. American River Parkway Fact Sheet Updated 2009. Available at: https://regionalparks.saccounty.net/Documents/American%20River%20Parkway%20Fact%20Sheet_REV%202009.pdf [Accessed December 2019].

———. 2018. "2018 Calendar of Events."

———. 2019. "Off-Paved Trail Cycling Pilot Program Open in Woodlake and Cal Expo." Available at: https://regionalparks.saccounty.net/Pages/OffPaveTrailCycling.aspx [Accessed October 2019].

———. 2019. "American River Parkway, Sunrise Recreation Areas, Upper and Lower." Available at: https://regionalparks.saccounty.net/Parks/Pages/SunriseRecAreasUpperandLower.aspx [Accessed July 2019].

———. 2019. "American River Parkway – Rossmoor Bar." Available at: https://regionalparks.saccounty.net/Parks/Pages/RossmoorBar.aspx [Accessed July 2019].

———. 2019. "Watt Avenue Access." Available at: https://regionalparks.saccounty.net/Parks/Pages/WattAvenueAccess.aspx [Accessed July 2019].

———. 2019. "River Bend Park [Map]." Available at: https://regionalparks.saccounty.net/Parks/Documents/River_Bend_Park_Map.pdf [Accessed July 2019].

———. 2019. "American River Parkway – Sacramento Bar." Available at: https://regionalparks.saccounty.net/Parks/Pages/SacramentoBar.aspx [Accessed July 2019].

———. 2019. "American River Parkway – Sailor Bar." Available at: https://regionalparks.saccounty.net/Parks/Pages/SailorBar.aspx [Accessed July 2019].

———. 2019. Regional Parks - Alcohol. Available at: https://regionalparks.saccounty.net/Rangers/Pages/Alcohol.aspx [Accessed November 2019].

———. 2019. Fire Risk Reduction. Available at: http://www.regionalparks.saccounty.net/Rangers/Pages/FireRiskReduction.aspx-?Paged=TRUE&p_ID=30&PageFirstRow=31&&View=%7B5AAFD-FEA-AD6D-4925-B2FB-E47ED7E7B264%7D [Accessed August 2019].

———. 2020. "Fire Risk Reduction." Available at: https://regionalparks.saccounty.net/Rangers/Pages/FireRiskReduction.aspx [Accessed January 2020].

Sacramento County Regional Sanitation District (Regional San). 2013. "Regional San Maintained Facilities." Available at: https://www.regionalsan.com/sites/main/files/file-attachments/rs_maintained_facilities_sept_2013.pdf [Accessed October 2019].

———. 2019. Major Sanitary Sewer Overflows. Available at: https://www.regionalsan.com/major-sanitary-sewer-overflows [Accessed January 2020].

Sacramento County Department of Water Resources (Sacramento County DWR). 2019. "Cordova Creek Naturalization Project." Available at: https://waterresources.saccounty.net/Pages/Cordova-Creek-Naturalization-Project.aspx [Accessed October 2019].

———. 2019. "Sacramento County Creeks." Available at: https://waterresources.saccounty.net/Documents/SacCountyCreeksMap.pdf [Accessed October 2019].

———. 2019. "Stormwater Quality Program." Available at: http://www.waterresources.saccounty.net/stormwater/Pages/default.aspx [Accessed August 2019].

———. 2019. Sacramento County Water Agency. Available at: https://waterresources.saccounty.net/scwa/Pages/default.aspx [Accessed December 2009].

Sacramento County Office of Budget and Debt Management. 2021. Annual Budgets. Available at: https://bdm.saccounty.net/Pages/AnnualBudgets.aspx [Accessed January 2021].

Sacramento River Watershed Program (SRWP). 2010. The Sacramento River Basin: a Roadmap to Watershed Management. Available at: http://www.sacriver.org/aboutwatershed/roadmap [Accessed October 2019].

Santo-Domingo, J. W. and N. Ashbolt. 2008. "Fecal Pollution of Water." *Encyclopedia of Earth*, pp. 1-12. National Council for Science and the Environment, Washington, D.C. Available at: https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NERL&dirEntryId=196784.

Save the American River Association (SARA). 2019. Available at: https://www.sarariverwatch.org/ [Accessed November 2019].

Sawyer, J. O., Keeler-Wolf, T., and J. Evans. 2009. A Manual of California Vegetation, 2nd Addition. California Native.

Schwartz, R.S. and B. May. 2008. Genetic Evaluation of Isolated Populations for Use in Reintroductions Reveals Significant Genetic Bottlenecks in Potential Stocks of Sacramento Perch. Transactions of the American Fisheries Society 137: 1764-1777.

Science Alert. 2017. Every 200 Years California Endures a Flood of Epic Proportions. Available at: https://www.sciencealert.com/every-200-years-california-endures-a-flood-of-epic-proportions-and-this-could-be-it [Accessed November 2019]

Sellheim et al. 2015. Juvenile Salmonid Utilization of Floodplain Rearing Habitat After Gravel Augmentation in a Regulated River. Available at: https://www.researchgate.net/publication/267287216_Juvenile_Salmonid_Utilization_of_Floodplain_Rearing_Habitat_After_Gravel_Augmentation_in_a_Regulated_River [Accessed October 2019].

Shlemon, R. J., Horner, T., and J. Florsheim. 2000. Quaternary Geology of the Sacramento Area. Includes Shlemon 1967 Figure. (i.e. Shlemon, R.J., 1967. Quaternary Geology of Northern Sacramento County, California; Annual Field Trip Guidebook of the Geologic Society of Sacramento).

Shuford, W. D., and T. Gardali, eds. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Sierra College. 2009. Mining Techniques of the Sierra Nevada and Gold Country. Journal of Sierra Nevada History & Biography. Spring 2009 Vol. 2 No. 1.

Smith, J. K., ed. 2000. Wildland fire in ecosystems: effects of fire on fauna. Gen. Tech. Rep. RMRS-GTR-42-vol. 1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 83 p.

Soil Conservation Service (SCS). 1993. Soil Survey of Sacramento County, California. Available at: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/CA067/0/sacramento.pdf [Accessed October 2019].

Stankey, G. H.; Clark, R. N.; Bormann, B. T. 2005. Adaptive management of natural resources: theory, concepts, and management institutions. Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 73 p.

Thrush, G. 2017. “As Affordable Housing Crisis Grows, HUD Sits on the Sidelines.” The New York Times. Available at: https://www.nytimes.com/2018/07/27/us/politics/hud-affordable-housing-crisis.html [Accessed August 2019].

UC Davis. 2019. Interactive PISCES Map viewer: longfin smelt. Available: https://pisces.ucdavis.edu/map [Accessed February 2019].

———. 2019. UC Davis Weed Control Handbook. Available at: https://wric.ucdavis.edu/information/natural%20areas/wr_D/Dittrichia.pdf [Accessed July 2019].

UCLA Center for Climate Science. 2019. “Climate Change in the Sierra Nevada”. Available at: https://www.ioes.ucla.edu/wp-content/uploads/UCLA-CCS-Climate-Change-Sierra-Nevada.pdf [Accessed June 2019].

United Nations. 2019. *Report of the Secretary-General on the 2019 Climate Action Summit and the Way Forward in 2020*. Available at: https://www.un.org/en/climatechange/assets/pdf/cas_report_11_dec.pdf.

URS-GEI. 2012. Revised Three-Dimensional Stratigraphic Model Report, American River Common Features General Reevaluation Report. [Accessed October 2019].

U.S. Army Corps of Engineers (USACE). 2015. American River, California Common Features Project General Reevaluation Report. Draft Report for Public Review. Available at: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/Final_ARCF_GRR_Jan2016.pdf [Accessed March 2019].

———. 2015. Habitat Mitigation, Monitoring and Adaptive Management Plan: American River Common Features General Reevaluation Report. Available at: http://www.safca.org/documents/ARCF_GRR/Project_Documents/2015.12_ARCF_GRR_EIS_EIR/Appendix_I_Habitat_Mitigation_Monitoring_and_Adaptive_Management_Plan.pdf [Accessed October 2019].

———. 2016. American River Watershed: Common Features General Reevaluation Report, Final Report. Available at: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/Final_ARCF_GRR_Jan2016.pdf [Accessed October 2019].

———. 2016. US Army Corps of Engineers Section 408 Overview. Regulatory Workshop. Available at: https://www.spk.usace.army.mil/Portals/12/documents/regulatory/Reg_workshop/2016-07-22/408-Overview-Regulatory-Workshop-7-19-16.pdf?ver=2016-08-02-134604-830.

———. 2017. Draft Folsom Dam and Lake American River, California Water Control Manual. Available at: https://www.spk.usace.army.mil/Missions/Civil-Works/Folsom-Water-Control-Manual-Update/ [Accessed October 2019].

———. 2019. Folsom Dam Modification Project Water Control Manual Update, Final, Supplemental Environmental Assessment/Environmental Impact Report. Available at: http://cvfpb.ca.gov/wp-content/uploads/2019/01/FINAL-Folsom-WCM-Update-SEAEIR.pdf [Accessed October 2019].

USACE (U.S. Army Corps of Engineers), CVFPB (State of California Central Valley Flood Protection Board), and SAFCA (Sacramento Area Flood Control Agency). 2015. American River Watershed Common Features General Reevaluation Report, Final Environmental Impact Statement Environmental Impact Report. Available at: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/ARCF_GRR_Final_EIS-EIR_Jan2016.pdf [Accessed June 2019].

U.S. Bureau of Land Management (BLM), National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), and U.S. Forest Service (USFS). N.D. “National Wild and Scenic Rivers System.” Available at: https://rivers.gov/ [Accessed January 2020].

U.S. Bureau of Reclamation (USBR). 2006. Folsom Dam 50th 1956-2006. Available at: https://www.usbr.gov/mp/folsom-50/docs/folsom-50-ann-booklet.pdf [Accessed October 2019].

———. 2016. Environmental Assessment Lower American River Anadromous Fish Habitat Restoration Project. Available at: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=24637 [Accessed October 2019].

———. 2017a. Water Facts Nimbus Dam and Power Plant. Last Updated April 2017. Available at: https://www.usbr.gov/mp/arwec/facts-nimbus-dam-powerplant.html [Accessed November 2019].

———. 2017b. About the Central Valley Project. Last Updated April 2017. Available at: https://www.usbr.gov/mp/cvp/about-cvp.html [Accessed November 2019].

———. 2019. “Central Valley Project Improvement Act (CVPIA).” Available at: https://www.usbr.gov/mp/cvpia/ [Accessed July 2019].

———. 2020. “Central Valley Project.” Available at: https://www.usbr.gov/projects/index.php?id=506 [Accessed January 2020].

U.S. Congress. 1940. An Act To authorize the American River Basin development, California, for irrigation and reclamation, and for other purposes. Available at: https://www.loc.gov/law/help/statutes-at-large/81st-congress/session-1/c81s1ch690.pdf [Accessed October 2019].

———. 1968. An act to provide for a National Wild and Scenic Rivers System, and for other purposes. Available at: https://www.rivers.gov/documents/act/complete-act.pdf [Accessed October 2019].

U. S. Court of Appeals of the Ninth Court. 2018. *Martin v. City of Boise*, No. 15-35845, D.C. No. 1:09-cv-00540-REB ORDER. Available at: https://cdn.ca9.uscourts.gov/datastore/opinions/2018/09/04/15-35845.pdf [Accessed September 2019].

———. 2019. *Martin v. City of Boise*, No. 15-35845, D.C. No. 1:09-cv-00540-REB ORDER AND AMENDED OPINION. Available at: http://cdn.ca9.uscourts.gov/datastore/opinions/2019/04/01/15-35845.pdf [Accessed September 2019].

U.S. Department of the Interior. 1980. Final Environmental Impact Statement: Proposed Designation of Five California Rivers in the National Wild and Scenic Rivers System. Available at: https://searchworks.stanford.edu/view/3869216 [Accessed October 2019].

U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Available at: https://www.census.gov/prod/2013pubs/fhw11-ca.pdf.

U.S. District Court. 1840. California, Northern District. Land case 359 ND, page 645; land case map D-740 (Bancroft Library). Joseph L. Folsom and Anna Maria Sparks, clmts. Pen-and-ink and watercolor. 4362 R57.

U.S. Environmental Protection Agency (EPA). 2017. Climate Impacts on Ecosystems. Available at: https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-ecosystems_.html [Archived] [Accessed December 2019].

U.S. Fish and Wildlife Service (USFWS). 1991. American River watershed investigation substantiating report, lower American River. June. Sacramento, CA.

———. 1992. Shaded Riverine Aquatic Cover of the Sacramento River System: Classification as Resource Category 1 Under the FWS Mitigation Policy. Available at: http://www.deltarevision.com/Issues/fish/dpm/riverine-aquatic-cover.pdf [Accessed October 2019].

———. 2013. “ESA Basics, 40 Years of Conserving Endangered Species.” Available at: https://www.fws.gov/endangered/esa-library/pdf/ESA_basics.pdf [accessed January 2020].

———. 2015. Formal Consultation on the American River Common Features (AFRC) Project, Sacramento County, California, pp. 1-313.

———. 2017. Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service; Sacramento, California. 28 pp.

———. 2019. Information for Planning and Conservation. Online at https://ecos.fws.gov/ipac/. [Accessed November 2019].

U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), National Park Service (NPS), and Bureau of Land Management (BLM). 2021. National Wild and Scenic Rivers System. American River (Lower), California. Available at: https://www.rivers.gov/rivers/american-lower.php [Accessed March 2021].

U.S. Forest Service (USFS). 2020. “Fire Effects Information System Glossary.” Available at: https://www.fs.fed.us/database/feis/glossary2.html [Accessed January 2020].

———. Pacific Southwest Region. 2020. “California Dry Steppe.” Chapter 31, Ecological Subregions of the United States. Available at: https://www.fs.fed.us/land/pubs/ecoregions/ch31.html [Accessed January 2020].

U.S. Geological Survey (USGS). 2019. The National Map [Online GIS Map Viewer]. Available at: https://viewer.nationalmap.gov/basic/ [Accessed October 2019].

———. 2019. Streamstats. Available at: https://streamstats.usgs.gov/ss/ [Accessed October 2019].

———. 2020. "California's Central Valley. The Central Valley: Sacramento Valley." Available at: https://ca.water.usgs.gov/projects/central-valley/sacramento-valley.html [Accessed January 2020].

———. 2021. NAS-Nonindigenous Aquatic Species. Available at: https://nas.er.usgs.gov/about/faq.aspx [Accessed January 2021].

Veselka, A. 2019. Personal communication. Sacramento County Department of Regional Parks (Regional Parks).

Vigars, K. N. 2016. Buried Beneath the Legislation It Gave Rise to: The Significance of Woodruff v. North Bloomfield Gravel Mining Co. Available at: https://lawdigitalcommons.bc.edu/ealr/vol43/iss1/10/ [Accessed October 2019].

Water Education Foundation. 2020. "California Wild and Scenic Rivers Act." Available at: https://www.watereducation.org/aquapedia/california-wild-and-scenic-rivers-act [Accessed January 2020].

The Water Forum. 2006. Lower American River Flow Management Standard. Available at: http://www.waterforum.org/wp-content/uploads/2014/11/2006-Flow-Management-Standard.pdf [Accessed October 2019].

———. 2015. The Lower American River Modified Flow Management Standard: A Drought Buffer for the Environment and Local Water Supplies. Available at: https://www.waterforum.org/the-river/flow-management-standard/ [Accessed October 2019].

———. 2019. Lower American River Fisheries and In-Stream Habitat Management and Restoration Plan. 2019 Update. Available at: https://www.waterforum.org/wp-content/uploads/2019/08/FISH-Plan-2019-Action-Update-Draft-Report-8.219.pdf [ Accessed March 2021].

———. 2021. Habitat Management. Available at: https://www.waterforum.org/the-river/habitat-management/ [Accessed January 2021].

Watson. 1985. Assessment of Channel and Riparian Vegetation Conditions, Lower American River, California. September 1985.

———. 2019. LAR Leveed Reach: Subreach-scale Channel Conditions, Processes, and Evolutionary Trends; --- Subreaches 1, 3, and 4 ---. [Accessed October 2019].

Welcomme, R. L., Bene, C., Brown, C. A., Arthington, A., Dugan, P., King, J. M., and V. Sugunan. 2006. "Predicting the Water Requirements of River Fisheries." *Ecological Studies*, Vol. 190, pp.123-154.

White, C. 2013. "Environmental Impacts of Homeless Encampments in the Guadalupe River Riparian Zone." Royal Roads University, Victoria, British Columbia. Available at: https://www.piercecountywa.org/DocumentCenter/View/44600/Environmental-Impacts-of-Homeless-Encampments.

Whitney. 1880. The Auriferous Gravels of the Sierra Nevada of California. Available at: https://theminingalliance.com/research/historical/reports/The_Auriferous_Gravels_of_the_Sierra_Nev_Whitney.pdf [Accessed October 2019].

Wildland Res Mgt; Ascent Environmental, Inc.; Interra Group. 2014. Sacramento Metropolitan Fire District Community Wildfire Protection Plan.

Wildlife Conservation Board (WCB). Lower American River Conservancy Program. Available at: https://wcb.ca.gov/Programs/Lower-American-River [Accessed January 2021].

Wilson, N. L. and A. H. Towne. 1978. "Nisenan." In *California*, edited by Robert F. Heizer, pp. 387-397, Handbook of North American Indians, vol. 8. William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Witham, C. W. 2006. Vernal Pools of Mather Field. California Native Plant Society. Sacramento, CA.

Wolkowski, R. 2008. "Soil Compaction: Causes, Concerns, and Cures." University of Wisconsin-Extension, Madison, Wisconsin. Available at: https://soils.wisc.edu/extension/pubs/A3367.pdf [Accessed August 2019].

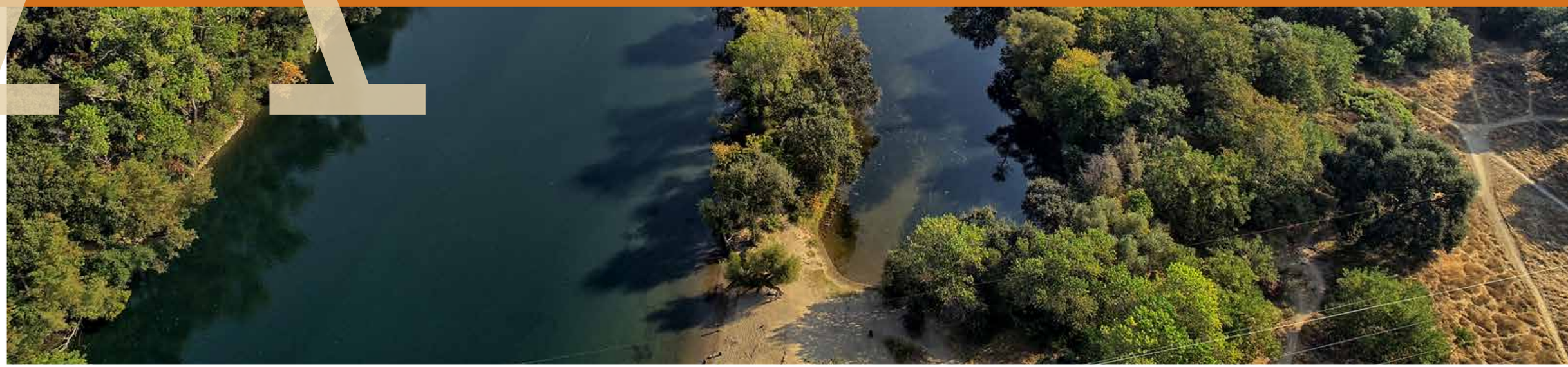
Yoon-Hendricks, A. 2019. "Citations soar for homeless on American River Parkway after ruling halts ban on camping." Available at: https://www.sacbee.com/news/local/homeless/article228738554.html [Accessed September 2019].

Zeiner, D.C., Laudenslayer, W.F., Mayer, K.E., and M. White. 1990. California's Wildlife Vol I-III. California Department of Fish and Game, Sacramento, California.

Zouhar, K., Smith, J. K., Sutherland, S., and M. L. Brooks. 2008. Wildland fire in ecosystems: fire and nonnative invasive plants. Gen. Tech. Rep. RMRS-GTR-42-vol. 6. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 355 p.

# APPENDIX A

## PUBLIC OUTREACH REPORT



APPENDIX A

# PUBLIC OUTREACH SUMMARY REPORT

American River Parkway Natural Resources Management Plan

## Public Outreach Summary Report

**May 2022**

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# American River Parkway Natural Resources Management Plan Public Outreach Summary Report

## Introduction

Between July 2020 and February 2021, the Natural Resources Management Plan (NRMP) project team conducted a variety of outreach activities to inform stakeholders and the public about the NRMP, and to solicit input on draft NRMP materials and the future of the American River Parkway. This outreach effort was part of the NRMP Community Engagement Plan, and public feedback from the community engagement process contributed to the development of the NRMP. The outreach allowed the public to provide input on the contents of the NRMP, including chapter text, goals and objectives, projects, and mapping products.

Outreach activities included an online, map-based community survey; two public workshops; an American River Parkway Advisory Committee (ARPAC) NRMP workshop; a County Recreation and Park Commission (RPC) NRMP workshop; two terrestrial resources stakeholders meetings; and a fisheries resources stakeholders meeting.

## Key Themes

Outreach participants raised six topics of discussion consistently throughout most of the public engagement activities. These topics, listed below, are considered key takeaways/themes of the NRMP community engagement process.

- Natural resources and public safety impacts associated with homeless encampments are a significant issue of concern.
- Impacts from invasive plant species are significant, and the NRMP should include a comprehensive list of species to be mapped and managed.
- Agencies conducting work in the Parkway need to communicate closely and coordinate regularly with each other and with Regional Parks.
- The Parkway needs better and/or expanded educational signage, materials, and programs to both reduce human use impacts on natural resources and prevent user conflicts.
- Long-term fire fuel reduction and post-fire assessment and restoration plans are needed to successfully address the impacts of wildfire on natural resources.
- Adaptive, long-term terrestrial and aquatic resources monitoring and research activities are essential and should be conducted in partnership with universities and citizen science organizations.
- Impacts from electrical utility vegetation management activities need to be addressed and mitigated.

- Social trails are causing significant resource impacts and need to be removed.

The table below shows the occurrence of these key themes in discussion during each of the outreach activities.

| | *Homelessness* | *Invasive Plant Species* | *Agency Communication and Coordination* | *Educational Signage and Programming* | *Wildfire* | *Monitoring and Research* | *Electrical Utilities* | *Social Trails* |
|---|---|---|---|---|---|---|---|---|
| *Online Community Survey* | ✓ | | | | | | | |
| *Public Workshops (4)* | ✓ | ✓ | ✓ | ✓ | | ✓ | | |
| *ARPAC Workshops (2)* | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *RPC Workshops (2)* | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| *Terrestrial Stakeholders Meetings (2)* | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ |
| *Fisheries Stakeholder Meeting* | | | | ✓ | | ✓ | | |

## Outreach Activities – Summaries and Findings

The following section provides an overview of each outreach activity and reports overall findings from each activity.

### 1. Online Community Survey

The interactive mapping exercise (powered by Maptionnaire) was offered for public input between July 15 and September 15, 2020. Participants used interactive maps to identify where they enter the Parkway, as well as what they like, what they don't like, and what they felt should change about the Parkway. Participants also provided feedback on preliminary NRMP goals.

Several of the themes that emerged throughout the survey responses are listed below:

- Access and use of the Parkway is concentrated in the middle and upper reaches.
- The most "liked" places on the Parkway are areas that provide opportunities for enjoying nature and trail-related activities.
- Homelessness, encampments, trash, and personal safety were the most frequently-mentioned concerns about the Parkway.

### 2. Public Workshops

The NRMP project team held two public workshops on July 16 and July 17, 2020 to inform the public about the NRMP, solicit input on Parkway natural resources management issues, and introduce NRMP mapping products for feedback. Two additional workshops were held on March 22 and March 26, 2021 to give the public the opportunity to comment on the public review draft NRMP.

Workshop participants made the following recommendations:

- Expand the existing list of invasive plant species and include mechanisms to measure success of invasive species management.
- Address poor water quality and high levels of E.coli in the river.
- Employ better social and public education strategies to address resource impacts.
- Ensure that regulatory agencies are communicating with each other.
- Expand research and restoration projects conducted by or in partnership with universities.
- Provide better infrastructure to address resource impacts from encampments.
- Revise or provide clarification on the proposed resource management categories.
- Ensure mapping is up to date and reflects current conditions.
- Provide the NRMP monitoring plan for public review.
- Ensure the NRMP does not prevent increase recreational use in the lower reach of the Parkway.

### 3. American River Parkway Advisory Committee NRMP Workshops

The NRMP project team held an ARPAC NRMP workshop on July 10, 2020 to provide an overview of the NRMP, including the NRMP status, NRMP Task Force, framework, and preliminary mapping products, to the committee members for feedback. A second ARPAC NRMP workshop was held on March 19, 2021 to allow the committee to give feedback on the public review draft NRMP.

Committee members commented and/or requested that the NRMP address the following topics:

- Use of signage and other means to prevent user conflicts on trails

- Alignment of the California State University, Sacramento (CSUS) Bushy Lake restoration plan and the U.S. Army Corps of Engineers (USACE) Ecosystem Restoration concept
- Inclusion of yellow star thistle in the NRMP's invasive plants list and updated mapping of the Parkway's invasive plants
- Resource managmenet issues at Sutter's Landing Park
- Potential to collect money from recreational and special events and reinvest said money into Parkway management
- Fire fuel reduction activities
- Alignment of electircal utility companies' wildfire mitigtion plans and the NRMP
- Use of citizen science and community-sourced data to inform management objectives and monitoring activities
- Creation of an interagency group to meet frequently to manage NRMP implementaiton
- Inclusion of non-conforming uses and facilities as topics of discussion

Committee members gave feedback or asked questions on the following topics related on the public review draft NRMP:

- Future recreationl development and how such development would interact with the NRMP.
- Ambient light and how it affects the Parkway.
- Vegetation community mapping in the NRMP.
- Need for new habitat areas to improve wildlife connectivity.
- Accuracy of NRMP maps in reflecting current conditions.
- Lack of success of past PG&E mitigation sites.
- Restoring areas previously occupied by invasive species.

## 4. Recreation and Park Commission NRMP Workshops

The NRMP project team facilitated the RPC public NRMP workshop on July 23, 2020 to provide an overview of the NRMP, including the NRMP status, NRMP Task Force, framework, and preliminary mapping products, to the committee members for feedback. A second RPC NRMP workshop was held on March 25, 2021 to allow the commission to give feedback on the public review draft NRMP.

Members of the public and commissioners requested the NRMP accomplish the following:

- Set numeric restoration goals.
- Incorporate specific restoration projects and provisions to facilitate future projects.
- Discuss and map past and anticipated future resource impacts.
- Conduct post-fire resource assessments and develop post-fire restoration plans in coordination with local fire departments.
- Remove and/or actively manage wild grapes.
- Discuss culturally significant plants.
- Expand upon the existing invasive plant species list.



- Coordinate adaptive management and quantitative monitoring activities.
- Bring in education providers, search at the Effie Yeaw Nature Center and American River Parkway Foundation, to manage portions of Bushy Lake.
- Leverage the NRMP to influence regulatory agencies conducting projects in the Parkway.
- Align the California State University, Sacramento (CSUS) Bushy Lake restoration plan and the U.S. Army Corps of Engineers (USACE) Ecosystem Restoration concept.
- Provide NRMP mapping products to the public in an easily accessible format.
- Add a community engagement objective.

Committee members gave feedback or asked questions on the following topics related on the public review draft NRMP:

- Diversity of outreach respondents.
- Partnerships for project funding.
- Recent efforts to improve habitat values at Bushy Lake.
- Availability of hard copies of the NRMP for purchase.
- Application of the resource management categories in reality.
- Availability of Parkway Plan EIR and upcoming Supplemental EIR for the NRMP.

## 5. Terrestrial Stakeholders Group Meetings

The NRMP project team and members of the NRMP Task Force engaged with Parkway stakeholders, including non-profit organization members and informed Parkway users, familiar with terrestrial resource issues during two (2) stakeholder meetings held on December 4, 2020 and January 8, 2021.

The terrestrial stakeholders gave the following feedback on the NRMP's draft terrestrial management objectives and proposed activities:

- Consider using past restoration projects as reference templates for future restoration projects.
- Consider the feasibility of investing funds in areas heavily impacted by encampments and fires when approving potential restoration projects.
- Address natural resources impacts from social trails and overuse at Sutter's Landing Park.
- Incorporate culturally significant and pollinator plants.
- Focus on replacing non-native trees with native species to provide important avian habitat.
- Incorporate non-conforming use facilities to allow said facilities to obtain grant funding in the future.
- Discuss the educational value of Camp Pollock and American River Ranch.
- Address impacts of invasive vegetation and spawning gravel placement on stand-up paddle boarding.

- Support the relocation of individuals experiencing homelessness outside the Parkway.
- Address user conflicts.
- Address water quality impacts from trash and encampments.
- Improve access to recreation areas to prevent impacts to sensitive vegetation and habitats.
- Develop baseline resources information against which to compare human use and encampment impacts.
- Create more low terrace floodplain and habitat.
- Prioritize only the most invasive plants species for active management and tolerate naturalized non-native plants.
- Develop long-term plans to protect mitigation trees from fires.
- Address impacts of electrical utility companies' vegetation management activities.
- Create more grassland habitat to benefit burrowing owl, yellow-billed magpies, and other wildlife species.
- Incorporate Western pond turtle as an indicator species for the Parkway.
- Map and prioritize management of all informal trails in the Parkway.
- Curtail illegal activities, including off-road cycling, in unauthorized areas.
- Consider unanticipated impacts from predatory fish resulting from the USACE Arden pond project.
- Create and improve existing pond habitat in the Parkway.
- Utilize, but expand upon the American River Parkway Foundation's invasive plant data.
- Manage in-Parkway areas adjacent to City and other parks to maximize habitat connectivity, particularly for native insect species and mammals that historically occurred in the Parkway.
- Capture all proposed restoration activities in the NRMP to ensure hydraulic modelling analyzes maximum restoration potential.
- Use the NRMP to persuade regulatory agencies to advance Regional Parks' management goals.
- Create new high-elevation riparian and upland habitat in Sacramento Bar.
- Incorporate a chapter detailing research needs.
- Assume higher recreation use patterns for future management planning.
- Incorporate land acquisition as a management objective.

## 6. Fisheries Stakeholders Meeting

The NRMP project team and members of the NRMP Task Force engaged with Parkway stakeholders, including agency scientists and informed Parkway users familiar with aquatic and fisheries resource issues, during a stakeholder meeting held on February 5, 2021.

The fisheries stakeholders provided the following feedback on the bank protection and fisheries projects presented during the meeting:

- Consider the risk of redd and juvenile stranding in the design of spawning and rearing enhancement and mitigation projects.



- Consider activities that would benefit non-salmonid species.
- Conduct ongoing operations and maintenance activities at spawning enhancement sites to address fish strandings.
- Continue regular monitoring activities to collect data on number of redds and, if possible, fish population counts.
- Use education and/or information to address recreational impacts on redds.
- Monitor and collect data on the frequency and timing of recreational impacts on fry spawning.
- Maintain some pond habitat for diving bird species.
- Address fish stranding in secondary channel areas.
- Consider removing perched and unfunctional island habitat.

APPENDIX A

# MAPTIONNAIRE RESULTS SUMMARY



## AMERICAN RIVER PARKWAY
## NATURAL RESOURES MANAGEMENT PLAN (NRMP)
## MAPTIONNAIRE RESULTS SUMMARY

### INTRODUCTION

This summary includes results of the interactive mapping exercise (powered by Maptionnaire) this project offered for public input between July 15 and September 15, 2020. Starting with a description of the exercise, this summary will then present the thematic results, a respondent profile, supporting data tables, and maps. This presentation of results will also include content analysis of thousands of open-ended responses.

### INTERACTIVE MAPPING EXERCISE

This exercise was designed by MIG using the Maptionnaire Community Engagement Platform. The strength of this platform is in sharing information and creating opportunities for meaningful, detailed public input including map-based answers. After a brief introduction to the project, which included a video presentation, respondents had two main tasks.

1. Respond on the map, showing where they enter the parkway, what the like, what they don't like and what should change.
2. Respond to preliminary goals, indicating their level of support and any comments on each of 7 goals.

*Figure 1: Interactive Map*

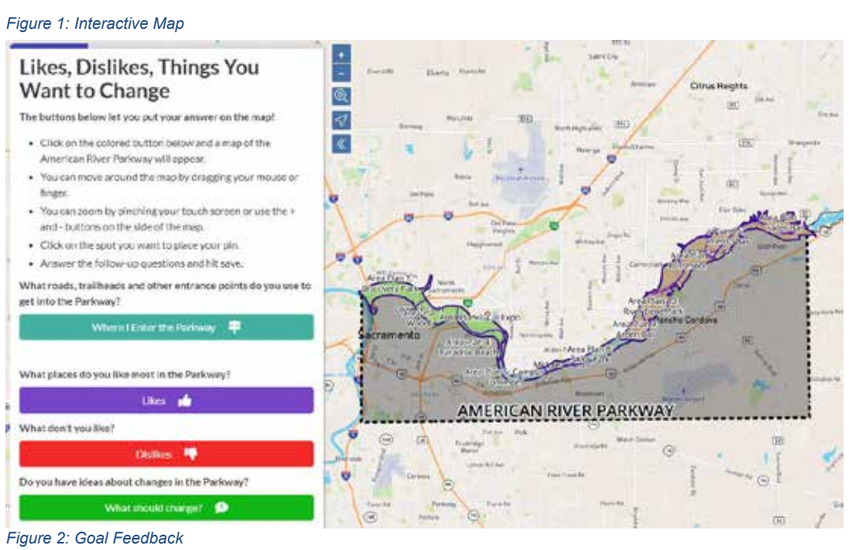



*Figure 2: Goal Feedback*

A concluding section asked for demographic information to help the team understand who had responded.

The Maptionnaire platform is built from the ground up to be mobile device friendly to maximize reach. The exercise was advertised by project partners through their social media and email channels. Over 1,600 respondents visited the site and answered questions.





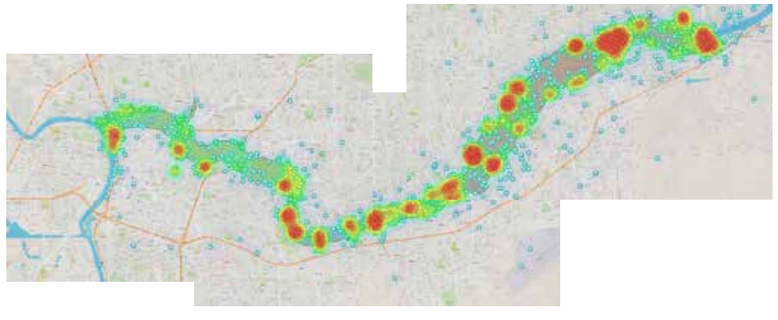
## THEMATIC RESULTS

Simplifying the large number of results, the project team identified several themes that capture the essence of many different individual responses. The following is the briefest version of what the users and stakeholders had to say.

**Access and Use**

- Access and use of the parkway is more concentrated in the middle and upper reaches
- Respondents live all around the Parkway but tend to use the middle and upper reaches the most.
- There are important access points in all three reaches.

*Figure 3: Concentrations of Access Points Placed on the Map*
*(Red areas represent the highest concentrations.)*



**Nature and Trails**

- The most “liked” places are important for enjoying nature and trail-related activities.
- Slightly less walking and more cycling in the lower reach
- The most common uses indicated are:
  - Enjoying nature
  - Walking
  - Jogging, Running
  - Bicycling

**Homelessness in the Parkway**

- Housing and homelessness is a major impact on the American River Parkway.
- The encampments, trash and personal safety were the most frequently mentioned issues.
- The primary focus on the lower reach of the river.
- 22% of open-ended comments throughout the survey mentioned homelessness impacts

Detailed response tables and visuals are provided below.

## RESPONDENT PROFILE

A total of 1634 respondents were logged into the database. However, since demographics were optional, the results below are based on a smaller set of respondents who completed them. Overall, respondents:

- Are older, with 34% over 65 and 9% under 35,
- Are working (57%) or retired (39%).
- Primarily speak English, with 5% of respondents indicated they speak a language other than English at home.
- Were largely white, with 9% of respondents identify as non-white.
- Primarily live within a few miles of the parkway (sez Figure A-2)

**Note: no questions were mandatory and the response to any given question may be significantly lower than this total. The total number of respondents or "n" is provided with each table below.*

*Table 1: Employment Status*

| | Number | Percent |
|---|---|---|
| **I'm working** | 349 | 57% |
| **I'm not working** | 27 | 4% |
| **I'm in school** | 15 | 2% |
| **I'm retired** | 238 | 39% |
| **Total** | 617 | 100% |

*Table 2: Age Group*

| | Number | Percent |
|---|---|---|
| **Under 18** | 13 | 1% |
| **18-24** | 16 | 1% |
| **25-34** | 77 | 7% |
| **35-44** | 149 | 13% |
| **45-54** | 194 | 17% |
| **55-64** | 309 | 27% |
| **65+** | 391 | 34% |
| **Total** | 1149 | 100% |





*Table 3: Race and Ethnicity*

| | Number | Percent |
|---|---|---|
| **African American/Black** | 10 | 1% |
| **Asian or Asian American** | 30 | 4% |
| **Caucasian/White (not Hispanic)** | 646 | 78% |
| **Hispanic/Latino** | 26 | 3% |
| **Native American** | 8 | 1% |
| **Prefer not to say** | 99 | 12% |
| **Prefer to identify myself in another way** | 27 | 3% |
| **Total** | 825 | 100% |

*Table 4: Languages Spoken In Your Home*

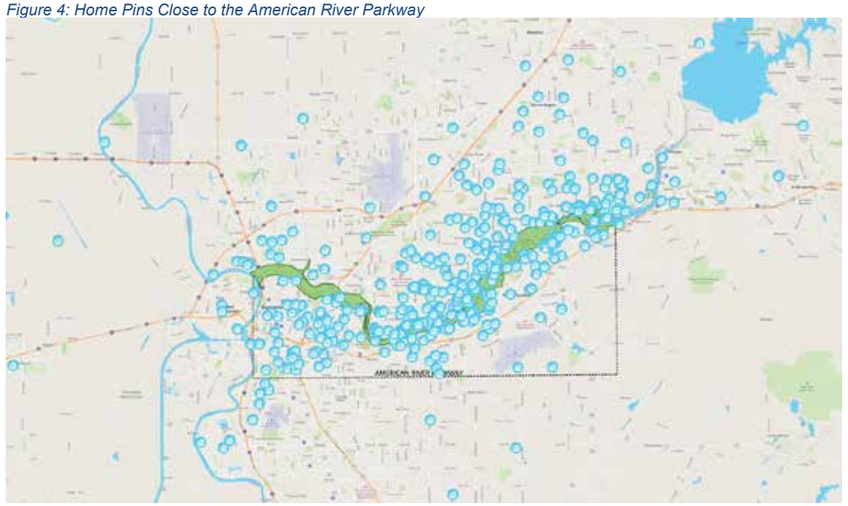
| | Number | Percent |
|---|---|---|
| **Arabic** | 3 | 0% |
| **Chinese – Cantonese** | 3 | 0% |
| **Chinese – Mandarin** | 5 | 1% |
| **English** | 621 | 99% |
| **French** | 10 | 2% |
| **Japanese** | 3 | 0% |
| **Korean** | 2 | 0% |
| **Russian** | 1 | 0% |
| **Thai** | 1 | 0% |
| **Vietnamese** | 3 | 0% |
| **Total** | 626 | 100% |

*Table 5: Gender Identity*

| | Number | Percent |
|---|---|---|
| **Female** | 324 | 49% |
| **Male** | 301 | 45% |
| **Non-binary** | 1 | 0% |
| **Prefer not to say** | 41 | 6% |
| **Total** | 668 | 100% |

417 Respondents indicated where they live using a pin on the map. The vase majority of these indicated living very close to the American River Parkway. Figure 5 shows the locations of these placed pins.

*Figure 4: Home Pins Close to the American River Parkway*







## RESPONSE TABLES AND MAPS

This survey included both closed and open-ended survey questions as well as an interactive mapping element that allowed respondents to place answers on the map to indicate the precise location the answer applies to. The following maps and tables report the results of this exercise. The full Geographic Information System (GIS) data was delivered separately and can be used for future project support. For some of the map-based answers, follow up questions were asked for each pin placed. Tables describing these responses are noted as a Follow-Up Question and located just below the map of the associated pins.

*Table 6: Multiple Choice Question How do you use or enjoy the American River Parkway?*

| Answer Choices | Number | Percent |
|---|---|---|
| **Walking, jogging, or running on trails.** | 716 | 76% |
| **Enjoying nature, birds, wildlife, views.** | 603 | 64% |
| **Bicycling (for fun and recreation)** | 554 | 59% |
| **Accessing the river.** | 526 | 56% |
| **Bicycling (commute or transportation)** | 164 | 18% |
| **Fishing** | 100 | 11% |
| **I don't do any activities at the Parkway.** | 24 | 3% |
| **Horseback riding** | 21 | 2% |
| **Total** | 937 | 100% |

*Figure 5: What roads, trailheads and other entrance points do you use to get into the Parkway? - Points*

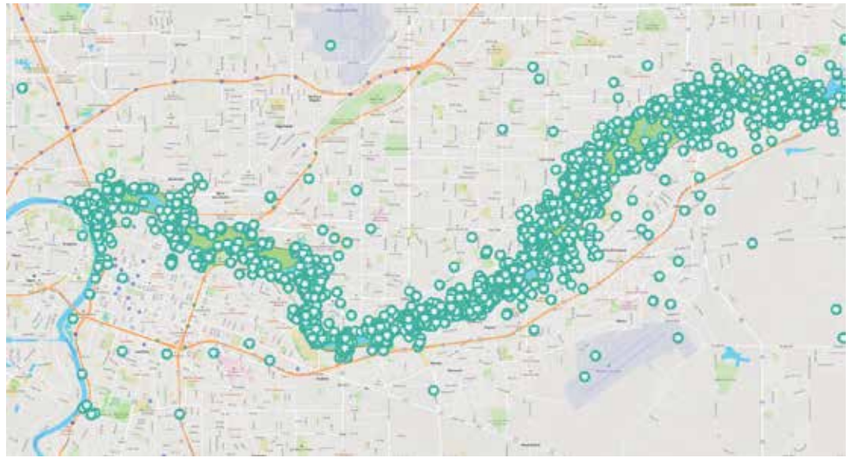


*Figure 6: What roads, trailheads and other entrance points do you use to get into the Parkway? - Heatmap[1]*

*Table 7: Follow-Up Question How do you travel to this entrance? Check all that apply.*

| Answer Choices | Number | Percent |
|---|---|---|
| **Walk, Jog, Run** | 1133 | 37% |
| **Bicycle** | 1270 | 42% |
| **Car** | 1705 | 56% |
| **Bus** | 6 | 0.2% |
| **Total** | 3035 | 100% |

[1] Heatmaps show the concentration of points as a color shift from blue (few points) to red (many points).





*Figure 7: What places do you like most in the Parkway?- Points*

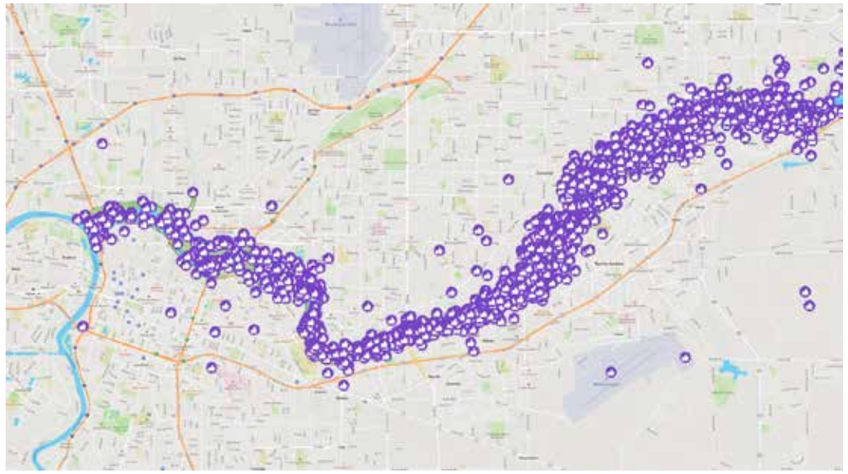


*Figure 8: What places do you like most in the Parkway?- Heatmap*

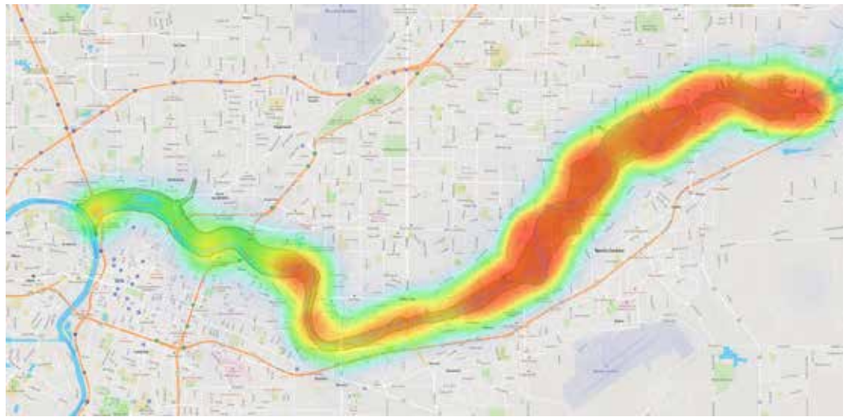


*Table 8: Follow-Up Question: What do you do at this location? Check all that apply.*

| Answer Choices | Number | Percent |
|---|---|---|
| **Walk** | 1311 | 56% |
| **Jog/Run** | 512 | 22% |
| **Bicycle** | 1081 | 46% |
| **Get in the river** | 611 | 26% |
| **Enjoy nature, birds, wildlife** | 1470 | 63% |
| **Fish** | 154 | 7% |
| **Total** | 2350 | 100% |

*Figure 9: What don't you like?- Points*

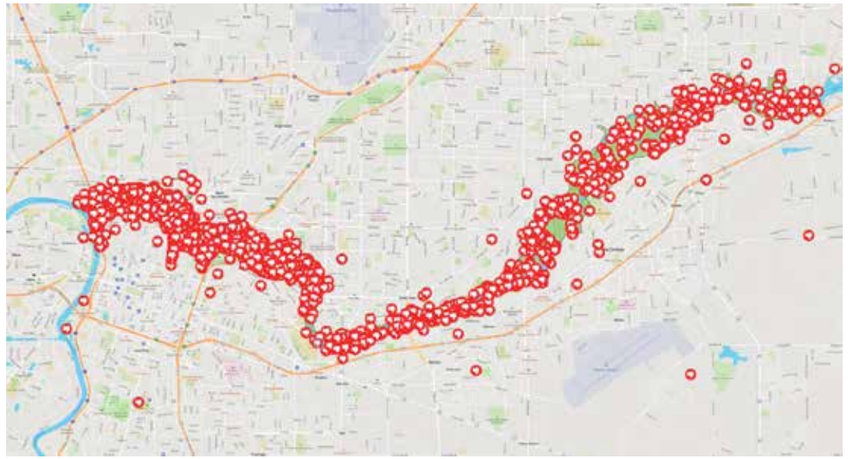






*Figure 10: What don't you like?- Heatmap*

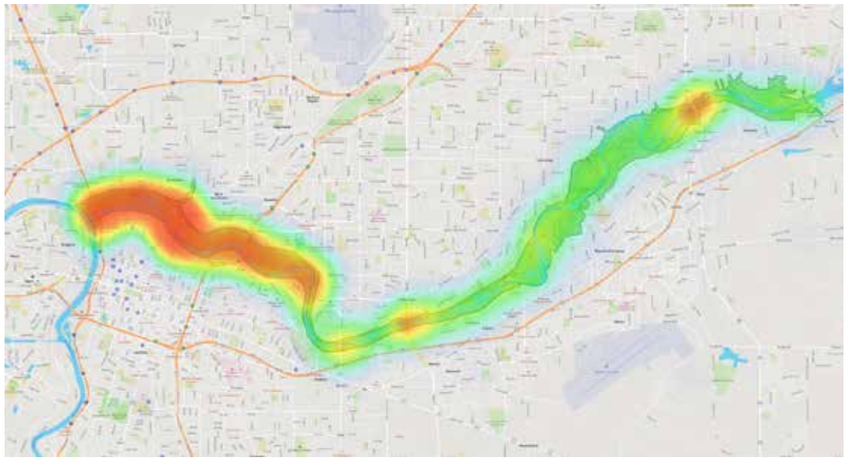


*Table 9: Follow-Up Question: Which of the following don't you like at this location? Check any that apply.*

| Answer Choices | Number | Percent |
|---|---|---|
| **Noise** | 92 | 7% |
| **I feel unsafe here** | 842 | 66% |
| **I feel unwelcome here.** | 392 | 31% |
| **Trash/garbage dumping** | 943 | 74% |
| **Encampments** | 975 | 76% |
| **Fire risks** | 247 | 19% |
| **I can't get to what I want to see.** | 68 | 5% |
| **I can't do what I want to do.** | 139 | 11% |
| **Total** | 1279 | 100% |

*Figure 11: Do you have ideas about changes in the Parkway?- Points*

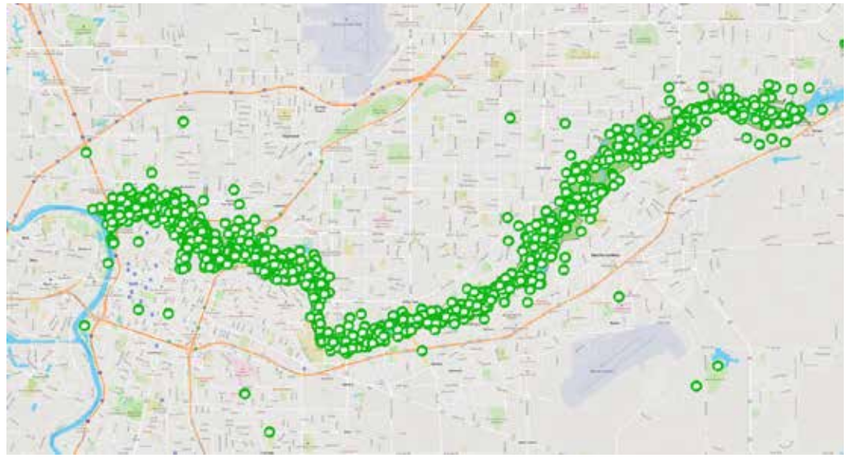
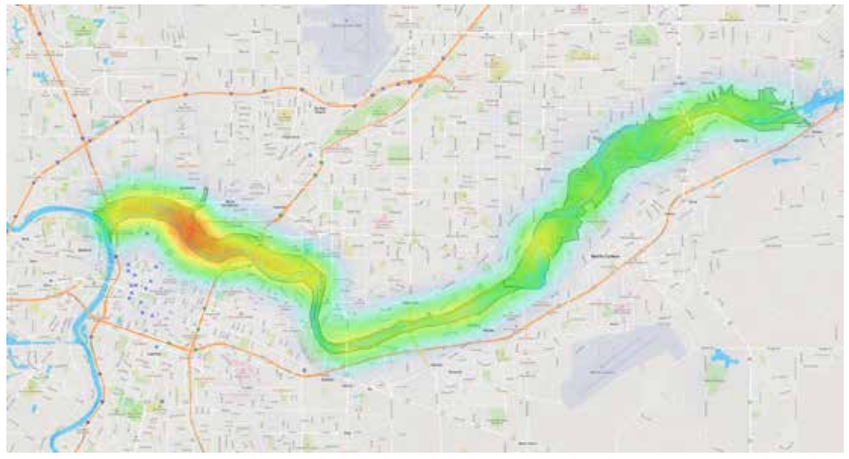


*Figure 12: Do you have ideas about changes in the Parkway?- Heatmap*



Comments recorded with the 920 pins illustrated above are included in the content analysis at the end of this document.





## SUPPORT FOR DRAFT GOALS

Each of the draft goals (as of July 2020) was tested for support. The goals as tested are presented before the table indicating the agreement by respondents. Respondents also had the opportunity to comment on each goal. The comments are included in the content analysis at the end of this document.

*Figure 13: NRMP Framework Draft June 2020*

**Goal 1: Preserve and enhance native communities.**

- Objective 1.1: Protect, enhance, and restore **native vegetation communities**, including emergent, riparian, grassland, and woodland habitats.
- Objective 1.2: Protect and enhance seasonal wetlands

*Table 10: Do you agree with Goal 1 for the American River Parkway?*

| Answer Choices | Number | % |
|---|---|---|
| **Yes, I agree** | 980 | 83% |
| **I agree and have comments (please write them in below)** | 174 | 15% |
| **I disagree (please add any comments below)** | 31 | 3% |
| **Grand Total** | 1185 | 100% |

**Goal 2: Protect and enhance a range of native species over life history stages.**

- Objective 2.1: Protect and enhance native species populations.
- Objective 2.2: Protect, enhance, and restore habitat connectivity and travel corridors to support local and migratory species movement.
- Objective 2.3: Restore and protect fish habitat and structure.
- Objective 2.4: Decrease the prevalence of invasive non-native species.

*Table 11: Do you agree with Goal 2 for the American River Parkway?*

| Answer Choices | Number | % |
|---|---|---|
| **Yes, I agree** | 974 | 83% |
| **I agree and have comments (please write them in below)** | 173 | 15% |
| **I disagree (please add any comments below)** | 22 | 2% |
| **Grand Total** | 1169 | 100% |

**Goal 3: Maintain and improve water quality of the river, its drainages, and the Parkway.**

- Objective 3.1: Maintain and improve soil resources and bank condition to minimize erosion and protect infrastructure.
- Objective 3.2: Augment solid waste cleanup and debris removal.

*Table 12: Do you agree with Goal 3 for the American River Parkway?*

| Answer Choices | Number | % |
|---|---|---|
| **Yes, I agree** | 957 | 82% |
| **I agree and have comments (please write them in below)** | 199 | 17% |
| **I disagree (please add any comments below)** | 17 | 1% |
| **Grand Total** | 1173 | 100% |

**Goal 4: Preserve and enhance open space within and surrounding the Parkway to promote the "naturalistic" character of the land.**

- Objective 4.1: Minimize bluff retreat to protect private property and Parkway resources.
- Objective 4.2: Reduce the amount of ambient light impacting natural resources in the Parkway while ensuring a safe park environment.
- Objective 4.3: Limit incompatible land uses adjacent to the Parkway.

*Table 13: Do you agree with Goal 4 for the American River Parkway?*

| Answer Choices | Number | % |
|---|---|---|
| **Yes, I agree** | 892 | 78% |
| **I agree and have comments (please write them in below)** | 162 | 14% |
| **I disagree (please add any comments below)** | 92 | 8% |
| **Grand Total** | 1146 | 100% |





**Goal 5: Minimize human use impacts in the Parkway.**

- Objective 5.1: Minimize recreation use impacts on natural resources.
- Objective 5.2: Manage impacts associated with homelessness in the Parkway.
- Objective 5.3: Control impacts related to large group and special events.

*Table 14: Do you agree with Goal 5 for the American River Parkway?*

| Answer Choices | Number | % |
|---|---|---|
| **Yes, I agree** | 705 | 61% |
| **I agree and have comments (please write them in below)** | 375 | 32% |
| **I disagree (please add any comments below)** | 76 | 7% |
| **Grand Total** | 1156 | 100% |

**Goal 6: Educate the public on value of the Parkway**

- Objective 6.1: Conduct public outreach and educational efforts.
- Objective 6.2: Interpret and protect natural, archaeological, and historical resources to educate the public on the significance of the Parkway in the greater Sacramento region.
- Objective 6.3: Implement a resource interpretation program to influence visitor behavior.

*Table 15: Do you agree with Goal 6 for the American River Parkway?*

| Answer Choices | Number | % |
|---|---|---|
| **Yes, I agree** | 897 | 78% |
| **I agree and have comments (please write them in below)** | 178 | 16% |
| **I disagree (please add any comments below)** | 70 | 6% |
| **Grand Total** | 1145 | 100% |

**Goal 7: Coordinate with other agencies, organizations, and partners to measure and manage the impact on natural resources.**

- Objective 7.1: Develop a robust environmental monitoring program, in cooperation with other agencies and organizations, to adaptively manage the Parkway.
- Objective 7.2: Support scientific research programs that occur in the Parkway and develop data management system.
- Objective 7.3: Set-up an interagency task force for implementation of the NRMP.

*Table 16: Do you agree with Goal 7 for the American River Parkway?*

| Answer Choices | Number | % |
|---|---|---|
| **Yes, I agree** | 899 | 80% |
| **I agree and have comments (please write them in below)** | 158 | 14% |
| **I disagree (please add any comments below)** | 68 | 6% |
| **Grand Total** | 1125 | 100% |

## OPEN ENDED RESPONSE CONTENT ANALYSIS

The comments recorded along with the agreement/disagreement on each goal were important to understanding the nuance of the respondents' selections. Digging in further to these results, the project team completed a content analysis of each response. This analysis involved examining each comment for mentions of any of what ultimately became a list of 22 classifications (which were developed from initial review of the responses). The table below provides a summary of the number of mentions logged per category. Note that the number of mentions is not the same as the number of comments as some were classified in two categories.

| Classification | Number | % |
|---|---|---|
| **Agree/Important** | 173 | 7% |
| **Disagree/Not Important** | 67 | 3% |
| **Homelessness** | 564 | 22% |
| **Wildfire/Prescribed Burns/Vegetation Management** | 27 | 1% |
| **Volunteering/Citizen Science/NPOs/Universities** | 115 | 4% |
| **Funding/Human Resources (Rangers)** | 99 | 4% |
| **Native Americans/Tribal Resources** | 21 | 1% |
| **Recreation/Recreation Provision/User Access** | 334 | 13% |
| **Native Vegetation/Native Wildlife/Restoration** | 148 | 6% |
| **Invasive Species** | 95 | 4% |
| **Private Property/Bluffs** | 55 | 2% |
| **Non-Recreational Facilities (Restrooms, Trash Cans, etc.)** | 53 | 2% |
| **Erosion** | 54 | 2% |
| **Solid Waste** | 121 | 5% |
| **Ambient Light/Light Pollution** | 32 | 1% |
| **In-Parkway and Adjacent Development** | 45 | 2% |
| **Water Quality/Water Levels** | 58 | 2% |
| **User Conflicts** | 20 | 1% |
| **Interpretation/Education** | 246 | 10% |
| **Other** | 189 | 7% |
| **Flood Control** | 10 | 0% |
| **Monitoring** | 31 | 1% |
| **Total (NOT total number of comments)** | 2557 | 100% |

APPENDIX A

# NRMP PUBLIC WORKSHOPS 2020 SUMMARY REPORT



## AMERICAN RIVER PARKWAY
## NATURAL RESOURES MANAGEMENT PLAN (NRMP)
## PUBLIC WORKSHOP #1 & #2

Thursday, July 16, 2020 ◆ 6:30 p.m. – 8:00 p.m.
(Workshop #1)

Friday, July 17, 2020 ◆ 2:30 p.m. – 4:00 p.m.
(Workshop #2)

Online by Zoom

## SUMMARY REPORT

### INTRODUCTION

On July 16 and July 17, 2020, Sacramento County Regional Parks and MIG, Inc. hosted two public workshops for the American River Parkway Natural Resources Management Plan (NRMP). The purpose of the public workshops was to: (1) provide an overview of the Parkway and NRMP; (2) discuss and understand the purpose of the NRMP; (3) review the overall framework for the NRMP, including its mission and vision, goals and objectives, and performance measures; (4) introduce draft NRMP mapping products prepared by MIG; and (5) receive public feedback, including questions, comments, and suggestions, on the draft NRMP.

**Meeting Format and Agenda**
The two public workshops occurred on July 16, 2020 from 6:30 p.m. to 8:00 p.m. and on July 17, 2020 from 2:30 p.m. to 4:00 p.m. online by Zoom. Three Sacramento County Regional Parks staff and four MIG staff facilitated the workshops. Nine members of the public in total attended the public workshops (Attachment A). The workshops included presentation slides (Attachment B). During the meeting, Daniel Iacofano of MIG recorded key points of discussion in graphic format (Attachment C).

Liz Bellas, Director of the Sacramento County Department of Regional Parks, opened the workshops by introducing the participating Sacramento County Regional Parks and MIG staff members and thanking the public for participating in the workshops. Ms. Bellas disclosed the County's intent to record the workshops. Mr. Iacofano then continued the workshop by stating the purpose of the public workshops, to gain input from the public and Parkway stakeholders on the future of the Parkway and its natural resources. He introduced MIG as an environmental services firm with previous experience in river system natural resources management planning and then asked participating members of the public to give self-introductions.

**NRMP PRESENTATION**

In both workshops, Bill Spain, an MIG team member and NRMP project manager, carried out a presentation introducing the Parkway; the NRMP background, topic areas, and framework; and draft NRMP mapping. At the end of the presentation, Mr. Iacofano asked the members of the public for questions comments, and suggestions, emphasizing the intent of the County and MIG to hear the participants' thoughts on aspects of the Parkway that need to be protected, issues of concern, and ideas for improving the Parkway.

**QUESTIONS, COMMENTS, AND SUGGESTIONS**

The members of the public presented the following questions, comments, and suggestions to the workshop facilitators. Facilitator responses are in *italics* (paraphrased).

**Public Workshop #1**

- I am interested in vegetation issues. Will the vegetation maps and the PowerPoint presentation be made available before the release of the final draft NRMP?
  (MIG) *Yes, the maps will be made available prior to the final draft NRMP.*
- I would like to leave comments on invasive species. Yellow star thistle, stinkwort, and other invasive species the Sacramento Weed Warriors (SWW) have been pulling in the Parkway are not on the list on the provided maps nor on the information provided to me by the County.
  (MIG) *We used IPMP (Invasive Plant Management Plan) point data, including those on removed species, in the maps. We will look into the possibility of incorporating the additional invasive species discussed in this workshop into the NRMP mapping.*
- I have a question on the public engagement process. Is this the only opportunity the public will have to comment before the final draft NRMP is pulled together? How will the public find out about the meetings? There are a very small number of people at this meeting.
  (MIG) *We have put together an online public survey that will be live through August 15, 2020. We are presenting at American River Parkway Advisory Committee (ARPAC) and Sacramento County Recreation and Park Commission meetings, which are open to the public. We will also hold additional public meetings in November 2020 before the public draft NRMP is released.*
  (Regional Parks) *We have asked the ARPAC to share information about NRMP public engagement throughout its stakeholder groups. We have also released information about NRMP public engagement on Facebook, Twitter, the County website, and through press releases. The agendas for the ARPAC and Recreation and Park Commission meetings have also been posted on the County website. Please let us know if you have ideas for getting the word out.*
- SARA is concerned about human impacts on water quality. Human and non-human species are impacted by water quality. High E. coli levels in the river are not good. I am wondering if the NRMP will address water quality.





(MIG) *Yes, the NRMP will address water quality, mainly through its objectives and performance measures. We know encampments in the Parkway are having an impact on water quality. The Parkway cannot have healthy habitat for species without good water quality.*

- I am seeing an increase in Parkway usage. There needs to be better social and public education regarding the Parkway. Trash, including rafts, are impacting the Parkway. How do you measure the human impact in terms of waste? How will the NRMP address waste and trash removal?
  (Regional Parks) *Parkway maintenance staff pick up trash on a regular basis. We have an agreement with PRIDE industries for trash and debris pick-up. The County tries to focus PRIDE efforts on keeping trash from entering the river. Parkway uses can report trash and waste to the City of Sacramento and the County through the 311 app. During a recent American River Parkway Foundation (ARPF) meeting, the participations expressed the intent to focus on helping Parkway users adopt a "pack it in, pack it out" mentality.*
  (MIG) *Social marketing is an effective strategy. We all know about recycling and anti-smoking campaigns. Behaviors change over time. We hope to use social marketing messaging to instill good environment values in Parkway users.*
- I think "pack it in, pack it out" is a good idea. We should also look into making sure people use environmentally safe sunscreens. Good Samaritans remove yellow star thistle and trash in the Parkway. We should encourage these people and educate the public on good behaviors.
- Will the full document be made available before the beginning of CEQA?
  (MIG) *We are looking to releases the public draft NRMP during November of this year.*
- Will the NRMP touch on the use of controlled burns for the removal of invasive understory plant species?
  (Regional Parks) *Yes, the County has removed invasive understory species for fire fuel reduction, though we have encountered challenges. In spring, potential removal areas, such as Woodlake and Cal Expo, are too wet for prescribed burns. By the time the vegetation dried out, we were in the middle of fire season and the fire departments were pinched. We are planning to continue prescribed burns, grazing, mechanical removal, and use of herbicides.*
- Will the NRMP include restricting uses, such as dogs, horses, and BBQs, in more sensitive areas of the Parkway?
  (Regional Parks) *The Parkway Plan established land use designations in the Parkway. Each land use designation allows for different uses. The Parkway Plan is available on the County website for public review. If we were to change a land use designation, we would need to go through an entire State process, so the NRMP will not include altering the existing land use designations.*
  (MIG) *We will pursue the idea of teaching people how to be better stewards of the Parkway. The NRMP will focus on reducing the impacts of human uses within the framework of the land use designations.*
- I am very curious about how the Sacramento Flood Control Agency (SAFCA), U.S. Army Corps of Engineers and Regional Parks are maintaining flood control priorities and ensuring the sustainability of flood control and the floodplain. I also think flood control

stakeholders need to communicate with each other.
(Regional Parks) *We want to make sure flood control activities in the Parkway are sensitive to the environment. There are big opportunities for flood protection and interventions, and to use mitigation areas for environmental restoration. Agency coordination is one of our major goals and we hope it will continue beyond the development of the NRMP.*

**Public Workshop #2**

- I am very impressed with the level of detail in the NRMP materials provided. Will the Area Plan maps and other mapping be part of the NRMP document?
  (MIG) *All maps will be in the document and made available on the County website.*
- I would like to emphasize the importance of the infrastructure, specifically the power lines, in the area. There is a need to enhance vegetation and still meet the requirements of utility companies.
  (MIG) *This issue is on our radar and we are looking at the possibility of adding power line locations to the NRMP maps.*
- I appreciate the section by section approach and level of detail provided. I am curious as to how you are positioning the plan with respect to historical data, such as the impact of hydraulic mining on the Parkway.
- I am interested in the potential for more infrastructure, such as public restrooms, for the homeless community in the Parkway. I am aware there are various jurisdictions involved, but I would like to advocate helping the homeless community.
  (Regional Parks) *There are very specific land use rules at play here. We are limited in what we can do. The County and the City [of Sacramento] are currently working on many programs related to homelessness, especially now with the COVID-19 pandemic.*
- Invasive species is a very important issue. I wonder how the NRMP will measure success.
  (MIG) *Perhaps you may be able to help us update our list of invasive species. The NRMP will include mechanisms for reviewing and assessing invasive species management efforts.*
- UC Davis students have worked on natural resources projects at Putah Creek. I hope that California State University, Sacramento (CSUS) will do something similar in the Parkway.
  (Regional Parks) *There is an ongoing 5-year restoration project at Bushy Lake that involves CSUS students.*
- I think the Bushy Lake project is a great first step, but I would like to see the program expanded to other areas of the Parkway.
  (Regional Parks) *We agree and second that idea.*

Mr. Iacofano ended both Q&A sessions by describing the next steps the NRMP team will take regarding public engagement. The interactive online survey will be live through August 15, 2020. A County Recreation and Park Commission meeting will occur on Thursday, August 23rd. The NRMP team will give presentations during the ARPAC and County Recreation and Park Commission meetings in November 2020. The release of the final draft NRMP will occur shortly before the Environmental Impact Report (EIR) is completed. The Sacramento County Board of Supervisors will review and approve the NRMP in early 2021. Ms. Bellas ended the workshops by



American River Parkway Natural Resources Management Plan
Summary Report | Public Workshop #1 & #2 2/26/21

thanking the members of the public for their participation, asking the workshop participants to keep an eye out for updated NRMP information on the County website, and giving a reminder to submit written comments to her via email.

# AMERICAN RIVER PARKWAY
# NATURAL RESOURCES MANAGEMENT PLAN (NRMP)
# PUBLIC WORKSHOPS #1 & #2

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Online by Zoom

## APPENDIX TO SUMMARY REPORT



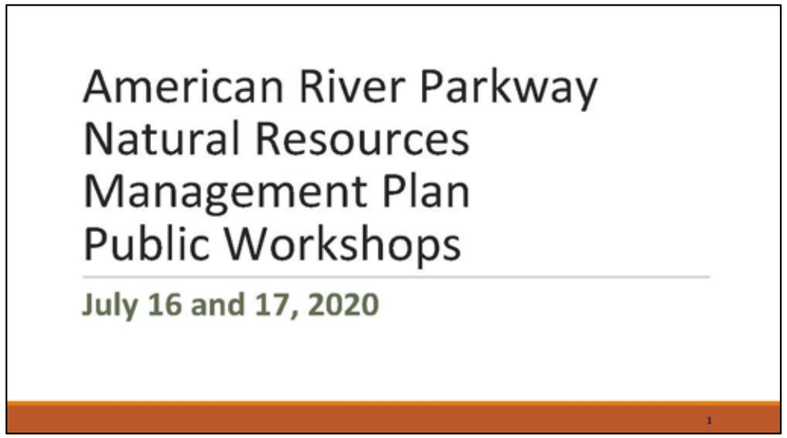
American River Parkway Natural Resources Management Plan
Summary Report | Public Workshop #1 & #2 2/26/21

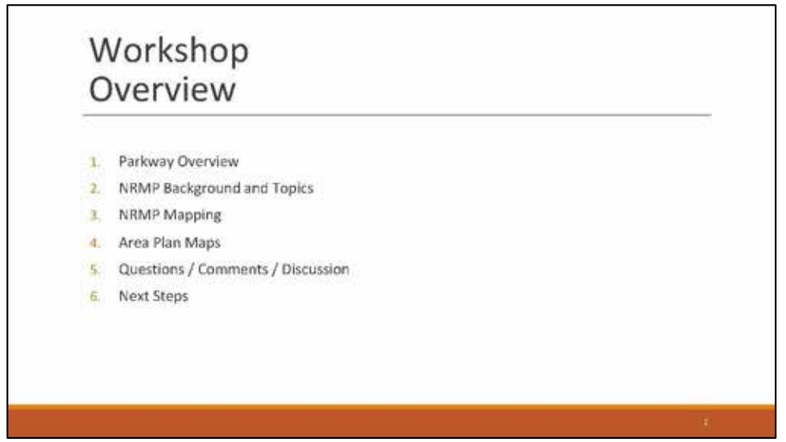
**ATTACHMENT A: MEETING PARTICIPANTS**

| **Public Workshop #1** | | |
|---|---|---|
| **Participant** | **Organization/Affiliation** | **Email Address** |
| *Members of the Public* | | |
| Elliot Chasin | Sacramento Audubon Society | N/A |
| Dennis Eckhart | County resident; Parkway volunteer | N/A |
| Shelly Eckhart | County resident; Parkway volunteer | N/A |
| Amy Rodrigues | Sacramento Valley Conservancy | N/A |
| Spencer Eberle | County resident | N/A |
| Stacy Moore | County resident | N/A |
| Jeff Miller | Save the American River Association (SARA) | N/A |
| *Workshop Staff* | | |
| Liz Bellas | Sacramento County Regional Parks | bellase@saccounty.net |
| Mary Maret | Sacramento County Regional Parks | maretm@saccounty.net |
| Michael Doane | Sacramento County Regional Parks | N/A |
| Daniel Iacofano | MIG | danieli@migcom.com |
| Bill Spain | MIG | bills@migcom.com |
| Jon Campbell | MIG | jcampbell@migcom.com |
| Miranda Miller | MIG | mmiller@migcom.com |

| **Public Workshop #2** | | |
|---|---|---|
| **Participant** | **Organization/Affiliation** | **Email Address** |
| *Members of the Public* | | |
| Dan Meier | California Native Plant Society; American River Coalition | N/A |
| Robert Moeller | UC Berkeley, UC Davis; County resident | N/A |
| *Workshop Staff* | | |
| Liz Bellas | Sacramento County Regional Parks | bellase@saccounty.net |
| Mary Maret | Sacramento County Regional Parks | maretm@saccounty.net |
| Daniel Iacofano | MIG | danieli@migcom.com |
| Bill Spain | MIG | bills@migcom.com |
| Jon Campbell | MIG | jcampbell@migcom.com |
| Nina Anderson | MIG | nanderson@migcom.com |

**ATTACHMENT B: POWERPOINT SLIDES**

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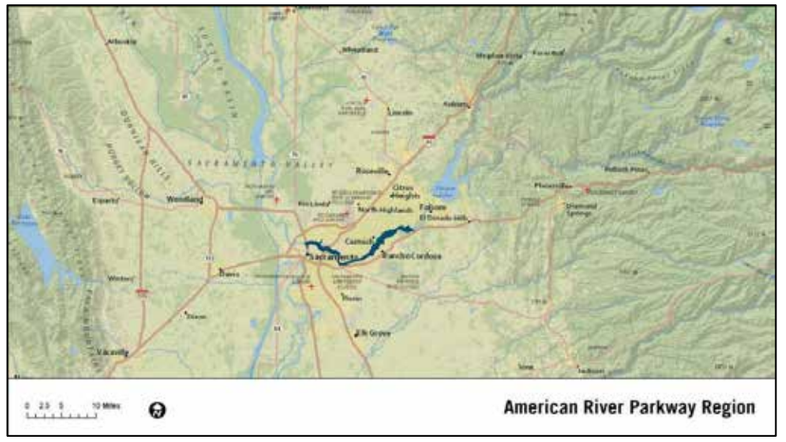


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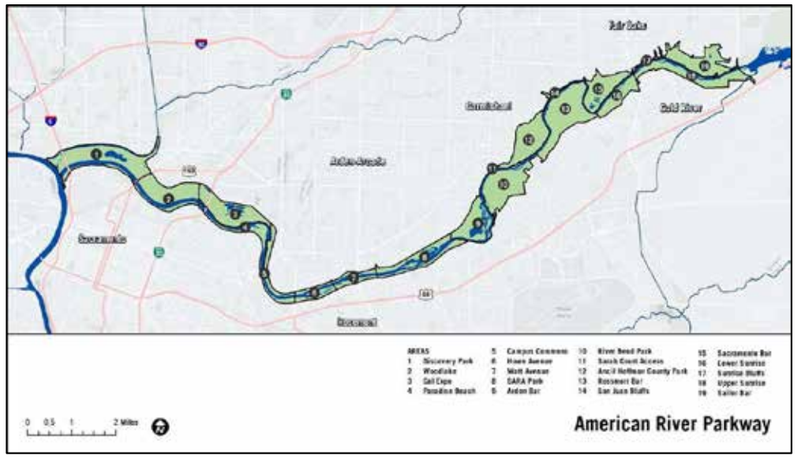
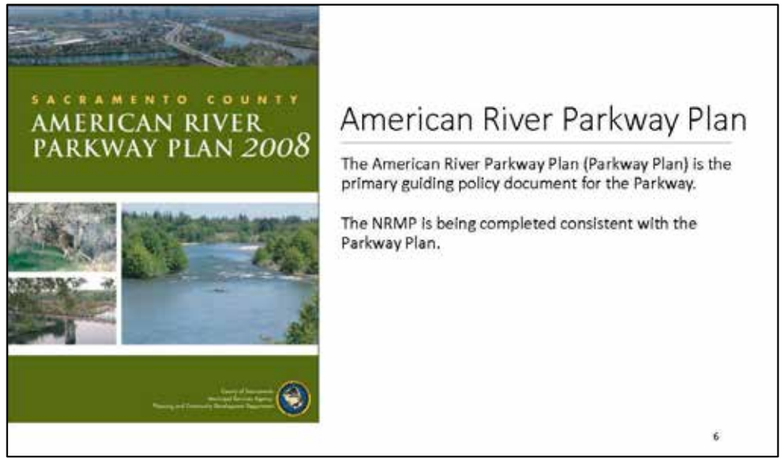
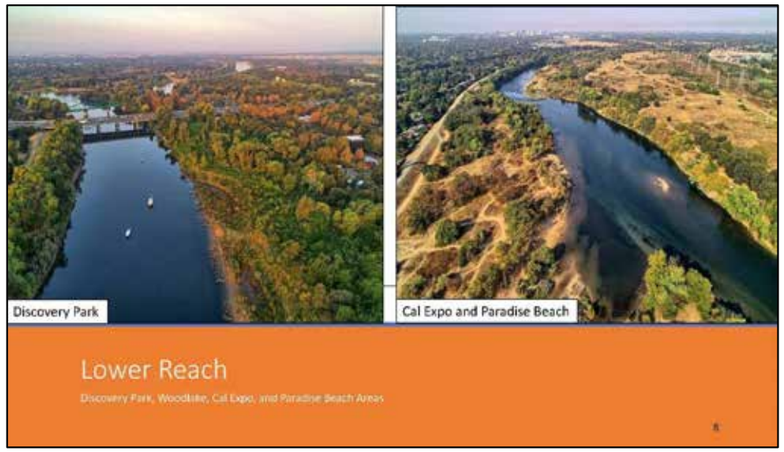

American River Parkway
0 0.5 1 2 Miles

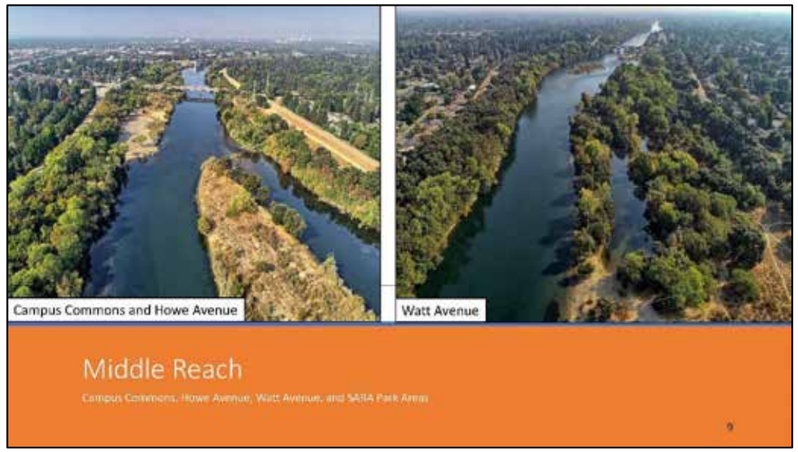
19

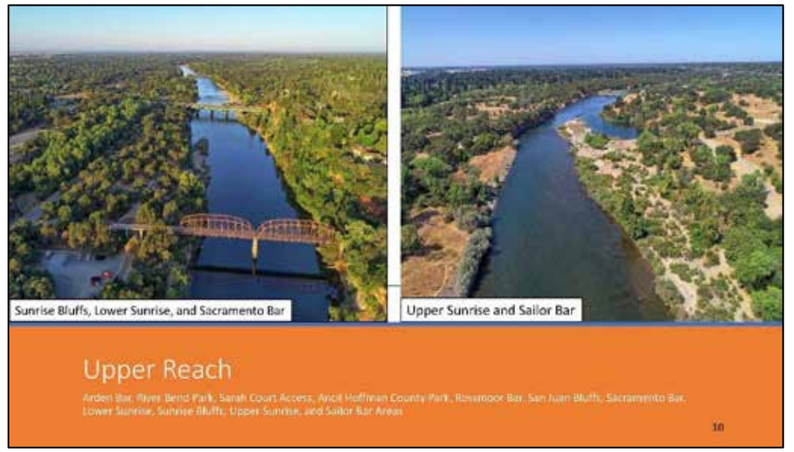

SACRAMENTO COUNTY
AMERICAN RIVER PARKWAY PLAN 2008
American River Parkway Plan
The American River Parkway Plan (Parkway Plan) is the primary guiding policy document for the Parkway.
The NRMP is being completed consistent with the Parkway Plan.
6

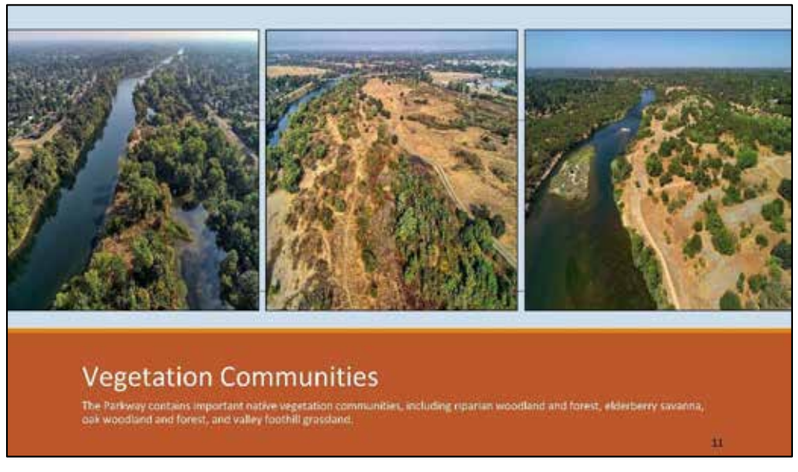
Fast Facts about the Parkway
Lower American River is a designated State and National Wild and Scenic River
The Parkway is split into 20 planning "Areas" and covers 7,000 acres
First known American River Parkway concept developed in 1915 by City of Sacramento planner John Nolen
Eight million visitors in 2009
Over 82 miles of trails


Discovery Park
Cal Expo and Paradise Beach
Lower Reach
Discovery Park, Woodlake, Cal Expo, and Paradise Beach Areas

12


Campus Commons and Howe Avenue
Watt Avenue
Middle Reach
Campus Commons, Howe Avenue, Watt Avenue, and SARA Park Areas
9


Sunrise Bluffs, Lower Sunrise, and Sacramento Bar
Upper Sunrise and Sailor Bar
Upper Reach
Arden Bar, River Bend Park, Sarah Court Access, Ancil Hoffman County Park, Rossmoor Bar, San Juan Bluffs, Sacramento Bar, Lower Sunrise, Sunrise Bluffs, Upper Sunrise, and Sailor Bar Areas
10


Vegetation Communities
The Parkway contains important native vegetation communities, including riparian woodland and forest, elderberry savanna, oak woodland and forest, and valley foothill grassland.
11

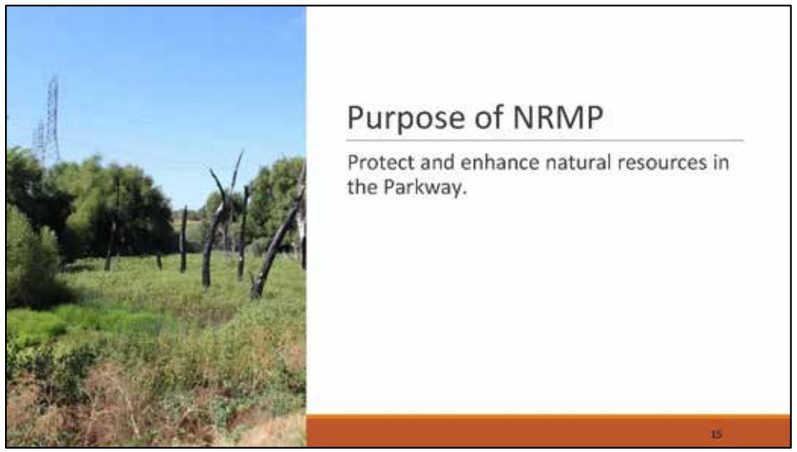
Valley elderberry longhorn beetle
Steelhead – Central Valley Distinct Population Segment
Western pond turtle
Swainson's hawk
Native Wildlife
The Parkway is home to and provides potential habitat for native wildlife species, including special-status species protected under State and federal law.
12

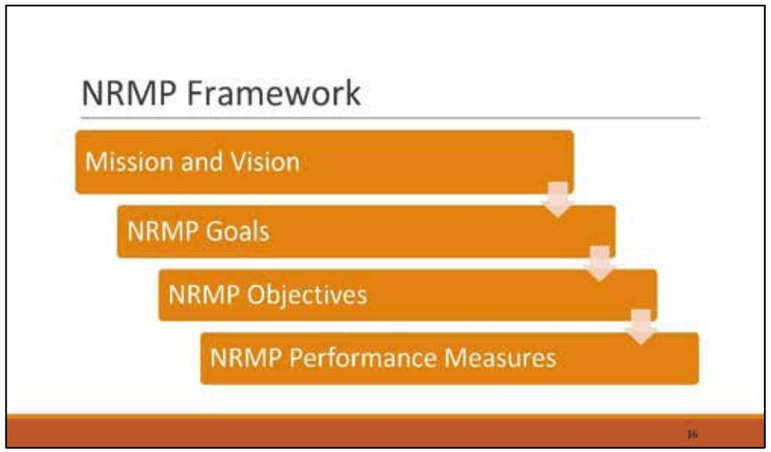
19

13

Native American History
The Parkway lies within the ethnographic territory of the Nisenan Maidu group. The Nisenan Maidu are the earliest known human inhabitants of what is now the Parkway.
13

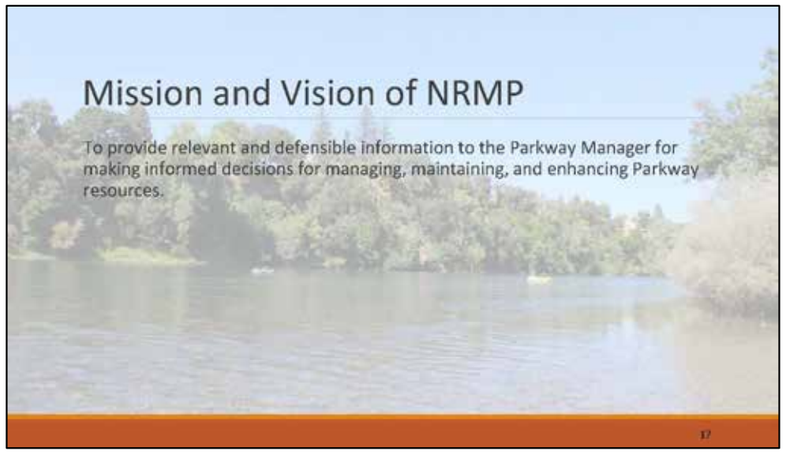
NRMP Background and Topics
14

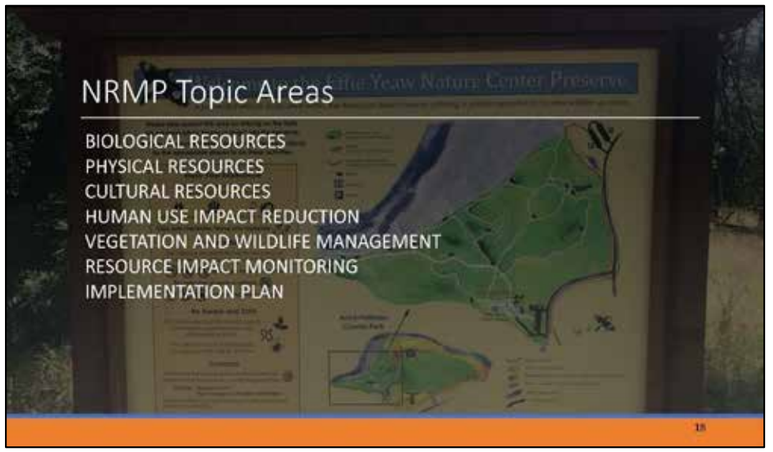

Purpose of NRMP
Protect and enhance natural resources in the Parkway.
15


NRMP Framework
Mission and Vision
NRMP Goals
NRMP Objectives
NRMP Performance Measures

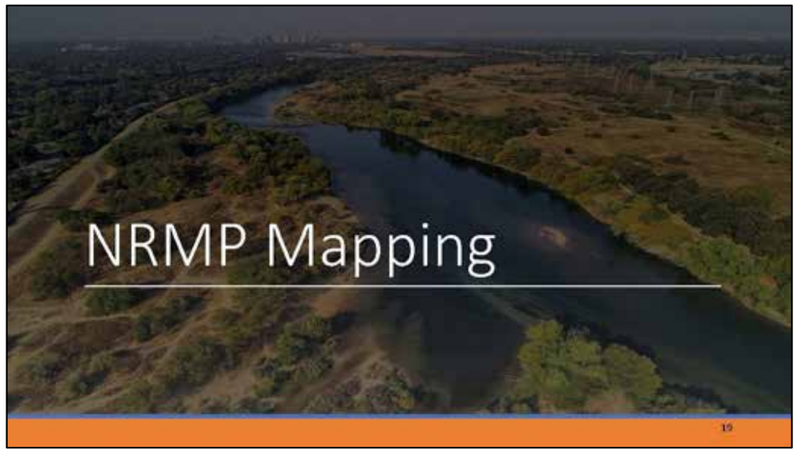
19

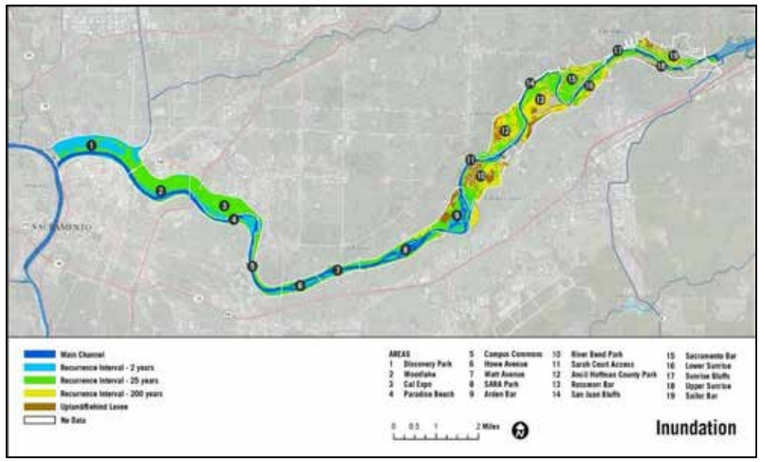
14


Mission and Vision of NRMP
To provide relevant and defensible information to the Parkway Manager for making informed decisions for managing, maintaining, and enhancing Parkway resources.
17


NRMP Topic Areas
BIOLOGICAL RESOURCES
PHYSICAL RESOURCES
CULTURAL RESOURCES
HUMAN USE IMPACT REDUCTION
VEGETATION AND WILDLIFE MANAGEMENT
RESOURCE IMPACT MONITORING
IMPLEMENTATION PLAN
18

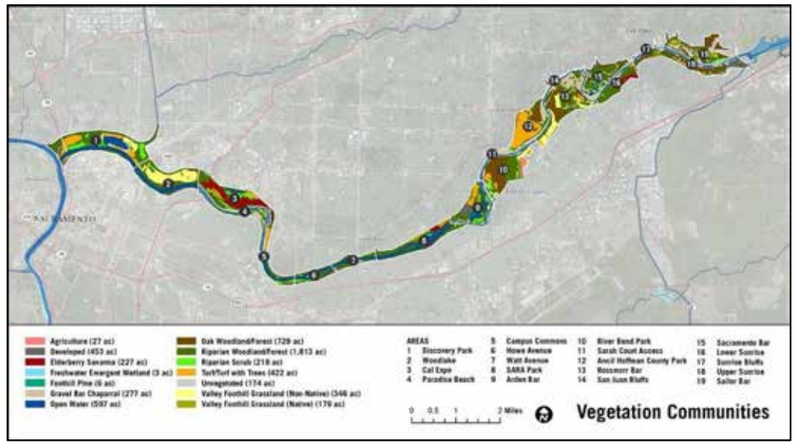
19

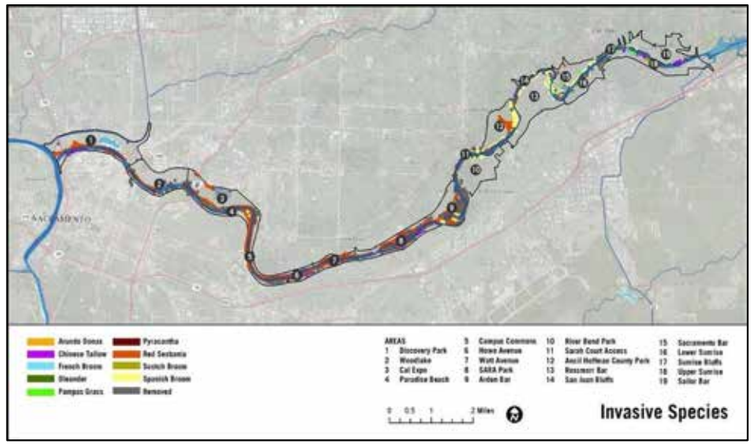

NRMP Mapping
19

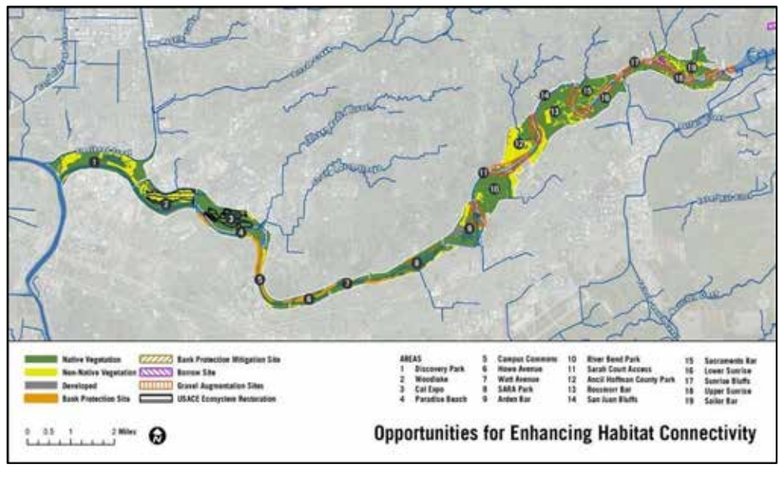

Main Channel
Recurrence Interval - 2 years
Recurrence Interval - 25 years
Recurrence Interval - 200 years
Uplands/Behind Levee
No Data
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Inundation

19

15


Agriculture (27 ac)
Developed (453 ac)
Elderberry Savanna (227 ac)
Freshwater Emergent Wetland (3 ac)
Foothill Pine (6 ac)
Gravel Bar Chaparral (277 ac)
Open Water (507 ac)
Oak Woodland/Forest (729 ac)
Riparian Woodland/Forest (1,813 ac)
Riparian Scrub (218 ac)
Turf/Turf with Trees (422 ac)
Unvegetated (174 ac)
Valley Foothill Grassland (Non-Native) (348 ac)
Valley Foothill Grassland (Native) (170 ac)
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Vegetation Communities

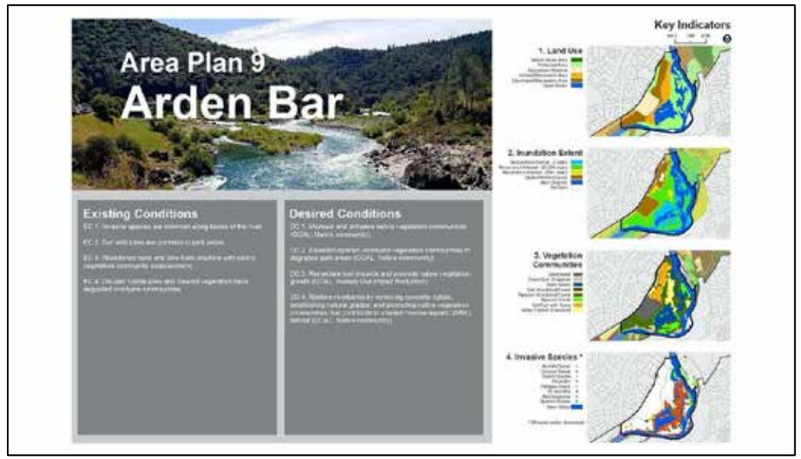

Arundo Donax
Chinese Tallow
French Broom
Oleander
Pampas Grass
Pyracantha
Red Sesbania
Scotch Broom
Spanish Broom
Removed
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Invasive Species

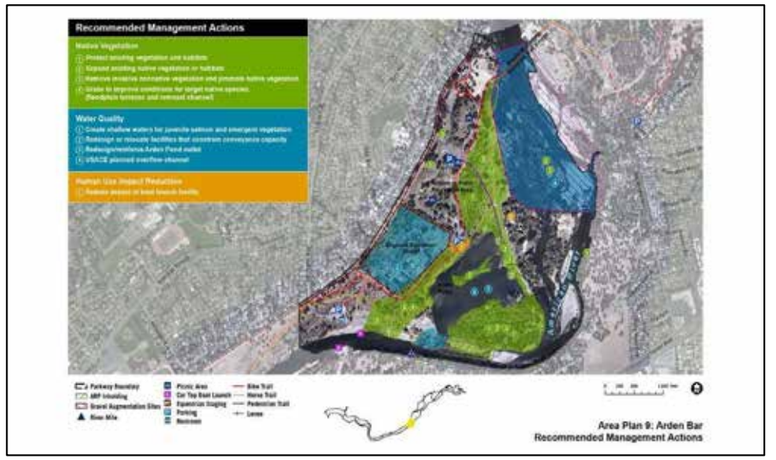

Native Vegetation
Non-Native Vegetation
Developed
Bank Protection Site
Bank Protection Mitigation Site
Borrow Site
Gravel Augmentation Sites
USACE Ecosystem Restoration
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Opportunities for Enhancing Habitat Connectivity

Area Plan Maps
24

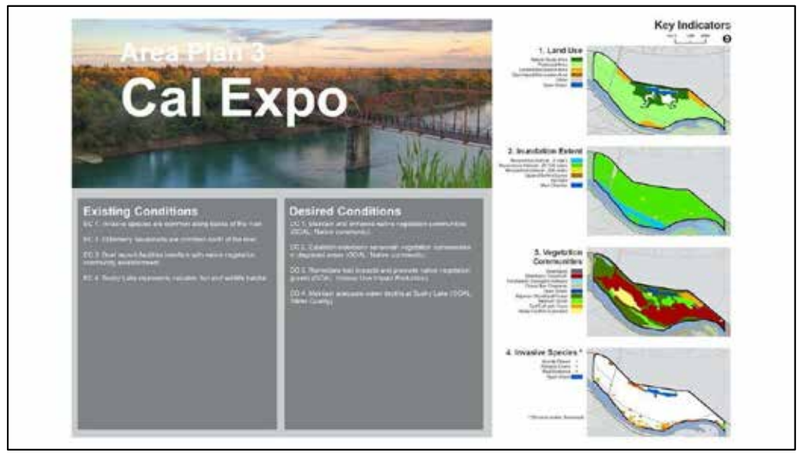
19

16


Area Plan 9
Arden Bar
Existing Conditions
Desired Conditions
Key Indicators
1. Land Use
2. Inundation Extent
3. Vegetation Communities
4. Invasive Species *

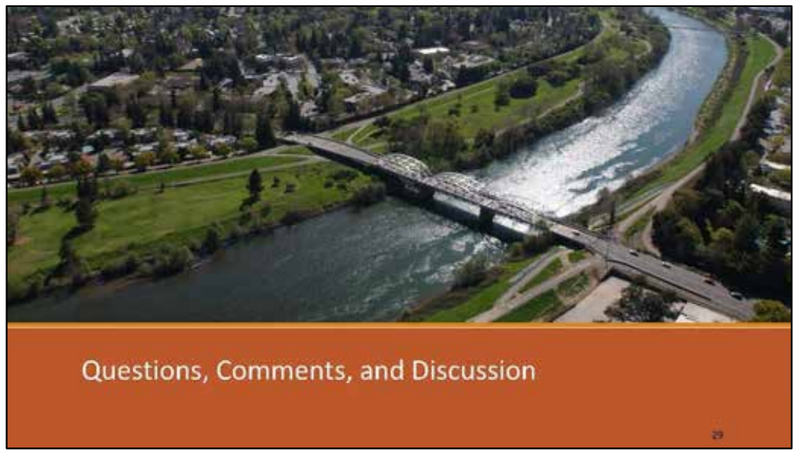

Recommended Management Actions
Native Vegetation
Water Quality
Human Use Impact Reductions
Area Plan 9: Arden Bar
Recommended Management Actions

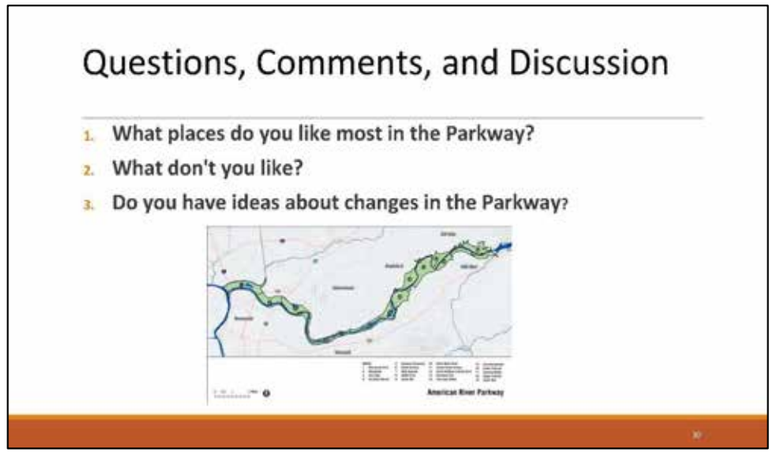
19


Area Plan 3
Cal Expo
Existing Conditions
Desired Conditions
Key Indicators
1. Land Use
2. Inundation Extent
3. Vegetation Communities
4. Invasive Species *

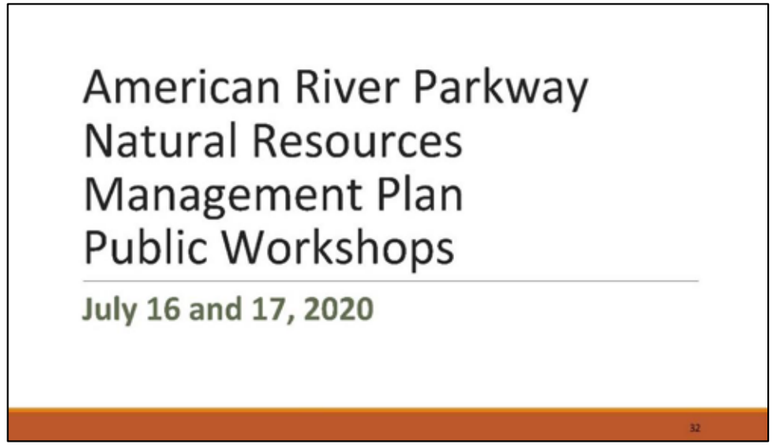
Recommended Management Actions
Native Communities
Water Quality
Human Use Impact Reductions
Area Plan 3: Cal Expo
Recommended Management Actions

17


Questions, Comments, and Discussion
29


Questions, Comments, and Discussion
1. What places do you like most in the Parkway?
2. What don't you like?
3. Do you have ideas about changes in the Parkway?
American River Parkway

Next Steps
Online Survey Available through August 15
Public Draft to be Released Late 2020
ARPAC and Recreation and Park Commission Meetings (November 2020)
Board of Supervisors Review and Approval (Early 2021)

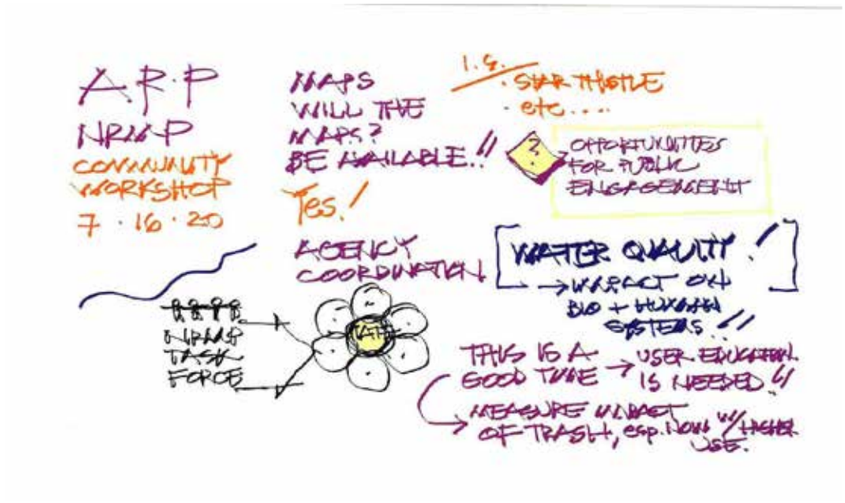

American River Parkway
Natural Resources
Management Plan
Public Workshops
July 16 and 17, 2020
32

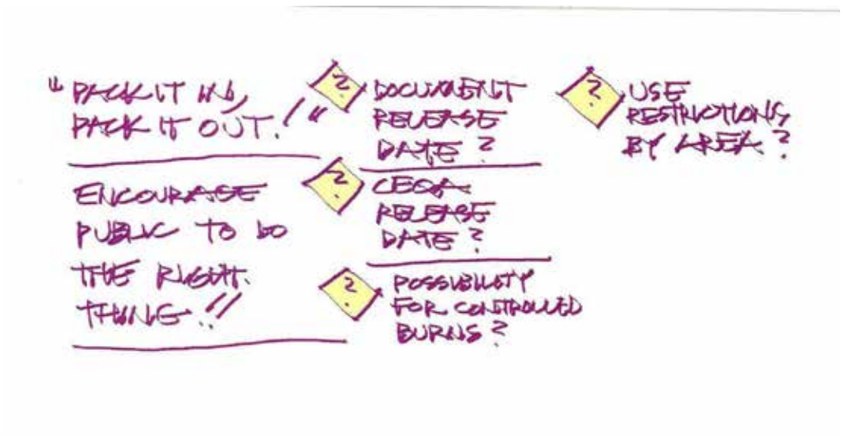
19

18

**ATTACHMENT C: GRAPHIC NOTES**

**Public Workshop #1**

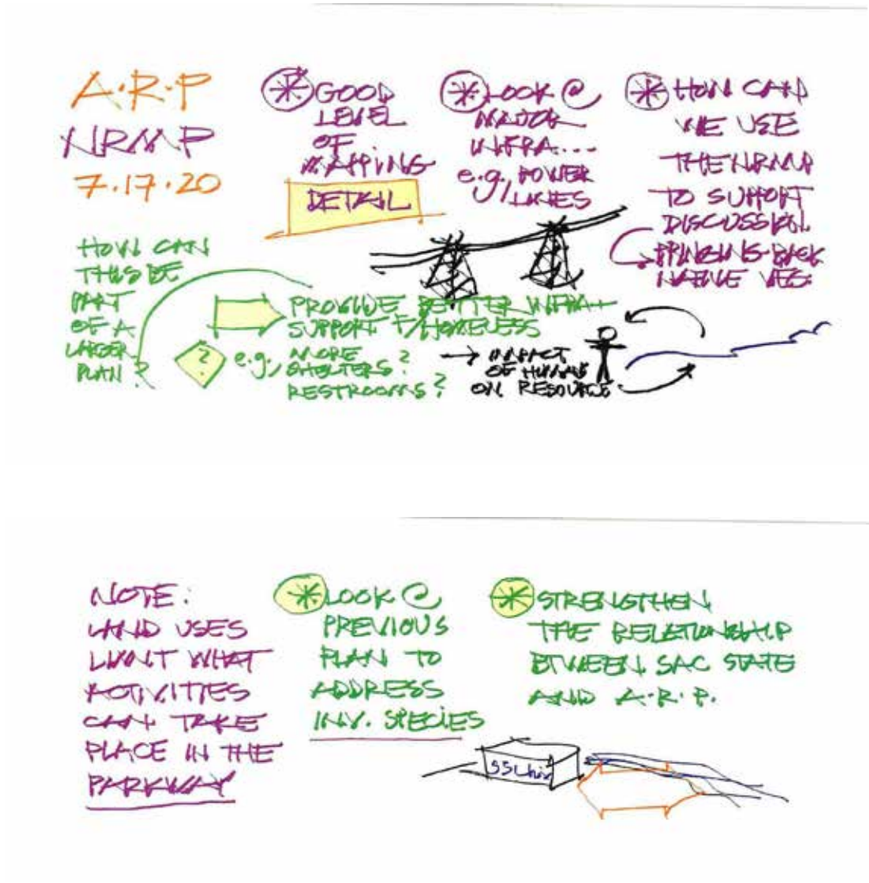







**Public Workshop #2**



APPENDIX A

# NRMP PUBLIC WORKSHOPS 2021 SUMMARY REPORT



## AMERICAN RIVER PARKWAY (ARP)
## NATURAL RESOURCES MANAGEMENT PLAN (NRMP)
## 2021 COMMUNITY MEETINGS ON THE PUBLIC REVIEW DRAFT NRMP

### 2021 COMMUNITY MEETING #1

Monday, March 22, 2021 ◆ 6:30 p.m. – 8:30 p.m.
Online by Zoom

## SUMMARY REPORT

**INTRODUCTION**

On March 22, 2021, Sacramento County Regional Parks, MIG, Inc., and ICF, Inc. held a community meeting on the public review draft of the American River Parkway (ARP) Natural Resources Management Plan (NRMP). The purpose of the meeting was to: (1) provide an overview of the NRMP planning process; (2) introduce the NRMP's Area Plan analyses, mapping, and potential management actions; (3) describe the forthcoming resource impact monitoring plan; (4) describe next steps in the NRMP development process, and (5) receive public feedback on the public review draft NRMP.

**Meeting Format**

The community meeting occurred on March 22, 2021, from 6:30 p.m. to 8:30 p.m. online by Zoom. Meeting participants included members of the public, Sacramento County Department of Regional Parks (Regional Parks or County Parks) staff, and consultant staff from MIG, Inc and ICF, Inc. Attachment A of the Summary Report Appendix includes the PowerPoint presentation slides displayed and discussed during the meeting.

**AGENDA**

Liz Bellas of Sacramento County Regional Parks opened the meeting and thanked the participants for their attendance. Daniel Iacofano of MIG provided the NRMP's status and discussed the schedule for NRMP completion moving forward, noting the final NRMP would be published in the fall of 2021. He then reviewed the meeting agenda, which included a PowerPoint presentation and discussion period.

**POWERPOINT PRESENTATION**

Mr. Iacofano began the PowerPoint presentation with a review of how the NRMP was scoped, an overview of the NRMP Task Force purpose and member agencies, a review of the NRMP process, an overview of the results of the 2020 NRMP Maptionnaire community survey, and an overview of the proposed NRMP management and implementation activities. Gregg Ellis of ICF

then presented the NRMP indicators, including level of alteration, inundations, vegetation communities, and land use, and accompanying mapping. Mr. Ellis presented potential management actions maps for 4 of the Parkway's 19 Area Plans and gave an overview of the components of the forthcoming NRMP resource impact monitoring plan. Mr. Iacofano and Mr. Ellis then provided an overview of the NRMP partners and finished the presentation with a discussion of the potential mitigation areas in each reach of the Parkway.

**OPEN DISCUSSION**

Mr. Iacofano opened the meeting to questions and comments on the public review draft NRMP and the contents of the PowerPoint presentation.

Comments and questions from the public are listed below. Responses from the meeting facilitators are given in *italics*. Each individual bullet point may include a single comment and response, or a back-and-forth conversation.

- I represent the Cordova Recreation & Park District. I am happy to see all the work that has gone into this plan, and the wealth of information in the plan will be helpful to local agencies as a resource. We are going to provide a formal comment letter in several weeks that will include several tweaks and requests. Of note, Hagan Park is managed by the Cordova Recreation & Park District not the City of Rancho Cordova. We would also like to make sure the Cordova Recreation & Park District is recognized as a partner. Lastly, we want to make sure our planning for the Larchmont, Hagan, and Sunriver parks corresponds to the management of the Area Plans that are adjacent to the parks.
  (MIG) *We will make sure Hagan Park is described as a park under the jurisdiction of the Cordova Park & Recreation District. It is going to take many hands to get this plan completed. Thank you for your feedback.*

- I have two questions. Though, first I would like to note it was difficult for me to load the document. I live in the Gristmill area. It is difficult for me to locate Gristmill on the maps and follow the color-coding. Over 10 years ago the USACE changed the landscape of Gristmill immensely, yet I do not see that intentional disruption displayed on the alteration maps. The maps need to show more delineation. Can I get a map that shows more detail in relation to streets and other features?
  (ICF) *The plan contains full size level of alteration maps for each reach of the river that show more detail than the thumbnail maps. It is difficult for us to map these areas down to the smallest detail. However, we would like to hear of any corrections or added details that are needed. We can certainly consider adding in the Gristmill boundary. On your second point, there could very well be alterations we missed. We have the area you pointed out depicted as unintentionally altered. We will revisit that mapping. However, at this point we do not have mapping that zooms into Gristmill specifically.*
  (MIG) *We would by happy to send you a custom map of your area. If you send us an email, we can respond with a map you can review to make sure the information is*





*correct. You can make notes and send back any changes to reflect existing conditions more accurately.*
My issue is that the map resolution is all variations of gray. I can see Hwy 50, but not much else. I have a leadership role in my community association, and I would be glad to share the zoomed in maps with the community as well.

- How is it to be decided where restoration and mitigation will occur?
  (ICF) *We discuss the process for determining potential management actions in Chapter 8. While there may be many agencies involved, it is ultimately up to Regional Parks, which has jurisdiction over most of the Parkway, to make decisions. Some decisions would also go to the County Board of Supervisors. The plan provides a foundation for that existing decision-making process. Nowhere does this plan state a project will absolutely move forward. The NRMP is intended to provide a solid foundation upon which to County can make restoration and mitigation decisions using its existing decision-making process.*

- Will there be room for the public to propose potential restoration projects or means by which Regional Parks can get funding?
  (MIG) *Yes. Please send in any ideas or recommendations you have regarding management actions.*
  What about into the future? Will there be a mechanism by which the public can propose Parkway projects?
  (MIG) *It is envisioned that the NRMP will be periodically updated, most likely every 5 years. The update process would be an opportunity to suggest projects for future rounds of funding.*

- I did not see any reference to the resource impact monitoring plan. Is that plan incorporated into the NRMP?
  (MIG) *The resource impact monitoring plan will be an appendix to the final NRMP.*
  When will the public be able to comment on that plan?
  (MIG) *You will be given the opportunity to comment when the Supplemental Environmental Impact Report is released. This is not the final draft. There will be more opportunities to provide comments.*

- The plan refers to social trails. I think of those trails as cut-throughs. They add additional disturbance to habitat. Calling them social trails gives a soft, friendly feeling I feel is inappropriate. Perhaps there is another term to better describe the trails.
  (MIG) *Agreed. Sometimes we use the term informal. Some trails are duplicative and redundant. We are also going to introduce a better mapping program to support replacing trails.*

- Will the Parkway Plan continue to be used as it has been for work done in the Parkway, for example, regarding recreation and concerts? The current process involves submitting applications to the County. How will the NRMP factor into that process?

(Regional Parks) *The Parkway Plan is the master document. The NRMP is a subset document. We look to the Parkway Plan for general management of the Parkway. The NRMP provides a deeper dive into the natural resources of the Parkway.*

- I understand USACE will need to mitigate for bank protection work. PG&E will need to mitigate as well. Are those actions retroactive?
  (Regional Parks) *Yes. PG&E is required to mitigation for tree removal that took place several years ago.*

- I could not download the document. It is too large of a file.
  (Regional Parks) *Yes, it is a very large file. We will see if there is a way to break it up into smaller pieces.*

- As a new Recreation and Park Commissioner, I am trying to wrap my head around the entire plan. Several folks expressed their frustration to me over how long this process has taken. However, it is clear a lot of thought went into this document, so that is good to see.
  (MIG) *That is good to hear, thank you.*

- The presentation you are giving to the Recreation and Park Commission will be part of the Commission's regular meeting, correct?
  (Regional Parks) *Yes, that is correct.*

Ms. Bellas thanked the community members and asked them to spread the word about the future public outreach meetings. She reminded the community members of the Zoom links to the public outreach meetings located on the Regional Parks webpage. Mr. Iacofano and Ms. Bellas then ended the meeting.



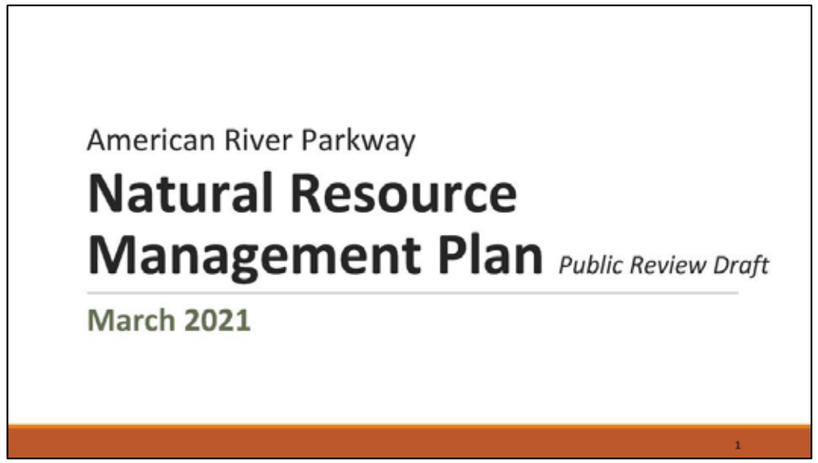


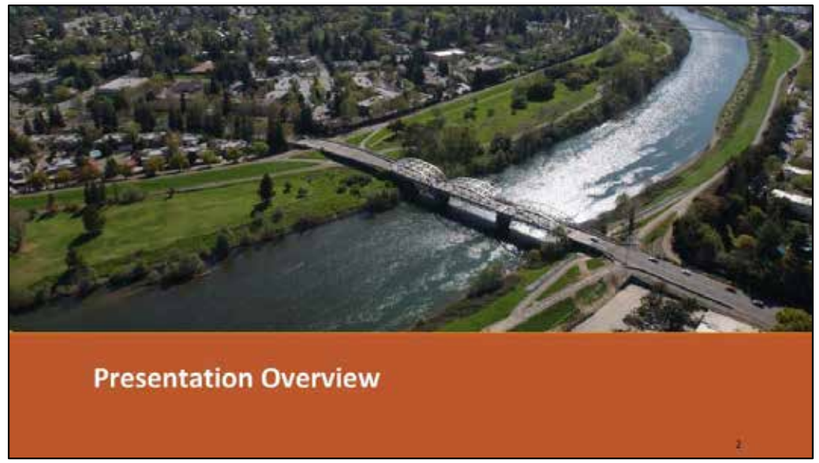
**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**PUBLIC REVIEW DRAFT WORKSHOP**

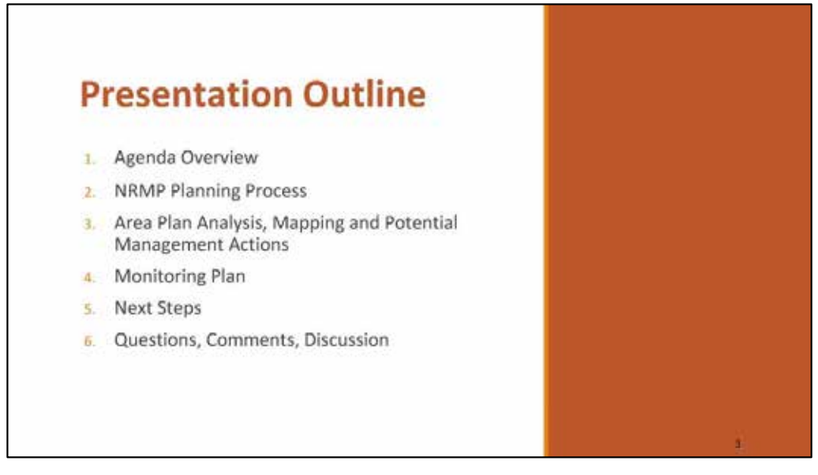
Monday, March 22, 2021 ◆ 6:30 p.m. – 8:30 p.m.
Online by Zoom

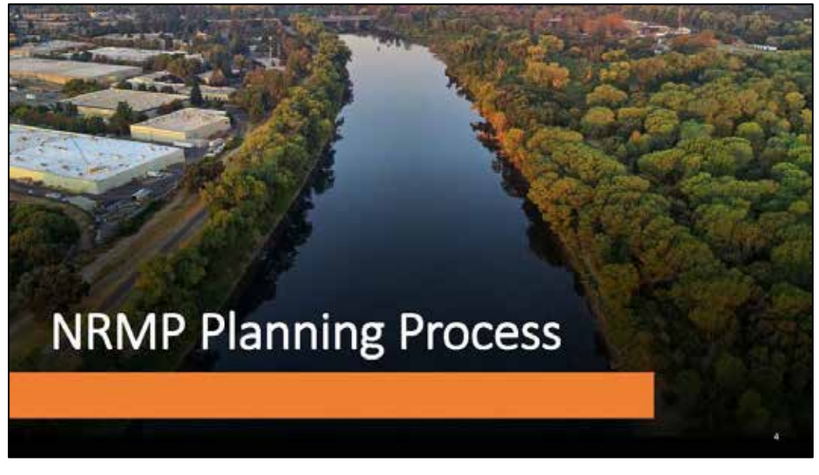
## APPENDIX TO SUMMARY REPORT

**ATTACHMENT A: POWERPOINT SLIDES**



## Previous Plans . . .

## The NRMP

- The NRMP was envisioned in 2007 during a Save the American River Association Retreat.
- Elmer Aldrich was appointed Committee Chair and developed initial recommendations.
- In 2014, the Department characterized the NRMP as being closely aligned with the goals and policies of the 2008 American River Parkway Plan.
- The initial data collection effort for the NRMP began in 2018.

## The County, WCB and SAFCA Join Forces . . . The NRMP Task Force Begins!

We are at a unique time where several efforts are coming together, and it makes sense to formalize the necessary collaboration.

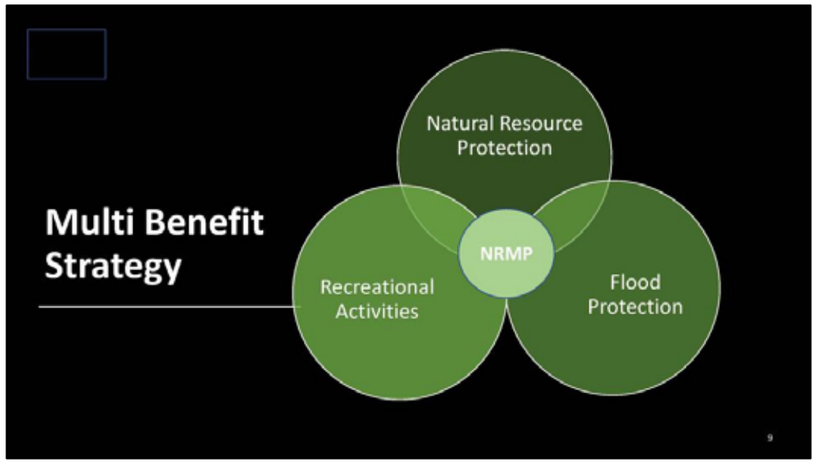
This collaboration will be carried out through the Natural Resources Management Plan Task Force

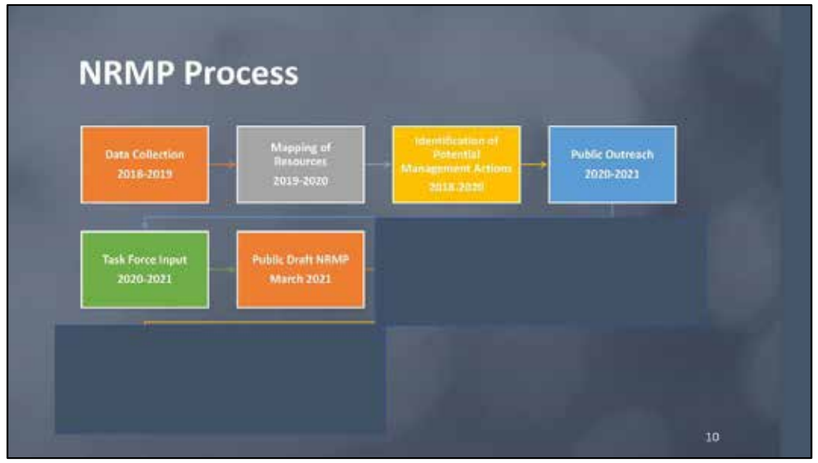
Regional Parks and the Wildlife Conservation Board are funding preparation of the Natural Resources Management Plan

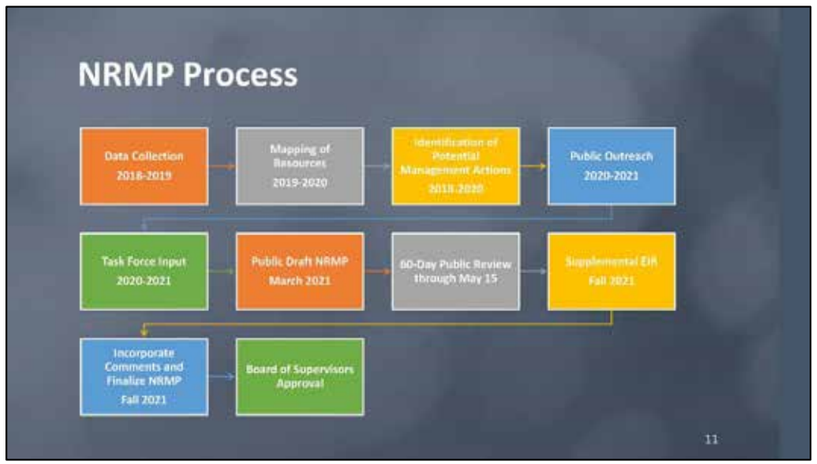
SAFCA is funding the Natural Resources Management Plan Task Force in Cooperation with Regional Parks

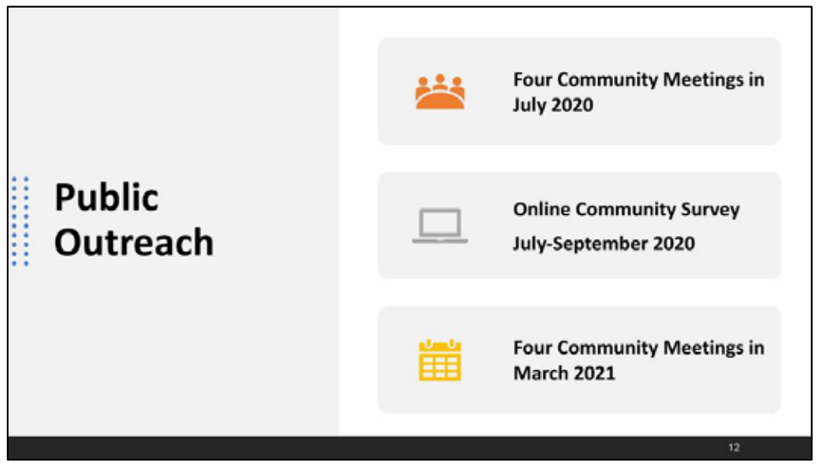
## NRMP Task Force Member Organizations

- Sacramento County Regional Parks
- Sacramento Area Flood Control Agency
- The Water Forum
- U.S. Army Corp of Engineers
- Wildlife Conservation Board
- Central Valley Flood Protection Board
- American River Parkway Stakeholders
- Sacramento County Department of Environmental Review
- DWR
- USFWS
- ICF
- MIG

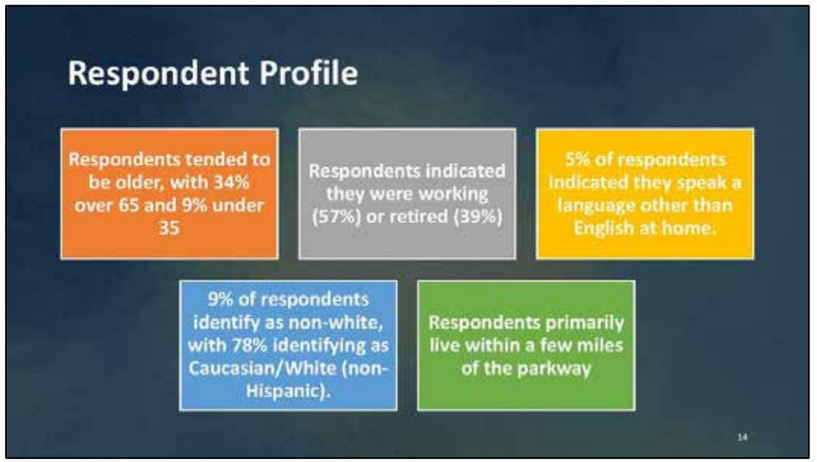

Multi Benefit Strategy
Natural Resource Protection
NRMP
Recreational Activities
Flood Protection
9

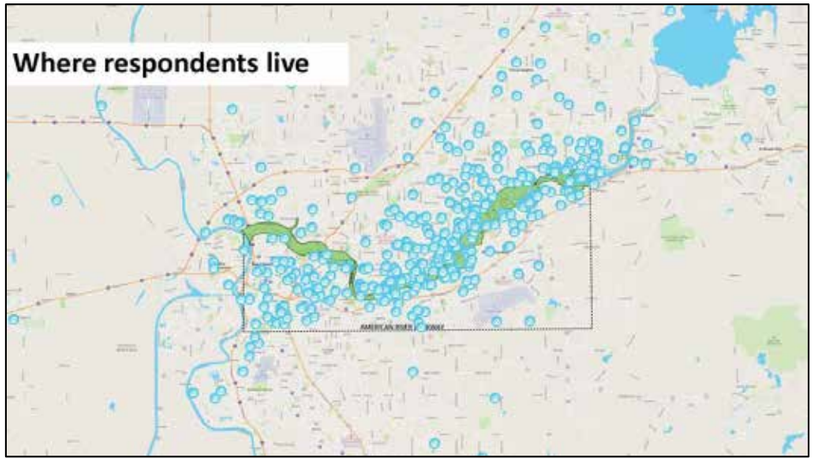

NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
10


NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
60-Day Public Review through May 15
Supplemental EIR Fall 2021
Incorporate Comments and Finalize NRMP Fall 2021
Board of Supervisors Approval
11


Public Outreach
Four Community Meetings in July 2020
Online Community Survey July-September 2020
Four Community Meetings in March 2021
12

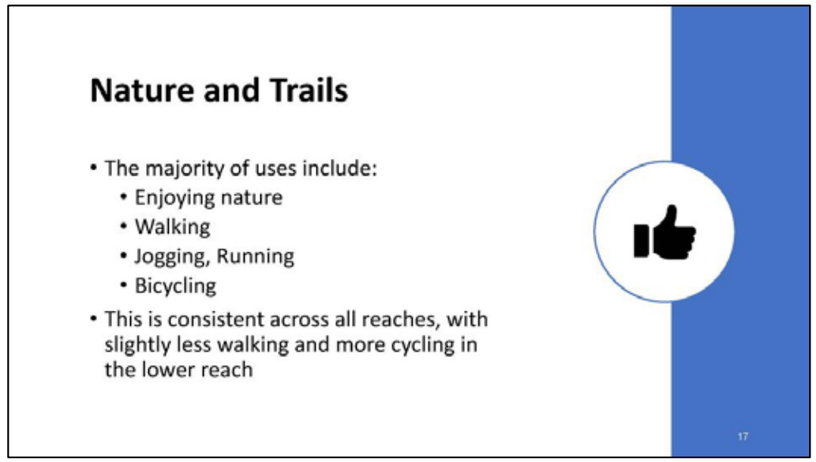
Online Community Survey Results
July 15 – September 15, 2020

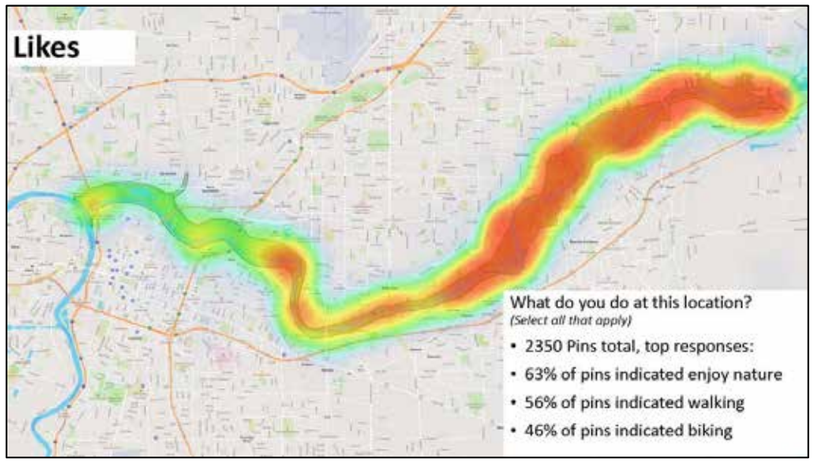

Respondent Profile
Respondents tended to be older, with 34% over 65 and 9% under 35
Respondents indicated they were working (57%) or retired (39%)
5% of respondents indicated they speak a language other than English at home.
9% of respondents identify as non-white, with 78% identifying as Caucasian/White (non-Hispanic).
Respondents primarily live within a few miles of the parkway

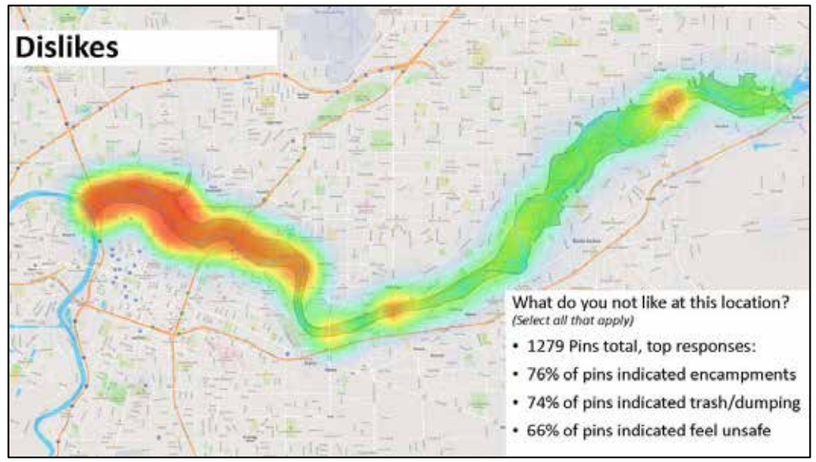

Where respondents live

Overall Findings
1,443 respondents placed 8,124 pins, sharing their place-based experience and ideas for the parkway.
Strong support for NRMP goals
Nature and Trails: The most "liked" places are important for enjoying nature and trail-related activities
Access and Use: Concentration of access and use in the middle and upper reaches
Homelessness: Responding to homeless encampments is the primary concern, focused on the lower reach of the river.

9

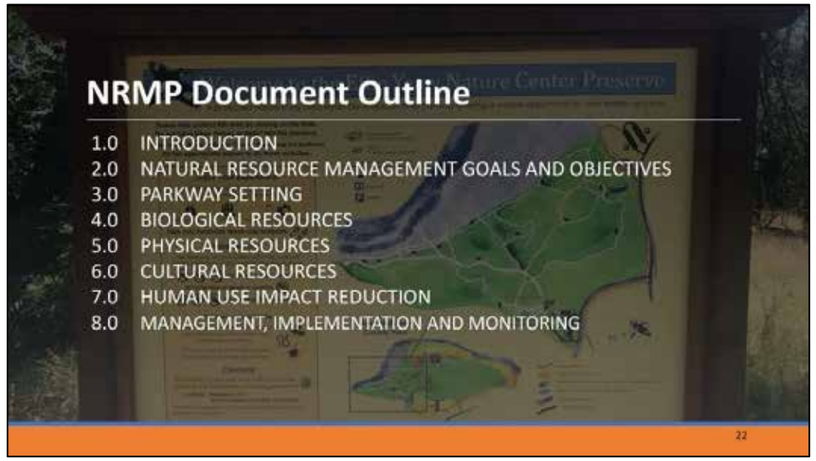

Nature and Trails
• The majority of uses include:
• Enjoying nature
• Walking
• Jogging, Running
• Bicycling
• This is consistent across all reaches, with slightly less walking and more cycling in the lower reach
17

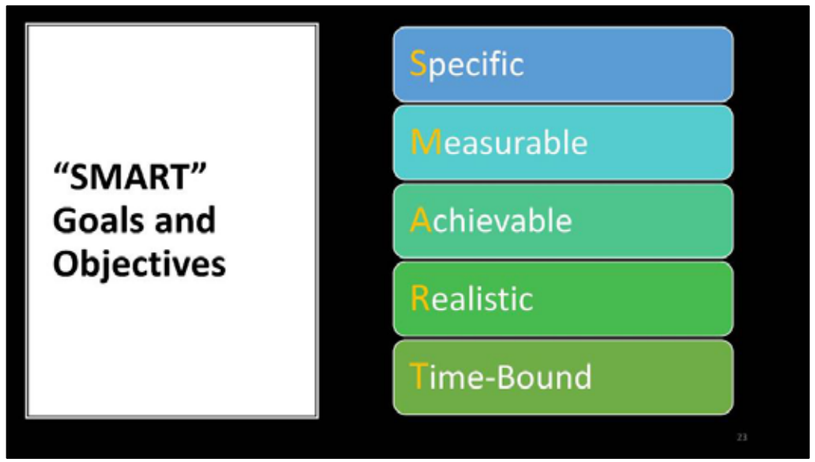

Likes
What do you do at this location?
(Select all that apply)
• 2350 Pins total, top responses:
• 63% of pins indicated enjoy nature
• 56% of pins indicated walking
• 46% of pins indicated biking


Dislikes
What do you not like at this location?
(Select all that apply)
• 1279 Pins total, top responses:
• 76% of pins indicated encampments
• 74% of pins indicated trash/dumping
• 66% of pins indicated feel unsafe

Homelessness in the Parkway
Housing and homelessness is a local, regional and national crisis impacting people and public spaces including the American River Parkway
Related impacts, trash, safety, encampments were the most mentioned issues in the parkway.
Concerns about safety are high, equally spread across gender identity
While no question specifically identifies a respondent as housed, the comments suggest minimal, if any, homeless perspectives in this data.
20

The Plan Document: Potential Management Actions and Area Plan Mapping
21


NRMP Document Outline
1.0 INTRODUCTION
2.0 NATURAL RESOURCE MANAGEMENT GOALS AND OBJECTIVES
3.0 PARKWAY SETTING
4.0 BIOLOGICAL RESOURCES
5.0 PHYSICAL RESOURCES
6.0 CULTURAL RESOURCES
7.0 HUMAN USE IMPACT REDUCTION
8.0 MANAGEMENT, IMPLEMENTATION AND MONITORING
22


"SMART" Goals and Objectives
Specific
Measurable
Achievable
Realistic
Time-Bound
23

NRMP GOALS AND OBJECTIVES FRAMEWORK
GOAL AREA 1
Biological Resources
GOAL AREA 2
Physical Resources
GOAL AREA 3
Cultural Resources
GOAL AREA 4
Human Use Impact Reduction
GOAL AREA 5
Agency and Community Coordination
Goal
Objectives
Performance Measures
Lead/Support Roles
Funding
Timeframe
24

## Potential Implementation Activities

- Update vegetation community map.
- Development of shaded riverine aquatic habitat map.
- Mapping of trails (including social trails) in the Parkway.
- Systematic survey of sensitive species.
- Invasive species surveys and production of Invasive Species Management Plan Update.

25

## Potential Implementation Activities

- Map and evaluate all areas damaged or degraded by wildfire or encampments annually.
- Identification of areas in the Parkway impacted by excessive ambient light.
- Development and implementation of a plan for wildfire prevention, response, and recovery.
- Development of a tracking system for wildfires in the Parkway.
- Development of an Interpretation Plan for the Parkway
- Development of a citizen science program.

## Key Indicators for Area Plan Analysis and Mapping

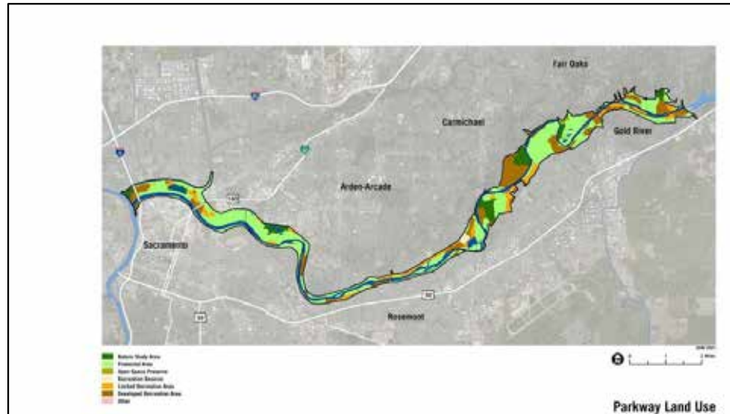
- Alteration
- Inundation
- Vegetation Communities
- Land Use

Parkway Alteration

12

Parkway Inundation

Parkway Vegetation Communities




Parkway Land Use

## Natural Resource Management Categories

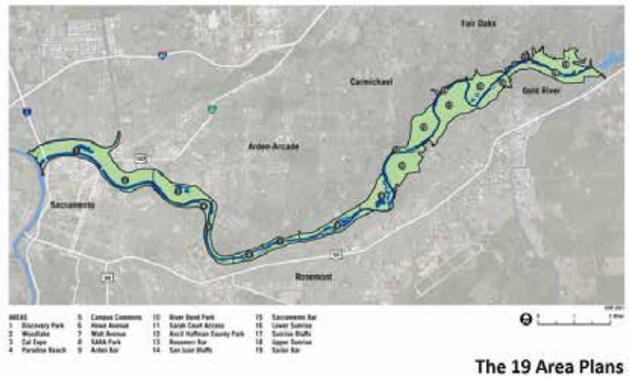
**Preservation**: Existing mitigation sites that require protection in perpetuity.

**Conservation:** Existing conditions are considered to generally meet desired conditions, but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved to meet goals.

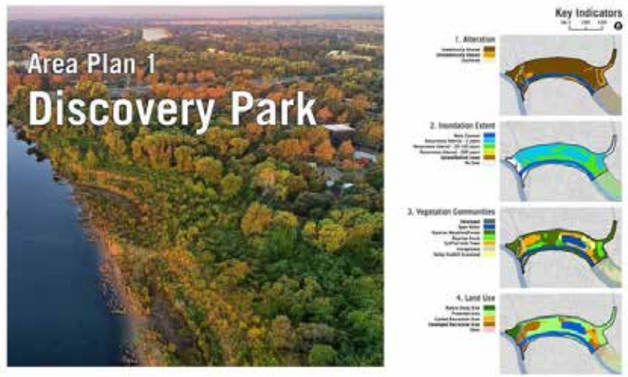
**Naturalization**: Modifying areas that were substantially altered in the past in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP, NRMP, and W&SR policies.

***Rehabilitation Overlay:** Applies to any of the aforementioned categories that are degraded or damaged in the future and require action to improve their condition.

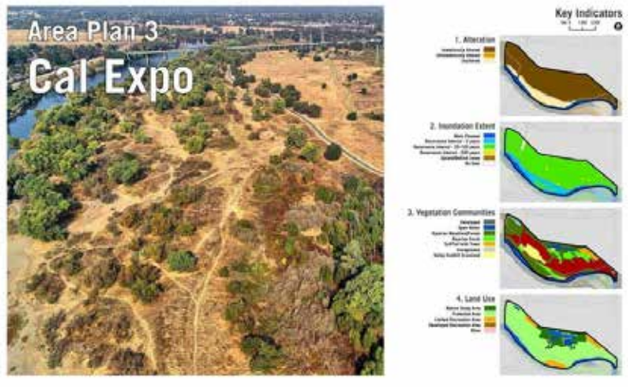
13



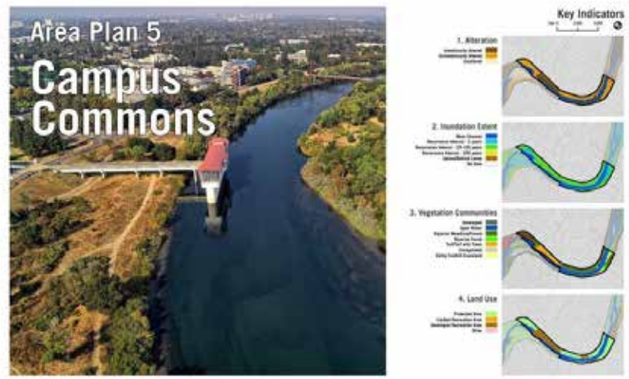

The 19 Area Plans



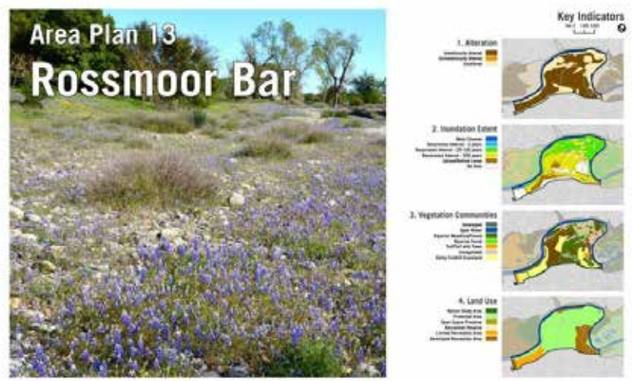
Area Plan 1: Discovery Park
Potential Management Actions



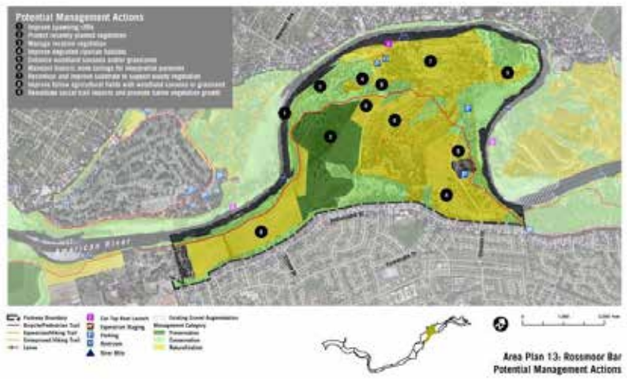
Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions

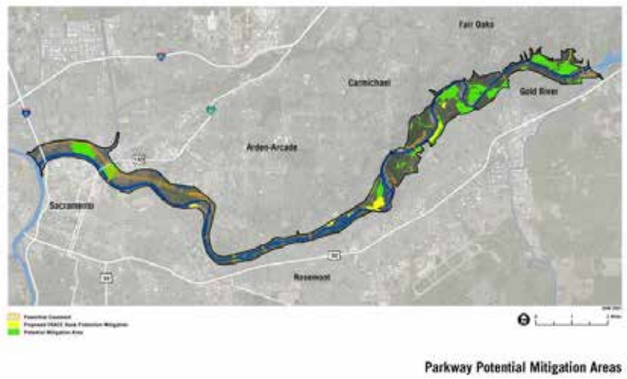

Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions


Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

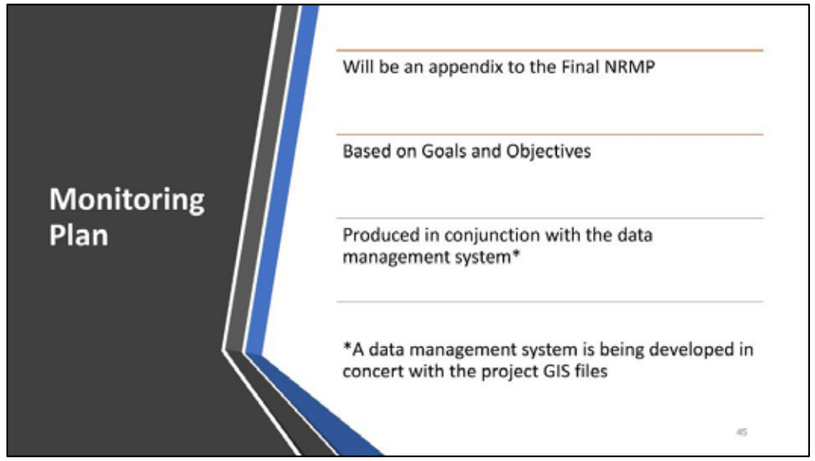
15




| FUNDING ENTITY | RATIONALE FOR PROPOSED PROJECT | POTENTIAL NUMBER OF ACRES AND/OR PROJECTS | TIMEFRAME FOR COMPLETION |
|---|---|---|---|
| USACE | Mitigation for the proposed bank protection | • 115 acres of native riparian vegetation communities; and<br>• 30 acres native elderberry | 3-5 years |
| PG&E | Mitigation for clearing and hardening of transmission lines | 11 acres of native woodland | 3-5 years |
| WCB | Potential future funding from WCB | • Three acres of native riparian vegetation communities;<br>• Three acres native elderberry;<br>• Two acres of native grassland; and<br>• Two acres of native woodland. | 3-5 years |
| USACE | Potential Ecosystem Restoration Projects | **Woodlake**<br>• 16 acres of native riparian vegetation communities;<br>• 50 acres of native grassland; and<br>• 41 acres of native woodland.<br>**Cal Expo (Bushy Lake)**<br>• 48 acres of native riparian vegetation communities; and<br>• 70 acres of native woodland. | 6-10 years |
| Water Forum | Mitigation for upstream dams | One salmonoid habitat enhancement project annually. | 3-5 years |

16

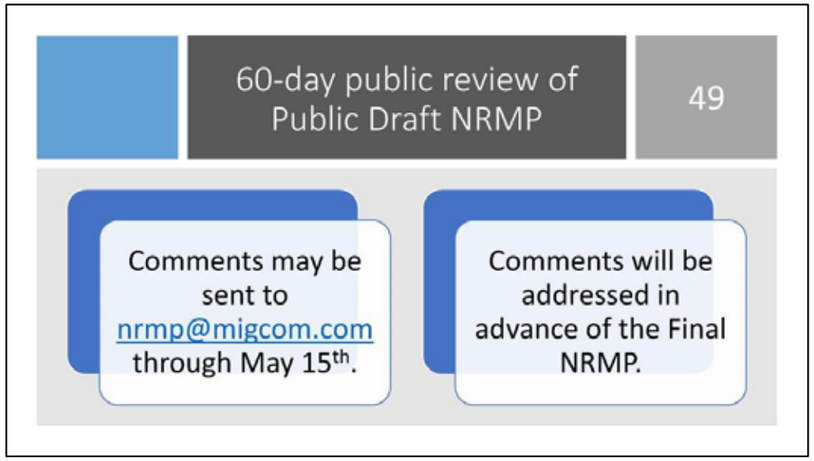

Monitoring Plan
Will be an appendix to the Final NRMP
Based on Goals and Objectives
Produced in conjunction with the data management system*
*A data management system is being developed in concert with the project GIS files
45

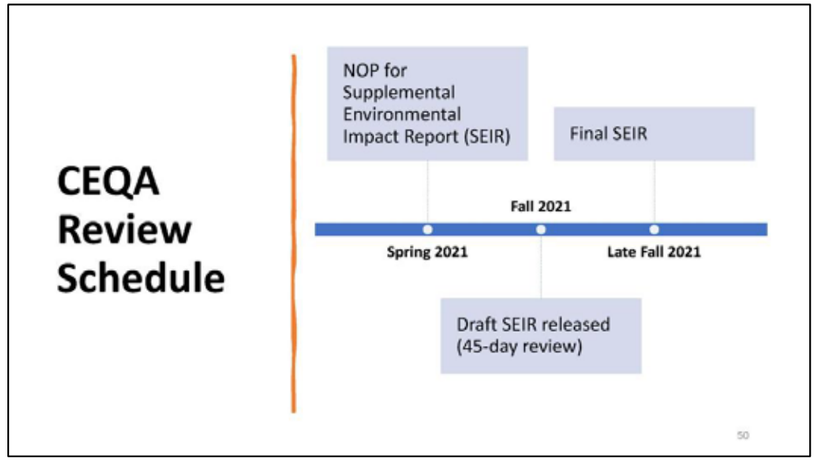
Monitoring Plan Components
Adaptive Management
Target species for observation
Monitoring interval and process
Data collection protocol, storage, and access
Accommodation for citizen science
Responsible parties and partners
Funding Sources
Success criteria
Reporting requirements

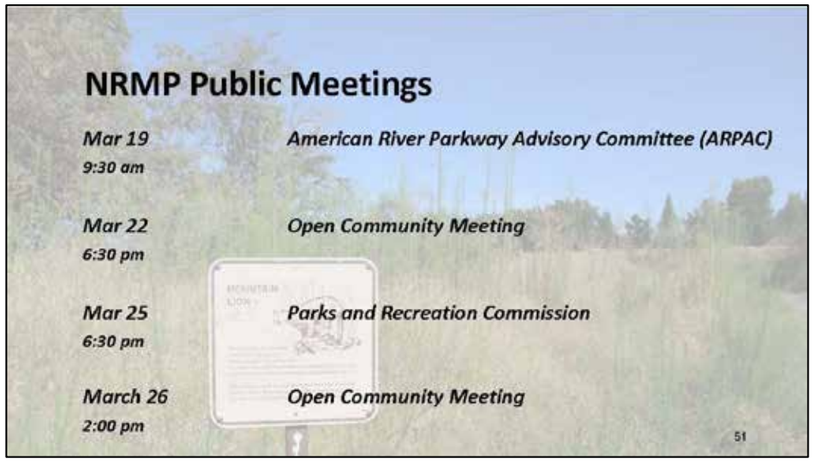
Next Steps . . .
47

SACRAMENTO COUNTY
LIVE / VISIT
BUSINESS
GOVERNMENT
Select Language
Regional Parks
Search...
AMERICAN RIVER PARKWAY
GIBSON RANCH
PARKS
ACTIVITIES
EVENTS/RESERVATIONS
RANGERS
ABOUT/MEETINGS
Home >
Natural Resources Management
Support Regional Parks, Save Time and Money - Purchase Your Parks Annual Pass Today
Public Draft Released
The public draft of the Natural Resource Management Plan (NRMP) for the American River Parkway (Parkway) has been released and is available for review.
NRMP Public Draft
NRMP Appendix A
NRMP Appenxid B
Popular Links
A - Z Regional Parks
Golf Course Gift Cards
Parks Annual Pass
SacCounty News Email Updates
ARP Multi-Use Trail Map

17

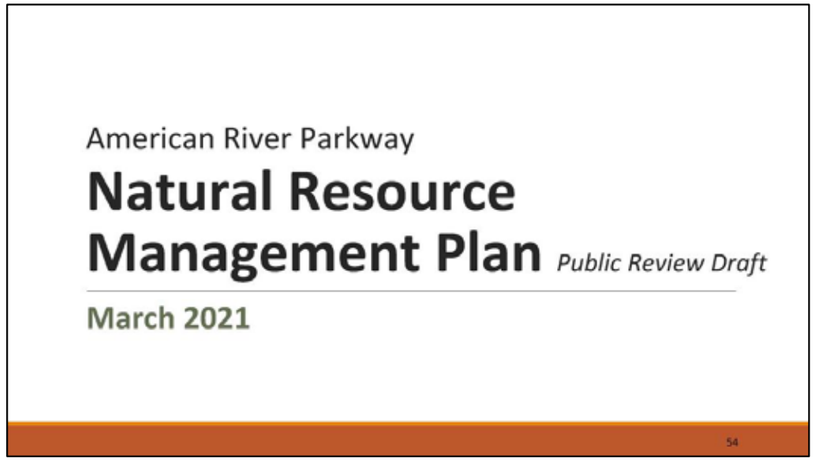

60-day public review of Public Draft NRMP
49
Comments may be sent to nrmp@migcom.com through May 15th.
Comments will be addressed in advance of the Final NRMP.


CEQA Review Schedule
NOP for Supplemental Environmental Impact Report (SEIR)
Final SEIR
Fall 2021
Spring 2021
Late Fall 2021
Draft SEIR released (45-day review)
50

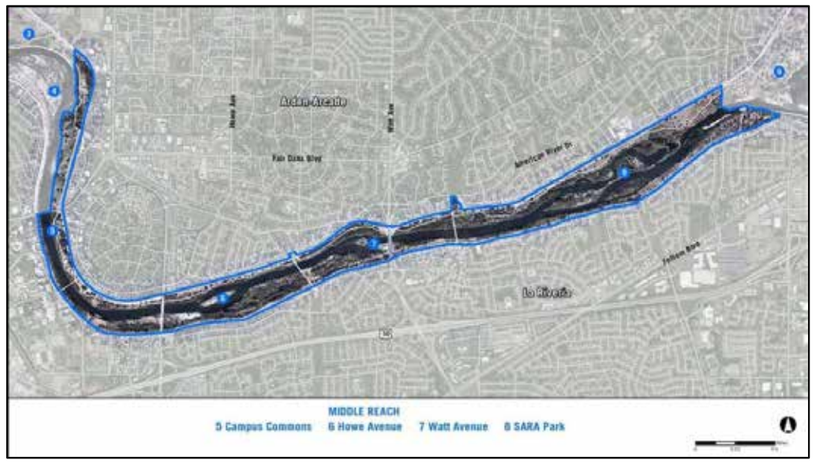

NRMP Public Meetings
Mar 19
9:30 am
American River Parkway Advisory Committee (ARPAC)
Mar 22
6:30 pm
Open Community Meeting
Mar 25
6:30 pm
Parks and Recreation Commission
March 26
2:00 pm
Open Community Meeting
51

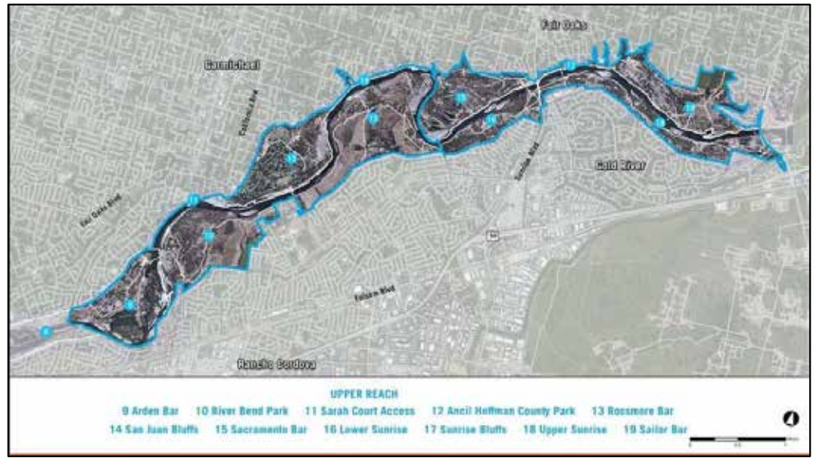
Many thanks to the funding partners!
Wildlife Conservation Board
SAFCA
County of Sacramento
52

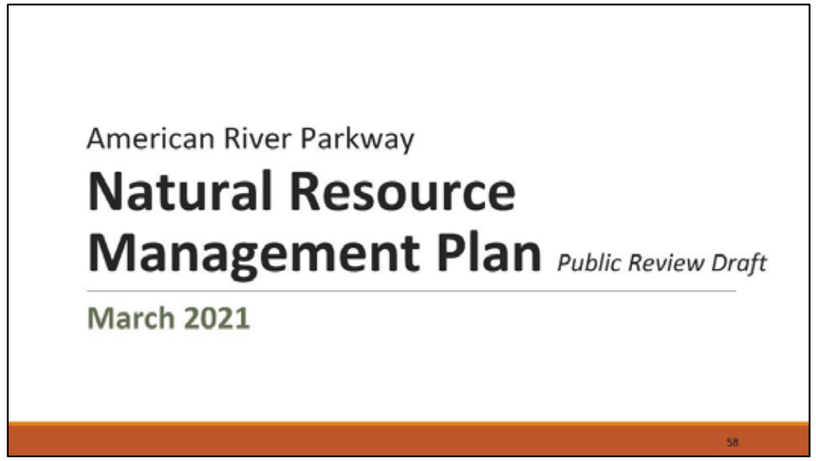
Questions, Comments, Discussion
53


American River Parkway
Natural Resource Management Plan Public Review Draft
March 2021
54

Land Park
Arden Way
Downtown Sacramento
East Sacramento
LOWER REACH
1 Discovery Park 2 Woodlake 3 Cal Expo 4 Paradise Beach


Arden-Arcade
Fair Oaks Blvd
La Riviera
MIDDLE REACH
5 Campus Commons 6 Howe Avenue 7 Watt Avenue 8 SARA Park


Carmichael
Fair Oaks
Gold River
Fulton Ave
Hazel Ave
Fair Oaks Blvd
Folsom Blvd
Rancho Cordova
UPPER REACH
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmore Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar


American River Parkway
Natural Resource Management Plan Public Review Draft
March 2021
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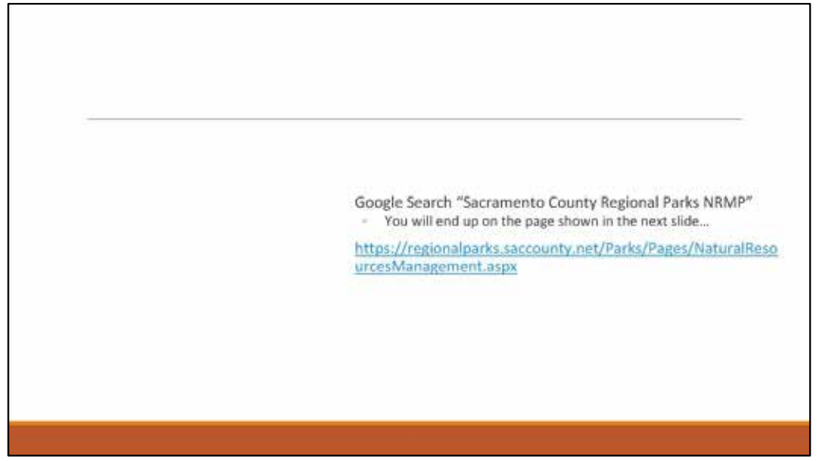
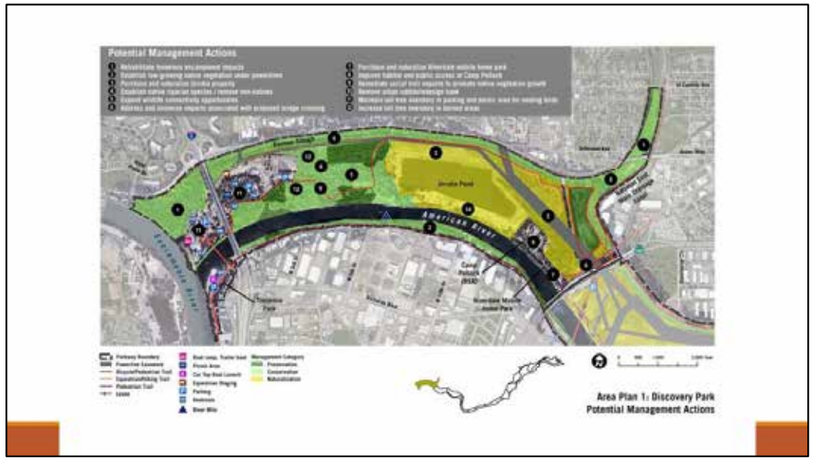
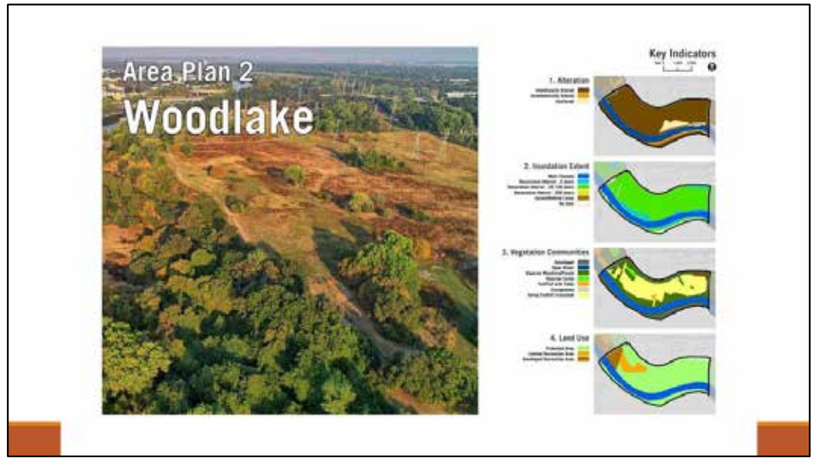
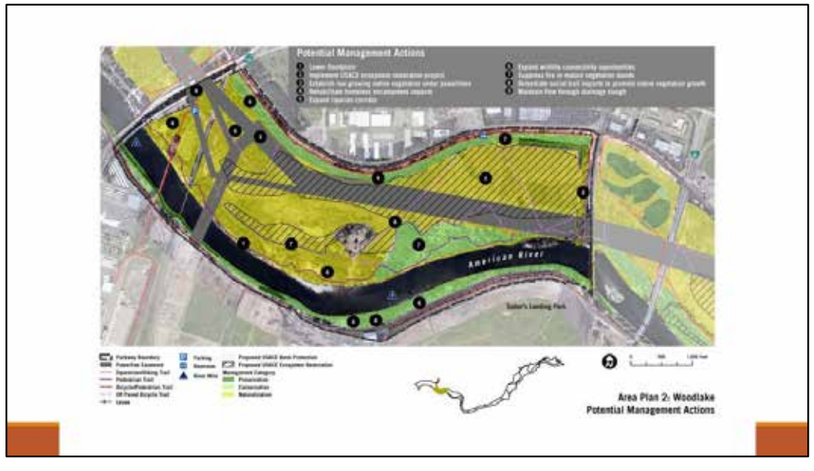

Google Search "Sacramento County Regional Parks NRMP"
You will end up on the page shown in the next slide...
https://regionalparks.saccounty.net/Parks/Pages/NaturalResourcesManagement.aspx

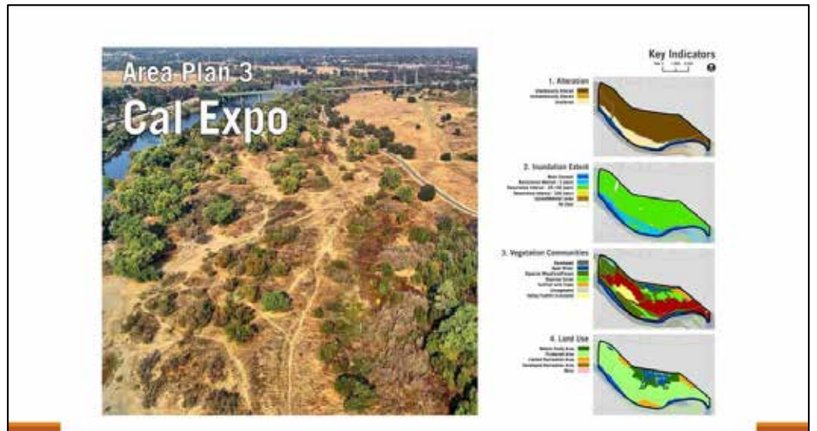
Area Plan 1
Discovery Park
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

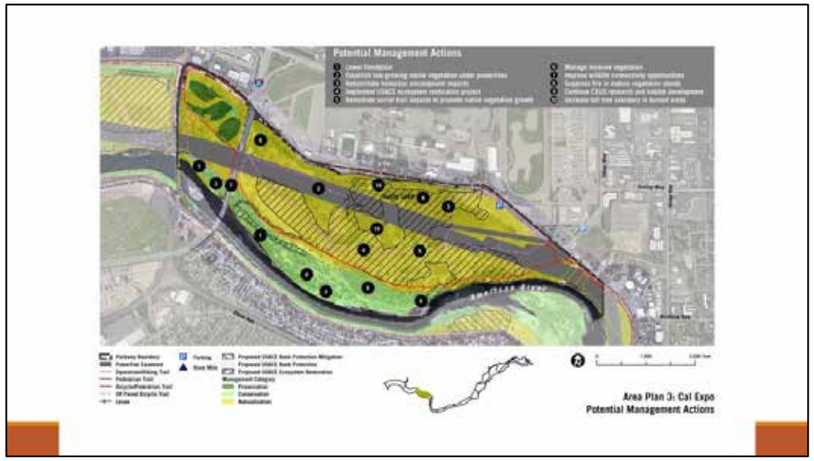
20

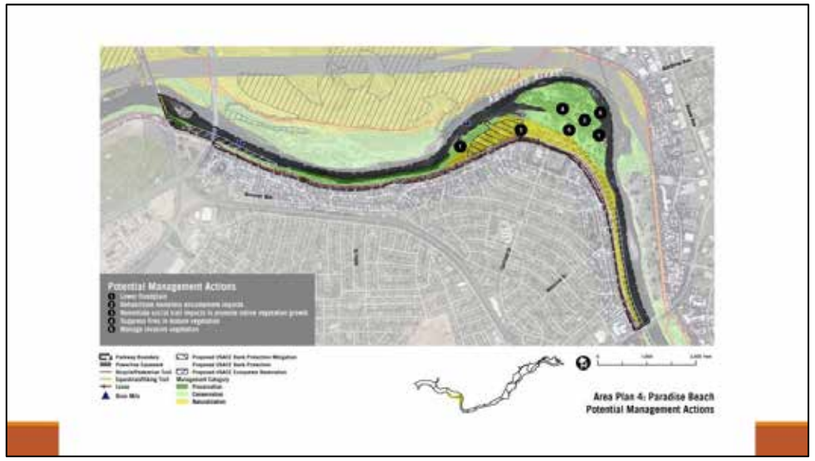

Potential Management Actions
Area Plan 1: Discovery Park
Potential Management Actions

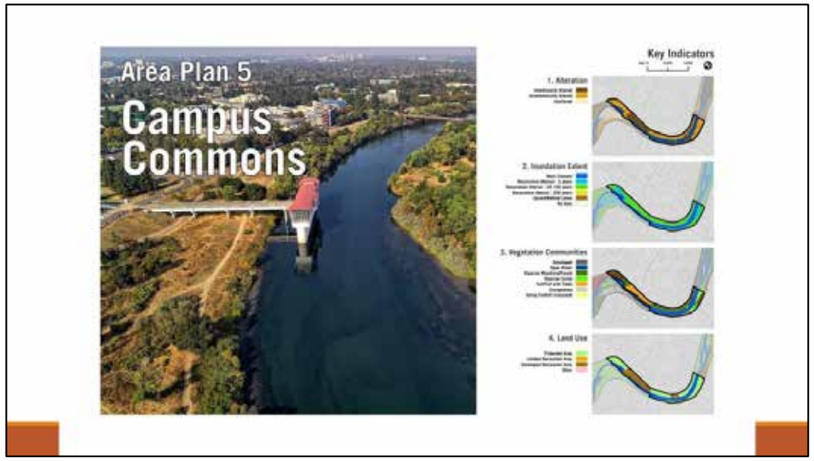

Area Plan 2
Woodlake
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

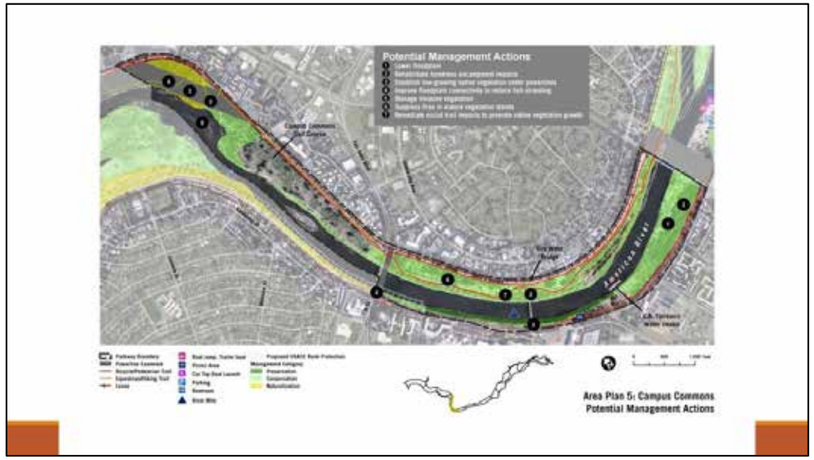

Potential Management Actions
American River
Area Plan 2: Woodlake
Potential Management Actions


Area Plan 3
Cal Expo
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions


Potential Management Actions
Area Plan 4: Paradise Beach
Potential Management Actions

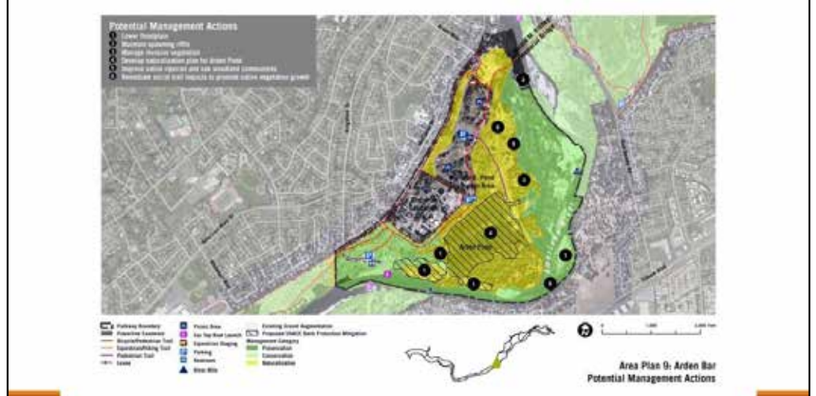

Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions

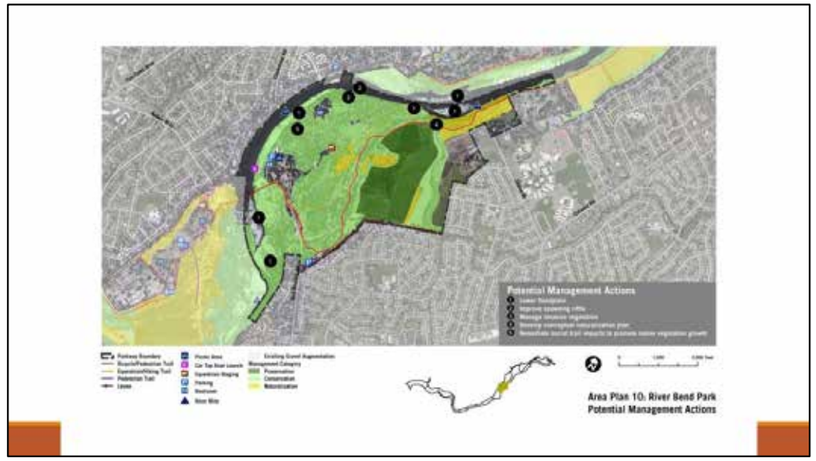
Area Plan 6: Howe Avenue
Potential Management Actions

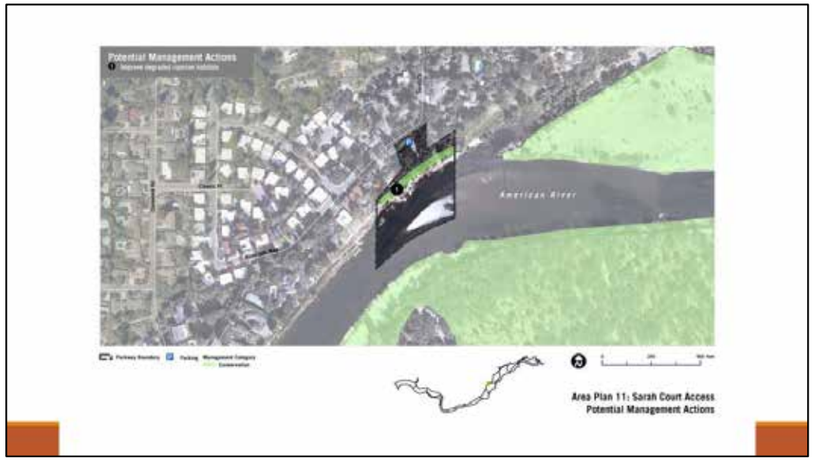
Area Plan 7: Watt Avenue
Recommended Management Actions

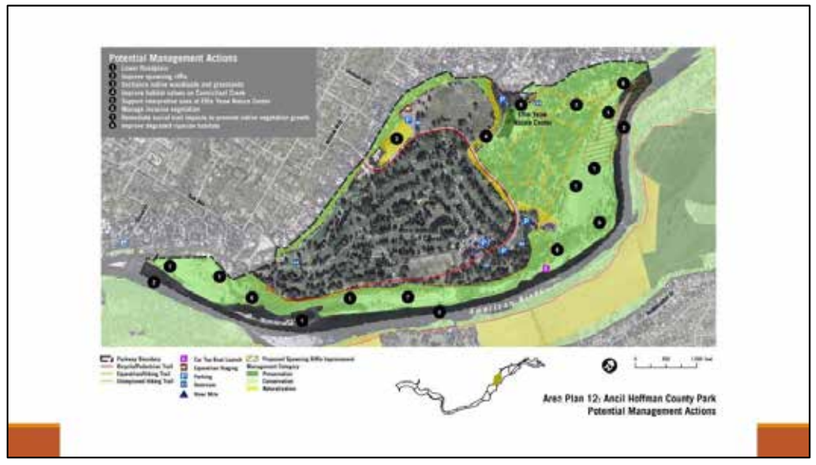
Area Plan 8: SARA Park
Potential Management Actions

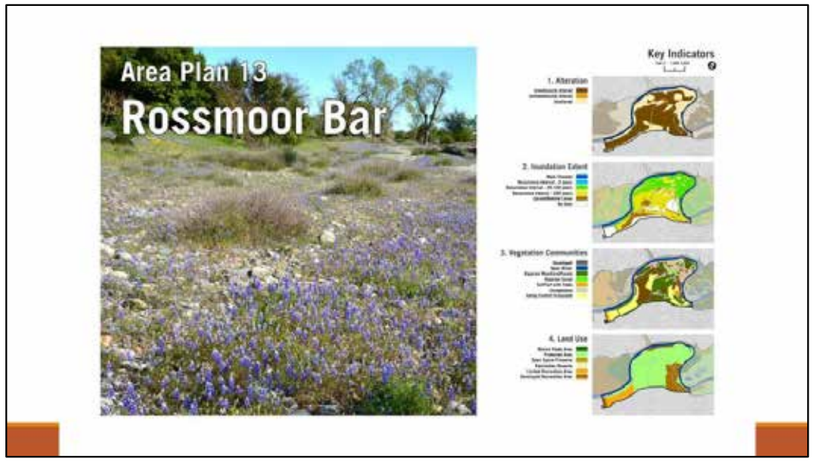


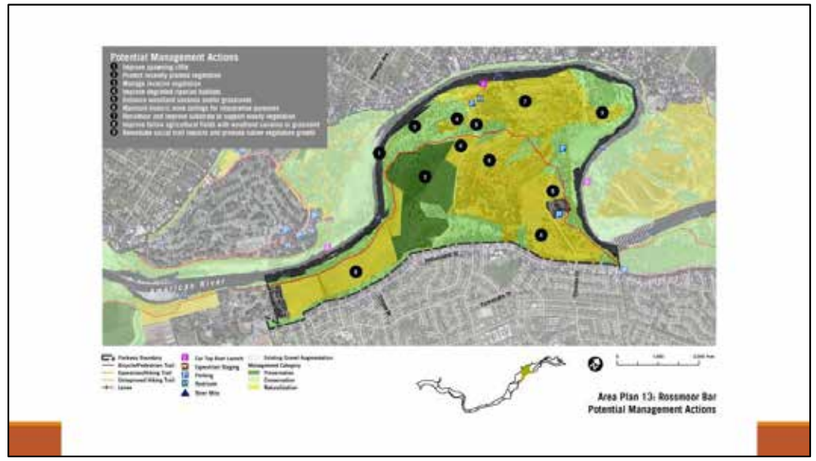

Area Plan 9: Arden Bar
Potential Management Actions

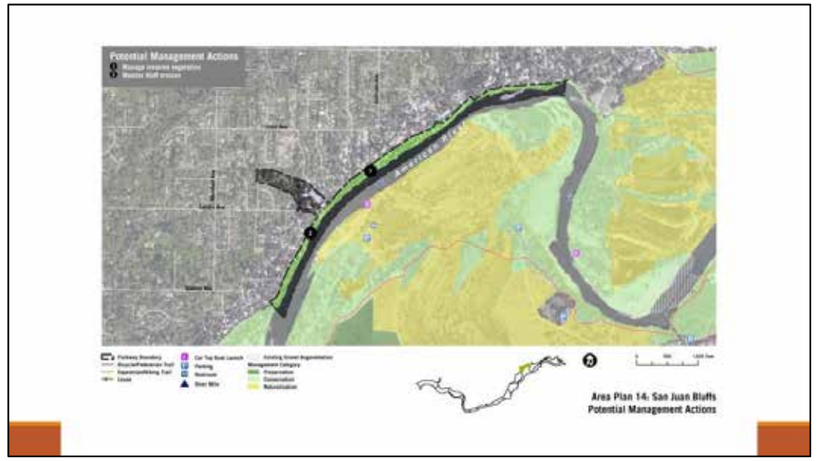

Potential Management Actions
Area Plan 10: River Bend Park
Potential Management Actions

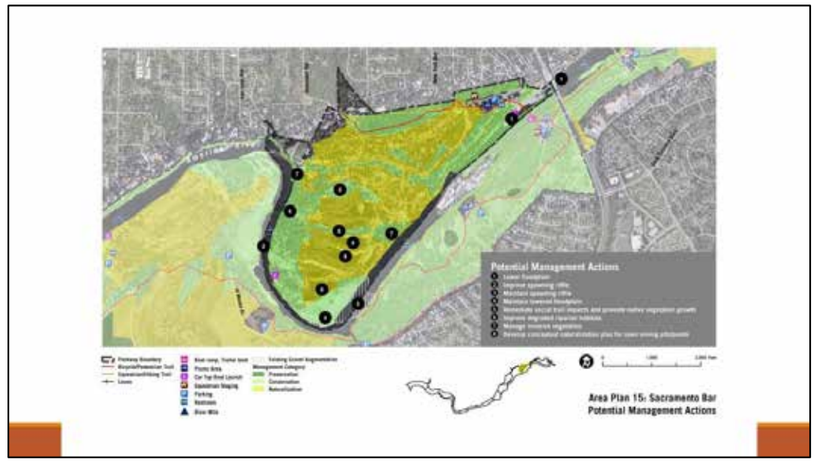

Potential Management Actions
American River
Area Plan 11: Sarah Court Access
Potential Management Actions

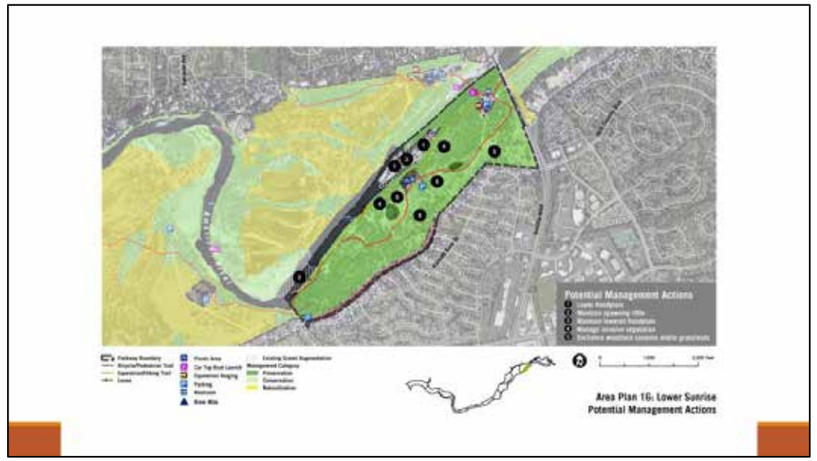

Potential Management Actions
American River
Area Plan 12: Ancil Hoffman County Park
Potential Management Actions

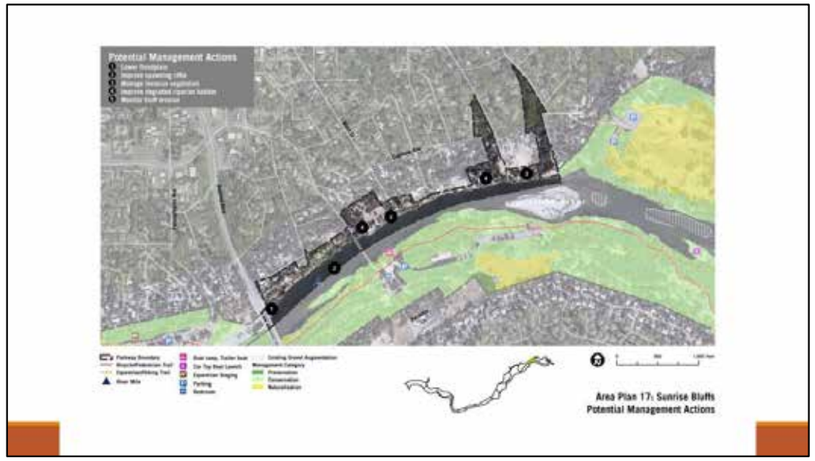

Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

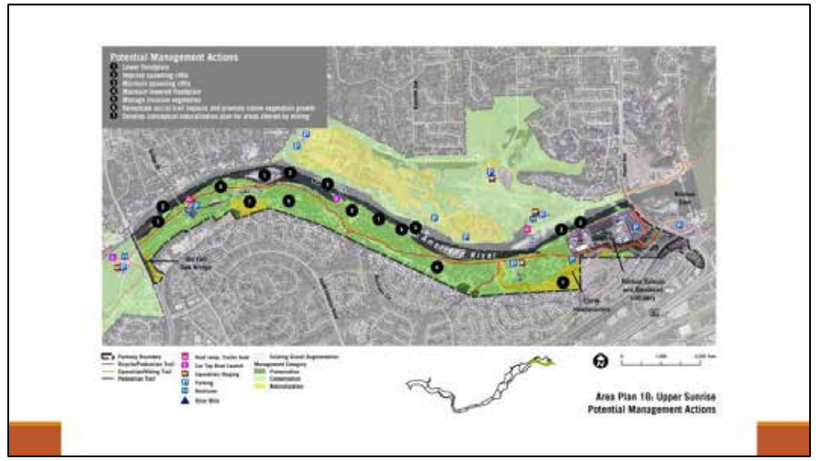

Potential Management Actions
Area Plan 13: Rossmoor Bar
Potential Management Actions

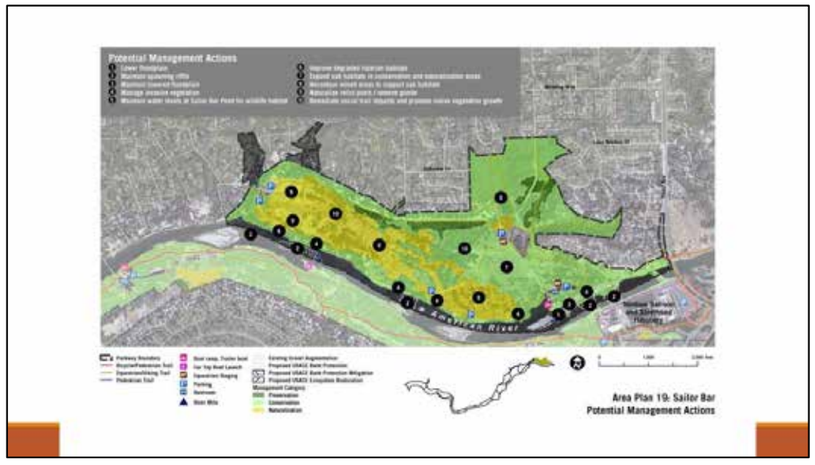

Potential Management Actions
Area Plan 14: San Juan Bluffs
Potential Management Actions


Potential Management Actions
Area Plan 15: Sacramento Bar
Potential Management Actions

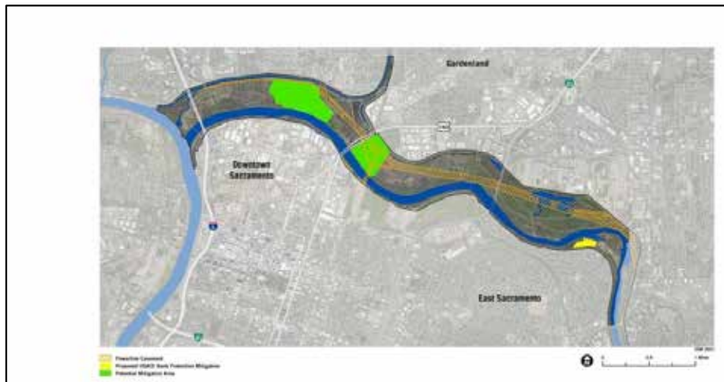

Potential Management Actions
Area Plan 16: Lower Sunrise
Potential Management Actions


Potential Management Actions
Area Plan 17: Sunrise Bluffs
Potential Management Actions

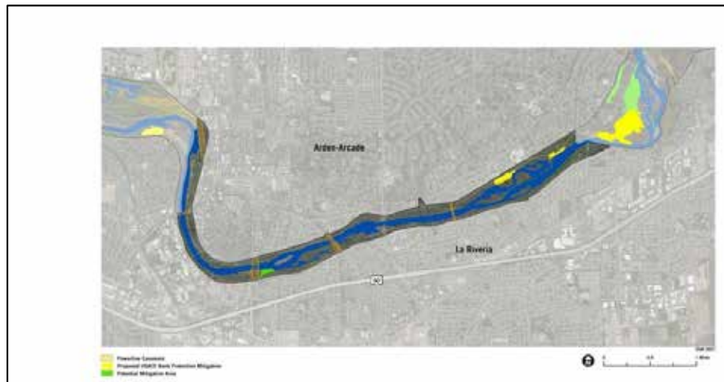

Potential Management Actions
Area Plan 18: Upper Sunrise
Potential Management Actions


Potential Management Actions
American River
Area Plan 19: Sailor Bar
Potential Management Actions

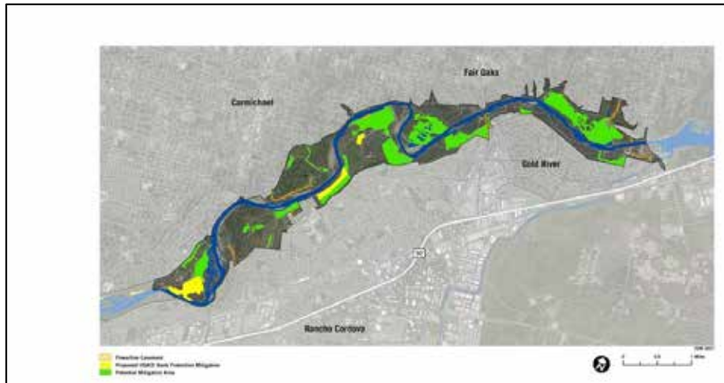
NRMP Partners
GOAL AREAS
GOAL AREA 1
Biological Resources
GOAL AREA 2
Physical Resources
GOAL AREA 3
Cultural Resources
GOAL AREA 4
GOAL AREA 5




Lower Reach Potential Mitigation Areas




Middle Reach Potential Mitigation Areas




Upper Reach Potential Mitigation Areas

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# AMERICAN RIVER PARKWAY (ARP)
# NATURAL RESOURCES MANAGEMENT PLAN (NRMP)
# 2021 COMMUNITY MEETINGS ON THE PUBLIC REVIEW DRAFT NRMP

## 2021 COMMUNITY MEETING #2

Friday, March 26, 2021 ◆ 2:00 p.m. – 4:00 p.m.
Online by Zoom

## S U M M A R Y  R E P O R T

**INTRODUCTION**

On March 26, 2021, Sacramento County Regional Parks, MIG, Inc., and ICF, Inc. held a community meeting on the public review draft Natural Resources Management Plan (NRMP). The purpose of the meeting was to: (1) provide an overview of the NRMP planning process; (2) introduce the NRMP's Area Plan analyses, mapping, and potential management actions; (3) describe the forthcoming resource impact monitoring plan; (4) describe next steps in the NRMP development process, and (5) receive community feedback on the public review draft NRMP.

**Meeting Format**

The community meeting occurred on March 26, 2021, from 2:00 p.m. to 4:00 p.m. online by Zoom. Meeting participants included members of the public, Sacramento County Department of Regional Parks (Regional Parks or County Parks) staff, and consultant staff from MIG, Inc and ICF, Inc. Attachment A of the Summary Report Appendix includes the PowerPoint presentation slides displayed and discussed during the meeting.

**AGENDA**

Becky Hertz, an RPC commissioner, began the meeting, noting the public review draft NRMP informational presentation was the first action item of the meeting. Liz Bellas of Sacramento County Regional Parks welcomed the commissioners, members of the public, and the County's consultants. Daniel Iacofano of MIG provided the NRMP's status and discussed the schedule for NRMP completion moving forward, noting the final NRMP would be published in the fall of 2021. He then reviewed the meeting agenda, which included a PowerPoint presentation and discussion period.

**POWERPOINT PRESENTATION**

Mr. Iacofano began the PowerPoint presentation with a review of how the NRMP was scoped, an overview of the NRMP Task Force purpose and member agencies, a review of the NRMP process, an overview of the results of the 2020 NRMP Maptionnaire community survey, and an





overview of the proposed NRMP management and implementation activities. Gregg Ellis of ICF then presented the NRMP indicators, including level of alteration, inundations, vegetation communities, and land use, and accompanying mapping. Mr. Ellis presented potential management actions maps for 4 of the Parkway's 19 Area Plans and gave an overview of the components of the forthcoming NRMP resource impact monitoring plan. Mr. Iacofano and Mr. Ellis then provided an overview of the NRMP partners and finished the presentation with a discussion of the potential mitigation areas in each reach of the Parkway.

**OPEN DISCUSSION**

Mr. Iacofano opened the meeting to questions and comments on the public review draft NRMP and the contents of the PowerPoint presentation.

Comments and questions from the commissioners are listed below. Responses from the meeting facilitators are given in *italics*. Each individual bullet point may include a single comment and response, or a back-and-forth conversation.

- If you go to Area Plan Map 1, Camp Pollock is shown as a Boy Scouts of America facility. Camp Pollock is no longer a Boy Scouts of American facility. In addition, the NRMP identifies 420 acres of turf in the Parkway. Is there any discussion about the turf acreage beyond presenting the amount in the Parkway? Do we need more turf, less turf, or turf in a different location?
  (Regional Parks) *The majority of the turf is part of the recreation sites. We are not looking to change the amount of turf we currently have in the Parkway.*

- Is there going to be any analysis for the developed recreation areas to determine if there is too much or too little turf? Perhaps the analysis could consider using a different kind of turf considering drought conditions and the use of pesticides.
  (ICF) *We did consider the value developed recreation areas, including turf and trees, can offer. In Discovery Park, the yellow-billed magpie uses the turf and trees in the developed recreation areas. We thought about the Parkway in its entirety, including the potential for developed recreational areas to provide good quality habitat for certain species.*

- I think the NRMP uses naturalization and restoration interchangeably. The use of these terms is confusing. What I am hearing is the naturalization areas are opportunities for restoration.
  (ICF) *The Task Force discussed this issue in depth. We thought about what federal agencies think about these different modes of modifications. Restoration is a common catch-all. It can be argued that restoration means bringing a landscape back to what it was originally. We are limited in it whether we can truly restore these areas. You raise good points. This was a tricky process.*

- I will be sending photos for map changes for the Gristmill area. The photos demonstrate that certain areas should be labeled as having been intentionally altered. USACE conducted activities a decade ago that altered the area. Please call out the Gristmill recreation area in the SARA Park section.
  (ICF) *I will have to look back at our polygons and how we mapped the Gristmill area.*

- Table 3-1 on Page 3-17 has a column labeled "undesignated." This seems to mean these areas do not have a land use designation. The accompanying maps do not match that. Are these 168 acres of undesignated land in Discovery Park?
  (MIG) *It could be a mapping issue. Discovery Park likely has 168 acres of river channel. We can clarify what undesignated means on the mapping.*

- The lower river does not have much developed recreation area if not for Discovery Park. The first eight or so miles of the Parkway are underutilized for recreational use. There is relatively more protected area. Unfortunately, we have not been able to protect a lot of these areas from illegal encampment. The downtown area of the Parkway needs more recreation. The upper river has more developed recreation area in comparison. A lot of people in the downtown area are looking to the Parkway for recreation opportunities.
  *(*Regional Parks*) The NRMP is not intended to change the land use designations. There are plans to add recreational opportunities, such as a boat launch, to the Woodlake Area. The NRMP is trying to take into account that we should not preclude ourselves from new recreation opportunities where these opportunities have already been called out in the Parkway Plan.*

- The NRMP mentions the mountain bike pilot program and the reference is a bit dated. It is now 2021. A small text change is required.

- We really need to focus on the recreational opportunities provided in the lower reaches of the Parkway. The trails may not be as well maintained as they should be. There are barriers to maximizing the use of existing recreational areas.

- I think the preservation management category definition talks about mitigation but you didn't indicate whether preservation includes areas that are currently in good condition that are not mitigation sites. Am I wrong?
  (ICF) *Our intention is the preservation category would almost exclusively include mitigation areas. There is a commitment to keep those areas healthy in perpetuity. However, there is a distinction to be made. There are areas of very high quality that are not formal mitigation sites, but these locations fall under conservation recognizing that in the future invasive species could be an issue, for example, so active management is needed. Formal mitigation, on the other hand, is guided by law. We will see if we can improve upon the wording and clarity of the management category definitions.*
  I think we need clarification. I will send in written comments.





Ms. Bellas thanked the meeting participants for their questions and comments and reminded the participants that they could send additional comments to nrmp@migcom.com. Mr. Iacofano and Ms. Bellas then ended the meeting.

During the public meeting, participants used the Zoom chat feature to leave comments. These Zoom comments are listed below in verbatim.

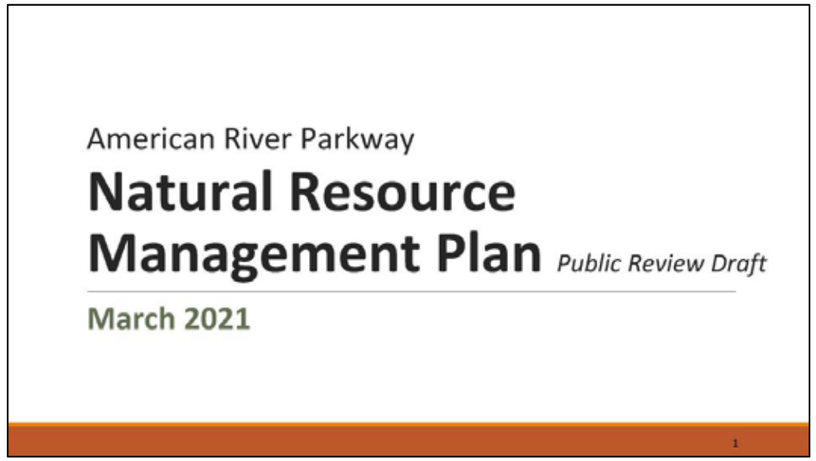
- FYI that there are homeless camps in the Rossmoor area, pretty much in the middle, near Ambassador.
- Former BSA property is likely owned by State Lands Commission.
- Turf is the dominant understory in picnic areas, golf courses and levees
- No comments or questions yet. Would like to review how the city land uses interface with the NRMP, the plan for adaptive management practices, responding to the unhoused, and the citizen science concept, specifically. We will submit our comments via email. Thank you.
- Agree with Betsy (OMG), and yes, Daniel's heat map would also tend to support the notion that recreation programs down there need help!

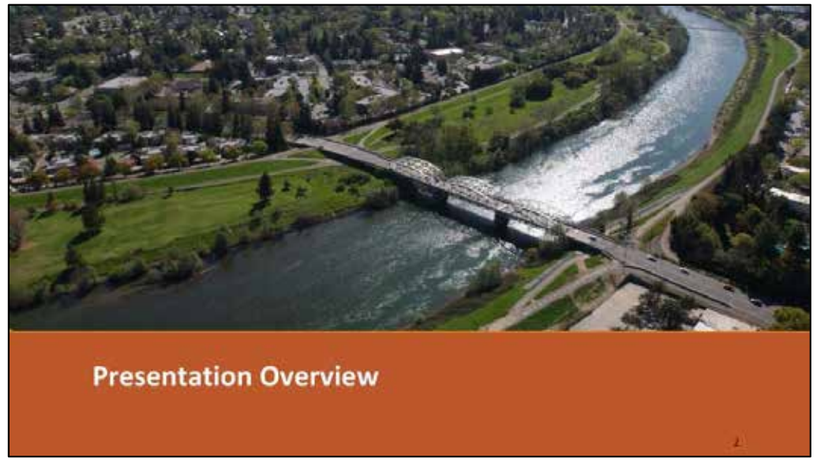
**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**RECREATION AND PARK COMMISSION MEETING ON THE PUBLIC REVIEW DRAFT NRMP**

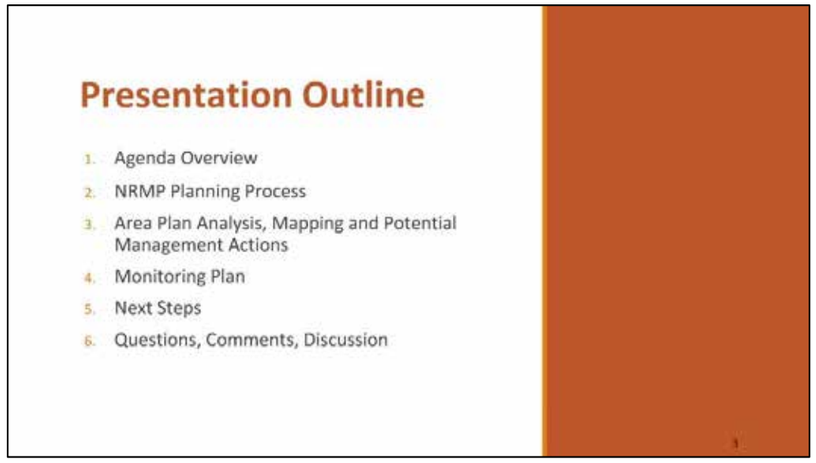
Friday, March 26, 2021 ◆ 2:00 p.m. – 4:00 p.m.
Online by Zoom

## APPENDIX TO SUMMARY REPORT

**ATTACHMENT A: POWERPOINT SLIDES**



## Previous Plans . . .

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## The NRMP

- The NRMP was envisioned in 2007 during a Save the American River Association Retreat.
- Elmer Aldrich was appointed Committee Chair and developed initial recommendations.
- In 2014, the Department characterized the NRMP as being closely aligned with the goals and policies of the 2008 American River Parkway Plan.
- The initial data collection effort for the NRMP began in 2018.

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## The County, WCB and SAFCA Join Forces . . . The NRMP Task Force Begins!

We are at a unique time where several efforts are coming together, and it makes sense to formalize the necessary collaboration.

This collaboration will be carried out through the Natural Resources Management Plan Task Force

Regional Parks and the Wildlife Conservation Board are funding preparation of the Natural Resources Management Plan

SAFCA is funding the Natural Resources Management Plan Task Force in Cooperation with Regional Parks

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## NRMP Task Force Member Organizations

- Sacramento County Regional Parks
- Sacramento Area Flood Control Agency
- The Water Forum
- U.S. Army Corp of Engineers
- Wildlife Conservation Board
- Central Valley Flood Protection Board
- American River Parkway Stakeholders
- Sacramento County Department of Environmental Review
- DWR
- USFWS
- ICF
- MIG

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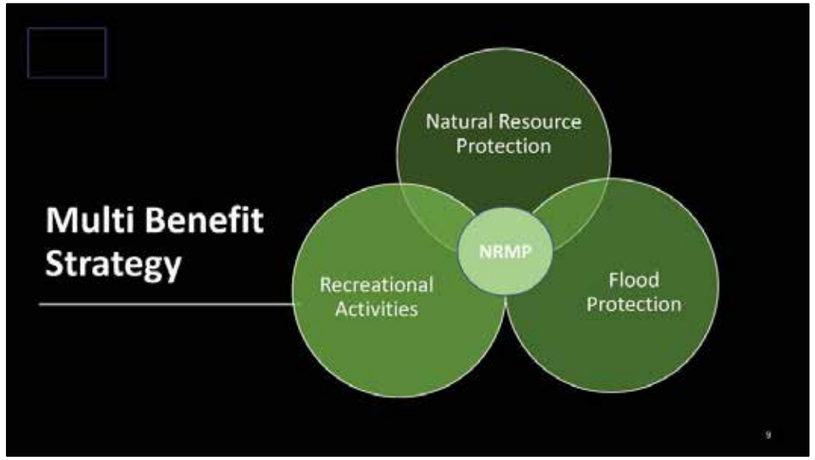
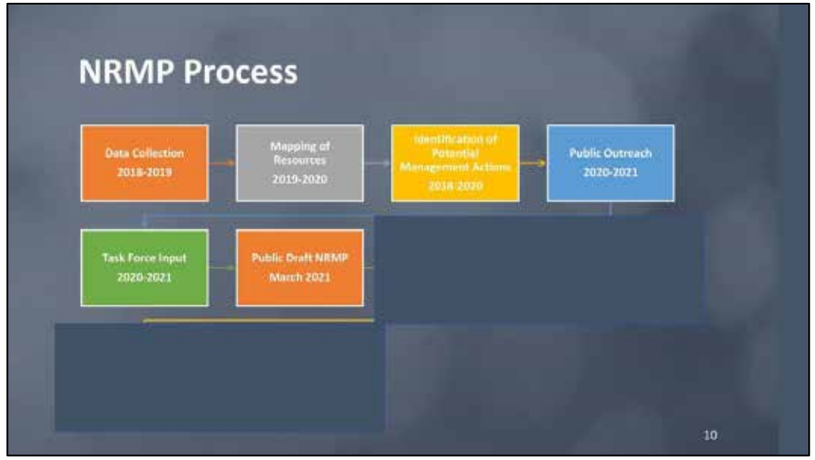
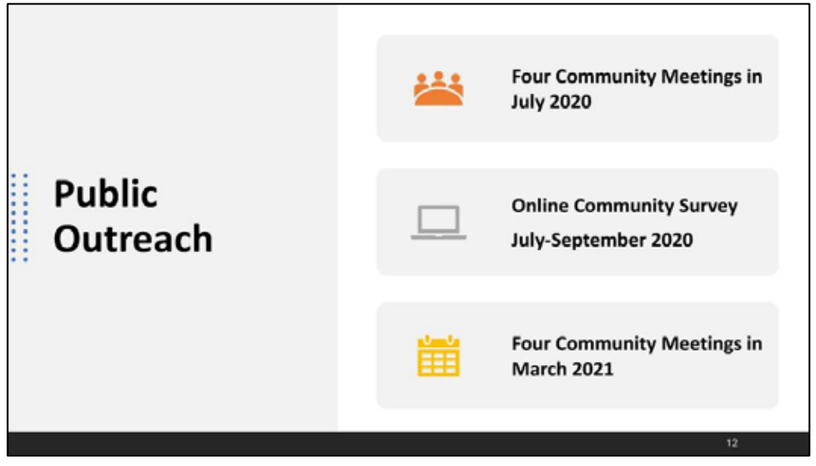
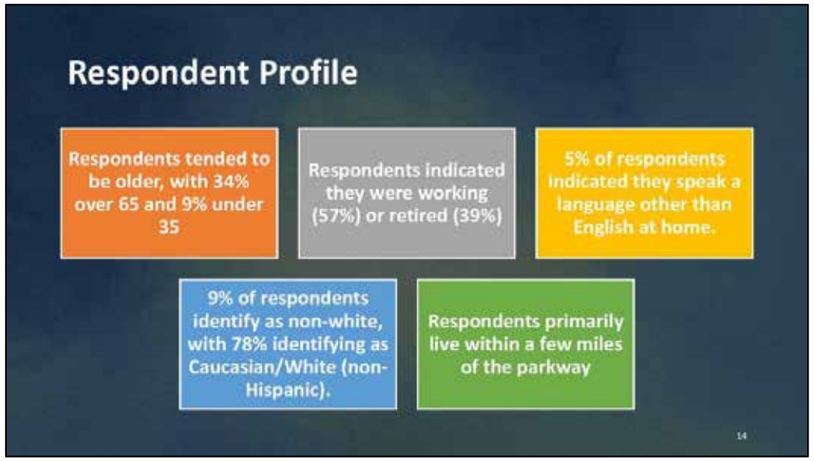

Multi Benefit Strategy
Natural Resource Protection
NRMP
Recreational Activities
Flood Protection
9

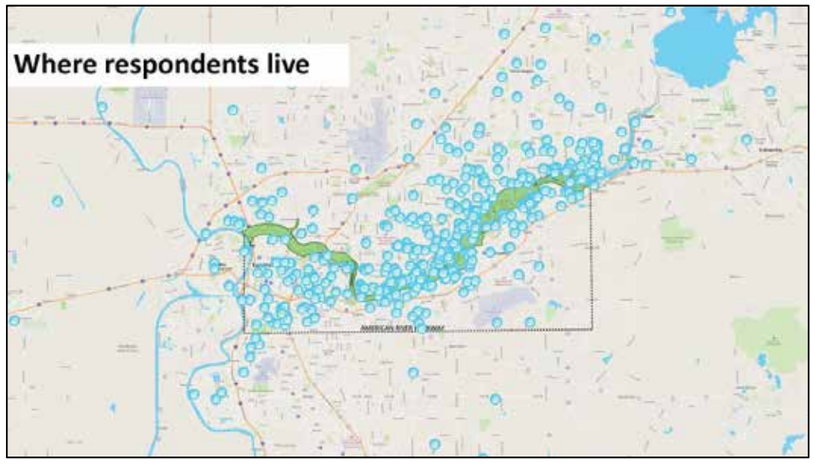

NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
10

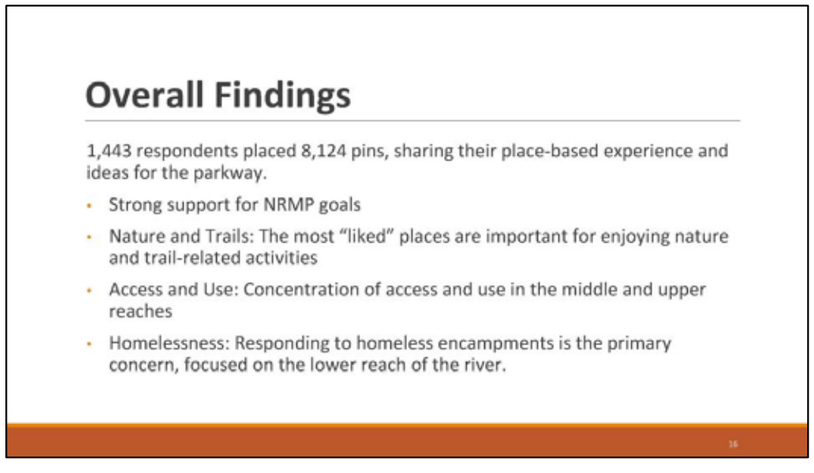
NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
60-Day Public Review through May 15
Supplemental EIR Fall 2021
Incorporate Comments and Finalize NRMP Fall 2021
Board of Supervisors Approval
11

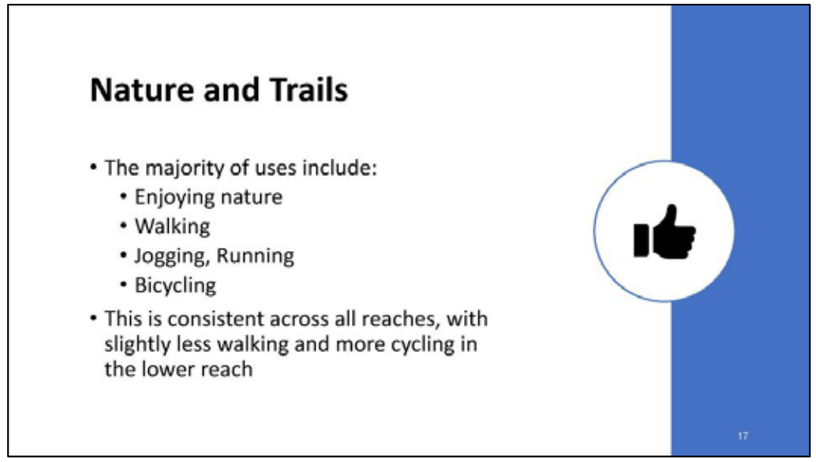

Public Outreach
Four Community Meetings in July 2020
Online Community Survey
July-September 2020
Four Community Meetings in March 2021
12

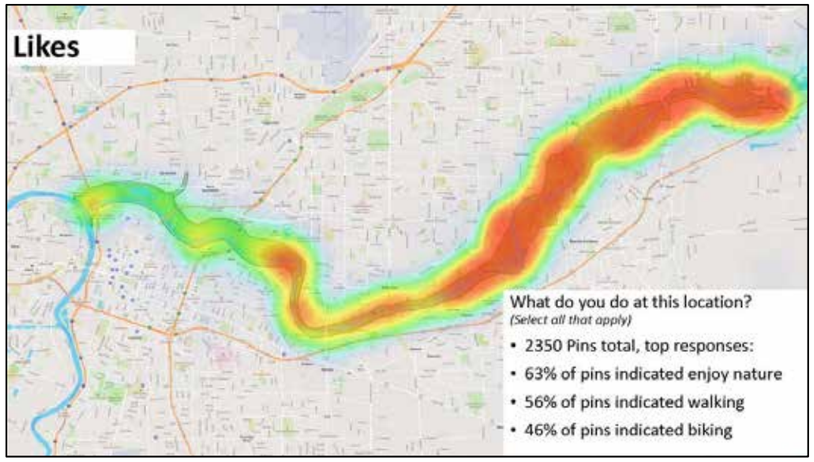
Online Community Survey Results
July 15 – September 15, 2020
13

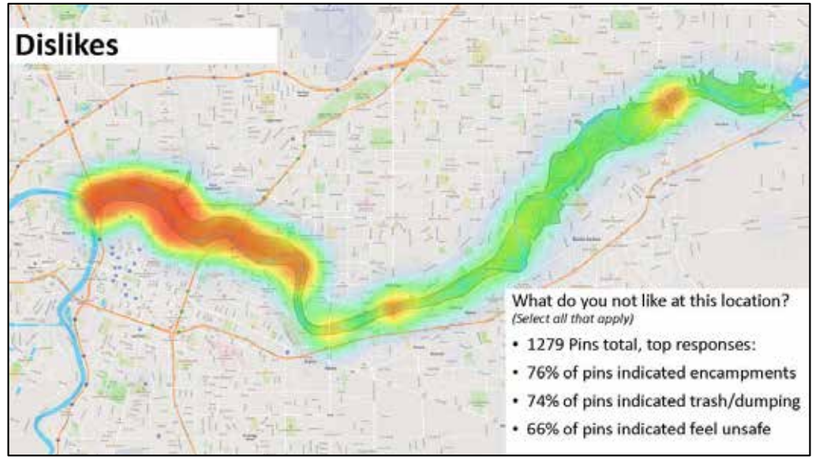

Respondent Profile
Respondents tended to be older, with 34% over 65 and 9% under 35
Respondents indicated they were working (57%) or retired (39%)
5% of respondents indicated they speak a language other than English at home.
9% of respondents identify as non-white, with 78% identifying as Caucasian/White (non-Hispanic).
Respondents primarily live within a few miles of the parkway
14


Where respondents live


Overall Findings
1,443 respondents placed 8,124 pins, sharing their place-based experience and ideas for the parkway.
Strong support for NRMP goals
Nature and Trails: The most "liked" places are important for enjoying nature and trail-related activities
Access and Use: Concentration of access and use in the middle and upper reaches
Homelessness: Responding to homeless encampments is the primary concern, focused on the lower reach of the river.
16

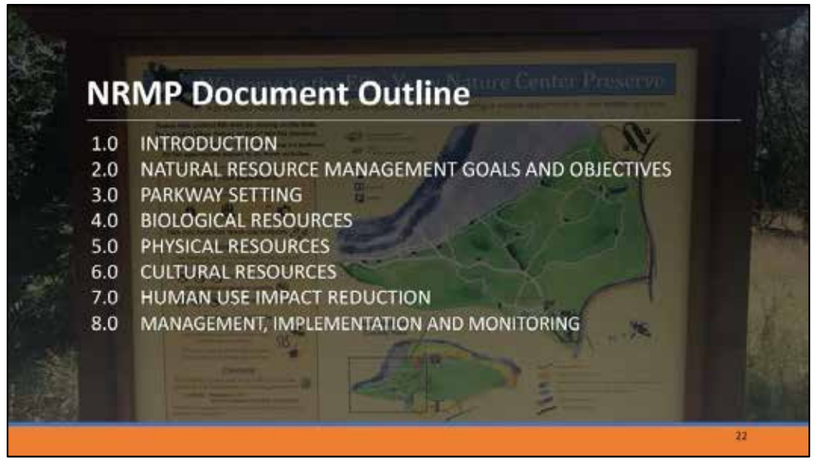

Nature and Trails
• The majority of uses include:
• Enjoying nature
• Walking
• Jogging, Running
• Bicycling
• This is consistent across all reaches, with slightly less walking and more cycling in the lower reach
17

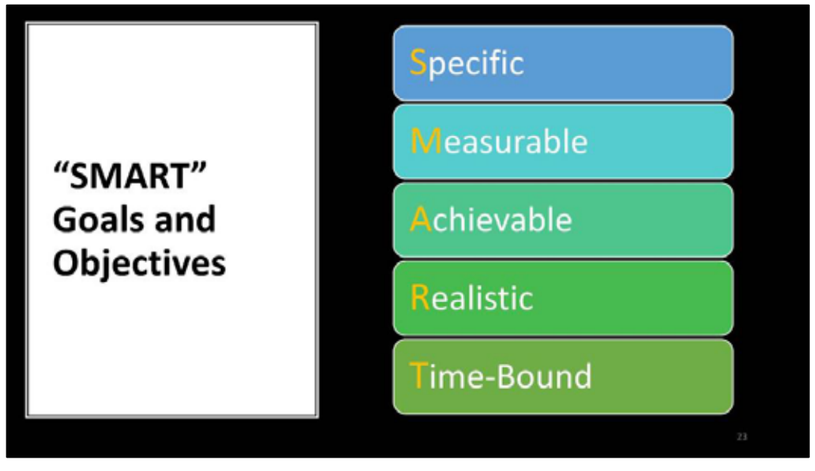

Likes
What do you do at this location?
(Select all that apply)
• 2350 Pins total, top responses:
• 63% of pins indicated enjoy nature
• 56% of pins indicated walking
• 46% of pins indicated biking

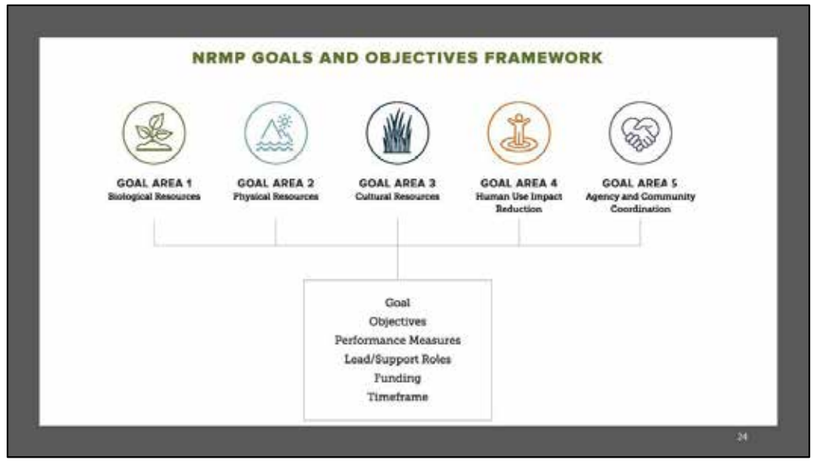

Dislikes
What do you not like at this location?
(Select all that apply)
• 1279 Pins total, top responses:
• 76% of pins indicated encampments
• 74% of pins indicated trash/dumping
• 66% of pins indicated feel unsafe

Homelessness in the Parkway
Housing and homelessness is a local, regional and national crisis impacting people and public spaces including the American River Parkway
Related impacts, trash, safety, encampments were the most mentioned issues in the parkway.
Concerns about safety are high, equally spread across gender identity
While no question specifically identifies a respondent as housed, the comments suggest minimal, if any, homeless perspectives in this data.
20

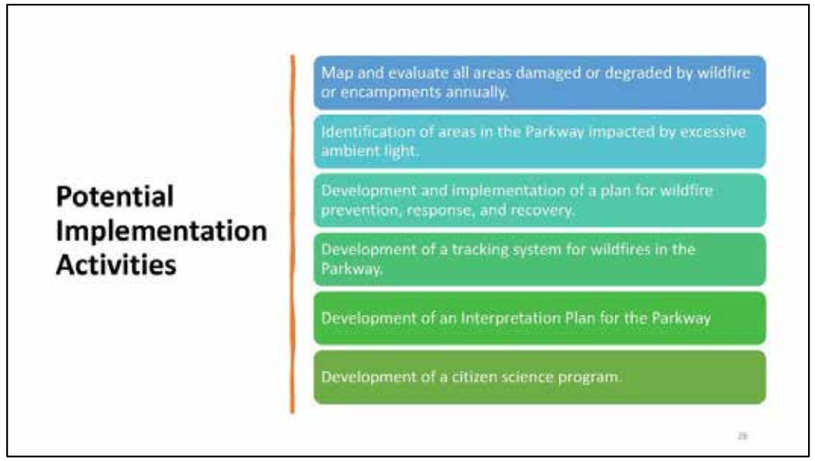
The Plan Document: Potential Management Actions and Area Plan Mapping
21


NRMP Document Outline
1.0 INTRODUCTION
2.0 NATURAL RESOURCE MANAGEMENT GOALS AND OBJECTIVES
3.0 PARKWAY SETTING
4.0 BIOLOGICAL RESOURCES
5.0 PHYSICAL RESOURCES
6.0 CULTURAL RESOURCES
7.0 HUMAN USE IMPACT REDUCTION
8.0 MANAGEMENT, IMPLEMENTATION AND MONITORING
22

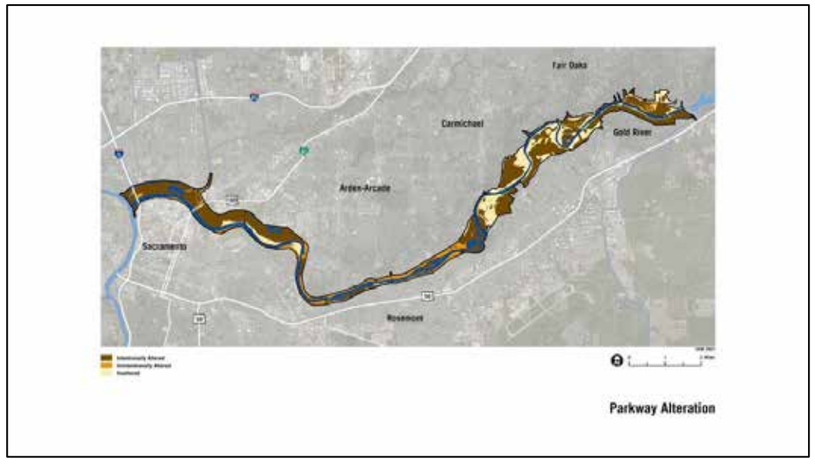

"SMART" Goals and Objectives
Specific
Measurable
Achievable
Realistic
Time-Bound
23


NRMP GOALS AND OBJECTIVES FRAMEWORK
GOAL AREA 1
Biological Resources
GOAL AREA 2
Physical Resources
GOAL AREA 3
Cultural Resources
GOAL AREA 4
Human Use Impact Reduction
GOAL AREA 5
Agency and Community Coordination
Goal
Objectives
Performance Measures
Lead/Support Roles
Funding
Timeframe
24

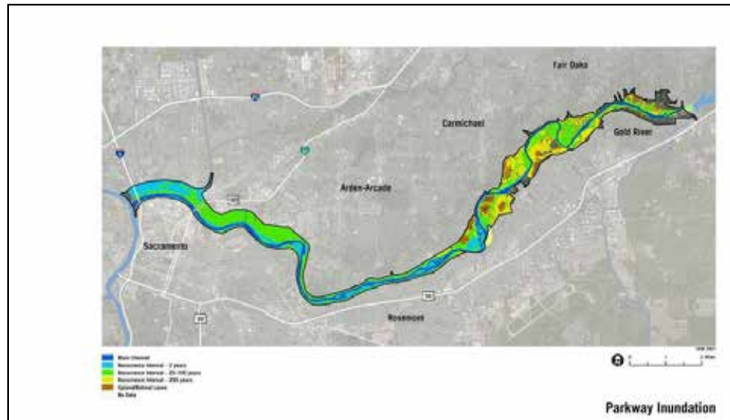
Potential Implementation Activities
Update vegetation community map.
Development of shaded riverine aquatic habitat map.
Mapping of trails (including social trails) in the Parkway.
Systematic survey of sensitive species.
Invasive species surveys and production of Invasive Species Management Plan Update.
25

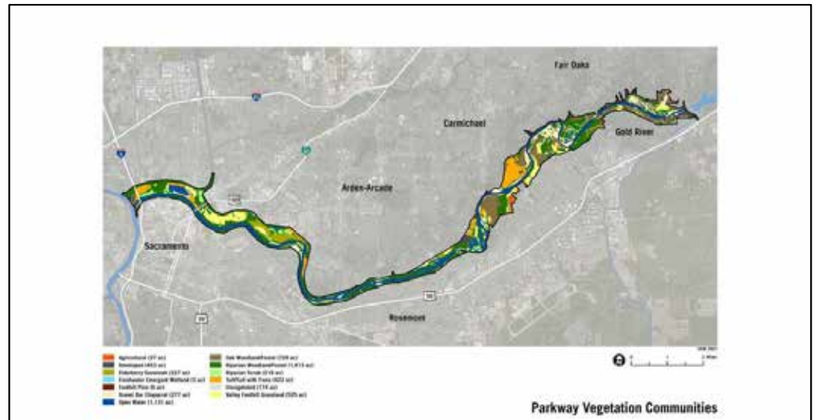

Potential Implementation Activities
Map and evaluate all areas damaged or degraded by wildfire or encampments annually.
Identification of areas in the Parkway impacted by excessive ambient light.
Development and implementation of a plan for wildfire prevention, response, and recovery.
Development of a tracking system for wildfires in the Parkway.
Development of an Interpretation Plan for the Parkway
Development of a citizen science program.

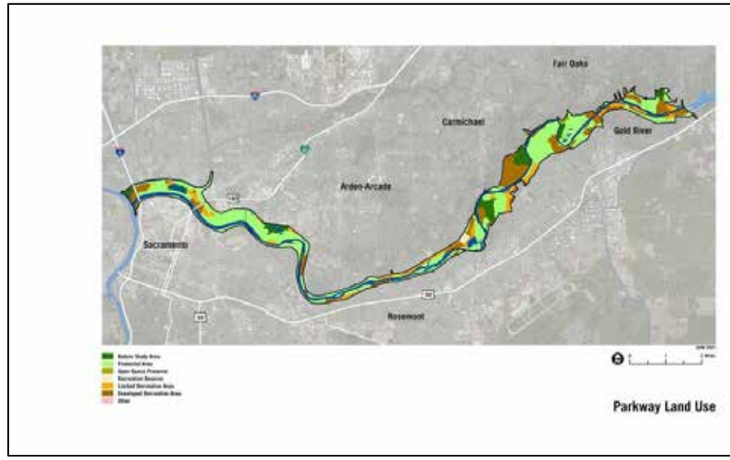
Key Indicators for Area Plan Analysis and Mapping
Alteration
Inundation
Vegetation Communities
Land Use


Fair Oaks
Carmichael
Gold River
Arden-Arcade
Sacramento
Rosemont
Parkway Alteration

12




## Natural Resource Management Categories

**Preservation**: Existing mitigation sites that require protection in perpetuity.

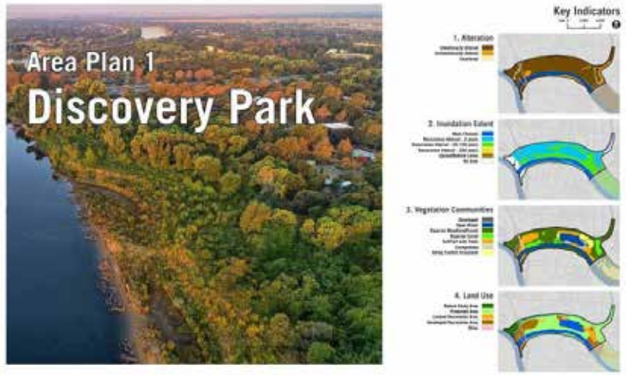
**Conservation:** Existing conditions are considered to generally meet desired conditions, but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved to meet goals.

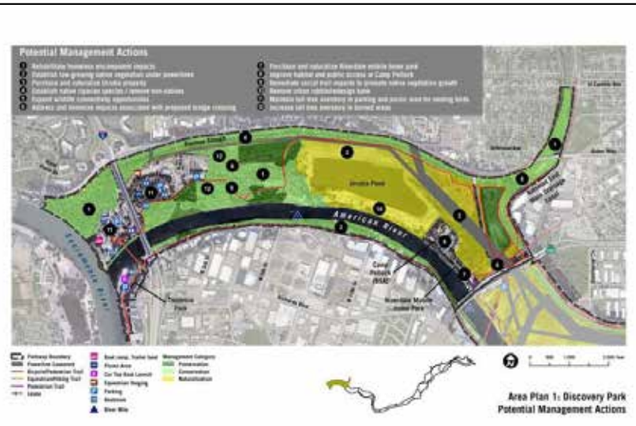
**Naturalization**: Modifying areas that were substantially altered in the past in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP, NRMP, and W&SR policies.

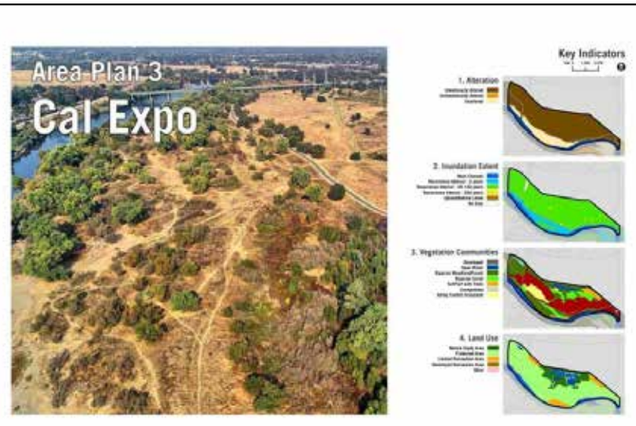
***Rehabilitation Overlay:** Applies to any of the aforementioned categories that are degraded or damaged in the future and require action to improve their condition.

13

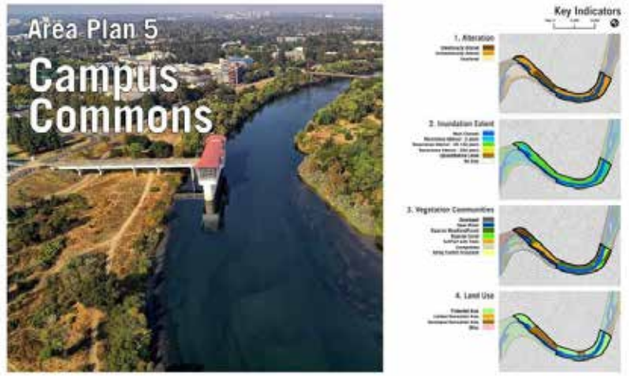
The 19 Area Plans

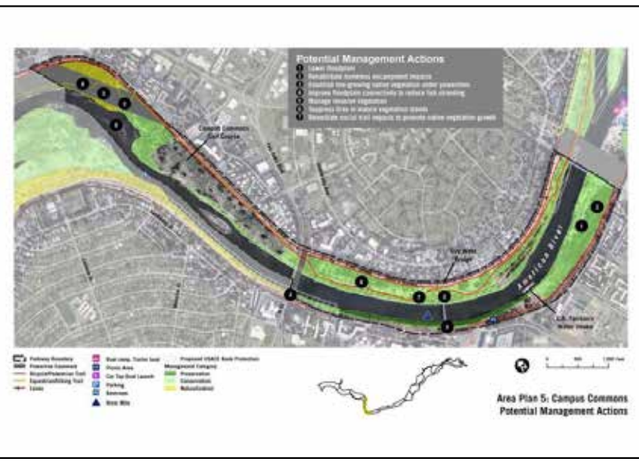


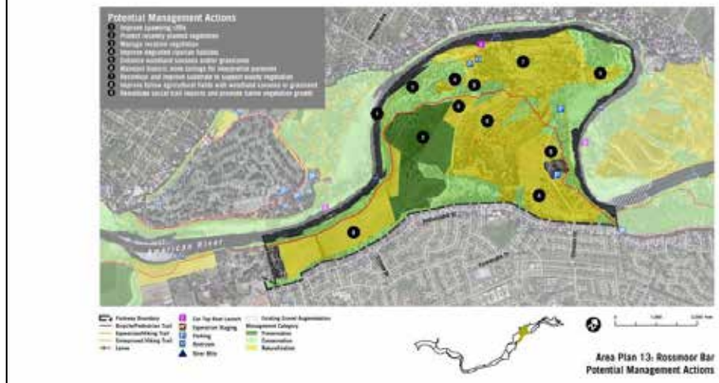



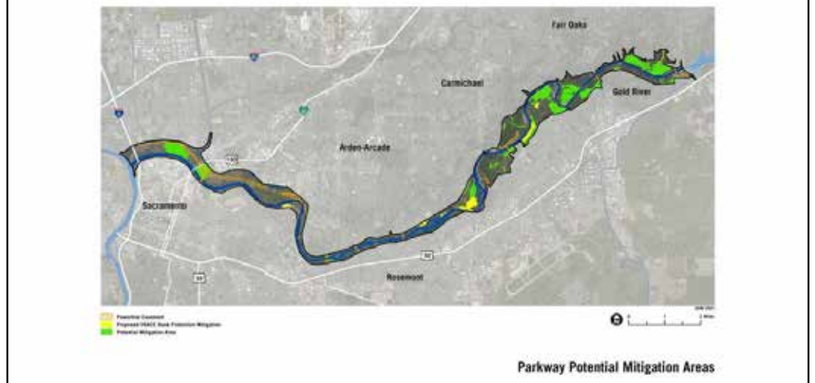
Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions


Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions

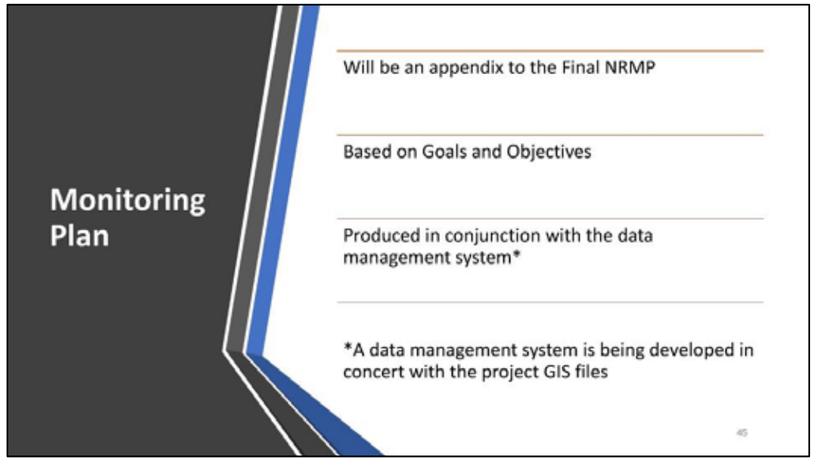
Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use




| FUNDING ENTITY | RATIONALE FOR PROPOSED PROJECT | POTENTIAL NUMBER OF ACRES AND/OR PROJECTS | TIMEFRAME FOR COMPLETION |
|---|---|---|---|
| USACE | Mitigation for the proposed bank protection | • 115 acres of native riparian vegetation communities; and<br>• 30 acres native elderberry | 3-5 years |
| PG&E | Mitigation for clearing and hardening of transmission lines | 11 acres of native woodland | 3-5 years |
| WCB | Potential future funding from WCB | • Three acres of native riparian vegetation communities;<br>• Three acres native elderberry;<br>• Two acres of native grassland; and<br>• Two acres of native woodland. | 3-5 years |
| USACE | Potential Ecosystem Restoration Projects | **Woodlake**<br>• 16 acres of native riparian vegetation communities;<br>• 50 acres of native grassland; and<br>• 41 acres of native woodland.<br>**Cal Expo (Bushy Lake)**<br>• 48 acres of native riparian vegetation communities; and<br>• 70 acres of native woodland. | 6-10 years |
| Water Forum | Mitigation for upstream dams | One salmonoid habitat enhancement project annually. | 3-5 years |

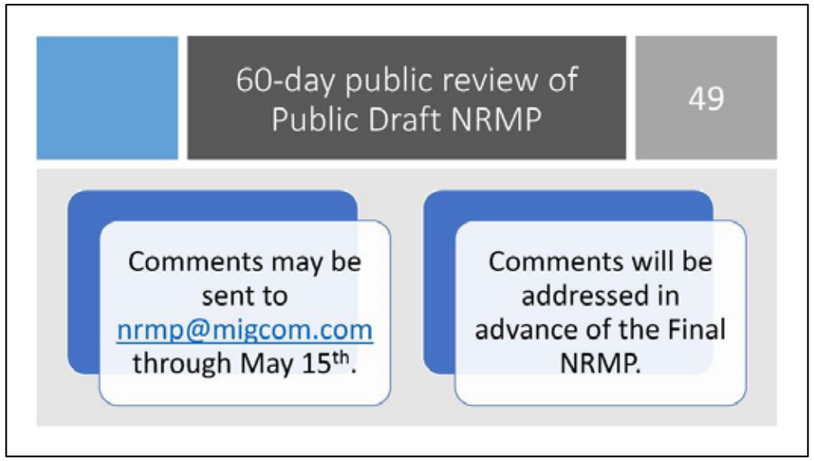
16

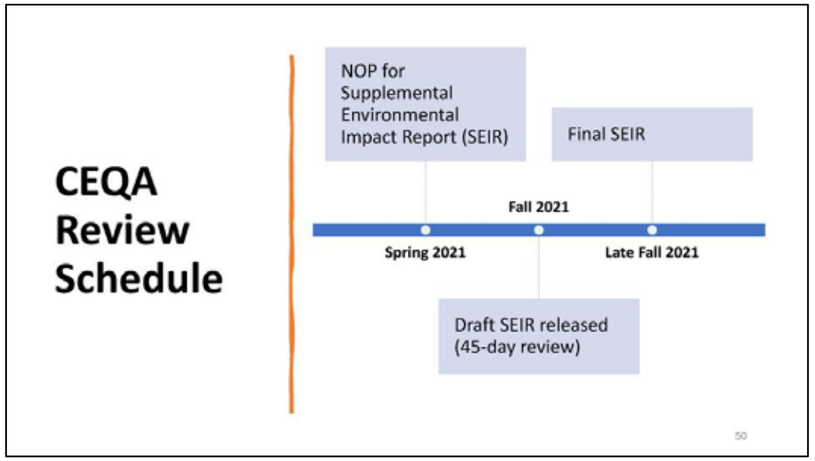

Monitoring Plan
Will be an appendix to the Final NRMP
Based on Goals and Objectives
Produced in conjunction with the data management system*
*A data management system is being developed in concert with the project GIS files
45

Monitoring Plan Components
Adaptive Management
Target species for observation
Monitoring interval and process
Data collection protocol, storage, and access
Accommodation for citizen science
Responsible parties and partners
Funding Sources
Success criteria
Reporting requirements
46

Next Steps . . .
47

SACRAMENTO COUNTY
LIVE / VISIT
BUSINESS
GOVERNMENT
Select Language
Regional Parks
Search...
AMERICAN RIVER PARKWAY
GIBSON RANCH
PARKS
ACTIVITIES
EVENTS/RESERVATIONS
RANGERS
ABOUT/MEETINGS
Home »
Natural Resources Management
Support Regional Parks, Save Time and Money - Purchase Your Parks Annual Pass Today
Public Draft Released
The public draft of the Natural Resource Management Plan (NRMP) for the American River Parkway (Parkway) has been released and is available for review.
NRMP Public Draft
NRMP Appendix A
NRMP Appenxid B
Popular Links
A - Z Regional Parks
Golf Course Gift Cards
Parks Annual Pass
SacCounty News Email Updates
ARP Multi-Use Trail Map

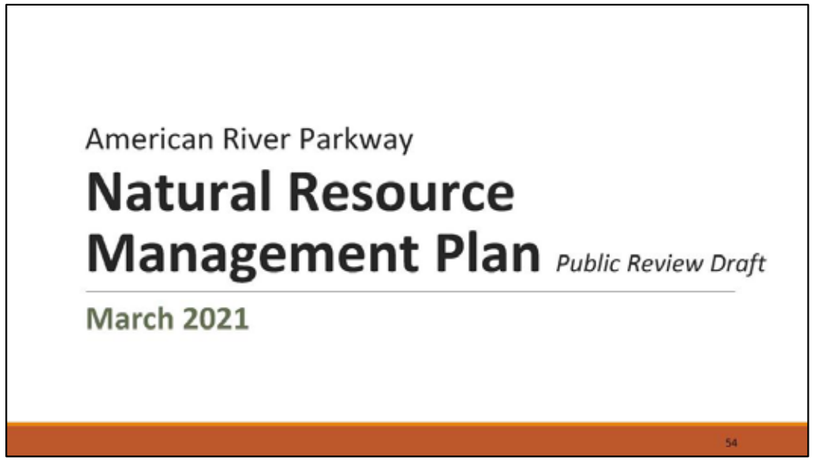

60-day public review of Public Draft NRMP
49
Comments may be sent to nrmp@migcom.com through May 15th.
Comments will be addressed in advance of the Final NRMP.


CEQA Review Schedule
NOP for Supplemental Environmental Impact Report (SEIR)
Final SEIR
Fall 2021
Spring 2021
Late Fall 2021
Draft SEIR released (45-day review)
50

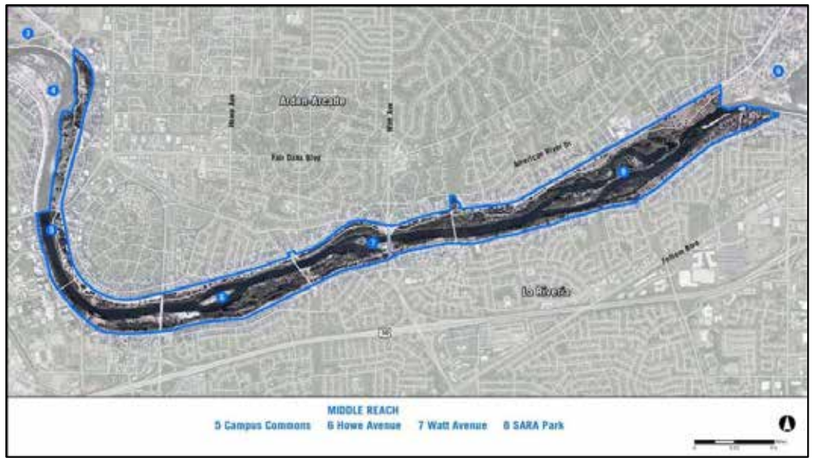
NRMP Public Meetings
Mar 19
9:30 am
American River Parkway Advisory Committee (ARPAC)
Mar 22
6:30 pm
Open Community Meeting
Mar 25
6:30 pm
Parks and Recreation Commission
March 26
2:00 pm
Open Community Meeting
51

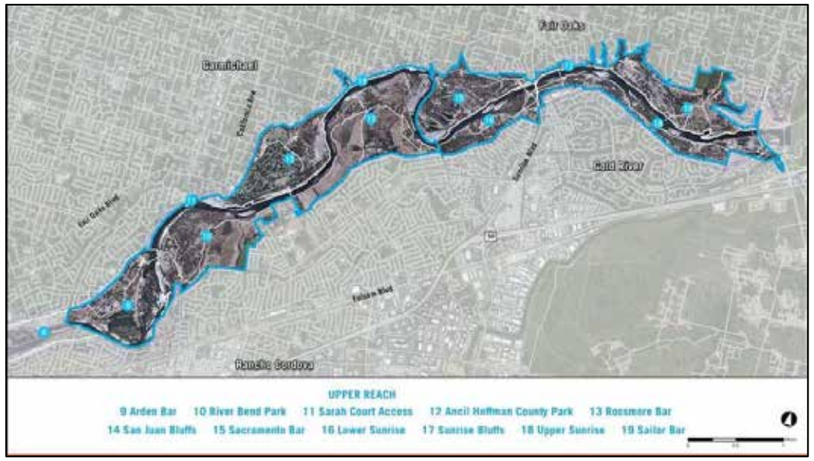
Many thanks to the funding partners!
Wildlife Conservation Board
SAFCA
County of Sacramento
52

Questions, Comments, Discussion
53


American River Parkway
Natural Resource Management Plan Public Review Draft
March 2021
54

Discovery Park
Woodlake
Cal Expo
Paradise Beach
LOWER REACH
1 Discovery Park 2 Woodlake 3 Cal Expo 4 Paradise Beach


Arden-Arcade
Campus Commons
Howe Avenue
Watt Avenue
SARA Park
MIDDLE REACH
5 Campus Commons 6 Howe Avenue 7 Watt Avenue 8 SARA Park




American River Parkway

# Natural Resource Management Plan *Public Review Draft*

March 2021

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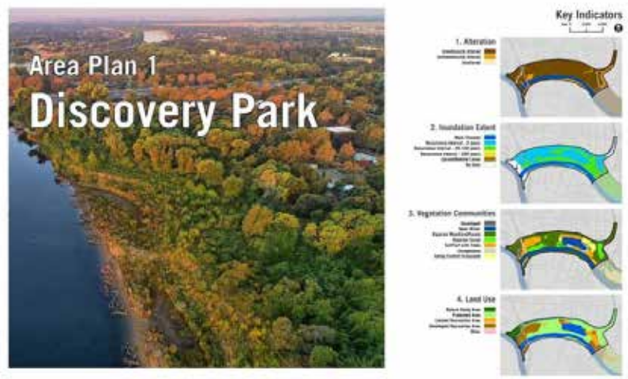
Google Search "Sacramento County Regional Parks NRMP"
- You will end up on the page shown in the next slide…

https://regionalparks.saccounty.net/Parks/Pages/NaturalResourcesManagement.aspx

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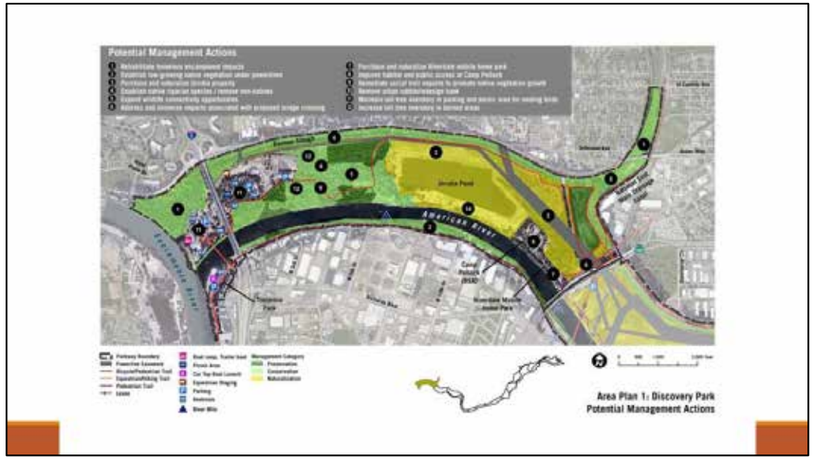
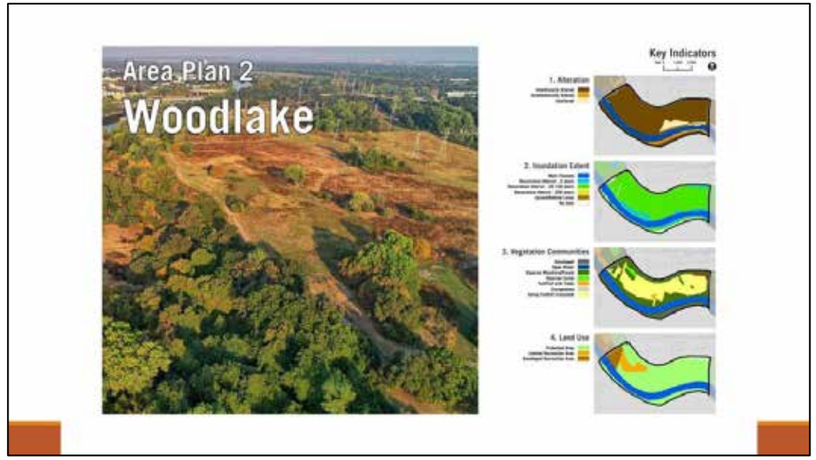
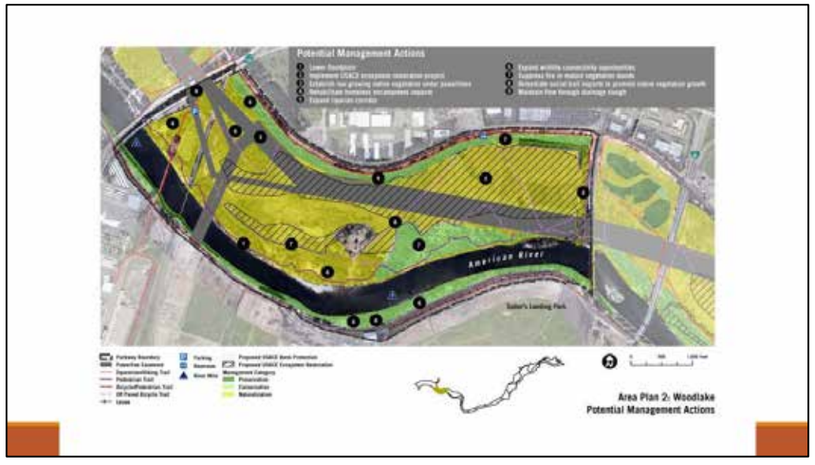
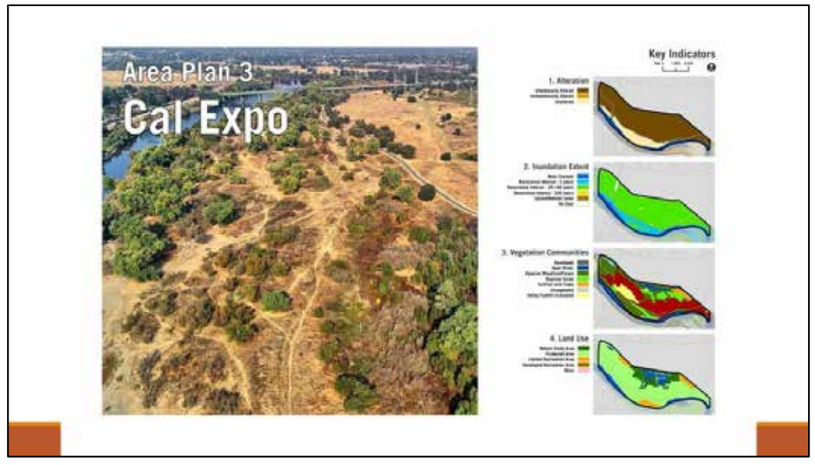
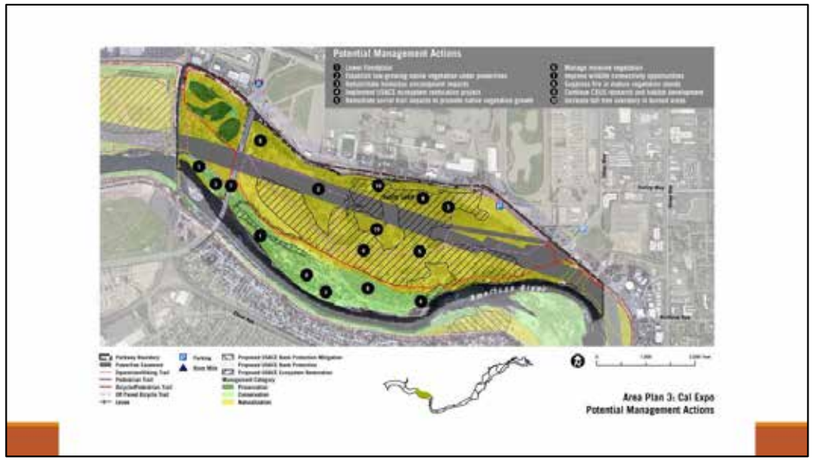
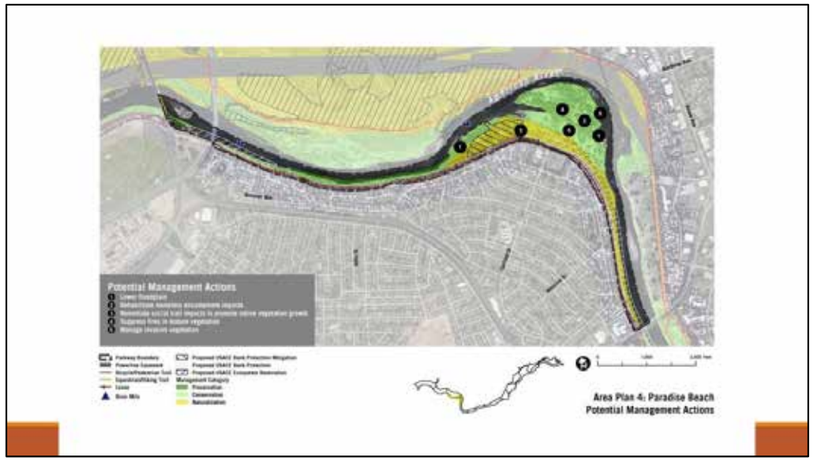

Potential Management Actions
Area Plan 1: Discovery Park
Potential Management Actions

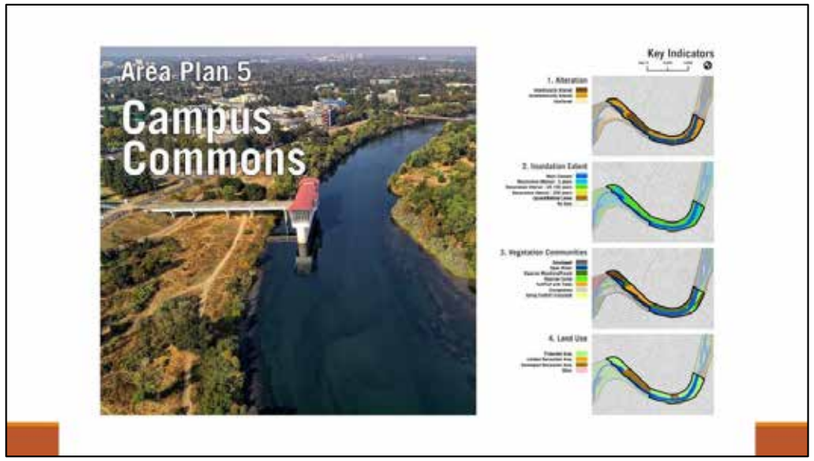

Area Plan 2
Woodlake
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

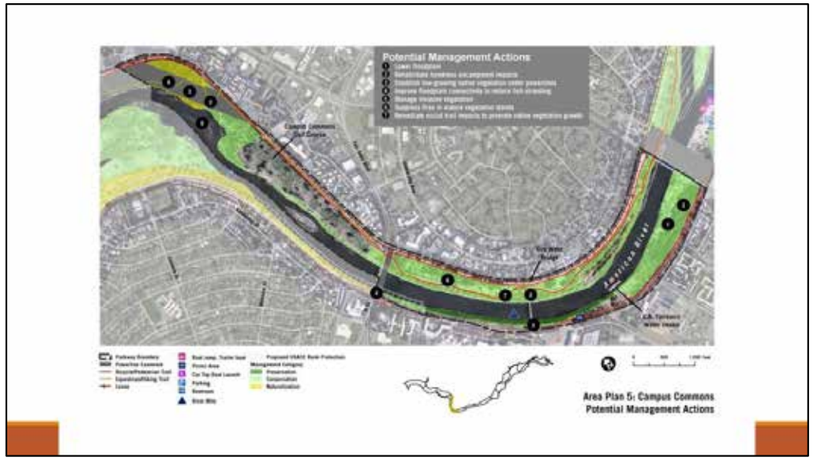

Potential Management Actions
American River
Area Plan 2: Woodlake
Potential Management Actions


Area Plan 3
Cal Expo
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions


Potential Management Actions
Area Plan 4: Paradise Beach
Potential Management Actions

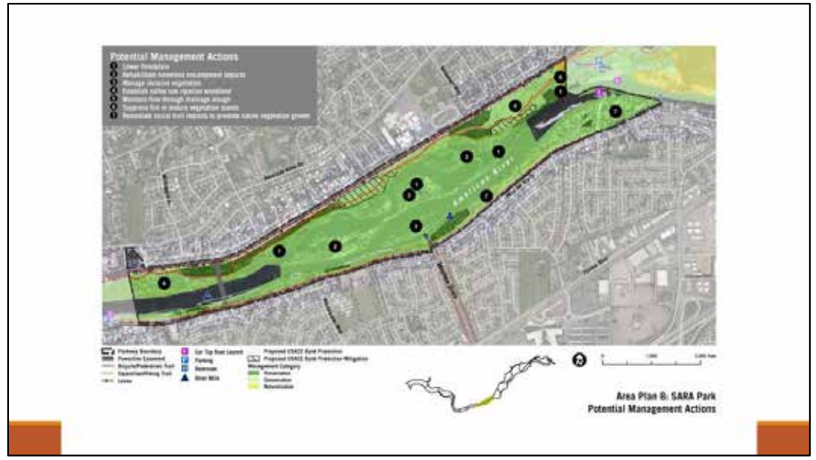

Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

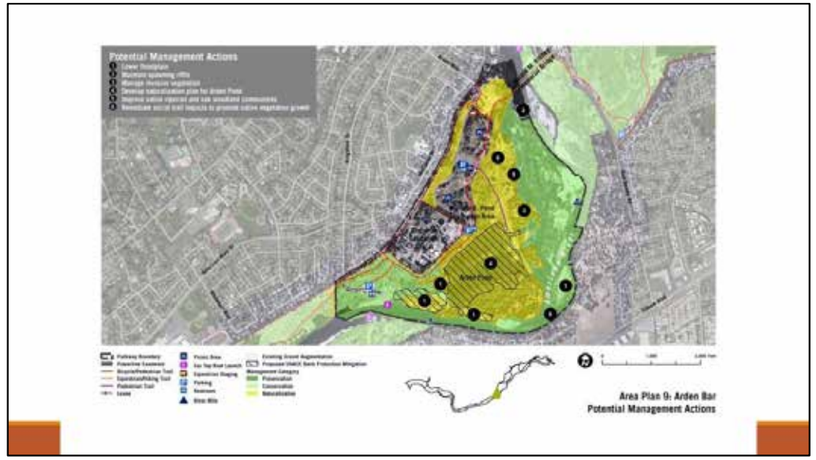

Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions

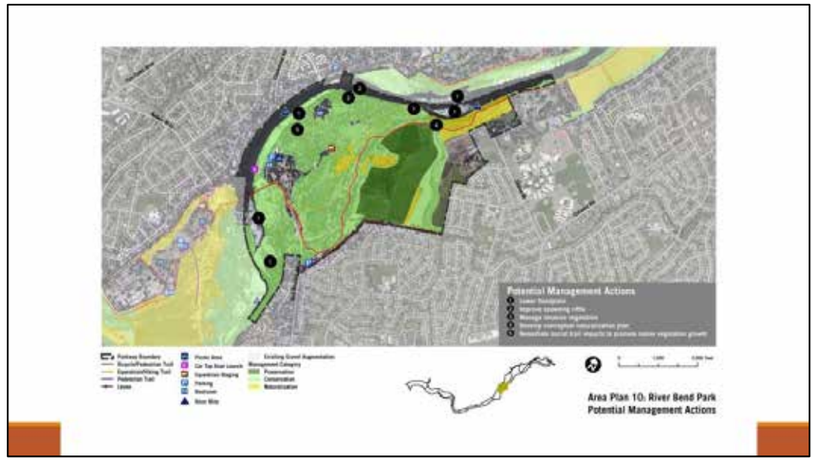
22

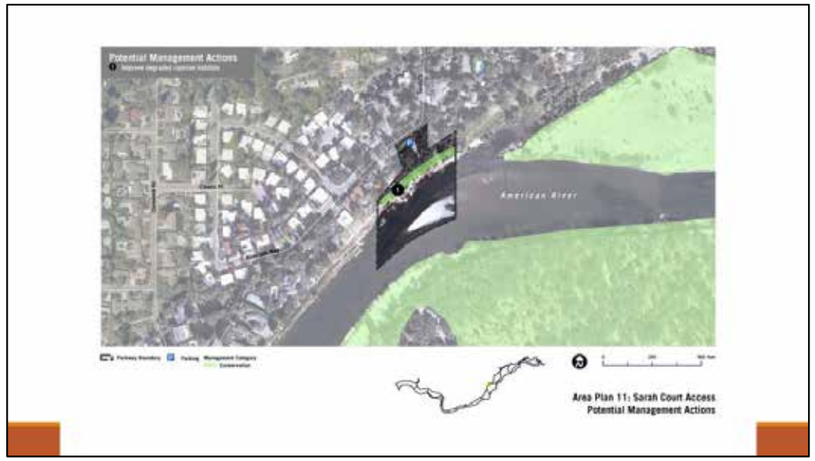
Potential Management Actions
American River
Area Plan 6: Howe Avenue
Potential Management Actions

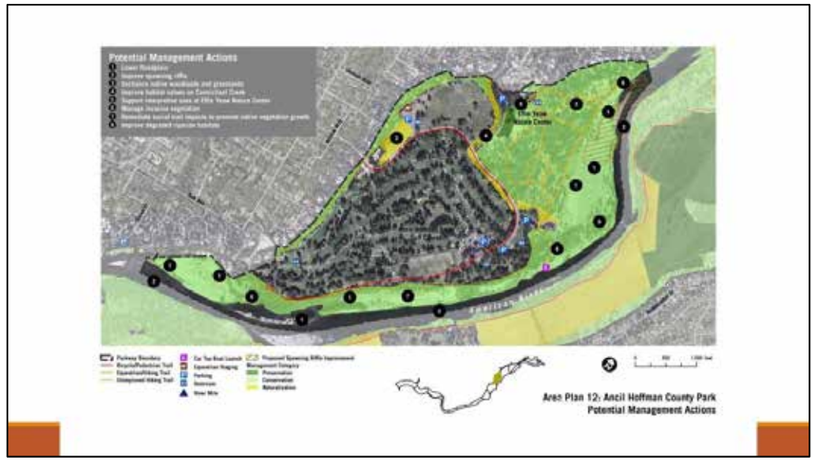
Potential Management Actions
American River
Area Plan 7: Watt Avenue
Recommended Management Actions

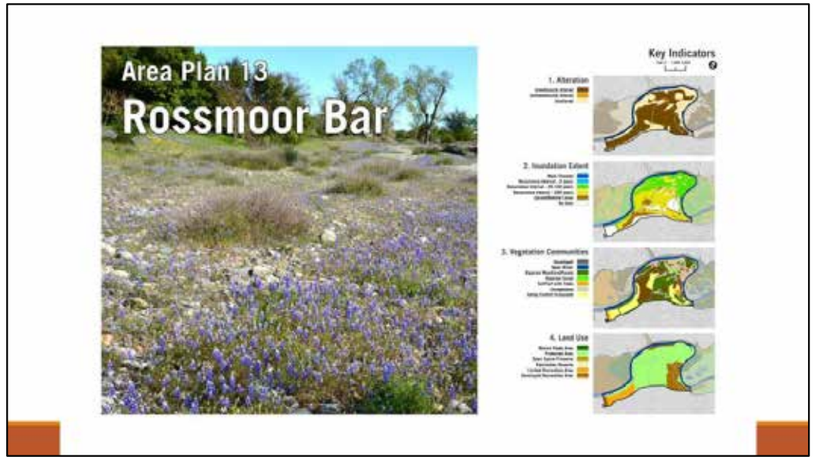

Potential Management Actions
Area Plan 8: SARA Park
Potential Management Actions

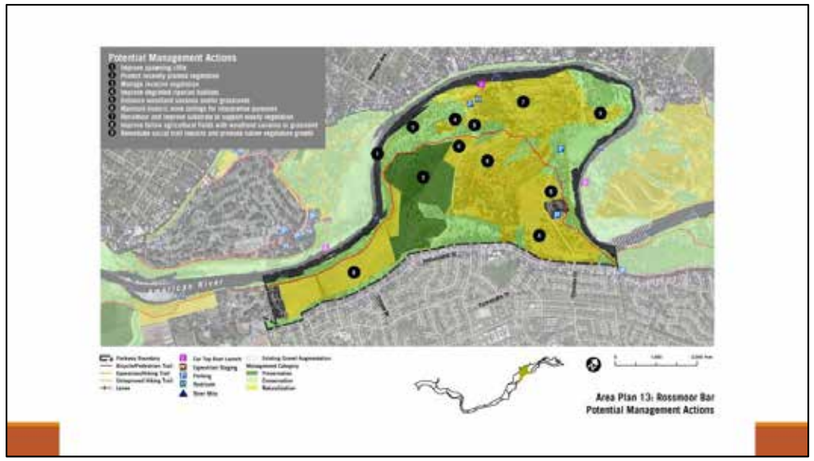

Potential Management Actions
Area Plan 9: Arden Bar
Potential Management Actions

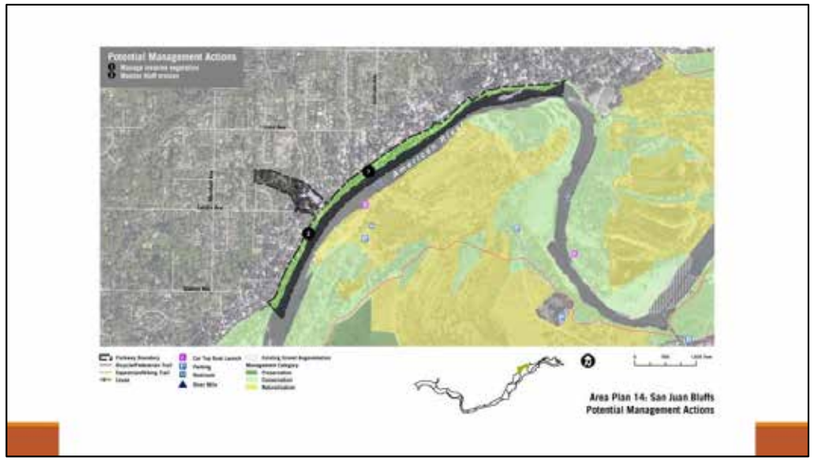

Potential Management Actions
Area Plan 10: River Bend Park
Potential Management Actions

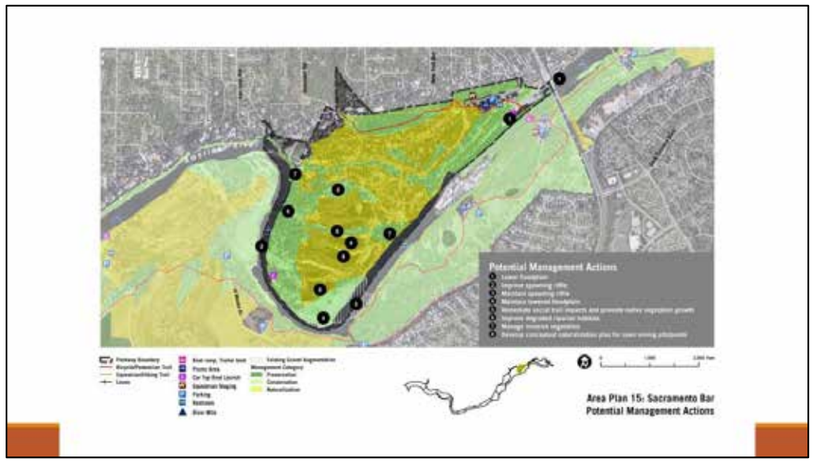

Potential Management Actions
American River
Area Plan 11: Sarah Court Access
Potential Management Actions

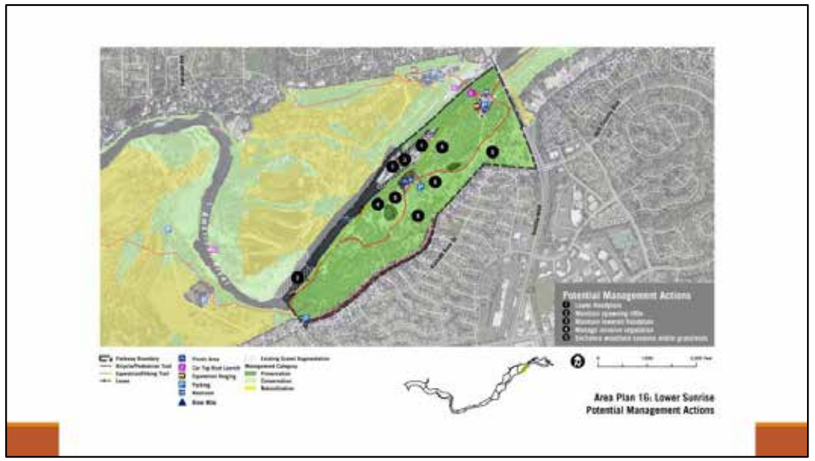

Potential Management Actions
Area Plan 12: Ancil Hoffman County Park
Potential Management Actions

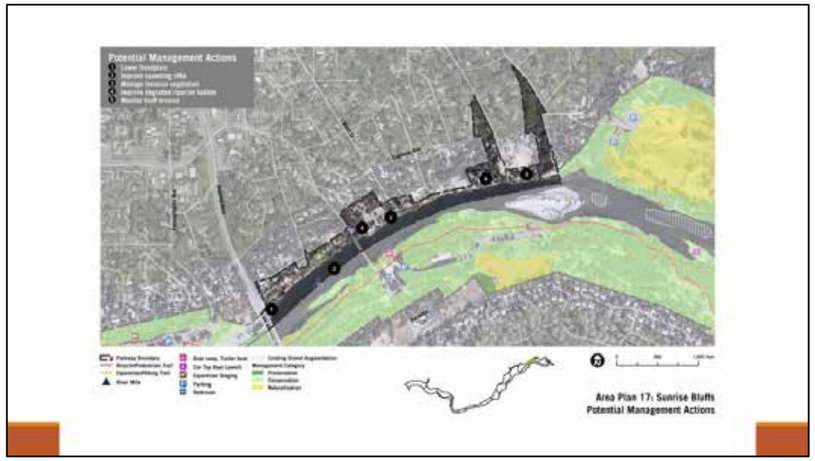

Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

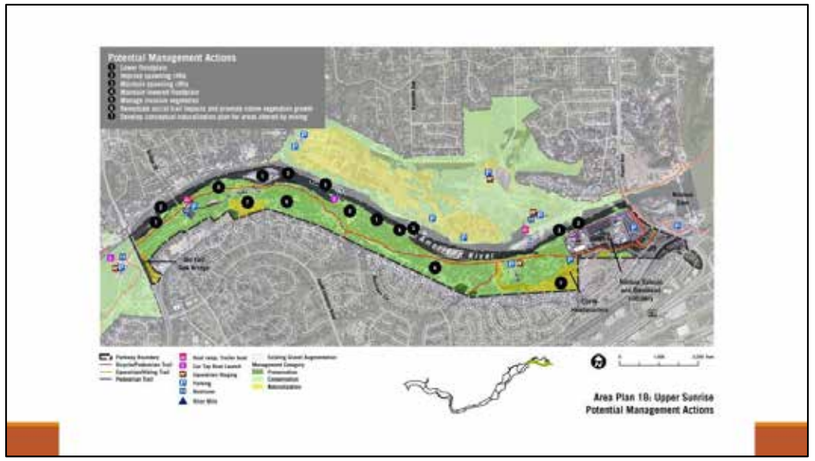

Potential Management Actions
Area Plan 13: Rossmoor Bar
Potential Management Actions

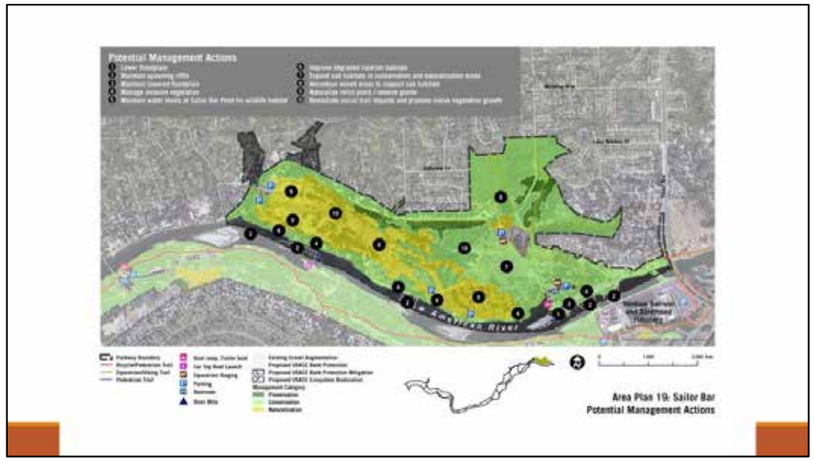

Potential Management Actions
Area Plan 14: San Juan Bluffs
Potential Management Actions


Potential Management Actions
Area Plan 15: Sacramento Bar
Potential Management Actions

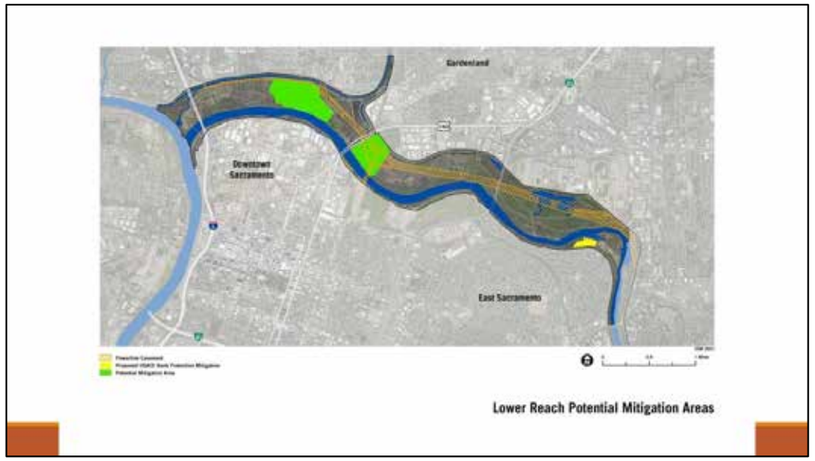

Potential Management Actions
Area Plan 16: Lower Sunrise
Potential Management Actions


Potential Management Actions
Area Plan 17: Sunrise Bluffs
Potential Management Actions

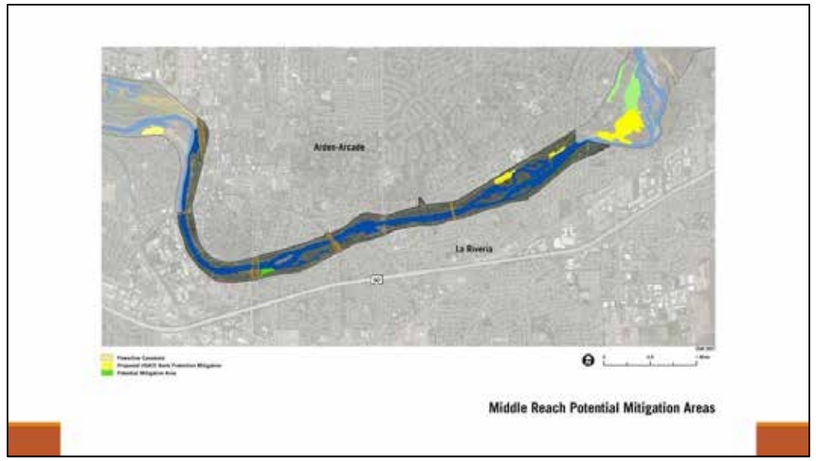

Potential Management Actions
Area Plan 18: Upper Sunrise
Potential Management Actions


Potential Management Actions
Area Plan 19: Sailor Bar
Potential Management Actions

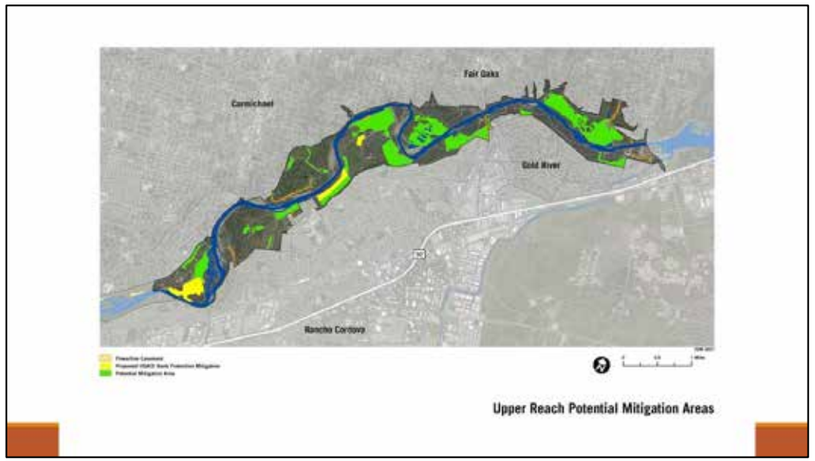
NRMP Partners
GOAL AREAS
AGENCY/ORGANIZATION
GOAL AREA 1 Biological Resources
GOAL AREA 2 Physical Resources
GOAL AREA 3 Cultural Resources
GOAL AREA 4
GOAL AREA 5 Agency and Community Coordination and Collaboration
American River Natural History Association
American River Parkway Advisory Committee
American River Parkway Foundation
Cal Expo
California Native Plant Society
California State University, Sacramento
City of Sacramento
City of Rancho Cordova
Department of Water Resources
Lower American River Conservancy
Pacific Gas & Electric Company
Reclamation Districts
Recreation and Park Commission
Sacramento Area Flood Control Agency
Sacramento City Fire
Sacramento County Department of Health and Human Services
Sacramento County Office of Education
Sacramento Metro Fire
Sacramento Municipal Utility District
Soil Born Farms
State Lands Commission
State Water Resources Control Board
University of California, Davis
U.S. Army Corps of Engineers
U.S. Bureau of Reclamation
Utility Arborist Association
The Water Forum
Tribal Governments
Western Area Power Administration
Wildlife Conservation Board




Lower Reach Potential Mitigation Areas




Middle Reach Potential Mitigation Areas




Upper Reach Potential Mitigation Areas

APPENDIX A

# ARPAC NRMP WORKSHOP 2020 SUMMARY REPORT



## AMERICAN RIVER PARKWAY ADVISORY COMMITTEE (ARPAC)
## AMERICAN RIVER PARKWAY (ARP)
## NATURAL RESOURCES MANAGEMENT PLAN (NRMP)
## WORKSHOP

Friday, July 10, 2020 ◆ 9:30 a.m. – 11:00 a.m.
Online by Zoom

## SUMMARY REPORT

### INTRODUCTION

On July 10, 2020, the American River Parkway Advisory Committee (ARPAC) held a workshop on the American River Parkway (ARP) Natural Resources Management Plan (NRMP). The purpose of the meeting was to: (1) provide an overview and status of the draft NRMP; (2) introduce and describe the NRMP Task Force; (3) describe the NRMP framework; (4) present draft NRMP mapping products.

### Meeting Format

The ARPAC NRMP workshop occurred on July 10, 2020, from 9:30 a.m. to 11:00 a.m. online by Zoom. Meeting participants included members of the ARPAC, Sacramento County Department of Regional Parks (Regional Parks or County Parks) staff, and consultant staff from MIG, Inc. Attachment A of the Summary Report Appendix includes the PowerPoint presentation slides displayed and discussed during the meeting.

### AGENDA

Daniel Iacofano of MIG, Inc. opened the meeting and asked the ARPAC members to introduce themselves and their organizations to the group. Mr. Iacofano expressed his appreciation to have the opportunity to discuss the NRMP with the ARPAC to gain community input on managing a Wild and Scenic River. He explained the ARPAC members would be given the opportunity to pose questions and comments following the presentation. Mr. Iacofano then presented the meeting agenda, giving a brief overview of each topic of discussion, and handed the meeting over to Bill Spain of MIG, Inc.

### POWERPOINT PRESENTATION

Mr. Spain gave an overview of the draft NRMP chapters, proposed types of implementation activities in the NRMP (i.e., site and land management; visitor management, agency

coordination, oversight, and reporting; and monitoring), the status of the draft NRMP (i.e., preliminary administrative draft, updated administrative draft, and the public draft), the NRMP Task Force, and the NRMP framework (Mission and Vision of NRMP, Goals, Objectives, and Performance Measures).

Mr. Iacofano then turned the meeting over to Jon Campbell of MIG, Inc. to give an overview of the NRMP mapping and GIS approach, including draft mapping products and the level of detail included therein. Mr. Campbell introduced preliminary graphics produced for the NRMP, including Parkway-wide inundation, vegetation communities, and invasive species maps, and three Area Plan-specific maps with existing and desired conditions, key indicators, and recommended management actions.

**OPEN DISCUSSION**

Mr. Iacofano opened the meeting to general questions and comments on the scope of the NRMP and the proposed goals and objectives. He prefaced the discussion with a reminder that the NRMP intends to manage natural resources within the boundaries of the American River Parkway Plan, and the NRMP intends to ensure the U.S. Army Corps of Engineers' (USACE) and the Sacramento Area Flood Control Agency's (SAFCA) concurrent flood control projects maximize benefits to natural resources.

Comments and questions from the ARPAC members are listed below. Responses from the meeting facilitators are given in *italics*. Each individual bullet point may include a single comment and response, or a back-and-forth conversation.

- Is there any plan to prevent horses and/or humans from using bike trails?
  (MIG) *At this point I am not aware of any plans to do so. There might be potential recommendations to realign trails to protect natural resources. However, recreational user values need to be maintained.*

- Does the NRMP's scope include signage to address or prevent user conflicts?
  (MIG) *I think it will. We want to use some type of uniform signage, nothing too obtrusive. Informing people about proper use will help protect natural resources in addition to ensuring a safe user experience. Therefore, we think signage is going to be a component of the NRMP.*

- As an ethnoecologist working with culturally significant plants, I have been awarded a grant by the Wildlife Conservation Board (WCB) to work with County Parks at Cal Expo on the restoration of Bushy Lake. We have a lot of data, and we have planted at least six (6) acres for eco-cultural restoration. We are adding a combination of culturally significant and pollinator plants. I would like to make sure we get advice from you as we move forward with our conceptual restoration plan. We would like to connect with everyone. I want to make sure Bushy Lake is not recognized as a USACE restoration





project. We are happy to work with Caltrans, USACE, and Cal Expo, but I have not talked to the USACE in the five (5) years I have been out there working with Mary Maret of Regional Parks, Audubon, and others. I want to make sure the extensive research and work we are doing out there is part of this plan. In addition, we are discovering a lot of Western pond turtles have been hit by bikers during the nesting season.
(MIG) *That sounds good. We would welcome your help in that regard. That is the purpose for this type of interaction—to make sure we coordinate with these ongoing restoration efforts and ensure the NRMP complements, rather than contradicts, parallel efforts. We would welcome information from you regarding the extent and area of your restoration activity. We need to factor that into the plan.*
My goal is to become obsolete and leave a treasure behind for the Lower American River. A stakeholder advisory group is required under my grant; perhaps we can discuss whether I can serve on the advisory committee and get input on our restoration plan instead of reinventing the wheel. I am really looking for partners and collaborators.
(MIG) *That sounds great.*

- I did not see yellow star thistle on the invasive plant list. Yellow star thistle is a major issue out there. I would like to see the river treated as a habitat corridor for fish. We know we are providing all the elements for the fish in a connected way. We do all these projects, but they never hang together to form a complete picture. Regarding stakeholders, I did not see Leo Winternitz on your list of participants in the NRMP Task Force. I feel we need to call out Sutter's Landing Park. At the moment it is lumped into the Woodlake Area Plan, but it needs its own attention. It has its own significant problems, and it has its own set of resources that are not getting enough attention. It is becoming a high recreation use area. Recreation and natural resource protection are butting heads in that area. The Salmon Festival has been defunct for several years, so please remove that from your list of large events. You might want to insert Aftershock as an intensive group activity that has the potential to be a factor in ecological disturbance. Is urban runoff something we should be looking at as far as water quality is concerned? I am not sure if that is something you want to go into or not. I am also very interested in your NRM #13 in the documents you gave us to look at. You said you were going to look at imprecisely used terms in the American River Parkway Plan [Parkway Plan] and your Task Force was going to agree on some better definitions. I think the stakeholders will want to make sure the new terminology keeps with what we understand the Parkway Plan to be saying. I think we really have to remember that recreation is an important source of funding for the County and for the cities, the City of Sacramento in particular. I would like to discuss if we are collecting money from recreation and special events; at least a portion of that money needs to be reinvested in the Parkway in some concrete way that we can see. During this process, we should take a look at including an update of the Memorandum of Understanding [MOU] with Cal Expo for Bushy Lake. That was supposed to have occurred years ago as part of the Parkway Plan, but it is not complete today. This causes problems when all the parties involved do not know which areas are under their authority.

(MIG) *Regarding tweaking any Parkway Plan terminology, yes, there has to be a clear crosswalk if we make any changes. You made some really good points. Regarding urban runoff, we do need to concern ourselves with that from the standpoint of protecting natural resources. There may be pollutants there degrading the vegetation we are trying to establish. It is to our benefit to deal with stormwater runoff and water quality. I think the map we presented with the streams and creek flows coming into the Parkway gives us a clue as to where to focus attention in that regard.*

- I know that in previous correspondence we have discussed fire fuel reduction plans. How does that dovetail with the NRMP, or in what section is it mentioned in the NRMP? I would like bring discussion and language related to existing fire fuel reduction activities into the NRMP.
  (MIG) *We have raised the subject of wildfire protection and vulnerability and we are going to map the risk and vulnerabilities associated with that.*
  (Regional Parks) *We have fire fuel reduction plans that are put together every year. We can look at incorporating those into the NRMP.*

- I had a chance to review all the materials. Thank you for a great presentation. In the Human Use section there are two pieces of information related to electrical utilities. Before there was a Parkway, the river was a transmission corridor for federal, state, investor-owned, and community-owned [SMUD] power. The Parkway grew up around the transmission corridor. I think the NRMP minimizes the impact and importance of electrical facilities. I did not see any overlays or mapping of any facilities. I think that is an important aspect of the Parkway. I think it would be important to have a utility representative on the Task Force because electrical utilities are much more significant than the other two line items in the Industrial section of the chapter. We have done a lot of work with Mary and Liz in implementing the wildfire mitigation plans. Utility companies are required to do that as part of State wildfire mitigation plans. This would be the perfect time to align the utility wildfire plans with the NRMP.
  (MIG) *That is a good point. We are going to be mapping the utility corridors and facilities. That is still to come. I think your idea of having a representative from a utility company for the purpose of coordinating with other agencies is a good idea.*
  *(MIG) We have the utilities data, but I did not include layers on the maps this round. I also did not include wildfire layers, which would be good to include.*
  (MIG) *As we know we are in the height of fire season in California, so this is on our minds. We could do all of this work restoring natural resources and have it wiped out in that area.*

- Are you going to re-map invasive species? If not, why?
  (MIG) *I believe we have to use the data we have currently. We do not have scope nor budget to go out and do original field surveys at this point.*
  (MIG) *We have gone back and forth on how we want to present yellow star thistle. We have that as polygon data, rather than as point data. We are trying to figure out a way*





*to incorporate yellow star thistle. We do not have an opportunity to re-map invasive vegetation at this point.*

- I am concerned as well. I think I heard that the most recent mapping information you have is from 2011. Is that correct?
  (MIG) *2011 is as far back as we reached. We looked at the data up to 2019, maybe 2018.*

- Are you using the American River Parkway Foundation's (ARPF) Invasive Plant Management Plan (IPMP) data?
  (MIG) *Yes, this is IPMP data.*
  So, you are using our maps, not a different source of information?
  (Regional Parks) *Yes, I used all the information I could get, including from Google Maps, and data maintained by the ARPF.*

- I was concerned the benchmark was going to be 2011 and that is not realistic. I have only been working with invasive plants since 2011 and I know that certain areas are very different than they were 10 years ago. What are you using as the benchmark for sensitive species and native plants?
  (Regional Parks) *It depends upon the sensitive species to which you are referring. Is there one you are most concerned about?*
  Elderberry is one of them, but I do not know that much about sensitive species. I also know there are potentially a lot more invasive, non-natives we should be targeting in addition to the species we target currently. Fennel, hemlock, and stinkwort were not presented in your list earlier.
  (MIG) *Please send us a list of invasive or special-status species you would like us to add to our list of species of concern.*
  (MIG) *For sensitive species we are using CNDDB. We are also going to look into iNaturalist data. We would supplement that information with local knowledge, and we may even remove some species we retrieve from CNDDB if they are extraneous.*
  (Regional Parks) *We picked our invasive species based upon the IPMP. I have other species mapped, including black locust, tree of heaven, and fig. I could put together a yellow star thistle map, if needed. So, there is more information that I have but have not included on the maps because we decided to limit our scope to the worst weeds and those that have been vetted through the IPMP.*

- How recent is the totality of this data on invasive species?
  (MIG) *I believe we are looking at 2011 to 2018. I do need to double check that range of years.*

- How can we add our local knowledge to this database?
  (MIG) *If you have GIS point information on invasive species, we could consider including that data. Please send it to us. If you have data in other formats, we will accept it and see if we can figure out ways to incorporate it into our products.*

To whom should we send out information? We have a lot of information on River Mile (RM) 12 south garnered over many years working in that area.
(MIG) *Please send any information you have to Liz Bellas with Regional Parks. We will incorporate it into our invasive species map. We welcome that citizen science component.*

- I heard you mention citizen science and iNaturalist as potential sources of data. There is tremendous information about bird life provided through eBird, which is the Cornell University site that most Audubon members participate in.
(MIG) *We have access to that dataset and we will be looking into the information it can provide.*

- In Section 7.3 of the document you gave us, you talk about an interagency task force or group. I really would like you to explore what that is supposed to mean. There are so many fingers in the Parkway. I would like to see an interagency group that meets regularly, keeps the Parkway Plan and NRMP front and center, and constantly interfaces to make sure that the plans are being implemented as envisioned.
(MIG) *We agree. As is evident, you have all worked on this project in one way or another. We need a way to keep everything organized and maintain that cross-agency communication. That is why agency coordination is a goal of this document, Goal #7 to be exact.*

- I wanted to add there are some additional notable facilities in the Discovery Park Area, specifically, Camp Pollock. I do not know how much detail you are going to include regarding other recreational facilities. In addition to small special events, there are day use picnic tables, parking facilities, and other existing recreational opportunities. While privately managed, Sacramento Valley Conservancy is held to the same standards and oversight by Regional Parks as far as our compliance with the Parkway Plan. So, I wanted to note there are more facilities than those currently reflected in the NRMP materials.
(MIG) *Is there room here to work with the individuals managing that facility in terms of making it more compatible with the existing and surrounding natural resources? What is your take on how that facility impacts natural resources?*
Sacramento Valley Conservancy directly manages Camp Pollock, which is owned by the State Lands Commission. All our existing uses are in compliance with the Parkway Plan. I think Camp Pollock is worth noting in this document. We also have GIS data on invasive species that I would be happy to forward to you.

- Utility company vegetation management activities are referred to as ecosystem simplification in Chapter 6 of the draft NRMP materials. However, in fact, we call our activities integrated vegetation management. It may look like we are taking down trees at random. However, at the foundation of our activities, there is the elimination of invasive species and the propagation of an environment where native species can survive. We worked in Serrano last year, and if you want to see how a utility company





can restore the natural aspects of a landscape that is how it is done. I can share pictures of that work.
(MIG) *That is a good point. To the extent that we can all follow best practices as individual actors and agency players, then that is all helping to move in a common direction. If vegetation management is conducted in the way you described, then there are multiple benefits that we can attributes to utility corridors.*

Mr. Iacofano ended the open discussion period with a discussion on next steps, including online public meetings, an online map-based survey, and additional meetings with ARPAC and the Recreation and Park Commission (RPC). He then thanked the ARPAC for its feedback and turned the workshop over to Ms. Bellas for final comments. Ms. Bellas thanked Mr. Iacofano for the presentation, encouraged the meeting participants to send in written comments, and reminded the group of the upcoming online survey starting July 15, 2020.

**Zoom Chat Comments**

The following comments were made in the Zoom Chat feature during the workshop. Comments are verbatim.

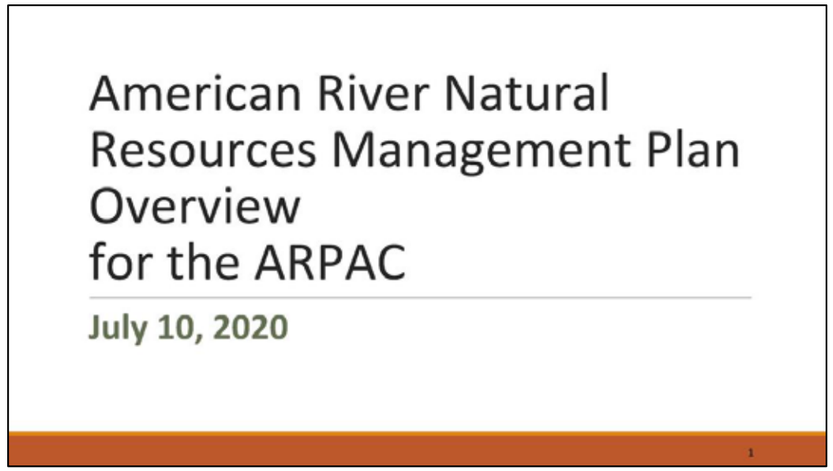
- This Bushy Area is an ongoing Eco Cultural Restoration Project and funded for a Conceptual Restoration Plan, with a reference six-acre project underway by Sac State.
- All written comments can be sent to Liz Bellas, bellase@saccounty.net
- I can be reached at Michelle Stevens, stevensm@csus.edu if you would like an update or more information on Bushy Lake. We are updating our web site www.bushylake.com plus a Wikipedia page.

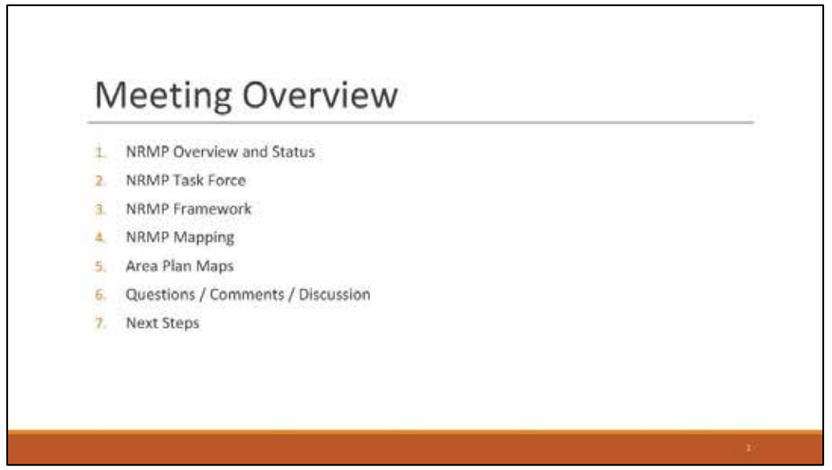
**AMERICAN RIVER PARKWAY ADVISORY COMMITTEE**
**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**WORKSHOP**

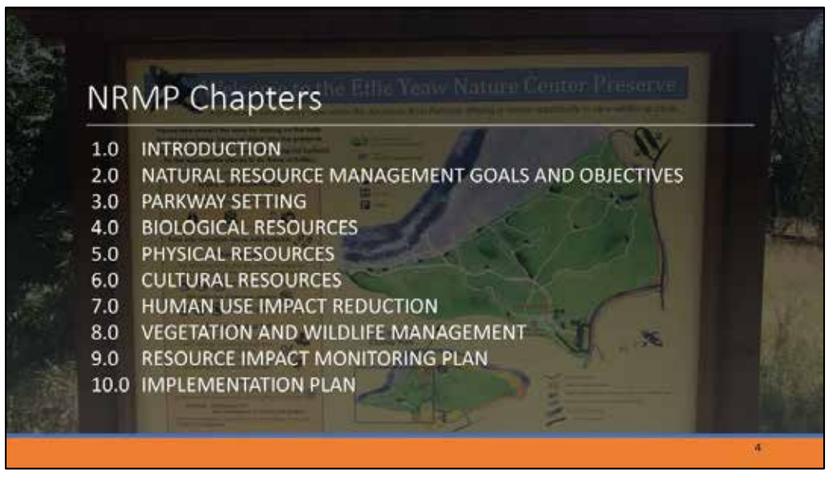
Friday, July 10, 2020 ◆ 9:30 a.m. – 11:00 a.m.
Online by Zoom

## APPENDIX TO SUMMARY REPORT

**ATTACHMENT A: POWERPOINT SLIDES**

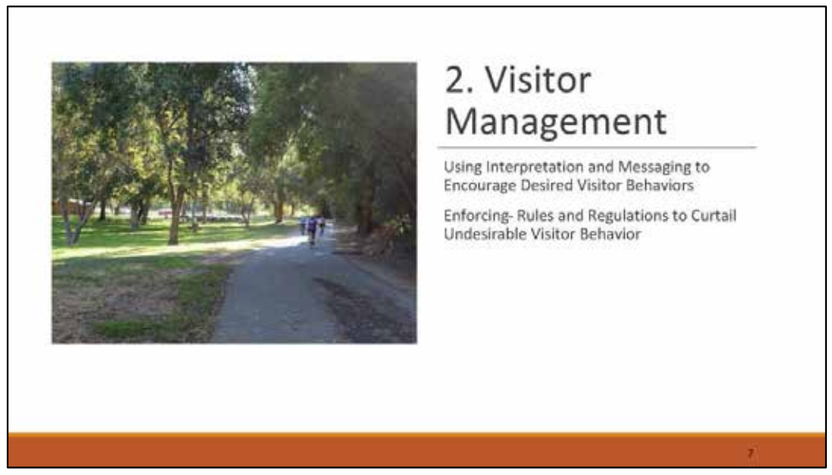


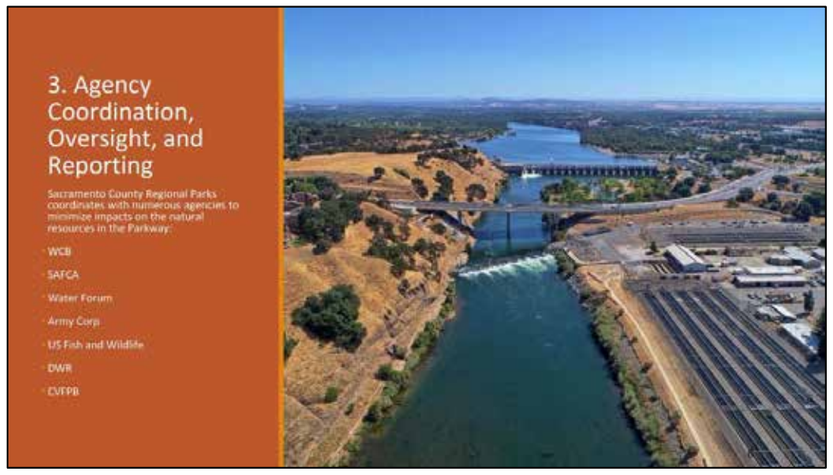





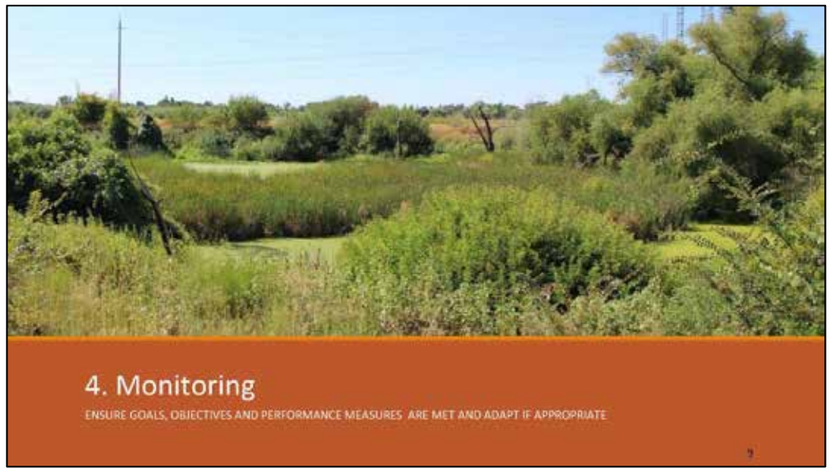
Implementation Activities
Includes the following types of actions:
1. Site and Land Management (Including Restoration)
2. Visitor Management
3. Agency Coordination, Oversight, and Reporting
4. Monitoring
5

1. Site and Land Management
Identifying Area for Restoration
Facilitating Restoration Activities
Protecting Special Status Species
Managing Areas Impacted by Human Uses including recreation
Managing Environmental Threats to Existing and Restored Lands
6


2. Visitor Management
Using Interpretation and Messaging to Encourage Desired Visitor Behaviors
Enforcing- Rules and Regulations to Curtail Undesirable Visitor Behavior
7

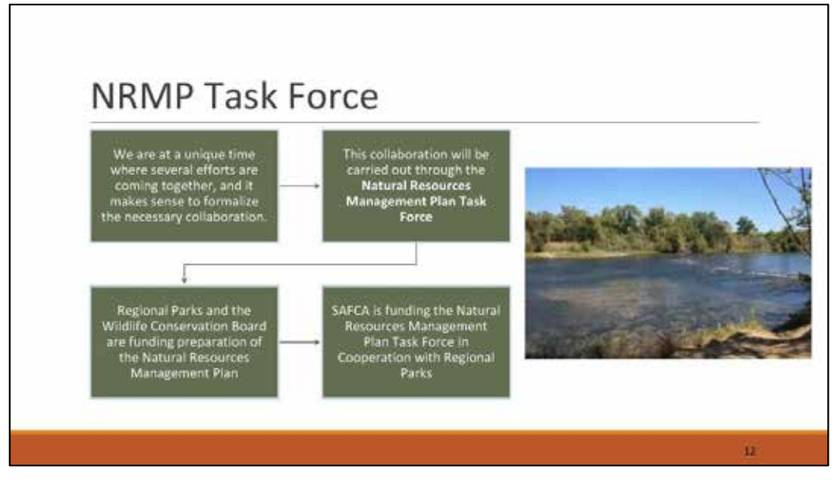

3. Agency Coordination, Oversight, and Reporting
Sacramento County Regional Parks coordinates with numerous agencies to minimize impacts on the natural resources in the Parkway:
WCB
SAFCA
Water Forum
Army Corp
US Fish and Wildlife
DWR
CVFPB

10


4. Monitoring
ENSURE GOALS, OBJECTIVES AND PERFORMANCE MEASURES ARE MET AND ADAPT IF APPROPRIATE
9

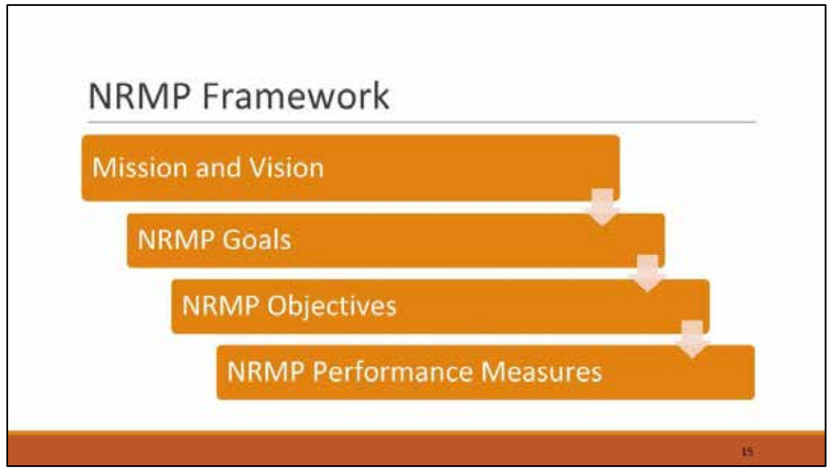
NRMP Status
Preliminary Administrative Draft Delivered to Regional Parks (February)
Task Force Commences (June)
Updated Administrative Draft (Chapters 1,2,3 and 7) Provided to Advisory Committee and the Public
Public Draft (November)
10

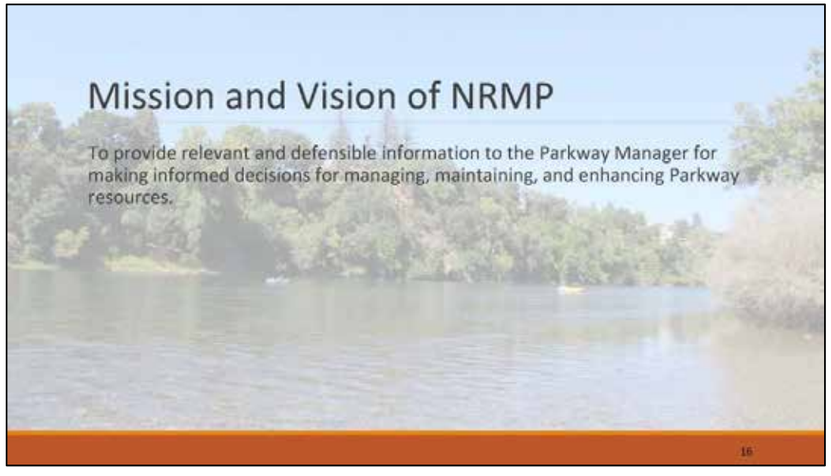
NRMP Task Force
11

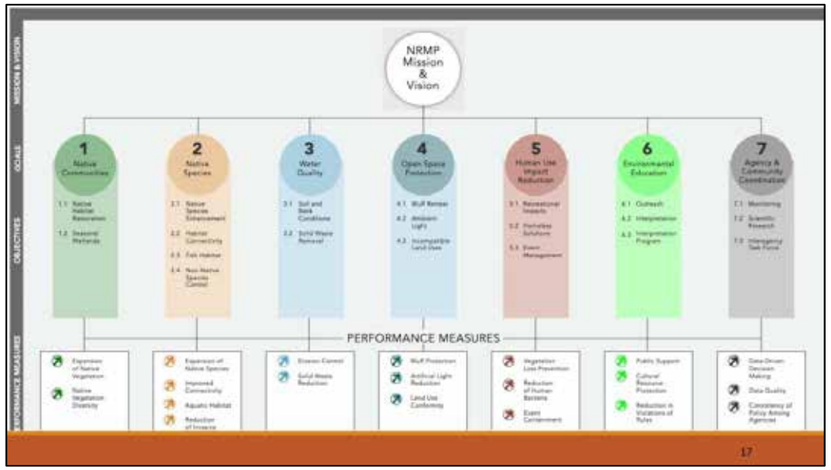

NRMP Task Force
We are at a unique time where several efforts are coming together, and it makes sense to formalize the necessary collaboration.
This collaboration will be carried out through the Natural Resources Management Plan Task Force
Regional Parks and the Wildlife Conservation Board are funding preparation of the Natural Resources Management Plan
SAFCA is funding the Natural Resources Management Plan Task Force in Cooperation with Regional Parks
12

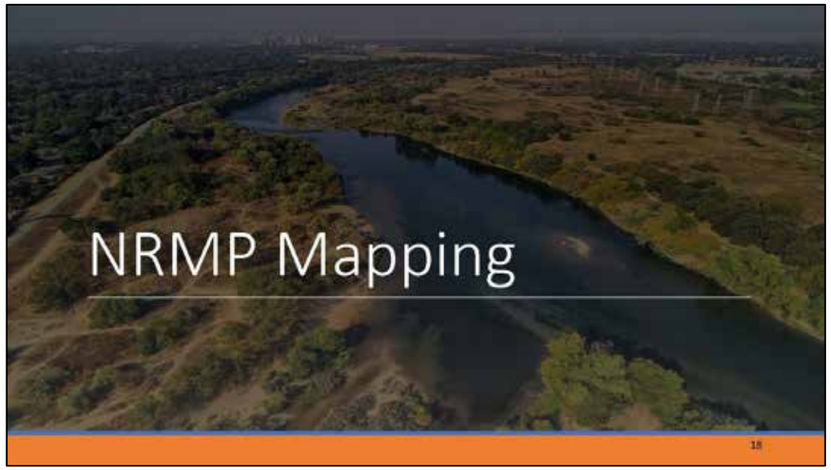
NRMP Task Force Member Organizations
Sacramento County Department of Regional Parks
Sacramento Area Flood Control Agency
The Water Forum
U.S. Army Corp of Engineers
Wildlife Conservation Board
Central Valley Flood Protection Board
American River Parkway Foundation
Sacramento County Department of Environmental Review and Assessment
WRC Environmental
ICF
MIG
13

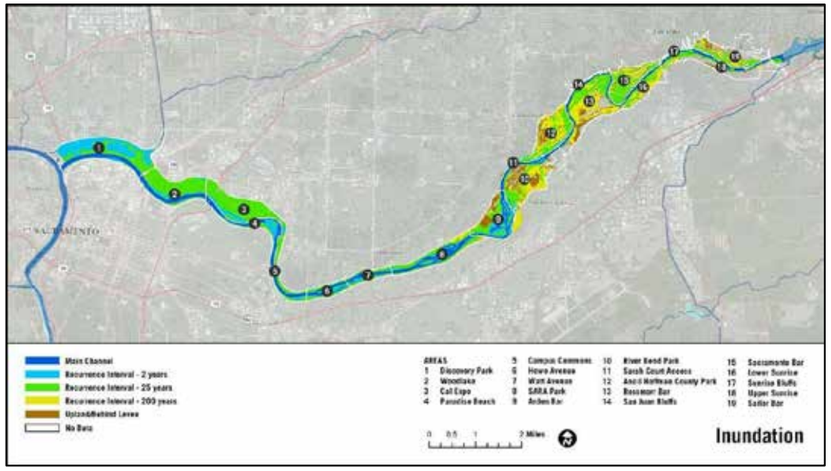
NRMP Framework
14

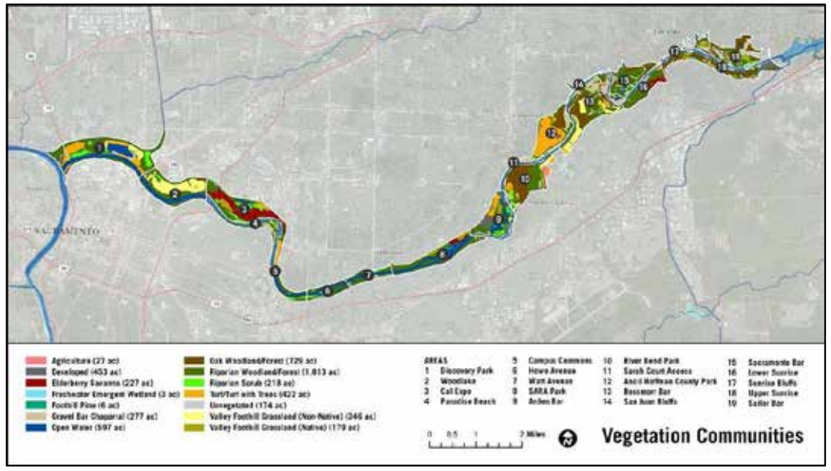

NRMP Framework
Mission and Vision
NRMP Goals
NRMP Objectives
NRMP Performance Measures
15

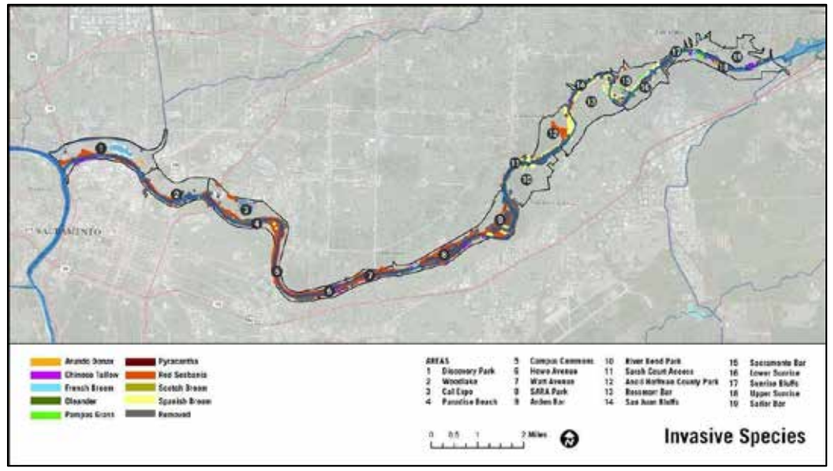

Mission and Vision of NRMP
To provide relevant and defensible information to the Parkway Manager for making informed decisions for managing, maintaining, and enhancing Parkway resources.
16

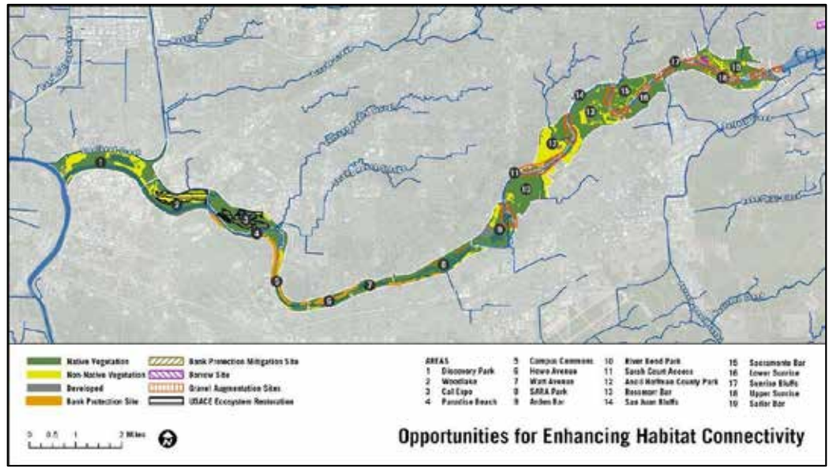

NRMP Mission & Vision
MISSION & VISION
GOALS
OBJECTIVES
PERFORMANCE MEASURES
1 Native Communities
2 Native Species
3 Water Quality
4 Open Space Protection
5 Human Use Impact Reduction
6 Environmental Education
7 Agency & Community Coordination
PERFORMANCE MEASURES
17


NRMP Mapping
18

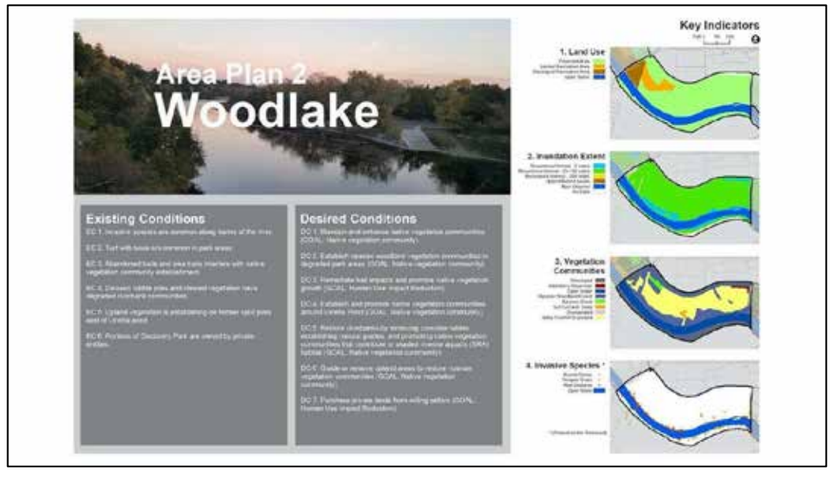

Main Channel
Recurrence Interval - 2 years
Recurrence Interval - 25 years
Recurrence Interval - 200 years
Inland/Behind Levee
No Data
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Inundation


Agriculture (27 ac)
Developed (453 ac)
Elderberry Savanna (227 ac)
Freshwater Emergent Wetland (3 ac)
Foothill Pine (6 ac)
Gravel Bar Chaparral (277 ac)
Open Water (597 ac)
Oak Woodland/Forest (726 ac)
Riparian Woodland/Forest (1,813 ac)
Riparian Scrub (218 ac)
Turf/Turf with Trees (422 ac)
Unvegetated (174 ac)
Valley Foothill Grassland (Non-Native) (346 ac)
Valley Foothill Grassland (Native) (179 ac)
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Vegetation Communities

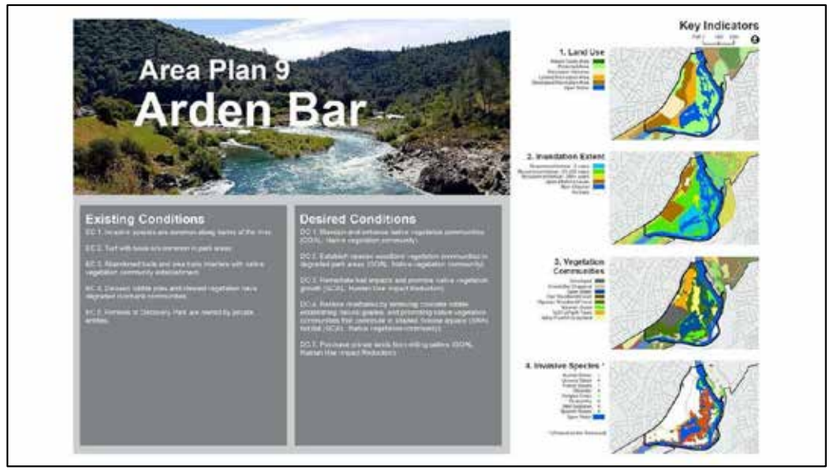

Arundo Donax
Chinese Tallow
French Broom
Oleander
Pompas Grass
Pyracantha
Red Sesbania
Scotch Broom
Spanish Broom
Removed
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
9 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
12 Bassmaster Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sutter Bar
0 0.5 1 2 Miles
Invasive Species

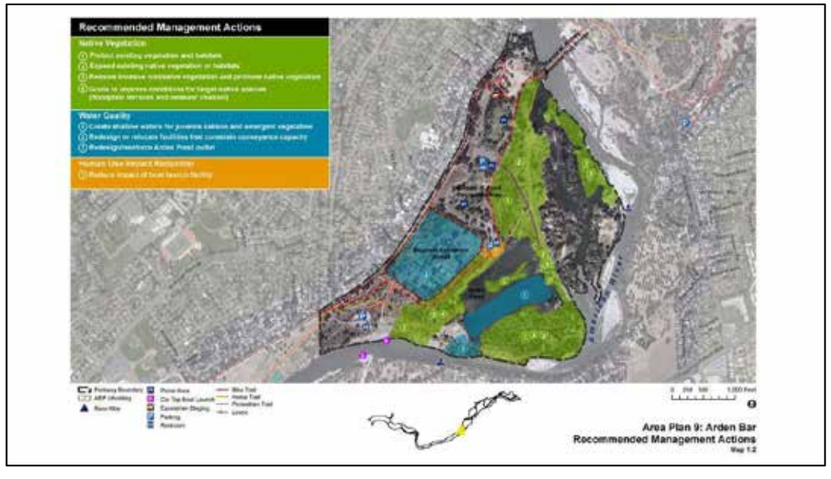

Native Vegetation
Non-Native Vegetation
Developed
Bank Protection Site
Bank Protection Mitigation Site
Borrow Site
Gravel Augmentation Sites
USACE Ecosystem Restoration
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
9 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
12 Bassmaster Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sutter Bar
0 0.5 1 2 Miles
Opportunities for Enhancing Habitat Connectivity

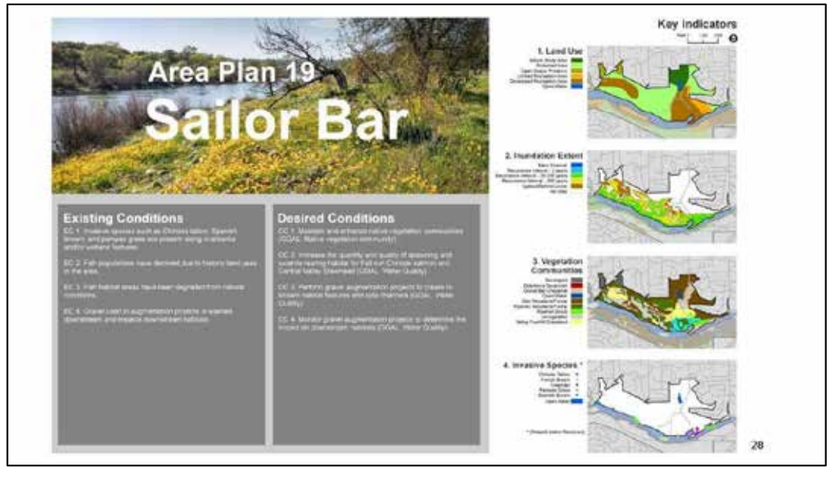
THIS IS A PROTECTED
NATURE STUDY AREA
TAKE ONLY MEMORIES
LEAVE ONLY FOOTPRINTS
Area Plan Maps
23

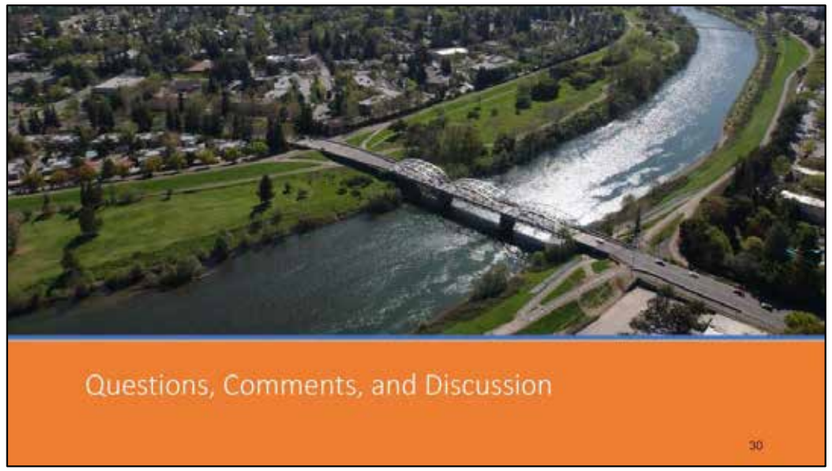

Area Plan 2
Woodlake
Existing Conditions
Desired Conditions
Key Indicators
1. Land Use
2. Inundation Extent
3. Vegetation Communities
4. Invasive Species

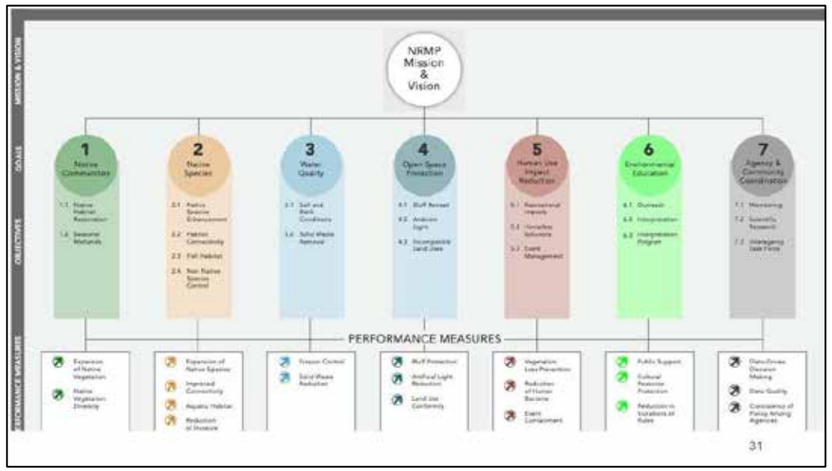
Recommended Management Actions
Native Vegetation
Water Quality
Human Use Impact Reduction
Area Plan 2: Woodlake
Recommended Management Actions


Area Plan 9
Arden Bar
Existing Conditions
Desired Conditions
Key Indicators
1. Land Use
2. Inundation Extent
3. Vegetation Communities
4. Invasive Species


Recommended Management Actions
Native Vegetation
Water Quality
Human Use Impact Reduction
Area Plan 9: Arden Bar
Recommended Management Actions


Area Plan 19
Sailor Bar
Existing Conditions
Desired Conditions
Key Indicators
1. Land Use
2. Inundation Extent
3. Vegetation Communities
4. Invasive Species
28



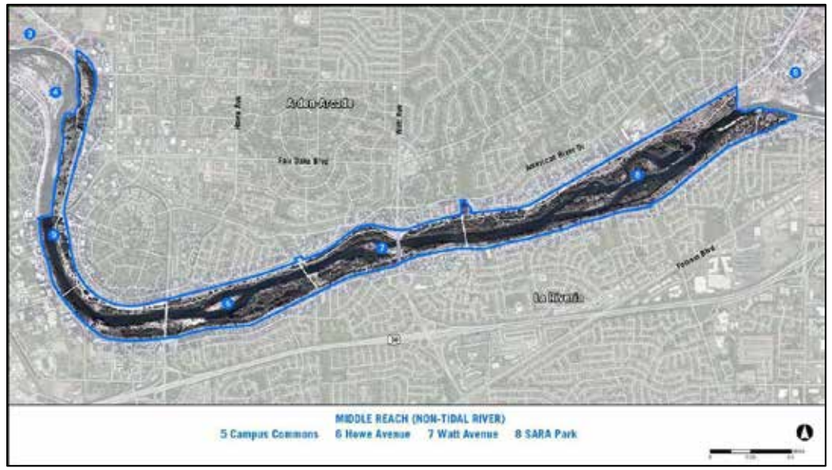

## Discussion Topics

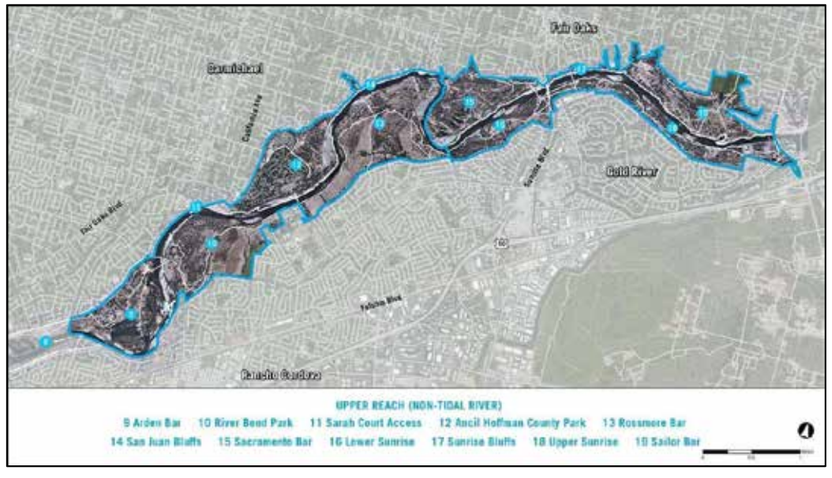
- Chapter 1 Introduction
- Chapter 2 Natural Resource Management Goals and Objectives
- Chapter 3 Parkway Setting

- *Chapter 7 Human Use Impact Reduction (see maps)*

32

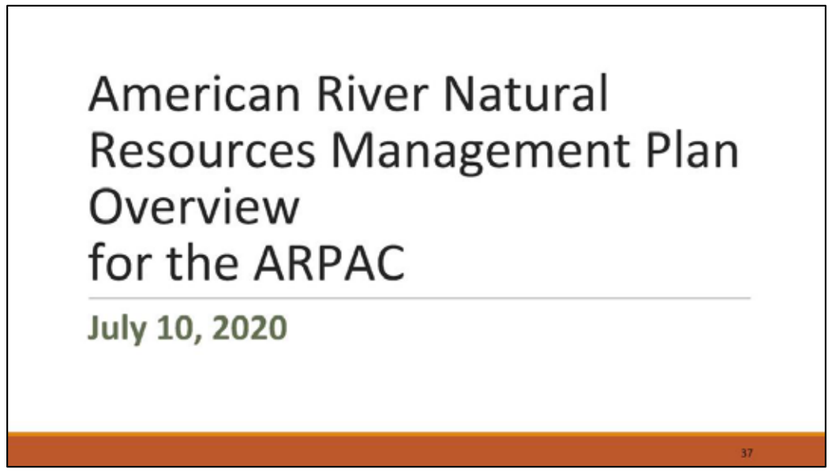
Downtown Sacramento
East Sacramento
LOWER REACH (TIDAL RIVER)
1 Discovery Park 2 Woodlake 3 Cal Expo 4 Paradise Beach


Arden Arcade
La Riviera
MIDDLE REACH (NON-TIDAL RIVER)
5 Campus Commons 6 Howe Avenue 7 Watt Avenue 8 SARA Park


Gold River
Folsom Boulevard
UPPER REACH (NON-TIDAL RIVER)
9 Arden Bar 10 River Bend Park 11 Sarah Court Access 12 Ancil Hoffman County Park 13 Rossmore Bar
14 San Juan Bluffs 15 Sacramento Bar 16 Lower Sunrise 17 Sunrise Bluffs 18 Upper Sunrise 19 Sailor Bar

Next Steps
• Online Public Meetings (July 16 and 17)
• Parks and Recreation Commission Meeting and Presentation (July 23)
• Public Draft Released (Late 2020)
• ARPAC and Recreation and Park Commission Meetings (November 2020)

17


American River Natural Resources Management Plan Overview for the ARPAC
July 10, 2020
37

APPENDIX A

# ARPAC NRMP WORKSHOP 2021 SUMMARY REPORT



**AMERICAN RIVER PARKWAY ADVISORY COMMITTEE (ARPAC)**
**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**PUBLIC REVIEW DRAFT WORKSHOP**

Friday, March 19, 2021 ◆ 9:30 a.m. – 11:00 a.m.
Online by Zoom

## SUMMARY REPORT

### INTRODUCTION

On March 19, 2021, the American River Parkway Advisory Committee (ARPAC) held a workshop on the public review draft of the American River Parkway (ARP) Natural Resources Management Plan (NRMP). The purpose of the meeting was to: (1) provide an overview of the NRMP planning process; (2) introduce the NRMP's Area Plan analyses, mapping, and potential management actions; (3) describe the forthcoming NRMP monitoring plan; and (4) describe next steps in the NRMP development process.

### Meeting Format

The ARPAC NRMP public review draft workshop occurred on March 19, 2021, from 9:30 a.m. to 11:00 a.m. online by Zoom. Meeting participants included members of the ARPAC, Sacramento County Department of Regional Parks (Regional Parks or County Parks) staff, and consultant staff from MIG, Inc and ICF, Inc. Attachment A of the Summary Report Appendix includes the PowerPoint presentation slides displayed and discussed during the meeting.

### AGENDA

Daniel Iacofano of MIG, Inc. opened the meeting and thanked the participants for their attendance. Mr. Iacofano provided the NRMP's status and discussed the schedule for NRMP completion moving forward, noting the final NRMP would be published in the fall of 2021. He then reviewed the meeting agenda, which included a PowerPoint presentation and discussion period.

### POWERPOINT PRESENTATION

Mr. Iacofano began the PowerPoint presentation with a review of how the NRMP was scoped, an overview of the NRMP Task Force purpose and member agencies, a review of the NRMP process, an overview of the results of the 2020 NRMP Maptionnaire community survey, and an

overview of the proposed NRMP management and implementation activities. Gregg Ellis of ICF then presented the NRMP indicators, including level of alteration, inundations, vegetation communities, and land use, and accompanying mapping. Mr. Ellis also presented potential management actions maps for each of the Parkway's 19 Area Plans. Mr. Iacofano and Mr. Ellis then provided an overview of the NRMP partners and finished the presentation with a discussion of the potential mitigation areas in each reach of the Parkway.

**OPEN DISCUSSION**

Dianna Poggetto of ARPAC then opened the meeting to questions and comments on the public review draft NRMP and the contents of the PowerPoint presentation.

Comments and questions from the ARPAC members are listed below. Responses from the meeting facilitators are given in *italics*. Each individual bullet point may include a single comment and response, or a back-and-forth conversation.

- How can people send in questions about the NRMP?
  (MIG) *You can send comments to nrmp@migcom.com. We may even be able to respond to everyone over email.*

- Are the future public meetings linked on the Regional Parks website?
  (Regional Parks) *All the meeting and Zoom links are located on our website. Future meetings will have a presentation similar to what you saw today.*

- How would proposals for future recreational development intersect with this plan and the areas you have color-coded in these maps?
  (Regional Parks) *We considered the Parkway's land use designations when we developed the NRMP. This plan's focus is on natural resources. We were careful in ensuring we would not preclude recreation from areas under recreational land uses.*
  (MIG) *None of the areas designated for resources improvements interfere with the recreational land use designations. We see opportunities to make existing recreational facilities more environmentally friendly through new techniques that reduce impacts, but keep the full extent of recreational access. We are keeping these factors in mind as the baseline for all the proposed actions.*
  What would be off-limits in terms of future recreational development opportunities?
  (Regional Parks) *You would need to look at the Parkway Plan as a whole. The Parkway Plan lays out what can and cannot be done based on the land use designations.*
  Okay. I will think of the NRMP as a sub-document to the Parkway Plan.

- This is a question for Cara Allen of WCB. From your perspective, how does the NRMP fit into your overall plans and priorities for Lower American River Conservancy Program (LARCP) funding?





(WCB) *The enabling legislation for the LARCP says WCB will help fund the development of this plan and implementing the plan. In the future, our solicitation notices for grant proposals will prioritize potential projects in this plan. We hope Parkway partners will be looking in the NRMP for ideas for projects.*

- I first wanted to say the mapping you put together is very helpful for the public. I am looking forward to any information you present in the plan on impacts from ambient light. Ambient light is a huge issue in the Parkway. The Save the American River Association (SARA) gets calls from people who have concerns about light sources affecting the Parkway.

- In determining the habitat areas of the Parkway, such as valley foothill grassland, what information was used? There are a lot of invasive species in the Parkway, and I am not sure how many of those grasses in the valley grassland areas are native. Are we looking at what habitats were there before or at remnants that we want to restore?
  (ICF) *We have high quality mapping of the vegetation communities. The mapping does not represent current conditions. We look at the dominant species in a location to determine the appropriate community type. Most species, for example, in the grassland areas are native grasses. However, yellow starthistle has continue to become more dominant in the Woodlake and Cal Expo Areas and there is a question of whether invasive plants are more dominant when we get on the ground. This ties into the importance of monitoring over time. We also need to update the mapping, which would help us make those calls on whether an area is woodland, grassland, savannah, or some other community type.*
  (Regional Parks) *We conducted a mapping effort of existing vegetation in the early 2010s. At the time I had assigned the categories, but what I used were not the standard categories used statewide. So, we revised the categories to match up with those of the state.*

- We are striving for a lot of connectivity to provide all the various habitats fish and wildlife need to successfully complete their life cycles in the Parkway. Certain areas of the Parkway may require establishment of habitat types that we would not have necessarily found in the Parkway when the mapping was completed, but are needed if we want to create a functioning ecosystem.
  (MIG) *That is very helpful, thank you. We have completed some regional connectivity mapping. We agree with your implied strategy. Conditions in the Parkway have changed over time, especially in the case of major alterations. We need to consider the best long-term approach for native species.*
  You also need to factor in the future impacts of climate change. For example, the fate of the valley oak may be in question with changing conditions and water tables. This is an important issue to consider.

- The American River Ranch currently encompasses 55 acres. 12 acres of American River Ranch is the restored Cordova Creek. However, the River Bend Park map shows a reduced footprint compared to the actual size of the facility. I think the actual footprint of the American River Ranch needs to be depicted to enable discussion about the best use of the western lands of the American River Ranch.
  (Regional Parks) *We will look at the River Bend Park Area Plan and the master plan for American River Ranch for consistency.*

- I believe the master plan for the Campfire Day Camp also needs to be considered here.
  (Regional Parks) *Yes, we will look at that master plan as well.*

- The Riverdale Trailer Park property has been purchased by a new owner, correct? I see on your maps that you want to acquire it and return it to a natural state.
  (Regional Parks) *I do not have specific knowledge of the ownership status of the Riverdale property. We can look into the property to see if it has changed hands. It was not offered up for sale into public ownership*.

- The resource impact monitoring plan ended up as an appendix. There is a policy in the Parkway Plan that requires the monitoring plan. Please discuss why the plan is proposed as an appendix.
  (Regional Parks) *We decided to make the resource impact monitoring plan an appendix because it will be a very large document. We want to make it easier for the reader to see all the plan's details.*
  (MIG) *We are treating the NRMP as a strategic plan, but we are looking for measurable outcomes as well. So, the resource impact monitoring plan will need to have structure and "teeth." We want to make sure the monitoring plan is a central part of the NRMP. The County needs a tool to measure progress and success.*

- You cited in the draft the 11 acres of oak woodland PG&E planted in the Parkway to mitigate the damage done when PG&E cut down cottonwoods. That 11 acres is a failed mitigation site. Now we are requiring PG&E to redo something that should have already been completed successfully. I do not want to see that again.
  (MIG) *We agree.*

- The maps show specific areas for invasive plant removal. Some of the species, like yellow starthistle, dominate vegetation communities. After the invasive plants are removed, we should restore those areas. I cannot tell if the areas overrun by invasive plants have been identified for restoration and what would replace those plants.
  (ICF) *We have not taken restoration to the site-specific level for each Area Plan. We are trying to provide a framework. We are saying what is appropriate for replacement to some degree, but we are not getting down to the species level. The USACE Ecosystem Restoration plan took a shot at imagining the specific plant communities that would be appropriate in some areas. A lot of the areas with yellow starthistle are proposed to be*





*grassland. As a general rule, you will not find specific plant recommendations in the NRMP. On the one hand, that approach provides flexibility. However, on the other hand, that approach requires additional work down the road. I would also like to note that our knowledge about various factors, including inundation, gives us insight into what plant species can survive in an area and what trends are affecting specific areas.*

Mr. Iacofano reminded the ARPAC members of the upcoming public meetings on March 22nd, 25th, and 26th. Ms. Poggetto thanked the ARPAC members for their feedback and ended the meeting.

**AMERICAN RIVER PARKWAY ADVISORY COMMITTEE**
**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**PUBLIC REVIEW DRAFT WORKSHOP**

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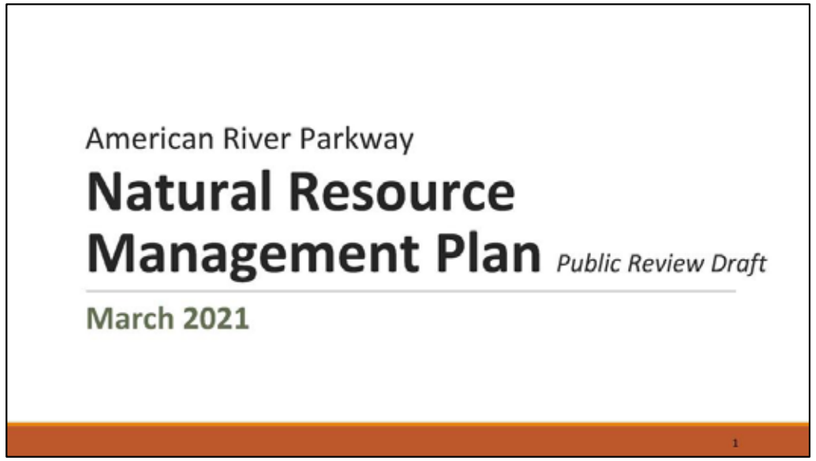
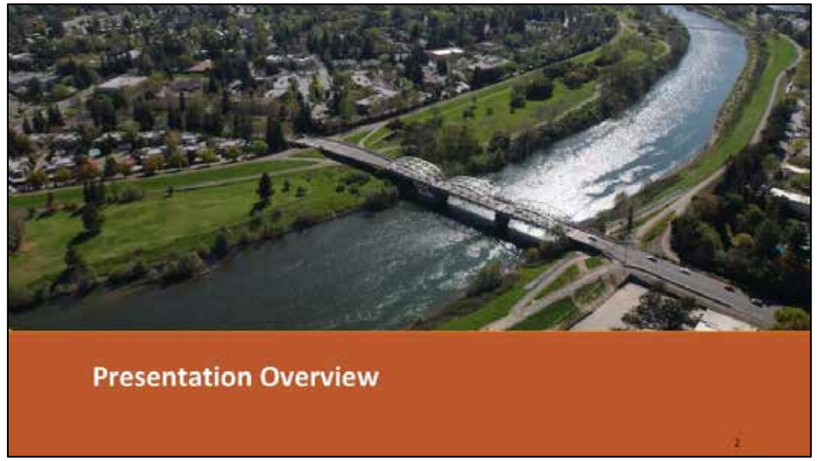
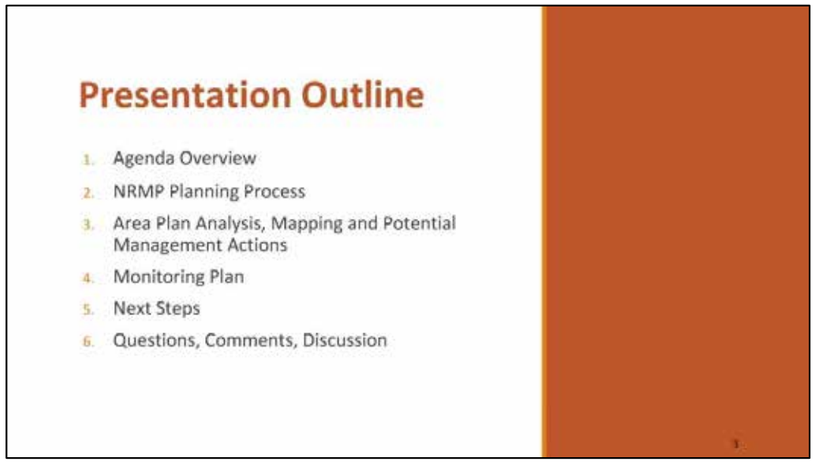
# APPENDIX TO SUMMARY REPORT

**ATTACHMENT A: POWERPOINT SLIDES**



## Previous Plans . . .

5

## The NRMP

- The NRMP was envisioned in 2007 during a Save the American River Association Retreat.
- Elmer Aldrich was appointed Committee Chair and developed initial recommendations.
- In 2014, the Department characterized the NRMP as being closely aligned with the goals and policies of the 2008 American River Parkway Plan.
- The initial data collection effort for the NRMP began in 2018.

6

## The County, WCB and SAFCA Join Forces . . . The NRMP Task Force Begins!

We are at a unique time where several efforts are coming together, and it makes sense to formalize the necessary collaboration.

This collaboration will be carried out through the Natural Resources Management Plan Task Force

Regional Parks and the Wildlife Conservation Board are funding preparation of the Natural Resources Management Plan

SAFCA is funding the Natural Resources Management Plan Task Force in Cooperation with Regional Parks

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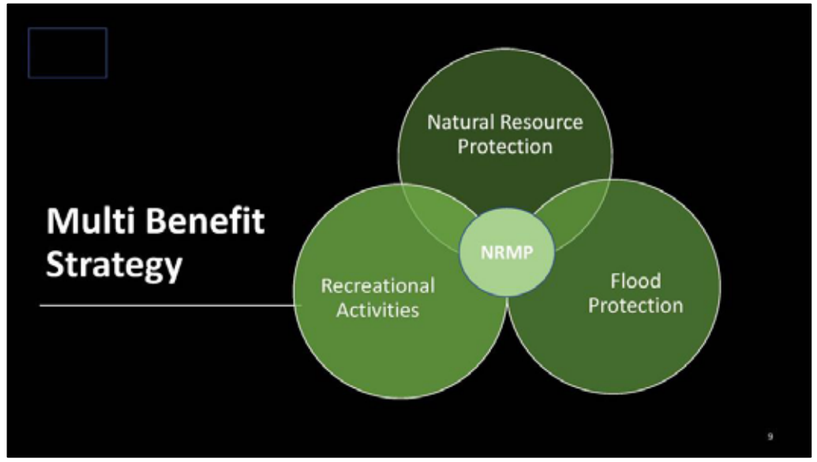
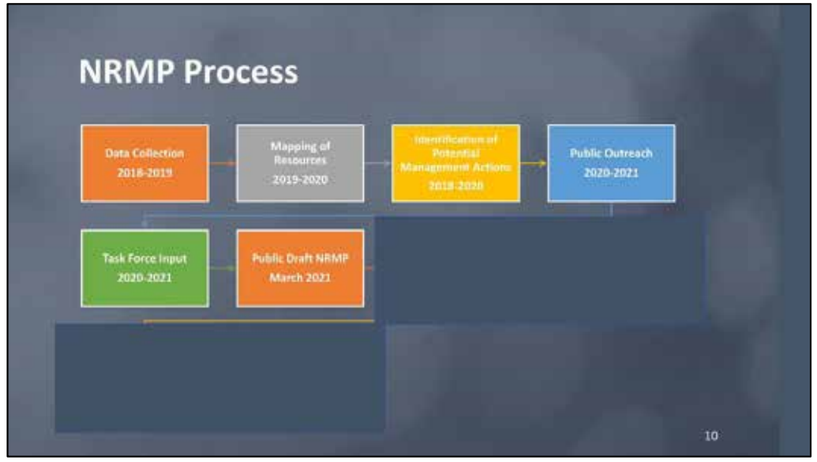
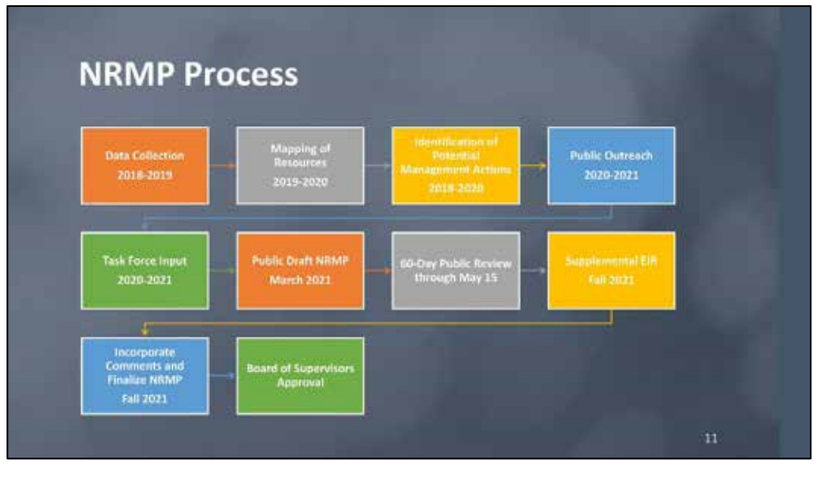
## NRMP Task Force Member Organizations

- Sacramento County Regional Parks
- Sacramento Area Flood Control Agency
- The Water Forum
- U.S. Army Corp of Engineers
- Wildlife Conservation Board
- Central Valley Flood Protection Board
- American River Parkway Stakeholders
- Sacramento County Department of Environmental Review
- DWR
- USFWS
- ICF
- MIG

8

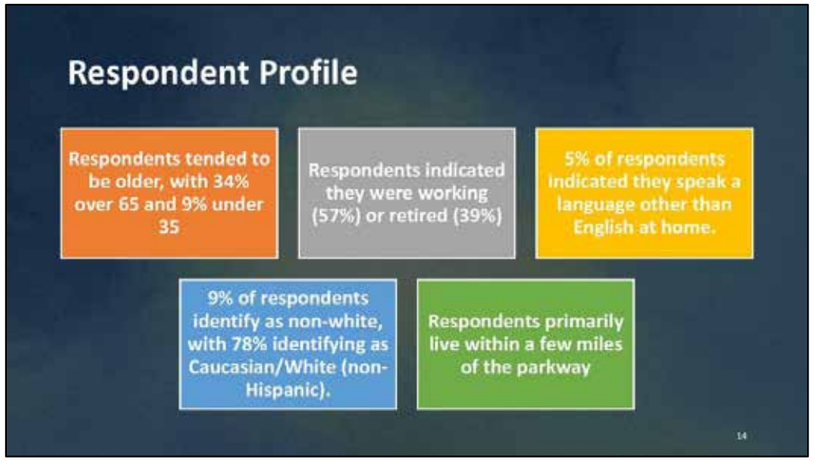

Multi Benefit Strategy
Natural Resource Protection
NRMP
Recreational Activities
Flood Protection
9

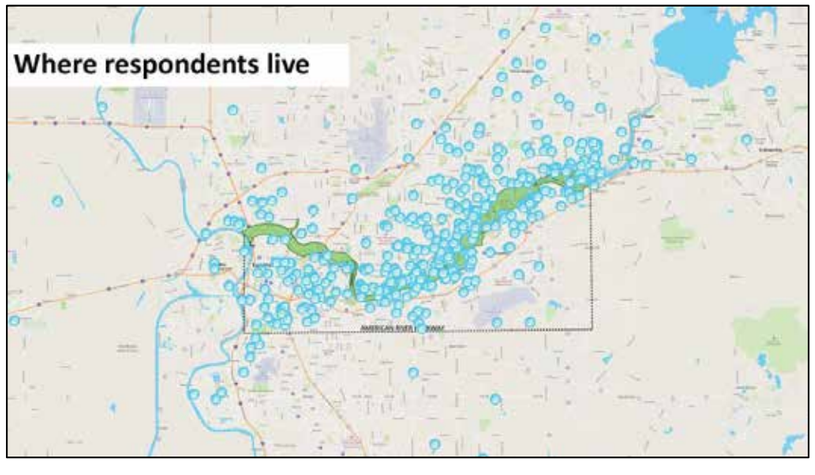

NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
10

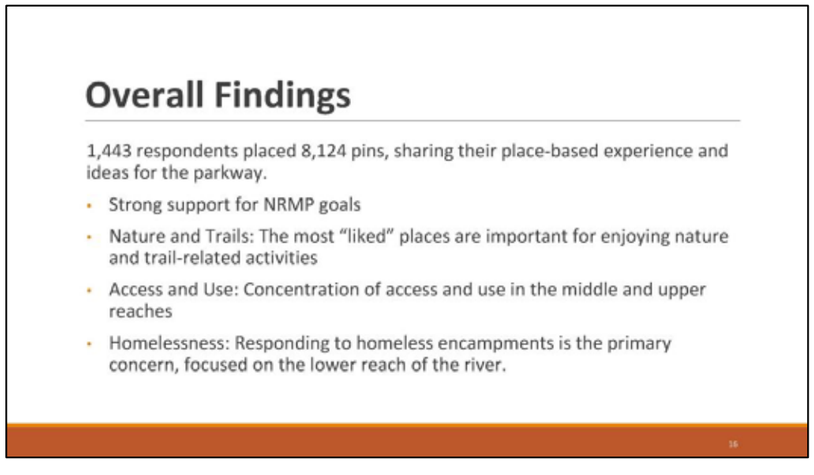

NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
60-Day Public Review through May 15
Supplemental EIR Fall 2021
Incorporate Comments and Finalize NRMP Fall 2021
Board of Supervisors Approval
11

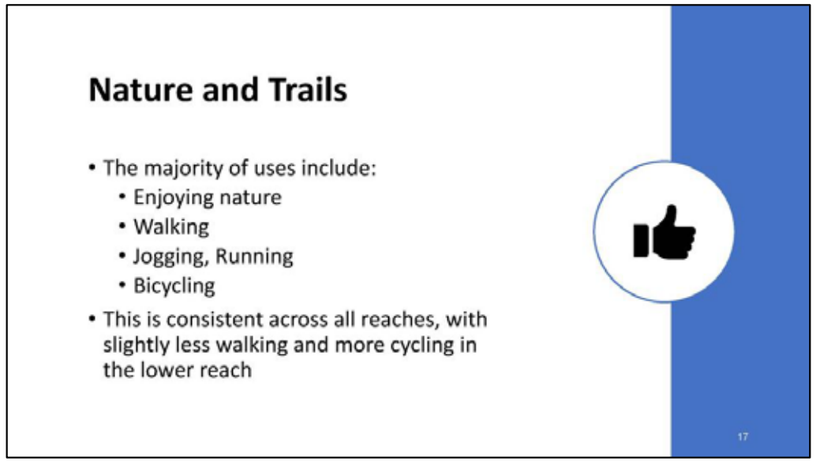
Public Outreach
Four Community Meetings in July 2020
Online Community Survey July-September 2020
Four Community Meetings in March 2021
12

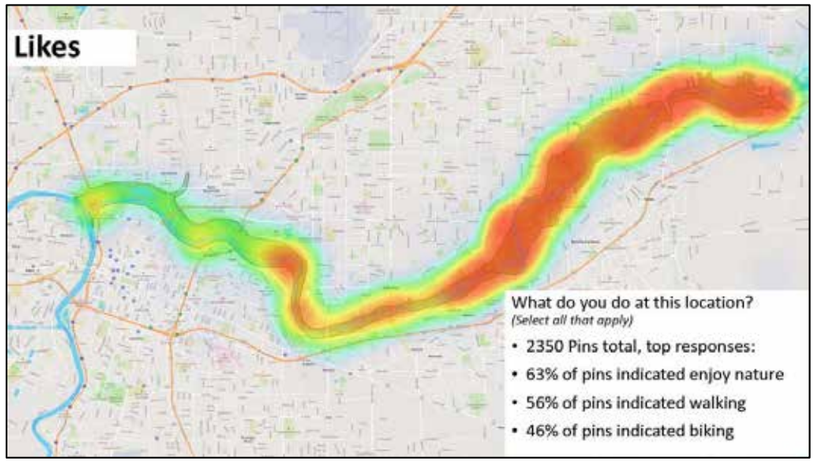
Online Community Survey Results
July 15 – September 15, 2020

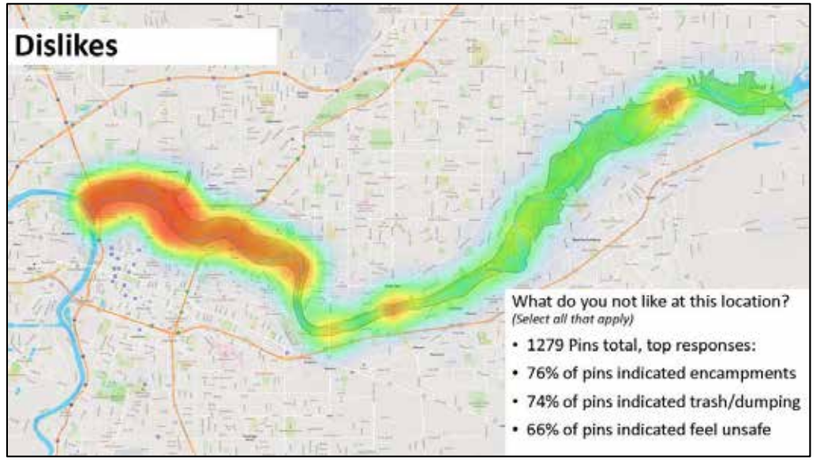

Respondent Profile
Respondents tended to be older, with 34% over 65 and 9% under 35
Respondents indicated they were working (57%) or retired (39%)
5% of respondents indicated they speak a language other than English at home.
9% of respondents identify as non-white, with 78% identifying as Caucasian/White (non-Hispanic).
Respondents primarily live within a few miles of the parkway


Where respondents live


Overall Findings
1,443 respondents placed 8,124 pins, sharing their place-based experience and ideas for the parkway.
Strong support for NRMP goals
Nature and Trails: The most "liked" places are important for enjoying nature and trail-related activities
Access and Use: Concentration of access and use in the middle and upper reaches
Homelessness: Responding to homeless encampments is the primary concern, focused on the lower reach of the river.

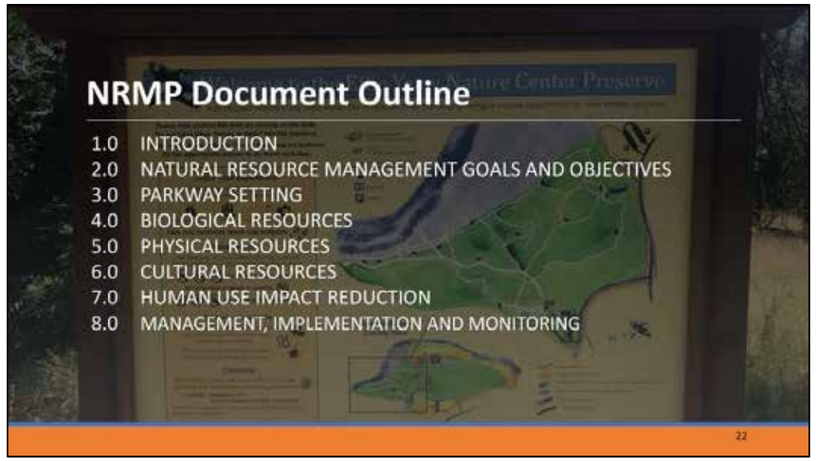

Nature and Trails
• The majority of uses include:
• Enjoying nature
• Walking
• Jogging, Running
• Bicycling
• This is consistent across all reaches, with slightly less walking and more cycling in the lower reach
17

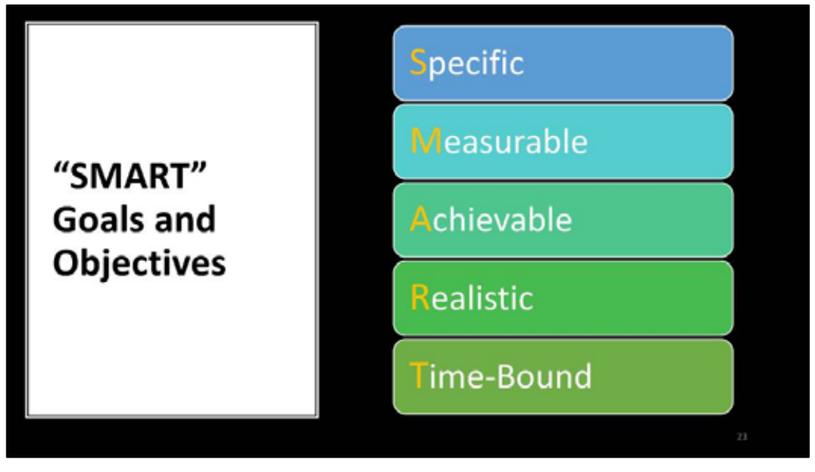

Likes
What do you do at this location?
(Select all that apply)
• 2350 Pins total, top responses:
• 63% of pins indicated enjoy nature
• 56% of pins indicated walking
• 46% of pins indicated biking

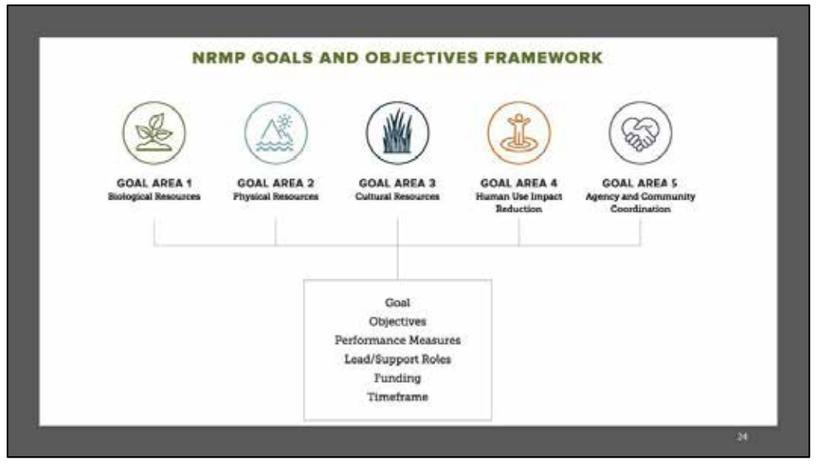

Dislikes
What do you not like at this location?
(Select all that apply)
• 1279 Pins total, top responses:
• 76% of pins indicated encampments
• 74% of pins indicated trash/dumping
• 66% of pins indicated feel unsafe

Homelessness in the Parkway
Housing and homelessness is a local, regional and national crisis impacting people and public spaces including the American River Parkway
Related impacts, trash, safety, encampments were the most mentioned issues in the parkway.
Concerns about safety are high, equally spread across gender identity
While no question specifically identifies a respondent as housed, the comments suggest minimal, if any, homeless perspectives in this data.
20

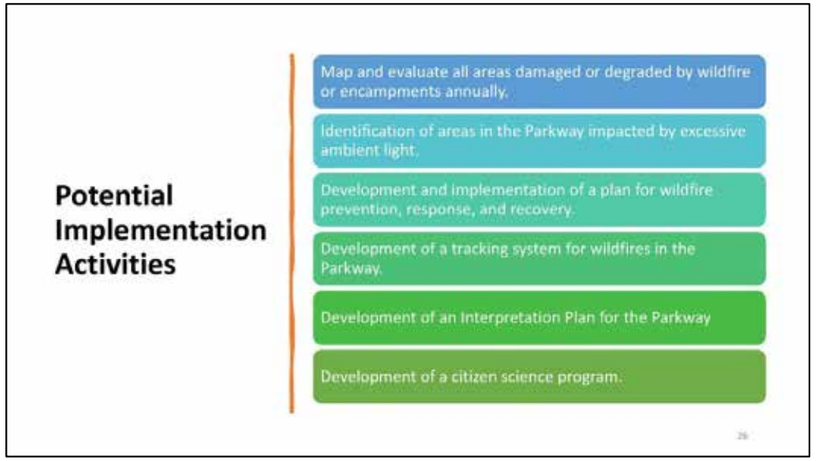
The Plan Document: Potential Management Actions and Area Plan Mapping
21


NRMP Document Outline
1.0 INTRODUCTION
2.0 NATURAL RESOURCE MANAGEMENT GOALS AND OBJECTIVES
3.0 PARKWAY SETTING
4.0 BIOLOGICAL RESOURCES
5.0 PHYSICAL RESOURCES
6.0 CULTURAL RESOURCES
7.0 HUMAN USE IMPACT REDUCTION
8.0 MANAGEMENT, IMPLEMENTATION AND MONITORING
22

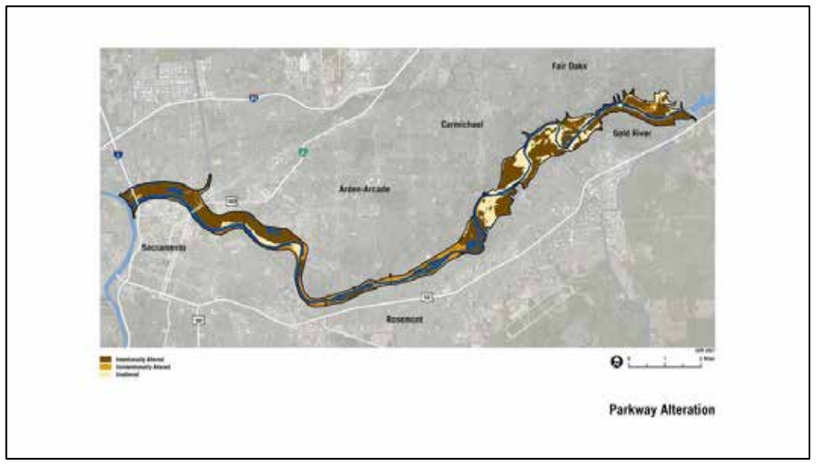

"SMART" Goals and Objectives
Specific
Measurable
Achievable
Realistic
Time-Bound
23


NRMP GOALS AND OBJECTIVES FRAMEWORK
GOAL AREA 1
Biological Resources
GOAL AREA 2
Physical Resources
GOAL AREA 3
Cultural Resources
GOAL AREA 4
Human Use Impact Reduction
GOAL AREA 5
Agency and Community Coordination
Goal
Objectives
Performance Measures
Lead/Support Roles
Funding
Timeframe
24

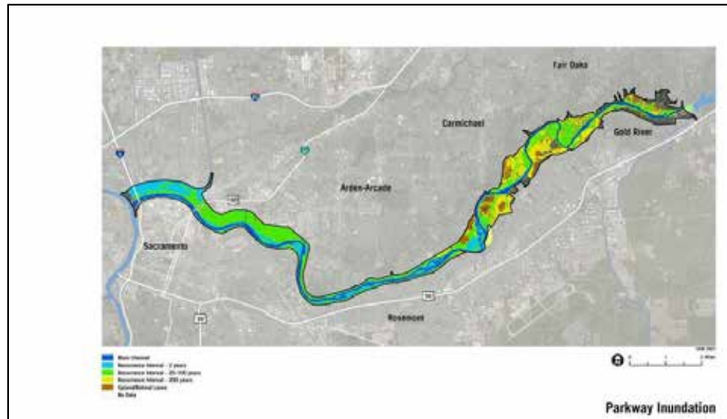
Potential Implementation Activities
Update vegetation community map.
Development of shaded riverine aquatic habitat map.
Mapping of trails (including social trails) in the Parkway.
Systematic survey of sensitive species.
Invasive species surveys and production of Invasive Species Management Plan Update.
25

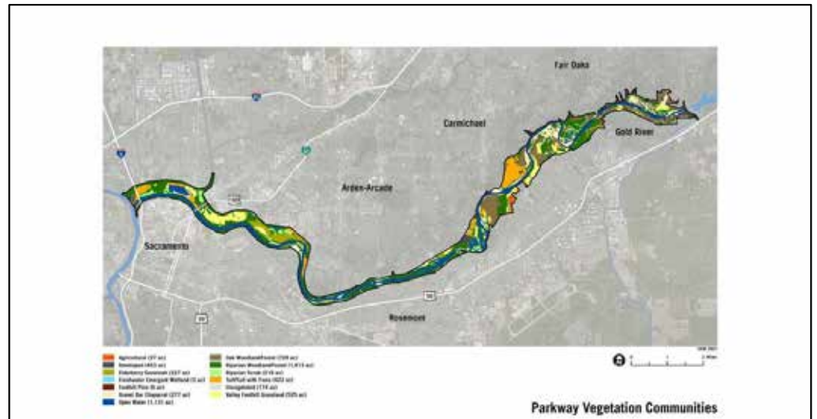

Potential Implementation Activities
Map and evaluate all areas damaged or degraded by wildfire or encampments annually.
Identification of areas in the Parkway impacted by excessive ambient light.
Development and implementation of a plan for wildfire prevention, response, and recovery.
Development of a tracking system for wildfires in the Parkway.
Development of an Interpretation Plan for the Parkway
Development of a citizen science program.

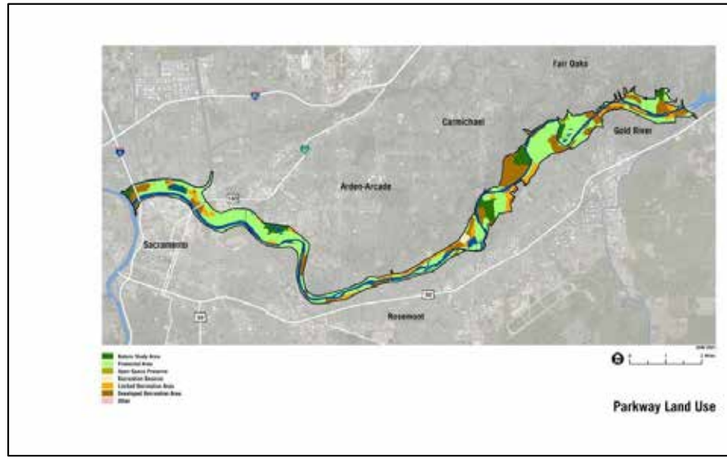
Key Indicators for Area Plan Analysis and Mapping
Alteration
Inundation
Vegetation Communities
Land Use


Fair Oaks
Carmichael
Gold River
Arden-Arcade
Sacramento
Rosemont
Parkway Alteration

13




## Natural Resource Management Categories

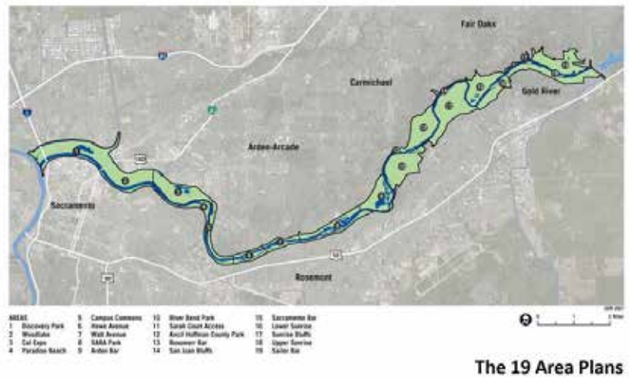
**Preservation**: Existing mitigation sites that require protection in perpetuity.

**Conservation:** Existing conditions are considered to generally meet desired conditions, but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved to meet goals.

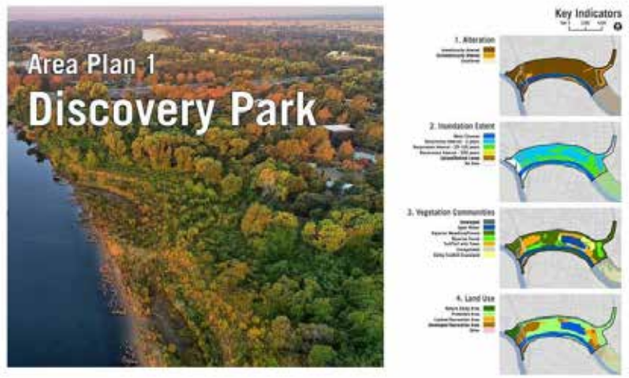
**Naturalization**: Modifying areas that were substantially altered in the past in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP, NRMP, and W&SR policies.

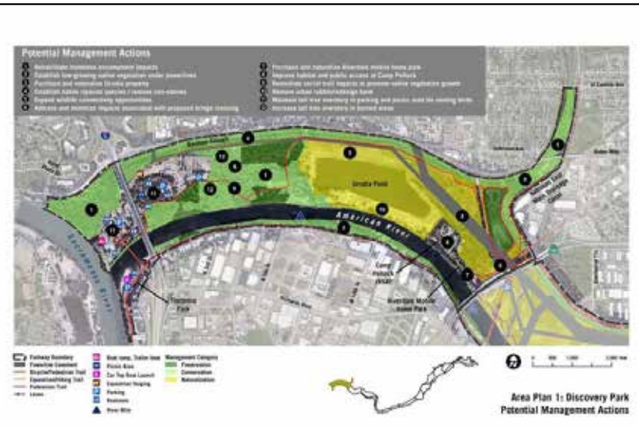
***Rehabilitation Overlay:** Applies to any of the aforementioned categories that are degraded or damaged in the future and require action to improve their condition.

14

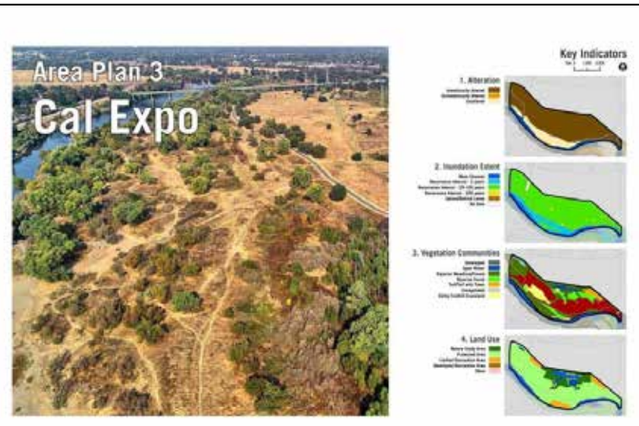



The 19 Area Plans

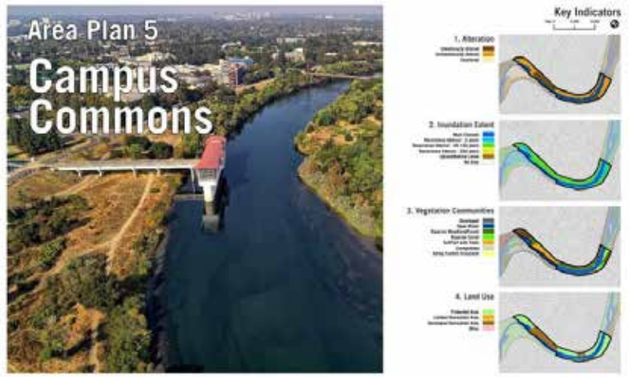


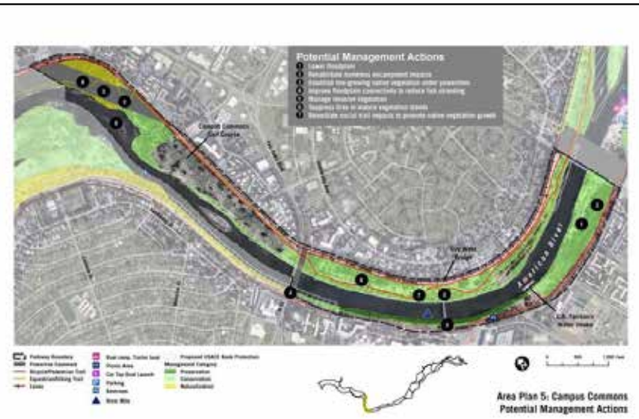



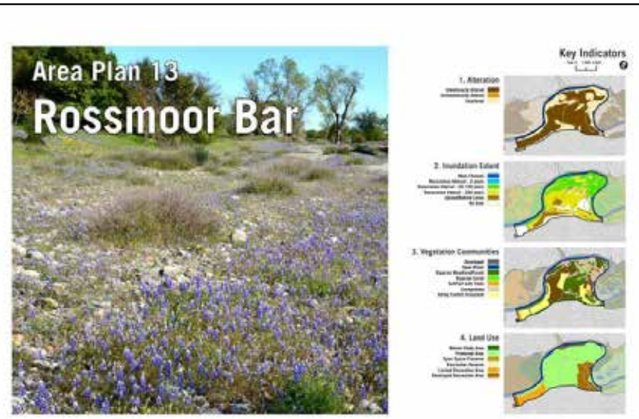

Area Plan 1: Discovery Park
Potential Management Actions

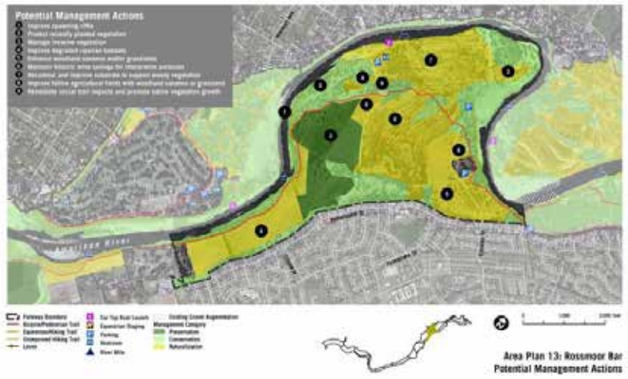


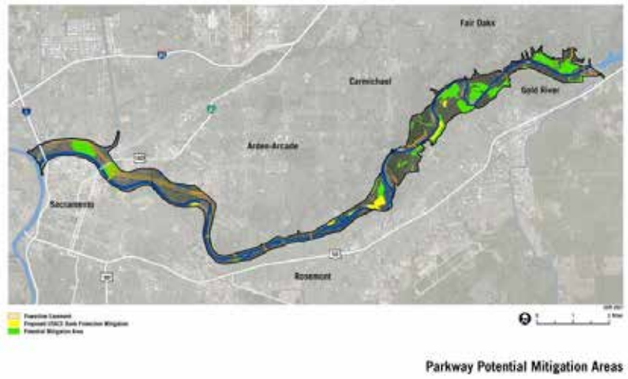
Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions


Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

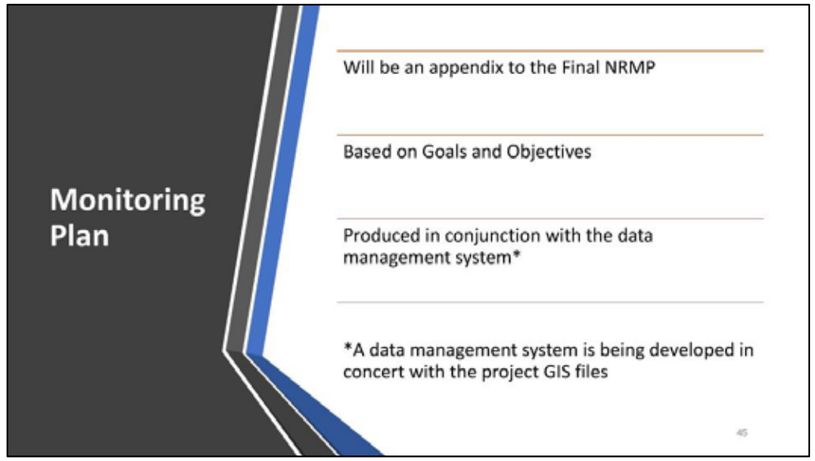

Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions


Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use




| FUNDING ENTITY | RATIONALE FOR PROPOSED PROJECT | POTENTIAL NUMBER OF ACRES AND/OR PROJECTS | TIMEFRAME FOR COMPLETION |
|---|---|---|---|
| USACE | Mitigation for the proposed bank protection | • 155 acres of native riparian vegetation communities; and<br>• 30 acres native elderberry | 3-5 years |
| PG&E | Mitigation for clearing and hardening of transmission lines | 11 acres of native woodland | 3-5 years |
| WCB | Potential future funding from WCB | • Three acres of native riparian vegetation communities;<br>• Three acres native elderberry;<br>• Two acres of native grassland; and<br>• Two acres of native woodland. | 3-5 years |
| USACE | Potential Ecosystem Restoration Projects | **Woodlake**<br>• 16 acres of native riparian vegetation communities;<br>• 50 acres of native grassland; and<br>• 41 acres of native woodland.<br>**Cal Expo (Bushy Lake)**<br>• 48 acres of native riparian vegetation communities; and<br>• 70 acres of native woodland. | 6-10 years |
| Water Forum | Mitigation for upstream dams | One salmonid habitat enhancement project annually. | 3-5 years |

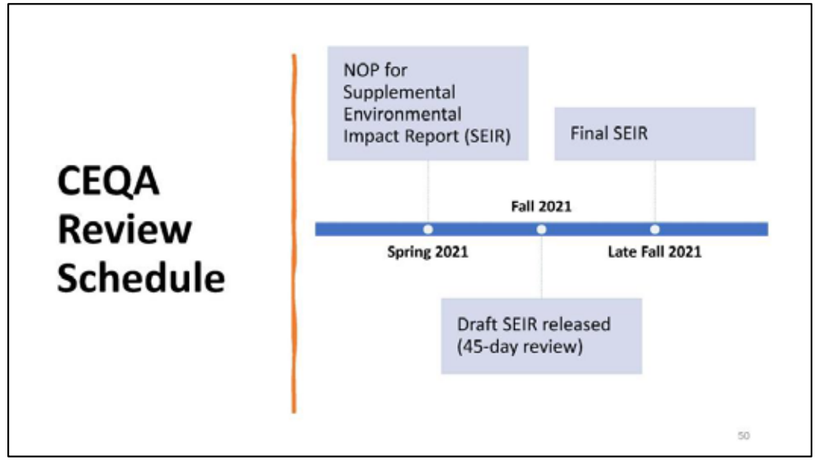

Monitoring Plan
Will be an appendix to the Final NRMP
Based on Goals and Objectives
Produced in conjunction with the data management system*
*A data management system is being developed in concert with the project GIS files
45

Monitoring Plan Components
Adaptive Management
Target species for observation
Monitoring interval and process
Data collection protocol, storage, and access
Accommodation for citizen science
Responsible parties and partners
Funding Sources
Success criteria
Reporting requirements

Next Steps . . .
47

SACRAMENTO COUNTY
LIVE / VISIT
BUSINESS
GOVERNMENT
Select Language
Regional Parks
Search...
AMERICAN RIVER PARKWAY
GIBSON RANCH
PARKS
ACTIVITIES
EVENTS/RESERVATIONS
RANGERS
ABOUT/MEETINGS
Home »
Natural Resources Management
Support Regional Parks, Save Time and Money - Purchase Your Parks Annual Pass Today
Public Draft Released
The public draft of the Natural Resource Management Plan (NRMP) for the American River Parkway (Parkway) has been released and is available for review.
NRMP Public Draft
NRMP Appendix A
NRMP Appenxid B
Popular Links
A - Z Regional Parks
Golf Course Gift Cards
Parks Annual Pass
SacCounty News Email Updates
ARP Multi-Use Trail Map

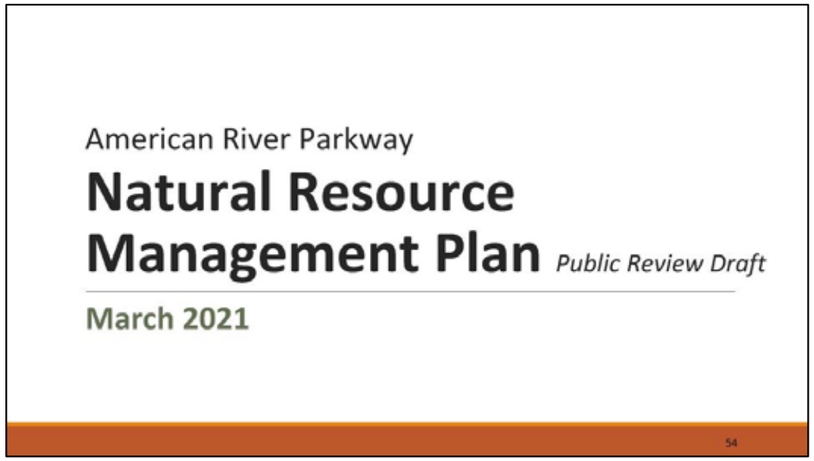
60-day public review of Public Draft NRMP
49
Comments may be sent to nrmp@migcom.com through May 15th.
Comments will be addressed in advance of the Final NRMP.


CEQA Review Schedule
NOP for Supplemental Environmental Impact Report (SEIR)
Final SEIR
Fall 2021
Spring 2021
Late Fall 2021
Draft SEIR released (45-day review)
50

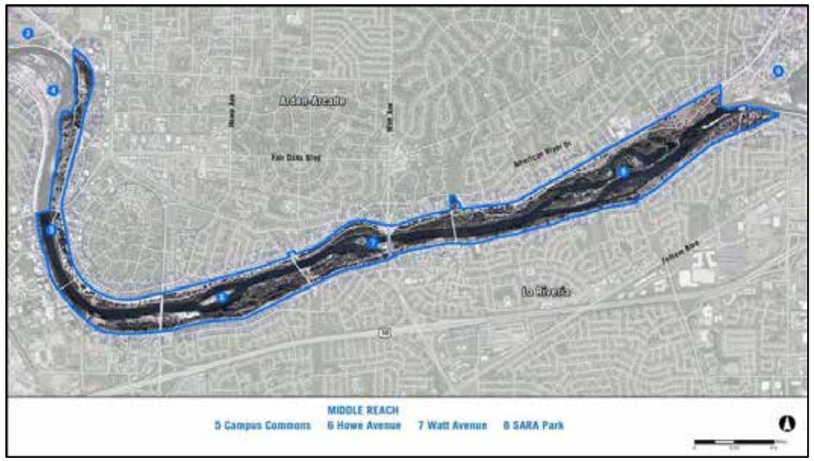
NRMP Public Meetings
Mar 19
9:30 am
American River Parkway Advisory Committee (ARPAC)
Mar 22
6:30 pm
Open Community Meeting
Mar 25
6:30 pm
Parks and Recreation Commission
March 26
2:00 pm
Open Community Meeting
51

Many thanks to the funding partners!
Wildlife Conservation Board
SAFCA
County of Sacramento
52

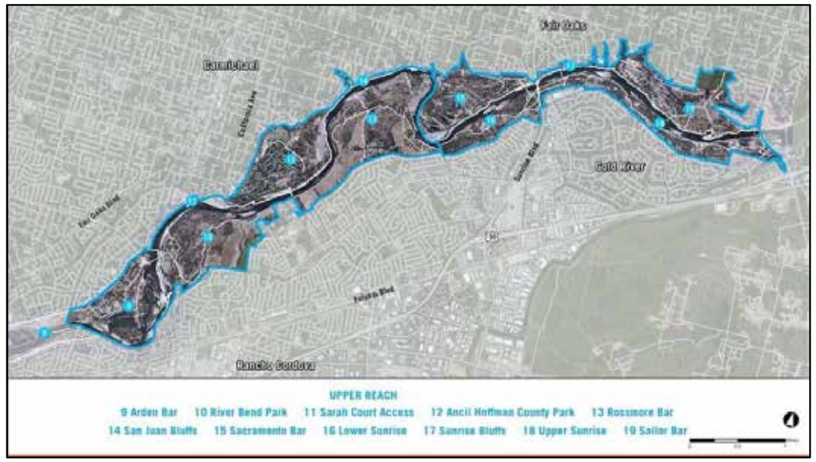
Questions, Comments, Discussion
53

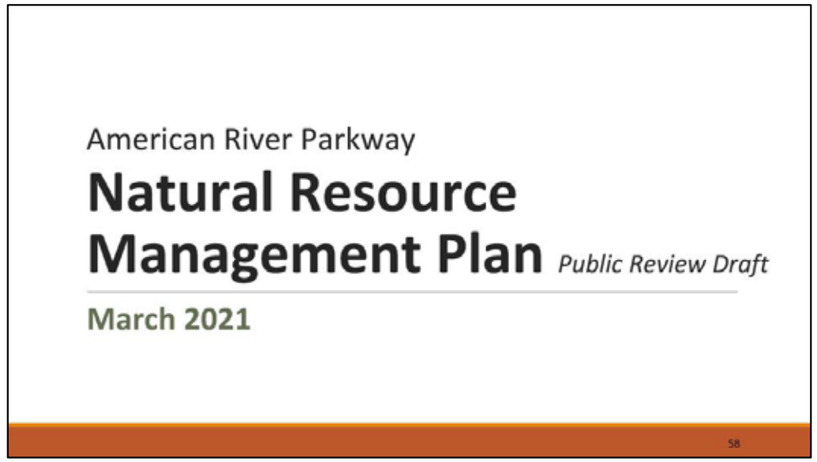

American River Parkway
Natural Resource Management Plan Public Review Draft
March 2021
54

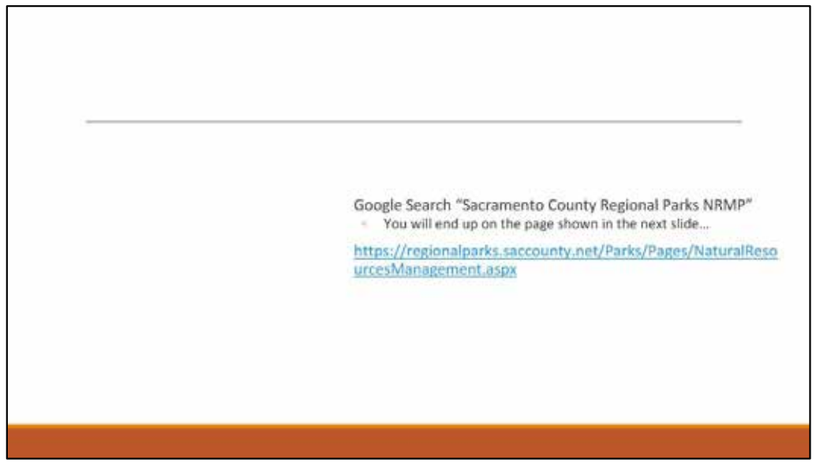
Gardenland
Downtown Sacramento
East Sacramento
LOWER REACH
1 Discovery Park 2 Woodlake 3 Cal Expo 4 Paradise Beach


Arden Arcade
La Riveria
MIDDLE REACH
5 Campus Commons 6 Howe Avenue 7 Watt Avenue 8 SARA Park

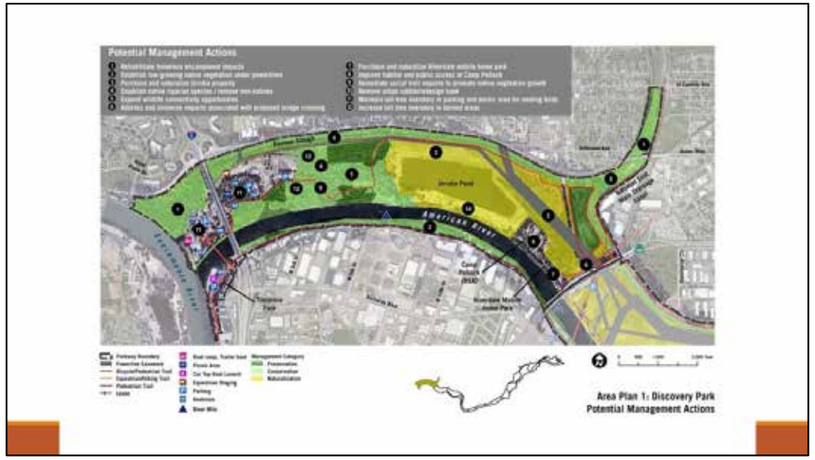
20

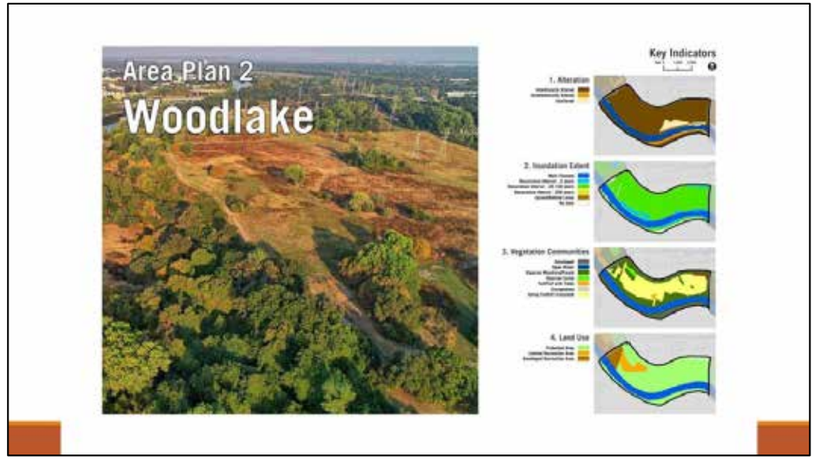

Carmichael
Fair Oaks Blvd
Folsom Blvd
Gold River
Rancho Cordova
UPPER REACH
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmore Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar

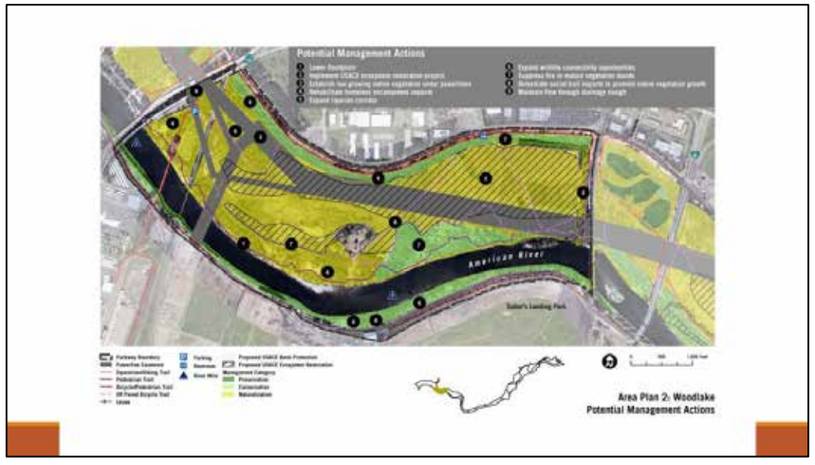

American River Parkway
Natural Resource Management Plan Public Review Draft
March 2021
58

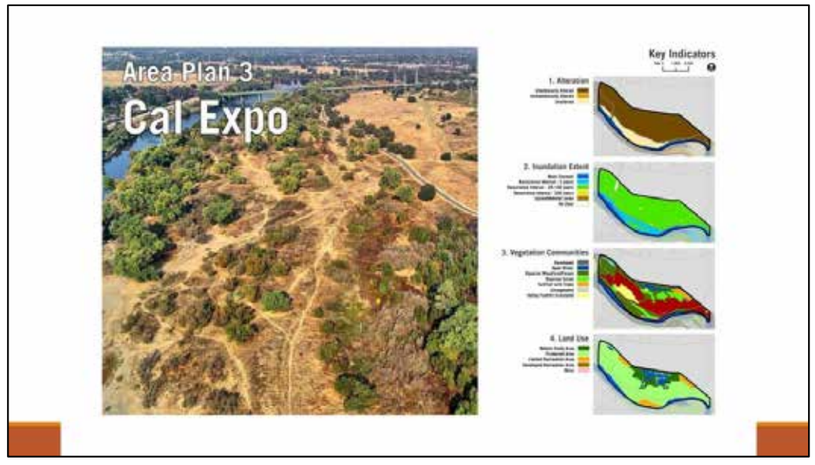

Google Search "Sacramento County Regional Parks NRMP"
You will end up on the page shown in the next slide...
https://regionalparks.saccounty.net/Parks/Pages/NaturalResourcesManagement.aspx

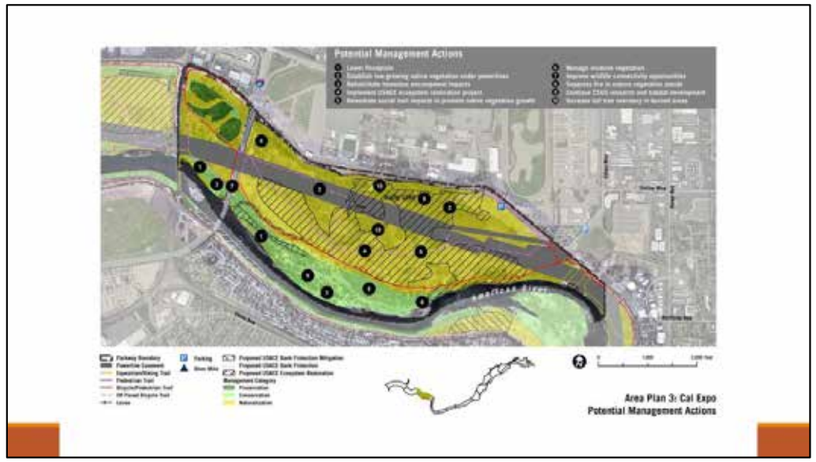
Area Plan 1
Discovery Park
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
Area Plan 1: Discovery Park
Potential Management Actions

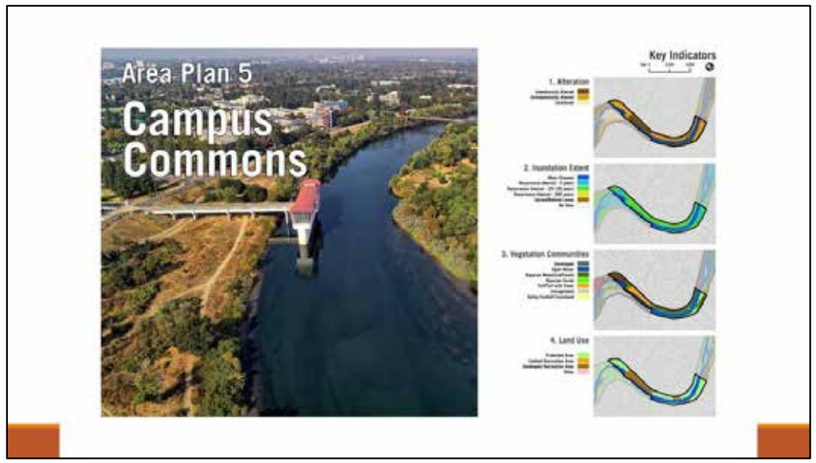

Area Plan 2
Woodlake
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

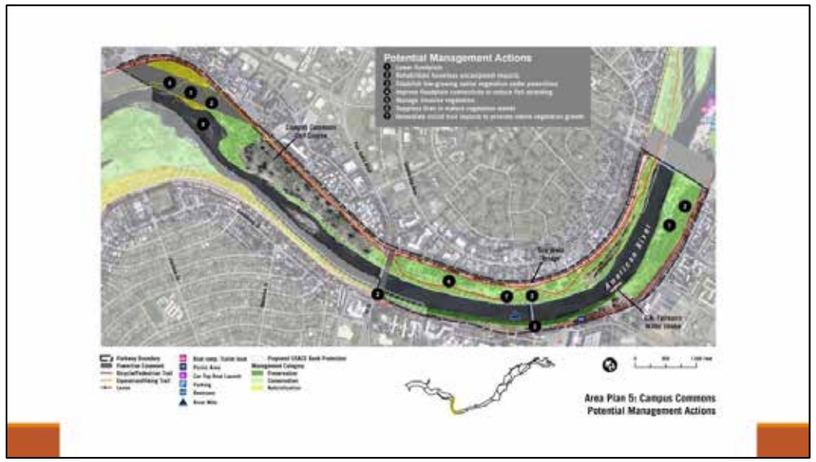

Potential Management Actions
American River
Area Plan 2: Woodlake
Potential Management Actions


Area Plan 3
Cal Expo
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions

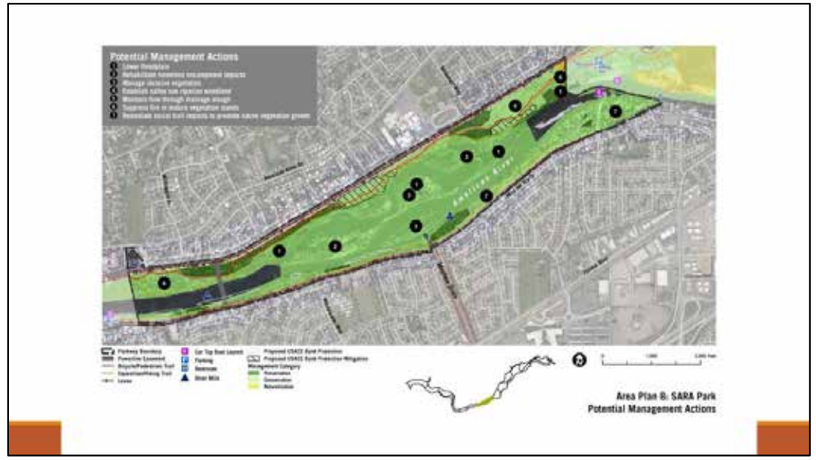
Potential Management Actions
Area Plan 4: Paradise Beach
Potential Management Actions

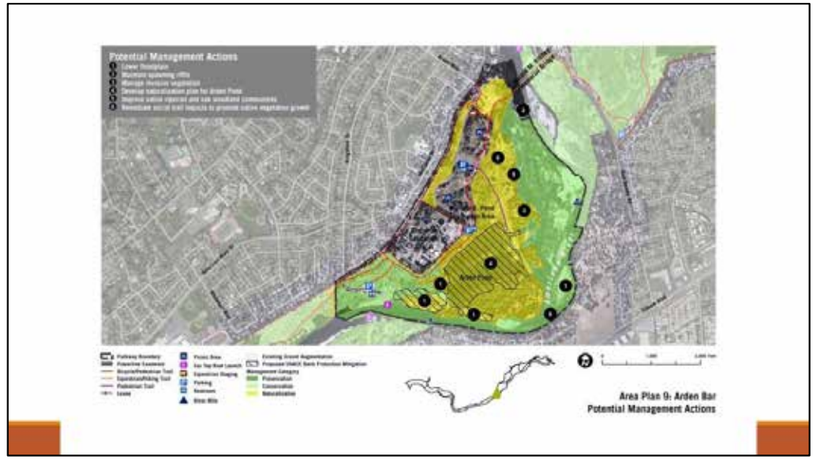

Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

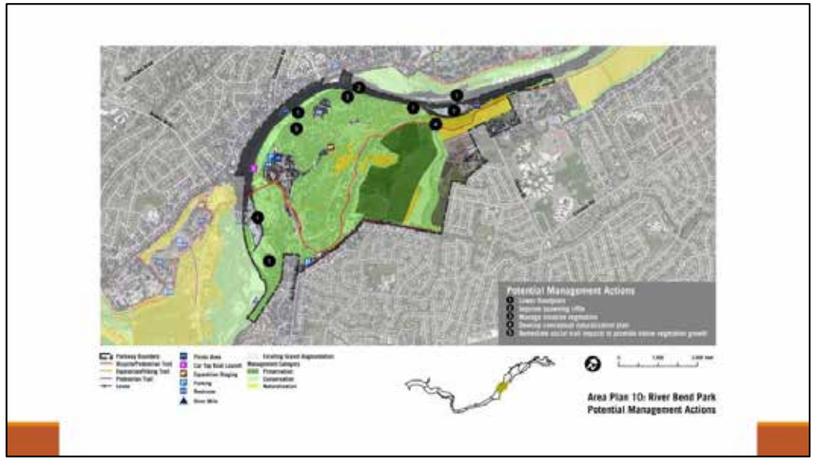

Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions

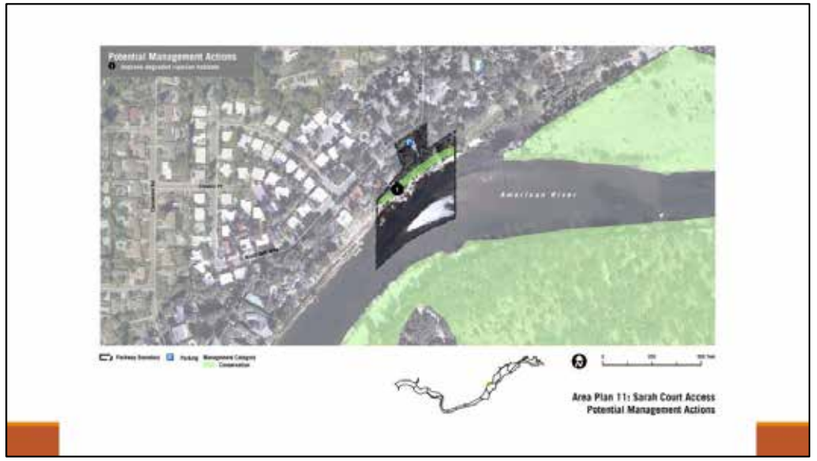
Potential Management Actions
American River
Area Plan 6: Howe Avenue
Potential Management Actions

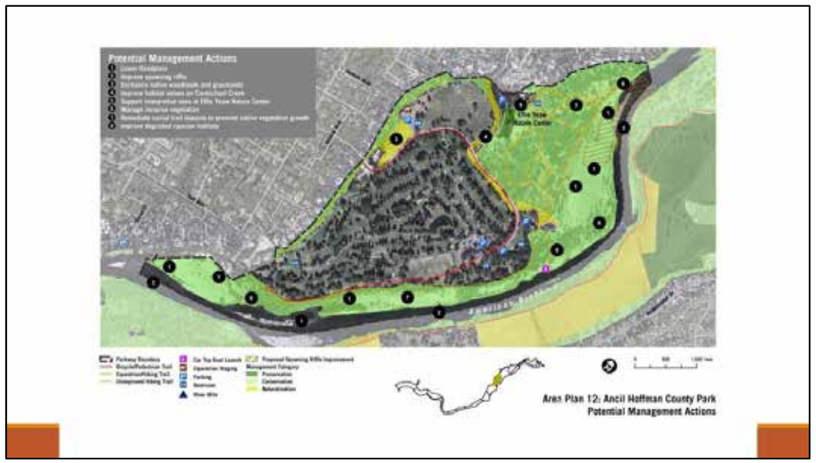
Potential Management Actions
American River
Area Plan 7: Watt Avenue
Recommended Management Actions


Potential Management Actions
Area Plan 8: SARA Park
Potential Management Actions

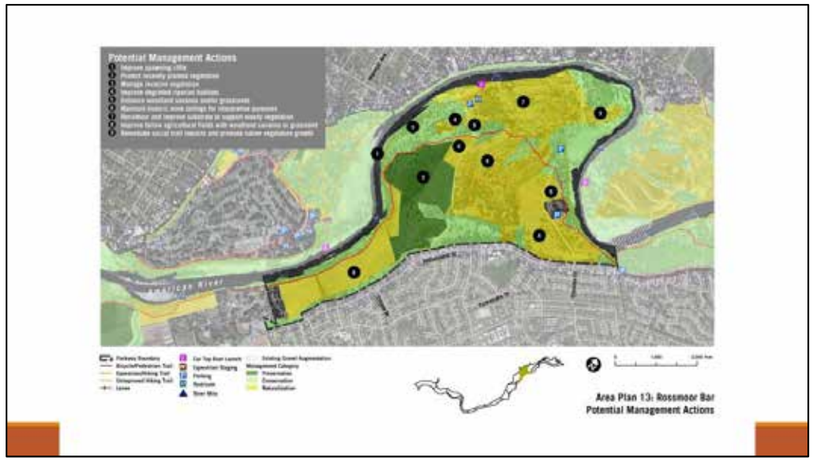

Potential Management Actions
Area Plan 9: Arden Bar
Potential Management Actions

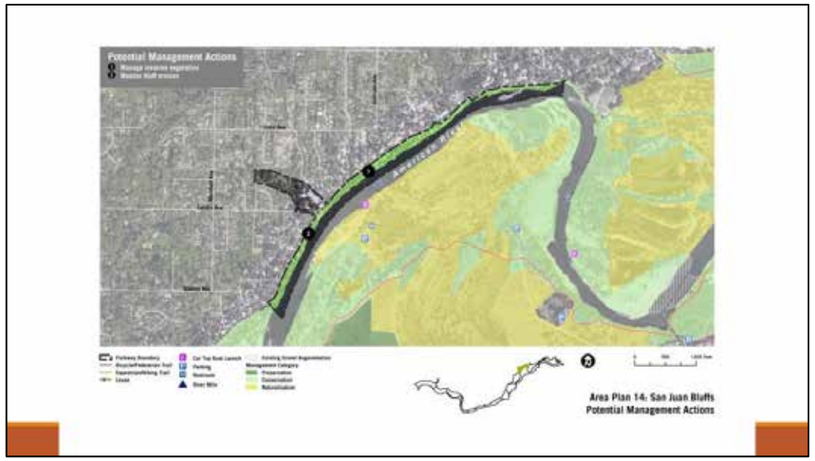

Potential Management Actions
Area Plan 10: River Bend Park
Potential Management Actions

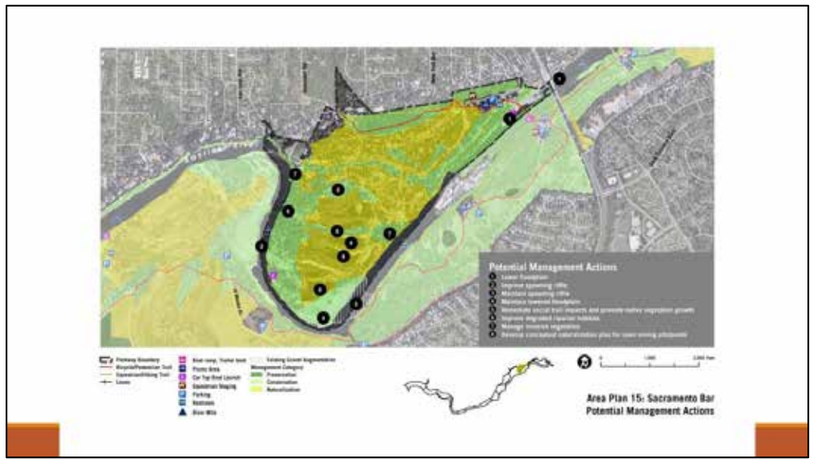

Potential Management Actions
American River
Area Plan 11: Sarah Court Access
Potential Management Actions

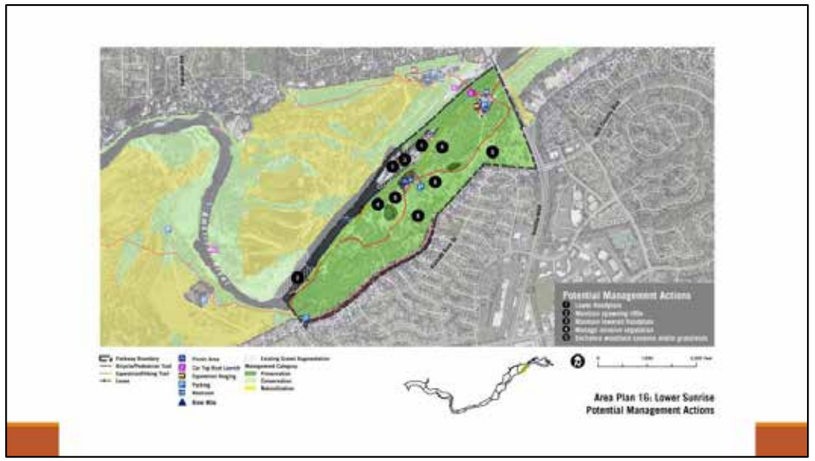

Potential Management Actions
Area Plan 12: Ancil Hoffman County Park
Potential Management Actions

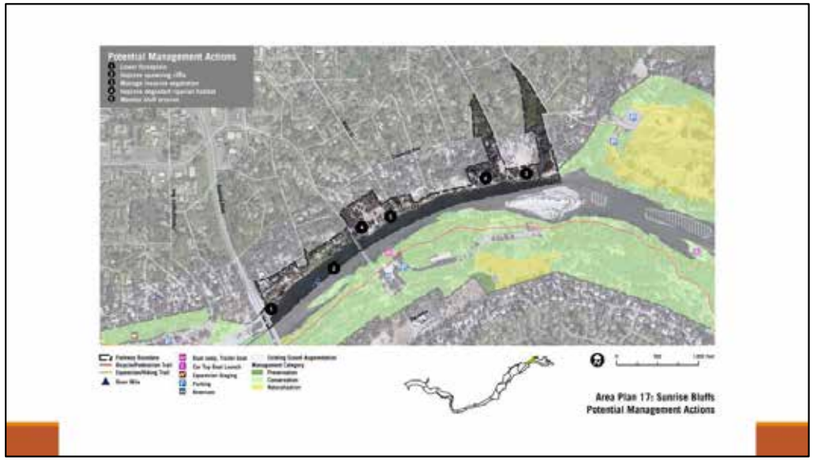
Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

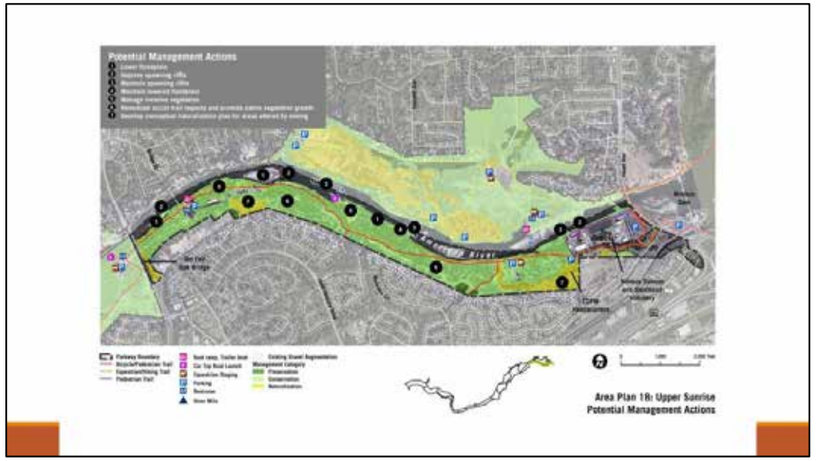

Potential Management Actions
Area Plan 13: Rossmoor Bar
Potential Management Actions

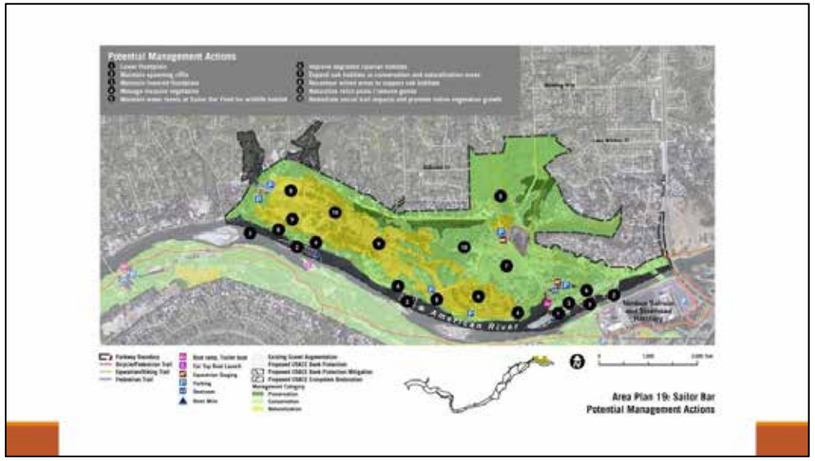

Potential Management Actions
Area Plan 14: San Juan Bluffs
Potential Management Actions


Potential Management Actions
Area Plan 15: Sacramento Bar
Potential Management Actions

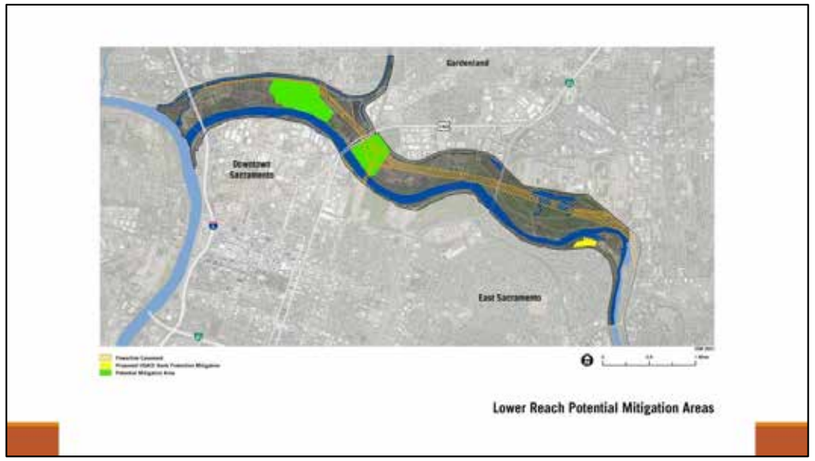

Potential Management Actions
Area Plan 16: Lower Sunrise
Potential Management Actions


Potential Management Actions
Area Plan 17: Sunrise Bluffs
Potential Management Actions

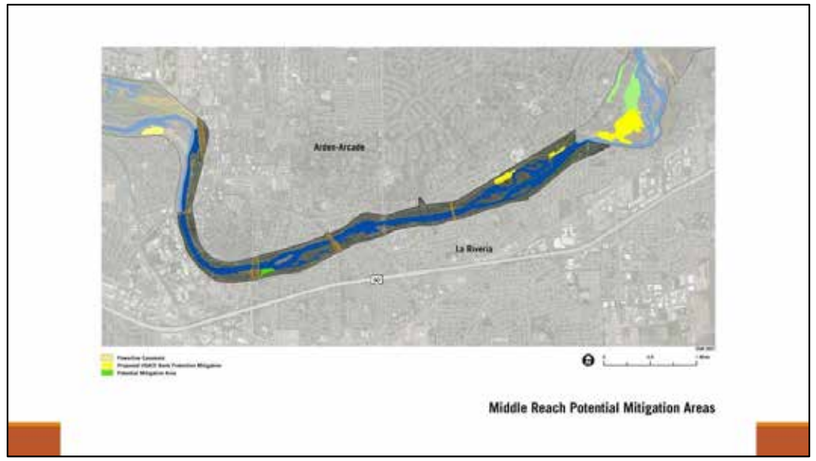

Potential Management Actions
Area Plan 18: Upper Sunrise
Potential Management Actions


Potential Management Actions
Area Plan 19: Sailor Bar
Potential Management Actions

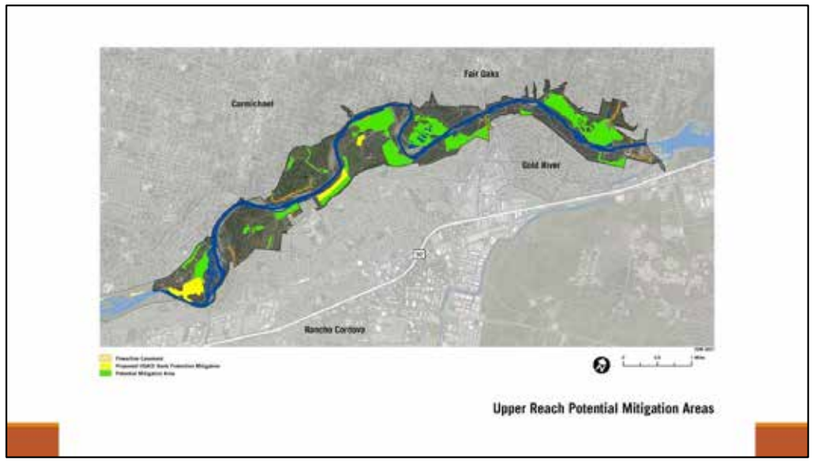
NRMP Partners
GOAL AREAS
AGENCY/ORGANIZATION
GOAL AREA 1 Biological Resources
GOAL AREA 2 Physical Resources
GOAL AREA 3 Cultural Resources
GOAL AREA 4 Human Use (expect Recreation
GOAL AREA 5 Agency and Community Coordination and Collaboration
American River Natural History Association
American River Parkway Advisory Committee
American River Parkway Foundation
Cal Expo
California Native Plant Society
California State University, Sacramento
City of Sacramento
City of Rancho Cordova
Department of Water Resources
Lower American River Conservancy
Pacific Gas & Electric Company
Reclamation Districts
Recreation and Park Commission
Sacramento Area Flood Control Agency
Sacramento City Fire
Sacramento County Department of Health and Human Services
Sacramento County Office of Education
Sacramento Metro Fire
Sacramento Municipal Utility District
Soil Born Farms
State Lands Commission
State Water Resources Control Board
University of California, Davis
U.S. Army Corps of Engineers
U.S. Bureau of Reclamation
Utility Arborist Association
The Water Forum
Tribal Governments
Western Area Power Administration
Wildlife Conservation Board




Lower Reach Potential Mitigation Areas




Middle Reach Potential Mitigation Areas




Upper Reach Potential Mitigation Areas

APPENDIX A

# RPC NRMP WORKSHOP 2020 SUMMARY REPORT



## RECREATION AND PARK COMMISSION (RPC)
## AMERICAN RIVER PARKWAY (ARP)
## NATURAL RESOURCES MANAGEMENT PLAN (NRMP)
## PUBLIC WORKSHOP

Thursday, July 23, 2020 ◆ 6:30 p.m. – 8:30 p.m.
Online by Zoom

## S U M M A R Y  R E P O R T

### INTRODUCTION

On July 23, 2020, the Sacramento County Recreation and Park Commission (RPC) held a public workshop on the American River Parkway (ARP) Natural Resources Management Plan (NRMP). The purpose of the meeting was to: (1) provide an overview and status of the NRMP, (2) describe the NRMP Task Force, (3) present draft NRMP mapping products, and (4) receive community and commissioner feedback on the draft NRMP materials.

#### Meeting Format

The RPC NRMP Public Workshop occurred on July 23, 2020, from 6:30 p.m. to 8:30 p.m. online by Zoom. RPC Commissioners, Sacramento County Department of Regional Parks (Regional Parks) staff, consulting staff from MIG, Inc., and members of the public participated in the meeting. Attachment A of the Summary Report Appendix contains slides from the workshop's PowerPoint presentation.

### OPENING

Following initial roll call, Lilly Allen of the RPC began the meeting, reminding participants to put themselves on mute when not speaking. Liz Bellas of Regional Parks gave a self-introduction, introduced Daniel Iacofano of MIG, Inc., and thanked all participants for dedicating their time to the NRMP public workshop. Ms. Bellas then handed the meeting over to Mr. Iacofano.

### POWERPOINT PRESENTATION

Mr. Iacofano first explained the structure of the public workshop, noting the first segment of the meeting would consist of a PowerPoint presentation and the remainder of the meeting would be reserved for open discussion during which the public and commissioners would be given the opportunity to pose questions and comments. He then gave a brief background of MIG's previous work with river corridor management projects, and introduced Bill Spain and

Jon Campbell, additional MIG staff members working on the NRMP. Mr. Iacofano also noted the NRMP development team had successfully held two (2) NRMP Task Force meetings prior to the public workshop.

Mr. Iacofano began the PowerPoint presentation, first presenting the workshop agenda. The agenda and PowerPoint presentation included the following topics: Parkway Overview, NRMP Task Force, NRMP Overview and Status, NRMP Framework, NRMP Mapping, Area Plan Maps, Questions/Comments/Discussion, and Next Steps. Mr. Iacofano gave an overview of the Parkway and the NRMP Task Force; Mr. Spain discussed the NRMP Overview and Status, including NRMP topic areas and the proposed NRMP implementation program, and the NRMP Framework, including mission and vision, goals, objectives, and performance measures; and Mr. Campbell presented the draft mapping products produced for the NRMP, including inundation, vegetation communities, invasive species, and habitat connectivity maps, and Area Plan-specific management maps.

**DISCUSSION PERIOD – MEMBERS OF THE PUBLIC**

Mr. Iacofano opened the meeting to questions and comments from the public. He emphasized the NRMP is a natural resources management document recommended under the American River Parkway Plan (Parkway Plan), and while the Parkway Plan delves deep into recreational and event facilities, the NRMP is intended to focus predominantly on natural resources protection and enhancement.

Ms. Allen paused the meeting briefly to note that while normally members of the public would be given three (3) minutes to speak, individuals commenters would be given less time to speak during the workshop due to the large number of community members present.

Questions and comments from members of the public are recorded below. Responses are shown in *italics*. Individual bullet points may include a single question and response, or a back-and-forth conversation.

- I would first like to thank Liz Bellas and her staff for doing a tremendous job with a low budget for this type of operation, and to thank the RPC for providing guidance to the County, the Task Force, and consultants. I have used the Parkway over the last 30 years. Part of the importance of the NRMP is in determining the type of Parkway we will leave future generations. This is about the legacy of this generation of County decision makers, Parks and Recreation staff, the Commission, and the public. Over the last 30 years, we have seen significant degradation of the Parkway and its resources. The NRMP provides the greatest opportunity to restore those resources. I was very happy to hear Daniel talk about restoration and enhancement. I would like to share several slides with the group. There are several things I think the NRMP needs to include to be effective. I was pleased to read through the materials. First, I think the NRMP should have set numeric restoration goals. Unless you have metrics to abide by in the plan, the public does not have an understanding of what the Plan means, and it is hard to measure our





progress. In addition, numeric goals give those of us who want to support the implementation plan a target to work toward to raise public funding to make sure we can implement those projects. Second, it is important to incorporate specific restoration projects and provisions to facilitate future projects. You may have areas that need restoration later on, and through the NRMP you can get buy-in for restoring those areas in the future. The U.S. Army Corps of Engineers (USACE) and others may include those areas as earmarked for future restoration. Third, it is important the NRMP discuss and map past and anticipated future impacts. We need to have a sense of what areas have been damaged over the past 20 -30 years. The draft materials provide good discussion on the types of impacts, but it is important to discuss the scale of those impacts, where the impacts occurred, and where we may address them. It is important to anticipate future impacts. We are going to see more flood control work along the Parkway and proposals for I-80, Highway 160, I-5, and, potentially, regional transit. Bridges can have severe adverse impacts upon the Parkway in terms of biology and public uses. It is important the NRMP includes standards for mitigation and enhancement that projects need to meet to get approved, and to require all mitigation and enhancement occur within the Parkway or on adjacent lands. It is also important to prevent and mitigate damage from fires. This picture was taken from Discovery Park on Sunday morning. This is the most recent Parkway fire, and it wiped out key riparian areas and trees. More trees would have bene wiped out had it not been for previous fires that wiped out a significant amount of the riparian canopy between the bike trial and the river. This is part of the legacy we will leave our children and future generations if we are not aggressive in terms of restoration efforts. Understanding there are fires is one thing. Preventing fire and taking action to mitigate and restore these areas is important. Over the last 10 years, I have seen numerous fires along the downstream section of the river. Following these fires, the wild grapes invade the areas and take over. It is important the NRMP recognizes invasive plants include native plants. Trees did not regenerate in those areas because the ground was covered with wild grapes. We have an ecosystem that is out of balance. Natural predators that would keep the grapes in check are no longer present. The grapes provide ladders by which fires reach the tree crowns. I suspect that is part of the reason we lose the major trees in this area. Form Discovery Park to Northgate along the trails where trees were lost to fires and PG&E vegetation management, the trees have been swamped with wild grapes. There is a lack of regeneration of sycamores and other riparian vegetation because of the grapes. We are also losing the diversity of species in this area. The grapes are turning part of Steelhead Creek and other areas into monoculture. The next slides show areas in Discovery Park up to the Urrutia property where we are losing habitat diversity and the ability to regenerate trees because of wild grape infestations. The blue dots are where major trees were lost, and some of those areas were recently impacted by fire. As you go up the river you see other places where we have lost major trees that are not growing back because the wild grapes are out of control and need to be properly cut back and managed. We need to get the grapes off the trees to avoid the crown fires that take out 40- to 80-year-old sycamore trees that are a crucial part of the environment. This graphic shows the Urrutia property and areas impacted by invasive grapes. Again, the

blue dots show where trees were lost. I would encourage you to look at all invasive plants, not just non-natives. On fires, it is very important that within a short period of time following a fire, the County assesses the damage that occurred to determine whether the area will regenerate by itself as it does in some areas, or whether you need to have active restoration to restore that habitat to prevent the ongoing damage that we see in the lower sections of the river. I am glad to hear the folks of MIG discuss habitat connectivity. Habitat connectivity can also occur using adjacent properties in tributaries like Steelhead Creek. One of the major opportunities to expand habitat connectivity is with Sutter's Landing Park and Urrutia, which is high priority, as you discussed in the NRMP. I will leave it at that. My more specific comments are in the materials I provided. Thank you to Liz for including my comments in your packet. I am happy to answer any questions about these comments and my written comments. I also want to thank each of you because you each play a critical role in making sure that we give future generations a Parkway we can all be proud of.
(MIG) *Thank you. That was an excellent presentation. We have your presentation recorded so we can take a look at your points in more detail at a later time.*

- As many of you know, I work at Bushy Lake. I am hopeful that the data we have gathered over the past five (5) years can contribute to the NRMP and help make the efforts more successful and integrated into the larger work you all are doing. I have been out on the Parkway observing the river. Sacramento State University has been serious in the engagement of science on the river, community service, and bringing school children out to the Parkway. I think we have an opportunity to bring the magic of science at Bushy Lake to Sacramento State students and Arden Arcade students who do not have that opportunity. Specifically, the first part of our design it very adaptive. Adaptive restoration involves doing experiments, seeing what works, and having good data. Then, you can contribute what you do to the larger restoration success along the river. One of the things we are doing is planting fire-resilient vegetation that also happens to have a low roughness coefficient and is significantly used by cultures along the river. Culturally significant plants are an element currently missing from the draft NRMP. Important cultural plants are white root, which are used for baskets, mug wort, a medicine plant, and fiber plants (i.e., milkweed and dogbane), which are important for insects. Tarweeds, the madias and hemizonias, are also important. Elderberry, oak, and these plants can be mapped, and we can invite traditional management, in part to address the grapes. I was asked by the Miwok people to harvest the grapes and help get a permit from Regional Parks to harvest the grapes as a building material for traditional construction of the roundhouse up at Indian Griding Rock State Park. So, on one hand, the wild grapes are important for traditional gathering, but the grapes do also provide a lot of habitat. I want to make sure invasive species like poison hemlock and white top are included because they are starting to proliferate. We are doing more experiments with plants for pollinators. The big thing we have been doing with adaptive restoration is the wildlife in the corridors. We have watched and learned about the Western pond turtles. The river is a porous system, so the turtles come and go where they have room. We are conducting detailed study partly through our conceptual restoration plan to





determine how the turtles are doing. Overall, they are not doing well, and they are on the verge of being listed. They are the kind of animal everybody loves. Recently, I was asked by a homeless woman on the Parkway if I knew anything about turtles, and she presented me with a giant red-eared slider turtle. I told her it was laying her eggs, so I put it back in the river. I am trying to say that everybody I talk to out on the Parkway loves the turtles. I think coordinating adaptive management and quantitative monitoring that feeds back into the overall restoration success on the river is vital. I also told the sheep handler how the sheep were helping the turtles find a place to nest. They [the goats] are doing an exceptional job out there. They are really clearing out the brush and the weeds and making the landscape more fire resilient. I would like to turn over large portions of Bushy Lake to people who know more about education, like Effie Yeaw or the American River Parkway Foundation. I want to invite you all to come out some time, especially when we are trapping, marking, and releasing. A beaver came out last year and the beaver have changed the landscape, making walkways, and the turtles are using the walkways to go up and out to the land, lay their eggs, and then return to the river. Everyone thinks the Parkway is just ratty with trash and homeless people, but on the inside it is just incredible. Thank you.
(MIG) *Thank you. You presented good comments.*

- I made quite a few comments at the American River Parkway Advisory Committee (ARPAC), and I hope those comments will be incorporated. One thing that occurred to me as I listened to everyone speak is that on a practical level, I want to know how you address taking this plan and applying it to projects or agencies who are working in the Parkway. I amt thinking of PG&E and the clear-cutting they do. If we have an NRMP in place, how would we apply that, and what levers would we have to make sure PG&E repairs the damage they did? Will this NRMP hold power to be used when others do damage in the Parkway? Also, Caltrans has indicated previously in environmental documents that the agency would come in, do a project, and restore the area to the condition in which they found it. We do not necessarily want the landscape restored to the conditions we found it in if the condition was invasive grasses, for instance. We might want to look at the NRMP and ask these agencies to apply remedies when they come back in to restore. I am thinking about how this will all work on a practical level. That is where we get stuck as Parkway advocates. We are commenting on these projects and we have to interject ourselves in the damage that has been done. Do you see the NRMP as a real tool we can use?
(MIG) *I think you make an excellent point. We can use the occasion of those agencies seeking approval to do things that would impact the Parkway to actually ask them to help us implement the recommendations of this NRMP. So, I think it comes down to how things are stated in the environmental document. There will be CEQA review of the NRMP as is required. That will become part of the baseline information that agencies will need to address when they do any kind of work that would have an impact on natural resources in the Parkway. Liz, do you want to comment on that further? The idea in the NRMP being coordinated with the agencies is that we would have their buy-in as a result.*

(Regional Parks) *You are correct. Working with all the agencies in our Task Force will ensure that we are keeping them close to the table and we have a better understanding of the things they will be doing. We will be driving the ship, so to speak, and we need to make it clear what we desire for the Parkway as the Parkway manager, and give the agencies the tools* and *the roadmap to do the restoration in the way that it needs to be done for the betterment of the Parkway.*
I am hearing you say that when agencies, such as PG&E and others, are applying for permits to County Parks to do work, you would hand them the NRMP.
(Regional Parks) *We have the utility companies at the table with our Task Force. Of course, the document will be available to them. Remember that PG&E is not applying for permits from us because they have the right-of way and are doing work within their legal right-of-way. It is not something that we are permitting.*
Okay, so their work does not require a permit from you, but rather from Fish and Wildlife. You know if Fish and Wildlife is going to have to comment on a project?
(Regional Parks) *CDFW is at the table too because they are on the NRMP Task Force. The Task Force itself is enabling us to bring all these players together so that everyone is well aware of what we are trying toa accomplish with the Parkway's natural resources. So, they will not be working in a vacuum and they will know we have this NRMP in place. When the County is reviewing a project, from a regulatory standpoint it has something to point to say to require an action and we will already have a plan in place for where a particular type of restoration or mitigation needs to occur.*

- I would like to take a minute and go back to Bushy Lake. From the planning and coordination for the NRMP, we have learned that the USACE has identified Bushy Lake as a site for their Ecosystem Restoration project. Knowing that Sacramento State is working on a conceptual restoration plan out there, I am wondering if you know who Dr. Stevens can contact to make sure that, when developing the conceptual restoration plan, she is considering these other preliminary designs that have been developed for this site and can see if she can incorporate those designs into her plan. I do not know if that would be somebody from the USACE or the Sacramento Area Flood Control Area (SAFCA), perhaps Greg Ellis, or someone who would have more information on the best-buy plan for the Bushy Lake area.
  (Regional Parks) *SAFCA would be an excellent group for Dr. Stevens to work with. I believe that Tim Washburn and Gregg Ellis are going to be reaching out to Dr. Stevens to discuss these very things. There are some preliminary plans in place, but I do not know how quickly they are going to be implementing anything. During our Task Force meeting today, I believe SAFCA mentioned the plans are at 15 percent design. I do not know if those plans are at a point where they could be incorporated into Dr. Stevens' plan. We want to make sure they are talking to each other, so they are not duplicating work or doing things that contradict one of the plans. We are well aware of this situation and we will definitely make that Dr. Stevens is aware of the existing USACE plans, but SAFCA would be the conduit for us.*
  I know Dr. Stevens is going to be collecting some valuable information about the terrestrial and aquatic environments out there. I think it would be good to share that





data with SAFCA and the USACE to see if they can use that information when moving forward with their designs for their Ecosystem Restoration best-buy plan. I think there is a lot of opportunity here. I really hope you all can put Dr. Stevens in touch with whoever is best over at SAFCA or the USACE.
(MIG) *You made a great point. We are definitely connecting the dots here.*

- Is Caltrans on the team [NRMP Task Force]?
  (MIG) *Caltrans is not a member of the Task Force.*
  Okay. Even if Caltrans is not on the Task Force, they need the NRMP in their hands.
  (MIG) *We agree.*

**DISCUSSION PERIOD – COMMISSIONERS**

Ms. Allen then transitioned the meeting to a discussion period in which the commissioners were given the opportunity to pose questions and comments.

Questions and comments from the commissioners are given below. Facilitator responses are shown in *italics*.

- I am going to work backwards. Looking at the comments Corey made, I want to highlight the idea that we following up with fires is an important thing to do. As you observe areas that have been damaged by fires, you see that damage persist years later. Things do not always grow back in quite the same way. Conducting assessments and coming up with a plan for a location for restoration over the six (6) months or two (2) years following a fire is key. I know sometimes fire benefits the environment and allows for new growth, but this would allow us to decide if the fire is okay and we let it be, or if we address it. I want to highlight that I thought that is a great and thoughtful idea. I also have questions about the invasive plants. When we remove an invasive plant species, do we replace it with a plant that belongs there or do we just leave the area empty?
  (Regional Parks) *When we remove invasive exotic plants, we generally do not replant ad the invasive plants are usually mixed with other desirable species, such as willows. Willows grow into those spaces on their own. We would not want to just leave a big mud hole. That would not be a good thing to do. For example, we decided not to remove yellow flag iris plants because they would leave huge holes. When you plant something, it takes a lot of resources to help the roots grow and to keep beaver and deer off of it. We have found the most success with letting the native plants in the vicinity fill in those spaces.*
  Does that provide enough diversity of native plants? When I look at the map, there are only a couple pockets of native plants. Are we having any shortages of any particular native plants and should we look at giving them more native habitat? Should we just let the native plants already in those areas spread?
  (Regional Parks) *There are places that need a wholesale do over. That is where we put our mitigation sites. We install irrigation systems and tree cages, and we maintain the*

*plants for several years. So, there are some areas for which we want to put a lot of money and effort into restoration. However, if we are just pulling a plant here or there, as we do when pulling a Spanish broom from a gravel bar or pulling a red sesbania off the bank, it does not work really well to replant afterwards.*
So, your approach is to remove minor problems and let native species in the vicinity move in. With big problem areas, you replant fully. My other question relates to the maps, which are great. Will those maps be available to the public and easy to access? And will you be able to zoom in and zoom out of them? I know they are very useful for the people who are using them, but as a member of the public, they are also very interesting.
(MIG) *We intend to make those maps available. They are a great resource for all the organizations active in the Parkway, including Dr. Stevens and her organization. We think they are good tools for all agencies and members of the public.*
The Arden Bar map contains an item to reduce to reduce boat ramp effects. Does that mean you are going to remove the boat ramp, or will you alter the existing boat ramp? Are there more detailed plans on what you do with a general recommendation or is that left to the Parks department to sort out?
(MIG) *That is a great question. We do not have the site-specific survey data to be able to do a design for that boat launch. Design would come with the next stage when a group would come along to zero in on Arden Bar. The intent of that directive is not to remove the boat ramp but to make is more compatible with the native vegetation and the other natural resources in that area. That would be the intent.*
So, when it is time to do a mitigation plan, then the group would look at those recommendations and get detailed in how they are going to go about altering the boat ramp. The current planning process gives the what and how you want something to look like and the why comes next version when you are actually making the action?
(MIG) *Precisely. That is exactly the procedure. Thank you.*

- I am curious to learn more about the invasive wild grapes. I was unaware of the problems that these cause, and the advantages of them naturally occurring. I know Corey's correspondence specifically addresses concerns with the grapes. What would a long-term approach for that species look like under this type of management plan?
(Regional Parks) *It is important to look at our objectives for the species. If your objective is to take care of the ladder fuels to protect the cottonwood trees and it is a dry year, then you would want to focus in on that issue. In general, even though wild grapes seem like they are invasive they are doing exactly what they are supposed to be doing. They are providing habitat for the birds that eat the grapes and they provide a lot of shade for the understory. It is true that they are not good sometimes for the tree they are growing on, but that is not always the case.*
(Member of the Public) The wild grapes are a native species and they do have some habitat value. The problem is they can help fires get into the crown of the trees. When you have the fires, you lose trees, and they are not regenerating because sunlight cannot get into the soil. The wild grapes also compete with trees for water and nutrients. It is important to urgently remove wild grapes from trees, so we do not lose





more trees. Secondly, look to see where we lost trees and where we want to see trees regrow and start cutting back the grapes in those areas. We can make them ecologically helpful, but we do not want to create a monoculture. To create a healthy riparian area, you need several stages of habitat from trees to midstory to stuff on the ground, especially stuff that is going to create shaded riverine aquatic (SRA) habitat. The wild grapes interfere with that. I think I would recommend to immediately get the vines off the trees so we do not lose trees. Then, engage the Sacramento Regional Conservation Corps in a removal and long-term maintenance program to keep the grapes in check so that they are located where they can contribute to the environment, but they are not so invasive that they reduce the ability of the trees to regenerate and the ability of other plants that we need to maintain the diversity of the Parkway to regenerate. I would be happy to take folks on a tour from Discovery Park to Northgate so you can see how extensive the problem is. I have seen this area significantly degrade over the last 30 years and the grapes are one of the major reasons why this system is overwhelmed and cannot regenerate the trees and other types of plants we need. I have worked on river parkway projects and river projects since 1982 and I am just amazed that this situation has been allowed to get as bad as it is.
(Commissioner) Dr. Stevens had a group that wanted to harvest those grapes. Is that something that would assist with in the removal of the grapes or was that more of an action to keep the grapes where they are so they can be harvested?
(Member of the Public) The idea is a combination of monitoring what is going on along the river and managing where grapes are a threat to trees. Also, we want to have more open landscape to invite First Nations people in to harvest the grapes. A combination of science and traditional knowledge is needed..
(Commissioner) To me that sounds like a win-win situation. If there is an option to pursue a multi-beneficial solution, as is the case here where the action would be environmentally and culturally beneficial, I think that is a great pairing.
(Regional Parks) *I think it would be better for biologists and ecologists to determine the answer to this question.*
(Commissioner) One of the things I am hearing is that there is a lot to understand with grapes on the Parkway and that ancestral cultural resources are also present. Liz, do you think it would be appropriate to ask Mary, Corey, and Dr. Stevens to spend some time developing a program or a small working group around grapes? It seems like a hot topic.
(Regional Parks) *I think that we should allow the NRMP to continue through this process. I think we will have some of the answers we need through the development of the NRMP. If this question is not answered within the NRMP, we will have additional opportunities for public comment to make sure we are addressing it thoroughly. I think discussing this issue in depth is a bit premature at this time. As far as allowing native peoples to do the harvesting, we do have an encroachment permit with the Shingle Springs Band of Miwok to do those very activities along the Parkway. We would like to explore and expand upon those relationships.*
(Commissioner) How will you square away this situation and question of whether there are too many grapes, not enough grapes, and where the grapes go and if they are hampering tree growth. It seems like you are going to take this back and digest it, but

are you going to come back to the RPC or are you going to call this out in a special, clear way? How can the public track this issue?
(Regional Parks) *The public would want to track the issue through the development of the NRMP. This situation is part of the reason why we are doing this plan. We are clearly laying out all of our objectives and goals for the Parkway natural resources. This is the very vehicle in which the issue would be addressed. I think we need a little bit more time to fully vet all of this information through our Task Force and our technical experts that are at the table so that we can have this information for the public. Again, this is not the last time that we are going to be receiving public comments. We are going to have two public workshops in November, much like this one, and the environmental review process for the document will provide another mechanism for public comment. This is the very tip of the iceberg and just the beginning of our public interaction. Please allow us some time to do our work and call us out if afterward you think we did not do enough.*
(Commissioner) Can I request that in November you highlight this grape debate? I do not know if I will remember, but it is of great interest. Perhaps you can develop a slide on the issue.
(MIG) *This can be addressed along with the dozens of other native or non-native species that we have in the Parkway. We need to have objectives for each of those species. It is not always clear which direction we should take. There seem to be two (2) or three (3) approaches just for this one.*

- As a long-time user of the Parkway, this is very exciting and I am excited to be part of this. I have been using the Parkway for over 30 years myself. I have seen it in various stages throughout that time. The one thing I have a great deal of concern about from a restoration standpoint is the post-wildfire response plan. It would be great to see a full restoration, revegetation, and erosion control component to a response after we experience a fire. I will concur with Corey's observation made earlier. Every summer, we have several fires. Unfortunately, it is tough area to access some of these areas and the fires cannot be addressed quickly. Fires are an eyesore and cause a loss of wildlife habitat, and the erosion affects the water quality downstream. I would like to see a response plan with a clearer partnership developed with Metro Fire, if needed. Thank you.
(Regional Parks) *I think it is important to note we work with a couple of different fire agencies. One is Sac Metro and one is City Fire. These two agencies have different philosophies on how they treat fires. Sac Metro tends to go in and put the fire out quickly and make sure they have contained the fire to as little acreage as possible. City Fire will let it burn to the river area and the fire might burn more acreage than we would like to have burn. One thing I want this NRMP to address is a clear objective that we share with these fire agencies. There may be areas where it is appropriate to let the land burn, but for the most part, our objective should be to put the fire out as quickly as possible and minimize the number of acres burned. I want the fire agencies to have very clear objectives and direction on what we need to have happen.*
(Commissioner) Thank you, Liz. That was exceptionally informative for me and probably a lot of other people here.





(Commissioner) To follow up, I understand there are different approaches by different agencies. However, I am more concerned about a more scientific approach to wildland fire response. I understand and agree that while it is not always great to see burned areas larger than what we would like, wildfire is a key component of the landscape. In some cases, I would just like to see a more science-based and environmentally based fire response. Regardless of how I think the fire looks, I would like to defer to the experts and hope to have a plan to restore, revegetate, and protect from erosion.

- I have a handful of questions and comments. In you slideshow, your Arden Bar photo is not of Arden Bar. I do not see hills like that in Sacramento. I would be happy to send you nice pictures of Arden Bar.
(MIG) *We are addressing the pictures and will have those sorted by the end of this process.*
I am also thinking about bullet number 6, which is Environmental Education and has 6.1 Outreach, 6.2 Interpretation, and 6.3 Interpretation Program. I am wondering how you are developing numerical metrics for reaching the community and doing outreach. I am assuming that the survey is multilingual and are you tracking how many people of different languages are taking the survey. Are you going into community groups near and far in the Sacramento region? Are you giving presentations in Spanish and are you reaching the African-American community and Farsi-speakers? We have a huge, diverse population here full of people who are not always English-speakers, or may not prefer to give formal comments in English. How is your group addressing that?
(Regional Parks) *The wonderful thing about our County website is the ability to select whatever language you would like, and it translates everything for you. I do not believe we would have the opportunity to translate the survey into those multiple languages. I would like to do that. I was grappling with this issue. Providing language-accessible materials is a very clear objective that we have from the WCB and in general. I am thinking about adding some additional language to our natural resource management page instructing people who need materials in a different language to contact a specific person and we make sure we can provide those materials. The County has several contracts for interpretive services, and it is usually a pretty quick turnaround, so we can get those materials to the people who desire them. As far as outreach on the survey itself, we are always looking to do more. We reached out on social media and we did a press release. Shockingly, there seem to be other things in the world the press is covering ad nauseum. We did get a couple small articles and we will continue on that course. Mary is going to assist us with getting the survey on NextDoor for the entire County. We are also working with some of our partners to make sure they are spreading the survey on their e-serve lists. We are getting it out there as much as we can. Mr. Iacofano can speak to how many responses we have received in one week. I was impressed by the number of people who have responded.*
(MIG) *We have 80 respondents as of last week when we last checked the survey statistics. That was very soon after the survey launched on July 15th. We are keeping that map-based survey online at least until the middle of August and we will continue to*

*promote the availability of it. It is mobile friendly meaning you do not need to have a computer. Most people have access to smartphone technology these days.*
(Commissioner) Thank you for that. Perhaps we can be a little proactive and ask the translating service to proactively translate the survey for folks. I am excited that 80 people have responded to the survey, but this County has 1.5 million people. I think we need to do more here. There are experts in this field. I do not know why we should not spend some resources really figuring out how to communicate with our community that we serve.
(MIG) *Okay. We will follow up on that.*
(Commissioner) Feel free to reach out to me if you would like to run things by me or talk offline. I am happy to talk, especially about this. I think we should make sure we are engaging the community and not just our partners in how we should develop the plan. I also think this should be done in a way that adheres to adaptive management. I have an amendment to the mission and vision slides. Bullet 7 (Agency and Community Coordination) contains 7.1 Monitoring, 7.2 Scientific Research, and 7.3 Interagency Task Force. I am a little dismayed to see there are no community items under a community coordination goal. I think adding a community section that is accessible to all, especially outside these one-off nightly meetings, would be very valuable.
(MIG) *Okay. We are making note of that.*
(Commissioner) A community member is saying in the chat that we need to ensure the full plan is released to various environmental and social justice groups. There are many environmental justice groups in the community, and she did not receive anything from them or from other local environmental groups. I think there is a good bit more to do in terms of outreach here. Thank you all for your commitment to this important topic as we move forward.

**CLOSING**

Mr. Iacofano ended the open discussion period, noting the workshop had been recorded and the workshop participants gave great comments. Mr. Iacofano gave thanks to the RPC for the opportunity to present on the NRMP. One commissioner requested to be sent the list of groups Regional Parks and MIG contacted as part of its outreach efforts, and Mr. Iacofano agreed to send the list.

The RPC then concluded the NRMP workshop.



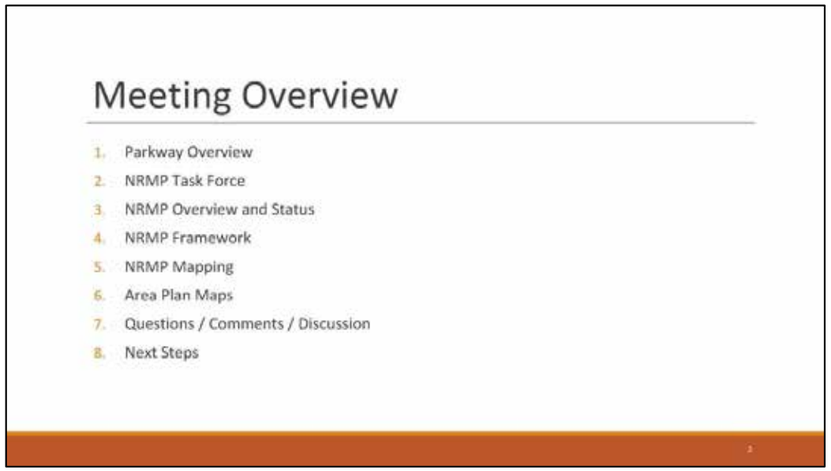


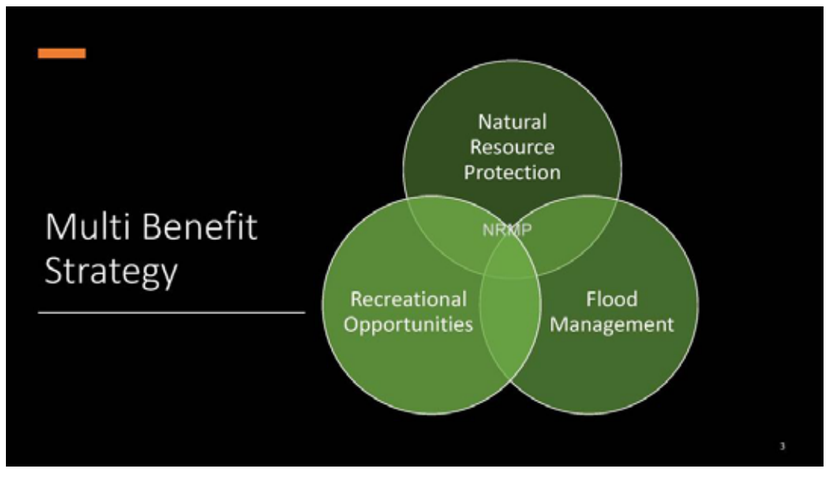
**RECREATION AND PARK COMMISSION (RPC)**
**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**PUBLIC WORKSHOP**

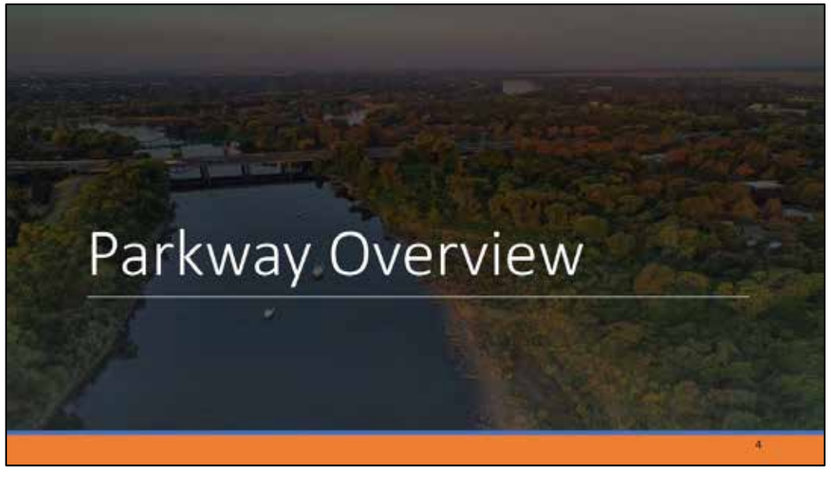
Thursday, July 23, 2020 ◆ 6:30 p.m. – 8:30 p.m.
Online by Zoom

## APPENDIX TO SUMMARY REPORT

**ATTACHMENT A: POWERPOINT SLIDES**

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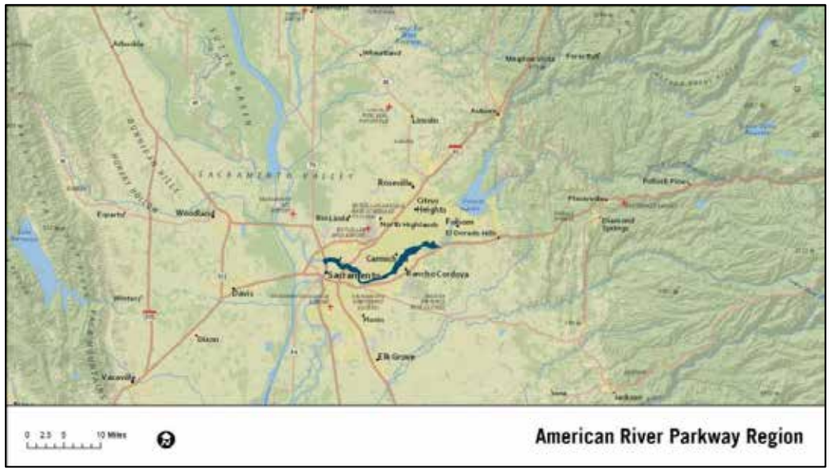
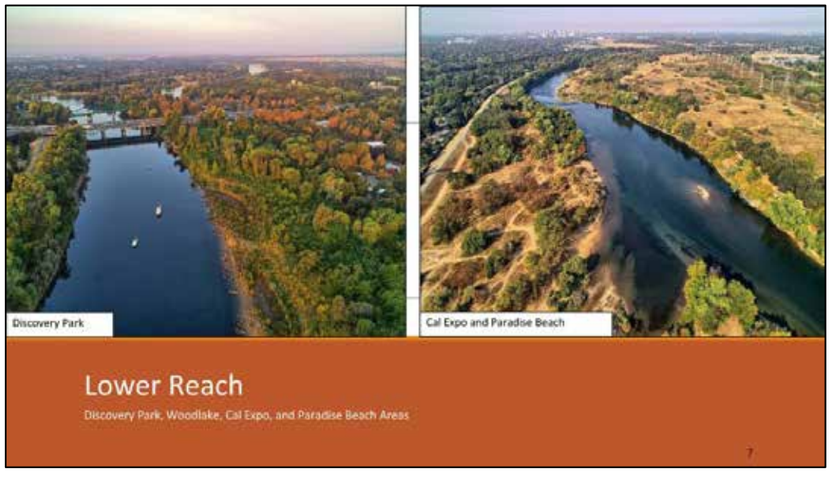
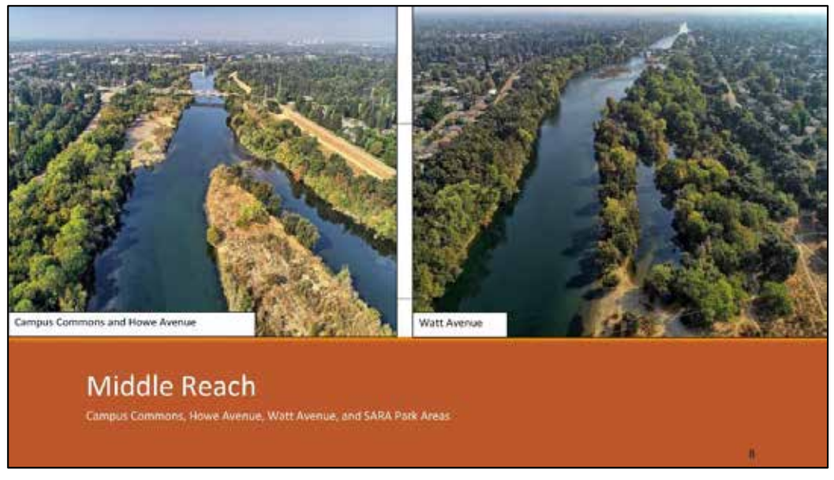
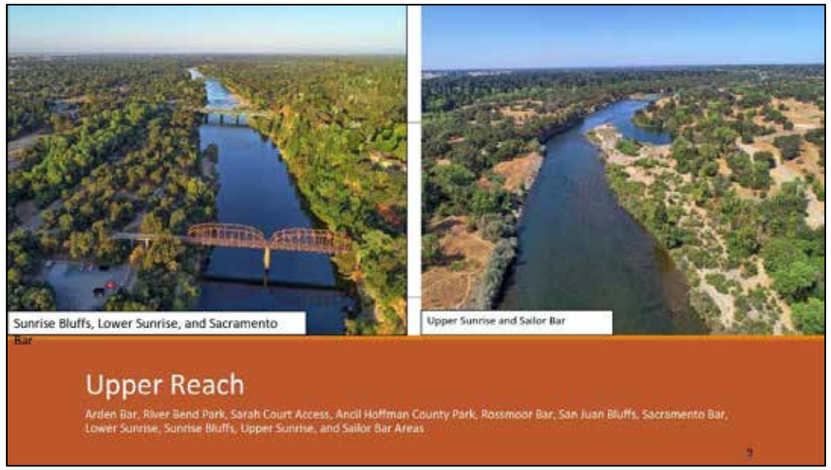
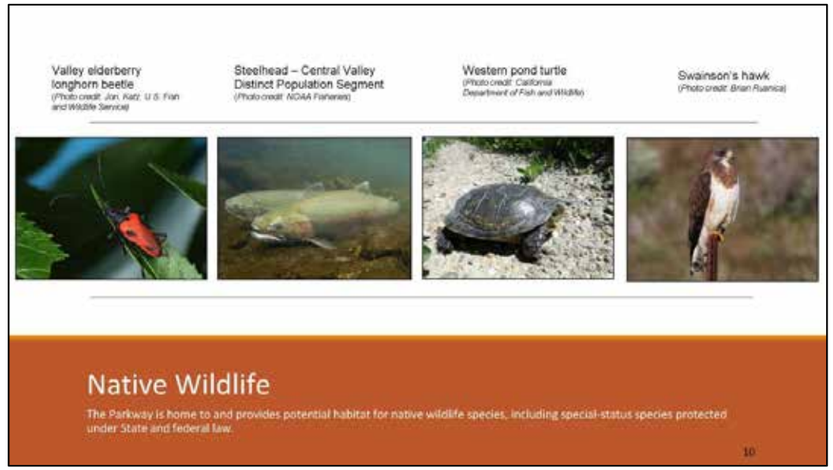

American River Parkway Region

American River Parkway


Discovery Park
Cal Expo and Paradise Beach
Lower Reach
Discovery Park, Woodlake, Cal Expo, and Paradise Beach Areas

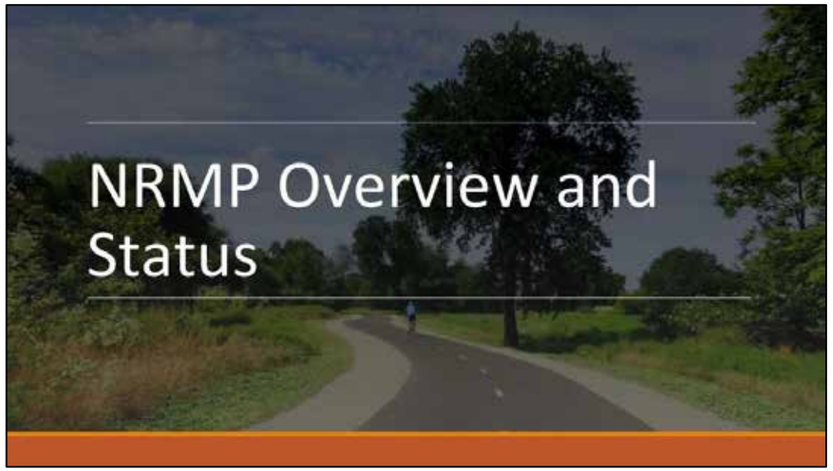

Campus Commons and Howe Avenue
Watt Avenue
Middle Reach
Campus Commons, Howe Avenue, Watt Avenue, and SARA Park Areas

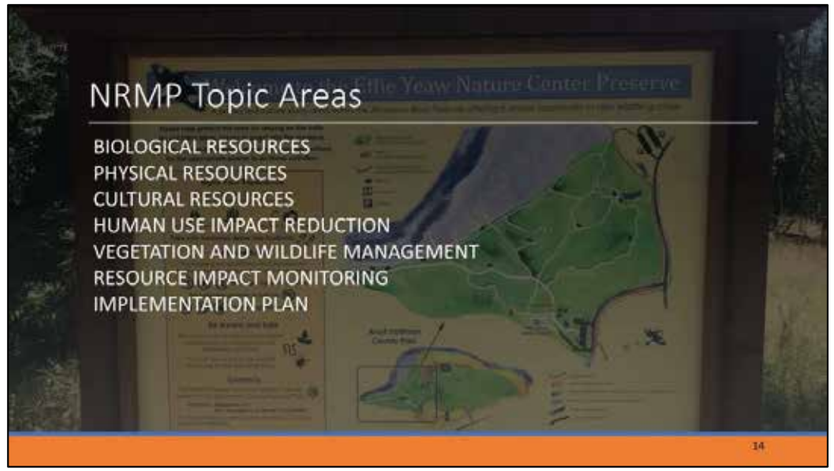

Sunrise Bluffs, Lower Sunrise, and Sacramento Bar
Upper Sunrise and Sailor Bar
Upper Reach
Arden Bar, River Bend Park, Sarah Court Access, Ancil Hoffman County Park, Rossmoor Bar, San Juan Bluffs, Sacramento Bar, Lower Sunrise, Sunrise Bluffs, Upper Sunrise, and Sailor Bar Areas
9


Valley elderberry longhorn beetle
(Photo credit: Jon. Katz. U.S. Fish and Wildlife Service)
Steelhead – Central Valley Distinct Population Segment
(Photo credit: NOAA Fisheries)
Western pond turtle
(Photo credit: California Department of Fish and Wildlife)
Swainson's hawk
(Photo credit: Brian Ruanica)
Native Wildlife
The Parkway is home to and provides potential habitat for native wildlife species, including special-status species protected under State and federal law.
10

NRMP Task Force

NRMP Task Force Member Organizations
Sacramento County Department of Regional Parks
Sacramento Area Flood Control Agency
The Water Forum
U.S. Army Corp of Engineers
Wildlife Conservation Board
Central Valley Flood Protection Board
American River Parkway Foundation
Sacramento County Department of Environmental Review and Assessment
WRC Environmental
ICF
MIG
12

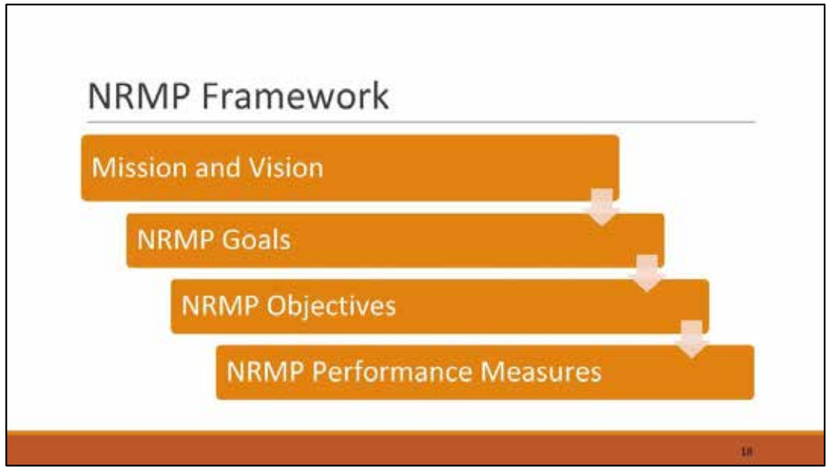

NRMP Overview and Status

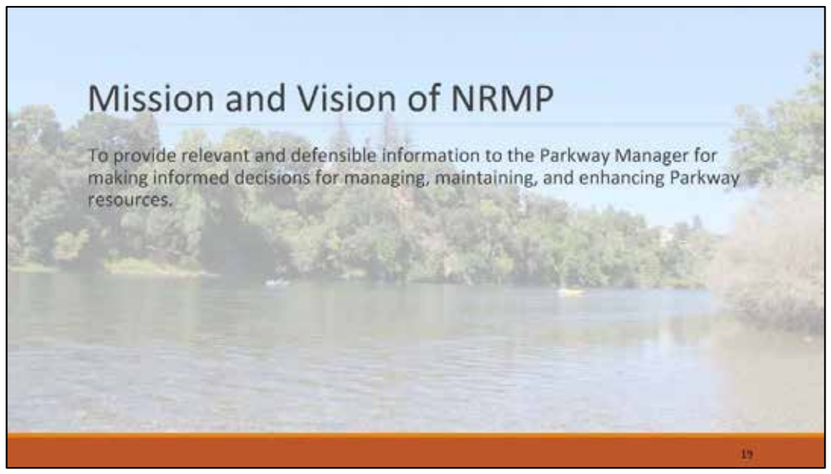

NRMP Topic Areas
BIOLOGICAL RESOURCES
PHYSICAL RESOURCES
CULTURAL RESOURCES
HUMAN USE IMPACT REDUCTION
VEGETATION AND WILDLIFE MANAGEMENT
RESOURCE IMPACT MONITORING
IMPLEMENTATION PLAN
14

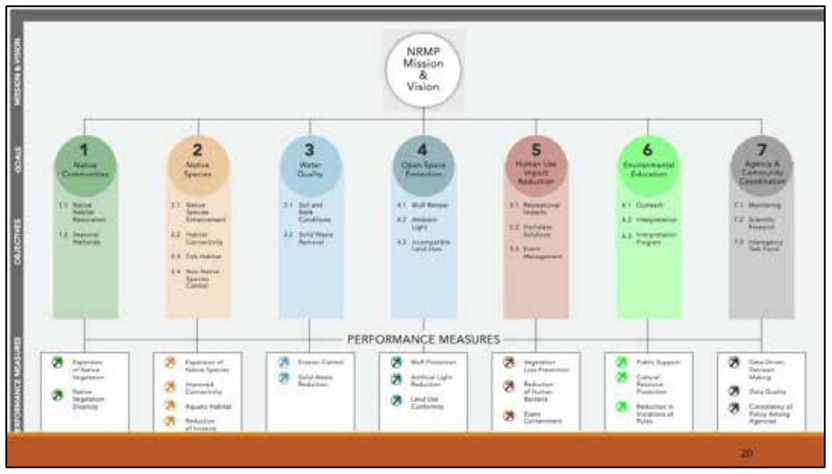
Implementation Program
Includes the following types of actions:
1. Site and Land Management (Including Restoration)
2. Visitor Management
3. Agency Coordination, Oversight, and Reporting
4. Monitoring

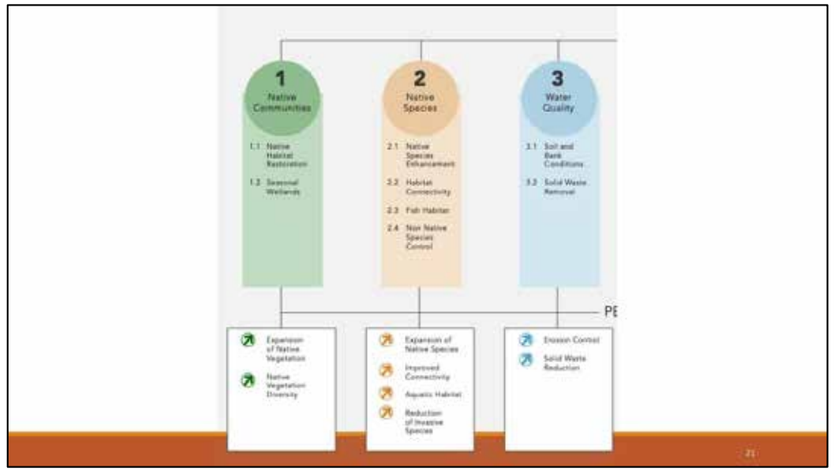
NRMP Status
Preliminary Administrative Draft Delivered to Regional Parks (February)
Task Force Commences (June)
Community Engagement Program Underway
Public Draft (November)
16

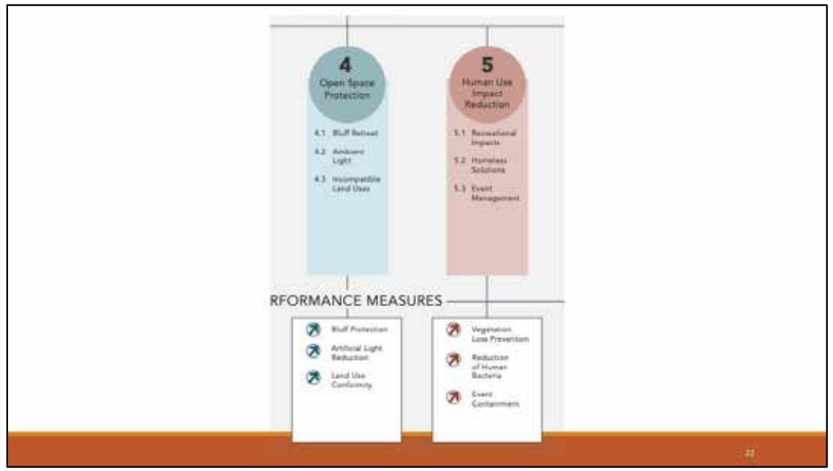
NRMP Framework
17

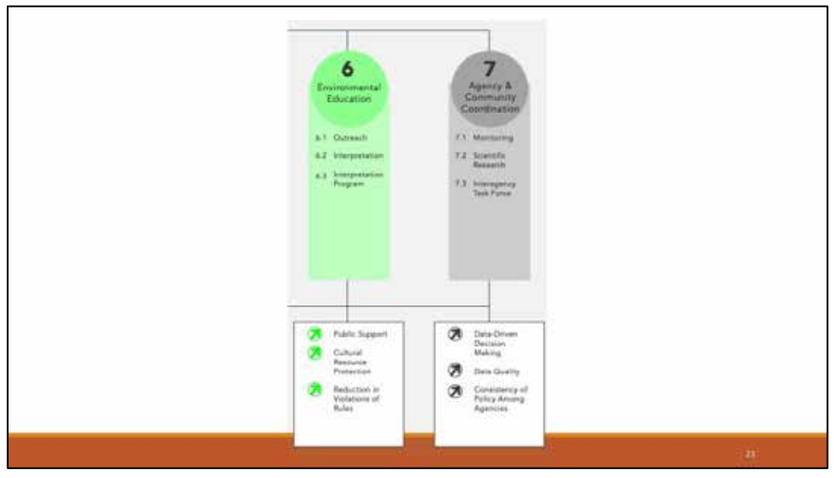

NRMP Framework
Mission and Vision
NRMP Goals
NRMP Objectives
NRMP Performance Measures
18

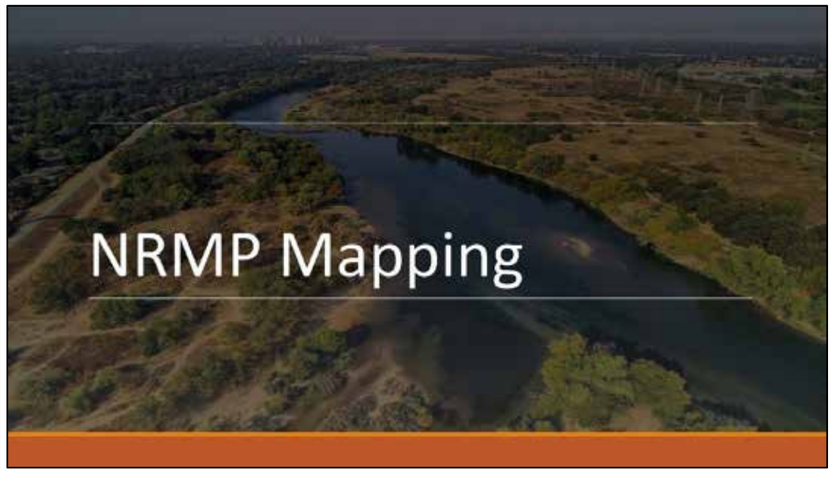

Mission and Vision of NRMP
To provide relevant and defensible information to the Parkway Manager for making informed decisions for managing, maintaining, and enhancing Parkway resources.
19

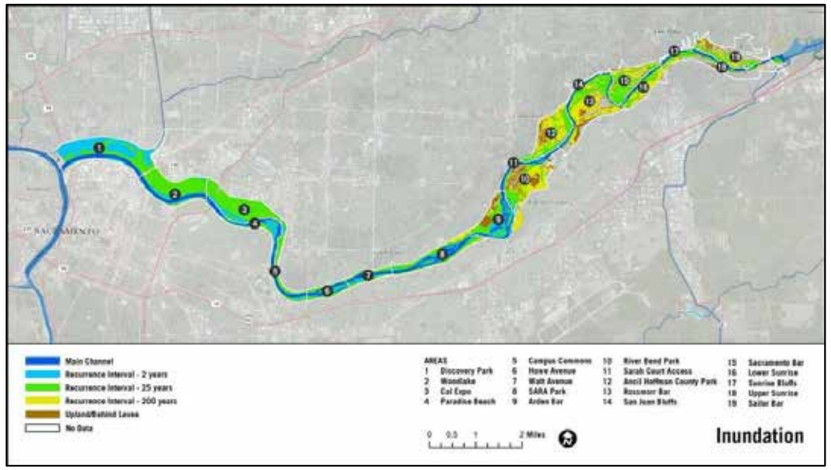

NRMP Mission & Vision
MISSION & VISION
GOALS
OBJECTIVES
PERFORMANCE MEASURES
1
2
3
4
5
6
7
20

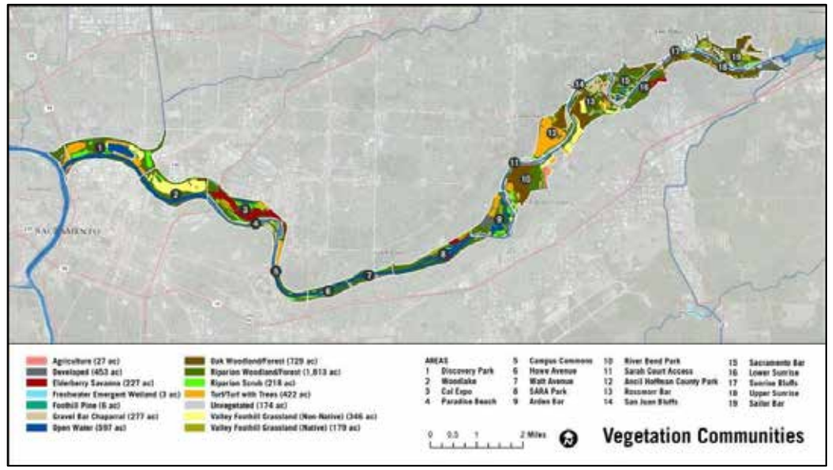

1
Native Communities
1.1 Native Habitat Restoration
1.2 Seasonal Wetlands
2
Native Species
2.1 Native Species Enhancement
2.2 Habitat Connectivity
2.3 Fish Habitat
2.4 Non Native Species Control
3
Water Quality
3.1 Soil and Bank Conditions
3.2 Solid Waste Removal
Expansion of Native Vegetation
Native Vegetation Diversity
Expansion of Native Species
Improved Connectivity
Aquatic Habitat
Reduction of Invasive Species
Erosion Control
Solid Waste Reduction

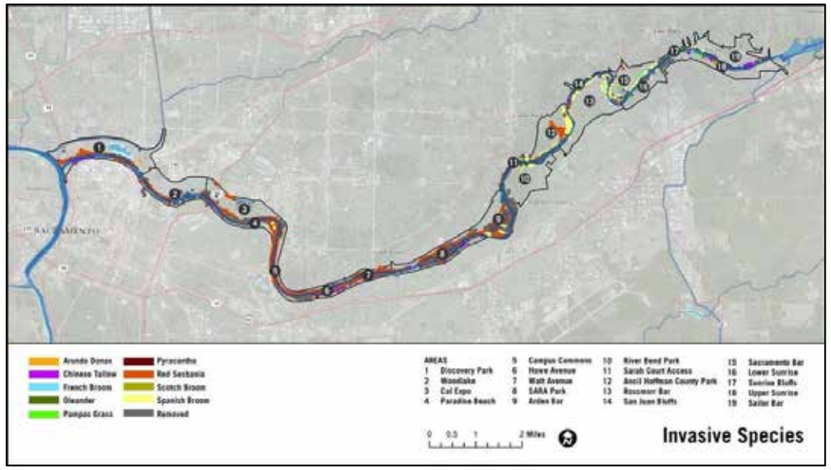

4
Open Space Protection
4.1 Bluff Retreat
4.2 Ambient Light
4.3 Incompatible Land Uses
5
Human Use Impact Reduction
5.1 Recreational Impacts
5.2 Homeless Solutions
5.3 Event Management
RFORMANCE MEASURES
Bluff Protection
Artificial Light Reduction
Land Use Conformity
Vegetation Loss Prevention
Reduction of Human Bacteria
Event Containment

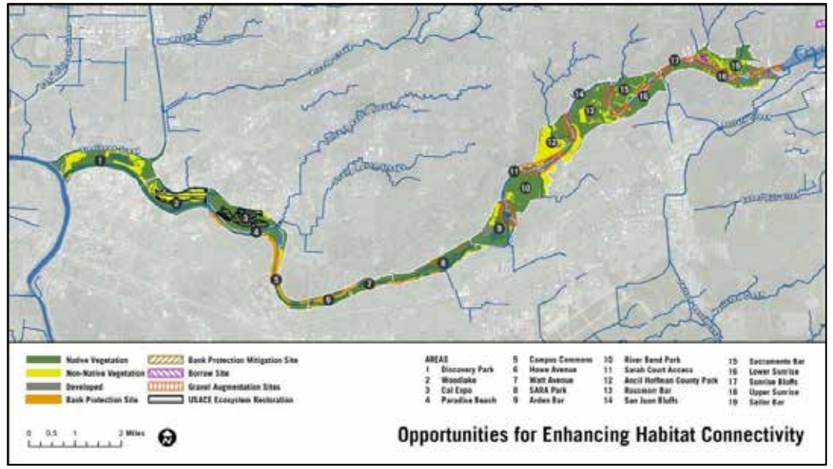

6
Environmental Education
6.1 Outreach
6.2 Interpretation
6.3 Interpretation Program
7
Agency & Community Coordination
7.1 Monitoring
7.2 Scientific Research
7.3 Interagency Task Force
Public Support
Cultural Resource Protection
Reduction in Violations of Rules
Data-Driven Decision Making
Data Quality
Consistency of Policy Among Agencies


NRMP Mapping

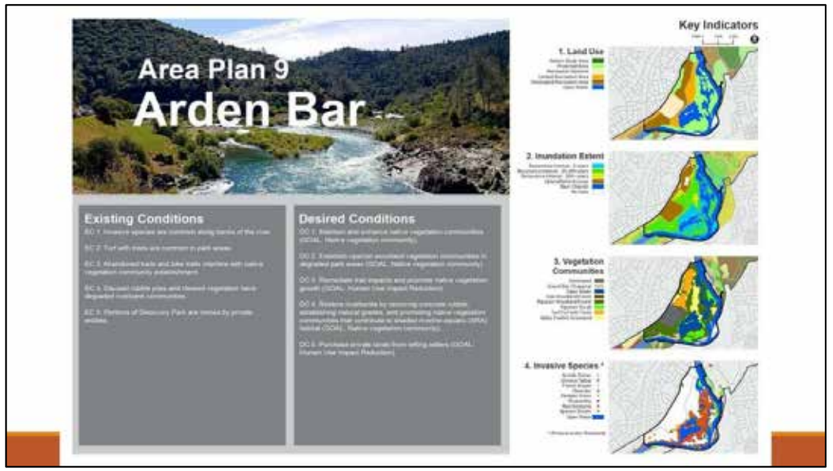

Main Channel
Recurrence Interval - 2 years
Recurrence Interval - 25 years
Recurrence Interval - 200 years
Upland/Behind Levee
No Data
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Inundation

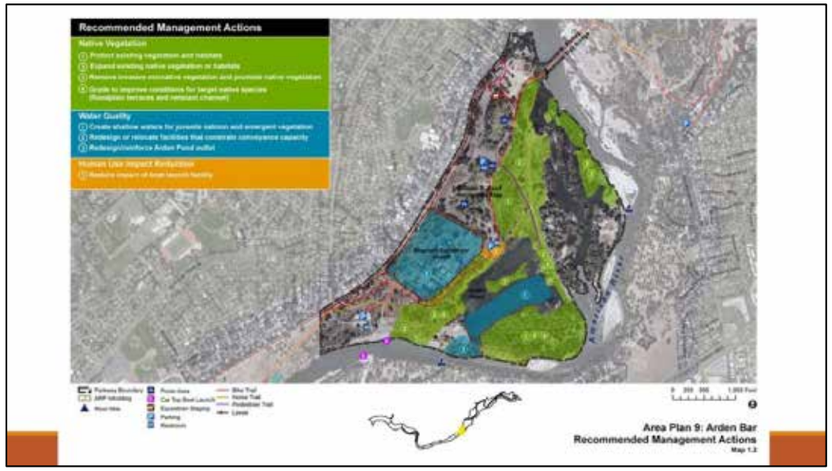

Agriculture (27 ac)
Developed (453 ac)
Elderberry Savanna (227 ac)
Freshwater Emergent Wetland (3 ac)
Foothill Pine (6 ac)
Gravel Bar Chaparral (277 ac)
Open Water (597 ac)
Oak Woodland/Forest (729 ac)
Riparian Woodland/Forest (1,813 ac)
Riparian Scrub (218 ac)
Turf/Turf with Trees (422 ac)
Unvegetated (174 ac)
Valley Foothill Grassland (Non-Native) (346 ac)
Valley Foothill Grassland (Native) (179 ac)
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Vegetation Communities

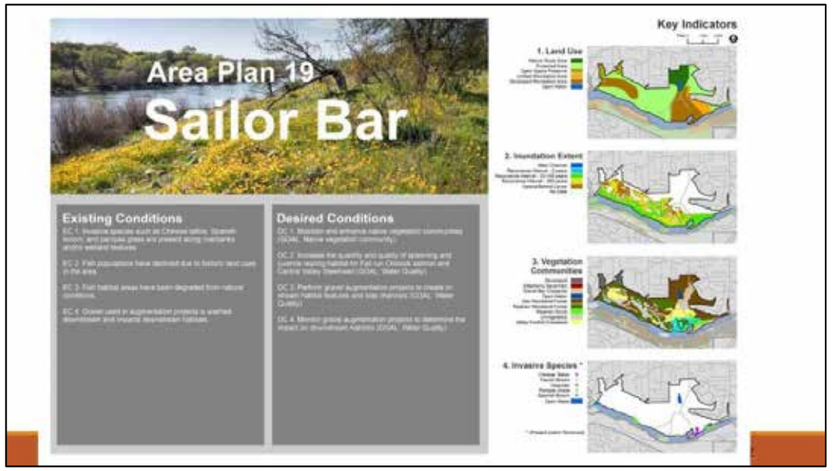

Arundo Donax
Chinese Tallow
French Broom
Oleander
Pampas Grass
Pyracantha
Red Sesbania
Scotch Broom
Spanish Broom
Removed
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Invasive Species


Native Vegetation
Non-Native Vegetation
Developed
Bank Protection Site
Bank Protection Mitigation Site
Borrow Site
Gravel Augmentation Sites
USACE Ecosystem Restoration
AREAS
1 Discovery Park
2 Woodlake
3 Cal Expo
4 Paradise Beach
5 Campus Commons
6 Howe Avenue
7 Watt Avenue
8 SARA Park
9 Arden Bar
10 River Bend Park
11 Sarah Court Access
12 Ancil Hoffman County Park
13 Rossmoor Bar
14 San Juan Bluffs
15 Sacramento Bar
16 Lower Sunrise
17 Sunrise Bluffs
18 Upper Sunrise
19 Sailor Bar
0 0.5 1 2 Miles
Opportunities for Enhancing Habitat Connectivity

THIS IS A PROTECTED
NATURE STUDY AREA
TAKE ONLY MEMORIES
LEAVE ONLY FOOTPRINTS
Area Plan Maps

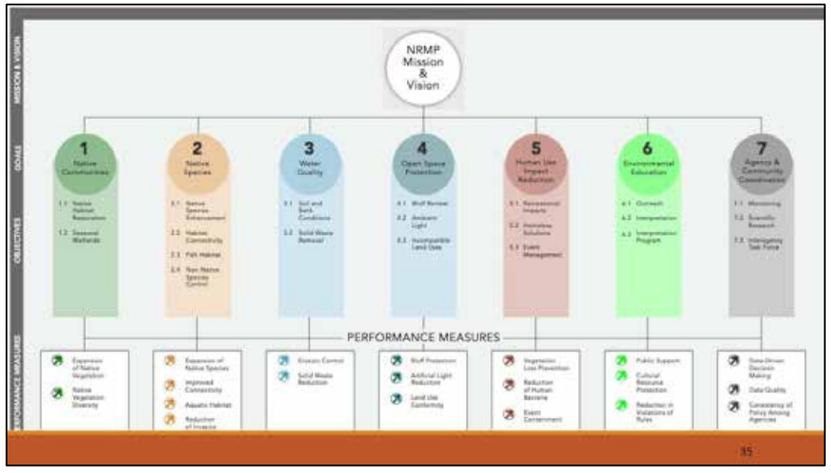

Area Plan 9
Arden Bar
Existing Conditions
Desired Conditions
Key Indicators
1. Land Use
2. Inundation Extent
3. Vegetation Communities
4. Invasive Species


Recommended Management Actions
Native Vegetation
Water Quality
Human Use Impact Reduction
Area Plan 9: Arden Bar
Recommended Management Actions


Area Plan 19
Sailor Bar
Existing Conditions
Desired Conditions
Key Indicators
1. Land Use
2. Inundation Extent
3. Vegetation Communities
4. Invasive Species

Recommended Management Actions
Native Vegetation
Area Plan 19: Sailor Bar
Recommended Management Actions

Questions, Comments, and Discussion
34


NRMP
Mission
&
Vision
1
2
3
4
5
6
7
PERFORMANCE MEASURES
35

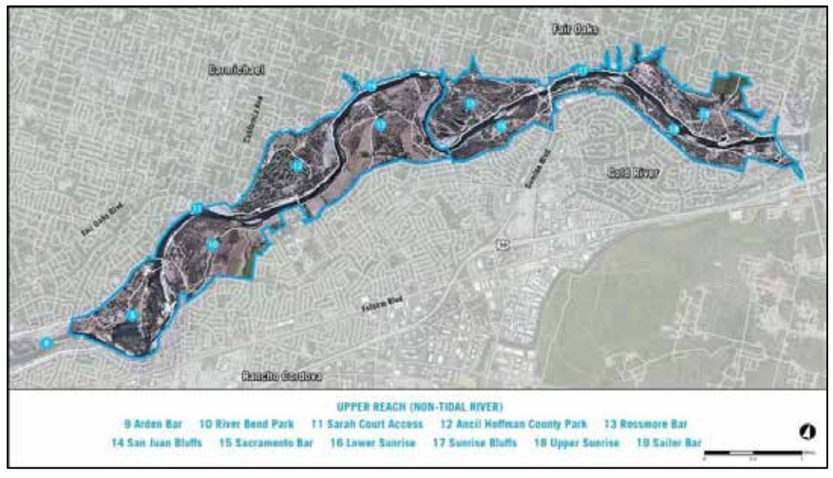
Next Steps
Public Draft Released (Late 2020)
ARPAC and Recreation and Park Commission Meetings (November 2020)
Board of Supervisors Review and Approval (Early 2021)

# American River Parkway Natural Resources Management Plan

## Parks and Recreation Commission

July 23, 2020

37



APPENDIX A

# RPC NRMP WORKSHOP 2021 SUMMARY REPORT



**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**RECREATION AND PARK COMMISSION MEETING ON THE PUBLIC REVIEW DRAFT NRMP**

Thursday, March 25, 2021 ◆ 6:30 p.m. – 8:30 p.m.
Online by Zoom

## SUMMARY REPORT

### INTRODUCTION

On March 25, 2021, Sacramento County Regional Parks, MIG, Inc., and ICF, Inc. gave a presentation on the public review draft Natural Resources Management Plan (NRMP) to the Sacramento County Recreation and Park Commission (RPC). The purpose of the meeting was to: (1) provide an overview of the NRMP planning process; (2) introduce the NRMP's Area Plan analyses, mapping, and potential management actions; (3) describe the forthcoming resource impact monitoring plan; (4) describe next steps in the NRMP development process, and (5) receive commissioner feedback on the public review draft NRMP.

### Meeting Format

The RPC meeting occurred on March 25, 2021, from 6:30 p.m. to 8:30 p.m. online by Zoom. Meeting participants included RPC commissioners, members of the public, Sacramento County Department of Regional Parks (Regional Parks or County Parks) staff, and consultant staff from MIG, Inc and ICF, Inc. Attachment A of the Summary Report Appendix includes the PowerPoint presentation slides displayed and discussed during the meeting.

### AGENDA

Becky Hertz, an RPC commissioner, began the meeting, noting the public review draft NRMP informational presentation was the first action item of the meeting. Liz Bellas of Sacramento County Regional Parks welcomed the commissioners, members of the public, and the County's consultants. Daniel Iacofano of MIG provided the NRMP's status and discussed the schedule for NRMP completion moving forward, noting the final NRMP would be published in the fall of 2021. He then reviewed the meeting agenda, which included a PowerPoint presentation and discussion period.

**POWERPOINT PRESENTATION**

Mr. Iacofano began the PowerPoint presentation with a review of how the NRMP was scoped, an overview of the NRMP Task Force purpose and member agencies, a review of the NRMP process, an overview of the results of the 2020 NRMP Maptionnaire community survey, and an overview of the proposed NRMP management and implementation activities. Gregg Ellis of ICF then presented the NRMP indicators, including level of alteration, inundations, vegetation communities, and land use, and accompanying mapping. Mr. Ellis presented potential management actions maps for 4 of the Parkway's 19 Area Plans and gave an overview of the components of the forthcoming NRMP resource impact monitoring plan. Mr. Iacofano and Mr. Ellis then provided an overview of the NRMP partners and finished the presentation with a discussion of the potential mitigation areas in each reach of the Parkway.

**OPEN DISCUSSION**

Mr. Iacofano opened the meeting to questions and comments on the public review draft NRMP and the contents of the PowerPoint presentation.

Comments and questions from the commissioners are listed below. Responses from the meeting facilitators are given in *italics*. Each individual bullet point may include a single comment and response, or a back-and-forth conversation.

- Previously, we asked for extra outreach efforts to reach a more diverse audience. Did you observe any increase in the diversity of the respondents to the community survey?
  (MIG) *Appendix A provides the detailed summary of our public outreach activities and the feedback we have received. 1,600 people responded to the public survey. The majority of the respondents identify as Caucasian. Nine percent of the respondents indicated a race or ethnicity other than Caucasian.*

- The public meetings you held were all conducted online, correct?
  (Regional Parks) *The County public health officer has not yet allowed us to conduct in-person meetings.*

- The document contains a page on partnerships for project funding. The page lists PG&E SMUD as entities that provide funding. Can those funds be used for matching grants?
  (Regional Parks) *The PG&E funds described in the plan refer to a specific project PG&E will complete on the Parkway. So, PG&E is not a source of matching grant funds.*
  Okay, so those partnerships are specific opportunities, not matching grants?
  (Regional Parks) *Yes, we have identified specific projects. There are also various opportunities to pursue grant funds from the Wildlife Conservation Board (WCB).*





Comments and questions from the public are listed below. Responses from the meeting facilitators are given in *italics*. Each individual bullet point may include a single comment and response, or a back-and-forth conversation.

- My team and I started working with California State University, Sacramento (CSUS) at Bushy Lake in 2015. We have received funding from Regional Parks. We are conducting an adaptive restoration project, sometimes in conjunction with the Miwok. We are even doing experiments with sacred pollinators, one of which is milkweed. If you look at the material history of California, large quantities of milkweed and hemp were available for use in fish nets. The Delta no longer contains the quantities of milkweed it used to support. We are crashing the Pacific population of monarch butterflies. We counted about 2,000 butterflies during our monitoring efforts this year. I would like to continue monitoring the pollinator species when the funding comes so we will have a template of pollinator plants that work at Bushy Lake. We are weeding by hand instead of using pesticides. We have also invited native Californians to source willow and white root for use as basketry materials. In addition, we have identified beavers in the Parkway. I would also like to add that the Western pond turtles are not doing well. I am predicting they will be listed soon. Hundreds of students are doing work out at Bushy Lake, and so far, we have restored about 5 acres. However, homeless people end up squishing some of the plants with their camps. It seems Regional Parks is looking out for us more recently, as we have not seen the same quantities of trash and encampments we had seen previously. What we are doing now at Bushy Lake is attempting to create a good dataset. When you design the NRMP's monitoring and adaptive management plan, please take a look at what we are doing now. We have professors studying aquatic invertebrates, water quality, and hydrology. We have noticed Bushy Lake is starting to fill in, and succession is occurring at a fast pace. We need funding earlier rather than later.
  (MIG) *Thank you for all the work you do. We would like to hear your feedback on the monitoring plan when we complete it.*

- We really appreciate the thought and time that has gone into the NRMP and its mapping products. We are trying to print hard copies of the document to mark up. However, printing the document has become a challenge. When we updated the Parkway Plan, the County made physical copies of the plan that we then purchased. Can you do the same thing with this document? Save the American River Association (SARA) would be willing to fund access to hard copies for groups that are unable to purchase copies.
  (Regional Parks) *We have some hard copies available. The NRMP Task Force members and RPC commissioners will receive copies first. Additional copies are available for purchase.*

- I am not clear exactly what is going to happen with the preservation, conservation, and naturalization areas. I think I understand how you are defining them, but I am not clear

how you will take action. Naturalization sounds like conservation in the sense that you are not going to develop an area, but instead restore it. I think the application of the management categories is a little unclear.
(ICF) *The concepts of preservation, conservation, and naturalization are explored in Chapter 8. They represent different degrees of making changes to the Parkway in the spirit of protecting or improving natural resources. The NRMP itself does not approve projects, but rather lays out a procedure for project approval and asking questions of project proponents. When a project proposal goes to Regional Parks, Regional Parks will have information specific to any proposal to use in decision-making. In some cases, Regional Parks could itself be the project proponent. We lay out this process in Chapter 8. The NRMP does not propose circumventing existing decision-making processes. For example, the RPC's role stays intact with regard to how a project is approved, assuming the activity is not purely a maintenance activity. The NRMP provides substance and support for the processes that already take place.*
I understand. Through the NRMP, you are trying to categorize the existing conditions of the landscape. As you take action, would naturalized areas move into the conservation or preservation designation?
(ICF) *We are currently proposing to update the NRMP every 5 years. Perhaps the Parkway Plan contains the exact time interval for updating the document. As changes are made to the Parkway, any update to the NRMP would reflect those changes.*

- Can the Parkway Plan's EIR be made available when the public is given the opportunity to review the forthcoming Supplemental EIR for the NRMP?
(Regional Parks) *I will discuss making the Parkway Plan EIR available with County Planning and Environmental Review. We can also provide the link. Keep in mind the Parkway Plan EIR is a large document.*

Ms. Hertz of the RPC advised the meeting participants to send in their comments on the public review draft NRMP in the next 60 days. Ms. Bellas then ended the meeting.





**AMERICAN RIVER PARKWAY (ARP)**
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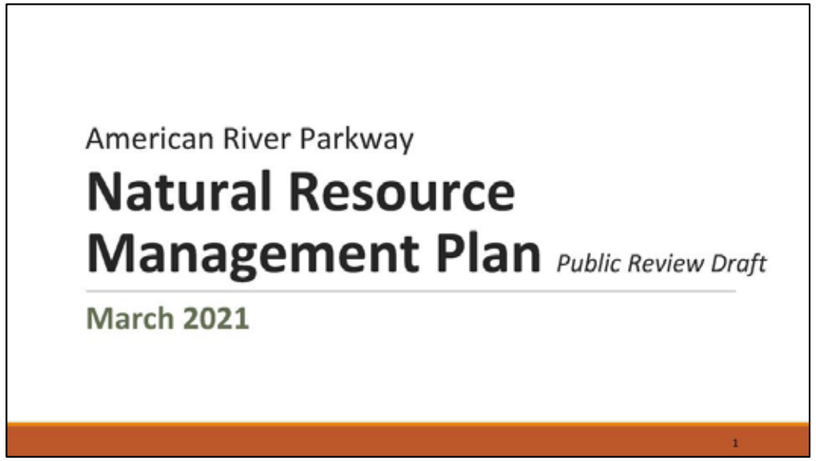
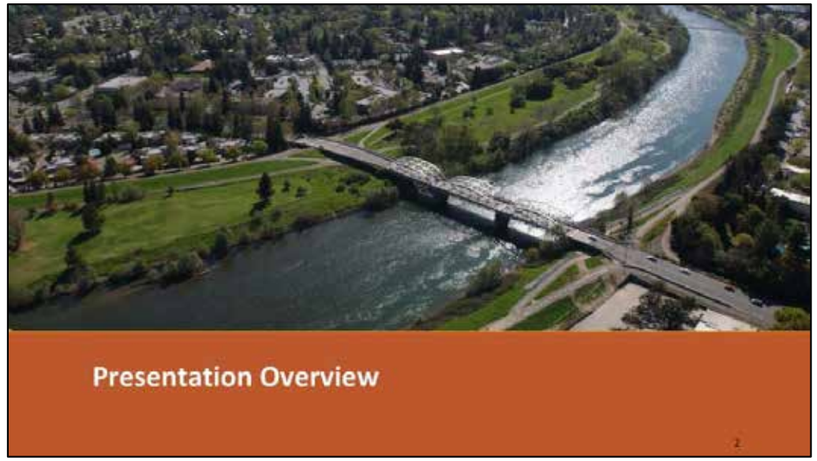
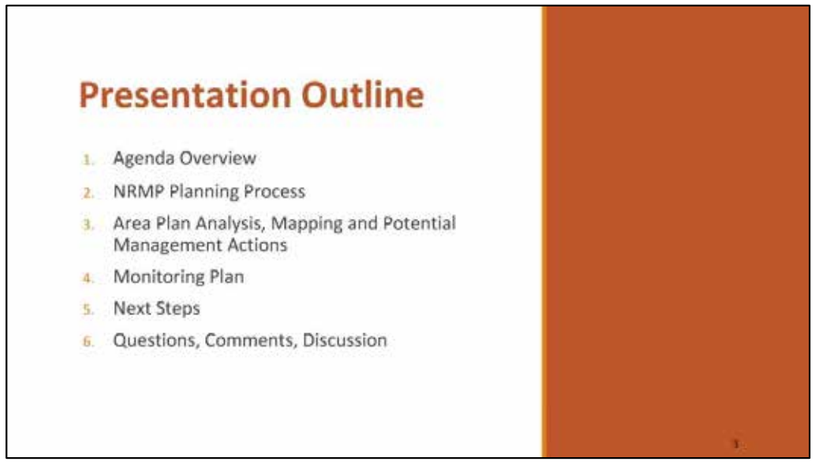
**APPENDIX TO**
**SUMMARY REPORT**

**ATTACHMENT A: POWERPOINT SLIDES**



## Previous Plans . . .

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## The NRMP

- The NRMP was envisioned in 2007 during a Save the American River Association Retreat.
- Elmer Aldrich was appointed Committee Chair and developed initial recommendations.
- In 2014, the Department characterized the NRMP as being closely aligned with the goals and policies of the 2008 American River Parkway Plan.
- The initial data collection effort for the NRMP began in 2018.

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## The County, WCB and SAFCA Join Forces . . . The NRMP Task Force Begins!

We are at a unique time where several efforts are coming together, and it makes sense to formalize the necessary collaboration.

This collaboration will be carried out through the Natural Resources Management Plan Task Force

Regional Parks and the Wildlife Conservation Board are funding preparation of the Natural Resources Management Plan

SAFCA is funding the Natural Resources Management Plan Task Force in Cooperation with Regional Parks

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## NRMP Task Force Member Organizations

- Sacramento County Regional Parks
- Sacramento Area Flood Control Agency
- The Water Forum
- U.S. Army Corp of Engineers
- Wildlife Conservation Board
- Central Valley Flood Protection Board
- American River Parkway Stakeholders
- Sacramento County Department of Environmental Review
- DWR
- USFWS
- ICF
- MIG

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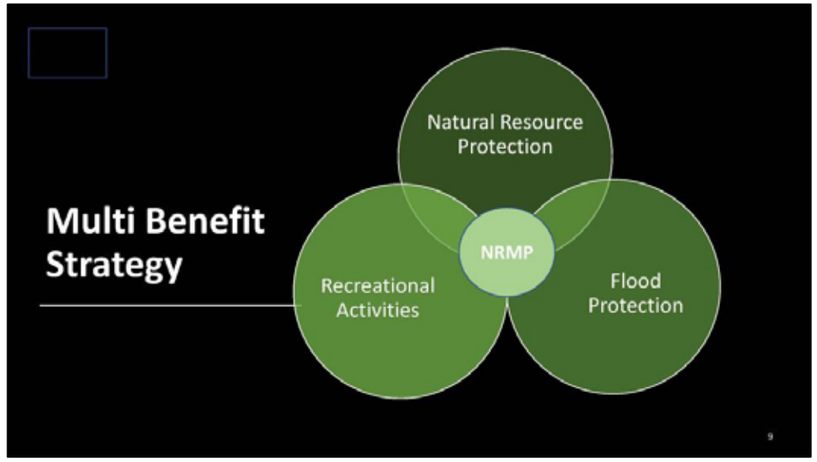
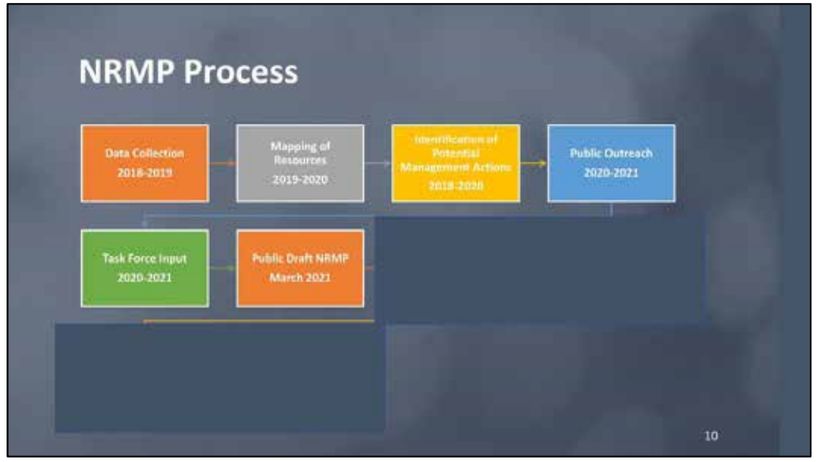
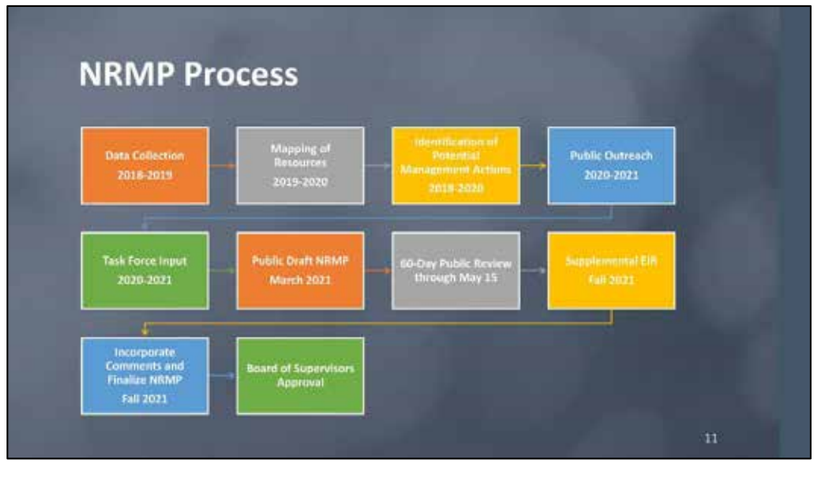
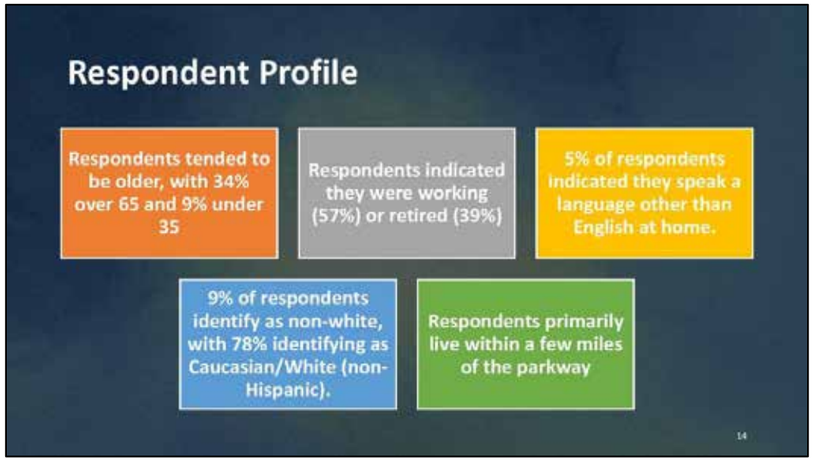

Multi Benefit Strategy
Natural Resource Protection
NRMP
Recreational Activities
Flood Protection
9

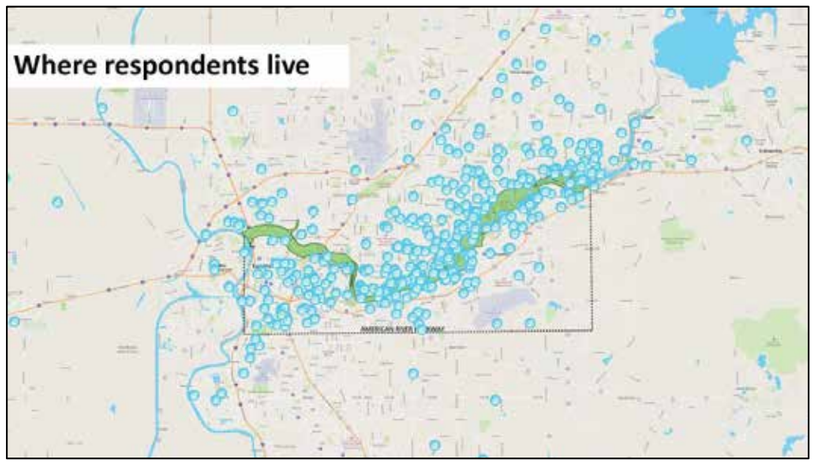

NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
10

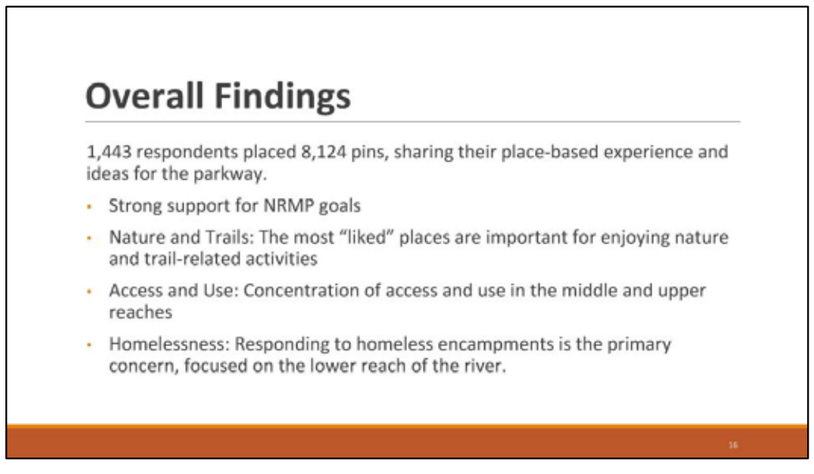

NRMP Process
Data Collection 2018-2019
Mapping of Resources 2019-2020
Identification of Potential Management Actions 2018-2020
Public Outreach 2020-2021
Task Force Input 2020-2021
Public Draft NRMP March 2021
60-Day Public Review through May 15
Supplemental EIR Fall 2021
Incorporate Comments and Finalize NRMP Fall 2021
Board of Supervisors Approval
11

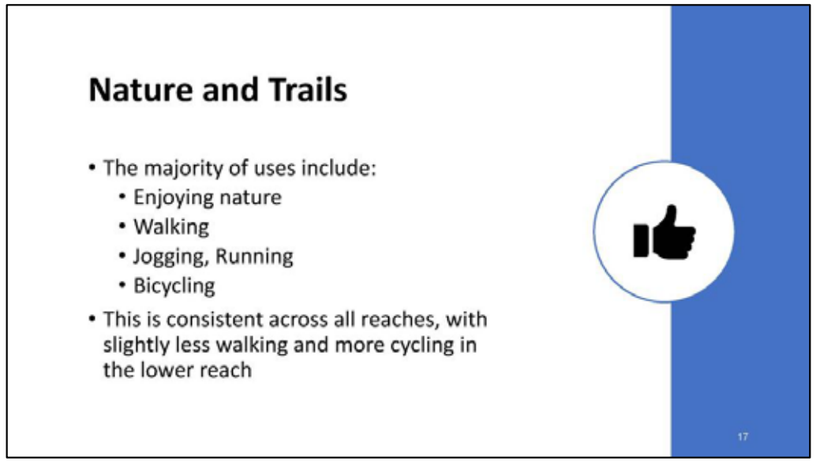
Public Outreach
Four Community Meetings in July 2020
Online Community Survey July-September 2020
Four Community Meetings in March 2021
12

Online Community Survey Results
July 15 – September 15, 2020


Respondent Profile
Respondents tended to be older, with 34% over 65 and 9% under 35
Respondents indicated they were working (57%) or retired (39%)
5% of respondents indicated they speak a language other than English at home.
9% of respondents identify as non-white, with 78% identifying as Caucasian/White (non-Hispanic).
Respondents primarily live within a few miles of the parkway


Where respondents live


Overall Findings
1,443 respondents placed 8,124 pins, sharing their place-based experience and ideas for the parkway.
Strong support for NRMP goals
Nature and Trails: The most "liked" places are important for enjoying nature and trail-related activities
Access and Use: Concentration of access and use in the middle and upper reaches
Homelessness: Responding to homeless encampments is the primary concern, focused on the lower reach of the river.


Nature and Trails
• The majority of uses include:
• Enjoying nature
• Walking
• Jogging, Running
• Bicycling
• This is consistent across all reaches, with slightly less walking and more cycling in the lower reach
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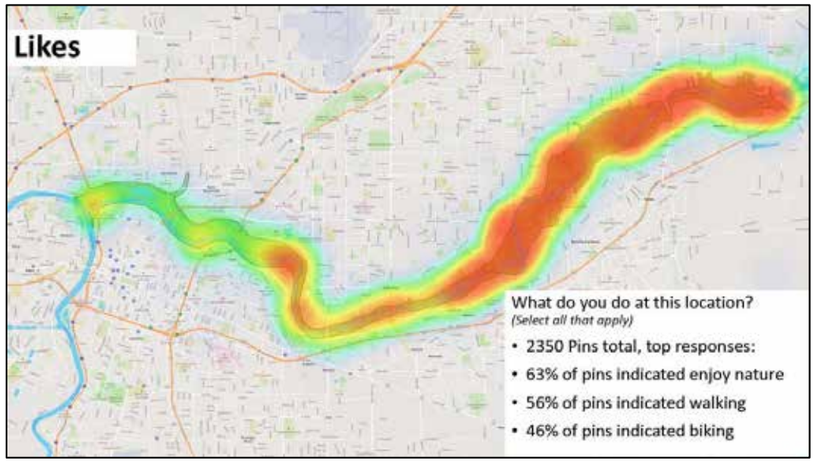
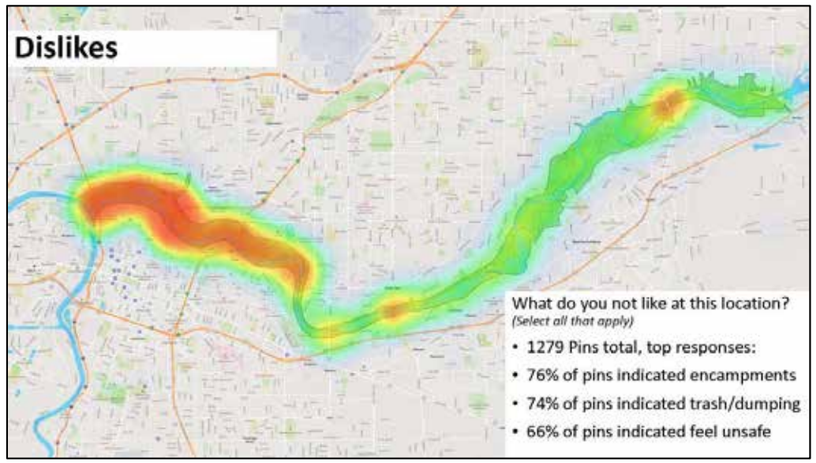
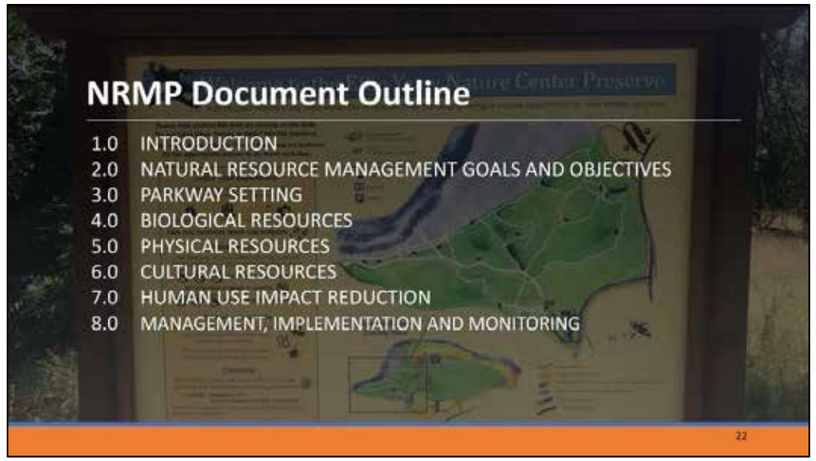
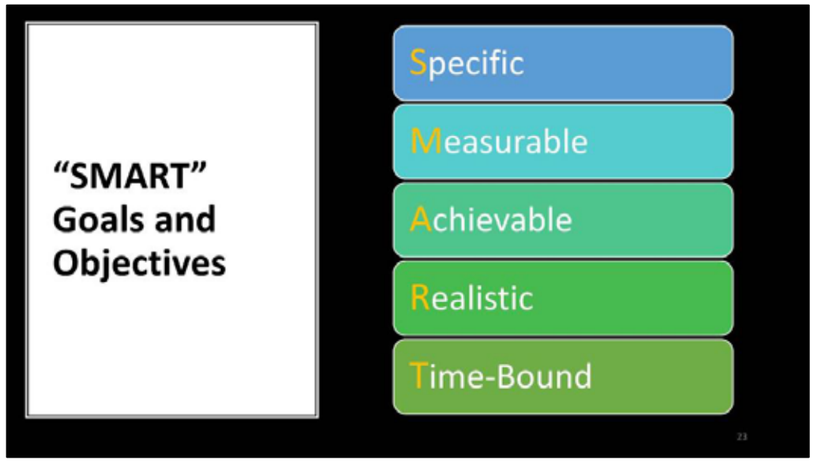

Likes
What do you do at this location?
(Select all that apply)
• 2350 Pins total, top responses:
• 63% of pins indicated enjoy nature
• 56% of pins indicated walking
• 46% of pins indicated biking

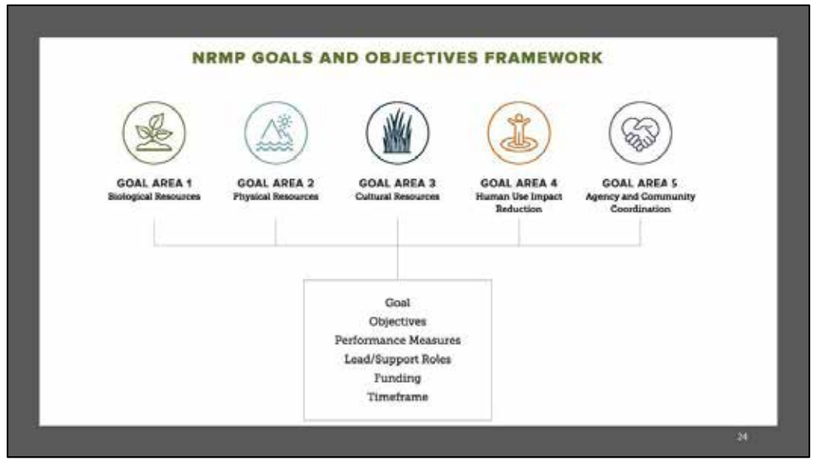

Dislikes
What do you not like at this location?
(Select all that apply)
• 1279 Pins total, top responses:
• 76% of pins indicated encampments
• 74% of pins indicated trash/dumping
• 66% of pins indicated feel unsafe

Homelessness in the Parkway
Housing and homelessness is a local, regional and national crisis impacting people and public spaces including the American River Parkway
Related impacts, trash, safety, encampments were the most mentioned issues in the parkway.
Concerns about safety are high, equally spread across gender identity
While no question specifically identifies a respondent as housed, the comments suggest minimal, if any, homeless perspectives in this data.
20

The Plan Document: Potential Management Actions and Area Plan Mapping
21


NRMP Document Outline
1.0 INTRODUCTION
2.0 NATURAL RESOURCE MANAGEMENT GOALS AND OBJECTIVES
3.0 PARKWAY SETTING
4.0 BIOLOGICAL RESOURCES
5.0 PHYSICAL RESOURCES
6.0 CULTURAL RESOURCES
7.0 HUMAN USE IMPACT REDUCTION
8.0 MANAGEMENT, IMPLEMENTATION AND MONITORING
22


"SMART" Goals and Objectives
Specific
Measurable
Achievable
Realistic
Time-Bound
23


NRMP GOALS AND OBJECTIVES FRAMEWORK
GOAL AREA 1
Biological Resources
GOAL AREA 2
Physical Resources
GOAL AREA 3
Cultural Resources
GOAL AREA 4
Human Use Impact Reduction
GOAL AREA 5
Agency and Community Coordination
Goal
Objectives
Performance Measures
Lead/Support Roles
Funding
Timeframe
24

## Potential Implementation Activities

- Update vegetation community map.
- Development of shaded riverine aquatic habitat map.
- Mapping of trails (including social trails) in the Parkway.
- Systematic survey of sensitive species.
- Invasive species surveys and production of Invasive Species Management Plan Update.

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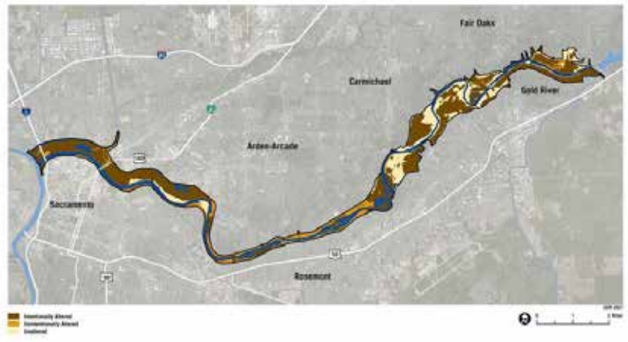
## Potential Implementation Activities

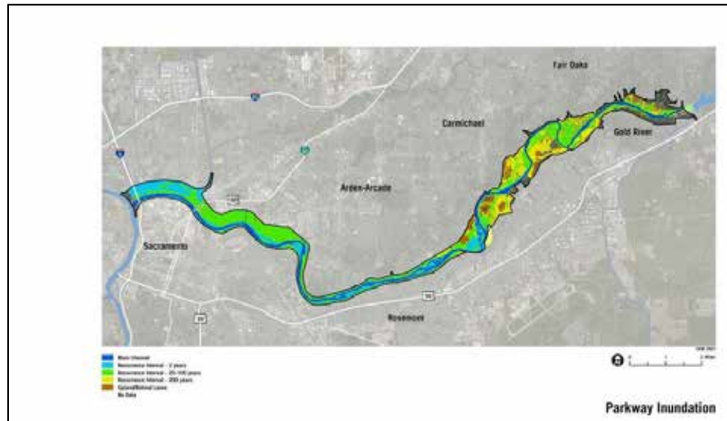
- Map and evaluate all areas damaged or degraded by wildfire or encampments annually.
- Identification of areas in the Parkway impacted by excessive ambient light.
- Development and implementation of a plan for wildfire prevention, response, and recovery.
- Development of a tracking system for wildfires in the Parkway.
- Development of an Interpretation Plan for the Parkway
- Development of a citizen science program.

## Key Indicators for Area Plan Analysis and Mapping

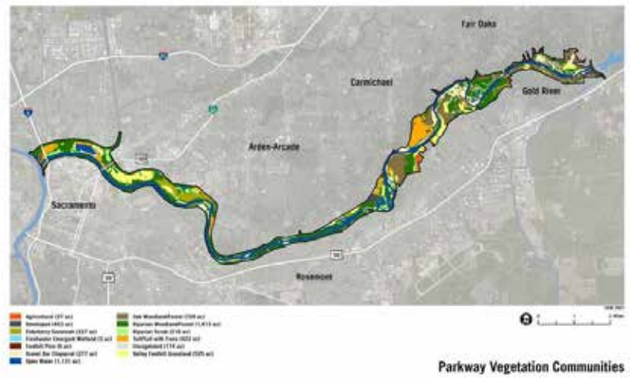
- Alteration
- Inundation
- Vegetation Communities
- Land Use



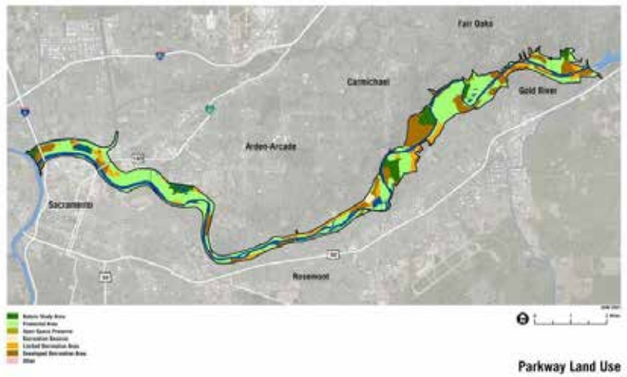

Parkway Alteration




Parkway Inundation




Parkway Vegetation Communities




Parkway Land Use

## Natural Resource Management Categories

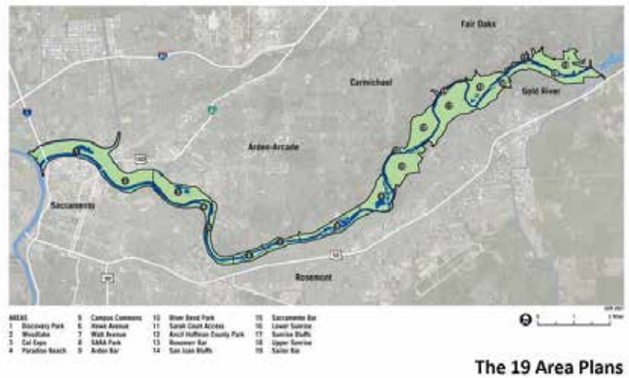
**Preservation**: Existing mitigation sites that require protection in perpetuity.

**Conservation:** Existing conditions are considered to generally meet desired conditions, but have been degraded to varying degrees (e.g., fire, illegal camping, social trails, degraded understory, etc.) and should be improved to meet goals.

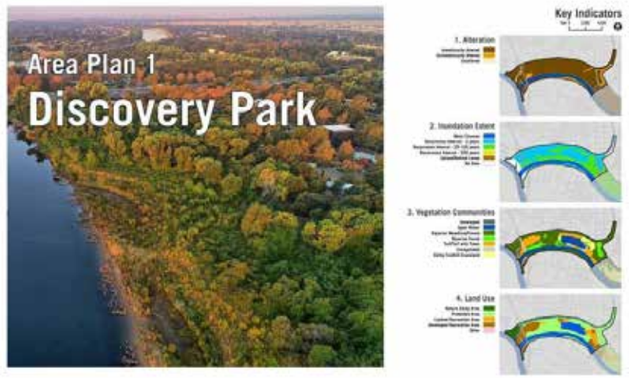
**Naturalization**: Modifying areas that were substantially altered in the past in order to improve existing natural resource conditions or otherwise modify to meet the management objectives of the ARPP, NRMP, and W&SR policies.

***Rehabilitation Overlay:** Applies to any of the aforementioned categories that are degraded or damaged in the future and require action to improve their condition.

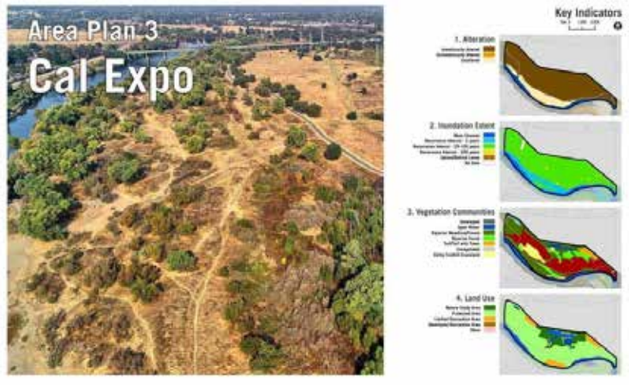
13



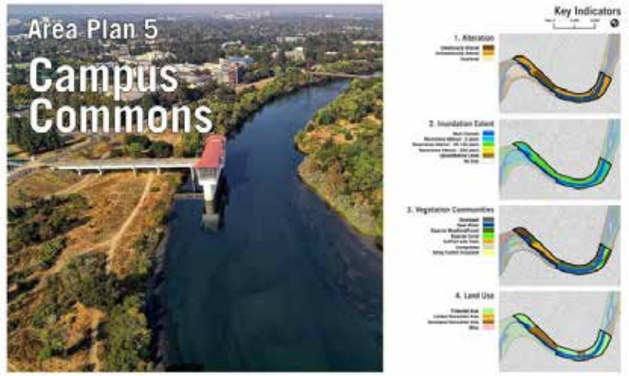

The 19 Area Plans

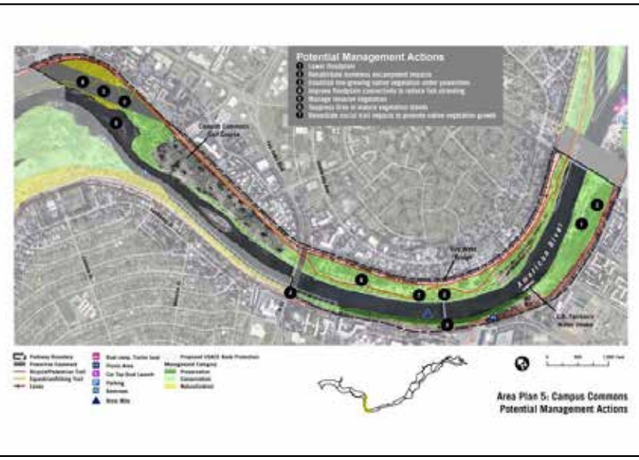


Area Plan 1: Discovery Park
Potential Management Actions

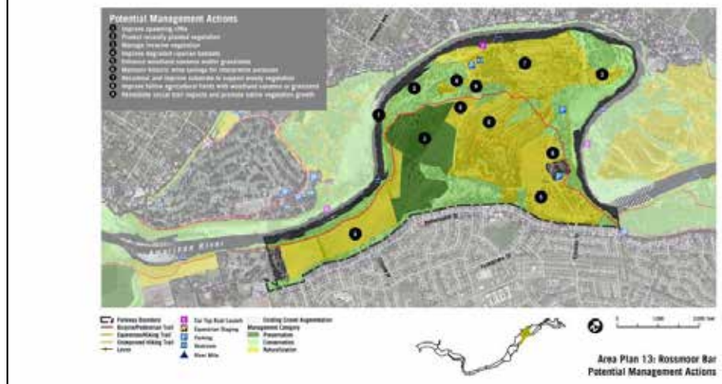


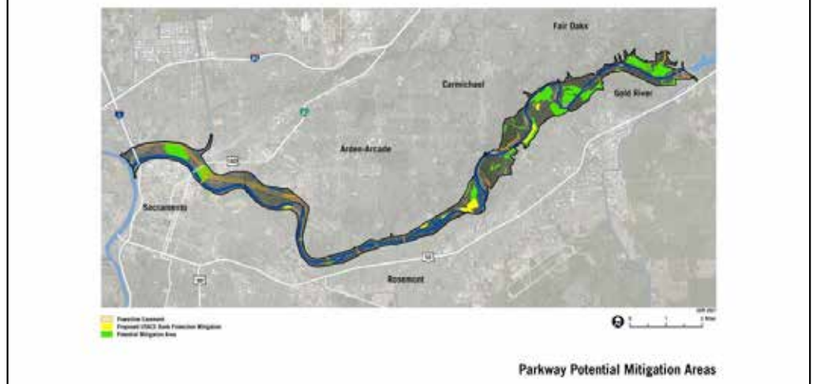
Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions


Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

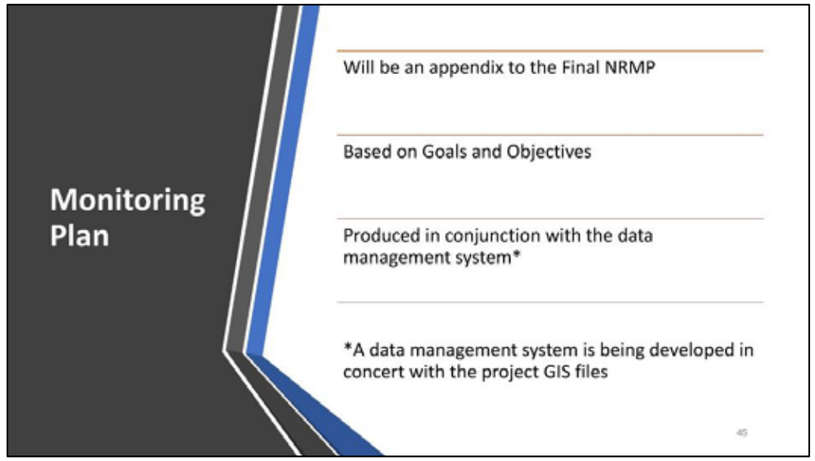

Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions

Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use




| FUNDING ENTITY | RATIONALE FOR PROPOSED PROJECT | POTENTIAL NUMBER OF ACRES AND/OR PROJECTS | TIMEFRAME FOR COMPLETION |
|---|---|---|---|
| USACE | Mitigation for the proposed bank protection | • 155 acres of native riparian vegetation communities; and<br>• 30 acres native elderberry | 3-5 years |
| PG&E | Mitigation for clearing and hardening of transmission lines | 11 acres of native woodland | 3-5 years |
| WCB | Potential future funding from WCB | • Three acres of native riparian vegetation communities;<br>• Three acres native elderberry;<br>• Two acres of native grassland; and<br>• Two acres of native woodland. | 3-5 years |
| USACE | Potential Ecosystem Restoration Projects | **Woodlake**<br>• 16 acres of native riparian vegetation communities;<br>• 50 acres of native grassland; and<br>• 41 acres of native woodland.<br>**Cal Expo (Bushy Lake)**<br>• 48 acres of native riparian vegetation communities; and<br>• 70 acres of native woodland. | 6-10 years |
| Water Forum | Mitigation for upstream dams | One salmonid habitat enhancement project annually. | 3-5 years |


Monitoring Plan
Will be an appendix to the Final NRMP
Based on Goals and Objectives
Produced in conjunction with the data management system*
*A data management system is being developed in concert with the project GIS files
45

Monitoring Plan Components
Adaptive Management
Target species for observation
Monitoring interval and process
Data collection protocol, storage, and access
Accommodation for citizen science
Responsible parties and partners
Funding Sources
Success criteria
Reporting requirements

Next Steps . . .
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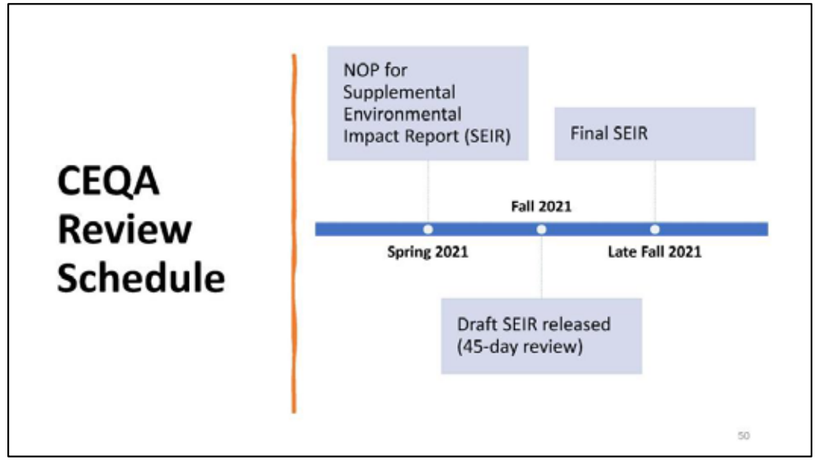
SACRAMENTO COUNTY
LIVE / VISIT
BUSINESS
GOVERNMENT
Select Language
Regional Parks
Search...
AMERICAN RIVER PARKWAY
GIBSON RANCH
PARKS
ACTIVITIES
EVENTS/RESERVATIONS
RANGERS
ABOUT/MEETINGS
Home
Natural Resources Management
Support Regional Parks, Save Time and Money - Purchase Your Parks Annual Pass Today
Public Draft Released
The public draft of the Natural Resource Management Plan (NRMP) for the American River Parkway (Parkway) has been released and is available for review.
NRMP Public Draft
NRMP Appendix A
NRMP Appenxid B
Popular Links
A - Z Regional Parks
Golf Course Gift Cards
Parks Annual Pass
SacCounty News Email Updates
ARP Multi-Use Trail Map

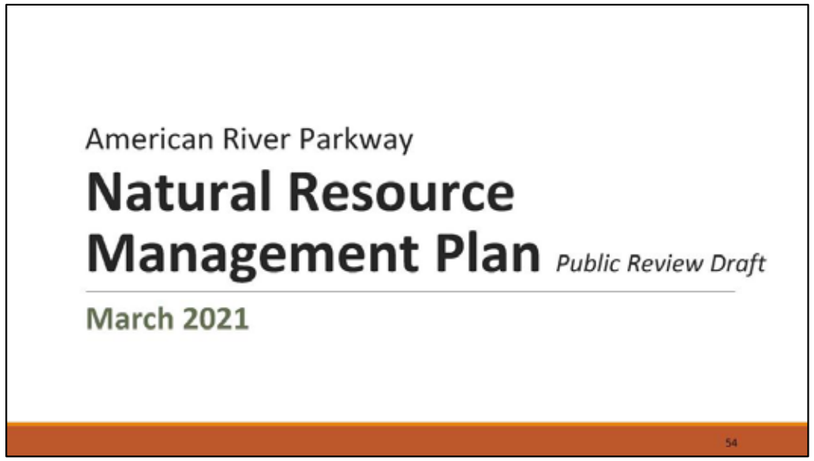
60-day public review of Public Draft NRMP
49
Comments may be sent to nrmp@migcom.com through May 15th.
Comments will be addressed in advance of the Final NRMP.


CEQA Review Schedule
NOP for Supplemental Environmental Impact Report (SEIR)
Final SEIR
Fall 2021
Spring 2021
Late Fall 2021
Draft SEIR released (45-day review)
50

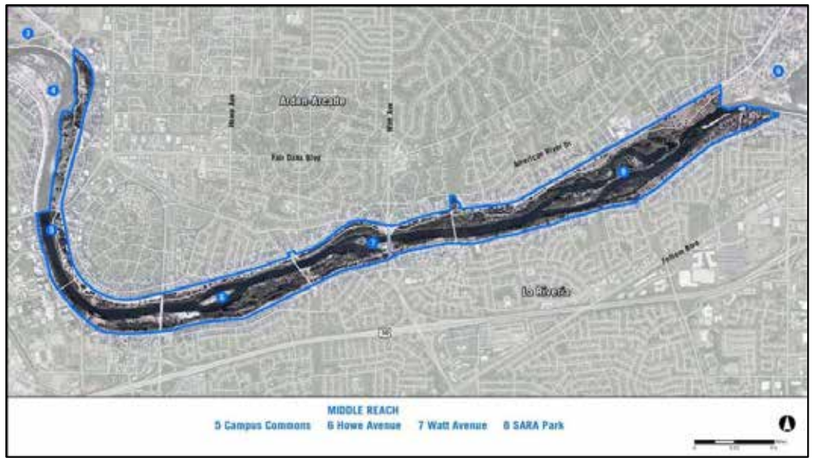
NRMP Public Meetings
Mar 19
9:30 am
American River Parkway Advisory Committee (ARPAC)
Mar 22
6:30 pm
Open Community Meeting
Mar 25
6:30 pm
Parks and Recreation Commission
March 26
2:00 pm
Open Community Meeting
51

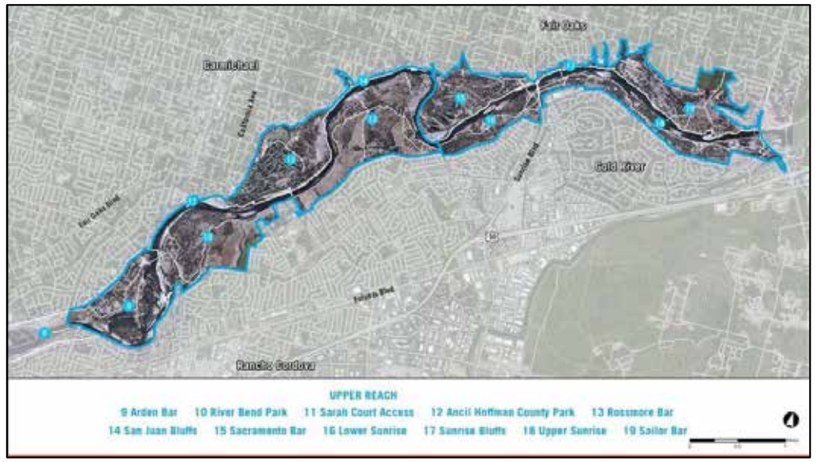
Many thanks to the funding partners!
Wildlife Conservation Board
SAFCA
County of Sacramento
52

Questions, Comments, Discussion
53


American River Parkway
Natural Resource Management Plan Public Review Draft
March 2021
54

Downtown Sacramento
East Sacramento
LOWER REACH
1 Discovery Park 2 Woodlake 3 Cal Expo 4 Paradise Beach


Arden-Arcade
La Riviera
MIDDLE REACH
5 Campus Commons 6 Howe Avenue 7 Watt Avenue 8 SARA Park




American River Parkway

# Natural Resource Management Plan *Public Review Draft*

March 2021

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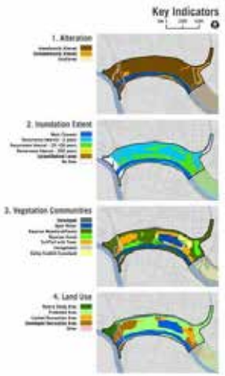
Google Search "Sacramento County Regional Parks NRMP"
- You will end up on the page shown in the next slide...

https://regionalparks.saccounty.net/Parks/Pages/NaturalResourcesManagement.aspx

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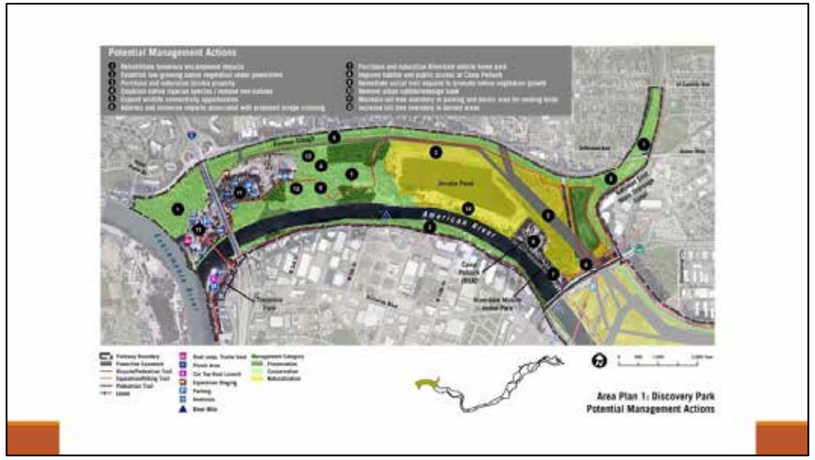
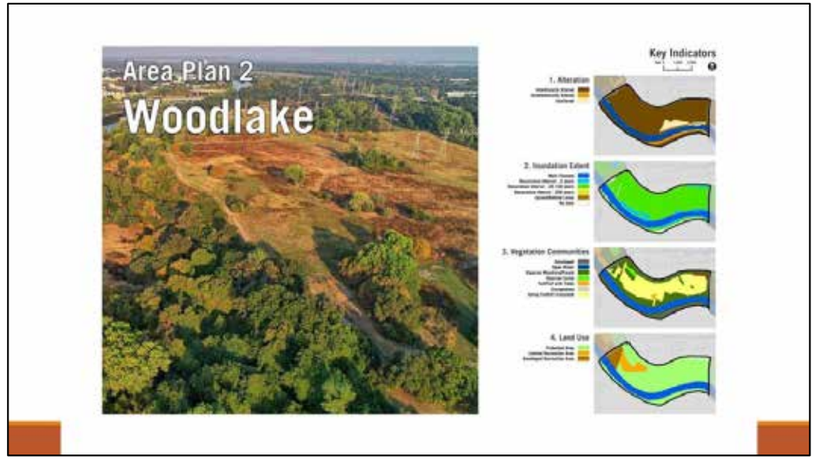
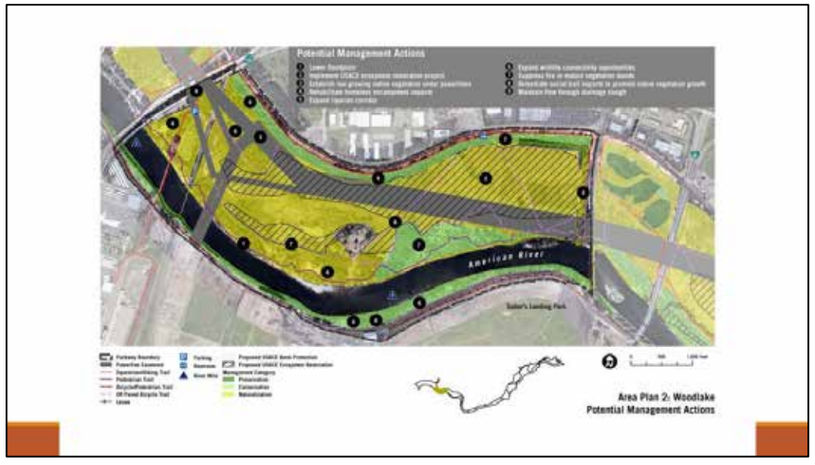
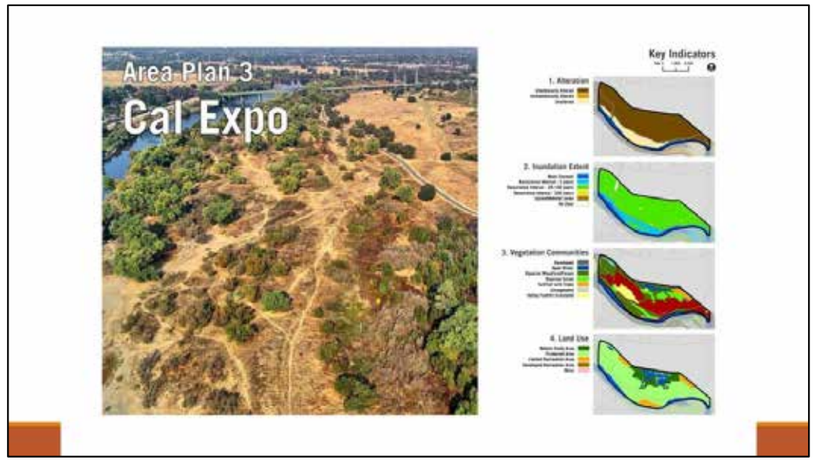

Potential Management Actions
Area Plan 1: Discovery Park
Potential Management Actions


Area Plan 2
Woodlake
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
American River
Area Plan 2: Woodlake
Potential Management Actions


Area Plan 3
Cal Expo
Key Indicators
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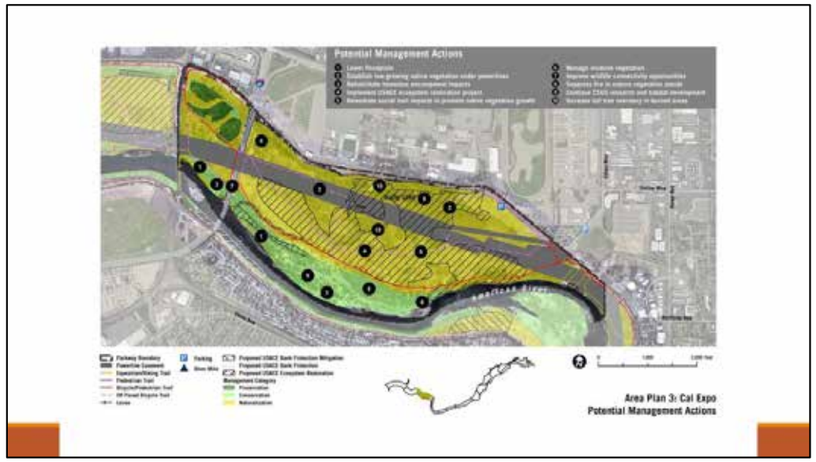
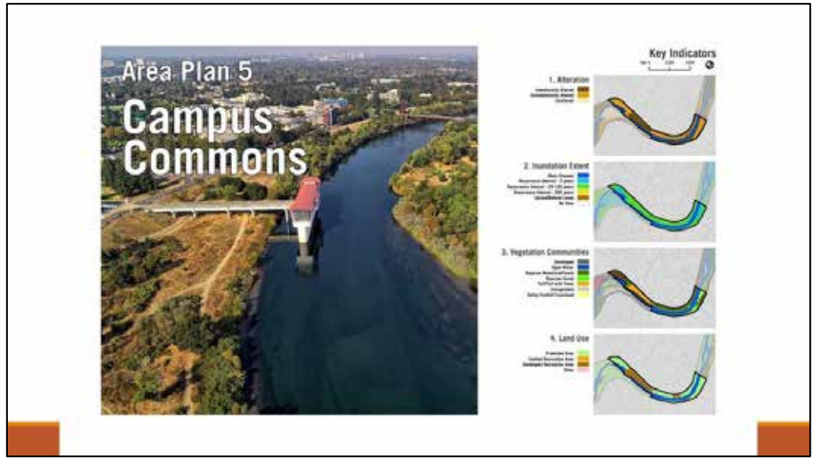
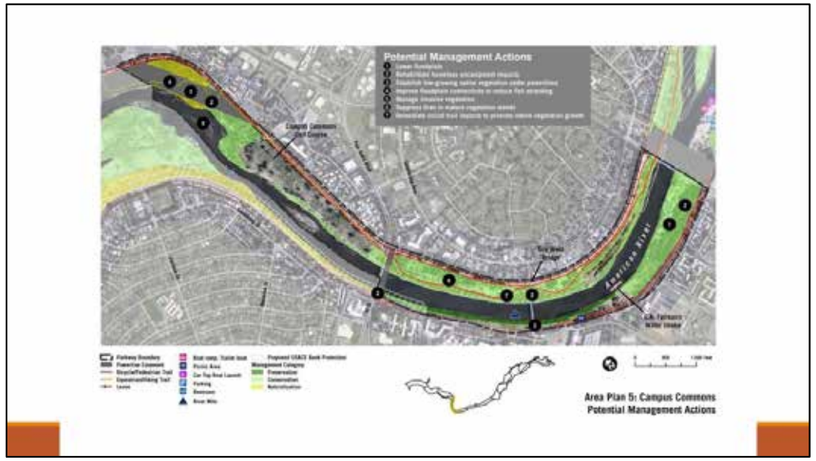
2. Inundation Extent
3. Vegetation Communities
4. Land Use


Potential Management Actions
Area Plan 3: Cal Expo
Potential Management Actions

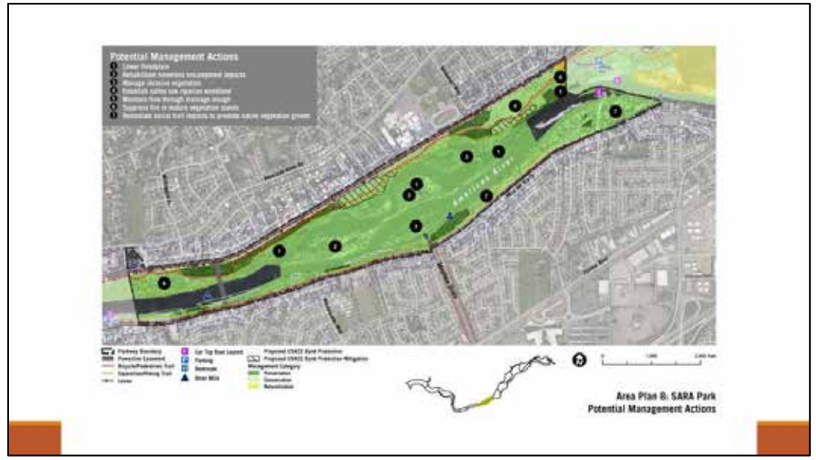
Potential Management Actions
Area Plan 4: Paradise Beach
Potential Management Actions

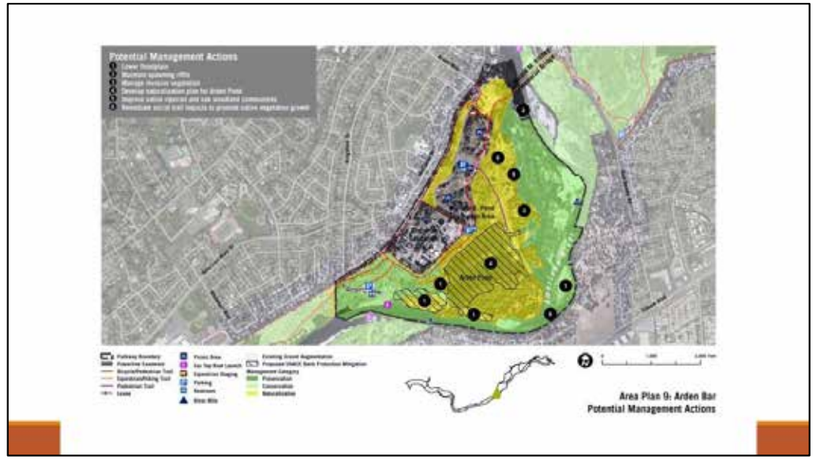

Area Plan 5
Campus Commons
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

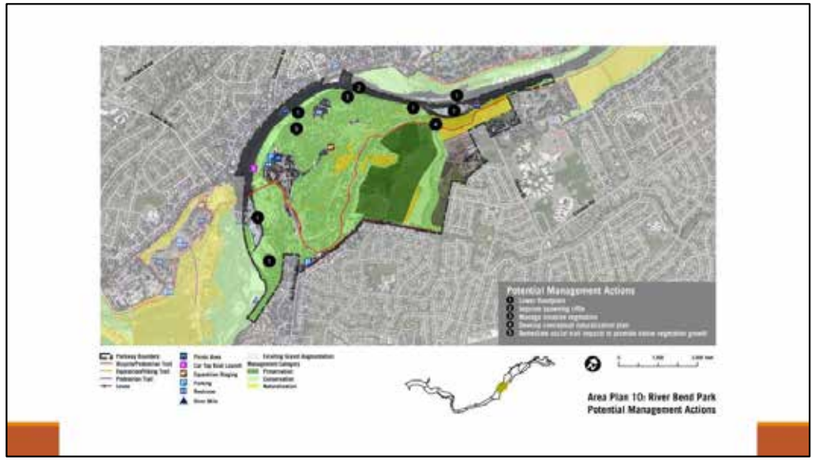

Potential Management Actions
Area Plan 5: Campus Commons
Potential Management Actions

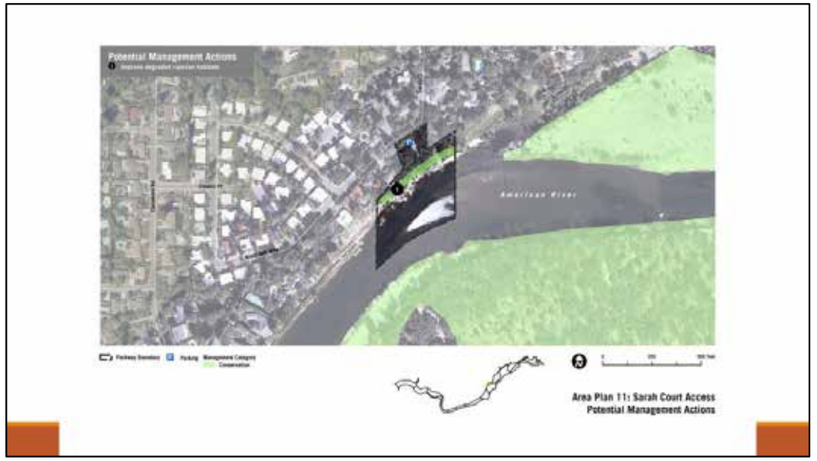
Potential Management Actions
American River
Area Plan 6: Howe Avenue
Potential Management Actions

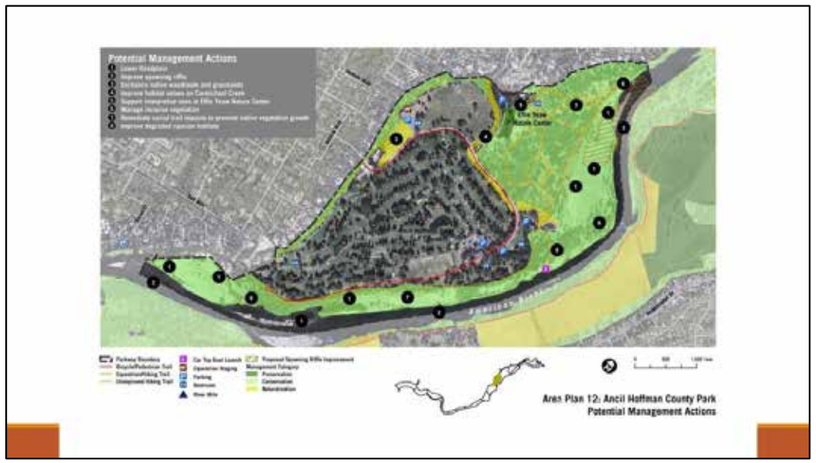
Potential Management Actions
American River
Area Plan 7: Watt Avenue
Recommended Management Actions


Potential Management Actions
Area Plan 8: SARA Park
Potential Management Actions

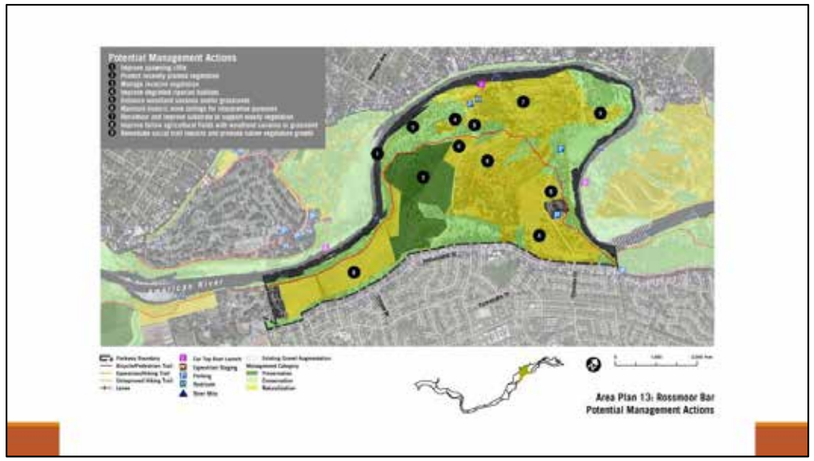

Potential Management Actions
Area Plan 9: Arden Bar
Potential Management Actions

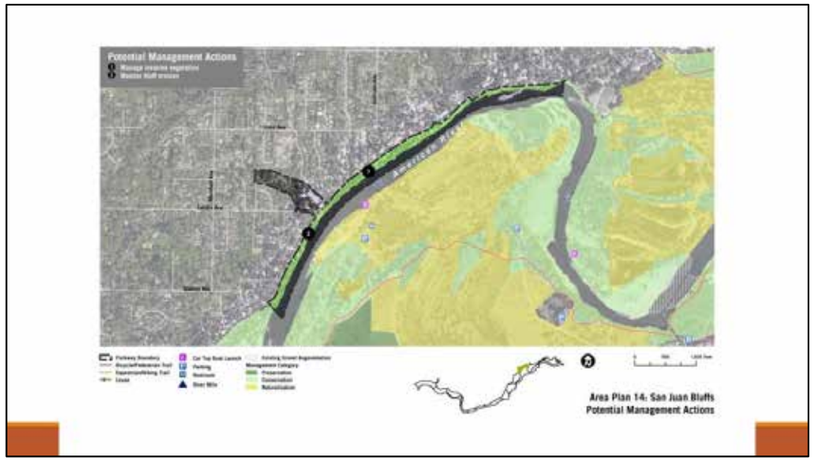

Potential Management Actions
Area Plan 10: River Bend Park
Potential Management Actions

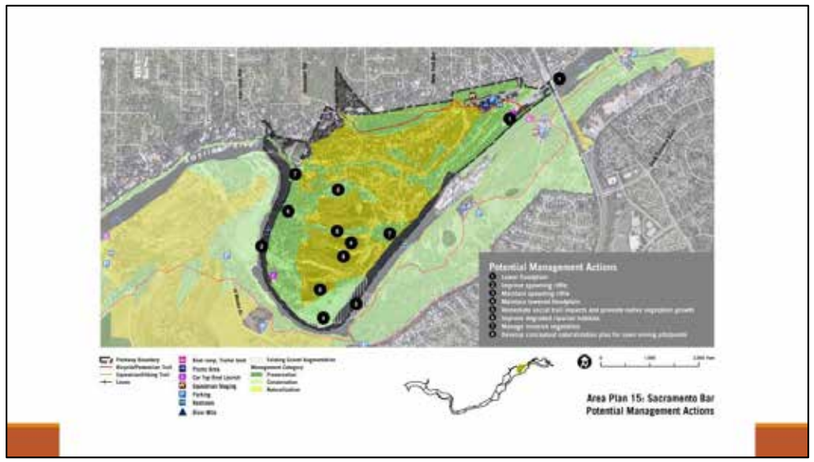

Potential Management Actions
American River
Area Plan 11: Sarah Court Access
Potential Management Actions

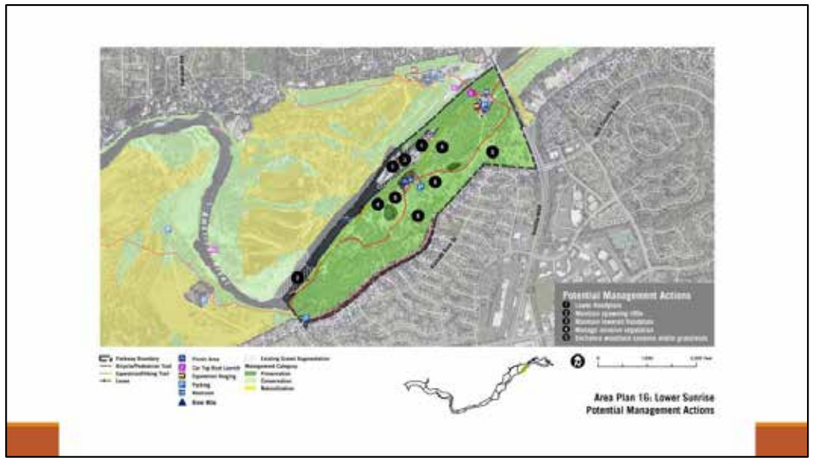

Potential Management Actions
Area Plan 12: Ancil Hoffman County Park
Potential Management Actions

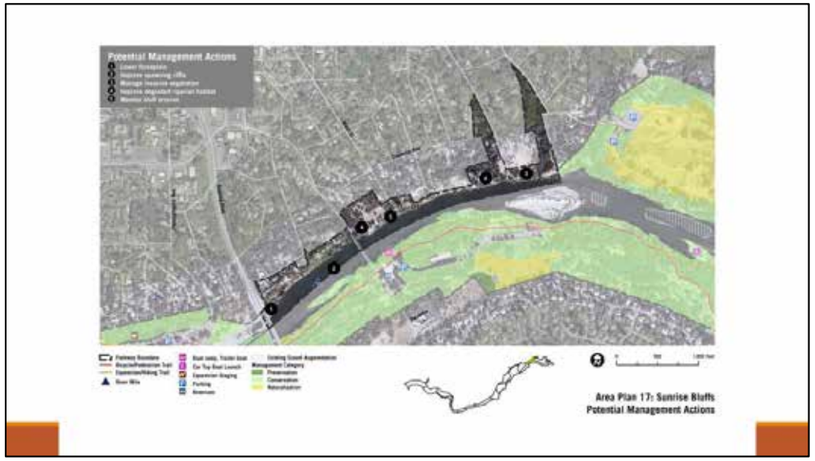
Area Plan 13
Rossmoor Bar
Key Indicators
1. Alteration
2. Inundation Extent
3. Vegetation Communities
4. Land Use

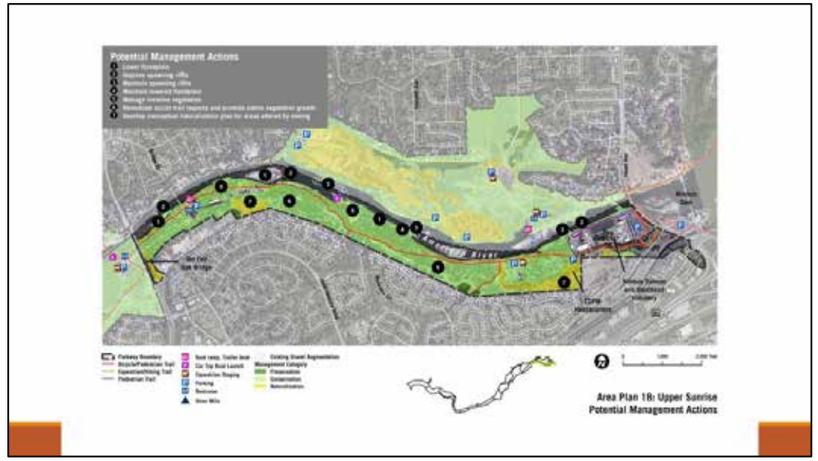

Potential Management Actions
Area Plan 13: Rossmoor Bar
Potential Management Actions

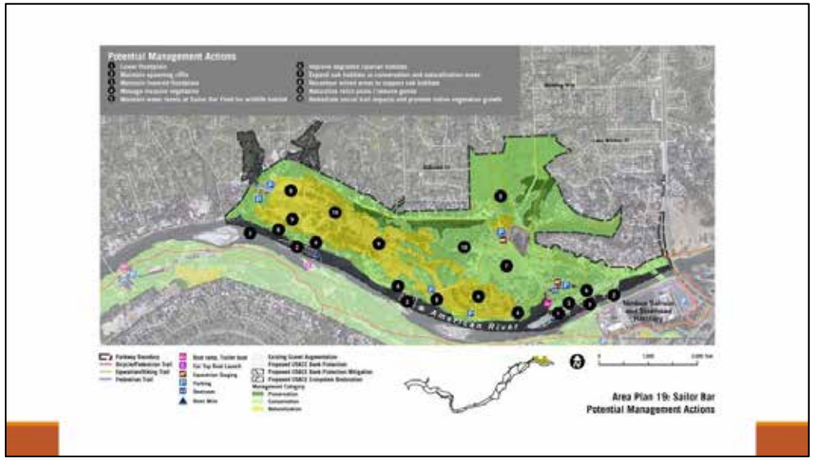

Potential Management Actions
Area Plan 14: San Juan Bluffs
Potential Management Actions


Potential Management Actions
Area Plan 15: Sacramento Bar
Potential Management Actions

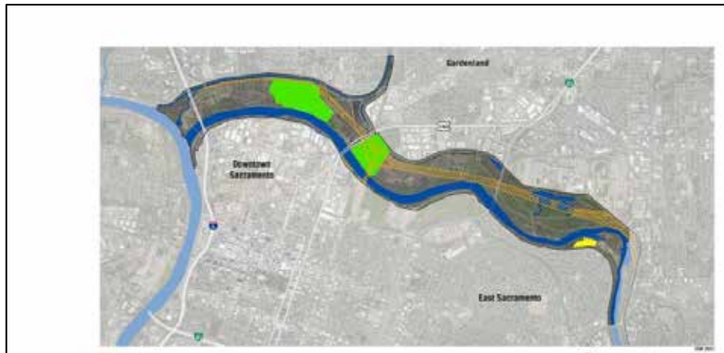

Potential Management Actions
Area Plan 16: Lower Sunrise
Potential Management Actions


Potential Management Actions
Area Plan 17: Sunrise Bluffs
Potential Management Actions

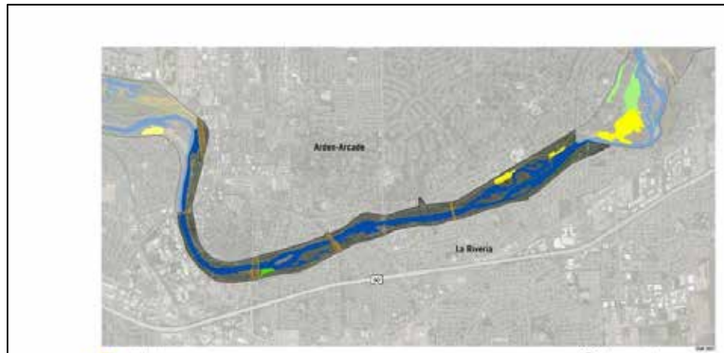

Potential Management Actions
Area Plan 18: Upper Sunrise
Potential Management Actions


Potential Management Actions
American River
Area Plan 19: Sailor Bar
Potential Management Actions

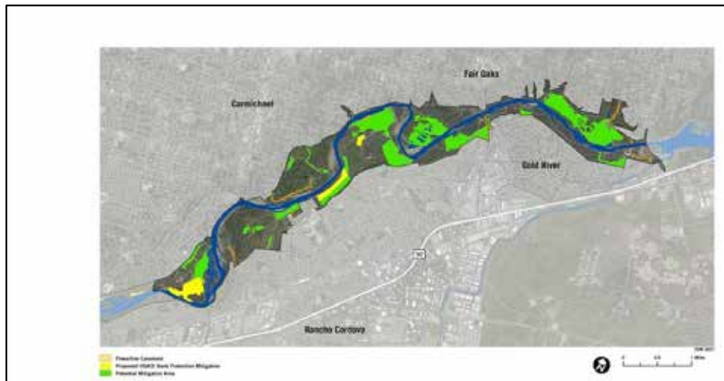
NRMP Partners
GOAL AREAS
GOAL AREA 1 Biological Resources
GOAL AREA 2 Physical Resources
GOAL AREA 3 Cultural Resources
GOAL AREA 4 Human Use Impact Reduction
GOAL AREA 5 Agency and Community Coordination and Collaboration
AGENCY/ORGANIZATION
American River Natural History Association
American River Parkway Advisory Committee
American River Parkway Foundation
Cal Expo
California Native Plant Society
California State University, Sacramento
City of Sacramento
City of Rancho Cordova
Department of Water Resources
Lower American River Conservancy
Pacific Gas & Electric Company
Reclamation Districts
Recreation and Park Commission
Sacramento Area Flood Control Agency
Sacramento City Fire
Sacramento County Department of Health and Human Services
Sacramento County Office of Education
Sacramento Metro Fire
Sacramento Municipal Utility District
Soil Born Farms
State Lands Commission
State Water Resources Control Board
University of California, Davis
U.S. Army Corps of Engineers
U.S. Bureau of Reclamation
Utility Arborist Association
The Water Forum
Tribal Governments
Western Area Power Administration
Wildlife Conservation Board




Lower Reach Potential Mitigation Areas




Middle Reach Potential Mitigation Areas




Upper Reach Potential Mitigation Areas

APPENDIX A

# ARP FISHERIES STAKEHOLDERS MEETING SUMMARY REPORT



**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**ARP FISHERIES STAKEHOLDER GROUP MEETING**

Friday, February 5, 2021 ◆ 3:00 p.m. – 4:30 p.m.
Online by Zoom

## SUMMARY REPORT

### INTRODUCTION

On February 5, 2021, Sacramento County Regional Parks, MIG, Inc. and ICF, Inc. co-hosted the American River Parkway (ARP) Fisheries Stakeholder Group meeting for the ARP Natural Resources Management Plan (NRMP). The purpose of the meeting was to: 1) introduce the NRMP and proposed bank protection and mitigation projects to Lower American River fisheries stakeholders and 2) receive feedback from stakeholders on Parkway fisheries issues and project proposals.

### Meeting Format

The ARP Fisheries Stakeholder Group meeting occurred on February 5, 2021, from 3:00 p.m. to 4:30 p.m. online by Zoom. Five ARP Fisheries Stakeholders and seven facilitating staff participated in the meeting (Attachment A). The meeting included presentation slides (Attachment B).

### MEETING PRESENTATION AND DISCUSSION

Bill Spain of MIG began the meeting with an overview of the meeting agenda, noting the goal of the meeting was to obtain the stakeholders' feedback on fisheries issues and fisheries-related proposals in the Parkway. He explained the meeting facilitators would first give an overview of the NRMP and then the meeting would be opened to the group for open discussion. Mr. Spain then asked for the group's permission to record the meeting. No objections were given.

All meeting participants first gave self-introductions. Mr. Spain also gave the fisheries stakeholders an introduction to MIG and its work. Mr. Spain then gave an overview of the NRMP, noting the NRMP intends to balance the complex issues of natural resources protection, recreation provision, and flood protection as a support document to the Parkway Plan. Mr. Spain ran through the key topics and chapters of the NRMP and noted the meeting would center on the topics of biological resources and physical resources. Lastly, he presented the NRMP's draft goal areas, noting MIG, ICF and Regional Parks were in the process of updating the goals and NRMP objectives. He then handed the meeting over to Gregg Ellis of ICF.

Mr. Ellis presented a series of levee bank protection projects completed under the American River Common Features Project (ARCF). He explained the U.S. Army Corps of Engineers (USACE), the Department of Water Resources (DWR), the Central Valley Flood Protection Board (CVFPB), and the Sacramento Area Flood Control Agency (SAFCA) were all collaborators on the ARCF and reviewed the additional ARCF bank protection projects that are in the works. He noted some proposed projects involve a standard design of a rock toe placed in river with a planting bench and riparian vegetation atop it, while others incorporate more innovative features, such as a rock trench that provides levee protection by releasing material under continued erosion. Mr. Ellis also noted the bank projects are intended to protect the levees in a way that also protects the resources of the Parkway, such as fisheries resources.

Mr. Ellis then asked for questions and comments. Stakeholder feedback is listed below, with facilitator responses shown in *italics*.

- What is the timeframe for construction of the future bank protection projects?
  (ICF) *The construction schedule is a monster. It is challenging to get anything aligned. The first project to reach construction would be the site between H Street Bridge and Paradise Beach. Construction would begin in 2022 and there would be a 2-year construction window from 2022 to 2023. Subsequent sites would follow. We are looking at 4 or 5 years of construction needed to work through these induvial sites.*
- Do you know what the timelines for mitigation would look like?
  (ICF) *The ARCF group is trying to mitigate on-site as much as possible. To some degree, these projects involve the removal of trees and riparian vegetation, and impacts to the channel and its substrates. Substrate impacts include replacing or altering existing substrates, such as cobble, with angular rock. The first year of construction involves installing the structure and trench. The sites are often planted the following year, though sometimes the window extends to 2 years. Off-site mitigation is also part of the package. Some mitigation sites have been identified for the first set of future bank protection projects. We have not yet received approval for our mitigation proposals. We are proposing improvements involving riparian plantings, and planting on the bank near Rio Americano, in particular. We are also looking at some plantings in the downstream end of the Rossmoor Bar Area. One mitigation proposal may be of interest to this group. We are looking at a partial reconfiguration of the Arden Pond in which we would create a low flow channel through the southern portion of the pond to provide good shaded riverine aquatic habitat and habitat for salmonids and anadromous fish. So, those are the specific mitigation projects identified at this point. Mitigation in general would be identified in parallel with site construction. The NRMP will also identify mitigation sites.*
  Thank you. We probably do not need to get into those additional mitigation sites at this point.
- What is the status of the environmental review documents for this work?
  (ICF) *A programmatic document was approved several years ago. Subsequent review documents are tiering off that previous document. A supplemental environmental review document was issued for the site between H Street and Paradise Beach. The public draft*





*of the document was released over the summer of 2020 and the comment period occurred thereafter. The project group is awaiting a Biological Opinion. Following the issuance of the Biological Opinion, a final NEPA/CEQA document would be issued. Subsequent environmental documents are in the process of being issued for the other sites. The next document would be released in the spring or summer of 2021 for the site on the right bank between Howe Avenue and the golf course.*

Mr. Ellis then handed the meeting over to Chris Hammersmark of cbec, who gave a self-introduction and explained he had worked with the Water Forum for the past 11 years on spawning habitat enhancements in the Parkway. Mr. Hammersmark explained he is currently working with the Water Forum on rearing habitat enhancements, some of which are fully designed and ready to be built, some of which are in the process of receiving permits, and some that are conceptual designs vetted through a stakeholder review process. He then described the features of the past and proposed spawning enhancements and the proposed rearing enhancement projects.

Mr. Hammersmark opened the meeting to questions and comments. Stakeholder comments and questions are listed below, with facilitator responses shown in *italics*.

- At what flow levels are these projects designed to be functional?
  (cbec) *They are designed to be functional across a wide range of flows. The spawning sites are design to be functional at 1,500 to 2,000 cubic feet per second (cfs). We also make sure the habitat functions at lower flows and higher flows. They are designed to not unravel during summer operations. The gravel involved is of the appropriate size, pea gravel to 4-inch cobble. We expect the material to be mobile, and we do not expect sites to remain exactly as they are when we constructed them. They will erode and degrade over time. A series of ripples are constructed in sequences and replenish downstream areas as erosion occurs upstream. However, we do need to revisit the sites. The material is mobile at 5,000 to 6,000 cfs, and at 10,000 cfs we expect more movement. The side channels have been challenging in terms of seasonal and perennial inundation. Many fish biologists urge us to work toward a seasonal regime, but there are challenges associated with the Bureau of Reclamation's [Reclamation] water releases at the dams. This is an evolving river, and current conditions will change. Deposition and erosion will occur. We are targeting results that dry out at some points. Seasonal floodplain areas inundate as flows go above 2,000 to 5,000 cfs. Significant habitat impacts occur at 3,000 cfs, but we do not always get 3,000 cfs in the fall. We want these side channels to be seasonally beneficial. If we make them much lower, there is the risk they perennially inundate and would not provide habitat.*
- Is there the risk of redd and juvenile stranding? You are considering that possibility, correct?
  (cbec) *We do not tend to have many issues with redd stranding. We work actively with Reclamation to examine those potential effects. We implement rearing design for positive drainage, and we are not trying to create stranding areas. I cannot promise a*

*seasonally inundated floodplain will not have stranding, particularly when a large flow reworks things.*

- What is the long-term funding source for maintenance?
  (cbec) *The CVPIA provides all the funding for the Reclamation sites. The LAR continually ranks high as far as Reclamation priorities go. One of Reclamation's priorities is to maintain spawning habitat in the CVPIA streams. As long as CVPIA is there, there will be funding to support the gravel augmentation sites, either for rebuilding or maintenance. We met with Mary Maret of Regional Parks and the Parkway rangers and discussed potentially revisiting sites and providing better boat access at the same time. A big flow event may move some gravel around and make it hard for jet boats to move through the channel. We have discussed a plan to go back and tune up our ripples. Other rearing sites are funded through Proposition 68 grants. I do not know if maintenance funding is available for those sites. The Proposition 68 grant was for planning and implementation. That does not mean we would not be able to seek maintenance funding.*
- Are there any measures that are planned or designed for fish that are not salmonids?
  (cbec) *No, there are no such projects that I am aware of. I try to target the full ecosystem with these restoration and habitat enhancement projects. However, in this instance, salmonid habitat enhancements have garnered funding because they are charismatic macrofauna.*
- A lot of the individuals in our club enjoy shad and striper fishing. I am curious if you would be able to target those species.
  (cbec) *Growing baby salmonids also provide striper habitat, as the rocks provide structures on which the shad can spawn.*
- I am not aware of any seasonally inundated floodplain on the Parkway because of the LAR's incised channel. When you speak of creating inundated floodplains, what size are we talking about?
  (cbec) *The majority of the water in the watershed flows in the LAR channel itself. One of the biggest changes in the watershed that occurred after the dams were constructed is the change in the spring snowmelt, which many native species are keyed into. We do not see a large spring snowmelt as we naturally would see. So, we are focusing on reconciliation ecology here. We are changing the land surface to work with the hydrology we have now rather than the naturally occurring and expected hydrology. We are talking about lowering gravel bars and adjacent areas by 2 to 8 feet, so they get wet more frequently. The Arden Bar project is approximately 6 acres in size, which is bigger than what we have constructed before, but it is still small compared to other sites, which can reach 20 to 25 acres in size.*
  (SAFCA) *The RM 0.5 project is much smaller. We have some ideas for other sites in the lower portion of the river, but those sites are a challenge due to the cost of moving materials.*

Mr. Spain then paused the meeting to remind the stakeholders that the discussion was not intended to focus only on bank protection and Water Forum projects, and that the stakeholders could bring any fisheries-related issues to the table. Mr. Ellis also added that he would like to





know from the stakeholders of specific areas they think are good or great examples of intact, high-value fisheries habitat and areas of poor habitat.

Mr. Hammersmark continued his presentation, explaining the color-coding of the polygons displayed by Mr. Campbell in Google Earth. He noted the light blue sites signify the 10 habitat enhancement sites that have undergone programmatic permitting, and the green sites are potential rearing habitat enhancement sites. He also focused on the location of the 2015 Nimbus Basin project and the 2008-2009 Sailor Bar project that was enhanced in 2019 to add ripples and a side channel.

Mr. Hammersmark paused the meeting to ask for questions and comments. Stakeholder feedback is listed below, with facilitator comments and responses shown in *italics*.

- I have observed spawning steelhead in the side channel at upper Sailor Bar. The velocities are a bit high in the new side channel, so the new vegetation in the side channel may not hold. Also, the side channel above the footbridge has provided good spawning habitat after your group completed construction. Though, I do think you need to go in for operations and maintenance because, when the flows dropped down in velocity, there were some strandings.
  (cbec) *One way to construct the side channels is the cut the channel down to make a stream. For the footbridge site, we built the channel up. It has provided excellent spawning and rearing habitat. However, with both erosion in the main channel and deposition of gravel in the side channel, it has not functioned as we want it to at low flows.*
  It was wonderful habitat, but it seems to have degraded in the last year or so. Some of that has to do with people building "hot tubs" in the side channel. Also, some of the hydraulics have changed.
- I am curious what sort of monitoring system you have going and what the data is showing in terms of the effects of these projects? Do you have data on number of redds and population counts?
  (cbec) *We have not been able to track a population level response, not surprisingly given the number of stressors on the population. We monitor the sites for utilization for spawning and rearing. More than 50% of the redds are being utilized each year. Some years it has been over 50%. So, we are working on determining the viability of the redds we created in comparison to natural habitat to see whether we are contributing to better egg embryo success. We conduct physical monitoring at the sites to understand how the sites evolve over time. We have not been able to document a population-level response, unfortunately.*
  That sounds perfect. I am not at all surprised you have not been able to track a population level response, which is challenging.
- A graduate student at Sacramento State did some comparative work with respect to juvenile habitats on the LAR. I am not sure if the thesis has been finalized. There was some monitoring conducted indicating limited steelhead use of the side channel areas.

Thermal conditions in the river are challenging for steelhead in general. A lot of this influences the Chinook salmon population. The issue really comes down to flow and temperature conditions. Those conditions are the overall constraints on the productivity of the river system. We are seeing these effects in sports fishery. There has been a late arrival of fall run Chinook, which then has a variety of impacts on the system. It is difficult to track populations, unfortunately. Juvenile Chinook salmon are so dynamic, as some leave early and some stay longer. Hopefully, what you would see is an increase in population, but we have not seen that just yet.
(cbec) *Are you referring to Whitney's work? If so, I have it.*
Yes, I am referring to Whitney's work. Do you know if it was finalized?
(cbec) *Whitney sent me a version she called finalized.*

- There have been some recreational impacts on fisheries in the upper river. There seems to be a fair amount of stomping on redds. I sometimes see 5 or 6 people lined up in the channels fishing. The impacts are hard to calculate and quantity, but I do believe this is a real impact. Whether education or information would solve the issue, I am not sure, but we do need to consider this issue.
  (MIG) *This impact is not intentional, correct?*
  Correct. Sport anglers line up on every ripple from Sailor Bar down to the Sunrise foot bridges on New Year's Day. I do not want to imply this is a regulatory issue. We open the fishery every year when steelhead start spawning. The new redds get these lines glossed across them. Again, this is an impact I have only observed, and I do not have any data at this time.
  (ARPF) *This issue should be addressed in the NRMP through education. We need to acknowledge these problems before we solve them. Education is a significant management tool. Perhaps we can also employ signage.*
- Are we managing for steelhead and Chinook, especially in the side channel we were discussing? It is a direct statement to what resources we are managing at the moment.
  (MIG) *One of our tasks it to develop a more in-depth interpretation plan for the Parkway.*
  (MIG) *We also have a human use impact reduction goal in the NRMP. Does your comment pertain to the entire river or only to the upper river?*
  My comment is specific to the upper river. There are types of impacts that are also seasonally dependent. The primary impacts are in the upper river, though you do see Chinook salmon spawning down to Paradise Beach.
  (cbec) *I agree. We have more fish spawning in the upper river. Recreational impacts to spawning at Nimbus Basin are awful. We see more impacts to spawning areas that are more easily accessible to fishermen.*
- Have you noticed any impacts of the gravel augmentation projects on drift boating?
  (cbec) *Not necessarily. I have not seen any significant impacts. You might see a riffle get deeper or shallower, but nothing big.*
- I would like to circle back to the wading issue. This issue has come up repeatedly over time. At one point, our regional office put up some signage. It was modest and not something that would persist over time. We should employ education tactics to get anglers to be more aware of the situation. Additionally, it is tough to get data on the





pervasiveness of the impacts of wading on redds. We would need to determine the frequency of impacts and the timing of impacts relative to spawning. When fry get closer to the surface of the water, they are more vulnerable to the effects of wading. It could be useful to gather more specific information.
(Stakeholder) I do not think there is any information other than observational information at this point.
There is a bit of literature, but nothing definitive. It is a tough issue to study, but we need to get people to appreciate this is issue could be a problem for juvenile fish survival.

Mr. Spain then asked Mary Maret of Sacramento County Regional Parks to speak to potential solutions to the issue of solid waste left in the river by boaters. Ms. Maret described a program to require concessionaries to provide sealable mesh bags to boaters and rafters on river systems and suggested implementing such a program on the LAR. Mr. Spain asked for feedback on a potential mesh bag requirement for trash. No feedback was given.

Mr. Ellis continued the presentation, moving on to the middle Reach of the river and describing the potential projects and mitigation planned for the reach. He asked the stakeholders for their thoughts on what habitat could be improved in the middle Reach of the river considering the reach contains elevations that inundate under higher flows (15,000 to 50,000 cfs). Mr. Hammersmark stepped in to note that Arden pond is a potential project location and the USACE is proposing to fill 2/3 of the existing pond and leave 1/3 of the pond for recreational use. Ms. Maret added more detail to Mr. Hammersmark's introduction, noting the pond would be dredged in its southern half and filled in the northern half, which would create more bass habitat in the northern portion of the pond. A channel would then be constructed to run through the former southern half of the pond to provide an inlet and outlet from juvenile fish rearing. In addition, she noted the project proposes to create two small side channels on the bank of the river downstream of the existing pond and use the material to fill part of the pond.

Several stakeholders then posed questions. Stakeholder questions and comments are listed below, with facilitator comments and questions shown in *italics*.

- Will the dry land we see now downstream of the pond be degraded and turned into a seasonal floodplain?
  (Regional Parks) *There is a trail that runs through that area. The trail would be rerouted. Lowering the floodplain would create seasonally flooded habitat.*
- Do you have any conceptual designs or LiDar designs for this project?
  (Regional Parks) *A presentation given recently incorporated the project design. The presentation recording is up on the Regional Parks website.*
- I heard the waterside of the pond is the portion that is going to be filled and the northern portion is going to be dredged, which is the opposite of what you presented.
  (Regional Parks) *That is correct. The northern portion of the pond is quite shallow, so we will dredge it down to 6 feet and keep that deeper part of the pond for fishing. There is*

*currently about 50 feet of emergent vegetation, water primrose, making it hard to throw a fishing line into the pond.*
I would like to point out the bird folks would like the pond to be fully isolated. The pond attracts its own unique set of diving bird species.

Mr. Spain then directed the conversation to the lower reach of the river. Mr. Ellis indicated many of the bank protection sites he referenced early in the meeting are located in the lower reach of the river. Specifically, he pointed out an island remnant of historical mining in the Howe Avenue Area and explained his team's thoughts on how to improve habitat in that segment of the river by dredging the island, replanting vegetation, and lowering overbank area on the left bank of the river. He then asked the group for comments and questions, which are listed below. Facilitator comments and responses are shown in *italics*.

- How far down are you going to dredge the island below the surface of the water?
  (ICF) *The target is 1.5 to 2 feet below the water surface at 800 cfs. It would be inundated at all times, but not to a substantial depth. It would be a bit lower than the ripple shown between the island and the north bank.*
- I am curious about all the areas colored green in the secondary channel areas.
  (cbec) *Those are areas for potential modification, but modifications will not be implemented in the exact locations depicted. The bank protection group would employ a slightly different design.*
  So, the secondary channels would remain more or less as they are currently? They are major stranding areas.
  (cbec) *Our vision was to fill them so there would still be a small side channel, but we would create a seasonally inundated floodplain.*
  (ICF) *We want to lower that same area but along the river's edge. Our work would extend back into those channels. I think the trend is these areas are slowly aggrading and filling with materials. We are open to exploring proposals beyond what the bank protection efforts have developed if the proposals make sense.*
  (SAFCA) *The USACE does not preclude doing that labor, but the design does not currently incorporate it. That area remains a potential opportunity.*
  (ICF) *If anything else is done in this reach, a lot of thought needs to be given to roughness components. We need to think about the hydraulics we would have at the water surface elevation.*
- I think this area provides a good opportunity. That island is very perched and unfunctional. What we can do with that material is up for debate. It is a low hanging fruit in the Parkway and would be good to move.

Mr. Ellis continued the meeting, describing an additional bank protection project planned for the left bank of the river across from the Campus Commons Golf Course. The project would lay back the existing steep left bank and install buried rock, and construct a gentle slope with plantings on the right bank. Lower elevations would be available for fish at flows of 2,000 cfs and above.





Ms. Maret then noted a potential project depicted at Paradise Beach that was unlikely to move forward as the Parks Department is hesitant to impact recreational use of the area.

A stakeholder posed the following question. Facilitator comments and responses are shown in *italics*.

- Is this area entirely backflow channel?
  (cbec) *Some of the area is intended as lower alcove and backflow channel. Some portions of it were called out for revegetation. However, this is a sensitive location for recreation and flood control, so any project there would be a challenge to implement.*

Tim Washburn of SAFCA then described the USACE Ecosystem Restoration concept for Woodlake and Cal Expo authorized in 2003. Mr. Ellis gave a brief overview of the current fisheries conditions at the Woodlake Area and described proposed terrestrial and aquatic habitat restoration and enhancement projects for the Area. Mr. Washburn commented on the Urrutia site in the Discovery Park Area, noting SAFCA is currently in discussion with the site owner to transition the property to public ownership. The Urrutia project, if realized, would become part of the USACE mitigation program and would consist of a major landscape transformation through lowering the bank to create a floodplain. He noted the pond would be filled in, but also pointed to a pond equal in size further upstream that could be improved to provide habitat for deep water birds.

Mr. Spain then described the upcoming schedule for NRMP development, noting a public draft would be released in mid-March and a Supplemental EIR would be produced later in 2021. Additionally, he noted MIG and Regional Parks plan to host 4 public outreach meetings, including an American River Parkway Advisory Committee meeting planned for the next day. He asked the fisheries stakeholders to contribute their comments in the future, including during the public draft NRMP and Supplemental EIR public review phases. Mr. Spain thanked the stakeholders for their participation and ended the meeting.

# AMERICAN RIVER PARKWAY
# NATURAL RESOURCES MANAGEMENT PLAN (NRMP)
# NRMP FISHERIES STAKEHOLDER GROUP MEETING

Friday, February 5, 2021 ◆ 3:00 p.m. – 4:30 p.m.
Online by Zoom

## APPENDIX TO
## SUMMARY REPORT

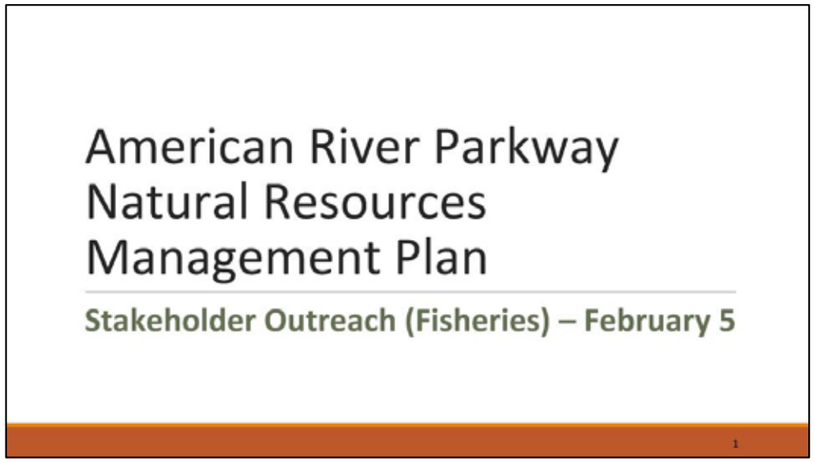


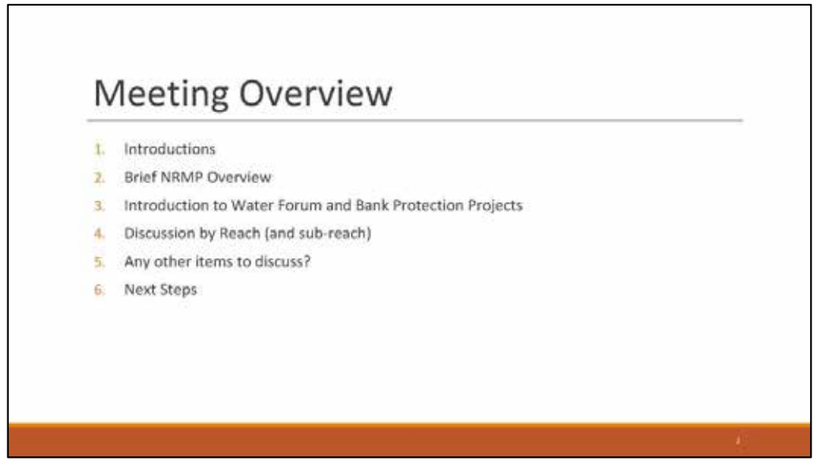


**ATTACHMENT A: MEETING PARTICIPANTS**

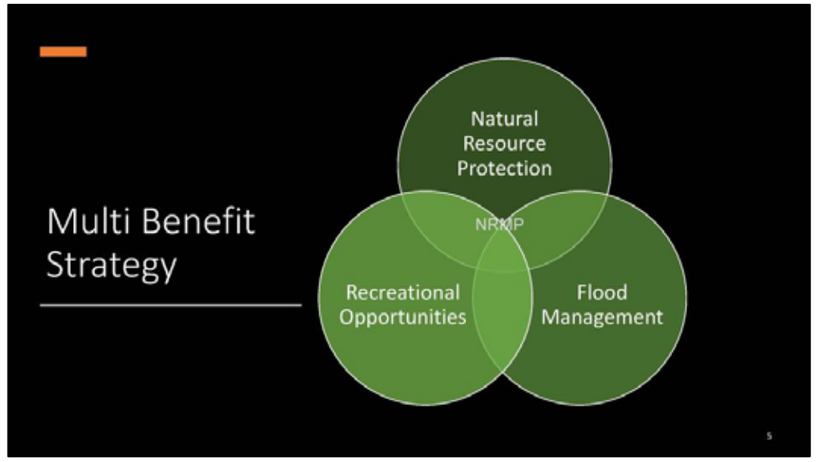
| Participant | Organization | Email Address |
|---|---|---|
| *ARP Fisheries Stakeholders* | | |
| Dave Lentz | California Department of Fish and Wildlife (CDFW) / CA Fly Fishing Unlimited | dlentz@surewest.net |
| Mike Giusti | CA Fly Fishing Unlimited | cffupresident2020@gmail.com |
| Rob Titus | California Department of Fish and Wildlife (CDFW) | rob.titus@wildlife.ca.gov |
| Mark Ashenfelter | GEI Consultants | mashenfelter@geiconsultants.com |
| Campbell Ingram | Sacramento-San Joaquin Delta Conservancy | cingram@deltaconservancy.ca.gov |
| *Facilitating Staff* | | |
| Mary Maret | Sacramento County Regional Parks | maretm@saccounty.net |
| Bill Spain | MIG | bills@migcom.com |
| Jon Campbell | MIG | jcampbell@migcom.com |
| Gregg Ellis | ICF | gregg.ellis@icf.com |
| Chris Hammersmark | The Water Forum (cbec) | c.hammersmark@cbecoeng.com |
| Tim Washburn | Sacramento Area Flood Control Agency (SAFCA) | washburnt@saccounty.net |
| Leo Winternitz | American River Parkway Stakeholders | lwintern@comcast.net |

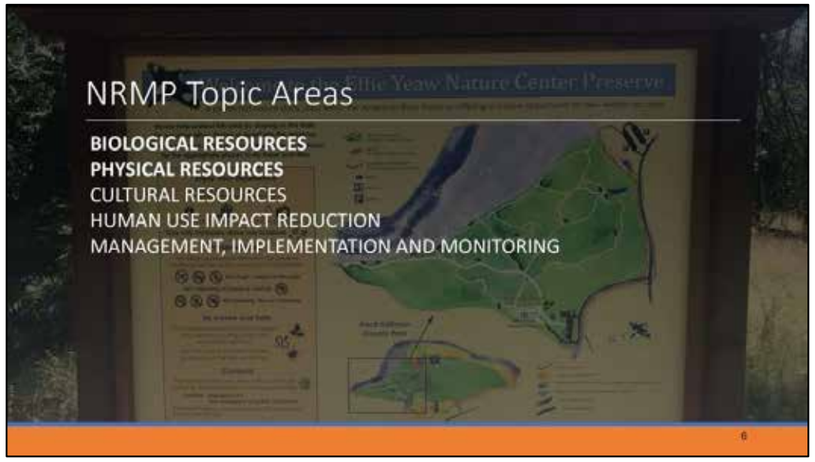
**ATTACHMENT B: POWERPOINT SLIDES**

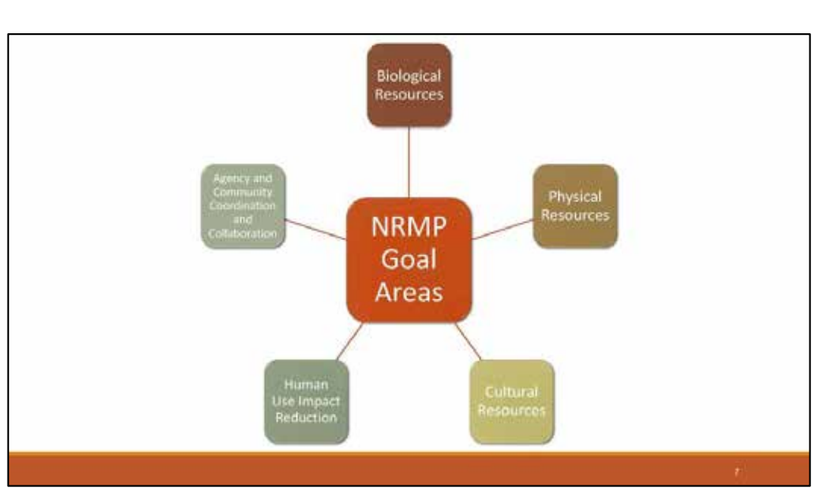


12

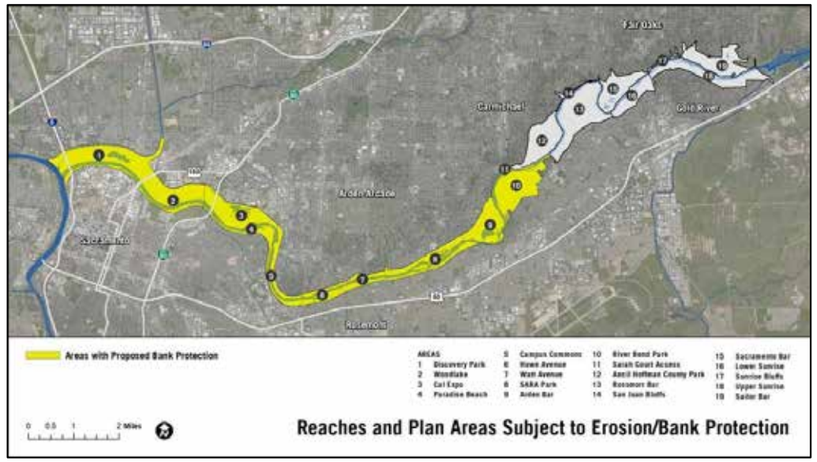

Multi Benefit Strategy
Natural Resource Protection
NRMP
Recreational Opportunities
Flood Management
5

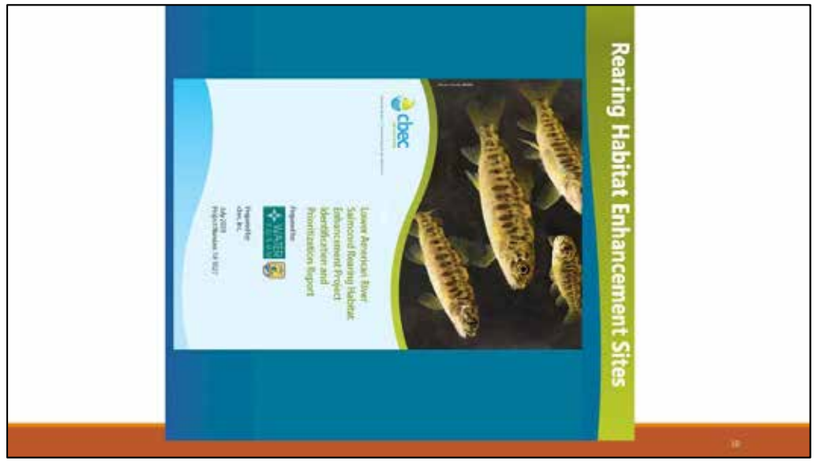

NRMP Topic Areas
BIOLOGICAL RESOURCES
PHYSICAL RESOURCES
CULTURAL RESOURCES
HUMAN USE IMPACT REDUCTION
MANAGEMENT, IMPLEMENTATION AND MONITORING
6


Biological Resources
Agency and Community Coordination and Collaboration
NRMP Goal Areas
Physical Resources
Human Use Impact Reduction
Cultural Resources
7

Some Potential Future Projects

13

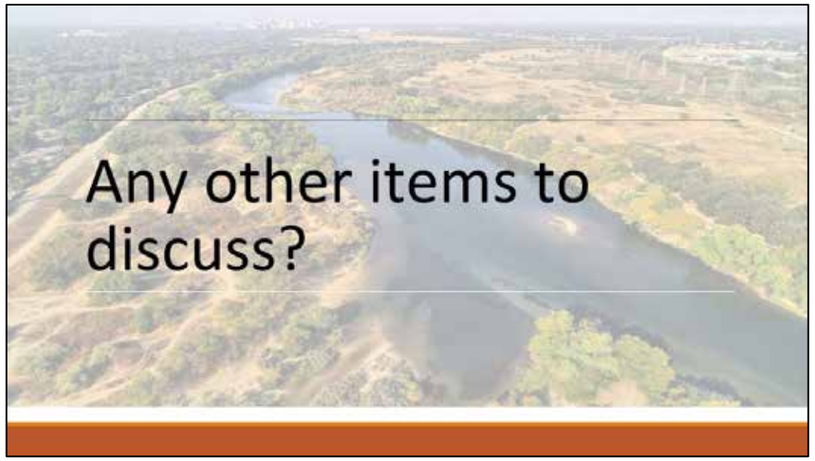

Areas with Proposed Bank Protection
Reaches and Plan Areas Subject to Erosion/Bank Protection


Rearing Habitat Enhancement Sites

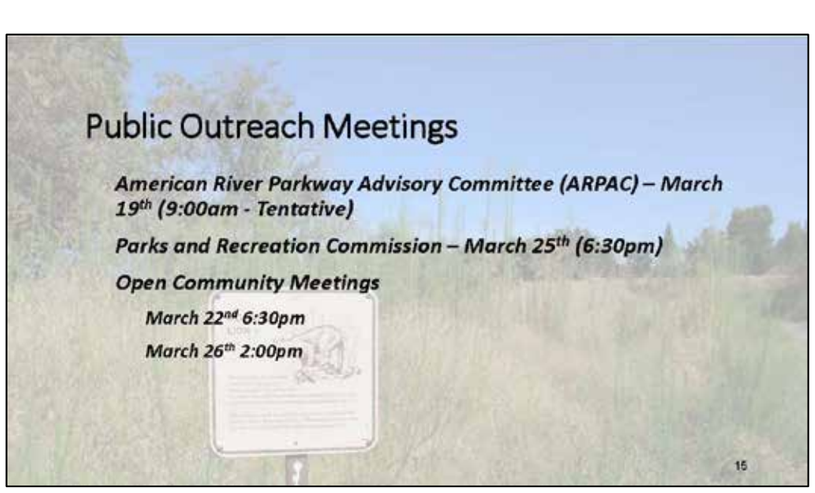
American River Parkway

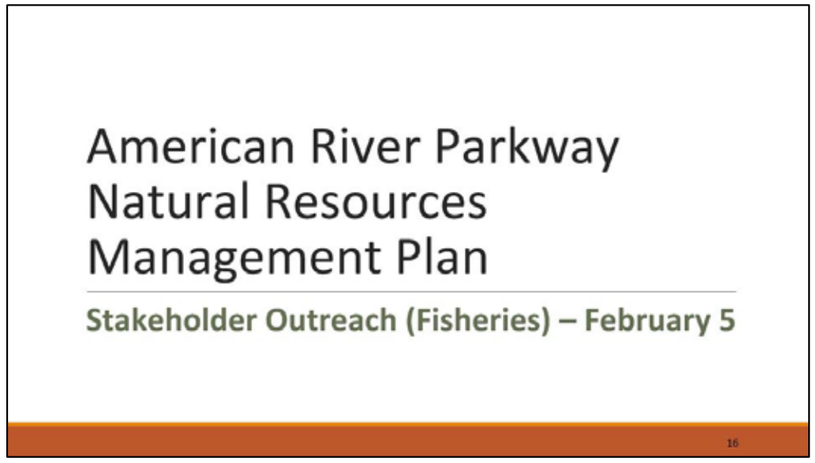
Discussion by Reach

14


Any other items to discuss?

Next Steps
Public Review Draft Released in Mid-March
60-day review
CEQA Review through the Fall


Public Outreach Meetings
American River Parkway Advisory Committee (ARPAC) – March 19th (9:00am - Tentative)
Parks and Recreation Commission – March 25th (6:30pm)
Open Community Meetings
March 22nd 6:30pm
March 26th 2:00pm
15


American River Parkway Natural Resources Management Plan
Stakeholder Outreach (Fisheries) – February 5
16

APPENDIX A

# ARP TERRESTRIAL STAKEHOLDERS MEETINGS SUMMARY REPORT



**AMERICAN RIVER PARKWAY (ARP)**
**NATURAL RESOURCES MANAGEMENT PLAN (NRMP)**
**ARP STAKEHOLDERS GROUP MEETINGS #1 & #2**

Friday, December 4, 2020 ◆ 10:30 a.m. – 12:30 p.m.
(Meeting #1)

Friday, January 8, 2021 ◆ 1:00 p.m. – 3:00 p.m.
(Meeting #2)

Online by Zoom

## SUMMARY REPORT

### INTRODUCTION

On December 14, 2020 and January 8, 2021, Sacramento County Regional Parks, MIG, Inc. and ICF, Inc. co-hosted two ARP Stakeholders Group meetings for the American River Parkway (ARP) Natural Resources Management Plan (NRMP). The purpose of the meetings was to: (1) present an overview of the NRMP; (2) introduce draft NRMP mapping products; and (3) discuss Parkway natural resources management by Parkway reach.

### Meeting Format and Agenda

The two ARP Stakeholders Group meetings occurred on December 4, 2020 from 10:30 a.m. to 12:30 p.m. and on January 8, 2021 from 1:00 p.m. to 3:00 p.m. Eleven ARP Stakeholders Group members and five facilitating staff attended the meetings (Attachment A). The meetings included presentation slides (Attachment B).

Both meetings began with an introduction period in which the meeting facilitators and ARP Stakeholders gave self-introductions. During both meetings, Bill Spain of MIG, Gregg Ellis of ICF, and Jon Campbell of MIG gave a presentation introducing the Parkway; the NRMP background, topic areas, and framework; the draft NMRP goals; the proposed NRMP vegetation management categories; and the draft NRMP mapping products. Throughout the meetings during the discussion periods, Mr. Spain and Mr. Ellis asked the Stakeholders Group for feedback on the draft mapping products and proposed NRMP terrestrial management actions by Parkway Reach and Parkway Areas, moving from downriver to upriver.

**DISCUSSION PERIODS – QUESTIONS, COMMENTS, AND SUGGESTIONS**

The ARP Stakeholders Group posed the following questions, comments, and suggestions to the meeting facilitators. Facilitator comments and responses are shown in *italics*. All comments and responses are paraphrased.

**Meeting #1**

- Can you clarify what you mean by enhancement? Also, what do you mean by converting an unaltered area to a different habitat?
  (ICF) *I will give an example. Let us take an area that is a low floodplain or bar along the river channel that we have identified as unaltered and that the river has created through its dynamic processes. However, we know fish, which are important, are struggling. A project that would propose to lower the elevation of an unaltered area to make it available to fish more often would be considered an enhancement. We want to think through what we would be doing to an unaltered area by lowering its elevation and making it inundate more often. That action could turn out to be a very good proposal and we would consider it an enhancement, but such an action would require the most certainty on our part in terms of projected outcomes.*
- What is the reference template for these criteria? I could imagine restoration for one focal species could be different than restoration for another species.
  (ICF) *We are in the process of determining how much detail we get into in the NRMP. Take Bushy Lake as an example. It is a good resource with a lot of value now, but a lot has happened in that area historically. We are not yet at a point where we can spell out a reference template for restoration. We certainly want to incorporate aspects of a template into the NRMP, but we are still working through how precise we can be. We welcome your input on that issue.*
  I am wondering if there could be a reference template at Effie Yeaw and Cordova Creek where my group is collecting data. We would like to be able to monitor conditions over time with citizen science in light of climate change and resiliency. Have you thought of using case studies as part of the reference template?
  (ICF) *Absolutely. Several examples come to mind. This is where all of the regular users of the Parkway can weigh in. For example, there is a small unaltered area in Woodlake. It has good mature canopy. That area may serve as a good template for what could be replicated nearby. Further up the river in Rossmoor Bar, much of that area has been modified by mining. However, there are some areas not modified by mining that would serve as a good template. Now, adjacent substrates in that location have been modified heavily and the effort and budget needed to manage that area would need to be considered.*
- There is a lot of area shown for naturalization. I wonder if it is realistic to invest that much money given the history of fire in these areas and the impacts of homeless populations. I question the value of investing in areas under such risk.





- There is a very narrow bed on the south side of the river. That area has been identified as preservation on your maps. There is a lot going on in such a narrow band of habitat, including conversion and destruction. We were involved in one small grant in the Sutter's Landing area. I do not know if restoration is the right word for the work needed here. I think it needs restoration and enhancement.
- I watched Sutter's Landing over the summer. Sutter's Landing is moving in the direction of Tiscornia Beach at this rate if we do not take direct steps to minimize the voluntary trails. There are a lot of trails at Sutter's Landing. The trails constitute significant acreage. I would also like to comment on the early maps you showed. Some of the chunks show both sides of the river as separate areas with a different number. Sutter's Landing is a very different area than Woodlake. Sutter's Landing gets significant use in that narrow reach of the river because of its proximity to residential areas. It would be a disservice to the lower 3 to 4 miles of the river to lump the north and south banks together.
  (MIG) *We have made a slight change to the Area Plan boundaries. We are using the centerline of the river to clean up confusion.*
- We have planted the east side of Bushy Lake. We are using fire resilient vegetation and adding culturally significant pollinator plants. We are experimenting and expanding our efforts every year. The most culturally important plant we have is carrot's barbary. We have also planted Indian hemp milkweed, native grasses, and mugwort, which is an important medicinal plant. I can identify and show where we have planted those, and I have a video showcasing our work.
  (MIG) *Thanks. Please provide everybody the video you shot.*
- I have a question about the white areas on the map. Are those areas not going to be included in this plan? For example, what is the white area near Bushy Lake?
  (ICF) *The white areas are not necessarily going to be excluded from the NRMP. We are recognizing the facilities that present opportunities for natural resources management. Camp Pollock has a lot of natural resources values, and right next to it is the Riverdale Trailer Park. There are also some radio towers. The white areas signify a broad use of the concept that there are facilities that might to varying degrees impact what can be managed in the Parkway.*
- Can you explain how the power lines and utility corridors will be handled under the plan?
  (ICF) *There are a few different ways the powerline corridors could be mapped. We fully recognize the corridors are there. What kind of vegetation can potentially be planted underneath them is a point of discussion that has been handled differently over the years. We are trying to maximize natural resources under power lines, but we also need to consider compliance with regulations and the guidelines of the utilities agencies. We do have the corridors as datasets.*
- I am concerned about Discovery Park. I am studying yellow-billed magpies. Discovery Park has the largest population of nesting magpies in the County. The majority are nesting in the London plane trees. One concern is maintaining the suitability of the

habitat for magpies. There are opportunities to enhance that area to replace the non-native vegetation with valley oaks and other trees.

- I am concerned about the areas indicated in white. What is the function of the plan and what would be the future, possibly unintended, consequences of not including those areas in the plan? If this plan provides an opportunity for grant funding and these areas are not included in the plan, it eliminates our ability to seek future funding.
  (MIG) *One of the purposes of the NRMP is to identify funding sources.*
  Okay. Please do not leave out Camp Pollock.
- There are particular facilities, such as Camp Pollock and the American River Ranch, that should be called out through color coding as having educational value. We have goals for each of these facilities and these goals should be complementary to the plan. I would like to see these facilities treated with more value than a powerline corridor or a trailer park.
- The stretch of the river in the main channel adjacent to Sutter's Landing is very shallow and there are low flows. It is very popular for stand-up paddle boarders. Invasive vegetation in that channel segment may very much restrict paddling. Parrot's feather fills the river channel in the summer months when there are low flows and warm weather.
- What are the baseline conditions you are going to operate from with respect to homeless encampments? Will the plan be aspirational or realistic? Are you going to assume the current conditions prevail and accommodate those conditions?
  (MIG) *We have spent a lot of time thinking about this issue. It is very challenging.*
- I am sympathetic to the homeless, but they should be somewhere other than the Parkway. The plan needs to be quite clear in describing the resource damage that is occurring due to the homeless population and we need to move them somewhere else in a humane and appropriate manner. I do not want the Parkway to be subject to inaction.
- We should not design a plan that accommodates homeless camps along the river, but rather that helps relocate these people to better facilities and areas that are more easily maintained. I watched habitat destruction every day at Sutter's Landing this summer. Sutter's Landing will soon look like Tiscornia with nothing but old growth trees and mud. We cannot blame the homeless camps for everything, but the destruction does correlate with the camp locations. Campfires require gathering wood and breaking wood off standing shrubs and trees. It is amazing to see how much Sutter's Landing's forest has been cleared underneath just this summer for deliberate wood gathering. Add to that the vast population walking all the social trails this summer. Bicycle traffic is significant too, despite the brand-new paved trials. Many bicyclists prefer the wooded trails. We really must pay attention to that.
- This plan should reflect our expectations of the Parkway and how we expect this management to occur. Following completion of the plan, it will be incorporated by the County. Then, we can use this plan to solve the current problems we have. We are partners in helping with implementation, so we will use the plan as a strategic tool. If we need to move the homeless out of the Parkway, then so be it.





- The off-paved trails in the Cal Expo Area have become permanent features. Are those trails taken into account in the plan in the area that is being flagged for naturalization? It is bothersome to me as a paved trail user to have off-paved trail bikers.
  (ICF) *The concept is that the type of naturalization we are proposing could also accommodate the off-paved bike trails. I recognize the management challenge here. In the eastern half of Woodlake there is a proposed ecosystem restoration concept from the U.S. Army Corps of Engineers (USACE). It was approved by Congress, but the plan has not yet been finalized. The ecosystem restoration concept does not account for the interface of the off-paved trails and the habitat areas. We would anticipate naturalization would need to align with some level of human use.*
  (Regional Parks) *I would like to add that those management areas were drawn with a broad brush. The off-road trails are also a facility, which we would color white, and we would not eliminate them from the mapping.*
  (MIG) *This plan is not necessarily designed to be applicable at a square meter scale. It is intended to be implemented at the Area level and Parkway-wide.*
- I want to concur with this discussion of the homeless population. We are finding a resident population of Western pond turtles that needs to be studied throughout the whole river. We are also finding high levels of phosphorous and turbidity in the river. So, homelessness may be impacting water quality. Trash is also a water quality problem. We have three resident coyotes on the river, and they have a lot of trash in their scat. So, we need to mention animals are eating the garbage as well. We need a compassionate alternative to having the homeless live in the Parkway.
  (MIG) *Do you think the phosphorus is coming from within the Parkway?*
  Yes, it originates from the homeless people bathing and defecating.
- North of Camp Pollock there is an unauthorized trail used by vehicles. There is an access point where people can get to the trail from Northgate Boulevard. There is significant vehicular traffic traversing the trail to service the illegal campers in the area. Several people have pointed out the nesting Swainson's hawk at Camp Pollock. The area along the river at Camp Pollock is used by day users, such as fishers and paddlers, because it is one of the few free-access areas. The slope there is not ideal, and we have ideas as to where people try to access the river at other locations along the bank. I do not know if this can be incorporated into the plan, but it would be nice to put in some sort of dock or decks for people to use and prevent people from accessing the sensitive areas with elderberry. So, I would advocate improving access there to protect that area. The Parkway Plan considers Camp Pollock and Riverdale as non-conforming uses, but does not address what could exist in their place. It would be beneficial to identify a conforming use for the Riverdale area.
  (MIG) *Okay, thank you.*
- I am struggling with the definitions of naturalized, preserved, and enhancement areas. It was noted there are areas that need to be preserved at Sutter's Landing, but there are also areas that need to be naturalized. What would be helpful is baseline naturalization resources survey information, such as hydrology, soils, and historical information about

what vegetation occurred along the Parkway. That information would better inform restoration activities.
(ICF) *That is a good comment. We are heading in the direction of developing the level of detail you discussed. We know we need to provide more clarity about what we mean by preservation. In our mind, that category does not suggest there are no improvements needed. We would keep the vegetation in Sutter's Landing in good, healthy condition. We just need to be clearer about what we are proposing here.*

- Has there been any discussion of the mining pit [Urrutia]?
  (ICF) *The Parkway Plan mentioned that pit is in private ownership. There are existing concepts that, if the pit is acquired, would provide for mitigation for impacts on the primarily anadromous fish that use the river. The conversations around this are occurring. The concept would be to reconnect that pit to the river. A similar project was completed upstream of the I-5 crossing. We would be consistent with the Parkway Plan by bringing it into public ownership. There is also a fair amount of bank protection area along the river channel with shaded riverine aquatic habitat. A project of this scale would have other implications as well.*
- A lot of the mining debris has created high terrace habitat that constrains the levees and impacts the cottonwood. Is there some opportunity to grade and lower the floodplain height? I would like to see more low terrace habitat.
  (SAFCA) *SAFCA is currently in discussion with the landowners for mitigation for bank protection projects. We share your view of lowering the floodplain to make the landscape accessible to fish in the spring and fall. You would see a transformation of the landform at Urrutia. We hope to know by 2021 if this project will get off the ground.*
- For the last 15 years, we have been running a monthly education program for children in the neighborhood. This summer we saw the crowd size triple at Sutter's Landing. We saw people coming from north of the river from Del Paso and Arden Arcade and from south Sacramento, in addition to people from Elk Grove and further out. It will be important to consider in the plan the higher use patterns we will likely continue to see. I think there will be much higher use than before. Sutter's Landing in particular is easy to access and valuable for parents and children.
- The development of adjacent railyard area adjacent to Sutter's Landing would also encourage more public use.
- I understand the need for bank protection in this area. I have seen the projects that are 10-15 years old that serve as a good model and they produced a lot of habitat value. Hopefully, the rock is concentrated at the toe of the levee and the designs incorporate substantial vegetation. There is a fair amount of black locust, a non-native species, in this area, though I do not have much data to prove that. The Black locust trees do have a pretty high value for migratory birds. I do not think all non-native plants are bad. Those that are the most invasive should be prioritized for management. Naturalized non-natives should be tolerated a bit more.
- There is quite a bit of Black locust across from Harrington Access. I would consider them a beneficial non-native species, and the species has not been included on our list for removal. The only trees we remove are Chinese tallow. Catalpa is also on our list. Trees





are the most difficult to be removed because they need to be cut down and the stumps need to be treated. I am curious how the tree issue will be addressed under the preservation and naturalization categories.
(Regional Parks) *I am a botanist, so I was not aware of the value of these non-native tree species to birds. We do manage areas we consider not having good value because they have non-native trees. If a tree has redeeming characteristics, we want to consider that. I have also identified a stand of Black locust in Paradise Beach to take down and replace with native trees.*

- Along Arcade Creek, we have seen secondary cavities for nesting birds in Black locust trees.
- When you remove a cavity, you remove a perching point. To some degree, maintaining some perching sites and providing nesting boxes will minimize impacts. That approach also requires some maintenance. I see so often that we plant trees and we meet our 5 year requirements, and then the mitigation area burns down the next year. We need long-term plans to protect trees from fire through mowing or grazing.
- What is the problem with Black locust trees? Do they expand their reach? What is the life cycle management for the species? Maybe we should focus on discouraging expansion.
  (Regional Parks) *I consider Black locust invasive. They spread by root and by seed. Once they become established, not many plants can grow in the shade of a Black locust tree. When there is a big stand, the trees would provide the only area for birds to perch.*
  Would it be possible to limit their expansion, tolerate them, and gradually replace them over time?
  (Regional Parks) *I believe most Black locust do not die. The area they occupy would always consist of Black locust. That is what I have noticed. However, it is not necessary to remove every Black locust tree from the entire Parkway.*
- Black locust might serve as a special topic of discussion in the NRMP.
- Why do you exclude the powerline corridors in the mapping of this [Middle] reach?
  (Regional Parks) *The utility companies that maintain the rights-of-way have become increasingly aggressive with their vegetation activities and there is now less room for plantings. I have explained multiple times that an approved planting has been destroyed later on.*
  I understand your concern and frustration, but I think this plan is an opportunity to change some of the policies in place, in agreement with the utility companies.
  (Regional Parks) *I agree.*
- I am not sure how we address non-native trees generally. There is a lot of Catalpa at the far end of the Arden Bar Area, and the distribution is increasing. Chinese tallow, Tree of heaven, and London plane are also issues. I do not know how the plan is going to deal with the non-native species that have taken hold of a lot of the Parkway. I hope the NRMP addresses those different species that take over areas that could be populated with native trees.
- Near Bushy Lake, the utility companies have cut back the riparian vegetation that provides bird habitat. I agree with Mary that there is a problem with the utility

companies taking down everything. This issue should be addressed in the plan. Perhaps a solution would be to plant fire-resistant trees and leave some trees for perching. We can provide examples of fire-resilient species for planting. That would help with the weed problem and habitat restoration.

- The Upper Reach is broken up into small divisions on your maps. Discovery Park should also be broken up into smaller pieces because it is composed of larger areas. I wanted to have that comment on the record for future updates of the Parkway Plan. I know your mapping here relies on the Parkway Plan division of areas.
  (MIG) *So, you would like the Areas to be more comparable in size.*
  Yes.
- I am not familiar with all of the Upper Reach. Many of the areas I have seen here are really overgrown with weeds. I suspect there were probably cultivated lands around Soil Born Farms. We have lost a lot of diversity in the Parkway as a result of the elimination of those agricultural uses, as is the case in Del Paso Regional Park. We have lost the entire burrowing owl population on the Sacramento River and we have lost the grassland in Parkway-adjacent areas. I would like to make a pitch for purposeful management of some areas as low grassland habitat that is either mowed or grazed. It is important to bring back burrowing owl. Yellow-billed magpies would benefit too. Tall weedy fields are good for some species, but they do not provide a lot of habitat value. I do not think we should focus totally on trees and woodlands.
  (ICF) *Much of the historical Upper Reach land modification was a combination of mining and agricultural uses. I echo your thought that good grassland areas are lacking in the Parkway. They are not completely absent, but what exists currently is not high-quality. We are looking for opportunities for grasslands in Woodlake, Cal Expo, and Rossmoor Bar. We should not be thinking exclusively about wooded areas, I agree. We may push for a combination of open grassland and sparse woodland in some areas.*
  - I see grazing and ground-nesting birds as coexisting.
    (Regional Parks) *We have a grazing program, but I have been criticized for allowed grazing in spring and disrupting the reproduction of different animal species. I am thinking about how to allow grazing without that conflict.*
    (MIG) *This speaks to the need to balance various priorities.*
    (Regional Parks) *I am wondering how to achieve the correct timing here.*
  - I think we can work on addressing the timing of grazing. Some people think no nest can ever be destroyed, but others think it is hard to manage habitat without some impacts on some species. It is more of a political and educational issue, compared to a biological issue.
  - I would like to comment on managed grazing. It is something we [Soil Born Farms] have been interested in for a long time. There is a lot of ground adjacent to our facility, including area for woodland and elderberry. There has been a lot of encroachment of yellow star thistle. The NRMP should address the issue of what managed grazing could look like. I think you have some potential willing partners in this. Grazing can be a valuable tool for fire suppression and decreasing the impact of invasive species.





- You should consider incorporating Western pond turtle as an indicator species for the Parkway. There should be no preservation, as everything requires adaptive management and monitoring. Whether you call it preservation or not, grazing is good to maintain habitat complexity and functional quality.
- (Regional Parks) *Regarding Arden Bar, the remaining pond may be dredged to a depth of 6 feet*.

*Zoom Comments*

The following substantive comments were posed in the Zoom chat feature during Meeting #1. Comments are verbatim.

- social trails as opposed to maintained trails
- Thx. Needed that term.
- volunteer is a term we often use
- where is the raise your hand button?
- we know Swainson's hawks have nested at Camp Pollock as an example of the need to include
- Bat habitat and feral cat issues at Discovery Park also argue for including it in resource management
- Camp Pollock
- raise hand
- The city of Sacramento has prioritized adding parcels to the west of Sutter's Landing Park via the Conservancy program grants etc. This area would like become part of the Parkway. Including in planning would help future
- There are other locations in the Parkway way illegal vehicle to camp or thru access is increasing like Camp Pollock. Both sides of the bike bridge at North Sac Bike trail is an example
- I have seen illegal vehicular use at gristmill as well. Folks drive their trucks out onto the river bank.
- Establish an improved path from the JSMTrail to CP as a hardened and approved path to the public facility to encourage use of established trail rather than further impacting the natural area.
- There have also been suggestions from some in the birding community that it be left as pond habitat. Pond habitat is very limited in the Parkway and provides for different species of birds.
- I agree with Dan Airola on lower the flood plain to retain riaprian habitat for Cottonwoods, etc.
- Jedediah Smith Memorial Trail the paved trail in the parkway.
- Trail is north of CP, not accessible or linked to CP. A bike/pedestrian has to cross Del Paso Blvd and Northgate (both are very unsafe to cross). Linking to the paved trail near the Arden Garden / Northgate Undercrossing would be idea.
- Black locust does appear to spread to create dense stands.

- Locust seem a habitat to monitor
- Gradual removal is definitely a good way to remove stands like these.
- Yes it's possible to limit their spreading. Of course that takes maintnenace attention & budget.
- And replace as a consequence of a catastrophic incident, like fire.
- But we have examples utilities over reach on their veg management in parkway
- I agree, with leo's comment, more info will help utilities manage resources better in parkway
- these upper areas are more appropriately divided, would like to see the same in the lower reach. Also, please note that Yellow Star is an issue around CP, spreads from Urrutia to CP each year.
- Perhaps we could find a desirable habitat type that Utilities could live with that provides good habitat for the Parkway.
- Yes, strongly support preparation of an Electric Transmission Line Vegetation Mgmt Plan with participation by the utilities.
- How do we maintain low grasses without disrupting spring nesting?
- Grazing and ground birds are not mutually exclusive.
- More perennials ?
- Even perennial grasslands require grazing to remove thatch and reduce fire risk.
- The more grazing  management can mimic wildlife grazing lowers impacts. Existing grazing more intensive
- Too much thatch reduces the habitat of range land value for ground nesting and foraging.
- Thank you for the opportunity to participate.
- Thank you everyone, I learned a lot of valuable information
- Good discussion all

**Meeting #2**

- Has there been any effort to map all of the informal trails in the Parkway?
  (Regional Parks) *Years ago I had an intern map the informal trails in the Parkway. He also created a trails handbook. Will that be included in the NRMP?*
  (MIG) *Yes, we can include it as a technical appendix.*
  (ICF) *I heard the intern mapped about half of the Parkway. Is that correct?*
  (Regional Parks) *He mapped all of the Nature Study Area lands and half of the Protected Area lands. Some of the areas under the Protected Area designation that did not get mapped were the locations of homeless camps.*
- The biggest unknown we have is the monetary value of the damage done to the Parkway from the homeless camps. Just as the deer, coyote, and birds are scared off by the camps, so are the users and management personnel.
  (Regional Parks) *We do have the monetary value of the cleanup.*
  However, that is not the cost of the actual damage.





(Regional Parks) *True. We do not have that information.*

- Is there no enhancement area on any of the maps?
  (MIG) *We only have a bit of enhancement area in Woodlake. We are currently working on redefining the management types and definitions.*
  (MIG) *We are tweaking the category titles and verbiage.*
- There are all sorts of social trails in River Bend Park. There are trails that have been created by hikers, cyclists, and off-road bikers. It is a very scarred landscape, which is sad because that area could be a very productive landscape, particularly for mature trees. I would like to see these social trails emphasized. I do not know if enforcement is necessary, or if education would suffice. The area needs to be converted to natural conditions.
  (ICF) *The majority of that area would fall into conservation as we refine our management categories. There is good habitat there that we want to maintain. However, we could improve upon existing damage, whether that be through enforcement or physical changes to the landscape. Our new definitions would capture what you are stating.*
- Do you have any theories as to why that area gets that kind of use? It is easy to access?
  (Stakeholder) There is a large parking lot adjacent to the bike trail, so the area is easy to access. Once you are there, there area is not isolated, but it is harder to see from the bike trail. I see ranger patrols parked either in the main paved parking area, in the two dirt parking lots in the back, or in the entry drive. I do not see rangers walking out into those areas.
  (Stakeholder) That area has been known as a cycling spot for at least 20 years.
  (Stakeholder) There is a lot of raptor nesting that should occur there. Great horned owl and other owl species should nest in that area because the trees are so tall. I can imagine the noise and other activities affect the wildlife in what is supposedly a quieter area of the Parkway. This area has attracted its own set of illegal activities. We need to either make these activities legal or do something else to fix the situation.
- There is a lot of native vegetation, including live oak trees, in River Bend Park. However, the understory contains a lot of non-native and invasive plants. I want us to use broad definitions to allow for a better functioning ecosystem in that area.
  (ICF) *That is an excellent point. Our updated definitions would lend themselves to that and would allow for necessary improvements.*
- The spawning gravel placed above the Arden rapids has smoothed out across the rapids. The gravel is making it harder to paddle in that area. It is going to take a pretty high flow to create a deep channel in that area.
- (Regional Parks) *USACE would like to connect the river to the pond at Arden Bar. This effort would involve brining fill materials to the south side of the pond south of the existing islands. The area from the islands to the south would be filled and a stream or overflow would cut through the fill. This project would improve juvenile fish rearing. The remaining pond is shallow, but I am lobbying to get that remaining pond to the north deepened through dredging.*
  Why is the depth of that pond important?

(Regional Parks) *The main issue is emergent vegetation. The pond is becoming shallower, and the area is being overrun by creeping water primrose. It will not serve as a good fishing pond too much longer.*
So, we want to preserve it as a place users can use for fishing. I would assume it would also be preserved as an area for birds.
(Regional Parks) *The first time I asked about that issue, I was told the north pond was outside USACE's project boundary. Liz has said she will not allow a project out there unless the north pond is deepened.*

- Ultimately, USACE has no right to do what it wants without your permission.
(Regional Parks) *I am asking USACE to do some additional work out there. The way the project would be constructed would allow fresh water to fall into the pond. Also, the pond is already a warm water fishery that does not support salmonids. The overflow channel would support salmonids and steelhead. However, if there is a large flood, that would create bad news in terms of access for predatory fish. NOAA Fisheries, however, is willing to make that trade-off. We cannot keep 100 percent of the predatory fish out, unfortunately.*
I want to go on record as saying predatory fish should be a consideration for the Arden pond project.
- What is the purpose of the USACE project at Arden pond?
(SAFCA) *It is mitigation for the loss of shaded riverine aquatic habitat.*
- Is USACE creating better habitat for salmonids or will there be adverse impacts?
(Regional Parks) *Right now, there are adverse impacts. There will be less adverse impacts and improved habitat as a result of the project.*
(SAFCA) *The pond will provide more habitat with implementation of the project. It is a huge transformation of the landscape.*
- Many in the birding community have suggested maintaining the Arden pond as a pond for the value it provides for animals that prefer deeper water. We have very little pond habitat within the Parkway.
(Regional Parks) *We need to deepen the pond by closing it at the outlet. If we keep with the status quo, the pond will continue to provide poor habitat for deep water birds. This project would take most of the pond away, but the remaining pond would be deeper. We cannot go back to how the pond was 10 years ago, as some people want, but there is no perfect solution.*
- Would the island on the northern half of Arden pond receive any sort of treatment?
(Regional Parks) *It is going to be part of the new bank USACE is building. The bank provides protection for goose nesting.*
- Is there potential pond habitat in the Gristmill area?
(Regional Parks) *That area contains levees, so an attempt to make pond habitat would be harder to pull off.*
(SAFCA) *Not only should we ask USACE to create deeper pond habitat at Arden pond, but we should also ask then to create new pond habitat elsewhere.*
- (Regional Parks) *The river islands in between Arden Bar and River Bend Park are very important. I have already logged them in the mapping system. They are important as a*





*heron and egret rookery. These islands need to be identified for preservation. I used to have a helicopter go in for monitoring, but the schedule has changed.*
I counted 16 nests yesterday at that location.

- (Regional Parks) *I do not have an overlay of the ponds, but the vegetation map in the NRMP will show them.*
- There is a lot of broom, including Spanish broom, from Ancil Hoffman to Sarah Court Access. Perhaps that area, including the gravel bar, is an area we need to keep an eye on. I had a group of AmeriCorps folks remove about 300 plants. In addition, the American River Parkway Foundation (ARPF) maps invasive species up and down the Parkway. I am wondering how the ARPF data might tie into the NRMP or how the Invasive Plant Management Plan (IPMP) ties in with NRMP.
(Regional Parks) *We are using the IPMP data, including the Google Earth maps, for the invasive species locations in the NRMP. The IPMP's invasive species data are part of this project.*
(MIG) *The American River Parkway Foundation has been a good source of invasive plant data.*
- At the downstream bar near the bottom of the Ancil Hoffman County Park, there was a large-scale vegetation mastication project last week.
(Regional Parks) *Part of that area is our property and part of it is not out property. I believe that project was conducted by a Homeowners Association. I took photos and showed them to Liz and Mike.*
- I understand that you are using the maps developed under the IPMP. There were only about 9 or 11 species the ARPF managed intensively under the IPMP. So, the IPMP provides a limited database in that respect. I would like to recommend the NRMP use that data as a foundation, but the NRMP should incorporate more species throughout the whole Parkway. We cannot remove all invasive species, so we need to keep prioritizing species for removal. ARPF suggested using Calflora as part of the recommended management activities for invasive species.
(Regional Parks) *As part of a grant I received from CDFA, I am supposed to upload data on red sesbania, French broom, and Scotch broom to Calflora. I think it is going to be an easy process. Calflora is a good sourcing house for this information.*
That should be a strategy incorporated into the NRMP.
- (Regional Parks) *Many of these bank areas are being considered for salmonid rearing habitat and floodplain lowering. There is not a floodplain in this area that is not being considered for those activities. Please keep that in mind.*
- There is a naturalization area identified on the south side of the river and near the large City Park [Hagan Community Park]. Is there anything that can be done in that area to project what little habitat is left? There is a sliver of area there impacted by recreation spillover from the City park.
(Regional Parks) *That area provides important connectivity and needs to be managed for that function. I have noticed fireworks are lit there every year. We need to protect and enhance that area.*
- Is the Effie Yeaw area being shown as preservation?

(Regional Parks) *That leased area is not being shown at all on the maps because it is developed. The light green area is preservation and includes all of the Nature Study Area lands at Ancil Hoffman County Park.*

- I know you have been working with the American River Natural History Association (ARNHA). ARNHA is looking at restoration, which is beyond the bounds of preservation, in the Ancil Hoffman area. I want to make sure those proposed restoration activities are captured in the plan to allow ARNHA the opportunity to conduct restoration.
  (Regional Parks) *The definition of preservation is being reworked to not imply we would put up a fence around an area and not let people in.*
- What is the condition of the ponds at Sacramento Bar?
  (Regional Parks) *There is a large pond at the southern end of Sacramento Bar. I am not aware of any proposed fill. The ponds are not filling up with emergent vegetation. They are left over from mining activities.*
- The ponds were excavated during past aggregate mining. The southernmost pond was partially filled during a past flood event. The other ponds are currently cut off from flood flows, but are connected to groundwater. The other two ponds could be lowered, and the excavated material should fill in the southernmost pond. That effort would yield good restoration results and there would be more reliable water in the interior ponds.
- What sort of habitat value would be created by filling the southernmost pond at Sacramento Bar? USACE is still looking for habitat enhancement opportunities, correct? This would be a good way to provide enhancement and offset losses at Arden Bar.
- The southern edge of that pond was a continuous flood shoot, which induces deposition and results in a loss of habitat. If you fill that area, you will get high elevation riparian and upland species.
  (ICF) *Mary may have more recent information on USACE mitigation. I do not know the exact acreages.*
  So, this is a good opportunity for Mary to tell USACE to create more upland habitat to offset impacts to Arden Bar.
- Those ponds would provide good habitat for Western pond turtle. The habitat between the river and the ponds would be excellent for nesting.
  (SAFCA) *How would connecting the ponds to the north to make a bigger pond affect the Western pond turtle?*
  The areas to be filled in would not provide good Western pond turtle habitat, but the ponds would provide good habitat.
  (SAFCA) *Are there any Western pond turtles in that area now?*
  I do not know.
  (SAFCA) *I think this is an idea worth pursuing. There is an opportunity to bring this up during discussion of the elimination of pond habitat at Arden Bar.*
- You can create an island out of the existing isthmus. Those larger ponds at Sacramento Bar are not connected to the river, so you do not have the connections for the salmonids.
  (SAFCA) *I think overall that is a good solution if there are no collateral impacts.*





(Regional Parks) *The Water Forum has identified this area as a flow through area. Perhaps this can be part of the plan to create side channel habitat.*
(SAFCA) *My point if that USACE has unmet mitigation needs, and we would be giving them aera for mitigation. This concept would help them.*

- The Water Forum would like to put a lot of surface material in that pond. That action would create deposition, which would make the area lose gravel. Raising the elevation is a better approach in the long-term.
  (SAFCA) *Okay. I will have to talk to Chris Hammersmark. When the USACE comes through looking for potential mitigation area, we can use the NRMP to direct them to a specific area and to give them comments and guidance.*
- I would like the note the NRMP needs a chapter detailing research needs moving forward. I do not know anything of the ponds, species, and habitat, but I think this potential mitigation and enhancement should be prioritized to develop some of that information.
- (Regional Parks) *Some of the areas indicated in dark green on the Rossmoor Bar map are open fields. Those areas are being considered for tree planting. This is one area on the Parkway where we still have some open space. I want to know what folks are interested in doing with our remaining fields.*
  (ICF) *Please note we are looking at what is the right mix of habitat everywhere, from River Bend Park to Woodlake to Cal Expo. We are considering if locations that are not currently supporting dense stands of trees would be logical for locating new grasslands. We want a diversity of habitat. There are some areas in Rossmoor Bar that do not contain dense woodlands and that have some grassland area. There are some invasive species there too. We want a good mixture of habitats for the wildlife species. Some of these areas in Rossmoor Bar are being looked at as mitigation sites for bank protection impacts. We want to consider where we have grasslands for certain species.*
  (Regional Parks) *Do any of you feel these particular fields are important? Would you be upset if these areas were planted with trees?*
  (SAFCA) *I think it would be helpful if you could explain what USACE is proposing.*
  (Regional Parks) *About 1/3 of that lower strip of land in Rossmoor Bar is being considered for tree planting. One way to do it is to maximize the view of the Sierra Nevada from the bike trail and the alterative is to keep the trees close to the river and maximize the contiguous grass spaces near the levee. USACE is also thinking of expanding the existing tree-occupied area. There is a portion in the southern part of that field that has been planted with oak trees and sycamore, which have done very well. In addition, USACE wants to plant elderberry in a little field in the corner where the trails come together to make an X on our maps. There is a gap in elderberry connectivity there. In the future, USACE is going to be looking at the fields in El Manto, which are going to be targeted for open space. We constantly get requests to mitigate that area.*
- That area in Rossmoor Bar near the trail crossing is prime pump track area.
- (Regional Parks) *I am interested in the wildflowers in those fields that do not occur anywhere else.*

- What are we trying to achieve in terms of open space and grasslands? Grasslands provide habitat for a variety of insects and birds. There is not an abundance of grassland on the Parkway. Pieces of land that have the potential to be better grassland habitat should not be eliminated and converted into something else. I do not think we should just go in and plant trees.
  (ICF) *I do not have precise numbers, but we do know the grasslands in the Woodlake and Cal Expo areas are heavily used by raptors, though they also contain a lot of yellow star thistle. We expect the grassland to occur on the river naturally. We want to make sure we preserve and improve some of that habitat. We are not yet at the point where we can give specific acreages. We want to think about how we determine if we should convert the areas we discussed to grassland or something different.*
  My point is that just because we have open space does not mean we should use it for mitigation and planting trees. I think we should be more thoughtful here.
- I have argued the Lower American River is a stable channel, but I have been reconsidering that position after looking at these two turns at Rossmoor Bar. It occurs to me that the channel margin along the edge of lower Rossmoor Bar is going to be susceptible to bank erosion in the future. I would argue that whatever you do for mitigation is supposed to exist in perpetuity. You need enough space to relocate anything located on those banks, should they erode.
- When considering whether to leave the remaining grassland, we should take a really good look at the subsoils, as some of them may or may not support only grasslands.
  (Regional Parks) *A lot of these areas in Rossmoor Bar were agricultural fields and orchards. I think that is why previous tree planting projects have done so well there.*
  So, those are deeper soils?
  (Regional Parks) *I think that is so, but I will check. This may not have always been grassland because trees may have been cleared previously.*
  - In other words, the USACE and others have had success planting trees in that area, so those results indicate that area would be good for mitigation. However, since we are dealing with demand for mitigation it is important to know of other areas that would be equally favorable to establish riparian habitat. That would enable us to not give up a habitat to valuable in its own way. There are other locations that are suitable for the mitigation the USACE wants. This location is easy pickings for their mitigation, but we do not necessarily have to give them easy pickings.
  - USACE planted cottonwoods at very high elevation sites. The cottonwoods survive if they have water. The ponds at Sacramento Bar have steep banks. You could probably plant a lot of riparian habitat on those banks.
    (SAFCA) *I agree, and I like that idea. We are naturalizing areas heavily altered by past mining activities. The USACE is going to object to that idea, saying it would be difficult to plant those ponds compared to planting the grassland. We need to give the USACE other locations to install their mitigation that make more sense in terms of the management of the Parkway, even if that adds more to the cost of the mitigation. I think Regional Parks has that latitude.*





(ICF) *I want to add that it is accurate to say at some point U.S. Fish and Wildlife Service (USFWS) did not want USACE mitigation further north than Rossmoor Bar.*
(SAFCA) *Did that request have a biological basis?*
(ICF) *I could not immediately come up with a reason behind that request.*
(Regional Parks) *I believe USFWS wanted to keep the mitigation closer to the location of impact.*
(SAFCA) *Again, that preference was formulated in the absence of an NRMP that would allow us to get a better sense of where to go with the demand for habitat enhancement in a way that would fit the Parks Department's [Regional Parks] management repertoire. This process is giving us an opportunity to take a more holistic view of management, which will allow the Parkway managers to manage in a way they see fit.*
(ICF) *We can make the argument that it would biologically be of good value to have more grassland.*
(SAFCA) *The Parkway managers should take the lead on this decision of how much grassland to keep or improve. There is value associated with this grassland.*

- (Regional Parks) *Sailor Bar is another opportunity for ponds. It is nothing like Sacramento Bar, but Sailor Bar has a lot of mined areas in which there is space for ponds. There is a bentonite pond near Olive Access at which we were going to construct a swimming hole, but it never worked. It is a low spot in the landscape, and it does not hold water. There are other pond opportunities, though the task would not be easy. It would be easier to address the ponds at Sacramento Bar.*
- Why is that area in which the Water Forum is borrowing gravel not flagged for naturalization?
  (ICF) *We have identified that area for naturalization. The next step is to determine how big of a lift would be required to naturalize the area.*
  (SAFCA) *That would depend on USACE's mitigation needs.*
  (ICF) *That was a rhetorical question, but we are saying the area could be naturalized to provide better habitat.*
  (SAFCA) *I think that next step is where you would get a sense of what a sustained landscape could look like. Then, you would match that up with what the USACE needs.*
- What are those gray areas in Sailor Bar?
  (Regional Parks) *Those are mine tailings. They are historic piles of rocks that are protected. It was the location of the first electric dredge used in California.*
  Are those rocks actually protected?
  (SAFCA) *The rock piles have historic value. You have to comply with state and federal requirements and install some educational features.*
  (Regional Parks) *When the Water Forum got their gravel borrow permits, they had to mitigate for impacts to the historic pile of rocks.*
  (SAFCA) *The mitigation requires providing historic signage.*
  (Regional Parks) *Correct. You do not have to rebuild another pile of rocks.*
- The rock pile area looks like an area in which enhancement should occur. I want the NRMP to identify it as such.

(ICF) *We are identifying areas to be naturalized. We have not yet determined the best type of landscape changes to get most species to survive. It is a bit of a moonscape out there at Sailor Bar. There is a reason things are not growing there currently.*

- (MIG) *Mary, you mentioned earlier there is a preference for mitigation to be located closer to the site of impact.*
  (Regional Parks) *USACE is going to run out of space. If we have a plan to identify what we want, we are more likely to get funding and get the go ahead on other potential mitigation sites. There are locations people do not know about, such as a soccer field in Upper Sunrise. I do no know if anything grows there. It has been mined twice and scraped, but that field looks like it can provide some open space. It is not actually a soccer field, but it is reminiscent of one. There are other locations on the Parkway that could use some help habitat-wise.*
  (SAFCA) *That is the point of our plan, to identify the areas we could use and then prioritize them.*
- Is the Upper Sunrise location about an acre in size?
  (MIG) *It is 3 acres.*
  (Regional Parks) *That would be an area we could improve for potential use by raptors. We will have to look at the soils.*
  (Regional Parks) *That is true. I doubt the soil is very good there.*
- There is showy milkweed growing near a PG&E site further downstream. The area I am referring to could provide pollinator habitat for monarch butterflies. There is also an existing pump next to the grove. One of the PG&E mitigation sites butts up against the location of the milkweed.
  (Regional Park) *Yes, I am aware of that location. It would be good to enhance that area. It is in Lower Sunrise near the parking area. There is a nice stand of milkweed there.*
- I am imagining the NRMP is held by Regional Parks, and when regulatory agencies come to Regional Parks with a proposal, Regional Parks would guidance and show the agencies where to go, as opposed to them telling Regional Parks where to put the mitigation.
  (Regional Parks) *I am in favor of that idea.*
- I think it is helpful to know where to mitigate and what to mitigate for. For instance, PG&E is looking to plant trees at its mitigation sites. We do not have enough information to know whether to plant riparian vegetation, forbs, or grassland.
  (ICF) *Are you referring to knowing what kind of species a mitigation site would be able to support?*
  Yes, and the mitigation function the site would provide.
  (Regional Parks) *Upper Sunrise has mostly been altered and mined, but it still has a lot of desirable habitat. Trees and other species have come back post-mining. The area is in a heavily altered state, but it is a preservation site we want to maintain, which is different from a lot of other areas on the Parkway.*
- I am interested in showing maximum restoration potential in the Parkway during the hydraulic modeling process. That would allow for a buffer to allow people to do as much





restoration as possible, particularly with trees and other species that might have hydraulic impact.
(ICF) *Your input is very helpful. When we put together our administrative draft, we can think of areas that might be improved and how they would be improved. We would then plug that information into the hydraulic model. There are obvious limitations in the lower river, but less limitation in the upper river. That is the path we are on. There will be some back and forth first to define thresholds. We will also need to discuss how to scale back our proposals if we go over the thresholds.*
Okay. I just want to make sure that, for example, the Effie Yeaw folks would not have to come back and have a second-round hydraulic analysis to do their proposed work.
(SAFCA) *You are not going to be able to escape getting approval, but you want to put this work on record for the hydraulic analysis. The Central Valley Flood Protection Board (CVFPB) will do the hydraulic analysis. We are going to have an NRMP that would make it harder for USACE and the CVFPB to say no to restoration. That would give Effie Yeaw more leverage for the work they want to do.*

- It is very obvious when we look at the Parkway from this scale that connectivity has to be emphasized as we move forward. I am concerned we do not have enough connectivity on the south side of the river in the lower reaches. Grassland conversions would come into play there.
- I am curious about the nature of connectivity. It seems to me most of the species that move around can bridge most of the gaps and species that do not move around have a patch configuration that might be suitable to our needs. What aspects of connectivity are most important?
- We do not have recent data, but we do know there were badgers in the Parkway in the past. There was a historical distribution of species throughout the Parkway. Is that possible now? That is a question I have in my mind. I think we can come up with a list of species that previously occupied the Parkway and may even do so now.
- I think the current user demand generated by COVID-19 will stick around, rather than decrease. We should plan for higher user demand moving forward. There are sensitive landscapes that cannot handle high foot and bike traffic. I do not have a solution to protect the vegetation aside from putting up physical barriers. We need to do something. Most of the public does not realize this is not just a big city park. It is a Wild and Scenic River (WSR), for recreation albeit, but it is also not a city park. This is a rare and small remaining area of native riparian wildland. How do we protect this wildland in that environment?
- The land we have in the Parkway is limited. We should be aware of the potential for land acquisition and incorporate land acquisition as a management policy in the NRMP.
  (Regional Parks) *A lot of people have their eyes on properties. A lot of the properties are in the lower Parkway. I also know the Lower American River Conservancy (LARC) is interested in purchasing property.*
  (SAFCA) *I do not see a problem with including in the NRMP a policy to acquire land where possible. The policy does not need to call out specific areas.*

- I think connectivity is really important and the Parkway is an important riparian east-west connector in the region. I think it is important to remember our native insects, which cannot move freely if the do not have habitat. Native bees might go as far as 100 yards from their nesting area. I think it is important to have as much habitat connectivity as possible.

*Zoom Comments*

The following substantive comments were posed in the Zoom chat feature during Meeting #2. Comments are verbatim.

- In many cases these types of impacts are increasing
- Deeper pond more likely to support warm water predator fish
- pond depth should be tied to salmonid needs over fishing opportunities
- In many cases these types of impacts are increasing
- Deeper pond more likely to support warm water predator fish
  pond depth should be tied to salmonid needs over fishing opportunities
  What about adding pond habitat as a priority where best suited for fish and wildlife needs?
  Replacement of that area of pond habitat to be lost should be replaced elsewhere
- n the reaction button
- island habitat within ponds would be good for birds
- create an island out of the isthmus between the two larger upper ponds
- edge habitat and soil for burrows good for pond turtles
- also these larger pond are not connected to the river so much less interaction between predator warm water fish and trout/salmonids
- Perhaps the goal should be not to lose more grassland habitat and it will be mitigated when replaced
- And it is important to consider whether the subsoil could support trees, or can only support grasslands
- A variety of pond depths at Sac Bar may also be beneficial to turtles
- The grassland & open areas are of value but restoration of these atreas could be important to provide full value by adding for a, grasses and removal of invasive.
- In the mean time, Man proposes, God disposes
- They have to do a documentation process
- historic preservation
- Absolutely that would be helpful.
- Dan is spot on.
- I believe that the increased visitor-days to the Parkway due to COVID will not drop off after the COVID threat subsides





- Connectivity for remaining and prioritized habitats is important and could be limiting in some sections of the Parkway. Our grassland discussion today could be a good example of that need.
- If that is the case, we will need to harden the high use areas, and add physical barriers to protect the natural landscape areas. There will likely never be enough money for enforcement to protect sensitive areas.
- My connectivity comment is tied to questions about the status of sensitive species with limited mobility. Connectivity and presence of adequate acreage and habitat quality may be limiting for some sensitive species formerly known from the Parkway. How do we treat this as a baseline condition?
- Every square foot counts. The pressure to reduce the useable acreage of the parkway is enormous for all sectors.
- and from all directions: Caltrans , Developers, utilities, , etc.
- Illegal trails - identifying the hardened areas. Education and signage. Additional enforcement isn't practical when current enforcement is unmanageable.
- I truly appreciated the opportunity and the time you have taken with this effort.
- everything is unstable right now

# AMERICAN RIVER PARKWAY (ARP)
# NATURAL RESOURCES MANAGEMENT PLAN (NRMP)
# ARP STAKEHOLDERS GROUP MEETINGS #1 & #2

Friday, December 4, 2020 ◆ 10:30 a.m. – 12:30 p.m.
(Meeting #1)

Friday, January 8, 2021 ◆ 1:00 p.m. – 3:00 p.m.
(Meeting #2)

Online by Zoom

## APPENDIX TO SUMMARY REPORT

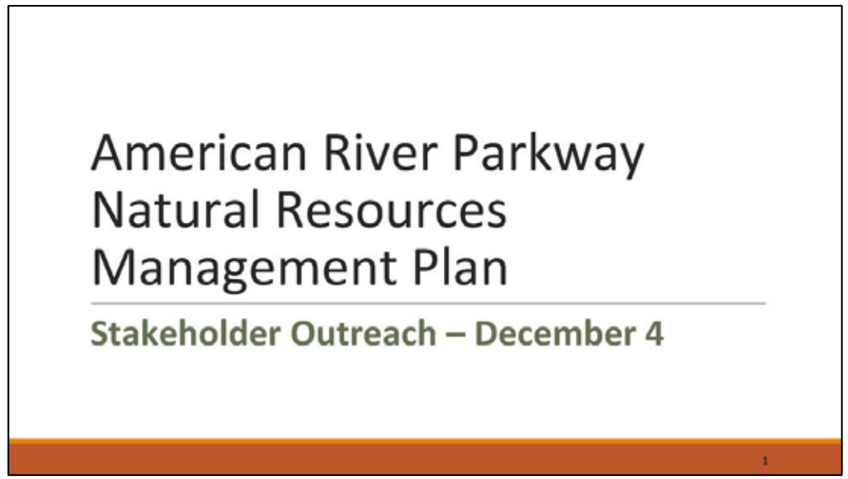


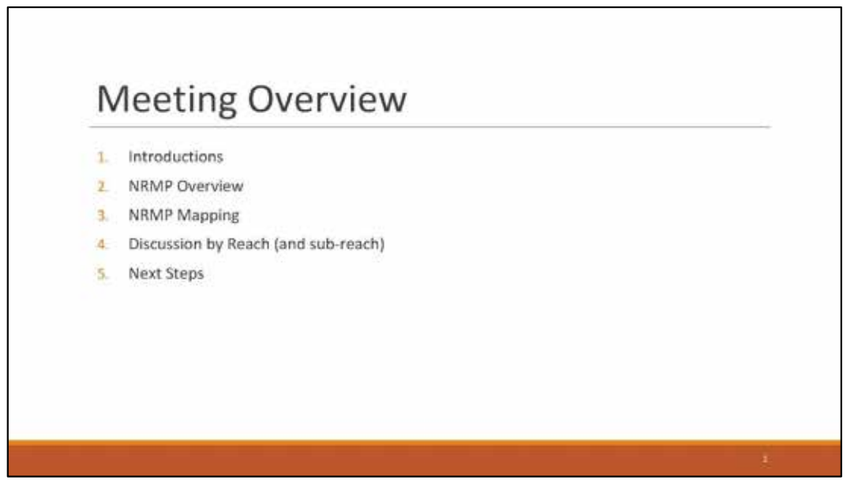


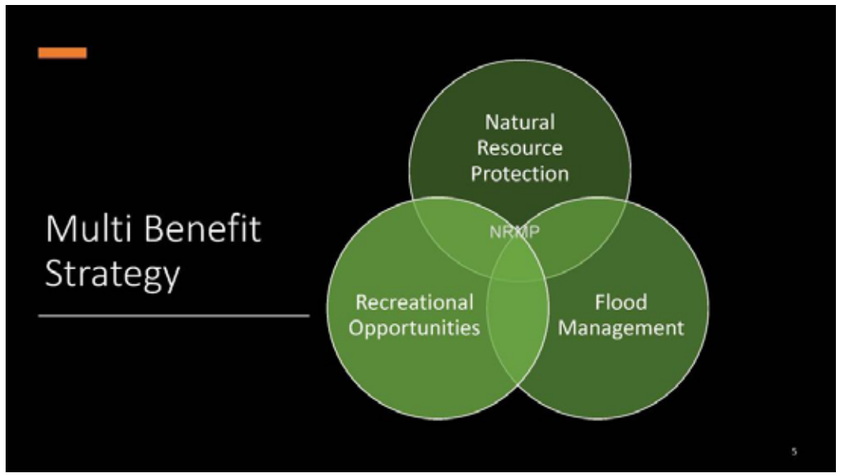
## ATTACHMENT A: ARP STAKEHOLDERS GROUP MEMBERS & MEETING FACILITATORS

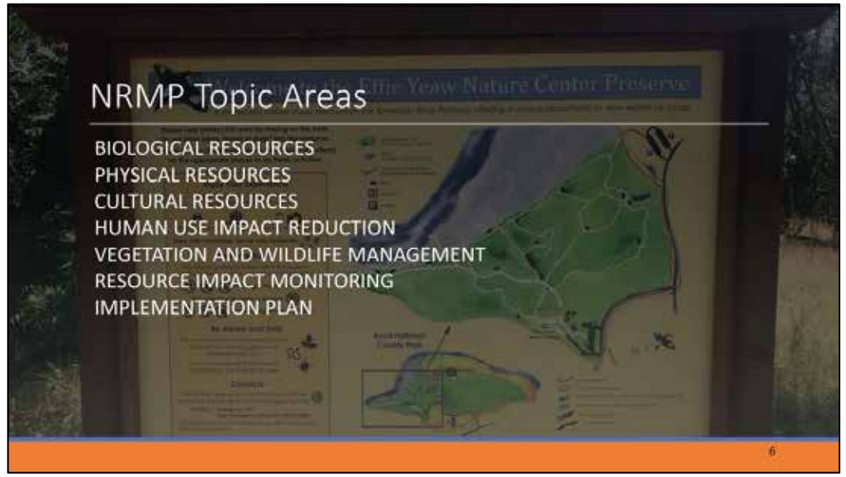
| Participant | Organization/Agency | Contact Information |
|---|---|---|
| *ARP Stakeholders Group* | | |
| Kelly Hopkins | Sacramento Valley Conservancy, Executive Director | Khopkins@sacramentovalleyconservancy.org |
| Chris Lewis | Elderberry Farms Native Plant Nursery, Founder/Director | Cnpschris@gmail.com; |
| Dale Steele | Friends of Sutter's' Landing (FOSL) | Daletsteele@yahoo.com |
| Tom Biglione | Friends of the River | Ftbiglione@gmail.com |
| Michelle Stevens | Sacramento State University (Bushy Lake) | Stevensm@csus.edu |
| Guy Galante | N/A; Educator, Geographer, Naturalist | Guy.galante@gmail.com |
| Shawn Harrison | Soil Born Farms, Director | Sharrison@soilborn.org |
| Dianna Poggetto | American River Parkway Foundation, Executive Director | Dpoggetto@arpf.org |
| Dan Airola | Knowledgeable user | d.airola@sbcglobal.net |
| Dan Meier | Elderberry Farms | 14danmeier@gmail.com |
| Zarah Wyly | Sacramento Tree Foundation | zarah@sactree.com |
| *Meeting Facilitators* | | |
| Mary Maret | Sacramento County Regional Parks | maretm@saccounty.net |
| Gregg Ellis | ICF | gregg.ellis@icf.com |
| Leo Winternitz | American River Parkway Stakeholders | lwintern@comcast.net |
| Tim Washburn | Sacramento Area Flood Control Agency (SAFCA) | washburnt@saccounty.net |
| Chuck Watson | WRC Environmental | wrcwatson@yahoo.com |
| Jon Campbell | MIG | jcampbell@migcom.com |

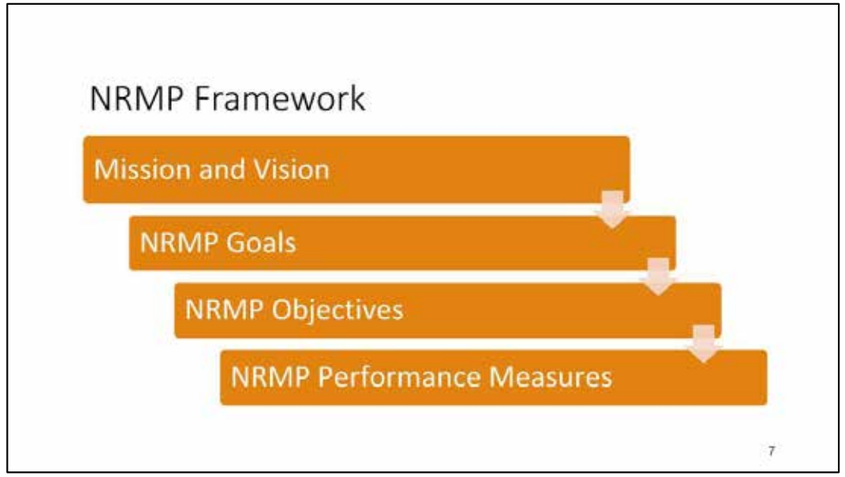
**ATTACHMENT B: POWERPOINT SLIDES**

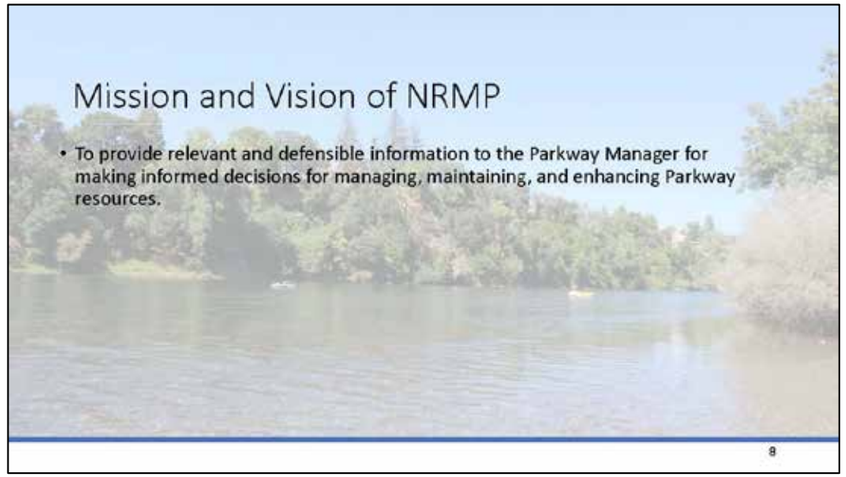


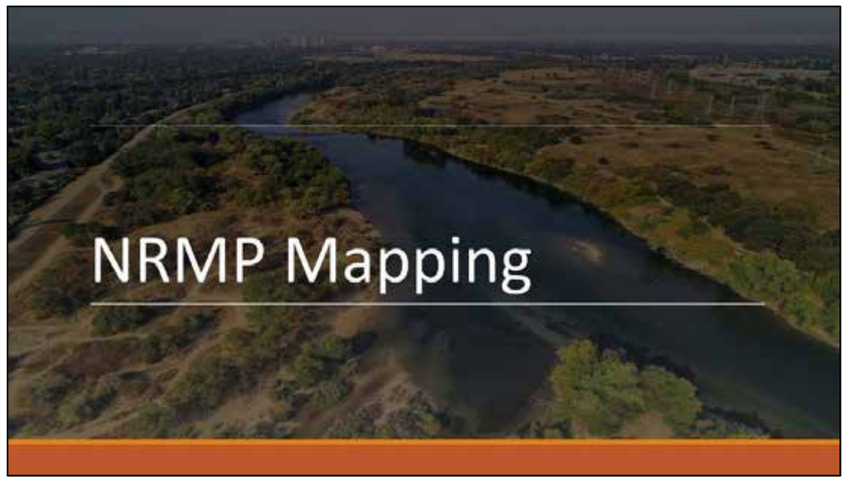

Multi Benefit Strategy
Natural Resource Protection
NRMP
Recreational Opportunities
Flood Management
5


NRMP Topic Areas
BIOLOGICAL RESOURCES
PHYSICAL RESOURCES
CULTURAL RESOURCES
HUMAN USE IMPACT REDUCTION
VEGETATION AND WILDLIFE MANAGEMENT
RESOURCE IMPACT MONITORING
IMPLEMENTATION PLAN
6


NRMP Framework
Mission and Vision
NRMP Goals
NRMP Objectives
NRMP Performance Measures
7


Mission and Vision of NRMP
• To provide relevant and defensible information to the Parkway Manager for making informed decisions for managing, maintaining, and enhancing Parkway resources.
8

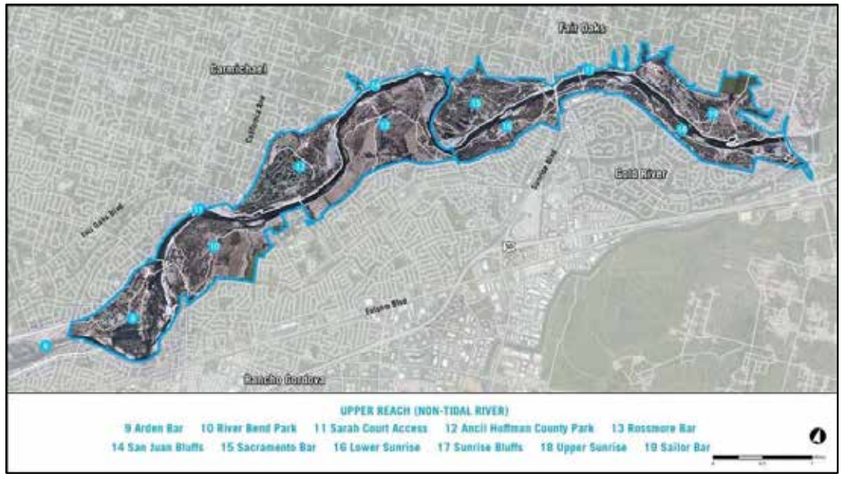
Biological Resources
Agency and Community Coordination and Collaboration
NRMP Goal Areas
Physical Resources
Human Use Impact Reduction
Cultural Resources


NRMP Mapping

American River Parkway

LOWER REACH (TIDAL RIVER)
1 Discovery Park 2 Woodlake 3 Cal Expo 4 Paradise Beach

Arden Arcade
Howe Ave
Watt Ave
Fair Oaks Blvd
Auburn River Dr
Fulton Blvd
La Rivera
MIDDLE REACH (NON-TIDAL RIVER)
5 Campus Commons 6 Howe Avenue 7 Watt Avenue 8 SARA Park


Fair Oaks
Carmichael
Gold River
Fulton Blvd
Rancho Cordova
UPPER REACH (NON-TIDAL RIVER)
9 Arden Bar 10 River Bend Park 11 Sarah Court Access 12 Ancil Hoffman County Park 13 Rossmore Bar
14 San Juan Bluffs 15 Sacramento Bar 16 Lower Sunrise 17 Sunrise Bluffs 18 Upper Sunrise 19 Sailor Bar

Proposed Management Categories
Rehabilitation: fixing a resource that has been recently degraded
Preservation: keeping a resource in a good or improved condition
Enhancement: converting an unaltered area to a different habitat type
Naturalization: converting a formerly altered area to a more natural condition

Discussion by Reach
THIS IS A PROTECTED
NATURE STUDY AREA
TAKE ONLY MEMORIES
LEAVE ONLY FOOTPRINTS

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## Questions by Goals / Goal Area

(1) Vegetation, Habitat, and Wildlife
(2) Water quality / Aquatic
(3) Other Comments

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# American River Parkway Natural Resources Management Plan

**Stakeholder Outreach – December 4**

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# APPENDIX B
## PHYSICAL RESOURCES REPORT

APPENDIX B

# GEOMORPHOLOGY & BANK AND CHANNEL ASSESSMENT DRAFT TECHNICAL REPORT



## Geomorphology & Bank and Channel Assessment Draft Technical Report

In support of the
Lower American River Natural Resources Management Plan

Last Updated: 03/03/2021

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Appendix 2 - LAR Stratigraphy (Fugro 2012).

Appendix 3 – Regional Surface Profiles (Fugro 2012)

Appendix 4 – LAR Infrastructure Encroachment

Appendix 5 – Parkway Segments (Designated Geomorphic Reaches)

Appendix 6 – Topographic Map

Appendix 7 – Inundation Areas

Appendix 8 - Functional Geomorphic Surfaces in the Parkway

Appendix 9 - Soils of the Parkway

Appendix 10 – Velocity/Shear Stress at 20.5k, 115k, and 160k cfs

Appendix 11 – Bank Inventory Report

# 1. Introduction

This report summarizes the physical features and historic impacts relevant to the Lower American River's current geomorphological condition. It begins with an introduction of the geologic and topographic genesis of the Lower American River (LAR) condition within the Parkway boundaries, followed by a description of the human interaction and interference with natural river processes that further shaped the river over the last 170 years, and concludes with current operational activities, infrastructure, and proposed enhancements that continue to influence the river condition now and into the future.

In addition to the geologic setting, relevant aspects and physical characteristics of the Parkway described in this section include the hydrology, inundation extents, geomorphic characteristics, underlying soils, hydraulic forces, bed and bank types, conditions, and ongoing improvements planned by others largely focused on flood protection and fish habitat enhancements.

# 2. Natural Background

## 2.1. Geologic Setting

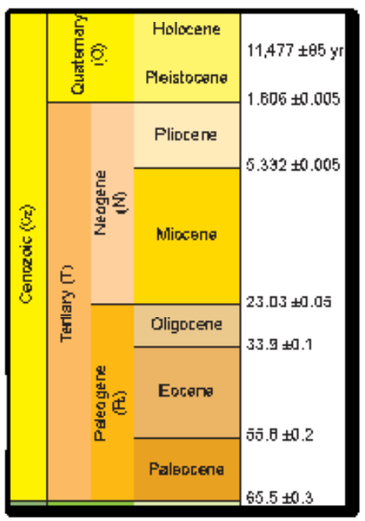



**Figure 2-1.** Geologic Time Scale (Source: USGS 2007)

The geomorphology and the present behavior of the LAR are intricately related to the geology, hydrology, and fluvial geomorphic history. The geomorphic development, including terrace sequences and associated fluvial deposits, the soils formed on terraces, and the underlying geology play a role in overall channel stability and factor in determining present and potential future sites of channel and bank erosion and deposition. The underlying geologic and geomorphic setting is also key to understanding the river's current state and the type and extent of restoration or mitigation that can ultimately be achieved within the confines of the physical setting.

The modern LAR floodplain is situated within Plio-Pleistocene age geologic units (Figure 2-1) primarily composed of deposits associated with the ancestral American River system. The middle Pliocene to Pleistocene (< 5.3 million to ~1.8 million year age) Fair Oaks Formation (also known as Turlock Lake Formation) and the Pleistocene (1.8 million to 11,000 year age) Riverbank and Modesto Formations underlie or are directly adjacent to the modern river's Holocene (<





11,000 year age) alluvium and basin deposits. Appendix 1, Figure 1.a shows the results of geologic mapping developed in detail for approximate river miles (RM) 5 to 11 and Appendix 1, Figures 1.b - d by reconnaissance for the remaining portions of the LAR (i.e., confluence to RM 5 and RM 11 to Nimbus Dam) to assess the capacity for erosion resistant layers to resist scour and aid in levee stability under high flood flows (Fugro 2012).

The oldest alluvial materials exposed along the river corridor are isolated terrace and bluff caps comprised of Arroyo Seco and older gravel. Minor localized outcrops of late Miocene to late Pliocene Mehrten Formation occur along the bluffs northwest of Nimbus Dam, but the remainder of the river corridor is underlain by more recent Quaternary and Holocene alluvium.

Four major Quaternary alluvial geologic units are expressed in "nested" geomorphic surfaces associated with channel cutting and filling during successive glacial/deglacial cycles (Figure 2-2). A combination of geologic, tectonic, and geomorphic factors resulted in a northward migration of the LAR during the Pleistocene, producing a series of gravel deposits and nested terraces, with the modern river currently situated at its northernmost position (Shelmon et al. 2000). The relative ages of the geomorphic surfaces are determined using soil geomorphic methods, which measure differences in the relative development of soil morphology associated with each surface. Soil morphologic characteristics, for example B-horizon development, color and thickness of soil horizons, and accumulations of pedogenic clay minerals are able to serve as stratigraphic markers that help correlate the geomorphic surfaces across the region.




**Figure 2-2.** Geologic Surfaces *(Adapted from Shelmon 1967)*

The early-Pleistocene Fair Oaks formation (a locally recognized geologic unit that correlates to the Laguna and Turlock Lake formations) forms the steep and relatively stable bluffs along the north side

of the American River, and this erosion resistant layer is exposed intermittently along the channel bed and bank margins (see Appendix 1, Figures 1a-d and Appendix 2). Fair Oaks-aged gravel deposits can also be found on terraces aged between the Riverbank and Arroyo Seco formations (Shlemon 1976).

The younger Riverbank and Modesto formations are expressed as a series of progressively younger, topographically lower alluvial deposits that are inset to ("nested within") the older geologic formations and were formed as the river migrated northward. These formations make up most of the surficial and shallow subsurface geology. The Modesto Formation is the youngest Pleistocene alluvium; it is mostly manifested on distinct alluvial terraces, but also formed alluvial fans and some remnant, mid-river ridges (Helley and Harwood 1985). The spatial distribution and form of the Riverbank Formation is similar to that of the Modesto Formation; however, it is usually found on topographically higher terraces as it is older. The Modesto Formation material reflects its source in color, whether granitic, metamorphic, or volcanic in nature, and was generally deposited by existing streams (Helley and Harwood 1985). The Modesto formation is divided into upper and lower members. The Riverbank Formation may be twice as old as the Modesto Formation and has experienced more physical and chemical weathering, which is reflected in its greater degree of soil horizon development relative to soils formed on the Modesto. The color of the Riverbank alluvium is distinguished from the Modesto alluvium primarily by the characteristic red-yellow hue (Helley and Harwood 1985). See Table 2-1 for additional characteristics of the geologic units.

**Table 2-1. Geologic Unit Descriptions**

| Unit ID | Unit Name | Description |
|---|---|---|
| Ra | Recent alluvium | sediment derived from upstream gold mining activities, which generally consists of mixtures of very loose sand, silt, and clay that are sometimes mottled with iron-oxide staining |
| Hs | Holocene marsh deposits | silt and clay, possibly with organic content, deposits present in perennially or seasonally submerged, low-lying areas |
| Hn | Holocene basin deposits | clay and silty clay with lesser sand deposited by low-energy water |
| Ha* | Holocene alluvium | areas of Ha that may have a thin cover of historical sediments |
| Ha | Holocene alluvium | loose, light-grey to light-brown colored, micaceous, sand, silt, clay, and gravel |
| Qmu | Modesto Formation (upper) | difficult to distinguish from Holocene deposits (mapped together) includes a distinct gravel layer within inset terrace deposit lesser in extent and lower in elevation than the lower Modesto Formation |





| | | |
|---|---|---|
| Qml | Modesto Formation (lower) | mostly coarse gravel, gravelly sand, silt, and clay<br>younger and inset into the Riverbank Formation<br>forms the terraces closest to the river |
| Qru and Qrl | Riverbank Formation (upper and lower) | younger alluvial fan deposit than Fair Oaks<br>primarily sand with scattered pebbles, gravel lenses and interbedded fine sand and silt |
| Qfo | Fair Oaks Formation | upper part may correlate with Turlock Lake formations<br>lower part may correlate with Laguna formation<br>forms steep bluffs on the north side of the river |
| Qas | Arroyo Seco gravel | run along the north side of the LAR<br>consists predominantly of dark metamorphic gravels and weathered Mehrten andesite clasts with a granitic sand matrix |
| Tm | Mehrten Formation | oldest of this series, consists of sandstone, laminated siltstone, conglomerate, and tuff breccia derived mostly from andesitic parent material, little granitic or metamorphic material |

*(Sources: Compiled from Fugro 2012 and others.)*

The modern topographic elevation ranges and profiles of the regional geologic formations (not just their geographic extent) also vary. The profiles are constructed from elevations of exposures and contacts between geologic formations (Appendix 3). Profiles indicate that the remnant geomorphic surfaces formed on the oldest deposits (e.g., Arroyo Seco gravels) along the LAR are preserved on higher topographic surfaces and have steeper profiles compared to profiles of progressively younger formations and units (e.g., Riverbank and Modesto). Profiles of the oldest surface are also steeper relative to the modern American Riverbed and Sacramento River floodplain due to lower sea levels during Pleistocene glaciations. The profiles also illustrate some of the uncertainties and exceptions to the overall pattern, such as the profile of the Fair Oaks undifferentiated and Holocene floodplain deposits (Appendix 3).

Ancestral channel alignments shifted frequently during Pleistocene glaciation cycles; channel alignment has shifted less dramatically during Holocene glacial retreat to present (Shlemon 2000). Throughout the Pleistocene, periods of glaciation introduced large volumes of coarse sediments within valley channels; during periods of deglaciation, fine sediments (i.e., sands and silts) would wash down the foothills, bury many channel braids, and coalesce large alluvial fans (Shlemon 2000). The course of the early Pleistocene American River was due south from the current location of Folsom, CA. Through time the channel has laterally shifted northward to its current location, the furthest north the confluence with the Sacramento River has ever been (Shlemon 2000). Pleistocene channels were filled in with gravels as the river migrated north, resulting in the "featureless" appearance of the modern Central Valley. Evidence of Holocene channels is more apparent, manifested as flights of terraces south of the LAR channel.

## 2.2. Regional Watershed and Local Tributaries

The LAR is part of a highly regulated river system fed by the American River basin that extends from Carson Pass on the south to Donner Pass on the north, and from the crest of the Sierra on the east to its confluence with the Sacramento River on the west (Figure 2-3a and 2-3b). In the upper watershed, there are many notable reservoirs, including French Meadows, Hell Hole, Union Valley, Ice House, and Stumpy Meadows (SRWP 2010). The North and Middle forks of the American River come to a confluence near the City of Auburn, CA before flowing on to Folsom Lake, the largest reservoir in the American River basin, dammed in 1955. The South Fork American River discharges into Folsom Lake after flowing along the US Highway 50 corridor from Echo Summit. Discharge from Folsom Dam is controlled to balance the water resource needs and flood risk control of the greater Sacramento area, while maintaining the ecological integrity of the LAR. It also provides hydroelectric power generation (USBR 2016). The furthest downstream dam and reservoir, about seven miles downstream of the Folsom Dam is Nimbus Damand Lake Natoma. Lake Natoma acts as a regulating reservoir for the Folsom Dam, generates hydroelectric power and diverts water to the Folsom South Canal (State Parks 2019). USBR operates both dams. After discharge from Lake Natoma (Figure 2-3b) the LAR flows approximately 23 miles through the cities of Folsom, Fair Oaks, Carmichael, Rancho Cordova, and Sacramento before joining the Sacramento River. In total, the American River basin encompasses 2,175 square miles of the Sierra high country, foothills, and central valley of California (Streamstats 2019).





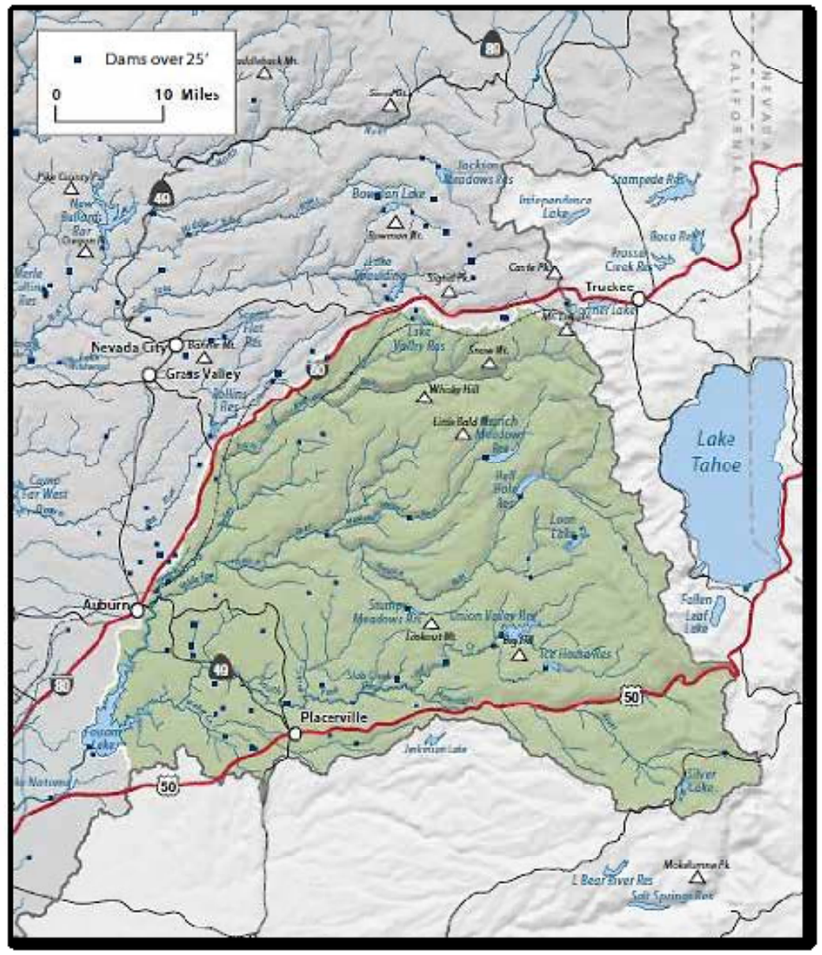



Figure 2-3a. Upper American River Watershed (Adapted from SRWP 2010)

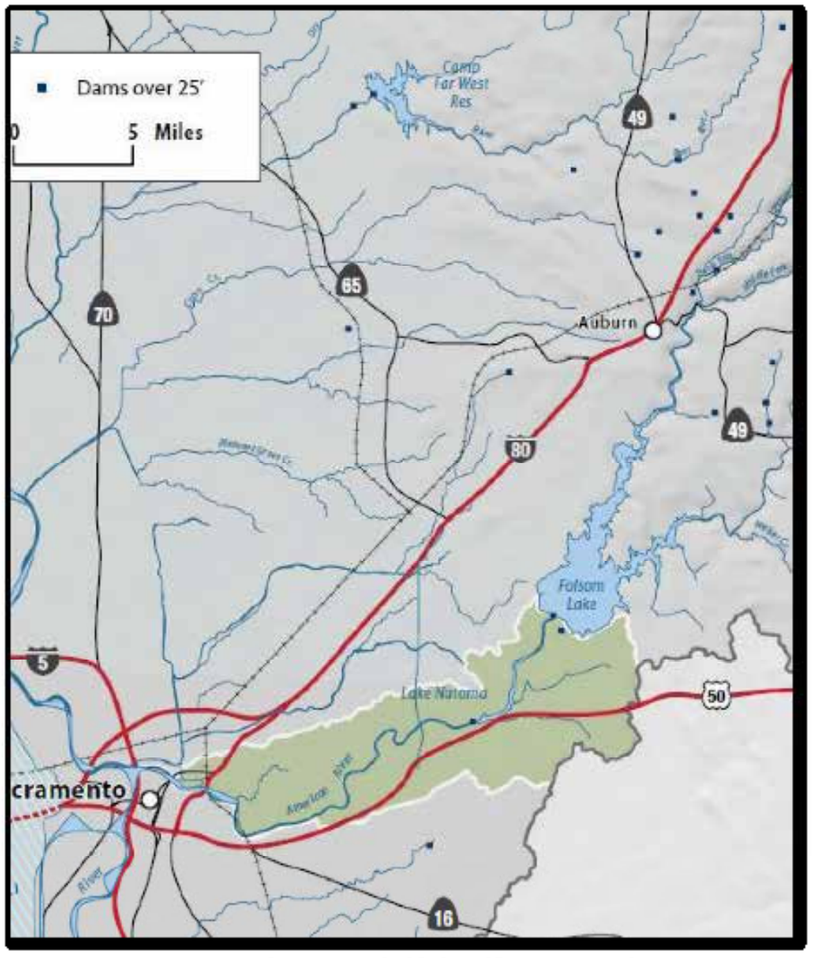



Figure 2-3b. LAR Watershed (Adapted from SRWP 2010)

Between Nimbus Dam and the mouth of the LAR, there are many small tributary inflows. The contributing subwatersheds are urbanized and small in comparison to the American River watershed. Therefore, the risk associated with flood flows in the LAR from the tributaries is negligible. However, each tributary entry point to the LAR represents a risk of scour erosion at the confluence and a potential point source for water quality impacts. Larger tributaries to the LAR between Nimbus Dam





and the confluence with the Sacramento River include: Buffalo Creek, Carmichael Creek, and Cordova Creek.

## 2.3. Unaltered River Condition

Historically, and prior to several dam control measures being put in, the hydrology of the American River was similar to other large rivers that drain the western slopes of the Sierra Nevada. The annual peak flows typically resulted from spring snowmelt and peaked in April or May, followed by a receding hydrograph to the annual minimum flow in September and October. Large floods often resulted from warm winter storms called "atmospheric rivers," which bring heavy precipitation to the Sierras and result in large floods from rain-on-snow events. As seen in Table 2-2 and Figure 2-4, prior to dam control, there was a much greater seasonal fluctuation in flow regime, with bigger swings in average flows moving from the spring to summer and fall months and from fall to the winter and spring months.

Table 2-2. Monthly Mean Flow at Fair Oaks Gauge from 1933-34 Water Year to 1953-54 Water Year

| Month | Monthly Mean (cfs) |
|---|---|
| January | 4777 |
| February | 6169 |
| March | 6735 |
| April | 8875 |
| May | 9221 |
| June | 4935 |
| July | 1217 |
| August | 355 |
| September | 312 |
| October | 518 |
| November | 1959 |
| December | 3410 |

*Source: (CASWRB 1958)*

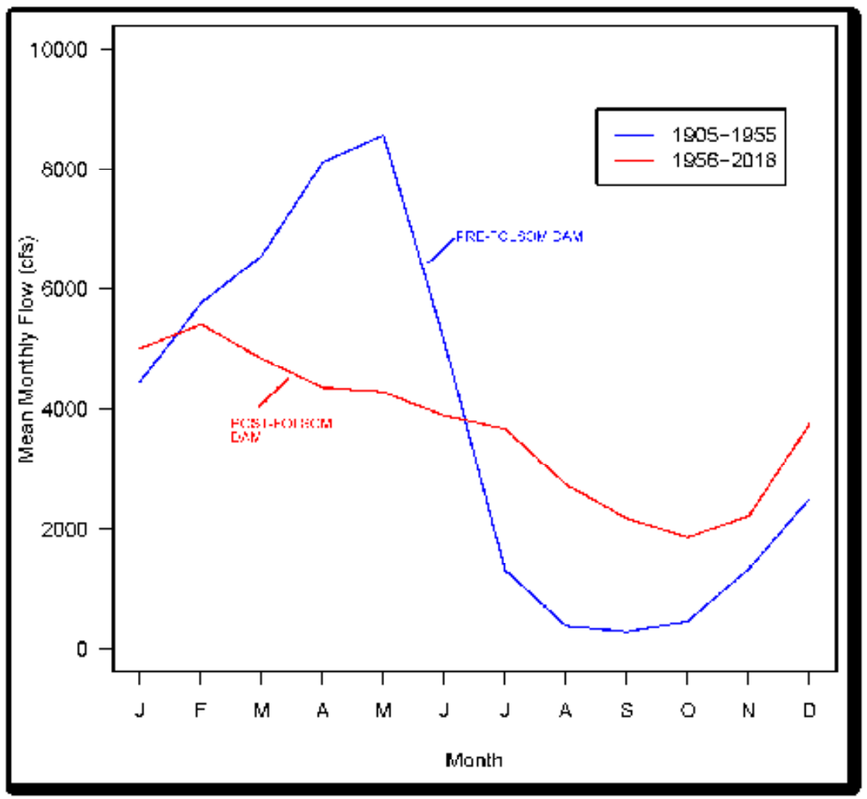



**Figure 2-4. Pre-Folsom Dam versus Post-Folsom Dam Flow Regime**

Prior to dam control (and other human disturbances described in the next section), the LAR channel and associated riparian vegetation was directly tied to the more varied unimpeded flow regime and accompanying sediment inputs from the upper watershed.

Before the mid-eighteenth century, the LAR was relatively free of human-induced impacts. Geomorphic processes during the end of the Pleistocene epoch to present day were propagated from the shift in glaciation cycles to deglaciation and sea level rise. At the maximum extent of global glaciation (33,000 to 19,000 years before present), it is estimated that sea level was nearly 400 feet lower than present day. During these periods of low sea level there was likely steepening of the channel slopes and back-stepping incision or headcutting up the Sacramento and American Rivers (Watson 2019). As sea levels rose rapidly (estimated about 30 feet per 1,000 years during the last





few thousand years of the Pleistocene until approximately 7,000 years before present), aggrading sediments resulting from backwaters from the growing Sacramento-San Joaquin Delta moved up the Sacramento River. Eventually the aggrading sediment plume encountered the confluence of the American and Sacramento Rivers where the aggradation continued moving up both rivers (Watson 2019). At a time just before human influences became the dominant driver of the American River geomorphic state, the lower 6.5 miles of the LAR were affected by the aggrading plume moving upstream and reaches upstream of RM 6.5 were still incising as the impacts of higher sea level had not yet been realized (Watson 2019).

## 3. Historic Use and Disturbance

The LAR evolved under a seasonal flood disturbance regime until recent historic human impacts caused considerable disturbance and resultant changes to channel form and condition. Gold and gravel mining in the nineteenth and twentieth centuries had major detrimental geomorphic effects. During the twentieth century and up to present, the Sacramento metropolitan area has expanded and currently occupies the historic floodplain. Because of urban development within the floodplain, flooding of the LAR has been mitigated by the City of Sacramento. Figure 3-1 shows a general timeline and descriptions of significant human influences on the LAR through 1997.

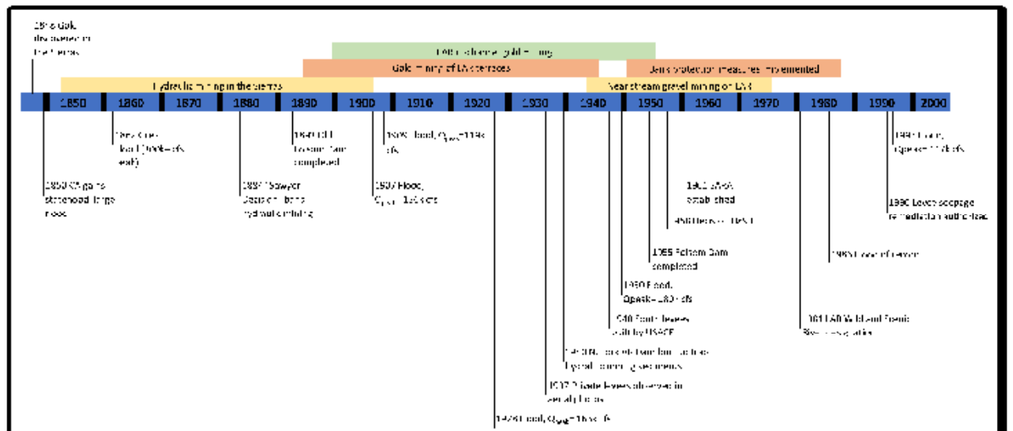



Figure 3-1. Historical Disturbance Timeline





### 3.1. Upstream Gold Mining and Debris

In 1848, gold was discovered along the South Fork of the American River in the Sierra Nevada foothills and the famous California Gold Rush was soon underway. Hydraulic mining of gold, using pressurized water to mobilize sediments through sluices to partition out gold-rich minerals, began around 1853. It is estimated that more than 250 million cubic yards of excavation took place in the American River Basin during hydraulic mining practices in the nineteenth century (Gilbert 1917); a large part of the excavated material was carried downstream and deposited into the valley reaches. Hydraulic gold mining created magnitudes of waste debris and those sediments would often be disposed of in or adjacent to mountain streams (Figure 3-2). Several vertical bank scars are still visible on the south bank just downstream of Folsom Dam as a reminder of the localized historic mining impacts.

Figure 3-2. Hydraulic Mining Photo (Whitney 1880)

The following description by Samuel Bowles, a visitor to California Gold Country in 1868, paints a stark picture of the impacts to the downstream rivers:

*Tornado, flood, earthquake, and volcano combined could hardly make greater havoc, spread wider ruin and wreck, than are to be seen everywhere in the track of the larger gold-washing operations. None of the interior streams of California, though naturally pure as crystal, escape the change to a thick yellow mud from this cause, early in their progress from the hills. The Sacramento River is worse than the Missouri. Many of the streams are turned out of their original channels, either directly for mining purposes, or in consequences of the great masses of soil and gravel that come down from the*

*gold-washing above. Thousands of acres of fine land along their banks are ruined forever by the deposits of this character. A farmer may have his whole estate turned into a barren waste by a flood of sand and gravel from some hydraulic mining up stream; more, if a fine orchard or garden stands in the way of the working of a rich gulch or bank, orchard or garden must go. Then the torn-out, dug-out, washed to pieces and then washed over side-hills, masses that have been or are being subjected to the hydraulics of the miners, are the very devil's chaos indeed. The country is full of them among the mining districts of the Sierra Nevada, and they are truly a terrible blot upon the face of nature.* (Sierra College 2009)

Gravels, sands, and silts were transported down the steep streams cascading through the foothills of the Sierras to the flatter valley rivers where slower flow velocities would cause the sediment to drop out and aggrade within the channels (Gilbert 1917). The finer materials were transported further downstream than the coarser material, which caused silt and sand aggradation, raising the bed elevation significantly in the lower portion of the LAR and other Central Valley streams (Gilbert 1917). Much of the coarser material remained in the mountain tributaries until the 1862 floods washed it downstream to the valley; this caused severe aggradation which led to many streams avulsing and prompted farmers to construct levees (James 1994). In order to contain some of the hydraulic mining debris that had been released and was making its way down the north fork of the America River, the North Fork Dam and Lake Clementine were constructed around 1940 and reportedly contained upwards of 70 percent of the hydraulic mining tailings produced in the North Fork basin during the height of gold mining (Ayers 1997, James 1997).

This time period experienced accelerated sediment supply carried by natural (uncontrolled) flows that resulted in significant sediment deposition and channel aggradation in the LAR. Comparing stages from historical rating curves at the Fair Oaks gage, cycles of bed aggradation and degradation from 1905 through 1940 were identified and tied to the continued supply of large volumes of coarse sediment being deposited during large floods, followed by channel incision during the smaller flood flows in between that were unable to carry the larger material (Northwest Hydraulic Consultants (NHC) 2018, James 1997).

In 1868, the downstream two miles of the LAR were artificially straightened to increase flow velocities with hopes of transporting some of the aggraded mining sediments further downstream. This caused the confluence of the American and Sacramento Rivers to migrate approximately a mile north (USBR 2006). Hydraulic mining was outlawed in 1884 by the United States 9th Circuit Court in the case of *Woodruff* vs *Bloomfield Gravel Mining Company* in a decision by former miner Judge Lorenzo Sawyer (Vigars 2016).

### 3.2. Dredge Mining

In the late 1800s and early 1900s, following the 1884 decision to ban uncontrolled hydraulic mining, gold continued to be mined via mechanical dredging in and immediately adjacent to the LAR channel. Dredge mining leaves behind tailings, linear deposits of sand and silt overlain by thick layers of gravel and cobble with minimal ability to support vegetation (Kondolf et.al. 2002). The large-scale gold





mining operations downstream of Folsom resulted in increased releases of sand and silt (Watson 1985), further accelerating the rate of aggradation in the lower portions of the river (Figure 3-3).

Figure 3-3. Dredger Mining Sacramento County 1921

The Old Folsom Dam (Figure 3-4), a hydroelectric project built in 1893 to power a private sawmill that ultimately powered a local prison and the early town of Folsom, was an interim barrier for coarse sediments flowing downstream until it was destroyed as part of the new Folsom Dam construction in early 1950s (Watson 1985, State Parks, Bartell 2019). After the closure of the Old Folsom Dam, dredge operations began in the current Lake Natoma Area to salvage gold which had washed downstream with the mining debris. Sediments were scraped from the bars, while tailings were deposited in the active channel (Watson 1985). During this time period, dredging for gold in the lower uncontrolled river system continued to exacerbate the sediment inputs to the system, furthering the aggradation process.

As the twentieth century progressed, the development of agriculture in the Central Valley and the city of Sacramento took over as mining for gold diminished by the 1940s (Watson 1985).

Figure 3-4. Old Folsom Dam.
Upper photo operational dam and canals early 1900s; lower photo former dam remains 2019.
*(Sources: Heise 2017 and Bartell 2019)*





### 3.3. Terrace Gravel Mining

From about the turn of the twentieth century until the 1970s, aggregates and gravels were procured by mining active bars, terraces, and in-channel areas (Watson 1985). Mining of bars caused over-widening of the channel, which in turn caused lower flow velocities and aggradation (Watson 1985). In addition, the destabilization of gravel bars allowed high flows to mobilize smaller sediment. While the exact effects of this destabilization are unknown, it was observed post-1949 that slow-moving mid-channel gravel bars appeared, particularly in the upper reaches between Sailor Bar and SARA Park (Watson 1985). These moving gravel bars induce short-term aggradation within the channel which accelerate bank scour, further exacerbating the feedback cycle of channel widening and aggradation (Watson 1985, Church and Jones 1982).

Gravel mining began in the early 1950s and continued through 1972. It widened the river from approximate RM 10 to RM 11.5 with the left bank bar first lowered to roughly the main channel bed elevation at the erosion resistant layer followed by lowering of the right bank floodplain (nhc 2018). This period had significant direct manipulation of the LAR channel bed and banks, particularly in the upstream reaches, that added to channel instability and sediment displacement. An inspection of historical aerial photography was used to identify sections of bank and floodplain that were actively mined during this time (Table 3-1). Most mining occurred above RM 8. Cobble spoil piles left behind are scattered throughout the terraces of Arden Bar from roughly RM 12 to 13 at William B. Pond Recreation Area (Figure 3-5) and could provide some local source material for future restoration efforts. Due to the controlled nature of the river system, there has been little to no significant natural channel bank migration, however where banks were mined for materials the resulting outward bank retreat is indicative of where the LAR has become over-widened (Ayers 2004). These locations are subject to reduced velocities and sediment transport and therefore likely to aggrade and become shallower if and when there is an incoming sediment supply.

Table 3-1. LAR Gravel Mining Locations

| River Mile[1] | Bank | Length (ft) | Air Photos with Mining | Comments |
|---|---|---|---|---|
| 1.1-1.4 | Left | 1,500 | 1964 | Small bar on left bank |
| 2.5-3.1 | Right | 3,000 | 1964 | Bar outboard of right bank |
| 4.2-5.0 | Right | 4,000 | 1957 | Lowered bank top; area exposed |
| 8.3-9.0 | Left | 3,500 | 1957 | Lowered bank top; area exposed |
| 8.0-0.3 | Left | 6,500 | 1964 | Extension of previous site |
| 9.3-9.6 | Right | 1,500 | 1957,1964 | Batch plant and minor removals |
| 9.9 | Right | Minor | 1957, 1964 | Small pit |
| 10.3-10.8 | Right | 2,500 | 1957 | Extensive mining by 1957 |
| 10.3-11.6 | Right | 6,500 | 1964 | Extension; created islands, split flow |
| 12.0-13.6 | Right | 7,000 | 1957, 1964, 1972 | Mining of point bar |

[1] *Slight variation in river miles used by Ayers (2004) versus USACE river miles used in this section.*

Figure 3-5. Cobble spoils in William B. Pond Recreation Area likely leftover from past gravel mining.

### 3.4. Agricultural and Urbanization Encroachment

Increased agriculture development coincided with the discovery of gold as the influx of gold mining pioneers brought greater demands for food resources. Agriculture in the central valley region which likely encompassed a significant portion of lands adjacent to the LAR generally started as cattle ranching until the devastating 1862 flood, which was followed by severe drought in 1863 to 1864 that wiped out most of the livestock. These events gave way to an increase in dry farming of grain crops such as wheat and barley in response to population growth, railroad development, and increased land costs. Many of these crops were replaced with specialized irrigation crops (USBR 2017b). Farmers in large part settled along the banks of the river where more fertile farmland could be found in the low-lying flood prone areas.

Sacramento, sometimes dubbed "River City" because of its location at the confluence of the Sacramento and American rivers, was incorporated as a city in 1850 and became the permanent state capital in 1879. More than one million dollars were spent between 1850 and 1861 to build and improve levees in and around Sacramento (Null and Hulbert 2007). Following the Flood of 1862, thousands of cubic yards of fill were hauled in by wagons and the city streets were raised almost ten (10) feet. The original street level can still be seen in Old Sacramento basements and under boardwalks (City of Sacramento 2018).

Localized irrigation efforts date to the 1850s when canals were constructed to water areas near the rivers. In 1931, the State Water Plan included a comprehensive plan for Central Valley water resources and in 1933 the California Central Valley Project Act was passed (USBR 2017b).





Agricultural encroachment on the floodplain persisted through the mid-1900s. From 1946 through 1965, the City began annexing surrounding county areas, accelerating its growth and more than tripling its size (City of Sacramento 2018). From that time on, agricultural fields were replaced with city and suburb development encroaching further upon the LAR corridor as exhibited in Figure 3-6.

The majority of the approximate 1200 acres of grassland and fallow farmland that remains within the Parkway resides between River Bend Park and Rossmoor Bar (2008 Parkway Plan). In this location hydraulic mining activities were largely absent preserving the floodplain deposited sandy alluvial soils beneficial to cultivation. Today the 55-acre American River Ranch within the Parkway just upstream of River Bend Park is one of the few remaining active farms along the LAR. Since adoption of the Parkway Plan in 2008, the American River Ranch has functioned as a community organic farm, native plant nursery and education center under the Soil Born Farms Urban Agriculture and Education Project with thousands of visitors each year (Soil Born Farms 2014). The site at Rossmoor Bar has been converted to an Oak Woodland restoration test site in the last few decades as mitigation measures by USACE for construction impacts. (County 2014, USACE EIR 2016).

Figure 3-6. Aerial Imagery of American River and Surroundings between Howe Avenue and Walt Avenue in 1937 (above) and 2018 (below).





Maps provided in Appendix 4 highlight the access and drainage infrastructure elements that cross and abut the river corridor, including permanent and seasonal bridges, the E.A. Fairbairn Intake Structure, existing trails, and stormwater outfalls. One of several bridges within the LAR is shown in Figure 3-7 Often times we see increased erosion where river flows intersect with compacted or hardened trails, outfalls, and bridge abutments and piers.

Figure 3-7. Jim Jones Bridge at Approx. RM 19.3

# 4. Flow Regime and Flood History

## 4.1. Major Flood Events

Due to its location within the floodplains of the Sacramento and American Rivers, the City of Sacramento has a history of severe flooding. In 1862, there was a catastrophic flood that put much of Sacramento underwater for three months. The flood was a result of 28 out of 30 days of rainfall from December 1861 to January 1862 exacerbated by melting of the Sierra snowpack under unseasonably warm rains, debris washing down from the hydraulic mining activities, and local levee breaks (Figure 4-1). It was reported that the newly elected governor, Leland Stanford, had to travel down the LAR by boat for his inauguration and the state government was temporarily relocated to San Francisco. The American River has been predicted to have easily exceeded 300,000 cfs at the time of this flood (Parrett 2009). This was the event that led to the City of Sacramento initiating a massive effort to raise the town streets and buildings introduced earlier.

Four large flood events (flows greater than 100,000 cfs) occurred after the Folsom and Nimbus Dams introduced next went into operation as described here.

- 1963 Flood: During the 1963 flood at Folsom Reservoir, the American River inflow peaked at a record-breaking 240,000 cfs and the dam release was increased from 10,000 cfs to 101,000 cfs to accommodate (USGS 1963).
- 1964/65 Flood: Folsom Reservoir storage was increased to 322,000 acre-feet and controlled releases were as high as 115,000 cfs reflected in high stages at the H Street bridge in Sacramento, which crested at 41.89 feet (DWR 1965).
- 1986 Flood: Flows from Folsom were increased to just over 130,000 cfs, 15,000 cfs over the design flow at the time. The reservoir levels reached 1.56 feet or 18,000 acre-feet more than the nominal full pool (Roos 2007).
- 1997 Flood: Flows once again were at 115,000 cfs during this event.

Figure 4-1. 1862 Flooding at K Street, Sacramento
(Source: Science Alert 2017)

During the 1964 flood event, flood-fighting efforts were required to prevent levees from failing. In February 1986, Sacramento had ten (10) inches of rain over an 11-day span and 15,000 acres flooded along the southern portion near Interstate 5 (Figure 4-2). A cofferdam in Auburn broke, releasing 100,000 acre-feet of water to Folsom Lake (McGough 2019). This rapid filling of Folsom Lake in 1986 led to releases of 134,000 cfs to manage the risk of dam failure. This flow stressed the LAR levees and came dangerously close to causing levee failures in the City of Sacramento. It was reported during





this time 500 people patrolled the American River levees to report on any signs of potential breaks. Conditions at Folsom Dam almost required operation of the emergency flood gates, which must occur at flows in excess of 152,000 cfs. A flow of that magnitude would have likely flooded the City of Sacramento. Fortunately, the storm subsided slightly before this action was required

See Figure 3-1 for additional dates of historic floods. Historic flooding has spurred multiple flood control infrastructure (e.g., levees, dams, etc.) projects in the American River basin.

Figure 4-2. 1986 Flood Photo (*Source: Sac Bee 2012*)

## 4.2. Dam Construction and Flow Regulation

The following section summarizes the history of dam construction and early instream flow regulations that affected the LAR. For information on recent dam modification projects and current instream flow regulations see section 5.2 "Modern LAR Management."

In 1940, the U.S. Congress approved the American River Basin Development Project. Its scope included constructing the Folsom and Nimbus Dams for flood control, hydroelectric power generation, and water storage/diversion. Construction of the Folsom and Nimbus Dams by USACE as part of the CVP started in 1948 and was completed in 1955 (Figure 4-3). At the end of 1955, the dams were functionally storing full capacity and producing electricity. Shortly after going into operation, a record-breaking flood in December filled Folsom Reservoir from 200,000 acre-feet to 1 million acre-feet in a week's time preventing damage from occurring along the river. The dams have been operated and

maintained since by USBR. The Folsom Dam was built as a concrete gravity dam flanked by earth wing dams and dikes for a total length of about nine (9) miles and a maximum outlet capacity of 115,000 cfs. The Nimbus Dam was built seven (7) miles downstream of Folsom Dam as a concrete dam after bay structure to further regulate flows, divert water into the Folsom South Canal, and serve as a forebay for hydroelectric generators (State Parks 2019, USBR 2017a). The dams essentially cut off the spawning and rearing habitat along the American River; so, as part of the Folsom-Nimbus Dam construction, USBR also constructed the Nimbus Hatchery (overseen by CDFW) to replace the salmon and steelhead runs (CDFW 2019).

The construction of these and other dams and reservoirs within the American River Basin has resulted in the delay of the annual peak discharge from snowmelt and substantially reduced the peak flood discharges from the occasional large winter floods (Figures 4-4 and 4-5). Conversely, under a more subdued seasonal hydrograph, the low flows that typically occur in the late summer and early fall saw a general increase compared to the pre-dam condition (Figure 2-4, as introduced earlier).

With the completion of Folsom Dam, sediment inputs to the LAR were cut off and the channel began to incise into the mining deposits (Fairman 2007, James 2012). This lowered the channel bottom by up to 30 feet in the lower few miles of the LAR and changed channel alignment to its current location (Fairman 2007).

During this period of regulated flows and upper watershed sediment supplies cut off, localized bed and bank sand, gravel, and cobbles became the only erosional sources under low rates of sediment transport, creating a sediment starved system with incision continuing in the upper reaches until the channel meets resistance from the older alluvial layers.

Figure 4-3. Folsom Dam Construction, 1953 (*Source: My Folsom.Com 2019)*





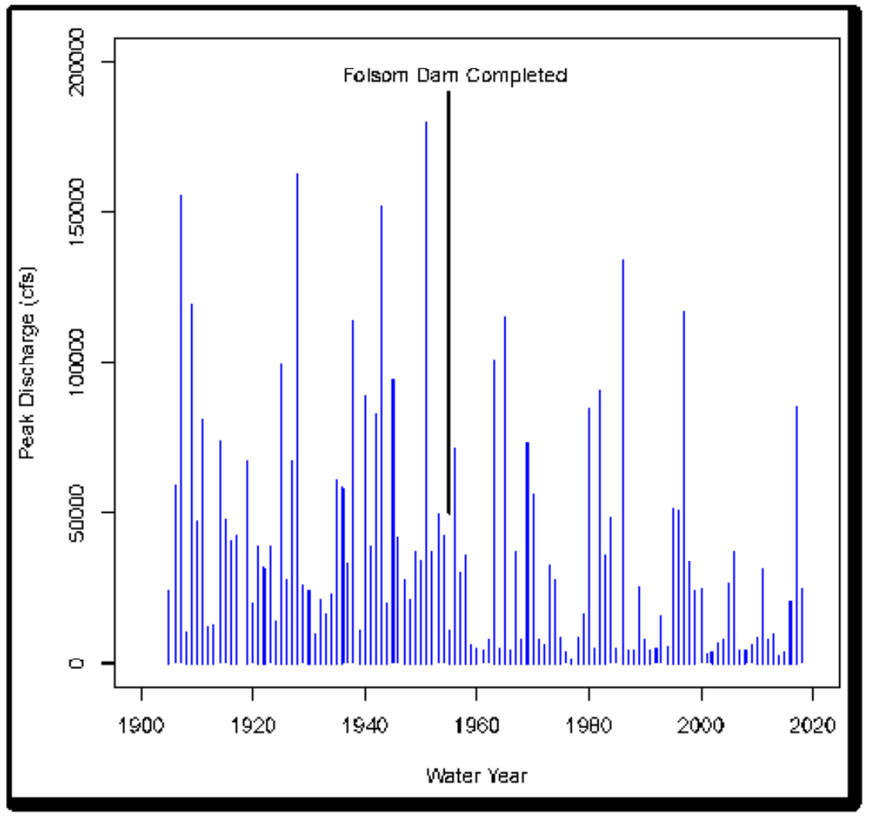



**Figure 4-4. Annual Peak Streamflow at Fair Oaks (Fair Oaks USGS Gage 11446500)**

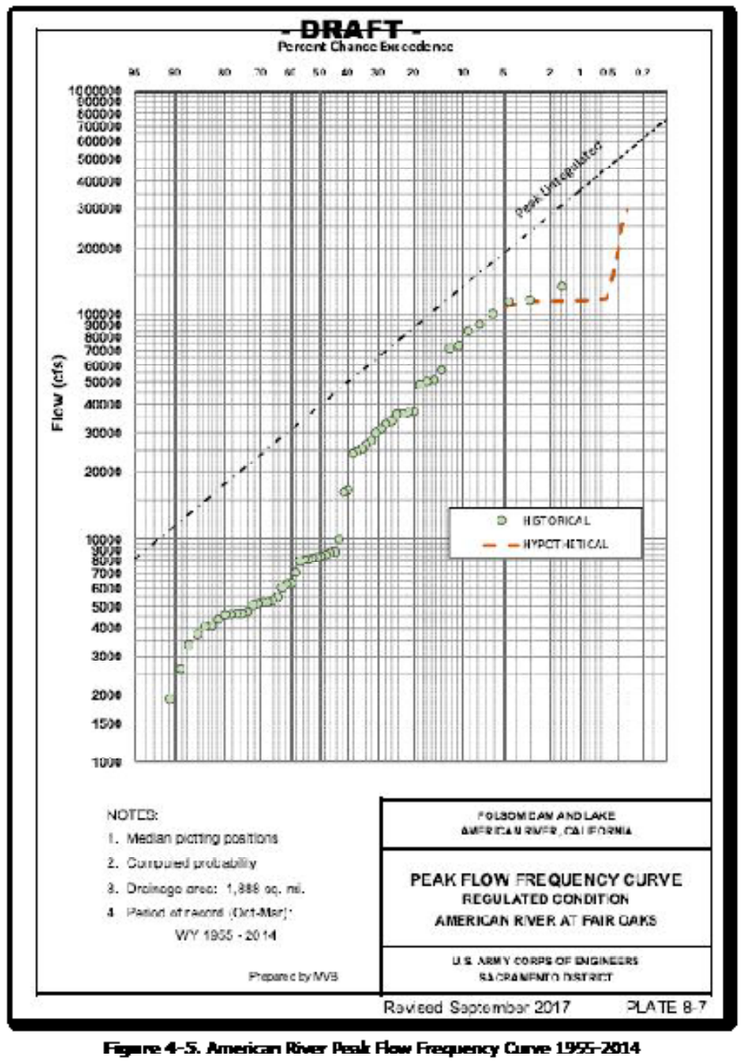



**Figure 4-5. American River Peak Flow Frequency Curve 1955-2014**

Maximum allowable discharges from Folsom Dam are dictated by the capacity of LAR channel and levee system (CRS 2006, USACE 2015). The maximum allowable release from Folsom Dam during





this time was 115,000 cfs, acknowledging that releases significantly higher would likely cause levee damage and/or flood the City of Sacramento (USACE 2015, 2017). During flood events, there are also regulations dictating the rate of change of discharge through Folsom and Nimbus Dams (USACE 2017). As of 2006, studies had suggested that the City of Sacramento flood protection capacity was below the 100-year precedent (1 percent probability of annual occurrence), which is the standard for considering building permits and flood insurance requirements under the National Flood Insurance Program (CRS 2006).

From 1958 to 2006, California State Water Rights Board Decision (CASWRB) D 893 regulated- low-flow releases from Nimbus Dam (CASWRB 1958). This decision in 1958 was the first time the CASWRB set a flow threshold for the benefit of fisheries (Water Forum 2015). In addition to protecting fisheries, the minimum flow policies on the LAR were instituted to ensure delivery of allocated water rights to the Delta and LAR and to promote salinity repulsion from the Sacramento-San Joaquin River Delta. The established minimum, low-flow thresholds and the associated uses during this time are summarized in Table 4-1.

**Table 4-1. Monthly/Periodic Flow Requirements (in cfs) by purpose at the Fair Oaks gauge per Decision D 893 of the California State Water Rights Board.**

| Month or Period | American River Consumptive | American River Fish | Delta Consumptive | Delta Salinity Control | Total |
|---|---|---|---|---|---|
| January | | 250 | | | 250 |
| February | | 250 | | | 250 |
| March | | 250 | | | 250 |
| April | 107.5 | | 102.8 | 151 | 361.3 |
| May | 161.7 | | 154.5 | 151 | 467.2 |
| June | 199.3 | | 190.8 | 151 | 541.1 |
| July | 221.7 | | 212 | 151 | 584.7 |
| August | 204 | | 195 | 151 | 550 |
| Sept. 1 15 | 119.3 | | 114.2 | 151 | 384.5 |
| Sept. 16-30 | 199.3 | 500 | | | 699.3 |
| October | 35.5 | 500 | | | 535.5 |
| November | | 500 | | | 500 |
| December | | 500 | | | 500 |

CASWRB. 1958. Decision on Major Applications to Appropriate Water from American River System. Available at: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d0850_d0899/wrd893.pdf [Accessed October 2019].

# 5. River Corridor Conditions and Processes

As highlighted above, the history of human impacts in the Sierra Nevada and Sacramento Valley have drastically changed the LAR from its unaltered, uncontrolled origins to its current geomorphic and hydrologic state. Legacy mining influence can presently be observed within the river corridor, as well as the surrounding human infrastructure that has historically been aimed at urban and agricultural development and flood control. In the last century, the LAR has been bolstered against floods and deprived of sediment by construction of dams and levees. This section focuses in on the present state of the LAR as a product of its geologic and human history already introduced and ongoing management and condition. Current river conditions, management actions and the hydrologic/geomorphic processes that are active at the present time and affect trends for the future are described here.

The following discussion describes locations using place names and Parkway Areas according to the nomenclature used by Regional Parks and by RM based on the USACE channel alignment and stationing system for the LAR (NHC 2018). Information cited from reference documents using various 'reaches' or other river alignment / mileage systems has been cross-referenced and is expressed using the present RM nomenclature (unless otherwise noted).

## 5.1. Parkway Segments

Parkway Segment breaks or reaches along the river corridor are identified and proposed as a framework for the description of the LAR geomorphology within the Parkway boundary in order to facilitate planning and management decision-making (Appendix 5 and Table 5-1). The individual Parkway Segments overlap or encompass more than one Parkway Area as shown in Table 5-1. The segments are based on the river channel and corridor-wide geomorphic conditions and processes, historic uses and disturbances, natural system responses, and trends. Segment breaks also consider Area boundaries, recreation, water supply, storm drainage infrastructure, flood protection infrastructure, and operations.

Specific hydrologic and geomorphic features and conditions of the Parkway Segments will be described as appropriate in the following sections, but some general characteristics are presented here as an overview (Table 5-1). Parkway Segment 1 extends from the confluence with the Sacramento River upstream to RM 6.5 at the H Street Bridge. It includes the four most downstream Parkway Areas and a portion of Campus Commons on the right bank of the river. While it is relatively narrow between the confining levees (0.46 miles), Segment 1 covers nearly a third (32.0 percent) of the overall Parkway. Parkway Segment 2 spans RM 6.5 to RM 11.5 and includes the rest of the Campus Commons Area and all of the Howe Avenue, Watt Avenue and SARA Park Areas. This is the narrowest part of the Parkway corridor, averaging just 0.24 miles wide. Parkway Segment 3 encompasses the Arden Bar, River Bend Park, and nearly all of Ancil Hoffman County Park Areas, covering RM 11.5 to RM 14.6. While Segment 3 is only 15.1 percent of the Parkway area, it is relatively wide, averaging about 0.46 miles wide. Segment 4 includes a little more than one quarter (26.6 percent) of the entire Parkway, from RM 15.6 to RM 19.5. This is the broadest section of the Parkway, averaging 0.51 miles wide, and includes most of Ancil Hoffman County Park, and all of the Rossmoor Bar, Sacramento Bar, and Lower Sunrise Areas. Segment 5 is the furthest upstream section of the Parkway, extending from





Sunrise Boulevard (RM 19.5) to Hazel Avenue (RM 22.1). This is the shortest segment, but it represents a total Parkway area similar to Segment 2 (which is twice as long) because Segment 5 is relatively wide (0.48 miles).

Table 5-1. Parkway Segments Overview

| Parkway Segment | | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Characteristic | Units | | | | | | |
| River Mile Extent | Miles | 0 to 6.5 | 6.5 to 11.5 | 11.5 to 14.6 | 14.6 to 19.5 | 19.5 to 22.1 | 0 to 22.1 |
| Segment Area | Acres | 1,923 | 781 | 909 | 1,596 | 800 | 6,009 |
| Typical Corridor Width | Miles | 0.46 | 0.24 | 0.46 | 0.51 | 0.48 | 0.42 |
| Parkway Areas | | Discovery Park | Campus Commons | Arden Bar | Ancil Hoffman County Park | Sailor Bar | All |
| | | Woodlake | Howe Avenue | Riverbend Park | Rossmoor Bar | Upper Sunrise | |
| | | Cal Expo | Watt Avenue | Ancil Hoffman County Park | Sacramento Bar | | |
| | | Paradise Beach | SARA Park | | Lower Sunrise | | |
| | | Campus Commons | | | | | |
| Proportion of Parkway | | 32.0% | 13.0% | 15.1% | 26.6% | 13.3% | 100% |

## 5.2. Modern LAR Management

Since the turn of the twenty-first century, management of the LAR focused on decreasing flood risk to the greater Sacramento area and preserving salmonid fisheries. Recent infrastructure improvements and modifications to dam operation rules for Folsom Dam aim to reduce flooding risk, ensure water resource availability, and promote quality salmonid habitat. Improvements to flood control infrastructure (i.e., levees and dams) on the American River, and throughout the Central Valley, were authorized and funded mostly by federal and state agencies with funding supplemented by local organizations like SAFCA.

Discharge and water temperature regulations that promote healthy fish habitat and spawning efficacy have been implemented and are currently being expanded upon (Water Forum 2006, 2015). Geomorphic restoration efforts since 2008 have focused on creating quality spawning habitat for fall run salmon and steelhead by creating side channels and augmenting the gravel supply in the river. Figure 5-1 highlights some of the regulatory requirements, operational changes and capital

improvements implemented since 1997 that affect the geomorphic condition by altering the flow regime or directly modifying the substrate or configuration of the channel bed, banks, or floodplain.





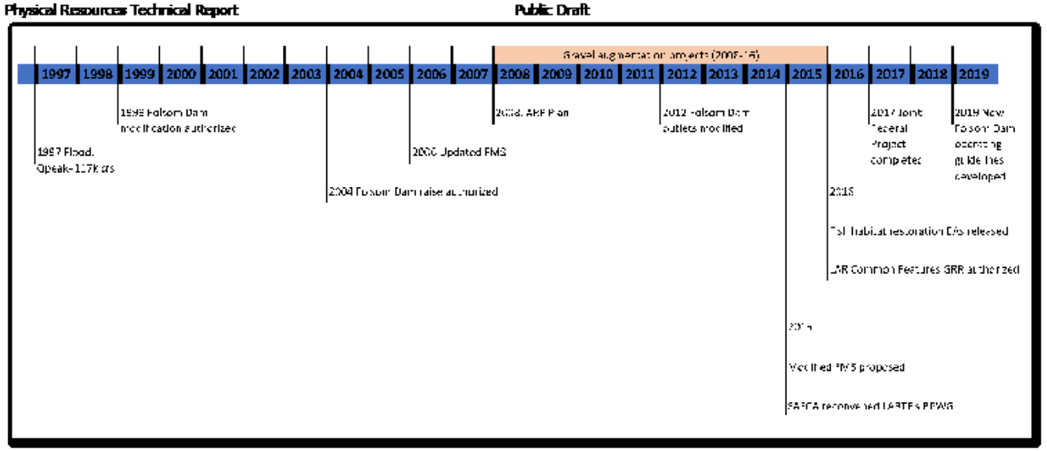



**Figure 5-1. Modern Timeline (1997-2019)**

### 5.3. Bank and Levee Flood Protection

Presently, there is an extensive system of federal levees in Yolo, Sacramento, and Sutter Counties protecting the Sacramento Valley from flood risk (Figure 5-2). In response to the 1986 flood event, the 1990s were an active time for levee related projects, including the American River Common Features Project authorized in 1996. The scope of the project included stabilizing 24 miles of levees along the LAR. See Figure 5-3 for map showing existing levees, both federal and non-federal along the LAR (USACE 2016). Additionally, the Water Resources Development Act (US Congress 1996) allocated millions of federal dollars to construct and improve levees and improve flood event forecasting in the LAR (USACE 2016). Levee and bank assessment and stabilization efforts are ongoing in order to counter the acknowledged possibility that the existing levee system would experience extensive damage if the 200-year Folsom Dam release discharge of 160,000 cfs occurred (USACE 2017).

The ongoing bank protection projects are implemented through USACE, Central Valley Flood Protection Board (CVFPB), and Sacramento Area Flood Control Agency (SAFCA). Both the Sacramento River Bank Protection Project, originally authorized under the Flood Control Act of 1960 (USACE 2020) to provide long term flood risk management, and the American River Common Features Project (ARCF), approved by Congress to provide levee and dam improvements following the 1986 flood, are the primary projects driving levee improvements. Ongoing flood protection efforts were outlined in the ARCF General Reevaluation Report (GRR). The 2016 WRDA included 11 miles of bank stabilization that is currently being investigated and designed (nhc, 2018).





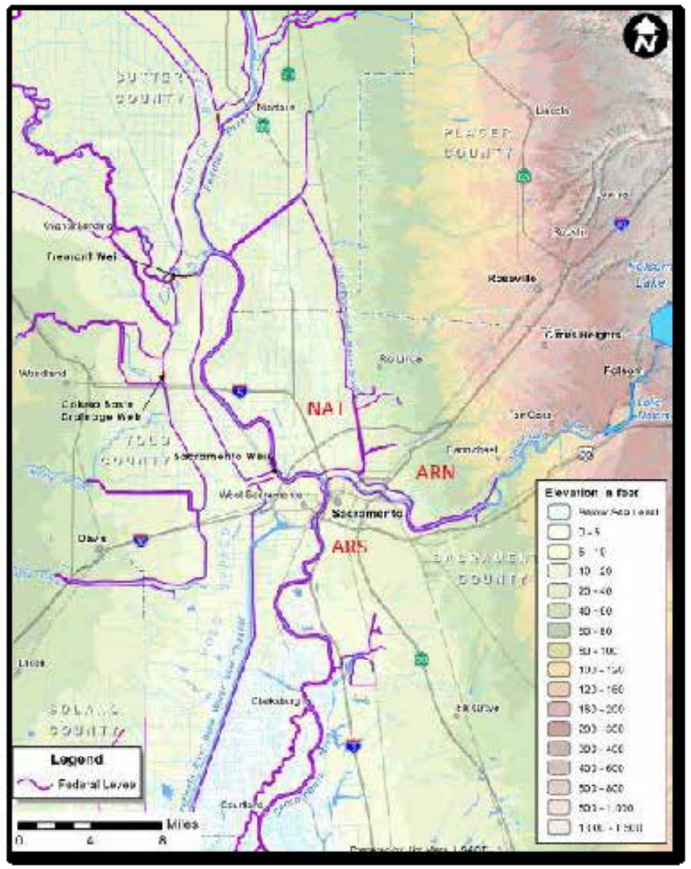



Figure 5-2. Existing Federal Levees in Sacramento Region (USACE 2016)

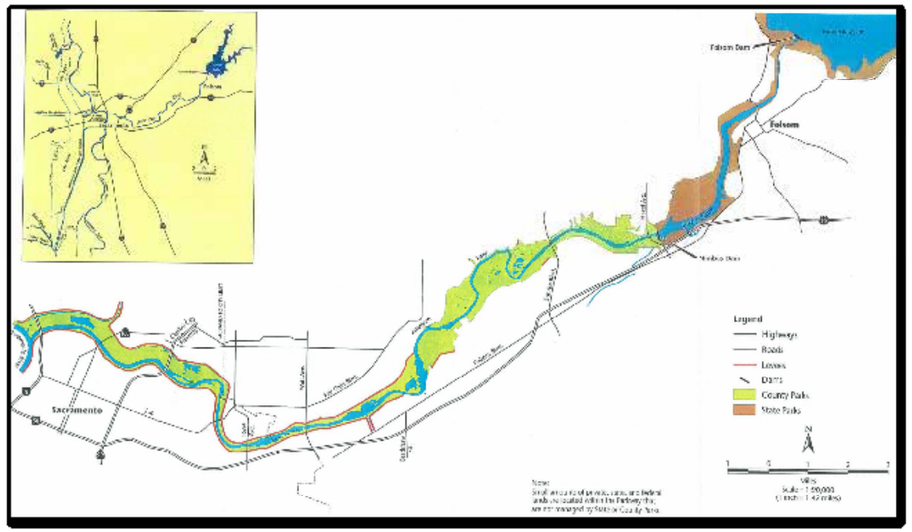



Figure 5-3 LAR Levees (Jones & Stokes 2002)





### 5.4. Flood Control and Fisheries Flow Regulation

Dam and spillway modification at Folsom Dam, performed between 2008 and 2017, was implemented with the primary purpose of reducing flood risk in the Sacramento Metropolitan Area (USACE 2019). A spillway was constructed that releases more water from the reservoir earlier in a storm event. Dam operating procedures were improved to preserve more flood control volume in Folsom Lake, and a more sophisticated weather forecasting process was implemented (USACE 2019). The new dam operation rules were developed to 1) pass the Probable Maximum Flood (PMF) with at least three (3) feet of freeboard below top of dam, 2) control a 100-year flood with max release of 115,000 cfs, 3) control a 200-year flood with max release of 160,000 cfs, 4) reduce the variable space allocation from 400,000 to 670,000 acre-feet to 400,000 to 600,000 acre-feet, and 5) incorporate improved forecasting capabilities from the National Weather Service (USACE 2019).

As a result of the new dam operating regulations, large flows will likely need to be conveyed through the LAR channel more often than under previous dam operating regulations, however, extremely large flow releases (i.e., greater than 115,000 cfs) will be less probable in a given year. These higher flood flows happening more frequently will apply increased pressure on banks and levees over the long term, leading to increased potential for erosion and possible low flow channel adjustments. In other words, the Parkway areas along the river will not be subjected to the more extreme infrequent flooding event that can cause significant flood and erosion damage however could be exposed to more recurrent large flows with the potential for localized flooding and erosion that need to be accounted for when planning any new projects in close proximity to the river channel. See Table 6 for estimated flood recurrence intervals from before and after the completion of the Folsom Dam Modification project.

Table 5-2. Estimated Flood Recurrence Intervals for Discharge from Folsom Dam, Pre- and Post-Modification *(Source: MHC 2018)*

| Recurrence Interval | Peak Discharge (cfs) | |
|---|---|---|
| | Former[1] | Current[2] |
| 2-yr (50%) | 30,200 | 25,200 |
| 10-yr (10%) | 43,100 | 71,700 |
| 25-year (4%) | 99,700 | 115,000 |
| 50-yr (2%) | 115,000 | 115,000 |
| 100-yr (1%) | 145,000 | 115,000 |
| 200-yr (0.5%) | 320,000 | 160,000 |

*[1] Values based on NAT HEC-RAS modeling using the American River storm centering.*

*[2] Values based on the American River Common Features "With-Project Condition" HEC-RAS modeling using the American River storm centering and assuming dam raise of 3.5' (USACE 2015).*

In addition to flood release dam operation rules, the Folsom Dam is operated to sustain minimum flows in the LAR to promote quality fish habitat. Since 2006, USBR has operated Nimbus Dam per Flow Management Standards (FMS) with higher low flow thresholds than those set in 1958 by CSWRB Decision D 893 (Water Forum 2015). The purpose of the 2006 FMS is to improve conditions for fish, particularly fall-run Chinook salmon and steelhead, by ensuring favorable flows and water temperatures (Water Forum 2006). Generally, flow in the LAR is not permitted to drop below 800 cfs, but to balance human water use with ecologically beneficial water use, special provisions are in place which allow Nimbus Dam to release less water under "critical hydrologic conditions" (Water Forum 2006). Low flow thresholds for the LAR are set for various periods throughout the year based on the "Four Reservoir Index," which indicates water availability in the basin based on reservoir levels (Water Forum 2006). In 2015, a Modified FMS incorporated additions like using hydrologic indices for improved water availability forecasting, setting reservoir storage requirements, releasing a "spring flush," and providing protection for existing redds from dewatering when hydrologic conditions change quickly for the worse during the spawning season (SWRCB 2017).

### 5.5. Aquatic Habitat Improvements

Anadromous fish habitat restoration in the rivers of California's Central Valley have been of high priority for federal and state level resource agencies since the late 1990s (USBR 2016). Most recent fisheries related projects on the LAR aim to improve the quality and quantity of spawning habitat and recruitment of fall-run salmon and steelhead (LARTF 2002). In 2001, the LAR Fisheries and In-Stream Habitat (FISH) Working Group released a habitat management and restoration plan, which included recommendations for restoring gravel bar and side channel habitat (FWG 2001, USBR 2016).

Gravel augmentation is a technique used to improve salmonid habitat in sediment starved systems. In order to promote lower-discharge floodplain activation, gravel is added to a riffle crest to raise water surface elevations over the range of instream flows (Sellheim et al. 2015). Several gravel augmentation projects occurring between 2008 and 2013 involved placing gravels at riffle crests to promote directing flows down constructed or existing side channels (USBR 2016). Between 2008 and 2011, nearly 50,000 tons of gravel were added to the Sailor Bar and Upper Sunrise Areas (Bean 2012). In a study conducted from 2008-2012, increased redd quantities were observed the year after gravel augmentation took place. However, beneficial results are not yet conclusive, given in subsequent years the quantity of redds varied unpredictably (Bean 2012). Some of the placed gravel appears to have been transported further downstream and does not necessarily remain or readily redeposit onto riffle crests. Instead, it may end up on laterals, in channel bars, or filling in deepened channel sections (Figure 5-4). The 2017 topo-bathymetric surveys showed spawning gravels from previously constructed gravel augmentation projects had moved downstream as anticipated (cbec 2019).

Looking forward to projects under consideration through the next decade, a study was recently conducted to prioritize anadromous fish habitat enhancement projects (cbec 2020). The types of





habitat enhancement techniques included: raising and revegetating bars, lowering, and revegetating bars, side channel creation, gravel augmentation, and reconnecting habitat. They ranked and prioritized 33 potential sites based on cost, ecologic uplift, and stakeholder input to come up with a metric that compares a ratio of cost per acre-days of spawning habitat to stakeholder support (cbec 2020). The total cost (including construction, design, and permitting) per acre of habitat enhancement for the higher priority sites was in the $250,000 to $600,000 range. When considering enhancement projects in urban, high-use areas it is important to consider the cost, long term ecological benefit, and potential recreational implications of the projects. Secondarily, when gravel augmentation projects are proposed, Regional Parks should consider if there is potential for any imported/placed material to migrate downstream and if so, how far and whether it could negatively impact any sensitive or restored habitat or recreational infrastructure.

Figure 5-4. Gravel Deposited on Downstream End of Vegetated Bar at about RM 13.2

### 5.6. River Corridor and Channel Topography

The overall topography of the LAR river corridor (Appendix 6) is inextricably tied to that of the surrounding landscape. Rolling hills underlie the neighboring communities of Fair Oaks and Carmichael to the north of Parkway Segments 3, 4, and 5 and are expressed in bluffs that border the river corridor. The gently sloping terraces south of the river in Rancho Cordova, like the terraces in Parkway Segments 3, 4, and 5, have been directly modified by historic mining (as well as urban development). Moving downstream (westward), the topographic relief decreases gradually within and adjacent to Parkway Segment 2. The river enters the vast lowlands of the Central Valley in Parkway Segment 1, where the surrounding topography and that of the LAR is nearly level, featuring secondary and relict channel swales, backwaters, and off-channel basins.

Mineral extraction and sedimentation, dam, and levee construction, rising tides, and flooding on the Sacramento and American Rivers has exacerbated large swings in sediment supply, changed the degree and type of lateral and vertical confinement, and altered downstream base water levels and backwaters. Severe aggradation from hydraulic mining debris raised the riverbed and floodplain surfaces along the American River in the late 1800s. Cessation of mining practices, capture of debris upstream, and the closure via Folsom and Nimbus Dams led to gradual lowering over several decades.

Available reconstructions of the historic LAR profile (Figure 5-5) indicate that the vertical fluctuations were largest in Parkway Segments 1, 2 and 3 (RM 0 to 14.5). During historic periods with aggraded riverbed and floodplain surfaces, prior to levee and dam construction, channel position and pattern shifted according to natural interactions of unregulated river flows with high sediment availability (Ayres 2004; Fairman 2007; NHC 2012; Fugro 2012 - see Figure 5-5).

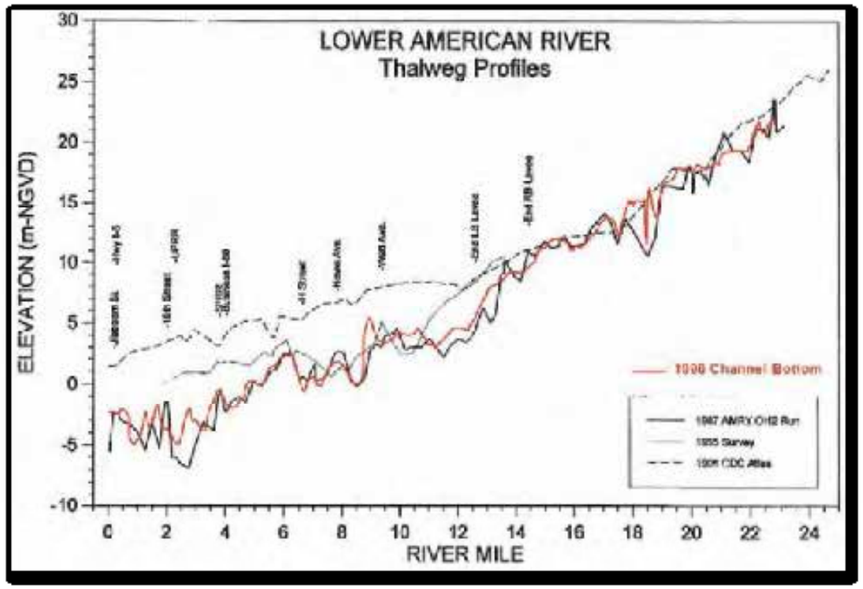



Figure 5-5. Historical Channel Thalweg Profiles (NHC 2016)

The modern lateral constraints on river dynamics and overbank flow along the LAR corridor in the upstream half (Parkway Segments 3, 4, and 5) are formed by natural geologic materials and topography that is exaggerated by post-Folsom Dam channel bed lowering. In the downstream half (Parkway Segments 1 and 2) modern lateral constraints are primarily the constructed levees (Table 5-3). While the ancestral American River experienced large changes in alignment over geologic time scales (see section 1.1), the modern river position has remained relatively fixed over human time scales. Based on several studies (Fairman 2007, Ayres 2004 and NHC 2012), modern (post-Folsom Dam) channel migration of the LAR has largely been absent and notable only in the Arden Bar and River Bend Park Areas (Segment 3). This portion of the river has a sinuous channel pattern and the highest modern bed slope (Table 5-3). Parkway Segment 3 coincides with the section of channel between RM 12 and RM 15 that appears to have had a locally steeper channel slope since the 1860s (Figures 5-6 and 5-7), although the bed experienced temporary burial by hydraulic mining sediment (NHC 2018).





Table 5-3. Corridor and Channel Topographic Summary

| Parkway Segment | | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Characteristic | Units | | | | | | |
| River Mile Extent | Miles | 0 to 6.5 | 6.5 to 11.5 | 11.5 to 14.6 | 14.6 to 19.5 | 19.5 to 22.1 | 0 to 22.1 |
| Segment Area | Acres | 1,924 | 781 | 911 | 1,600 | 799 | 6,015 |
| Typical Corridor Width | Acres/Mile | 301 | 159 | 396 | 471 | 320 | 310 |
| Lateral Constraints | | Levees | Levees | Terraces / Levees | Bluffs / Terraces | Bluffs / Terraces | |
| | | | | | | | |
| Channel Length | Miles | 6.5 | 5.0 | 3.1 | 4.9 | 2.6 | 22.1 |
| Corridor Length | Miles | 6.4 | 4.9 | 2.3 | 3.4 | 2.5 | 19.4 |
| Channel Sinuosity | Miles/Miles | 1.0 | 1.0 | 1.4 | 1.5 | 1.0 | 1.1 |
| Channel Slope | Percent | 0.02 | 0.07 | 0.15 | 0.07 | 0.01 | 0.06 |

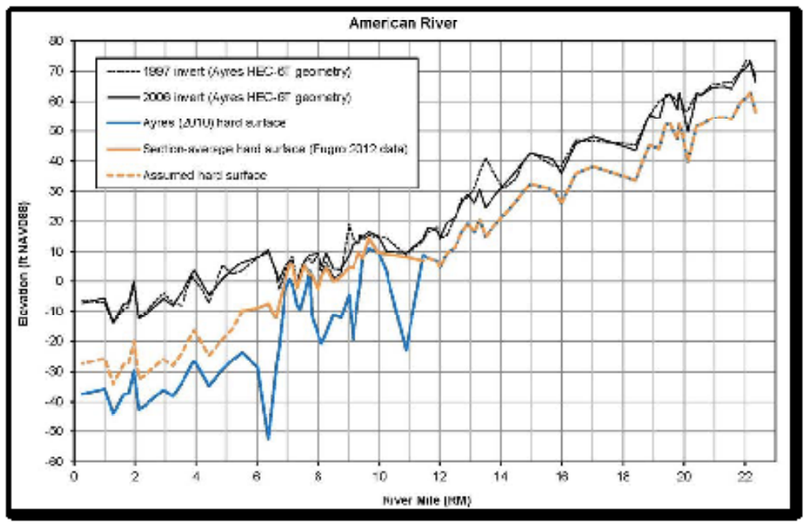
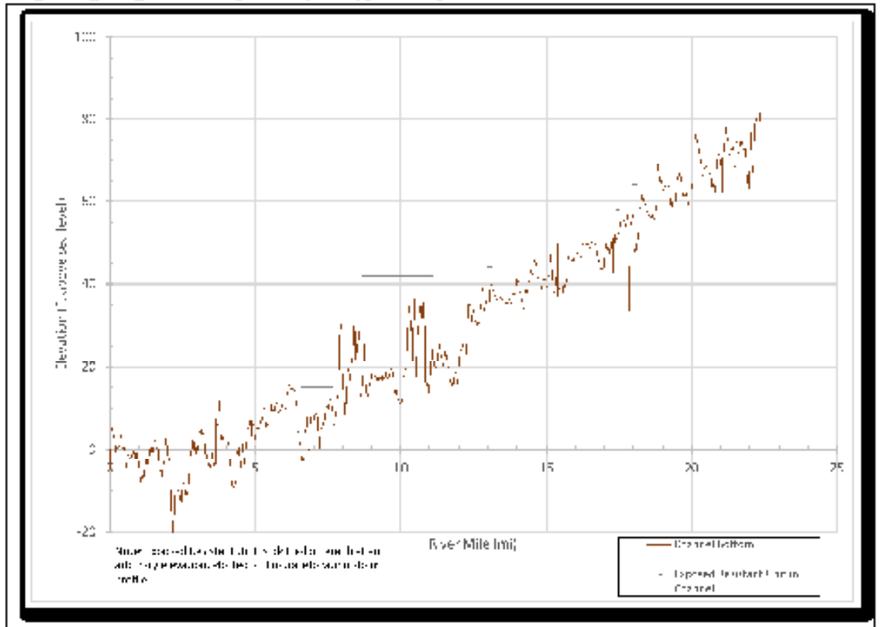



Figure 5-6 Modern Channel Thalweg Profiles (NHC 2018)

Figure 5-7 shows the most recent channel profile view. The overall LAR average channel slope (0.06 percent) (Table 5-3) and the slopes of the channel bed along the profile (Figure 5-7) and of floodplain and terrace remnants within the upstream half of the corridor (Figure 5-8) are consistent with the regional geologic surfaces profiles (see Appendix 3).




*This profile was derived from a Digital Elevation Model (DEM) developed from 2017 LiDAR data (CBEC 2018). The profile was cut along the channel alignment associated the USACE system of river stationing (see Section 4.0). Elevations were associated from the DEM at approximately 0.01 mile increments.*

Figure 5-7. 2017 Channel Bed Profile





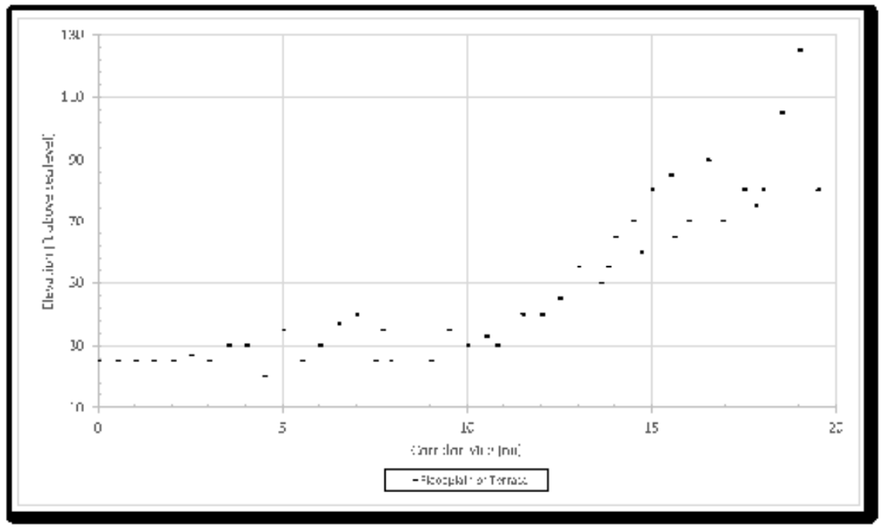



Figure 5-8. 2017 Floodplain or Terrace Profile

The 2017 bed profile has similar characteristics to the historic and modern thalweg profiles (Figures 5-6 and 5-8 above). There are consistent and slightly steeper slopes in the upstream half between Nimbus Dam and RM 12 and extremely low slopes in the furthest downstream portion (RM 0 to RM 3.5), which is affected by tidal influence backwater from the Sacramento River. Streambed surface irregularities, an overall low channel slope, and exposures of erosion resistant geologic units are evident in the channel bed profile through Parkway Segment 2 (RM 6.5 to RM 11.5).

The extent, elevation, and distribution of the erosion-resistant geologic materials have been a focus of several studies since their presence under or in the channel bed or banks influences the susceptibility to erosion (NHC 2018). Fairman (2007) mapped bedrock outcrops (Figure 5-9) and depth to bedrock in the upstream sections of the LAR. He noted more than ten bedrock outcrops along the channel bottom. Most recent studies have explored the stratigraphy within the leveed reaches. Fugro (2012) attributes the apparent erosion resistance to a high degree of compaction and minor cohesion with clay, but no significant cementation. The erosion-resistant surface indicated in the figures and appendices in the URS-GEI (2012) report is described as a nearly continuous surface sloping in a westerly direction beneath the study area. It correlates well with surficial mapping by Fugro (2012) and with higher penetration resistance recorded in the boring logs. URS-GEI (2012) associated the resistant surface with penetration resistant fine-grained sandy silt, silty sand, and sandy clay.

URS-GEI (2012) was unable to differentiate materials in their boring logs that matched the 'Upper Unit' of erosion resistant materials described by Fugro (2012). The erosion-resistant materials are not

necessarily a discrete stratigraphic deposit. Fugro's (2012) petrographic analyses indicate that the materials are not cemented by a siliceous or clayey material.

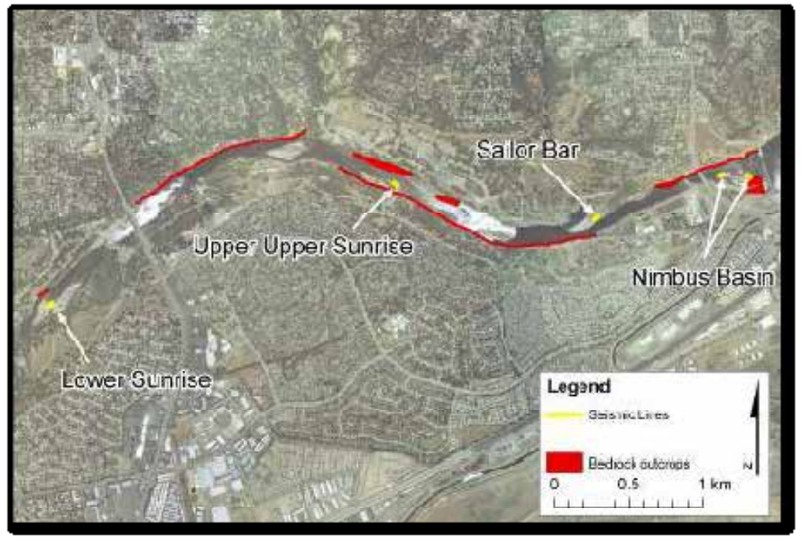



Figure 5-9. Bedrock Outcrops on Upper LAR (Fairman 2007)

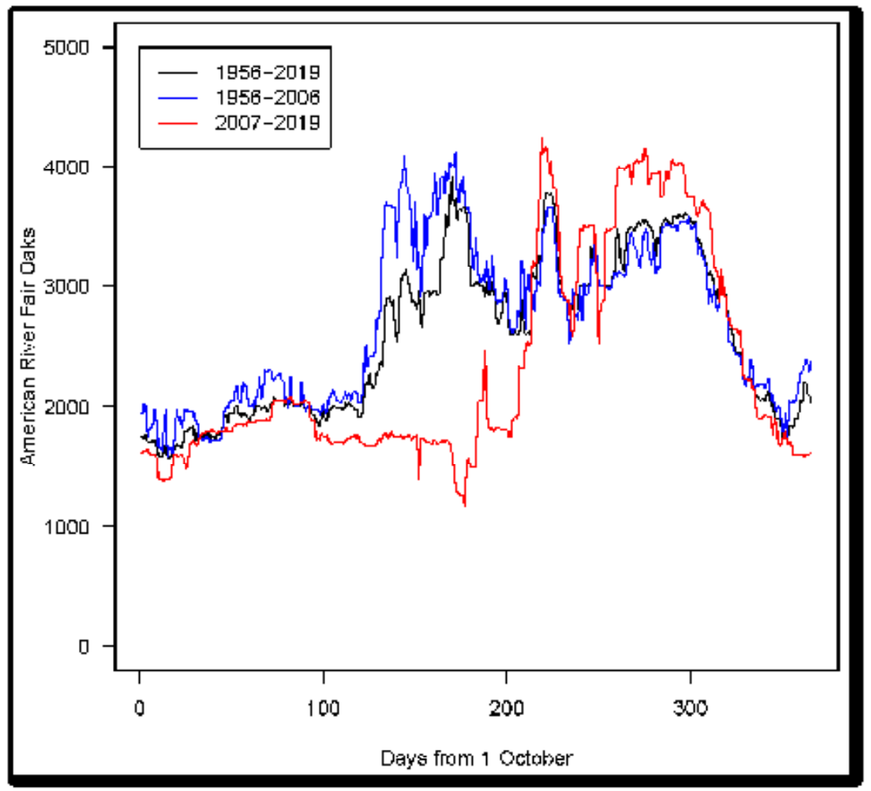
# 6. Hydrology and Flooding

## 6.1. Seasonal Flow Regime

As described earlier, compared with the unregulated, natural, seasonal discharge regime in the LAR, the modern regulated, seasonal discharge regime is dampened (i.e., runoff and flood discharges are lower in the wet season and higher in the dry season). In 2006, the new flow management standards that took effect mandated higher discharges during low-discharge times of the year for the sake of spawning and resident fish habitat improvement, primarily for salmonids (Water Forum 2006). Figure 6-1 shows seasonal discharge regimes observed during different time periods associated with different flow management standards.








*Data (Seasonal Discharge Regime, Fair Oaks Stream Gage Station) downloaded from the USGS National Water Information System (NWIS) for the Fair Oaks station (USGS Stream gaging Station 11446500, American River at Fair Oaks, California). The period of record for the data sample was from Water Year 1956 through Water Year 2019. Daily data were downloaded and average daily flow for each day in the water year was computed for 1) the entire period of record, 2) the period from 1956 through 2006, and 3) the period from 2007 through 2019. The second and third periods were delineated as such because change to minimum flow standards was mandated in 2006.*

Figure 6-1. Seasonal Discharge Regime, Fair Oaks Gauge

The black line on Figure 6-1 represents the average daily flow for the entire period in cfs (y axis) based on the number of days since October 1 (x axis, October being start of the water year). The blue line depicts the impact of the minimum average daily flow standards set at Nimbus Dam during

the period 1956 through 2006. The red line represents the impact to average daily flow based on the revised minimum flow requirements for the period 2007 through 2019.

Since 2006, flows have been, on average, drastically lower from January to April and as expected notably higher during early summer (Figure 6-1). One possible explanation for the drastically lower daily average discharge from January to April (in the 2006-2019 data compared to the 1956-2006 data) could be that the region was in the midst of severe drought and the "Four Reservoir Index" dictated storing additional water. Notably, there is not enough data in the modern (2006-2019) data set to make any statistically significant comparisons to the 1956-2006 data set. Without this data, it is unclear if changes in the discharge regime are caused by water resource availability or the new dam operation regulations.

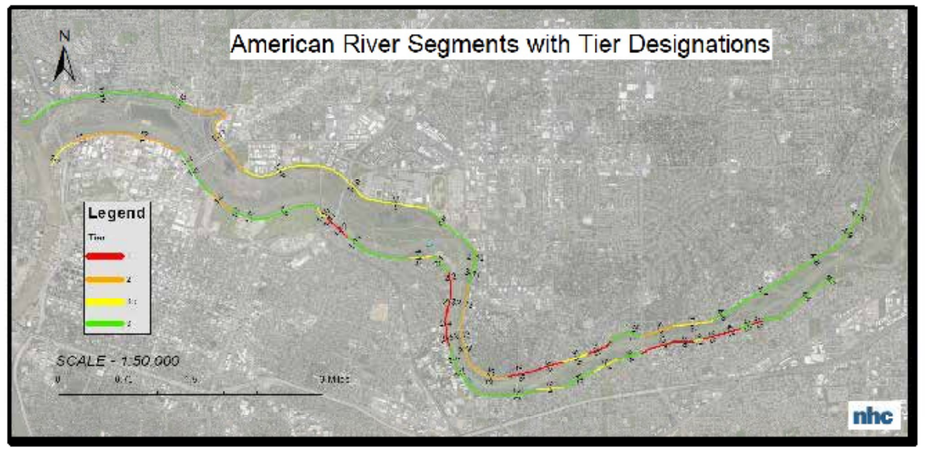
Discharge in the LAR is dictated primarily by upstream water resource availability and releases from Folsom Dam. Communities along the LAR have water rights to extract water directly from the river. This is factored into dam releases, as minimum flow thresholds must be maintained along the entire Parkway extent. Contributions of local tributaries, which enter the LAR between Folsom Dam and the Sacramento River confluence, are negligible compared to the flow released from the dam. The watershed area for the entire American River Basin is approximately 2,175 square miles, whereas the sum of the watershed areas for all tributaries that enter the LAR between Folsom Dam and the Sacramento River is around 280 square miles (StreamStats 2019).

### 6.2. Flood Flows

As discussed earlier, spillway improvements and updated dam operating procedures to improve flood protection along the LAR will result in the release of higher flows with greater frequency (Table 5-2). 115,000 cfs will be released through the range of 25- to 100-year recurrence events and 160,000 cfs under a 200-year flood scenario. Levees are being assessed and ranked for any vulnerabilities against the 200-year predicted flow, and bank improvements are being designed and implemented to protect and stabilize the levees, where needed (Figure 6-2).








*Tier 1 = Erosion is an immediate threat to levee stability Tier 2: Erosion is not an immediate threat but anticipated to reach that condition following one or more high flows. Tier 3= Erosion is not an immediate or long term threat to levee stability.*

**Figure 6-2. Bank erosion assessment in leveed reaches *(NHC 2020)***

### 6.3. Hydrodynamic Model Description

An unsteady, two-dimensional hydrodynamic model was recently developed as part of the LAR Current Condition DEM and 2D Model Development Project, a joint effort undertaken by the Water Forum and SAFCA (cbec 2019) to inform management and project decisions for bank and levee stability and aquatic habitat improvements moving forward. The following summarizes the model conditions and results as background for Regional Parks when participating as landowners and stakeholders in these decisions going forward. Flowrates used in the model ranged from an ecological flowrate of 2,000 cfs to 160,000 cfs flood flows from Nimbus Dam. Table 6-1 lists flowrates and boundary conditions for model runs with discharges of 20,500, 115,000, and 160,000 cfs.

**Table 8. Flowrates and Boundary Conditions for Hydrodynamic Model**

| | | WSE (ft NAVD88) | | |
|---|---|---|---|---|
| Date or Plan | LAR Flowrate (cfs) | at Sacramento River | at Watt Ave. | Note |
| 12/20/2016 | 20,500 | 24.95 | 28.08 | |
| Q115 | 115,000 | | 48.06 | |
| Q160 | 160,000 | 31.95 | 52.29 | |
| Plan 08 | 115,000 | | 48.06 | |
| Plan 10 | 160,000 | 30.3 | | |
| Plan 13 | 115,000 | 31.1 | | |
| Plan 14 | 40,000 | 30.7 | 38.62 | |
| Plan 16 | 80,000 | 30.9 | 43.48 | |
| Plan 17 | 160,000 | 31.9 | | Lower 90 |
| Plan 18 | 160,000 | 39 | | Upper 90 |
| Plan 19 | 160,000 | 39 | | Upper 90 |
| Plan 20 | 115,000 | 37.7 | | Upper 90 |
| Plan 21 | 80,000 | 37 | | Lower 90 |
| Plan 22 | 80,000 | 36.7 | | Upper 90 |
| Plan 23 | 40,000 | 25.8 | | Lower 90 |
| Plan 24 | 40,000 | 33.2 | | Upper 90 |
| Plan 24 | 160,000 | 35.1 | | Expec. 90 |
| Plan 26 | 115,000 | 33.5 | | Expec. 90 |
| Plan 27 | 80,000 | 31.7 | | Expec. 90 |
| Plan 28 | 40,000 | 28.5 | | Expec. 90 |
| Plan 29 | 1,500 | E | | |
| | | | | |
| 2016 20k | 20,500 | | 29.31 | Observed BC |
| 1997 117k | 117,000 | | 47.63 | Observed BC |
| 1986 134k | 134,000 | | 49.7 | Observed BC |
| 2017 50k | 60,000 | | 38.39 | Observed BC |
| 2017 82k | 82,200 | | 43.47 | Observed BC |





At a minimum, two boundary conditions are required to operate an unsteady hydrodynamic model, such as the two-dimensional HEC-RAS model developed for the LAR. The natural boundary conditions are 1) stage (water-surface elevation) at the downstream end of the model reach and 2) a discharge hydrograph (flowrate as a function of time) at the upstream end of the model reach. In the case of the LAR model, the possibility of a third boundary condition within the model domain was used to account for additional inflow of water. The downstream (stage) boundary condition used in this analysis was selected based on the anticipated stage of the Sacramento River for the flowrate being studied. That means that for the lower flowrates, the anticipated Sacramento River stage would be lower and for the higher flowrates the Sacramento River stage would be higher. The hydrodynamic model then propagates these boundary conditions (upstream and downstream) through the model reach in a fashion that satisfies the physical requirements of conservation of mass, momentum, and energy.

The hydrodynamic modeling efforts undertaken in partnership by SAFCA and Water Forum were purposely broken out into two distinct sub reaches to focus individually on the federal leveed portion and the upper fisheries habitat improvement areas, respectively. This leaves a disconnect and some uncertainties in the Parkway area where the two models overlap. The two subreaches are as follows; 1) the first is from the Sacramento River confluence to 16 miles upstream (proximal to the Watt Avenue crossing), 2) the second extends from the Watt Avenue crossing to the base of Nimbus Dam. The two model domains overlap between RM 9.5 and RM 16. The decision to divide into two was made in part to optimize computational run times and allow the lower 16 river miles to fully cover the federal leveed portion of the river to support ongoing levee and bank erosion analysis. Watt Avenue was determined to be a suitable place to end the upper model domain due to available high-water marks, long-term stage gage, and lack of tidal influence (cbec 2019). Dividing the model solution domain into two parts has the result of decoupling the conservation of mass, momentum, and energy between the models. When the results are examined, there are differences in the overlapping portion of the two models, particularly for inundation area under larger discharges. These differences may be negligible, for the prior efforts focused largely on velocity, shear, and water surface elevations, but they do leave uncertainty within the Parkway boundary. It is recommended for future Parkway planning that the model be set up and run as a single domain in order to provide a more accurate representation of Parkway inundation areas, velocities, and shear stresses. For the time being, the lower model was used for the overlapping reach extent presented here, as its result is derived from the boundary condition at the Sacramento River and is considered more appropriate for the purposes of this assessment.

The inundation extents, velocities and shears within the Parkway boundaries produced by the model should be taken into consideration when planning recreation, geomorphic or habitat improvements within the river corridor. These data may be key to determining location, configuration or composition of certain facilities based on where inundation areas intersect and to what degree of energy they impose. This data can also be useful to park planners highlighting where velocities are higher or lower and where sediments, gravels or cobbles may move or deposit impacting the long term functionality of in-channel features such as boat ramps or outfall armoring or where proposed biotechnical features may succeed or fail.

### 6.4. Inundation Areas

Appendix 7, figures 1 through 3 display the inundation extents along the LAR corridor under the following flows:

- Eco flows – 2,000 cfs
- 2-year flows – 20,500 cfs
- 25-100-year flows – 115,000 cfs
- 200-year flows – 160,000 cfs

The Eco flow of 2,000 cfs is largely confined to the main channel in the lower portion of the reach (Parkway Segment 1). As expected, the 2-year flow of 20,500 cfs is required for wetted areas to occur beyond the main channel in Segment 1 or along the south (left) side of the Paradise Beach bend. In Parkway Segments 2 and 3, the 2,000 cfs flow enters split flow channels around the Howe Avenue, Watt Avenue, SARA Park and Arden Bar Areas. The River Bend Park Area is not inundated until the 2-year, 20,500 cfs flow. At Arden Bar, the 2,000 cfs low flow surprisingly shows up within the existing ponds and the 20,500 cfs flow goes through the ponds and beyond the spillway. During the 1997 event, flows through the ponds made their way through a remnant swale and onto the Harrington Way parking lot access road before returning to the main channel, rather than out the pond spillway (Watson 2019). Given the extent of inundation in this area at 20,500 cfs, this occurrence may become common. The 20,500 cfs flow also enters and carries through the existing north ponds at Arden Bar in Parkway Segment 3. The low 2,000 cfs flow is contained within the main channel in the upper reaches through Parkway Segments 4 and 5 with more of the margins activated under the 2-year, 20,500 cfs flow.

Given the levee and topographic confinement, the 115,000 cfs flow covers the entire river corridor in lower Parkway Segments 1 and 2. Parkway Segments 3 and 4, particularly around the River Bend Park, Rossmoor Bar, and Sacramento Bar Areas, show more variability under the 115,000 cfs flow. There are only slight increases in inundated areas between the 115,000 and 160,000 cfs, however it is notable that the 200-year flow goes beyond the Parkway boundary on the south side of Arden Bar in Parkway Segment 3.

## 7. Geomorphic Functional Surfaces

The geomorphic processes and conditions within the Parkway have been modified extensively by direct historical impacts, natural system responses, and continuing operations and management. Therefore, the relationships between geology, topography, soils, vegetation, and the active river channel are not necessarily consistent. Geomorphic functional surfaces have been identified and mapped in the Parkway to reflect the combined effects of natural and human factors on the present river corridor landscape and to help guide decision-making about enhancement opportunities or possible adverse impacts (Appendix 8). The existing topography (derived from the 2017 LiDAR dataset acquired by Quantum Spatial, depicted in Appendix 6) and inundation zones, indicated by recent hydraulic modeling (described in section 6.4, Appendix 7), are the primary basis for grouping landscape features





into functional surfaces. Additionally, the relationship of current topographic and hydraulic conditions to the surficial geology (see Appendix 1, Figures 1b-d) and soil series also informs the functional surface boundaries (Table 7-1).

Table 7-1. General Characteristics of the LAR Functional Geomorphic Surfaces

| Functional Geomorphic Surface | Inundation Zone | Principal Geologic Unit(s) | Typical Soil Series |
|---|---|---|---|
| Active Channel | Area inundated by the 20,500 cfs (~2-year event) flow | Recent Alluvium and Basin Deposits; Holocene Alluvium; isolated outcrops Fair Oaks Formation (Upper) | Riverwash; Sailboat; Laugenour; Columbia; Xerofluvents |
| Floodplain | Area inundated by flows greater than 20,500 cfs and less than 115,000 cfs | Recent Alluvium, Holocene Alluvium and Modesto Formation, upper member | Xerofluvents; Riverwash; Rossmoor |
| High Floodplain / Low Terrace | Area between the 115,000k cfs and 160,000 cfs inundation boundaries | Modesto Formation, upper member | Rossmoor; Xerofluvents; Xerorthents, dredge tailings; Urban Land |
| Terrace(s) | N/A | Modesto Formation (upper and lower members); Riverbank Formation | Xerarents; Xerorthents, dredge tailings; San Joaquin; Urban Land |
| Bluffs and Hills | N/A | Fair Oaks Formation (Upper); Arroyo Seco Gravels; Laguna Formation; Mehrten Formation | Xerarents; Xerolls; Red Bluff; Americanos; Urban Land |

The functional geomorphic surfaces identified in the Parkway include: (1) active channel, (2) floodplain, (3) high floodplain / low terrace, (4) terrace, and (5) bluffs / hills (Table 7-1 and 7-2). The active channel is delineated principally by the area inundated at the 20,500 cfs flow (Appendices 7 and 8), which approximates the 2-year event. The active channel occupies about 30.4 percent of the entire Parkway, but much greater proportions in the lower half of the LAR where the channel is wider (e.g., Parkway Segment 1) and the levee corridor narrower (e.g., Parkway Segment 2). Review of the 2-year inundation pattern, the 2017 imagery, and local topography supports a description of the dominant channel form as single thread throughout the LAR. Additional channel features such as backwaters, alcoves, mid-channel bars, and disconnected low flow threads, indicated by the ecological flow modeling and the recent imagery, occur in Segments 1, 2, and 3. The channel is comparatively narrow and simple in Segments 4 and 5.

The existence and extent of the other surfaces along the LAR are consistent with the geologic and topographic conditions and hydraulic context. Floodplains and active channels are the only other surfaces within Parkway Segments 1 and 2. Conversely, bluffs and hills are a small, but important surface only in Parkway Segments 4 and 5. Terrace(s) are the natural and modified surfaces that are

generally above the 200-year inundation zone (160,000 cfs) under present conditions, although some terrace locations may have disturbed topography with isolated low spots. These broad uplands occupy approximately 40 percent of the Parkway in Segments 4 and 5. Intermediate areas of high floodplain/low terrace surfaces are delineated and are an important component of Segments 3 and 4. While most of these surfaces are not subject to flood inundation for events smaller than the 100-year peak flow, the disturbed topography creates a complex pattern of partially connected ridges and swales that foster surface and/or groundwater supported saturation or inundation potential.

The floodplain area, generally exposed to overbanking flows larger than the 2-year peak and smaller than the 100-year event, comprises over a third of the entire Parkway (35.7 percent). It ranges from very narrow in a small proportion of Segments 4 and 5 to wide and expansive in Segments 1 and 2 (limited only by the levees). The areas mapped as floodplain surfaces emphasize locations that are functionally connected to the main channel or local tributaries and subject to overbanking, rather than areas of extensive topographic disturbance that complicates flow routing. Accordingly, areas of uncertain surface flow connectivity within the 115,000 cfs inundation areas are grouped in the high floodplain / low terrace surface.





Table 7-2. Functional Geomorphic Surfaces of Parkway Segments

| Parkway Segment | | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Characteristic | Units | | | | | | |
| River Mile Extent | Miles | 0 to 6.5 | 6.5 to 11.5 | 11.5 to 14.6 | 14.6 to 19.5 | 19.5 to 22.1 | 0 to 22.1 |
| Segment Area | Acres | 1,924 | 781 | 911 | 1,600 | 799 | 6,015 |
| Channel Length | Miles | 6.5 | 5.0 | 3.1 | 4.9 | 2.6 | 22.1 |
| | | | | | | | |
| Dominant Channel Form | | Single Thread | Single Thread | Single Thread | Single Thread | Single Thread | |
| Additional Channel Features | | Backwater floodplain basins | A couple of mid-channel bars | A few alcoves and disconnected threads | - | - | |
| Functional Geomorphic Surfaces | | | | | | | |
| Active Channel extent | acres | 779 | 396 | 263 | 244 | 145 | 1,827 |
| Active Channel extent | % | 40.5% | 50.7% | 28.9% | 15.3% | 18.1% | 30.4% |
| Active Channel width | feet | 989 | 653 | 700 | 411 | 460 | 682 |
| | | | | | | | |
| Floodplain area | acres | 1,145 | 360 | 248 | 185 | 98 | 2,036 |
| Floodplain extent | % | 59.5% | 46.1% | 27.2% | 11.6% | 12.3% | 33.8% |
| Floodplain width (both sides) | feet | 1,453 | 594 | 660 | 311 | 311 | 760 |
| | | | | | | | |
| High Floodplain/Low Terrace area | acres | 0 | 24 | 153 | 433 | 93 | 703 |
| High Floodplain/Low Terrace extent | % | 0.0% | 3.1% | 16.8% | 27.1% | 11.6% | 11.7% |
| | | | | | | | |
| Terrace(s) area | acres | 0 | 1 | 247 | 693 | 313 | 1,254 |
| Terrace(s) extent | % | 0.0% | 0.2% | 27.1% | 43.3% | 39.1% | 20.9% |
| | | | | | | | |
| Bluffs and Hills area | acres | 0 | 0 | 0 | 45 | 150 | 195 |

| Parkway Segment | | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Bluffs and Hills extent | % | 0.0% | 0.0% | 0.0% | 0.0% | 20.0% | 3.2% |

Given the suite of human and geologic controls on the LAR within the Parkway discussed throughout this section it is not practical to set specific standalone river form or function objectives such as increase floodplain area or sinuosity as it would be for a river system that is still under a seasonal flood disturbance regime with less long term confinement. Instead, this information will be developed further into recommended guidance and principles for incorporation into the Natural Resource Management Plan in order to provide Regional Parks a pathway to follow for future riverine health and aquatic habitat preservation, enhancement and restoration while recognizing the limitations of the system.

# 8. Streambanks

## 8.1. Bank Types and Conditions

Varying bank types within the Parkway are dependent upon the underlying geology, soils, and human disturbance regimes. The following section summarizes the general types, stability, and impacts to banks along the river.

## 8.2. Side Slope/Vertical Earthen Banks

In the lower LAR reaches (Parkway Segment 1), earthen side slope banks, with varying amounts of native and non-native vegetation, are most common. Adjacent to a sediment-laden stream with slow moving water, these banks are stable and relatively homogenous, with little to no floodplain variability (Figures 8-1 and 8-2). In the high use Parkway areas, banks are often heavily compacted or crisscrossed with social trails. A few scattered locations vulnerable to erosion within Parkway Segment 1 are armored with cobble/gravel toe protection, primarily for levee protection (Figure 8-3). At Paradise Beach, a well vegetated bar along the left bank was reportedly cleared during the 1997 flood flows of 115,000 cfs. As seen in (Figure 8-4), the vegetation grew back in essentially the same footprint, exhibiting a "scour and sprout" phenomenon as opposed to a meandering floodplain channel with point bars and downed woody debris (Watson 2019).

Figure 8-1. Mature oaks line upper portion of mostly bare earthen left bank near confluence (~RM0.2)

Figure 8-2. Left bank vegetated bar at Paradise Beach (~RM 5.6)

Figure 8-3. Left bank cobble/gravel toe protection.

Figure 8-4. Left bank vegetated bar at Paradise Beach (~RM 5.6)

Moving further upstream along Parkway Segment 1, a shift to more intermittent vertical banks is expressed (Figure 8-5). Several of the proposed and ongoing levee revetment projects introduced in Section 4.2 Modern LAR Management are located in the upper portion of Parkway Segment 1 and into Segment 2. Scattered throughout the Parkway Segments pockets of high recreation use, homeless encampments, and the occurrence of wildland fires on riverbanks and levees contribute to vegetation loss, localized erosion, and sediment inputs into the river (Figure 8-6 and 8-7).

Figure 8-5. Steep vertical bank with exposed resistant layer (~RM 5.5)

Figure 8-6. Fire scar on bank/levee close to river channel (~RM 5.5)

Figure 8-7. Homeless encampment at Cordova Creek Outfall (~RM 14.5)

Figure 8-8. Mined left bank widened river, formed in channel bar seen from boat ramp (~ RM 9).

### 8.3. Alluvial Material Banks

Parkway Segment 2 is roughly the terminus of gravel movement and deposition. However, in this reach there is little visible alluvial material. Most banks are earthen and vegetated with localized exceptions where the channel has been directly manipulated by human activity. On the upstream side of Howe Avenue Bridge and the downstream side of Watt Avenue Bridge, old mining excavations lowered the left banks of the river, widening the channel and forming in-channel islands with alluvium surfaces. Parkway facilities and recreational access often coincide with these artificially lowered banks due to their accessibility to the river, such as the boat ramp southwest of Watt Avenue Bridge (Figure 8-8). In some cases, Parkway infrastructure may become compromised as the slow-moving water in widened reaches drops material out of suspension and fills the channel. Monitoring of this location may be warranted in order to plan for when boat access may soon become infeasible or require a suite of permits to dredge and remove deposited material as the river becomes too shallow in the vicinity of the boat ramp. If and when new or updated river access infrastructure is planned for, the inundation extents and velocities as predicted by the hydrodynamic model and potential for upstream source material to be transported and deposited at the site should be considered so as not to install infrastructure that could become inadequate or in-operational over time.





In Parkway Segment 3, the frequency of bare ground and exposed alluvial material increases and contrasts with relatively undisturbed vegetated banks. Some of these areas are heavily compacted in high use areas, such as car top boat launches (Figure 8-9) and other banks appear to be increasing in height due to overbank deposition (Figure 8-10 and 8-11). Locally the more resistant Fair Oaks formation is exposed along some bank margins (Figure 8-12).

**Figure 8-9.** Gravel banks both sides of the river (top photo). Heavily used right bank at car top boat launch (bottom photo) (~ RM 11.6)

Figure 8-10. Gravel side bar (right bank) (~ RM 12.1)

Figure 8-11. Left bank gravel bar (left photo).

Figure 8-12. Right bank exposed Fair Oaks formation. (~ RM 13.2)

Parkway Segment 4 exhibits a continuation of bank toes hardened with gravel surfaces or exposed erosion-resistant material (Figure 8-13) interspersed between the heavily vegetated banks (Figure 8-14). Some banks within this segment are showing signs of erosion and are retreating to areas where banks have been fortified (Figure 8-15). The channel bed in Parkway Segment 4 is holding grade due to the underlying Fair Oaks formation and cobble size armoring, particularly in the upper portions. The hardened bed through this area applies increased pressure on the banks resulting in erosional areas where the banks are most vulnerable. These banks should be flagged for monitoring and changes recorded.

Figure 8-13. Substantial right bank gravel bar (upper photo). Exposed erosion resistant bank toe (lower photo) (~RM 15.3)

Figure 8-14. Vegetated stable banks, small number of woody debris along toe (~RM 16.7)

Figure 8-15. Erosion along clay shelf (upper photo). Rip rap protected bank (lower photo) (~RM 17.8)

### 8.4. Bluffs

In the upper reach of Parkway Segment 4 and into Parkway Segment 5, the resistant Fair Oaks formation has been more fully exposed and there are a number of nearly vertical, but relatively stable bluffs often with a clay shelf forming along the toe (Figure 8-16). The cliff banks can however be destabilized by activities from above including loading the upper surface via irrigation or stormwater runoff and below from trail encroachment, road maintenance, or channel overflow events impinging on the face of the bank. These events could produce mass wasting via slumps, slides or surface erosion that could threaten private property and cause a large sediment influx to the river impacting water quality, fish spawning grounds or other sensitive resources.

Figure 8-16. Steep bluffs along right bank (~RM 19.4)

### 8.5. Outfalls

There are several outfalls of varying types and conditions along the LAR (Appendix 4 Infrastructure Map). Some are associated with tributary drainages and others with localized or larger urban stormwater drainages. Figures 8-17 through 8-19 show some of the various types and their condition.

Outfalls can be a driver for localized adverse effects on the geomorphic condition of the LAR and tributaries, public safety, and water quality. Scoured areas where tributary inflow meets the LAR channel are often observed at outfall locations. This scour can lead to head-cuts and incision perpetuated further up the tributaries with earthen channels leading to an increased sediment load and degraded tributary channel condition. Tributary incision and channel degradation reduce the amount of quality riparian and instream habitat within the Parkway. Deeply incised channels with unstable banks pose a public safety risk in high traffic recreation environments like the LAR Parkway. Flow from tributary streams, ditches and stormwater inputs to the LAR may be of poor water quality due to non-point pollution loading in the upstream watersheds.

Adverse impacts associated with tributary and stormwater outfalls into the LAR can be mitigated through restoration and preventative measures. Scour in the LAR channel at outfall locations can be mitigated by placement of bank/channel rock armor or flow velocities at the outfall can be reduced by the use of flow energy dissipation structures. To prevent head-cutting up tributaries and associated stream incision grade control structures could be implemented in the tributary channel upstream of the confluence with the LAR. Issues associated with natural tributary channels should be mitigated using site appropriate biotechnical methods if feasible. To reduce non-point pollutant loads from the surrounding metropolitan area passive treatment techniques could be employed like sediment traps

installed and maintained higher up in contributing watersheds or infiltration basins/galleries in the upland areas of the Parkway.

An inventory of all existing outfalls within the Parkway is recommended as a first step to properly inform and prioritize improvement efforts. The inventory should include outfall type, size, and condition and include photo documentation and GPS mapped locations. Following the inventory, a set of potential projects could be developed to rectify problems, improve outfall condition, and mitigate any impacts to the tributaries and where they outlet to the LAR. Outfalls that present the greatest risk for the most widespread adverse impact on LAR natural resources should be prioritized.

Figure 8-17. Localized stormdrain outfall with eroded outlet (~RM 0.2)

Figure 8-18. Large urban stormwater outfall with broken apron (~RM 5.3)

Figure 8-19. Buffalo Creek outfall (~RM 19.5)

### 8.6. Bank Stability

As discussed, spatial distribution of geologic layers with varying degrees of resistance along the LAR define where bed and bank migration are largely impeded. For example, the younger, less-resistant Modesto formation that occurs more frequently in the lower reaches appears to be restricting river migration in some locations and is eroding elsewhere. In the upper reaches, the more erosion-resistant Fair Oaks (Turlock) formation is intermittently exposed and holds the bed of the river between Nimbus Dam and River Bend Park (Ayers 2004). The Riverbank formation is exposed and holding in the bed of LAR at RM 7 to 7.3, 9.4 to 10.9, 11.6, and from 13.8 to 14. With the Riverbank and Fair Oaks (Turlock) layers preventing continued channel incision in the upper reaches, the potential for channel widening could continue to pose an erosional risk to banks and nearby levees. In the lower reaches, there is still some bed degradation risk that could eventually impact levee integrity via toe scour.

In addition to the geological factor affecting bank stability, anthropogenic degradation has a significant impact on localized erosion in the LAR. To begin to assess bank erosion and its causes, a bank erosion inventory was conducted on November 17th and 18th, 2019. The primary goal of this inventory was to identify locations of bank erosion and recreational impacts to banks. The secondary goal was to identify sites of bank protection and field truth outfall locations. Data collected from this inventory informed this section and the full report is included in Appendix 11.

Ayers (2004) did an analysis of bank retreat in the lower leveed reaches (RM 0 to ~RM 14.5) by delineating bankline positions of the river on available time sequential aerial photography dating back to 1957. They noted that the banks have not naturally migrated to any significant degree and the only major changes were due to the sand and gravel mining operations that took place along the river. These are clearly shown by variations in bank line designations between 1957 and 1972. A follow up

evaluation of bankline migration was conducted by NHC (2012) by incorporating 2010 aerial imagery. There was agreement that no active meander bend migration has occurred since 1957 and that any significant shifts coincided with historic sand and gravel mining.

### 8.7. Levee Protective Revetments

In addition to flood protection provided through controlled dam releases at Folsom and Nimbus Dams, several miles of federal levees were constructed between 1948 and 1958 from the confluence with the Sacramento River to approximately RM 12 on the left bank and RM 14 on the right bank (Ayers 2004, 2010).

Levee proximity to active channel varies as follows:

- RM 0 to 5 – North levee is setback from the channel roughly 2,000 to 4,000 feet. At 160,000 cfs, the overbank velocities range from 1 to 3 feet/second (ft/s) and shear from 0 – 0.2 pounds per square foot (psf) (Ayers 2004).
- RM 5 to RM 11 – Levees closely parallel the channel. The distance between levees ranges from 700 to 1500 feet. Overbank velocities and applied shear stresses at a flow of 160,000 cfs range from 2-5 ft/s and 0-0.5 psf, respectively (Ayres 2004).

Earlier bank protection methods used along the lower leveed sections of the LAR included rock revetment, river cobble revetment, concrete walls, gabions, stone dikes, and concrete rubble (Figure 8-20) (Ayers 2004, Ayers Associates 1997). The original levees were designed for a 115k cfs flow event. However, during the 1986 flood, a release of 134k cfs at Folsom Dam caused significant damage to several levee sections. Following the 1986 flood-induced levee damage, bank protection projects were installed at five locations and include slurry walls, bank erosion repair, and vegetation planting and management (Ayers 2004). A bank protection program was implemented in partnership with the LARTF and SAFCA that provided embankment protection measures between 1986 and 2004 (MBK). In addition, under the authorization of the 1999 modified Water Resources Development Act the American River Common Features Project improved levees in conjunction with upgrades to Folsom Dam to withstand the estimated 200-year flow of 160k cfs. These levee improvements under the ARCFP were completed in 2016. In 2015 the Lower American River Task Force (LARTF) called to reconvene the Bank Protection Working Group (BPWG) tasked with continuing efforts to better understand the extent of erosion impacts and continue improving bank protection (nhc 2018). With the input of the Technical Resource Advisory Committee (TRAC) ongoing efforts include resource inventory in addition to hydraulic modeling. As of fall of 2018 extensive work has been done to assess geomorphology of the leveed section (RM 0-14) and identify erosion risks in Subreach 2 (nhc 2018). Site identification, prioritization and improvement design are ongoing.

**Figure 8-20.** Earthen left bank with cobble/gravel toe revetment and planted riparian bench (~RM 1.8)

From RM 0 to RM 9.5, 48,000 linear feet (or about 50 percent of total bank length) of bank protection has been installed since 1948, mostly between RM 4 and RM 8 where the levees encroach on the channel. Between RM 9.5 and RM 15 about 5,760 linear feet (or about 9 percent of total bank length) of bank protection has been installed. Lateral channel migration and erosion rates within the leveed reach are highly constrained by the extent of bank protection, especially downstream of RM 9; however, some areas of bank erosion remain, and further bank protection would help mitigate erosion and limit sediment deposition into the system (NHC 2018).

Annual inspections monitoring the condition of the LAR federal project levees have been conducted since 2005 by MBK Engineers with SAFCA and American River Flood Control District staff to track the condition of previously identified erosion sites and identify new sites that require maintenance or repairs. These efforts also support adherence with FEMA's NFIP under 44 CFR 65.10. Under this federal statute, in order for the project levees to maintain their base flood protection status on the Flood Insurance Rate Maps (FIRMS), there must be procedures under an adopted maintenance plan to maintain the stability, height, and overall integrity of the levee and its associated structures and systems (MBK 2017, FEMA 2018).

In fall 2006, Ayers (2010) inventoried erosion and armored sites for the levee reaches through RM 14 and only found four (4) erosion sites. Two (2) sites were repaired by the report publication date, and two (2) were scheduled for repairs. The armored sites inventoried by Ayers (2010) were based on visual observations (Table B-1).

Table 4-6. Levee Assessments and Conditions

| Location (RM) | Type of Levee | 2018 Overall Condition[1] | USACE Corps Maintained? 2017 Monitoring Observations[2] 2018 Observations[3] |
|---|---|---|---|
| 0.0L | Setback | Poor | |
| 0.0R | Setback | Very Poor | Encroachment issues. |
| 0.2L | Bank Riprap | Fair | |
| 0.2L | Riprap/Setback | Fair to Poor | |
| 1.0R | Concrete Pedestal | Poor to Fair | |
| 1.2L | Bank Riprap | Fair | |
| 1.2L | Bank Riprap | Very Poor | 1.2 Continued downdrop and toe scour at the end of the concrete revetment. Bank erosion behind the revetment is progressing. |
| 2.0L | Setback | Poor to Fair | 2.0 Partial failure of setback levee at the end of the concrete revetment. Bank erosion behind the revetment is progressing. |
| 2.0L | Bank Riprap | Very Poor | Continued | 1.2 Bank erosion behind the revetment is progressing. Scour at the end of the revetment is progressing. Bank erosion is occurring behind the revetment. Scour at the end of the revetment is progressing. Bank erosion is occurring behind the revetment. |
| 2.0L | Concrete Pedestal | Fair | 2.0 Partial failure of setback levee at the end of the concrete revetment. Bank erosion behind the revetment is progressing. |
| 3.0L | Bank Riprap | Very Poor | |
| 4.0L | Bank Riprap | Fair | 4.0 - Expansion joint failure and slight bank erosion |
| 4.0L | Bank Riprap | Very Poor | 4.0L - slight bank erosion and undermining (Photo 3) |
| 5.0R | Setback | Fair | 5.0 - Expansion joint failure and slight bank erosion (Photo 4) 5.0 - Expansion joint failure and slight bank erosion |
| 6.0L | Setback | Fair | |
| 6.0L | Bank Riprap | Fair | |
| 6.7L | Bank Riprap | Fair | |
| 6.8L | Bank Riprap | Very Poor | |
| 7.0R | Bank Riprap | Fair | 7.0R-6.8 to Jonathan Trail: 40 ft of bare, eroded bank with progressive retreat since 2018 bathymetry. Potential lateral bank sloughing into river. 100 ft inside levee. Vegetation cover shifted to shrub / small tree and weed bank. |
| 7.4L | Setback/Riprap | Fair | |
| 8.0R | Riprap | Very Poor | |
| 8.0L | Setback | Poor to Fair | 8.0L/8.0R to Jonathan Trail: 40 ft of bare, eroded bank with progressive retreat since 2018 bathymetry. Potential lateral bank sloughing into river. 100 ft inside levee. Vegetation cover shifted to shrub / small tree and weed bank. Vegetation cover shifted to shrub / small tree and weed bank. |
| 9.0L | Setback/Riprap | Poor to Fair/Previously replaced rocky revetment has failed, Bank investigation recommended due to erosion by the water. | 9.0L - 10-4 bifurcation around Steelhead has historically caused very high protective encroachment and, because it does not appear to have progressed significantly since 2018. The 2018 bathymetry was created by Corps prior to the January / 2019 flood, but could not have caused much of the erosion. The 2018 bathymetry captured and represents breakthrough velocity and thermal plume upstream of RM 10 on the N Branch of the river for years and failed have resulted in the erosion measured during the April Monitoring Corps. |
| 9.2L | | | 9.2L - Extensive bank erosion (full vertical bank) and significant bank undercutting observed along the entire levee. Vegetation shifts has not changed significantly since 2018 bathymetry, which shows 2018 completed and shifts shows signs of minor erosion, channel natural transitions observed for the stage upward within bank. 2018 depth has been reported by the Corps under the 2017 / 2018 flood. A few of the old mature trees have fallen into the river, with exposed root systems. Vegetation is primarily shrubs and small trees. Additional new, 2018 bathymetry data was collected in response to a new levee. The 2018 survey has been created since the 2017 flood. |
| 10.0L | | | 10.0L - 2018 bathymetry data was collected in the field / channel differences in the channel bottom since the 2018 survey. Bank vegetation, bank undercutting with 2018 bank erosion. Bank of vegetation has not changed since the 2018 bathymetry survey. Bank vegetation has not changed since the 2018 bathymetry survey. |
| 10.4L | | | 10.4L - Bank erosion is occurring along the length of the levee. Vegetation has been removed. Bank has eroded to the point that the levee is exposed. Bank erosion is occurring along the levee. Bank erosion is occurring along the levee. Bank erosion is occurring along the levee. Bank erosion is occurring along the levee. |

[1] Visual observations of condition based as follows: "poor" = significant design event; "fair" = likely failure; "poor" = adequate for near-term maintenance; and "very poor" = will require for the design event.
[2] USACE Corps of Engineers Information. Shared annual over maintenance if maintained.
[3] Michael Baker International 2017 Monitoring Observations and 2018. Note numbers are not exact, some of the numbers are approximate.

In 2015, SAFCA reinstated the Bank Protection Working Group (BPWG) of the LARTF, which focused on the lower 14 RM that encompass the federal project levees. It tasked NHC with assessing and designing bank protection measures to ensure continued levee functionality and flood protection (NHC 2018). As part of this effort, NHC predicted channel adjustments for six (6) of their subreaches associated with the RM location within the project levee reach (Table 8-1). All channel adjustments were predicted to result in the loss of Parkway land with the exception of Subreach 5.1. Only changes in Subreaches 2.1 and 2.2 were expected to increase erosion risk to project levees, with Subreach 2.1 expected to experience greater risk. The report also recommended the bank protection inventories be updated to better plan for needed improvements (NHC 2018). Some of the revetments identified as cobble may be mistaken for exposures of Upper Modesto cobbles and gravels in the banks (NHC 2018).

### 8.8. Other Bank Protection Revetments

In addition to the federal project levees and their associated bank protection measures, there are other public and private bank retrofits scattered throughout the LAR largely associated with protecting private property our preventing erosion at stormwater outfalls. Examples are pictured below in Figure 8-21 and 8-22.

Figure 8-21. Shotcrete stabilized right bank (~RM 13.5)

Figure 8-22. Rock rip-rap placed at Cordova Creek outfall (~RM 14.5)

### 8.9. SRA Habitat

The LAR from Nimbus Dam to the confluence with the Sacramento River was identified as an "Area of Concern" and prime for potential mitigation projects pertaining to enhancing SRA habitat (USFWS 1992). As discussed earlier in this chapter, SRA habitat occurs at the interface between a stream and stream banks, where the banks support woody, riparian vegetation. Three characteristics of healthy SRA habitat are: overhanging vegetation, in-water cover, and natural banks adjacent to the stream (USFWS 1992). Onsite mitigation associated with Parkway projects likely include creation of SRA habitat as restoration of the riparian corridor typically promotes SRA habitat (USACE 2015).

Woody, well-vegetated stream banks associated with high-quality SRA habitat provide bank protection against flow-induced shear stress and scour. The root systems of riparian plants hold bank material in place and provide conduits for hyporheic (nutrient-rich sediment layer) exchange. Woody debris that protrudes into the channel creates hydraulic diversity, which leads to localized scour/sedimentation processes that can hold stream banks in dynamic equilibrium and reduce lateral scouring of banks. The traditional stream bank protection technique of rip-rap placement is detrimental to all characteristics of quality SRA habitat (USFWS 1992). Modern, biotechnical stream restoration practices aimed at promoting bank stability against erosion often incorporate woody debris and riparian plants (i.e., willows) in various ways to mimic the natural bank protection afforded by thriving riparian habitat.

Due to the natural and imposed conditions on the LAR, there is little in common with a meandering channel system. Instead, the planform of the LAR is largely fixed within the naturally and artificially stabilized banks. The system is challenging for restoration given it is operating within a more cyclical scour and sprout phenomenon with fewer opportunities to introduce overbank and meander with high

value riparian vegetation and woody debris. The riparian vegetation, although abundant in some areas, is challenged by competing exotic and invasive plants. These non-native species are being irrigated year-round and are supported by continuous high summer flows. There is also minimal opportunity for the accumulation of persistent, river-introduced woody debris. SRA is valuable to this system, particularly in providing habitat complexity, but needs be managed with a clear understanding of how it can be effectively designed and integrated into this unique setting.

## 9. Soils and Sediment

Numerous studies have recounted and analyzed the varied effects of historic human disturbances on sediment supply in the LAR. Early increases in excess coarse and fine inputs due to hydraulic mining in the watershed was followed by the permanent interruption of upstream coarse sediment after dam construction and direct removal of local soils and sediment for mineral extraction. Modifications to channel and overbank hydraulics from the direct topographic disturbance, channel aggradation and incision cycles, levee confinement, and flow regulation have all altered where sediment sources may be mobilized and deposited. The managed flow regime and the hydraulic backwater from the Sacramento River influence the locations, frequency and duration of velocity, and shear stress conditions capable of mobilizing and transporting available sediment.

Sediment supply within the LAR is primarily comprised of alluvium that is either modern in origin or has been reworked historically by the active channel (NHC 2018). Additionally, the soils forming channel banks of the active channel and the most accessible portions of the floodplain may be future sediment sources. The availability of floodplain soils and sediment for mobilization and transport is reduced by the stabilizing effect of vegetation, particularly where the intervals between scouring floods or long duration inundation allow plant establishment success and growth.

The soils in the Parkway include many series and areas beyond the locations likely to be accessible to the river channel and flood flows (Appendix 9), including several relatively well-developed (older) soils on undisturbed or high terraces and the bluffs (see Table 2-1 regarding soils associated with the schematic geologic surfaces). A few key soil series and phases are common within the floodplain and along the active channel margins (Table 9-1). All of the soils are formed in alluvial (river) deposits and are deep (~60 inches thick or more). As would be expected for soils that are developing within river sediments, they often feature stratified layers of particles sorted by size. The dominant textures reflect the geologic material origins and the hydraulic conditions for deposition. Finer silts and loams are in the downstream sites and on the floodplain away from the active channel. The most unusual soils are the Xerorthents, which are forming within the disturbed dredge tailing deposits. They have extremely coarse materials, wide variability of surface and subsurface textures, complex topography, and patchy distributions of fine textured lenses.





Table 9-1. Soil Types and Characteristics of the LAR Floodplain

| Map Unit #s | Soil Name | Surface Texture | Sub-Surface Textures | Depth | Drainage | Position | Surface topography | Vegetation |
|---|---|---|---|---|---|---|---|---|
| 116, 117 | Columbia | sandy loam (varies) | stratified sandy loam, silt loam, loam, and sand | Very deep | artificially drained | natural levees on low floodplains | planar | vegetation in uncultivated areas is annual grasses, forbs, and scattered oaks |
| 169 | Laugenour | loam | | Very deep | artificially drained | low floodplain splays and natural levees | slopes are planar | vegetation in uncultivated areas is a mix of grasses, forbs, and hydrophytic plants |
| 203 | Riverwash | varies | varies | Varied | well drained | unstabilized stratified sandy, silty, cobbly and gravely sediments | reworked by river flows nearly every year | little or no vegetation |
| 204, | Rossmoor | Fine sandy loam (varies) | fine sandy loam | Very deep | well drained | on narrow high floodplains in mixed alluvium | slopes are smooth, but may be complex | vegetation in uncultivated areas is a mix of grasses, forbs, and hydrophytic plants |
| 206, 207, 208 | Sailboat | Silt Loam | Silt loam, clay loam; loam | Very deep | artificially drained | along narrow, low floodplains, may be | slopes are planar | vegetation in uncultivated areas is a mix of grasses, forbs, and hydrophytic plants |

| Map Unit #s | Soil Name | Surface Texture | Sub-Surface Textures | Depth | Drainage | Position | Surface topography | Vegetation |
|---|---|---|---|---|---|---|---|---|
| | | | | | | protected by levees | | |
| 242, | Xerofluvents | Sand (varies) | stratified sand to fine sandy loam | Very deep | excessively drained to well drained | formed in alluvium from mixed rocks | slopes are complex; ranging from smooth to hummocky | native vegetation of oaks, hardwoods, grasses, and forbs |
| 245, 246 | Xerorthents | Extremely cobbly fine sandy loam (varies) | poorly sorted rounded stones, cobbles, and gravel; extremely cobbly and very cobbly fine sandy loam | Very Deep | Somewhat excessively drained and excessively drained | Formed in material with high content of gravel and cobbles | slopes are short, complex, disturbed | vegetation is mainly sparse stands of annual grasses and forbs, scattered hardwoods |





### 9.1. Mobilization and Transport

An unsteady, two-dimensional hydrodynamic model (cbec 2019) based on the two-dimensional HEC-RAS (Version 5.0.5 or equivalent) computational engine was used to obtain velocities and shear stresses throughout the LAR at discharges of 20.5k, 115k, and 160k cfs (Appendix 10).

Shear stresses range from almost zero to greater than ten (10) psf in all three models. Amongst all models, the lower third of the model domain corresponded with lower shear stresses. This result was not surprising given that slope decreases and width increases in the lower reach, which causes generally lower velocities in Parkway Segment 1. In addition, the impact of the confluence of the LAR and the Sacramento River is most noticeable in the lower reach. Relatively high shear stress was observed at the sharp bends between the Upper and Lower Sunrise Areas and William B. Pond Recreation Area. Overall, the figures substantiate prior assessments that net erosion in the upper reaches transitions to net deposition in the lower reaches. The figures also support what is generally observed along the river, that there is a clear gradation in bed material starting at Parkway Segment 5, with a coarse bed of cobbles transitioning to smaller cobbles and gravels with some new bars forming from local erosional sources or gravel augmentation in Parkway Segments 3 and 4, and then to smaller gravels and eventually sand and sediment in Parkway Segments 1 and 2.

## 10. Geomorphic Process Trends

### 10.1. Future LAR Morphology Trends

Analysis by NHC (2018) predicted future morphology of the channel over the next 50 to 100 years with a focus on the leveed reach of the LAR between RM 0 and RM 14.5 (Segments 1, 2 and 3). Sediment transport modeling of the system downstream of Nimbus Dam indicates net erosion upstream of RM 14 and net deposition in the downstream reaches, continuing recent (post-Folsom Dam) trends.

Parkway Segments 4 and 5 are expected to experience channel slope decreases due to lack of sediment inputs and managed flow releases. Expected conditions will result in further disconnection from surrounding surfaces, reducing the already small active floodplain, unless erosion-resistant geologic materials limit channel bed incision. A net discharge of sediment to downstream segments is forecast as the dominant trend. However, sediment delivery to the channel from streambanks and side slopes could increase locally as bed erosion occurs (increasing bank heights and instability). Whether such sediment could form sustained channel depositional features (e.g., riffles and bars) would depend on the volume, grain size distribution, and timing of sediment inputs relative to high flushing flows and vegetation establishment.

Parkway Segment 3 (~NHC 2018's LAR 5) would potentially experience incision at its upstream end, lowering slopes and prompting continued deposition, unless the channel bed elevation is supported by erosion-resistant geologic materials at shallow depth. The discontinuous connections between active channel and overbank areas with irregular topography and over-wide and over-deep mining remnants suggest that a variety of processes and conditions may occur in this section of the LAR.

Local aggradation may induce channel shifts and increase erosion of above grade fill and terrace soils. Channel shifts and increased overbank flow frequencies may deliver additional fine and/or coarse materials to existing pits and swales. Net transport of sediment to downstream reaches would also occur.

Parkway Segment 2 (~NHC 2018's LAR 4 and 3) has erosion-resistant geologic materials exposed in the channel bed or at shallow depth that restrict the ability of the river to incise in the future. This Segment would continue to receive coarse sediment input from Segment 3 but would not be hydraulically capable of transporting further downstream, so coarse material would be deposited near its upstream end. The channel bed would be expected to remain stable in other portions of Segment 2, but channel widening and local bank erosion are predicted and currently being addressed as part of the levee flood protection efforts being done by others.

Parkway Segment 1 (~NHC 2018's LAR 2 and 1) is projected to continue to receive and generally accumulate sediment, given the supply from upstream reaches, the typically low-energy environment of Sacramento River backwater and rising sea level. In response to net aggradation, channel adjustments are expected to result in local bank erosion and/or channel shifts. At Paradise Beach the channel could shift due to the interplay between aggradation in the main channel along the outside bend and degradation/incision of the overflow channel that flows around the left side of the left bar. This could result in a "cut off" of the meander and head cut up the deepening overflow channel, causing the overflow channel to become the main channel and slope through the area to increase. This possible channel cut off at Paradise Beach could increase local bed slope and bed erosion. Projected channel dynamics in this segment could increase the risk of erosion to levees.

### 10.2. Future Drivers: 2020 and Onward

As discussed in Chapter 3 of the NRMP, as the global climate changes, most experts forecast a rise in global average temperatures and sea level elevation accompanied by changes in precipitation patterns. These direct effects will cause indirect consequences that vary by region. Indirect effects that will impact the Sierra Nevada Mountains and Central Valley include increased frequency and duration of extreme heat events, loss of snowpack (i.e., snow drought where more precipitation may fall as rain as winter temperatures increase), increased wildland fire risk, and increased flooding due to increased frequency of rain on snow events in the higher elevations (Ascent Environmental 2017).

Natural and water resource managers who work with the LAR will continue to be challenged with balancing ecological preservation with water resource demands and flooding alleviation under these changing climatic conditions that are likely to impose more recurrent drought and flood situations. Changing climatic conditions may further stress threatened species and accelerate ecological degradation (Ascent Environmental 2017). More widespread wildland fire activity may have negative impacts on river systems by causing increased erosion and sediment loading into streams, as discussed in Section 9.7. The supply of water resources from the Sierra Nevada may become more volatile as temperatures rise and more high-elevation, winter storms result in rain, instead of snow. This would change the timing of water availability by increasing the frequency of high-flow events (caused by rain-on-snow in the Sierra Nevada Mountains) in the winter and causing the snowpack to melt earlier





in the year (Ascent Environmental 2017). Changes in timing of water availability would necessitate changes in water resource infrastructure operation or water allocation.

## References

American River Parkway Foundation. 2019. American River Parkway Foundation. Available at: http://arpf.org/newsletter/11November_2017/newsletter.html [Accessed October 2019].

Ascent Environmental. 2017. Climate Change Vulnerability Assessment for the Sacramento County Climate Action Plan: Communitywide Greenhouse Gas Reduction and Climate Change Adaptation. Available at: https://planning.saccounty.net/PlansandProjectsIn-Progress/Documents/Climate%20Action%20Plan/Climate%20Change%20Vulnerability%20Assessment.pdf [Accessed October 2019].

Ayers. 1997. Final Report, American and Sacramento River, California Project. Available at: http://www.safca.org/protection/NR_Documents/BPWG_Library_1997_Ayres_Geomorphic_Sediment_Engineering_Channel_Stability.pdf [Accessed October 2019].

Ayers. 2004. Lower American River, Erosion Susceptibility Analysis for Infrequent Flood Events. Available at: http://www.safca.org/Protection/NR_Documents/BPWG_Library_2004_Ayres_Report.pdf. [Accessed October 2019].

Bartell. 2019. Forbidden Ruins of Folsom's Past. June 24, 2019. Updated June 25, 2019. Available at: https://www.abc10.com/article/entertainment/television/panorama/backroads/forbidden-ruins-of-folsoms-past-bartells-backroads/103-968c1D8F-294c-4f26-bacD-f517fd09875e [Accessed November 2019].

Bean. 2012. Physical and geochemical characteristics of the Lower Sailor Bar 2012, Upper Sunrise 2010/2011, Upper Sailor Bar 2009, and Upper Sailor Bar 2008 gravel additions. Available at: https://www.caus.edu/indiv/h/homert/ [Accessed October 2019].

CDFW 2019. History of Nimbus Hatchery. Available at https://www.wildlife.ca.gov/Fishing/Hatcheries/Nimbus/History. [Accessed November 2019]

CA State Parks. 2019. Folsom Dam. Available at: https://www.parks.ca.gov/?page_id=882 [Accessed September 2019].

CA State Parks. 2019. The First Folsom Dam. Available at: https://www.parks.ca.gov/?page_id=1341. Access November 2019.

CASWRB. 1958. Decision No. D 893. Available at: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d0850_d0899/wrd893.pdf [Accessed October 2019].





cbec. 2018. LAR Current Condition DEM and 2D Model Development Project. [Accessed October 2019.

cbec. 2019. LAR Current Condition DEM and 2D Model Development Project Flood Flow Hydrodynamic Modeling Report. March 2019.

cbec. 2020. Lower American River Salmonid Rearing Habitat Enhancement Project Identification and Prioritization Report. July 2020.

City of Sacramento. 2018. History. Available at https://www.cityofsacramento.org/Fire/About/History. [Accessed November 2019]

Congressional Research Service (CRS). 2006. Sacramento Flood Control and Folsom Dam: Recent Action and Current Issues. Available at: https://www.everycrsreport.com/files/20061006_RL33682_9c2bb046697fd7128dccd788c4a1243f64b6fbcf.pdf [Accessed October 2019].

County of Sacramento Department of Regional Parks. 2014. Approve Expansion of Rossmoor Bar Mitigation Site. https://regionalparks.saccounty.net/PublicMeetings/Documents/2014%20Rossmoor%20ARPAC/ARPAC_%202014_rossmoor_mitigation.pdf

Fairman. 2007. A Gravel Budget for the Lower American River. Available at: https://www.caus.edu/indiv/h/homert/Dave%20Fairman%20thesis%20gravel%20budget%20American%20River.pdf [Accessed October 2019].

FEMA. 2016. Federal Emergency Management Agency. Flood Insurance Study Sacramento County, California, and incorporated areas. Flood Insurance Study Number 06067CV001C. [Accessed October 2019].

FEMA 2018. Federal Emergency Management Agency. Federal Regulations. Available at https://www.fema.gov/media-library-data/20130726-1541-20490-8375/lv_section6510_0408.pdf. Accessed October 2019.

Fish Working Group (FWG). 2001. Initial Fisheries and In-stream Habitat Management and Restoration Plan for the Lower American River. Available at: http://www.waterforum.org/wp-content/uploads/2015/09/Fish-Plan_Executive-Summary.pdf [Accessed October 2019].

Folsom Historic Photos. 2019. Available at http://www.ci.folsom.com/resident-guide/folsom-history/folsom-historical-photos/

[Accessed November 2019]

Fugro Consultants, Inc. (Fugro). 2012. Lower American River Stratigraphic and Geomorphic Mapping Report River Common Features, Sacramento County, California. September 2012.

Gilbert. 1917. Hydraulic-Mining Debris in the Sierra Nevada. Available at: https://pubs.er.usgs.gov/publication/pp105 [Accessed October 2019].

Heise. 2017. The History Behind the Walls of Folsom State Prison. November 2017. Available at https://www.kcra.com/article/the-history-behind-the-granite-walls-of-folsom-state-prison-1/13135305#. [Accessed November 2019].

Helley, Harwood. 1985. Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California. Available at: https://www.cnas.edu/index/h/homert/Geologic%20maps%20and%20References/Helley%20and%20Harwood%201985%20maps/AR-M550U_20071026_141512.pdf [Accessed October 2019].

James. 1994. Channel Changes Wrought by Gold Mining: Northern Sierra Nevada, California. Available at: https://people.cas.sc.edu/ajames/Research/Pubs/1994%20James%20_AWRA.pdf [Accessed October 2019].

James. 2012. Hydraulic Mining Sediment Impacts on American River Channel Morphology and Flood Stages. Available at: https://casavm.org/Symorp2012/James.pdf [Accessed October 2019].

Jones & Stokes. 2002. Flood Management Element of the River Corridor Management Plan for the Lower American River. Available at: http://www.safca.org/Protection/NR_Documents/RCMP_B_Appendix.CFloodManagementElement.pdf [Accessed October 2019].

Kondolf, Mathias G., Smeltzer, Matt, and Kimball, Lisa. 2002. Freshwater Gravel Mining and Dredging Issues White Paper. Prepared for Washington Department of Fish and Wildlife. April 2002.

Lower American River Task Force. 2002. Lower American River Corridor Management Plan. [Accessed September 2019].

Lower American River Task Force. 2015. Lower American River River Corridor Management Plan: Three Year Action Plan. [Accessed September 2019].

National Wild and Scenic Rivers System (NWSRS). 2019. Available at: https://www.rivers.gov/rivers/american-lower.php [Accessed October 2019].

Northwest Hydraulic Consultants, Inc. (nhc). 2012. Revised Task 14 Draft Memo Report – Update of Lower American River Bank Migration Analysis (Contract No. W91238-07-D-0039). [Accessed October 2019].

Northwest Hydraulic Consultants, Inc. (nhc). 2016. Lower American River Task Force Bank Protection Working Group Lower American River Geomorphology Assessment: Draft Report. Prepared for Sacramento Area Flood Control Agency. [Accessed September 2019].

Northwest Hydraulic Consultants, Inc. (nhc). 2018. Attachment 1 to the Lower American River Subreach 2: Summary of Bank Protection Conceptual Design Process. [Accessed September 2019].





Parret. 2009. USGS Internal Document: Recommended revised estimate of Jan. 1862 peak discharge on American River at Fair Oaks gauge (USGS 11446500). Available at: https://casavm.org/history/2009-Parrett-USGS.pdf [Accessed October 2019].

Sacramento Bee (Sac Bee). 2012. The 10 Biggest Sacramento Storms of the Past 100 Years. Available at: https://www.sacbee.com/news/databases/article4059618.html [Accessed October 2019]. This is the reference for the 1986 flood photo.

Sacramento Bee (Sac Bee). 2019. Think this week's storm is bad? Here are 5 of the worst floods in Sacramento history. Available at https://www.sacbee.com/news/weather-news/article226861949.html. [Accessed November 2019].

Science Alert. 2017 Every 200 Years California Endures a Flood of Epic Proportions. Accessed at https://www.sciencealert.com/every-200-years-california-endures-a-flood-of-epic-proportions-and-this-could-be-it. February 2017. [Accessed November 2019]

Sacramento County. 2008. American River Parkway Plan 2008. Available at: https://regionalparks.saccounty.net/Parks/Documents/Parks/ARPP06-021909_sm.pdf [Accessed August 2019].

Sacramento River Watershed Program (SRWP). 2010. The Sacramento River Basin: A Roadmap to Watershed Management. Available at: http://www.sacriver.org/aboutwatershed/roadmap [Accessed October 2019].

Sacramento Area Flood Control Agency (SAFCA). 2008. Policies and Legislation. Last updated 2008. [Accessed September 2019]

Sellheim et. al. 2015. Juvenile Salmonid Utilization of Floodplain Rearing Habitat After Gravel Augmentation in a Regulated River. Available at: https://www.researchgate.net/publication/267287216_Juvenile_Salmonid_Utilization_of_Floodplain_Rearing_Habitat_After_Gravel_Augmentation_in_a_Regulated_River [Accessed October 2019].

Shlemon, Horner, Florsheim. 2000. Quaternary Geology of the Sacramento Area. March 2000. Includes Shlemon 1967 Figure. (i.e., Shlemon, R.J., 1967. Quaternary Geology of Northern Sacramento County, California; Annual Field Trip Guidebook of the Geologic Society of Sacramento).

Sierra College. 2009. Mining Techniques of the Sierra Nevada and Gold Country. Journal of Sierra Nevada History & Biography. Spring 2009 Vol. 2 No. 1

Soil Born Farms and Mogavero Notestine. 2014 American River Ranch Master Plan.

Soil Conservation Service (SCS). 1993. Soil Survey of Sacramento County, California. Available at: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/CA067/0/sacramento.pdf [Accessed October 2019].

URS-GEI. 2012. Revised Three-Dimensional Stratigraphic Model Report, American River Common Features General Reevaluation Report. [Accessed October 2019].

USACE. 2015. American River, California Common Features Project General Reevaluation Report. Draft Report for Public Review. Available at: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/Final_ARCF_GRR_Jan2016.pdf [Accessed March 2015].

USACE. 2015. Habitat Mitigation, Monitoring and Adaptive Management Plan: American River Common Features General Reevaluation Report. Available at: http://www.safca.org/documents/ARCF_GRR/Project_Documents/2015.12_ARCF_GRR_EIS_EIR/Appendix_I_Habitat_Mitigation_Monitoring_and_Adaptive_Management_Plan.pdf [Accessed October 2019].

USACE. 2016. American River Watershed: Common Features General Reevaluation Report, Final Report. Available at: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/Final_ARCF_GRR_Jan2016.pdf [Accessed October 2019].

USACE. 2016. Folsom Dam Modification Project: Phase V Site Restoration and Related Mitigation Activities, Draft Supplemental Environmental Assessment/Environmental Impact Report: https://www.spk.usace.army.mil/Portals/12/documents/usace_project_public_notices/DFP%20Phase%20V_%20Final%20Draft%20Supplemental%20EA-EIR,%20Main%20Body%20with%20Appendices.pdf

USACE. 2017. Draft Folsom Dam and Lake American River, California Water Control Manual. Available at: https://www.spk.usace.army.mil/Missions/Civil-Works/Folsom-Water-Control-Manual-Update/ [Accessed October 2019].

USACE. 2018. American River Common Features 2016 Project. Available at: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/Documents/American%20River%20Common%20Features%20-%20%20Draft%20EA15.PDF?ver=2018-12-27-185956-163

USACE. 2019. Folsom Dam Modification Project Water Control Manual Update, Final, Supplemental Environmental Assessment/Environmental Impact Report. Available at: http://cvfpb.ca.gov/wp-content/uploads/2019/01/FINAL-Folsom-WCM-Update-SEAEIR.pdf [Accessed October 2019].

USACE. 2020. Post Authorization Change Report Sacramento River Bank Protection Project. Available at: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/SacBank/PACR-EIS-EIR/PACR-Report-Apr2020.pdf?ver=2020-04-09-143533-833

USBR. 2006. Folsom Dam 50th 1956-2006. Available at: https://www.usbr.gov/mp/folsom-50/docs/folsom-50-ann-booklet.pdf [Accessed October 2019].

USBR. 2016. Environmental Assessment Lower American River Anadromous Fish Habitat Restoration Project. Available at: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=24637 [Accessed October 2019].

USBR. 2017a. Water Facts Nimbus Dam and Power Plant. Available at:





https://www.usbr.gov/mp/arwec/facts-nimbus-dam-powerplant.html Last Updated April 2017 and Accessed November 2019.

USBR. 2017b. About the Central Valley Project. Available at https://www.usbr.gov/mp/cvp/about-cvp.html. Last Updated April 2017 and Accessed November 2019.

US Congress. 1940. An Act To authorize the American River Basin development, California, for irrigation and reclamation, and for other purposes. Available at: https://www.loc.gov/law/help/statutes-at-large/81st-congress/session-1/c81s1ch690.pdf [Accessed October 2019].

US Congress. 1968. An act to provide for a National Wild and Scenic Rivers System, and for other purposes. Available at: https://www.rivers.gov/documents/act/complete-act.pdf [Accessed October 2019].

US Department of the Interior. 1980. Final Environmental Impact Statement: Proposed Designation of Five California Rivers in the National Wild and Scenic Rivers System. Available at: https://searchworks.stanford.edu/view/3869216 [Accessed October 2019].

US Fish and Wildlife Service (USFWS). 1992. Shaded Riverine Aquatic Cover of the Sacramento River System: Classification as Resource Category 1 Under the FWS Mitigation Policy. Available at: http://www.deltarevision.com/Issues/Fish/dsm/riverine-aquatic-cover.pdf [Accessed October 2019].

USGS. 2019. Streamstats. Available at: https://streamstats.usgs.gov/ss/ [Accessed October 2019].

Vigars. 2016. Buried Beneath the Legislation It Gave Rise to: The Significance of Woodruff v. North Bloomfield Gravel Mining Co. Available at: https://lawdigitalcommons.bc.edu/ealr/vol43/iss1/10/ [Accessed October 2019].

Water Forum. 2006. Lower American River Flow Management Standard. Available at: http://www.waterforum.org/wp-content/uploads/2014/11/2006-Flow-Management-Standard.pdf [Accessed October 2019].

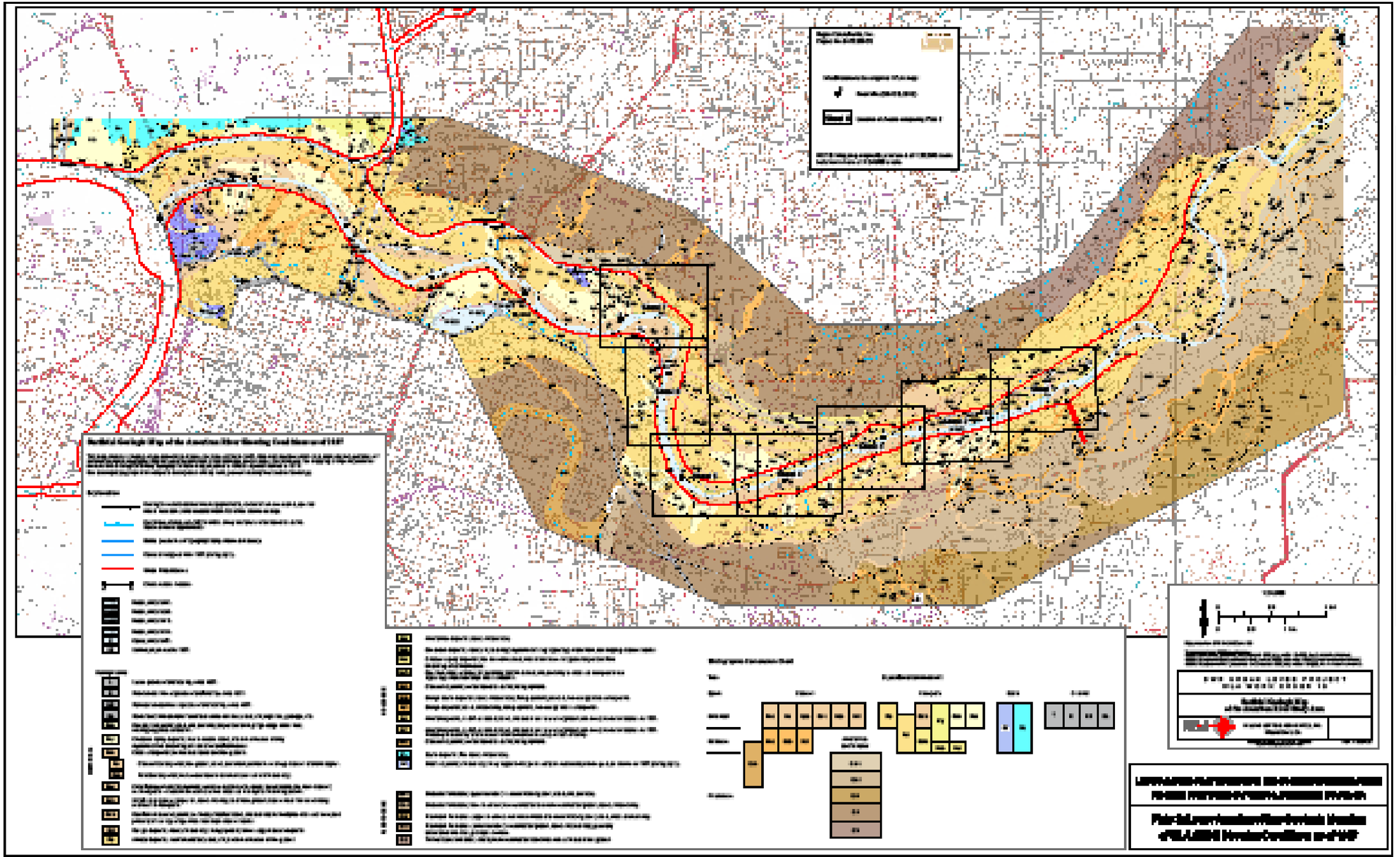
Water Forum. 2015. The Lower American River Modified Flow Management Standard: A Drought Buffer for the Environment and Local Water Supplies. Available at: https://www.waterforum.org/the-river/flow-management-standard/ [Accessed October 2019].

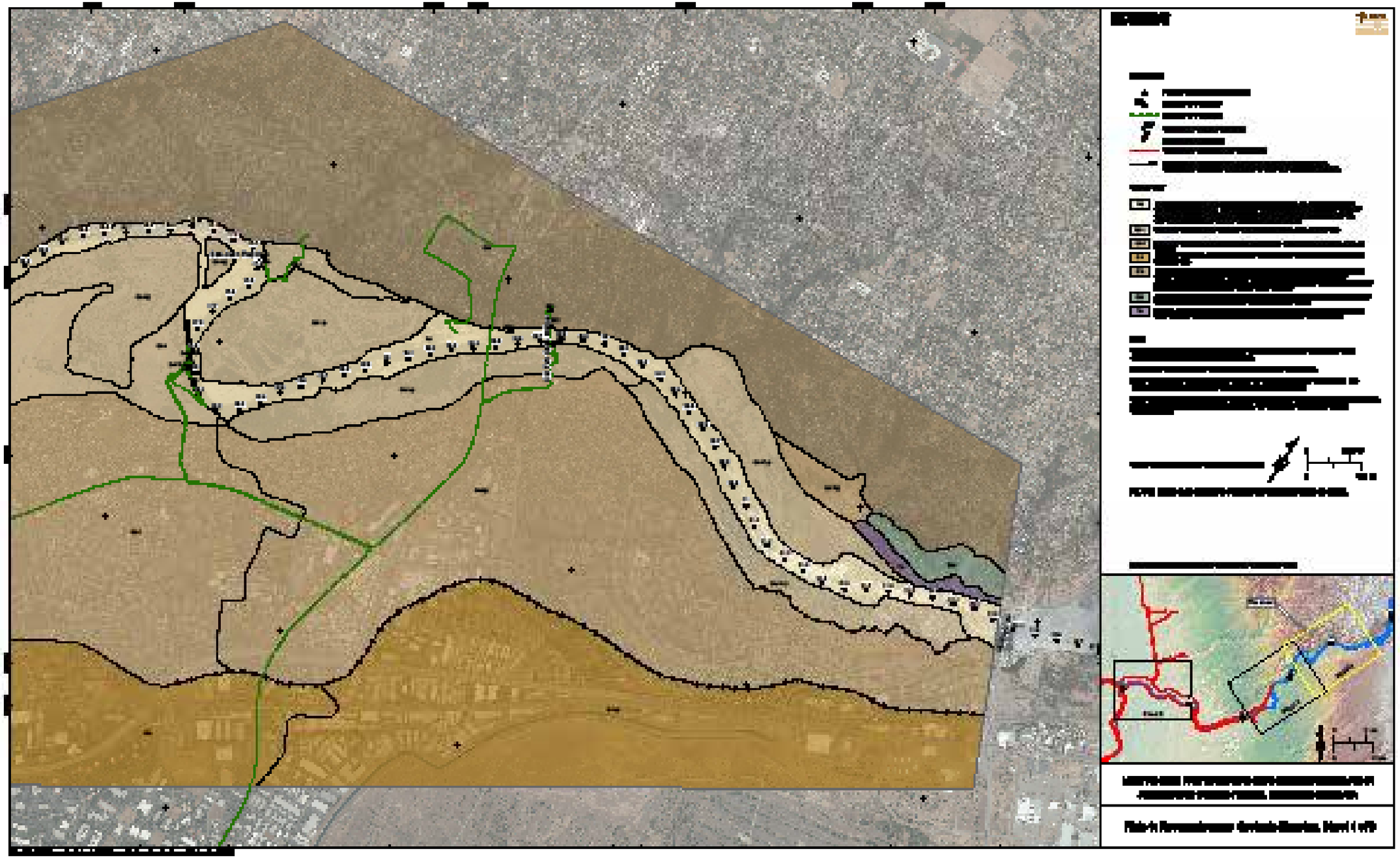
Watson. 1985. Assessment of Channel and Riparian Vegetation Conditions, Lower American River, California. September 1985.

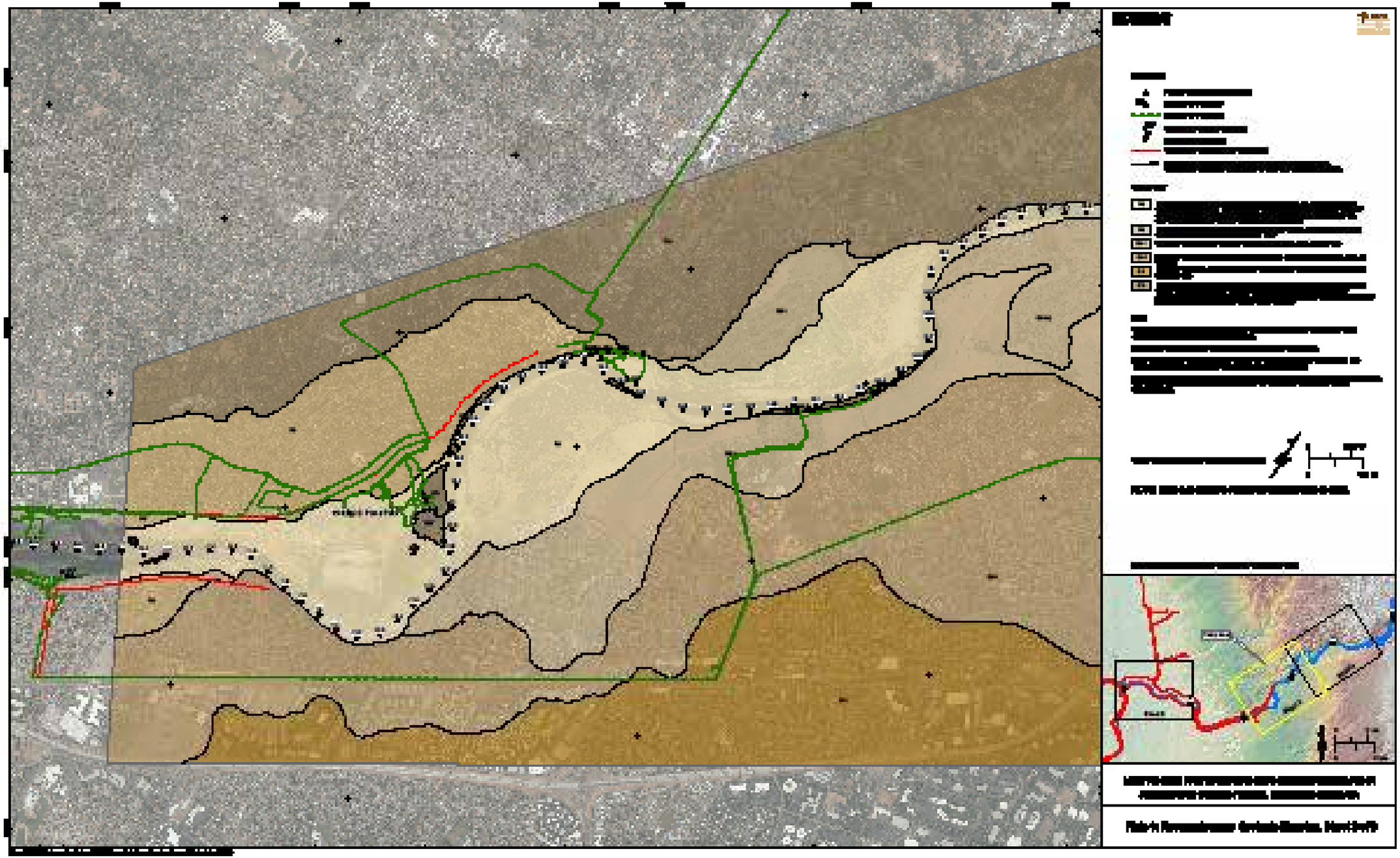
Watson. 2019. LAR Leveed Reach: Subreach-scale Channel Conditions, Processes, and Evolutionary Trends; — Subreaches 1, 3, and 4 —. [Accessed October 2019].

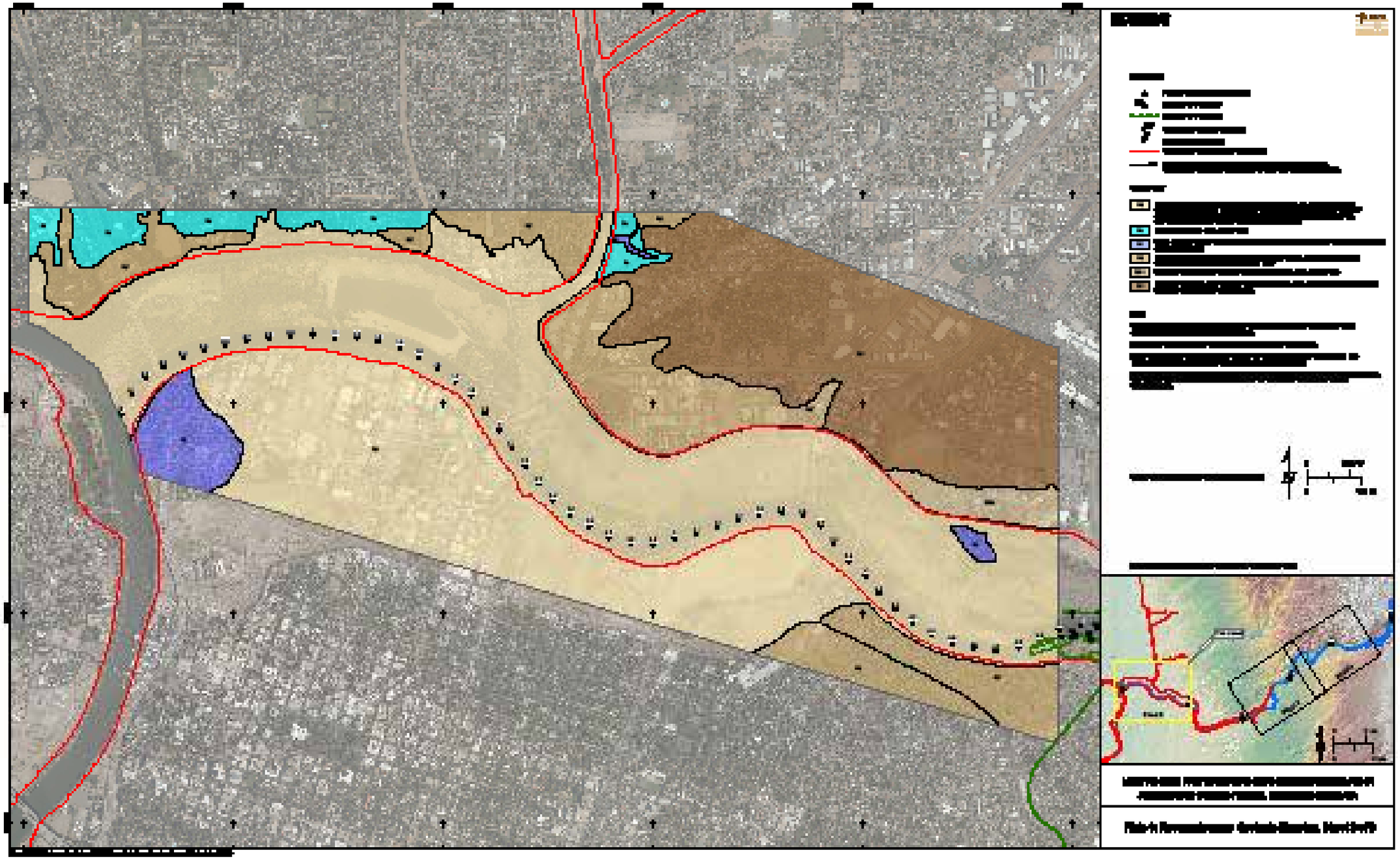
Whitney. 1880. The Auriferous Gravels of the Sierra Nevada of California. Available at: https://theminingalliance.com/research/historical/reports/The_Auriferous_Gravels_of_the_Sierra_Nev_Whitney.pdf [Accessed October 2019].

Appendix 1
Geologic Mapping Figures 2a, b-d. (Fugro 2012).

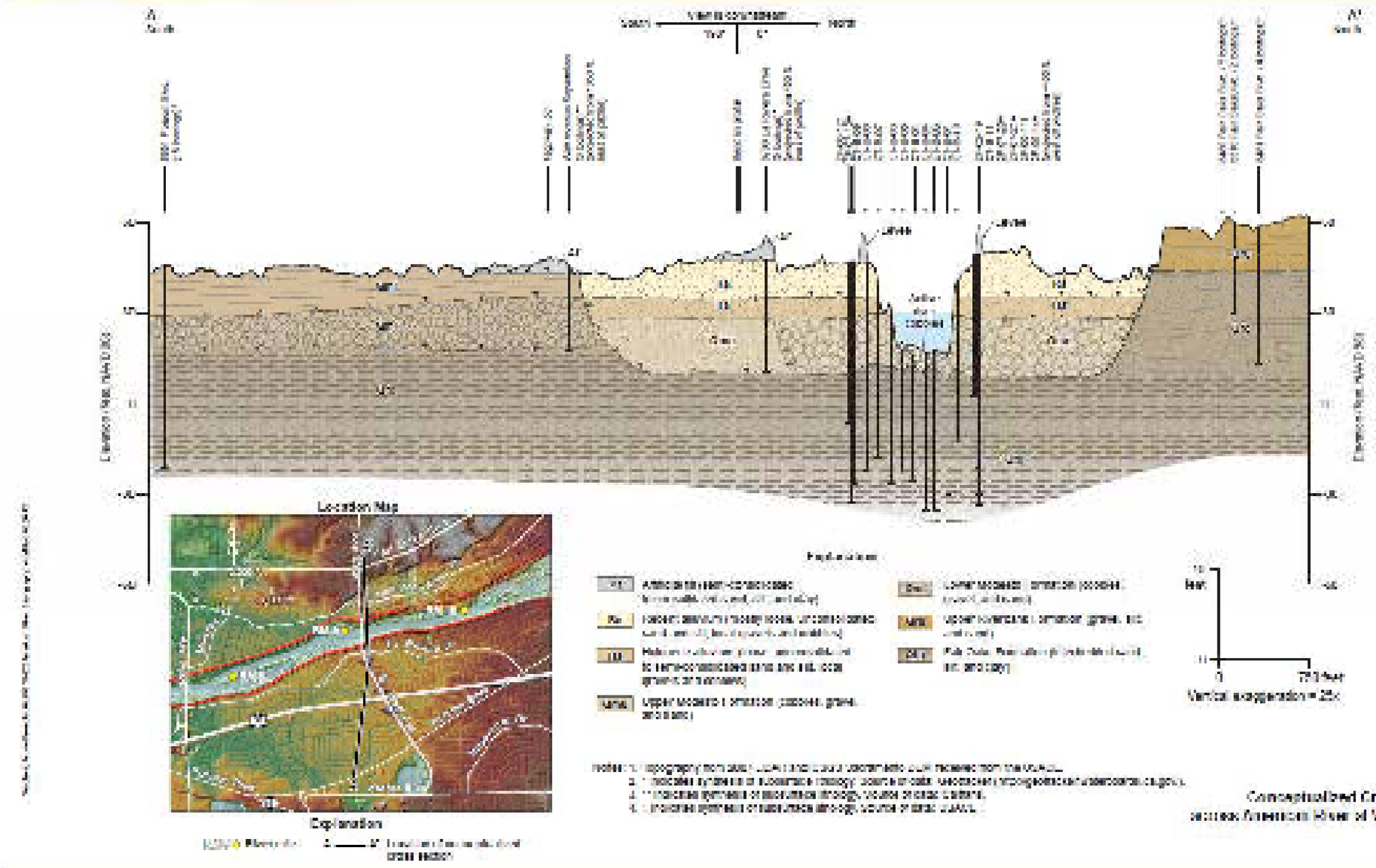






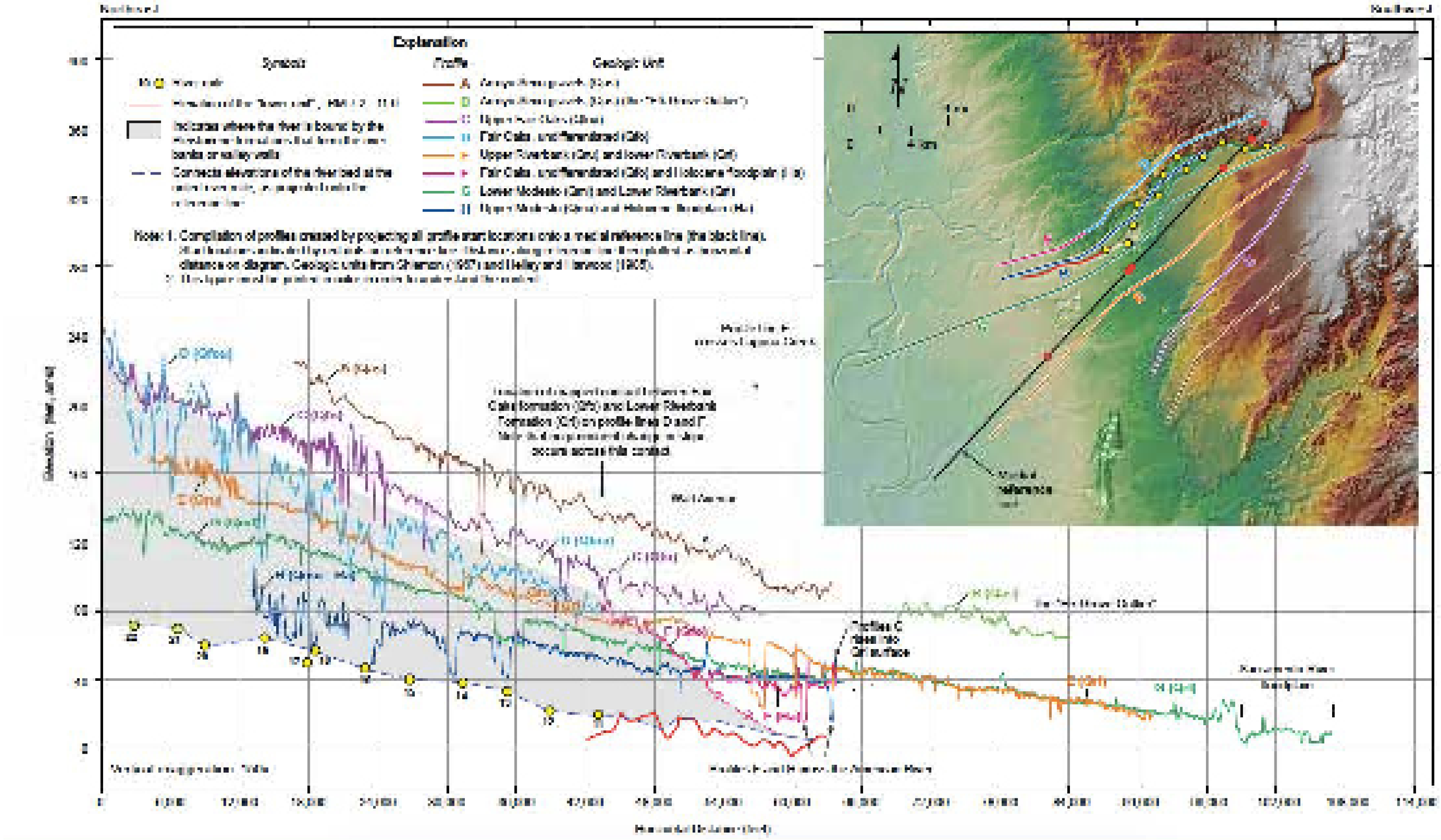


# Appendix 2
# LAR Stratigraphy (Fugro 2012)

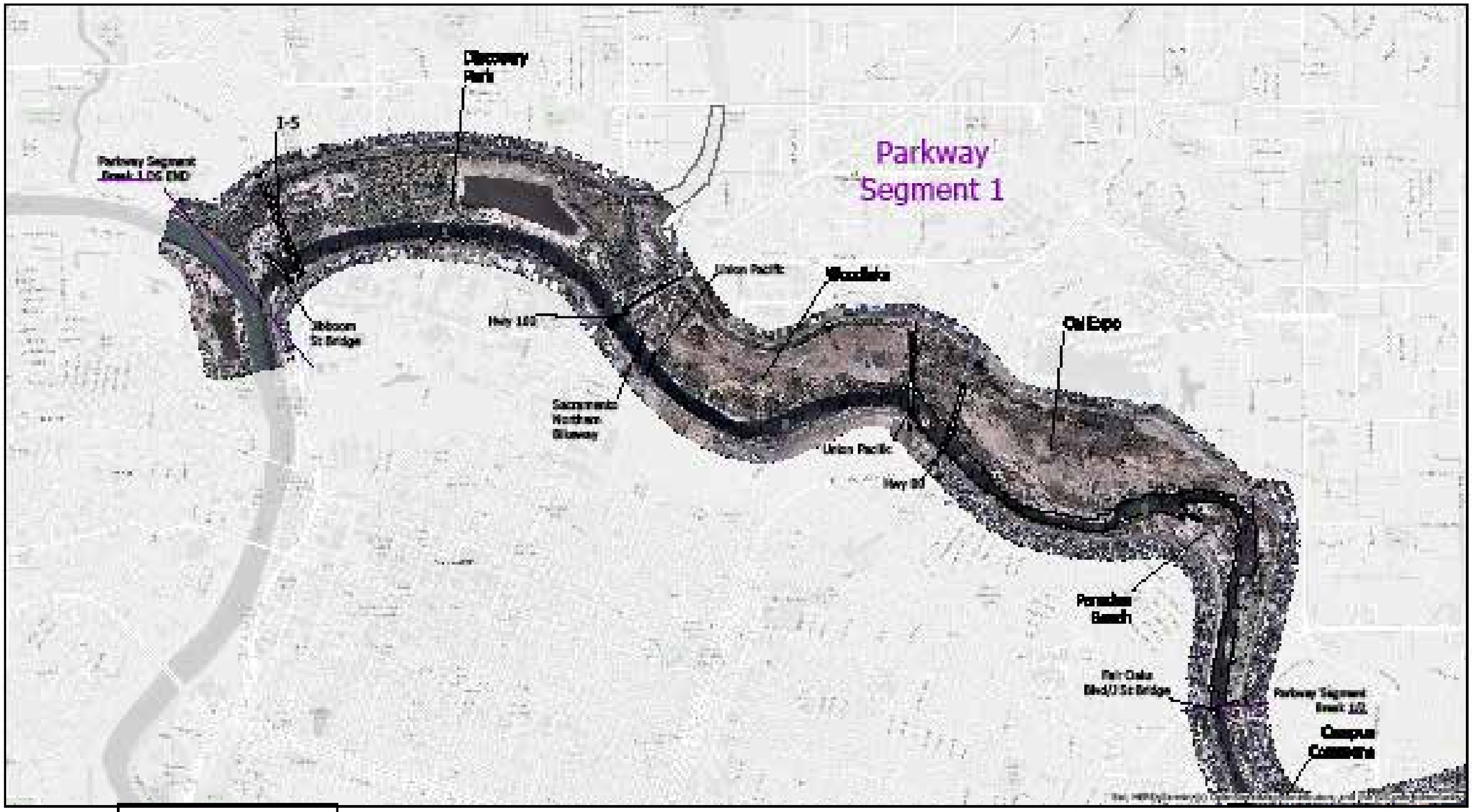


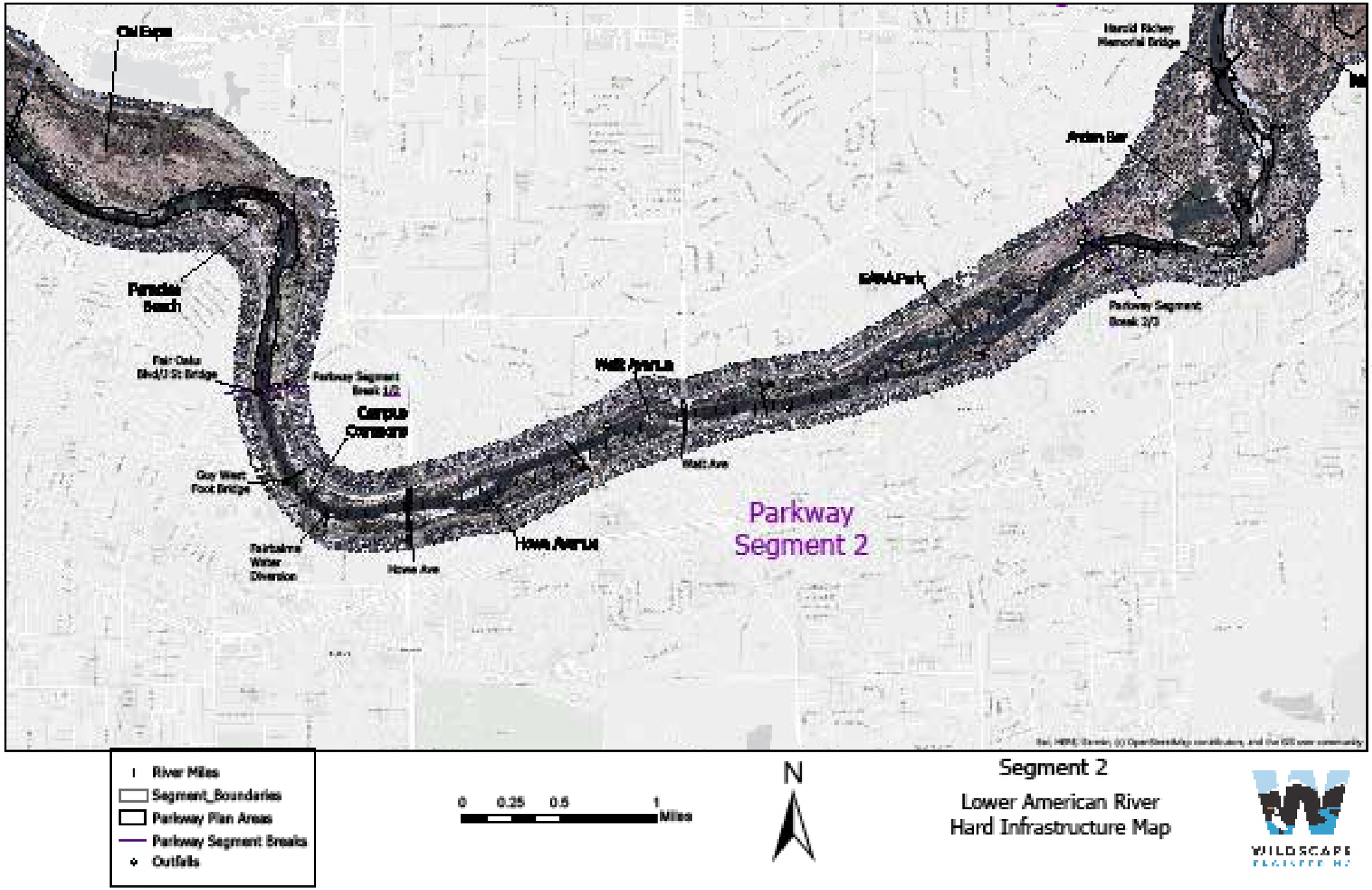

Conceptualized Cross Section
across American River at Watt Avenue

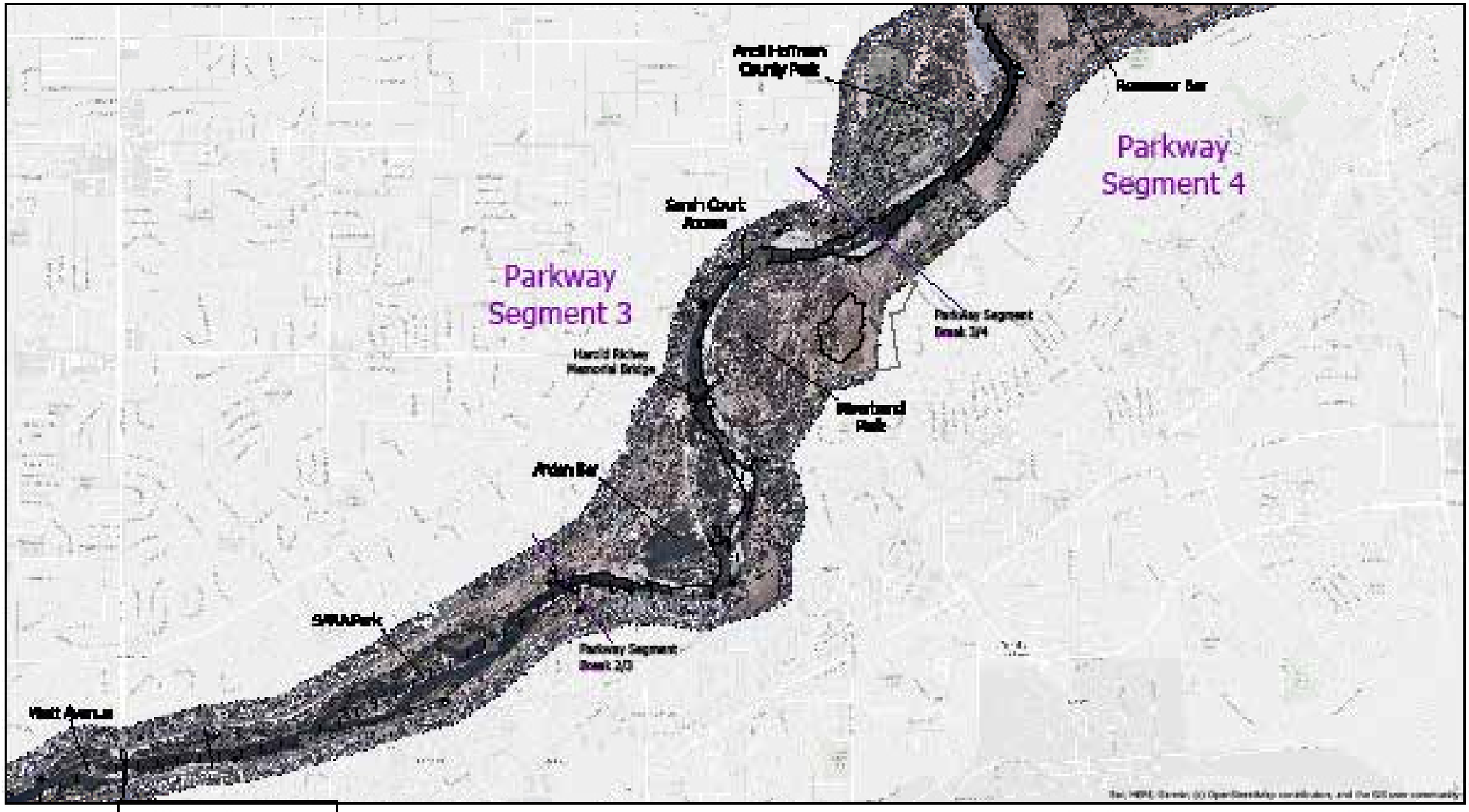
# Appendix 3
## Regional Surface Profiles (Fugro 2012)


Explanation
Symbols
Profile
Geologic Unit
Note: 1. Compilation of profiles created by projecting all profile start locations onto a medial reference line (the black line).
Profiles C
Gri surface

# Appendix 4
# LAR Infrastructure Encroachment

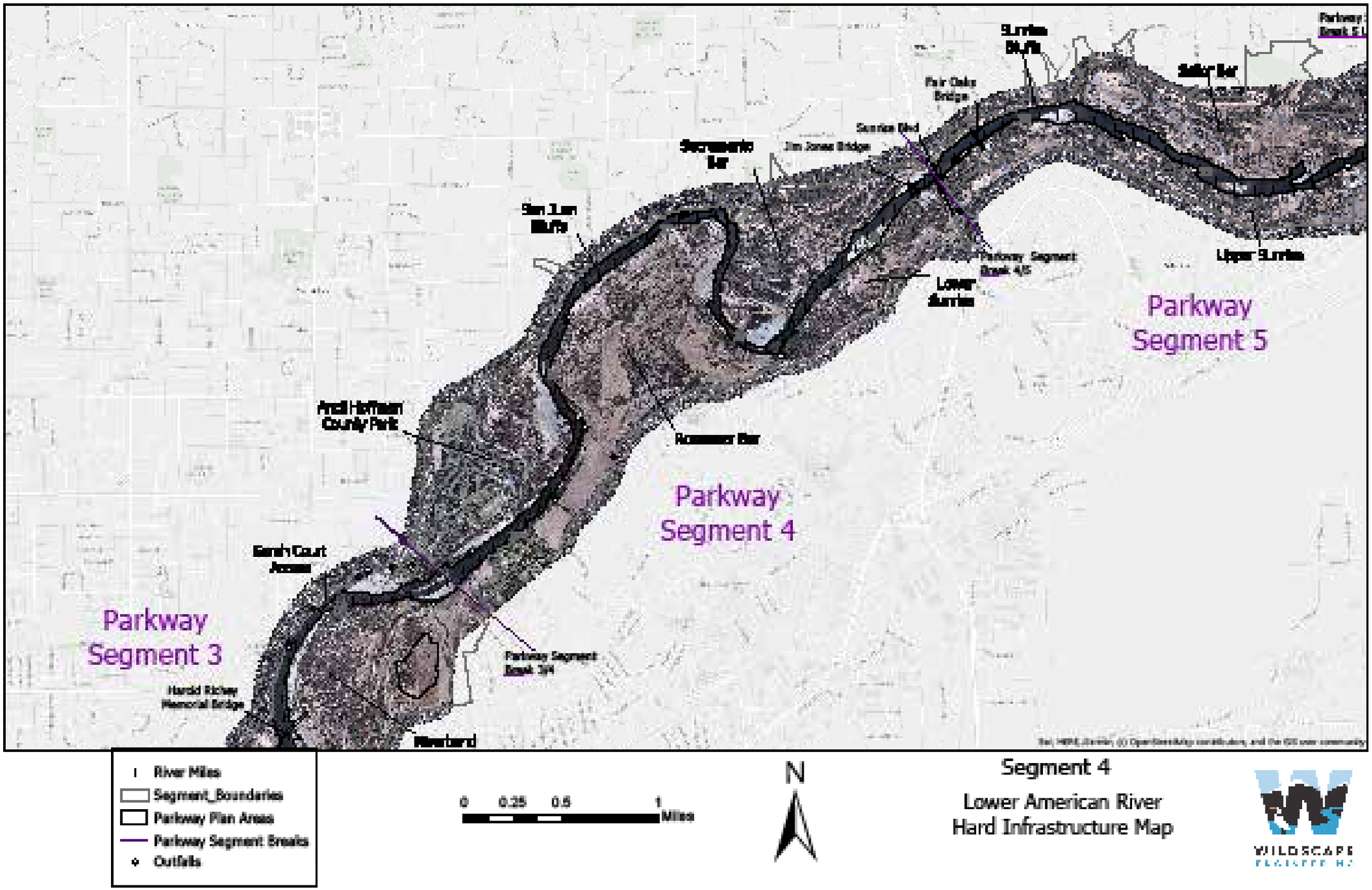

Parkway
Segment 1
Discovery
Park
I-5
Parkway Segment
Break LOC END
Bloom
St Bridge
Hwy 160
Union Pacific
Woodlake
Old Expo
Sacramento
Northern
Bikeway
Union Pacific
Hwy 50
Paradise
Beach
Rio Oso
Blvd/U St Bridge
Parkway Segment
Break 1.02
Campus
Commons
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
Outfalls
0 0.25 0.5 1
Miles
N
Segment 1
Lower American River
Hard Infrastructure Map
WILDSCAPE


Cal Expo
Harold Richey Memorial Bridge
Arden Bar
Paradise Beach
Fair Oaks Blvd/J St Bridge
Parkway Segment Break 1/2
Campus Commons
Guy West Foot Bridge
Fairbairns Water Diversion
Howe Ave
Howe Avenue
Watt Avenue
Watt Ave
Parkway Segment Break 2/3
Parkway Segment 2
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
Outfalls
0 0.25 0.5 1 Miles
N
Segment 2
Lower American River
Hard Infrastructure Map
WILDSCAPE



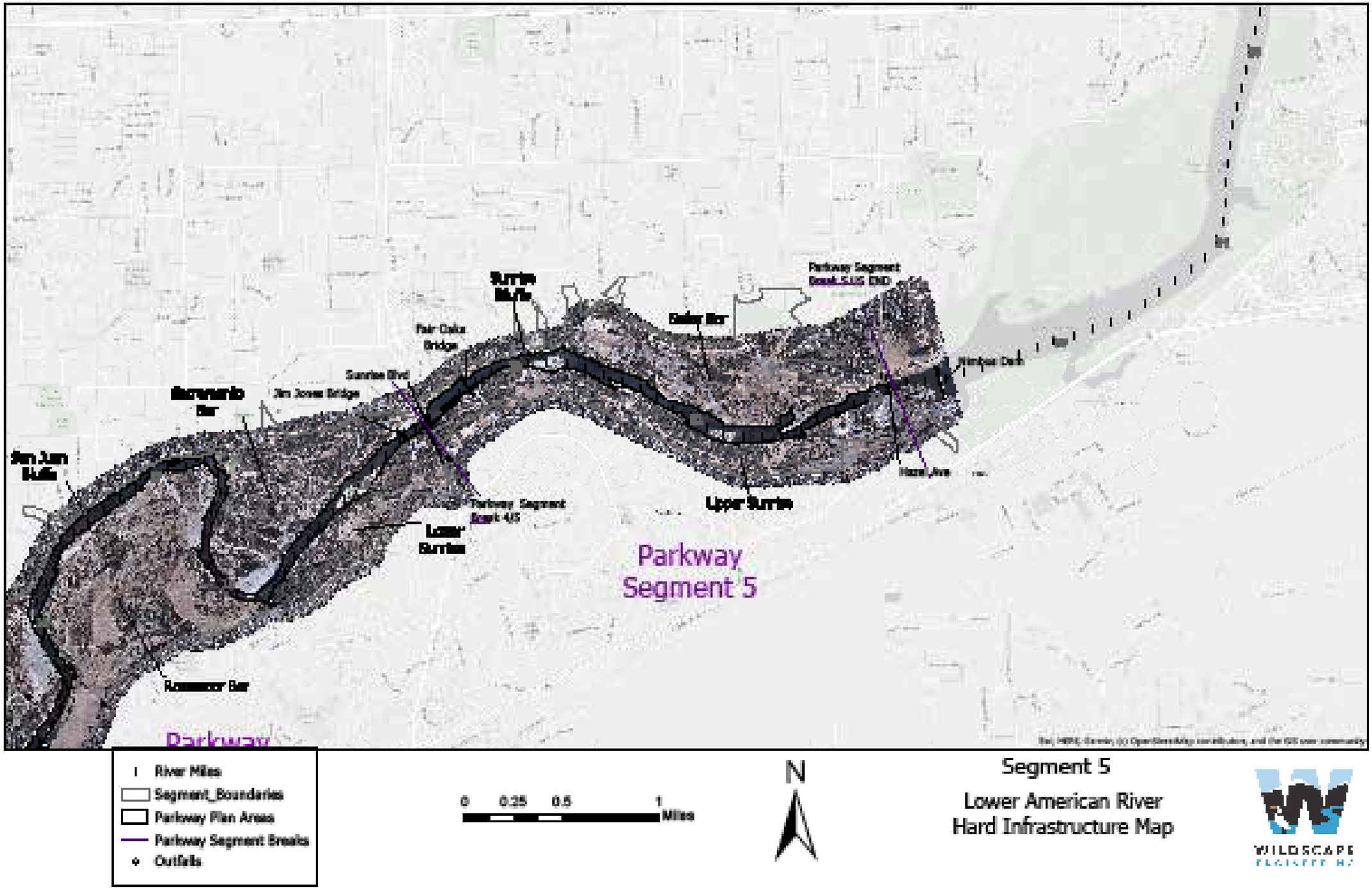

Segment 3

Lower American River
Hard Infrastructure Map

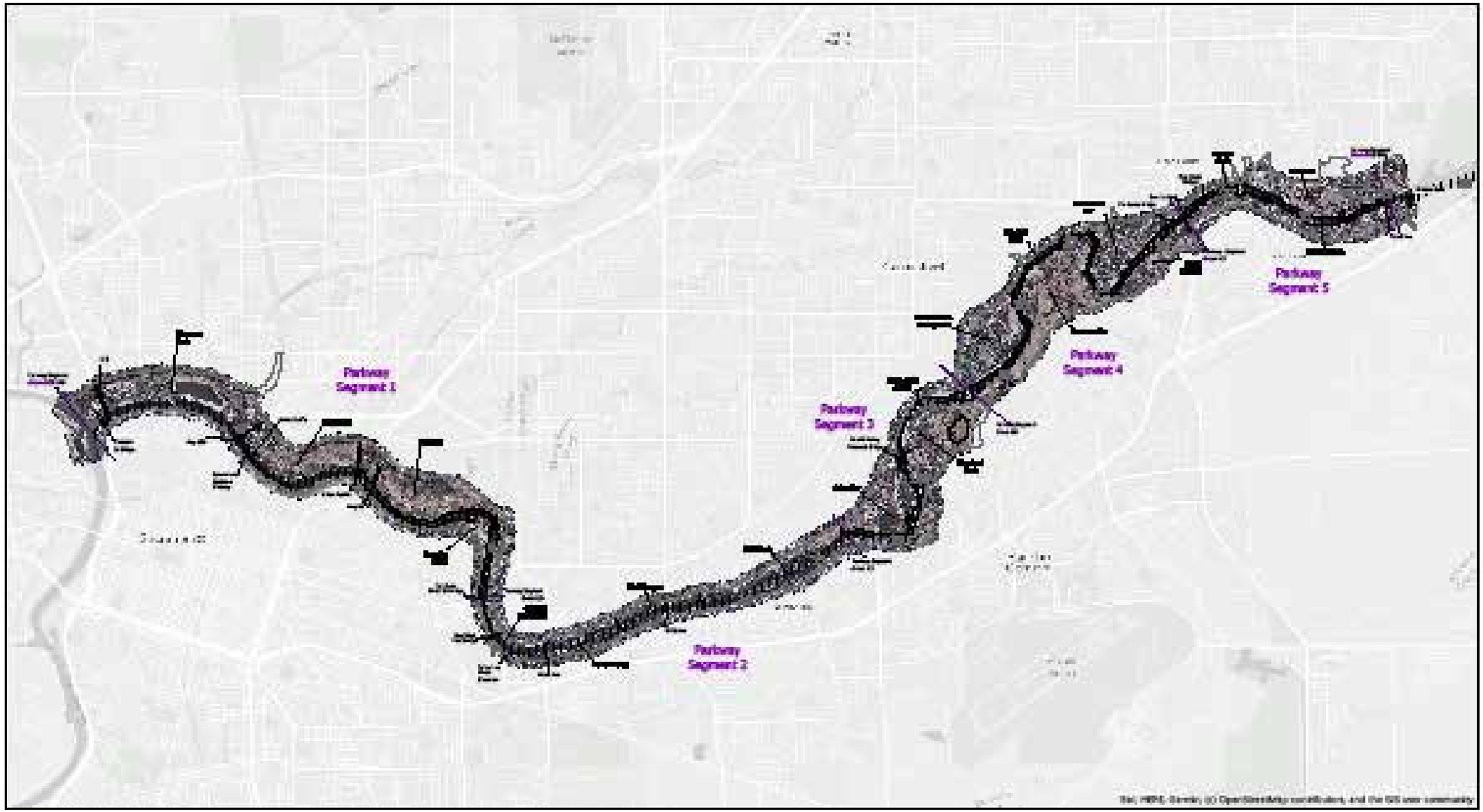



Segment 4

Lower American River
Hard Infrastructure Map


Parkway Segment Break 5.US END
Fair Oaks Bridge
Sunrise Blvd
Jim Jones Bridge
Parkway Segment Break 4/5
Upper Sunrise
Hazel Ave
Parkway Segment 5
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
Outfalls
0 0.25 0.5 1 Miles
N
Segment 5
Lower American River
Hard Infrastructure Map
WILDSCAPE

# Appendix 5
# Parkway Segments (Designated Geomorphic Reaches)




River Miles
Parkway Segment Breaks
Parkway Plan Areas

0 0.25 0.5 1 1.5 2 2.5 3 3.5 Miles

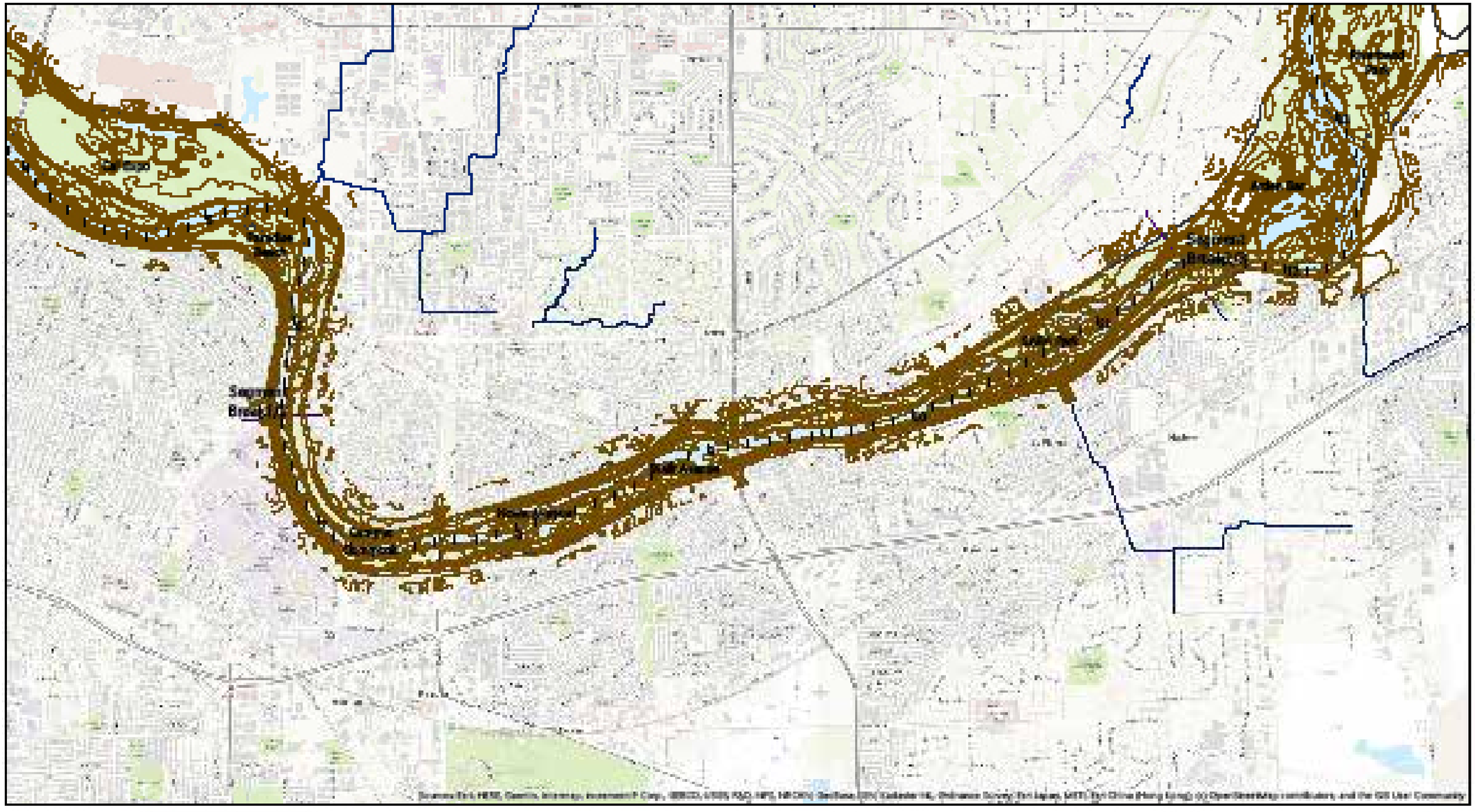
N

Lower American River
Parkway Segments Map

# Appendix 6
# Topographic Map

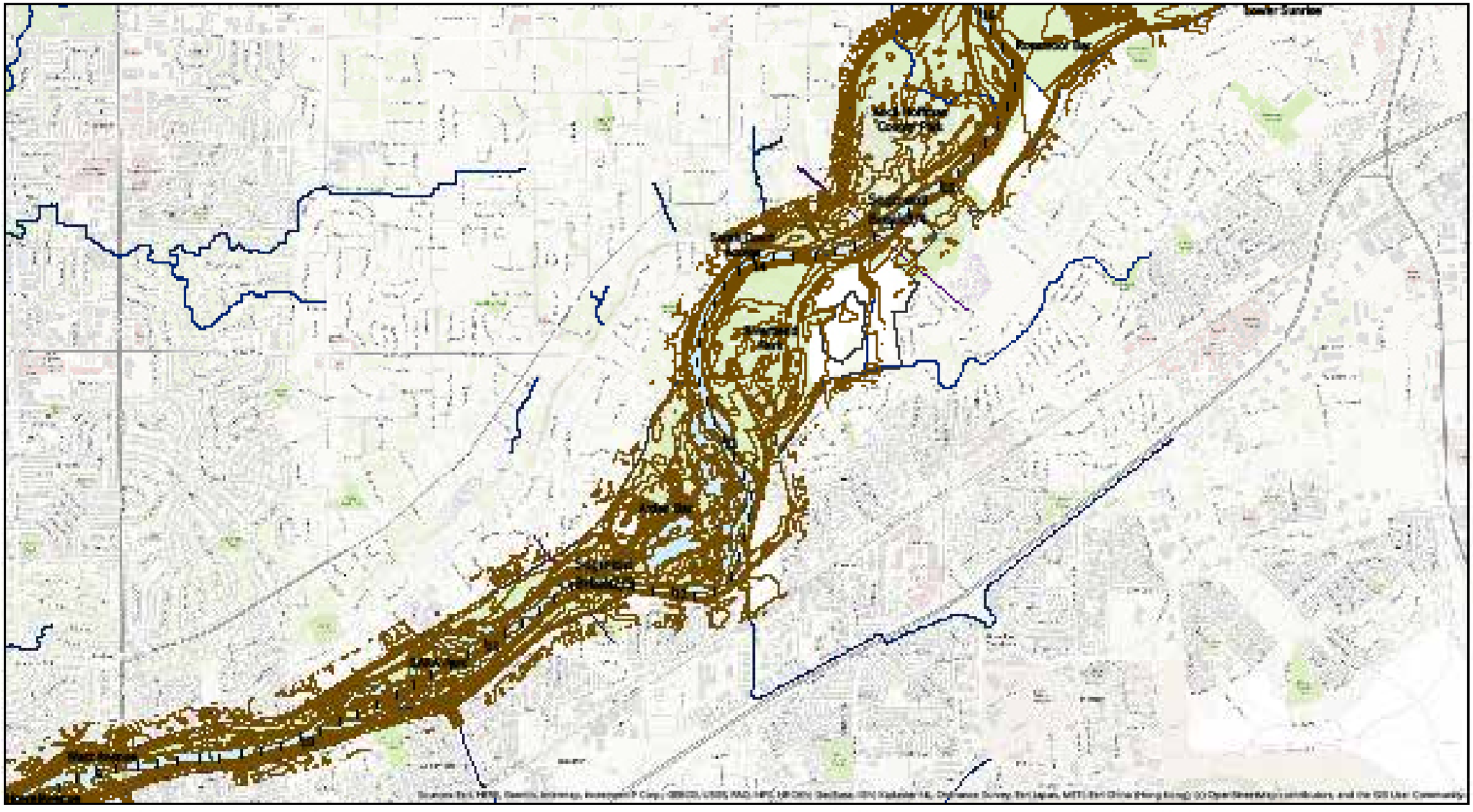
Segment 1

Lower American River
Topography Map



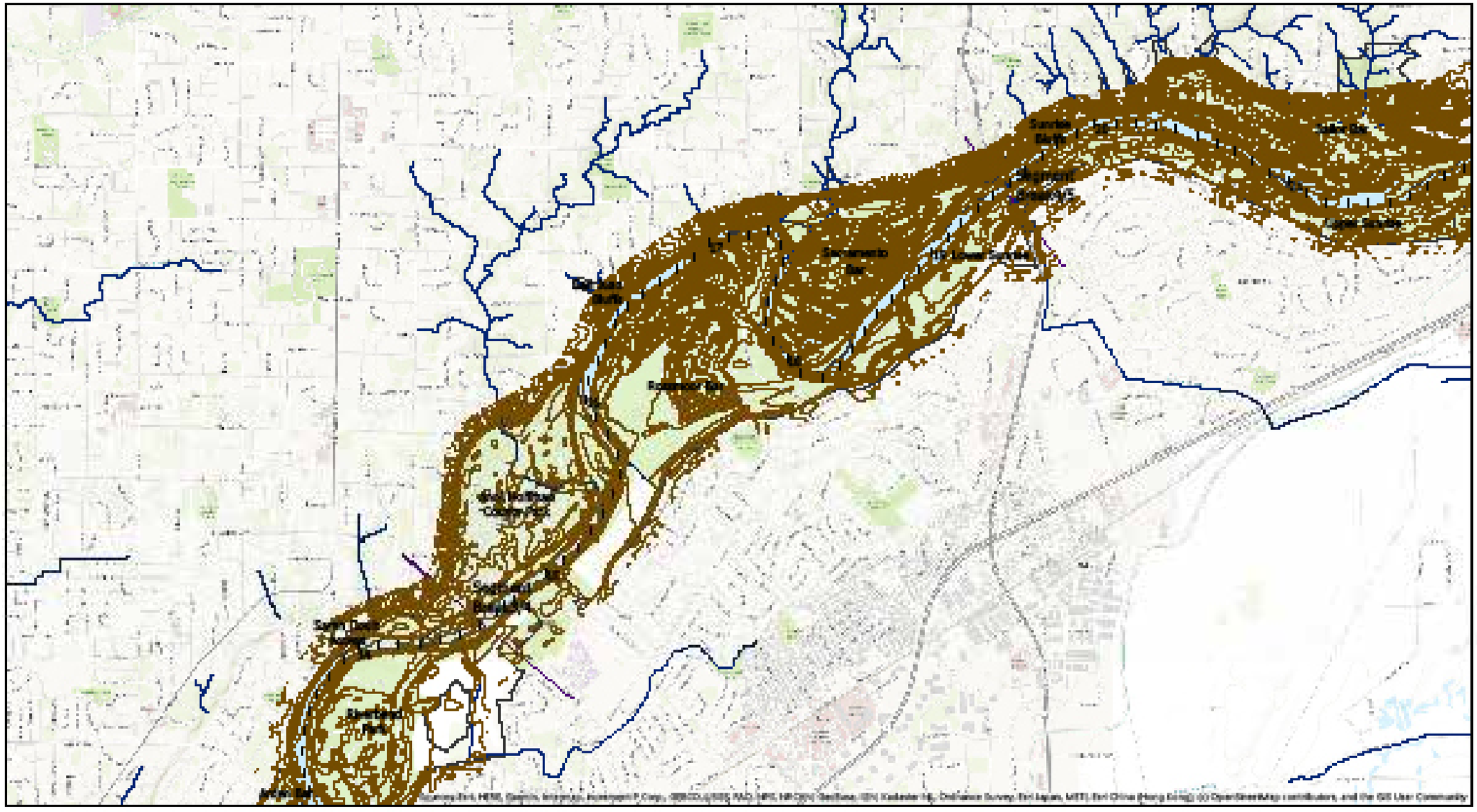

Segment 2

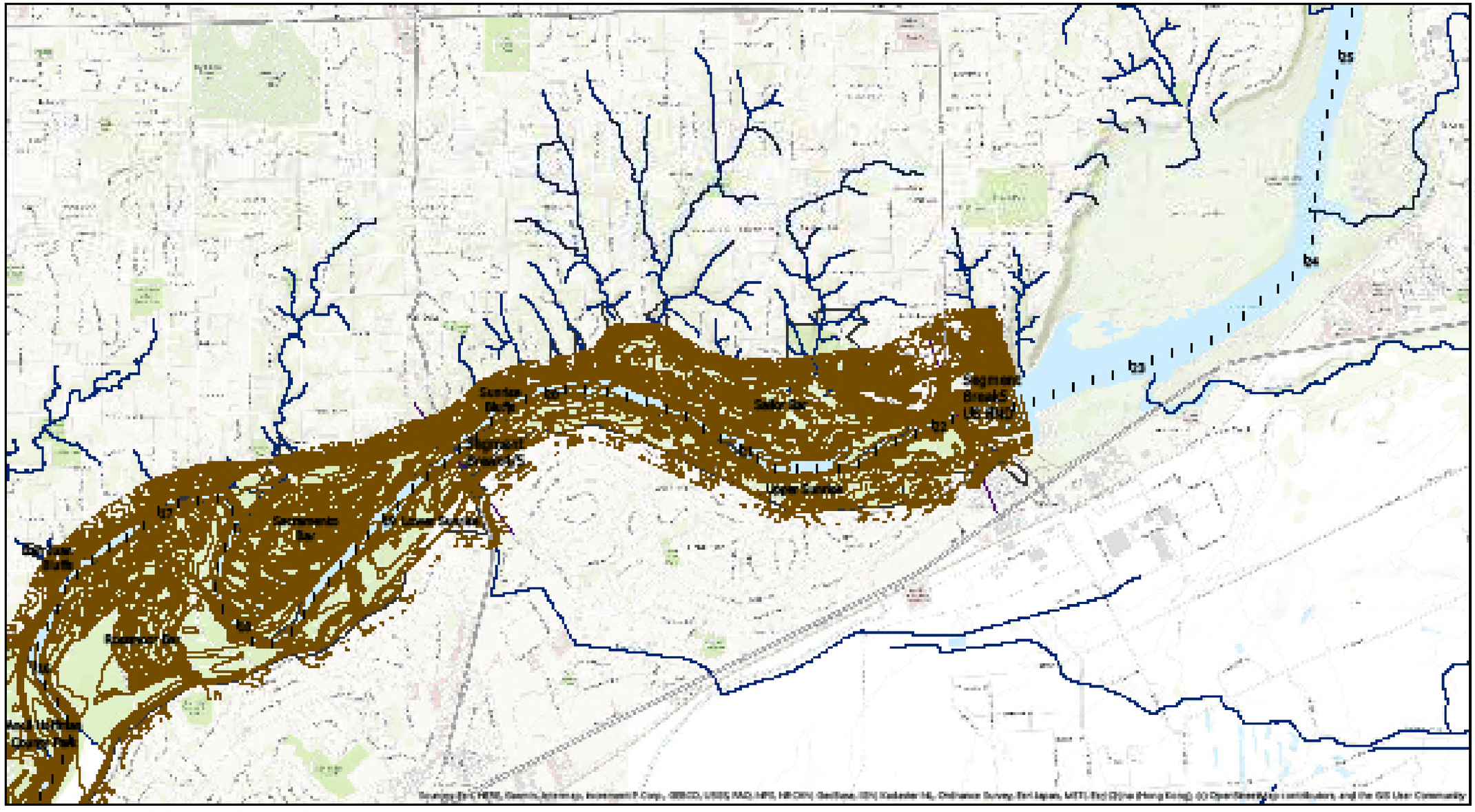
Lower American River
Topography Map




Segment 3

Lower American River
Topography Map


River Miles
Tributaries
Plan Area Boundary
Segment Breaks
5ft Contours
0
0.25
0.5
1
Miles
N
Segment 4
Lower American River
Topography Map
WILDSCAPE

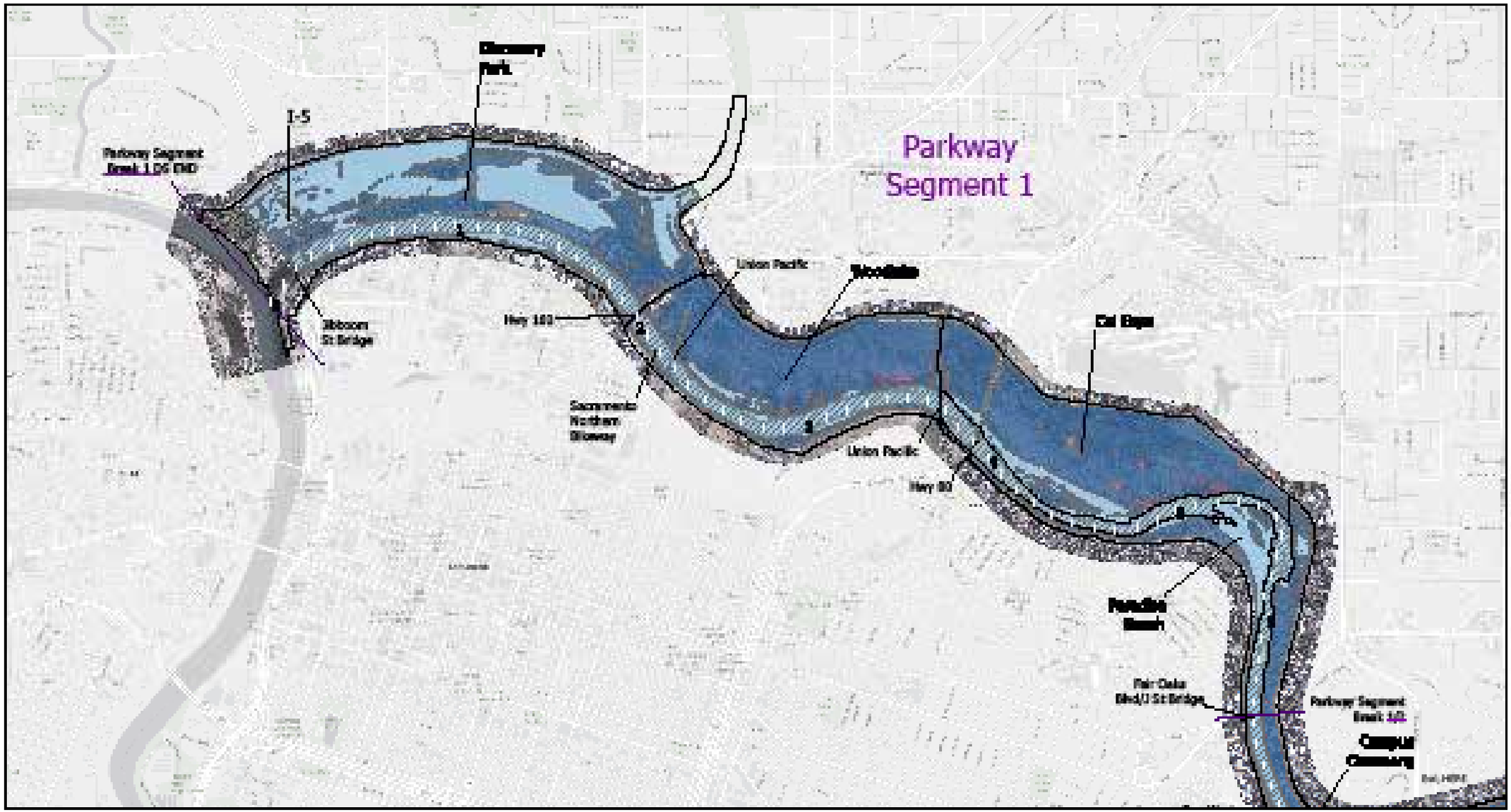


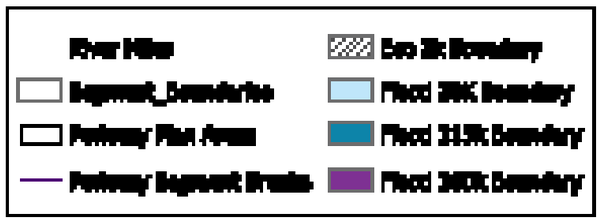

Segment 5

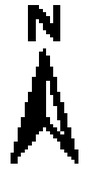
Lower American River
Topography Map

WILDSCAPE

# Appendix 7
# Inundation Areas

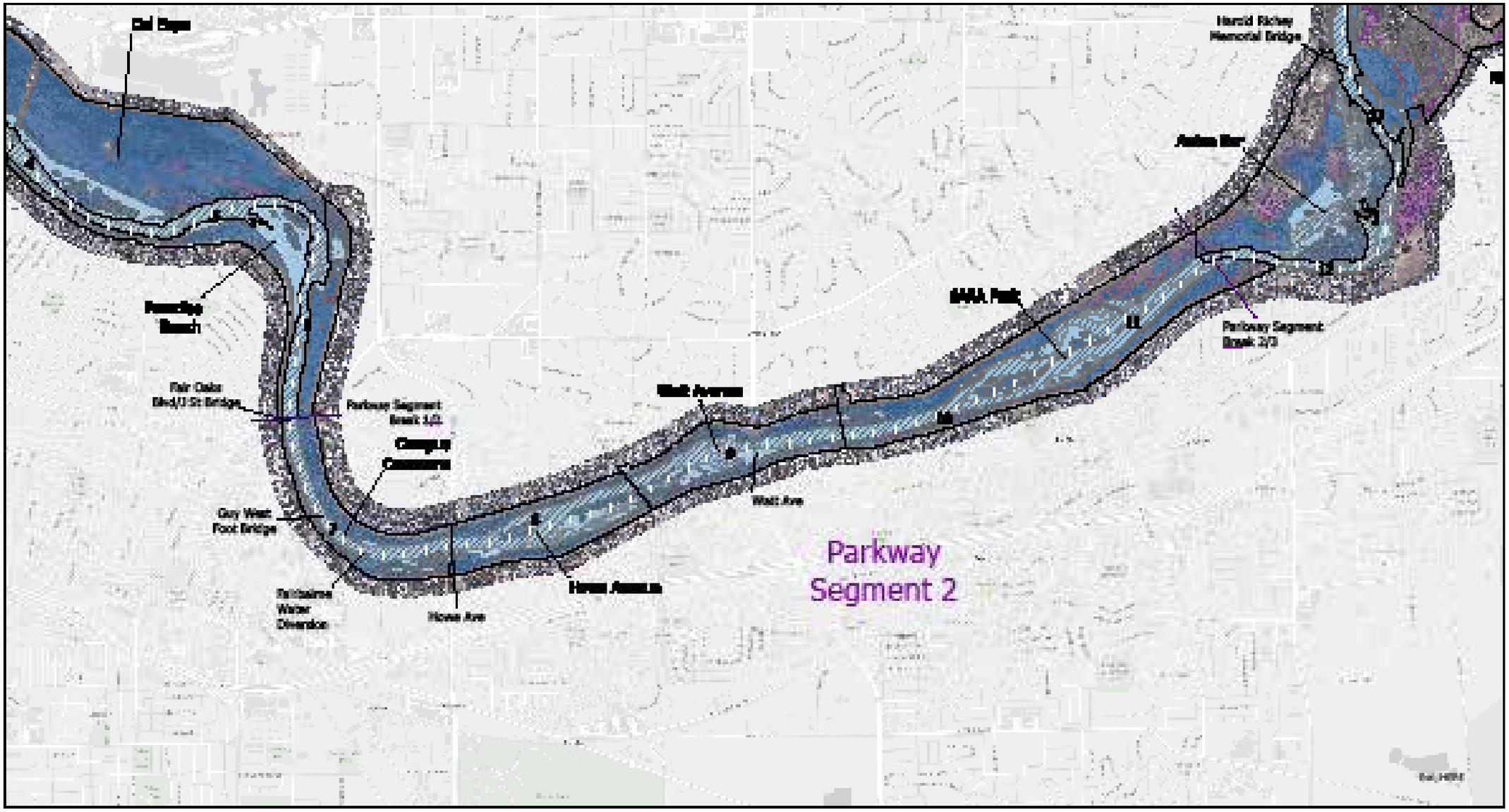




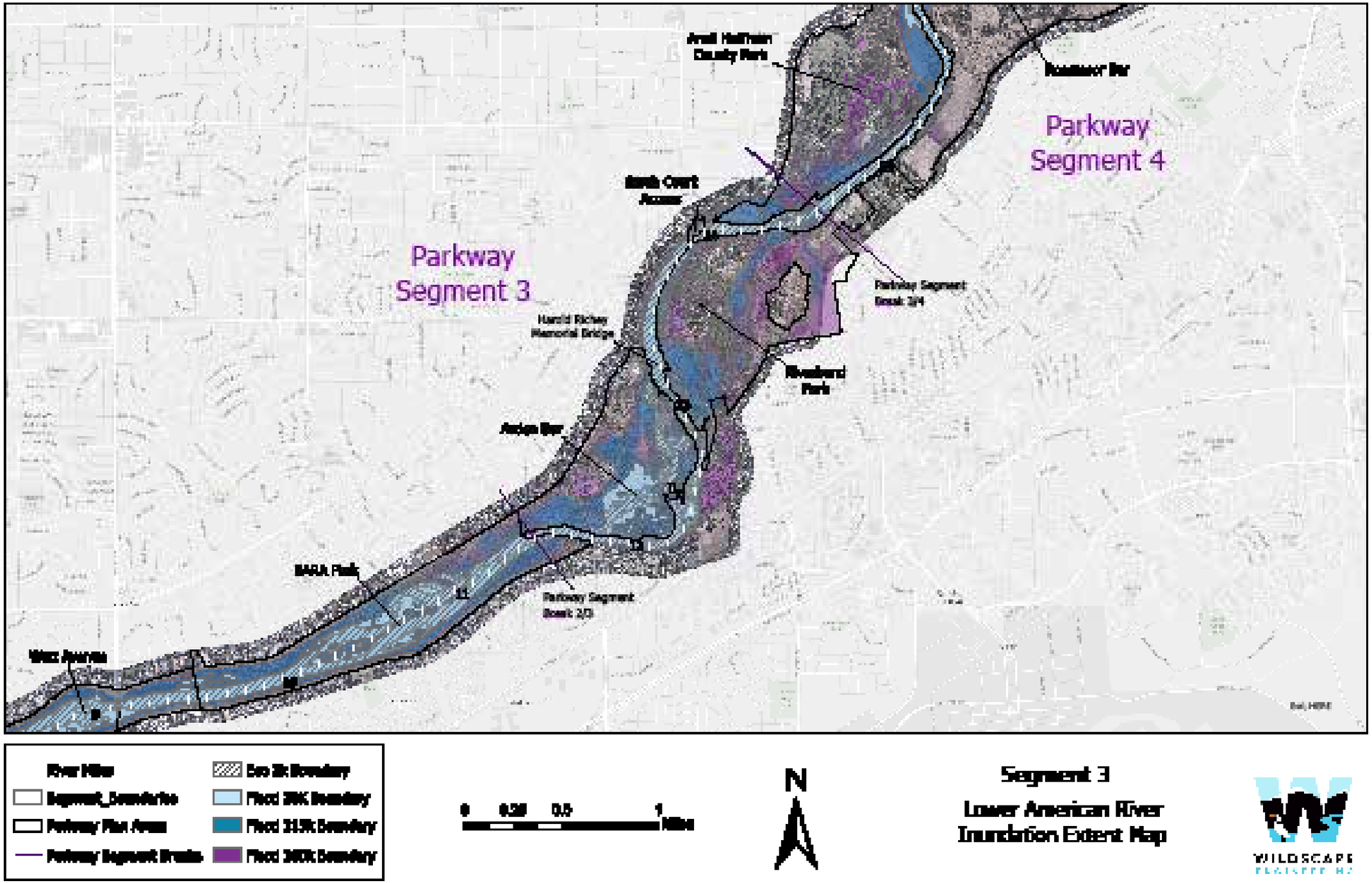

**Segment 1**

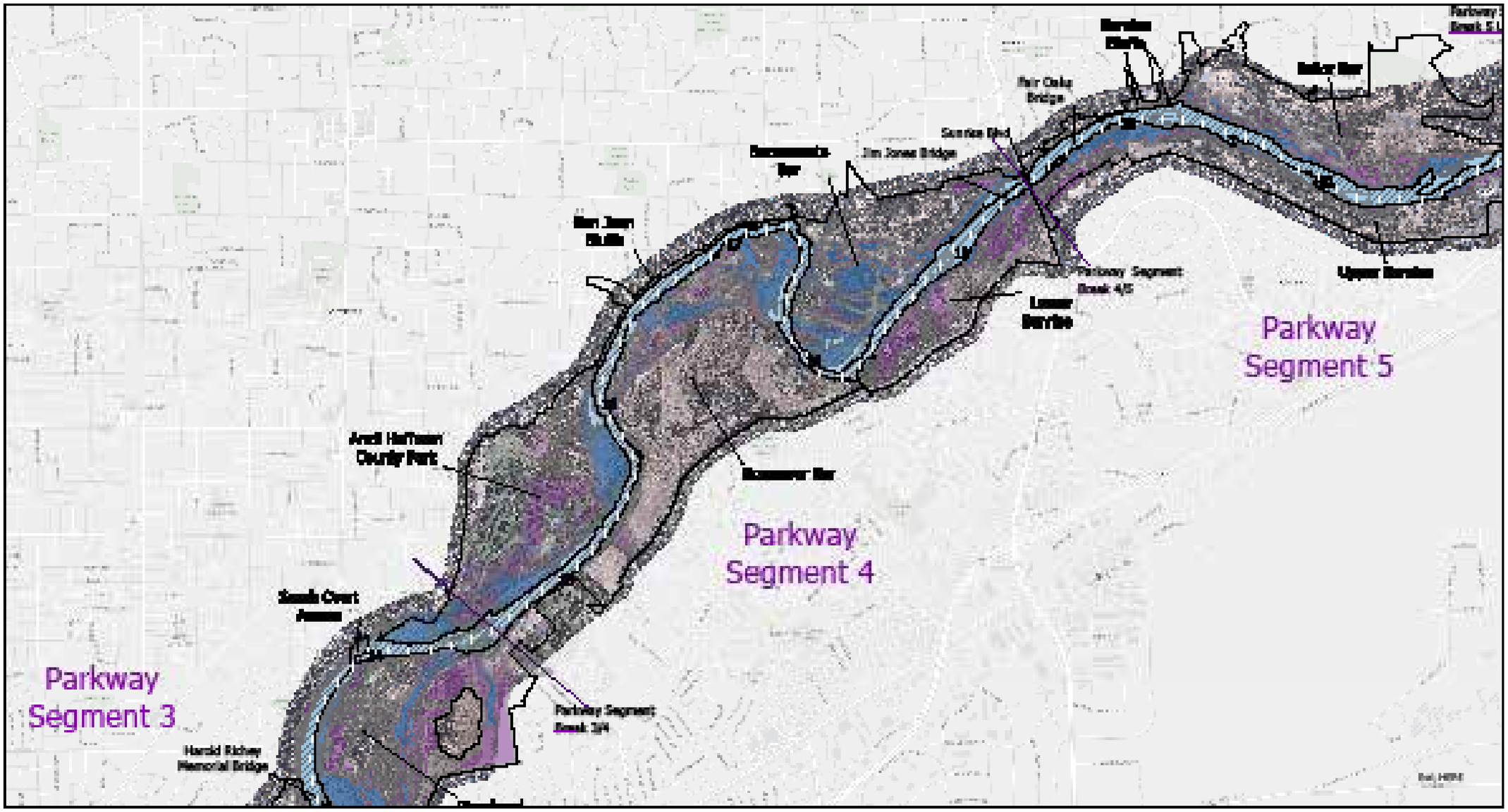
**Lower American River Inundation Extent Map**

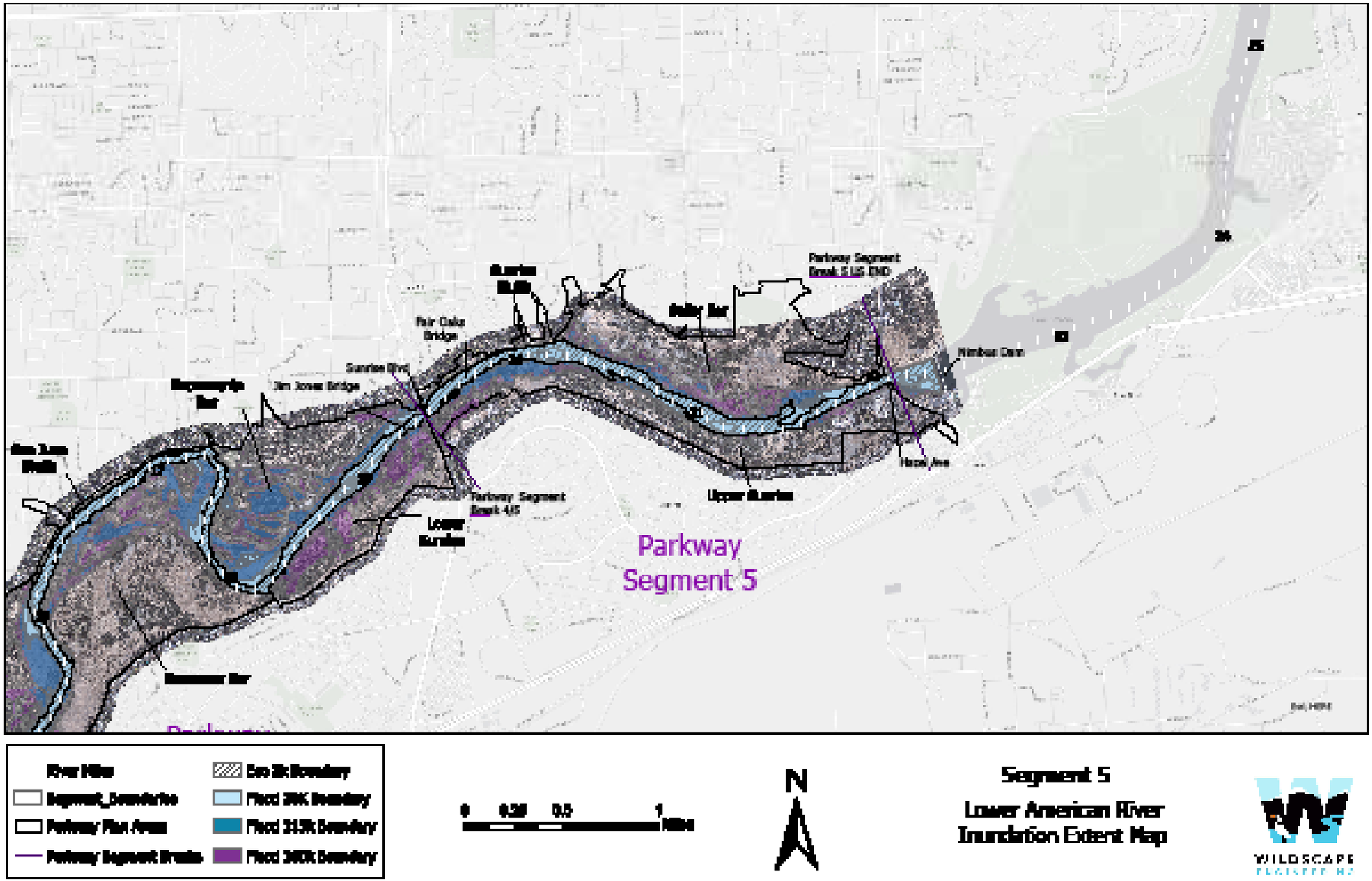



Segment 2

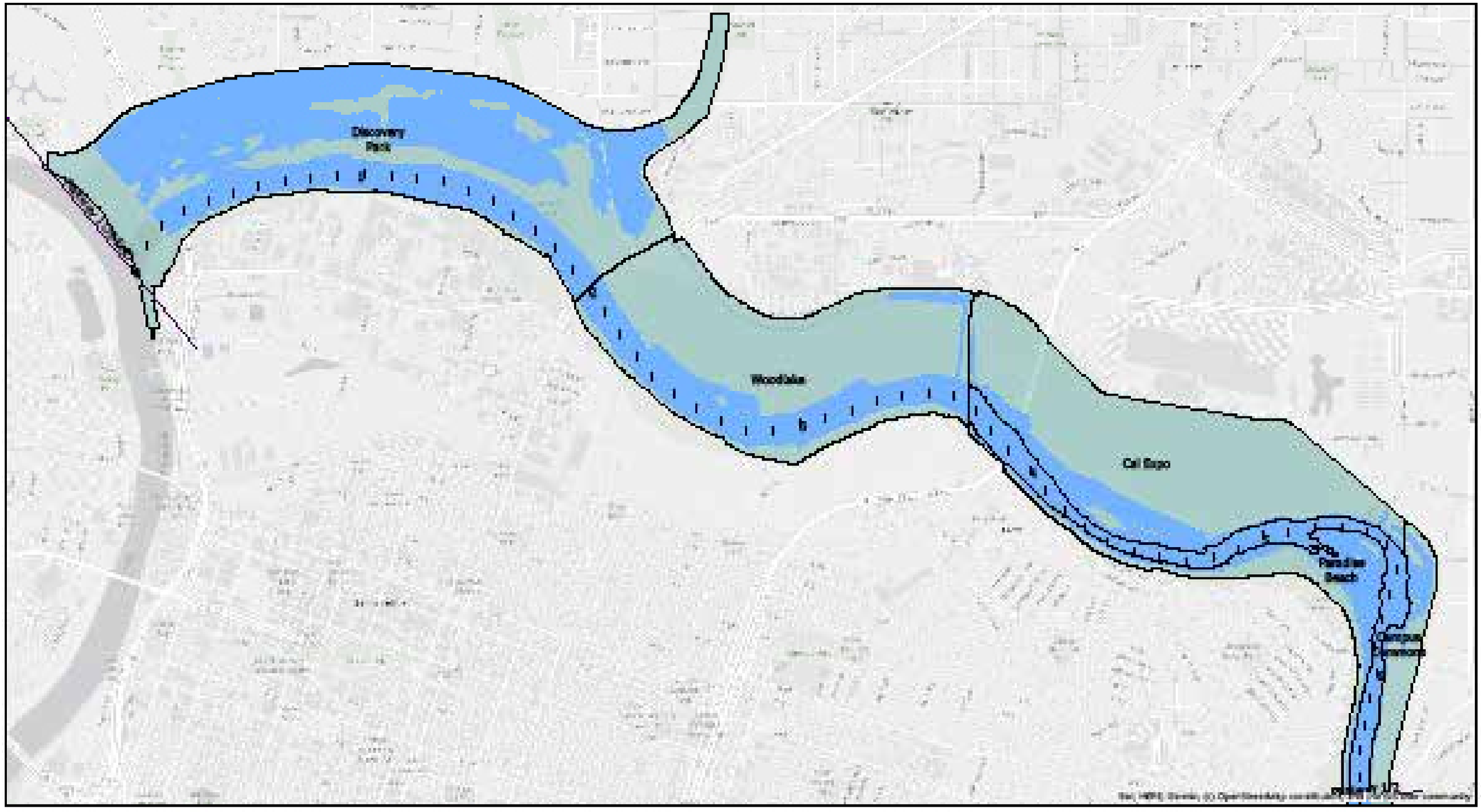
Lower American River
Inundation Extent Map


Parkway
Segment 4
Parkway
Segment 3
Parkway Segment
Break 3/4
Parkway Segment
Break 2/3
Harold Richey
Memorial Bridge
Arden Bar
BARA Park
Riverbend
Park
Roadmoor Bar
Arnold Halfman
County Park
Sixth Court
Access
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
Eco 2k Boundary
Flood 30K Boundary
Flood 315k Boundary
Flood 360k Boundary
0
0.25
0.5
1
Miles
N
Segment 3
Lower American River
Inundation Extent Map
WILDSCAPE


Parkway
Segment 5
Parkway
Segment 4
Parkway
Segment 3
Parkway Segment
Break 4/5
Parkway Segment
Break 3/4
Jim Jones Bridge
Sunrise Blvd
Fair Oaks
Bridge
Lower
Sunrise
Upper Sunrise
Harold Richey
Memorial Bridge
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
100-Yr Boundary
Flood 200K Boundary
Flood 315K Boundary
Flood 500K Boundary
0
0.25
0.5
1
Miles
N
Segment 4
Lower American River
Inundation Extent Map
WILDSCAPE


Parkway Segment
Break 5 US END
Fair Oaks
Bridge
Sunrise Blvd
Jim Jones Bridge
Nimbus Dam
Hazel Ave
Parkway Segment
Break 4/5
Parkway
Segment 5
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
Eco 2k Boundary
Flood 30K Boundary
Flood 315k Boundary
Flood 300k Boundary
0
0.25
0.5
1
Miles
N
Segment 5
Lower American River
Inundation Extent Map
WILDSCAPE

# Appendix 8
# Functional Geomorphic Surfaces in the Parkway



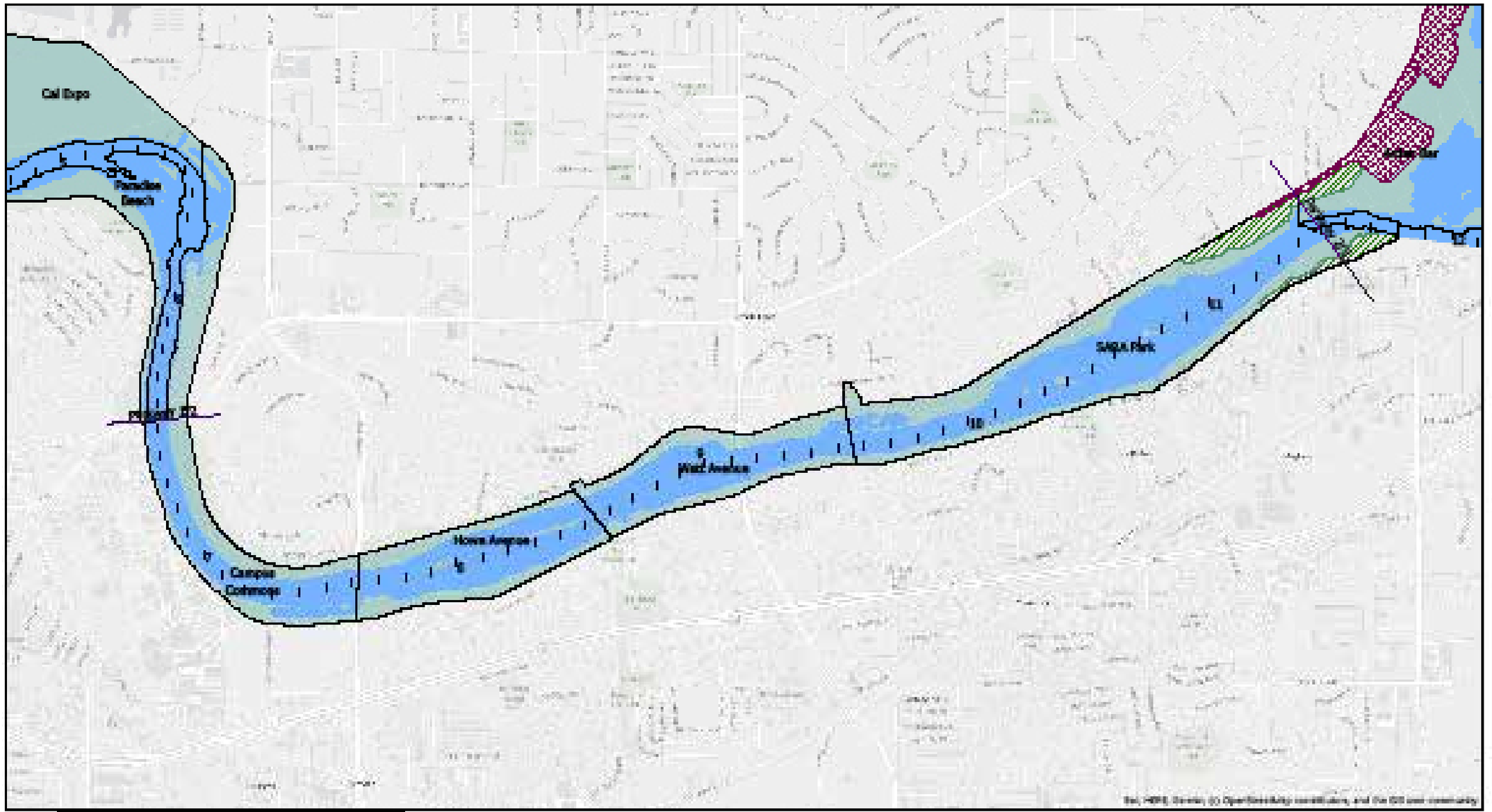

River Miles
Segment Breaks
Parkway Plan Areas
Active Channel
Floodplain
Terrace(s)
Bluffs and Hills

0 0.25 0.5 1 Miles

N

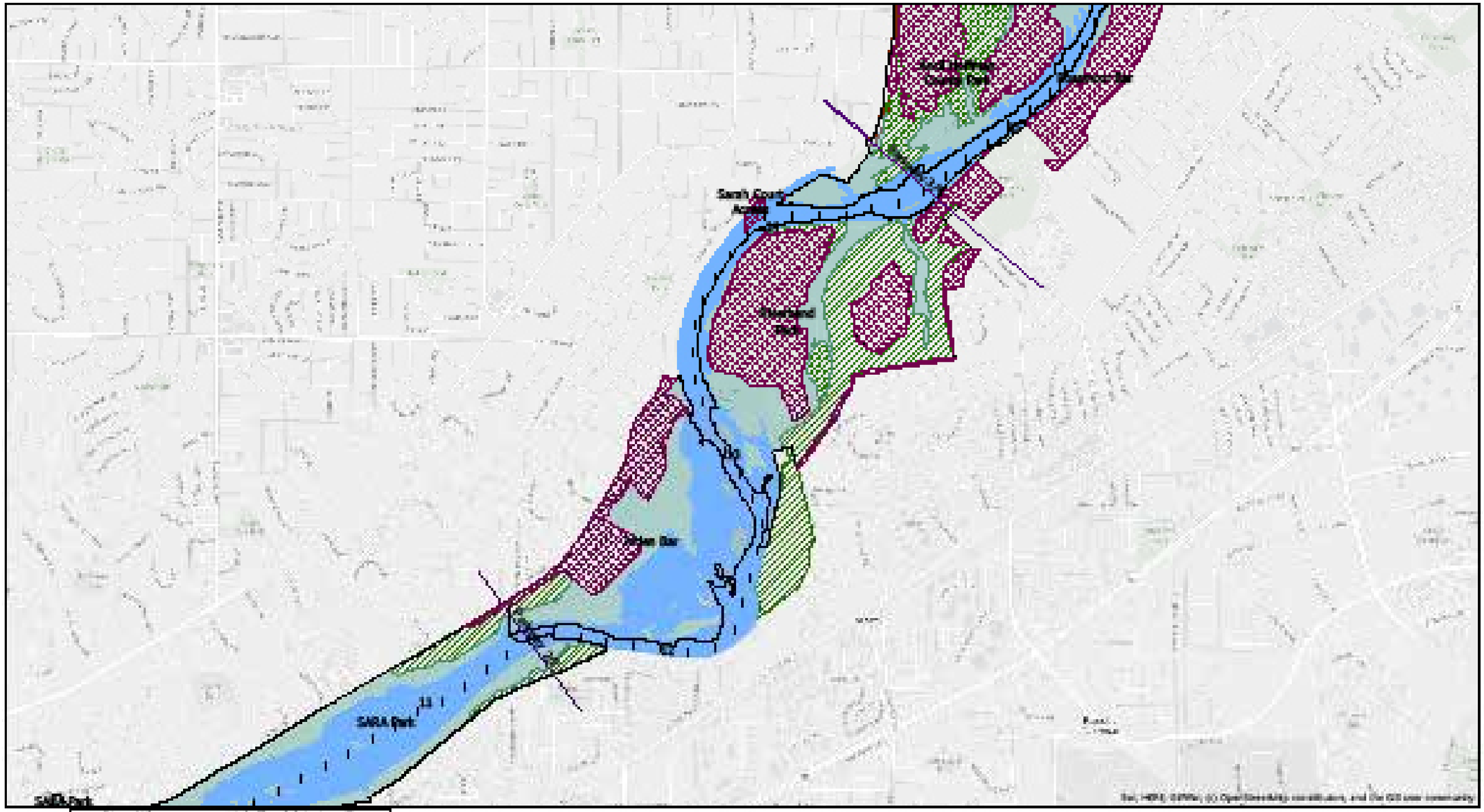
Segment 1

Lower American River
Functional Geomorphic Surfaces Map



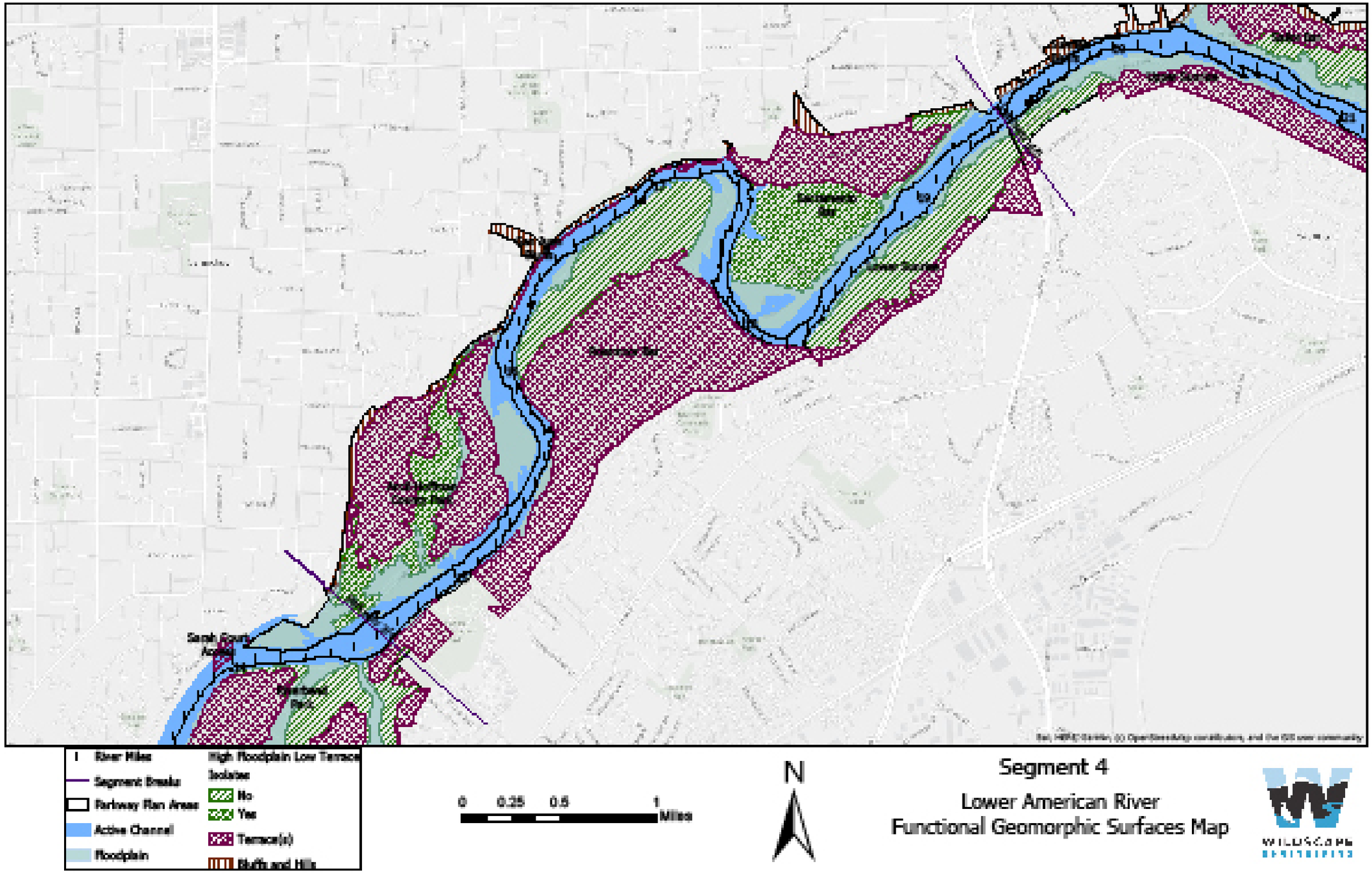

## Segment 2

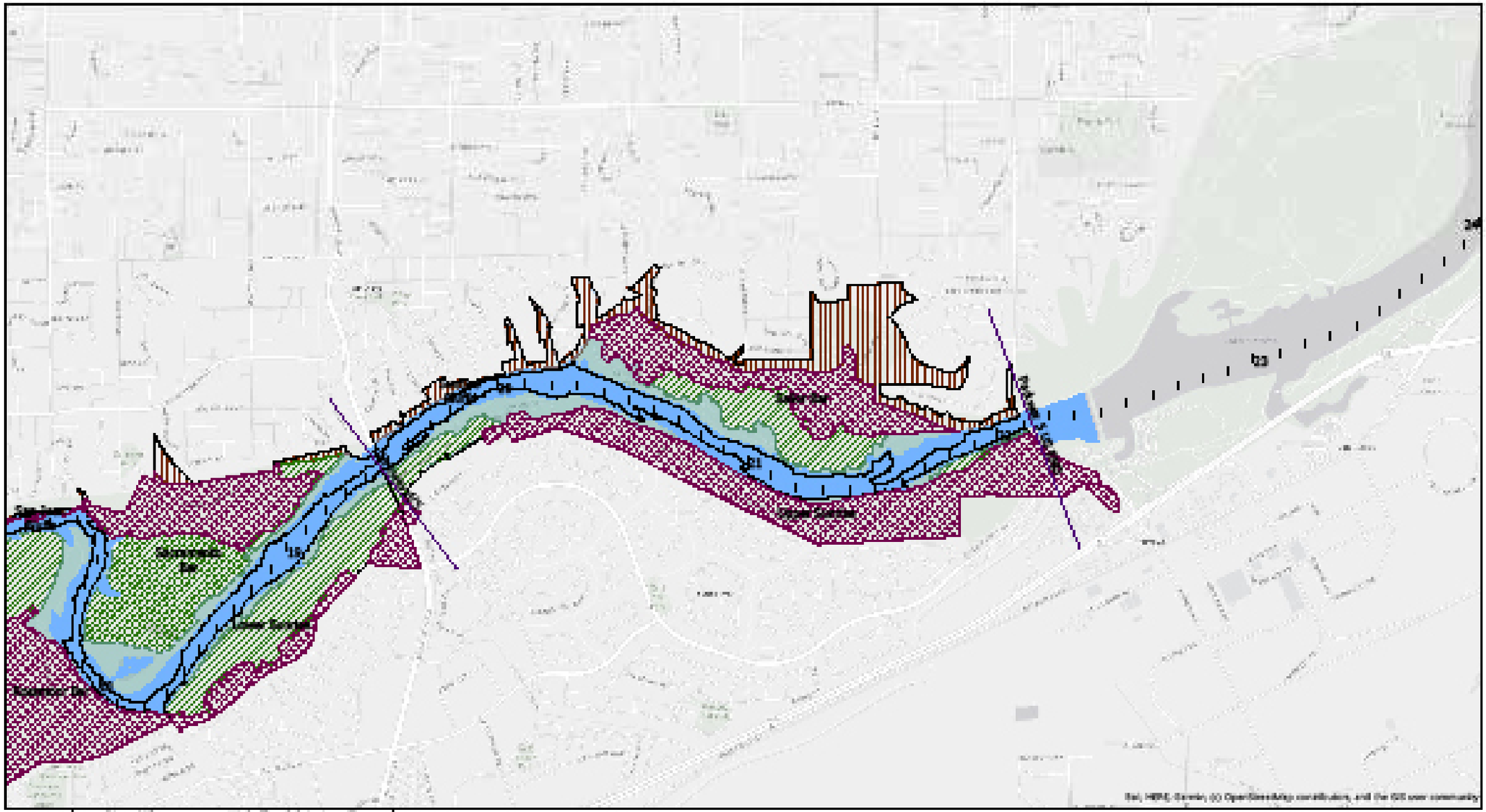
### Lower American River
### Functional Geomorphic Surfaces Map




Segment 3

Lower American River
Functional Geomorphic Surfaces Map

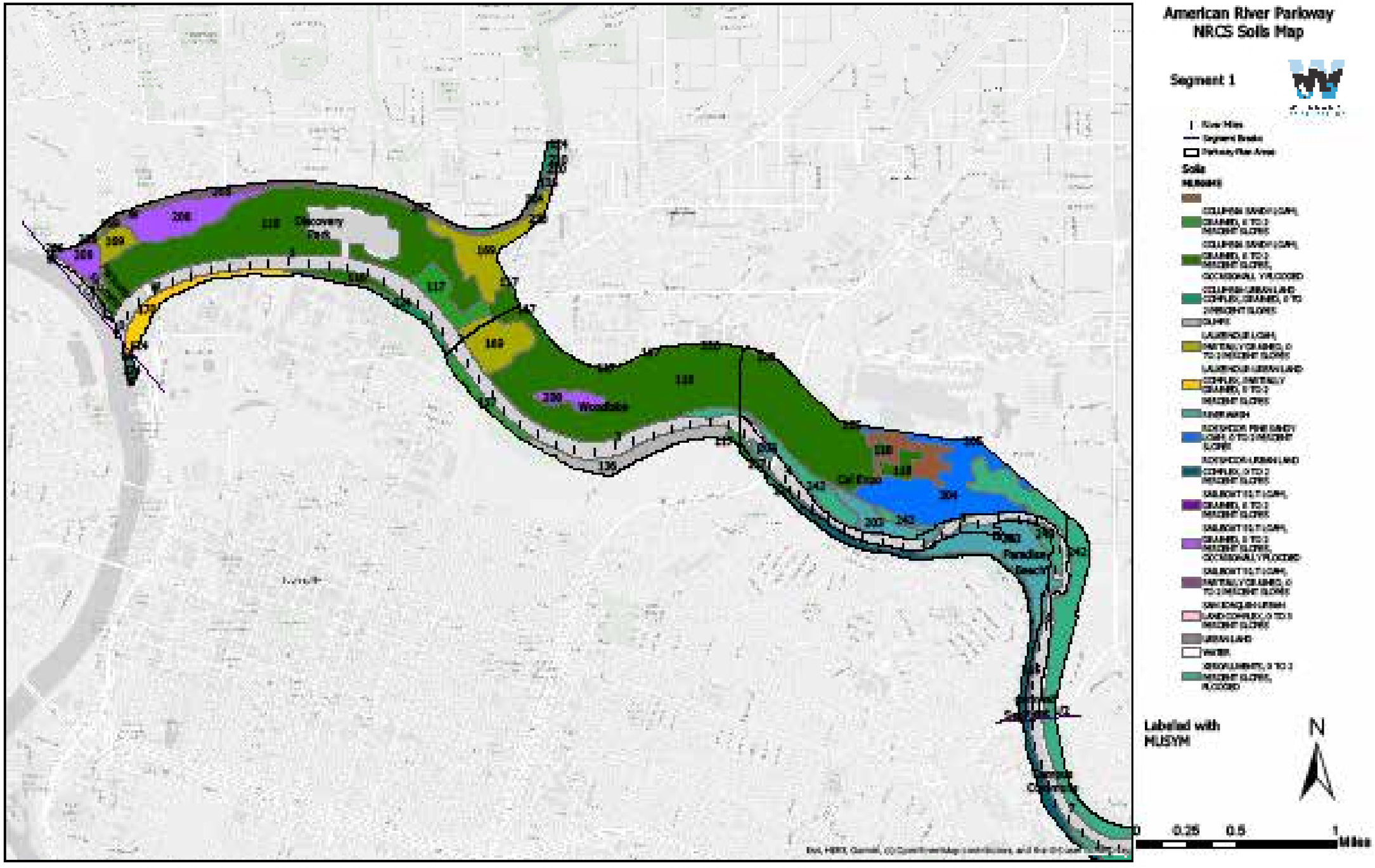

River Miles
Segment Breaks
Parkway Plan Areas
Active Channel
Floodplain
High Floodplain Low Terrace Isolates
No
Yes
Terrace(s)
Bluffs and Hills
0
0.25
0.5
1
Miles
N
Segment 4
Lower American River
Functional Geomorphic Surfaces Map

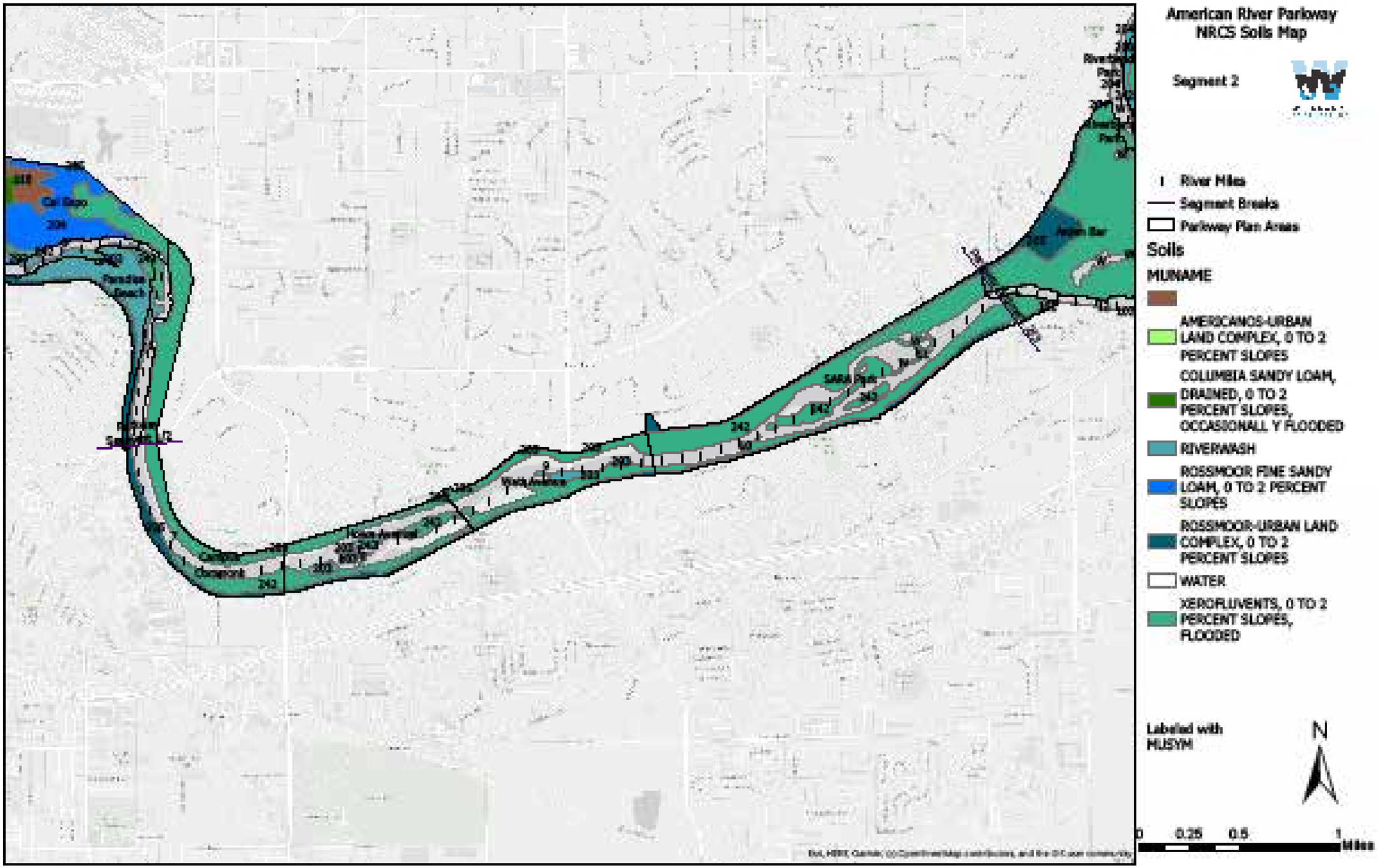


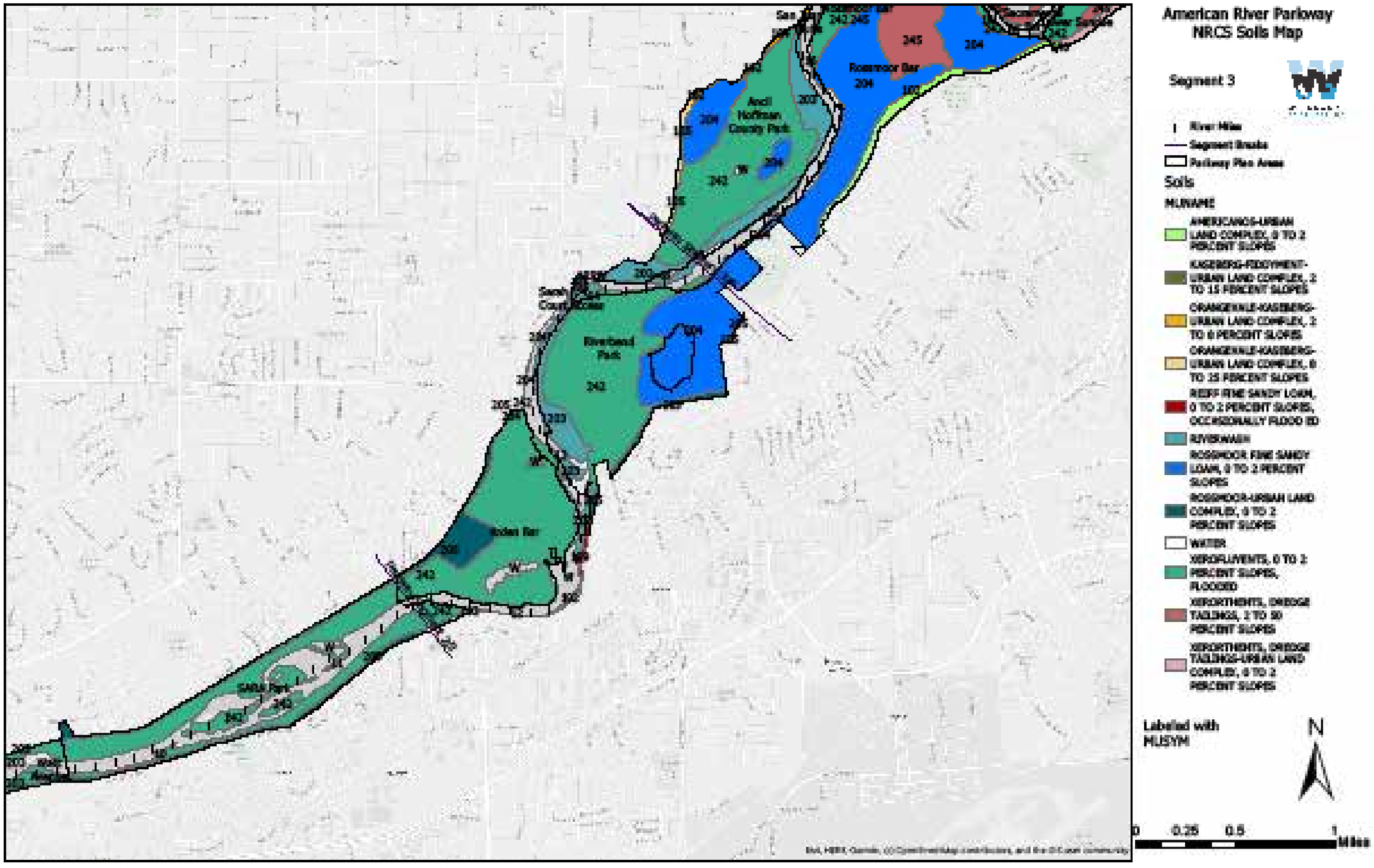

## Segment 5

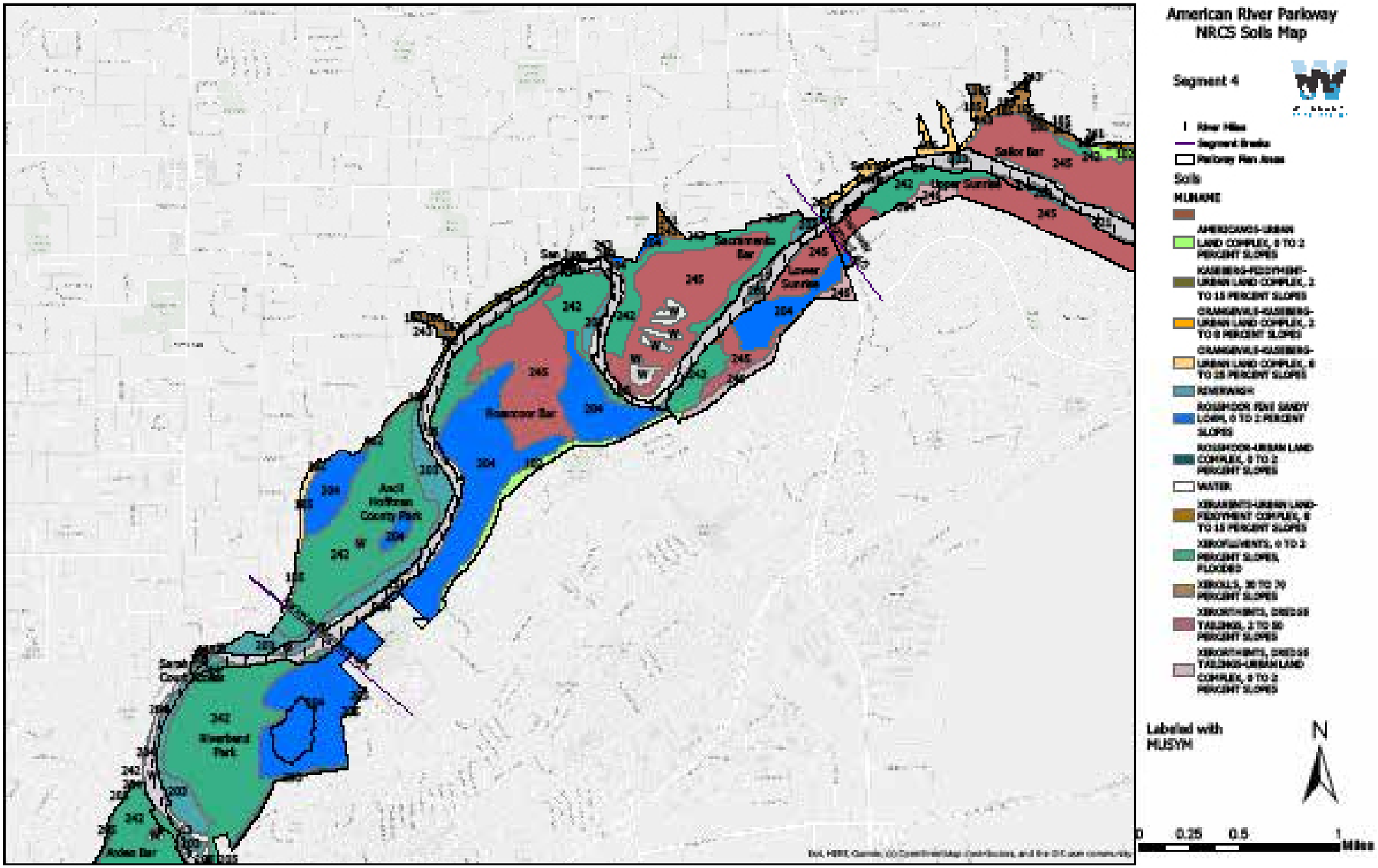
## Lower American River
## Functional Geomorphic Surfaces Map

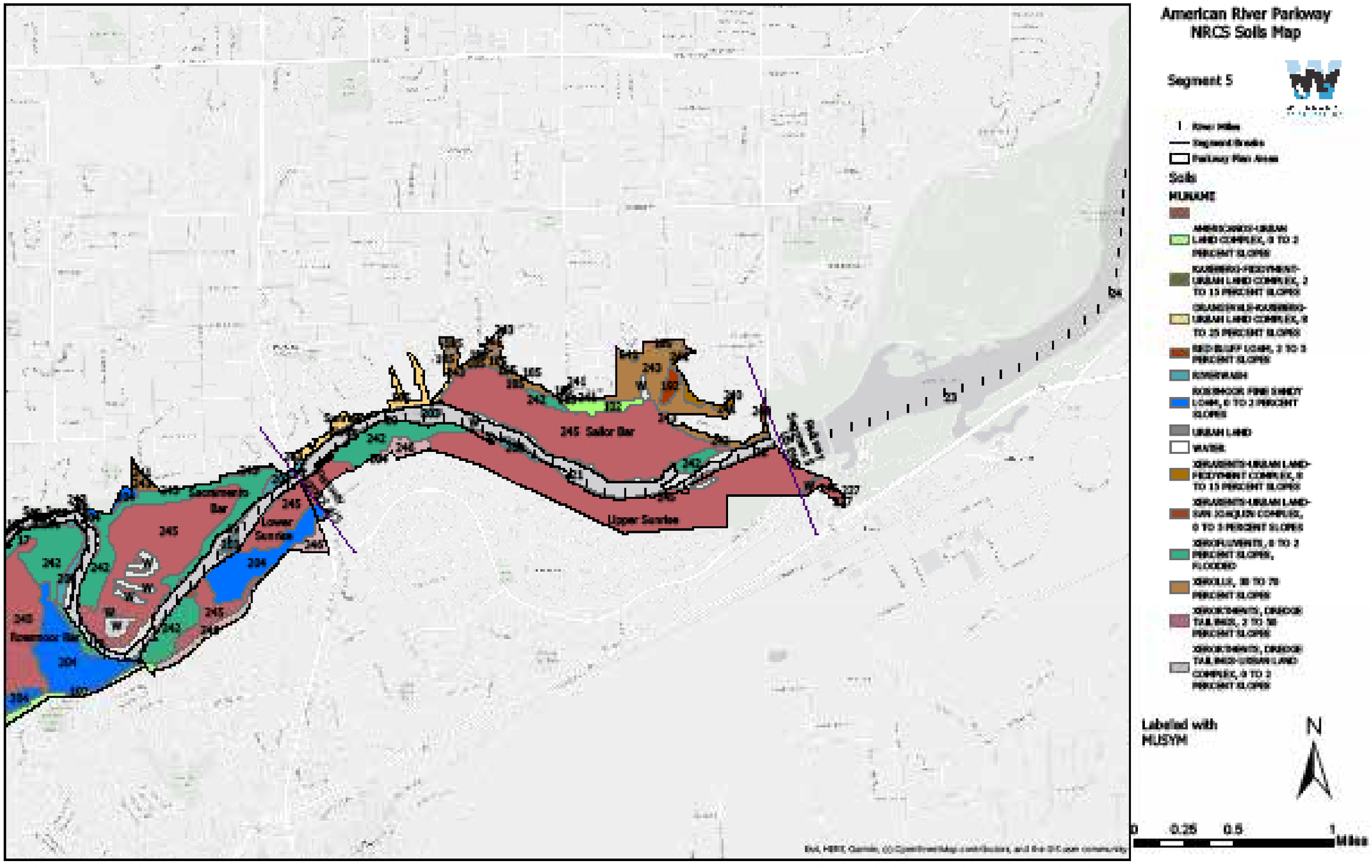
# Appendix 9
# Soils of the Parkway


American River Parkway
NRCS Soils Map
Segment 1
River Miles
Segment Breaks
Parkway/Plan Area
Soils
Discovery Park
Woodlake
Cal Expo
Paradise Beach
Labeled with HUSYM
N
0
0.25
0.5
1
Miles

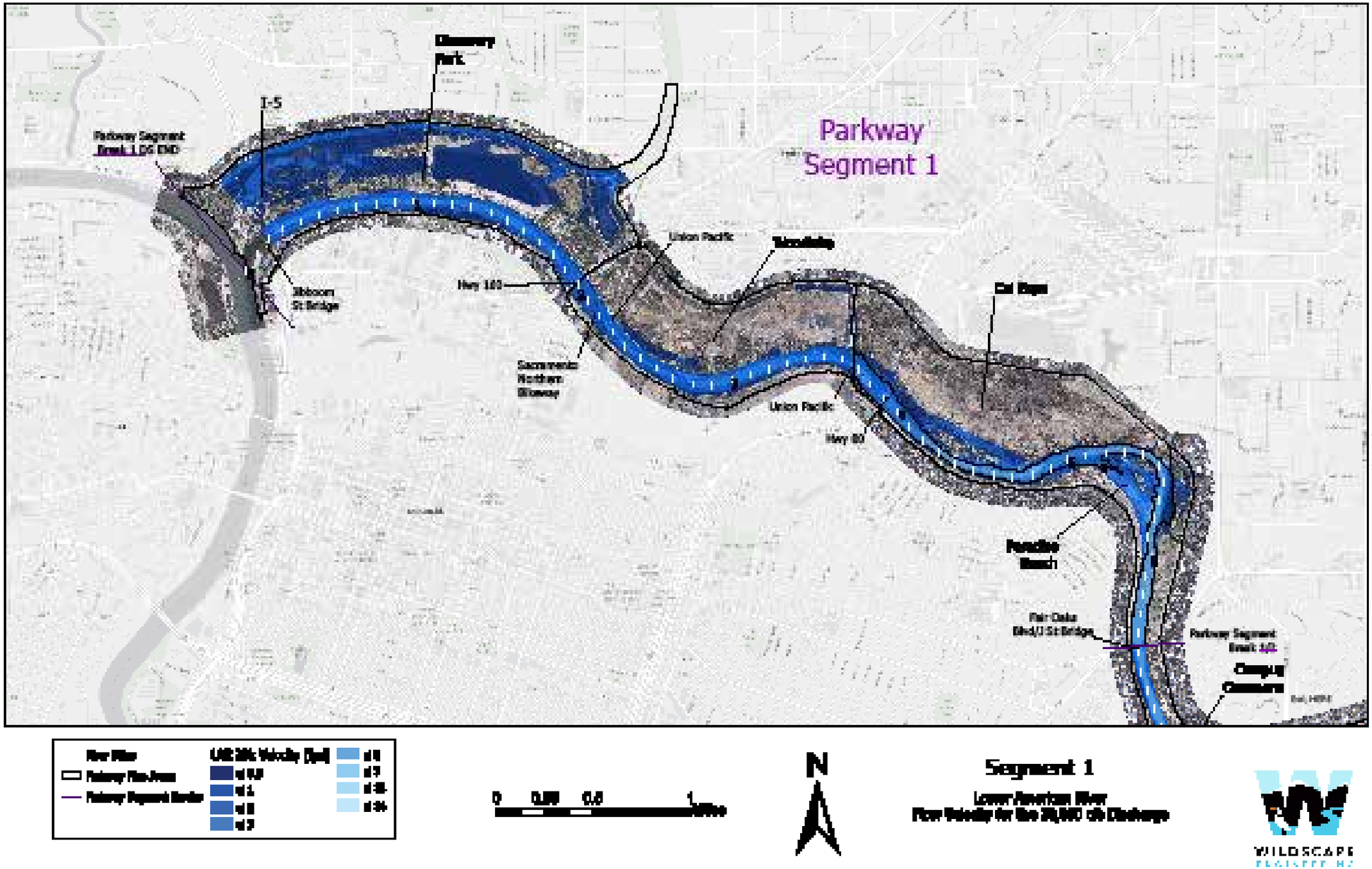

American River Parkway
NRCS Soils Map
Segment 2
River Miles
Segment Breaks
Parkway Plan Areas
Soils
MUNAME
AMERICANOS-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
COLUMBIA SANDY LOAM, DRAINED, 0 TO 2 PERCENT SLOPES, OCCASIONALL Y FLOODED
RIVERWASH
ROSSMOOR FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES
ROSSMOOR-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
WATER
XERORTHENTS, 0 TO 2 PERCENT SLOPES, FLOODED
Labeled with MUSYM
N
0
0.25
0.5
1
Miles

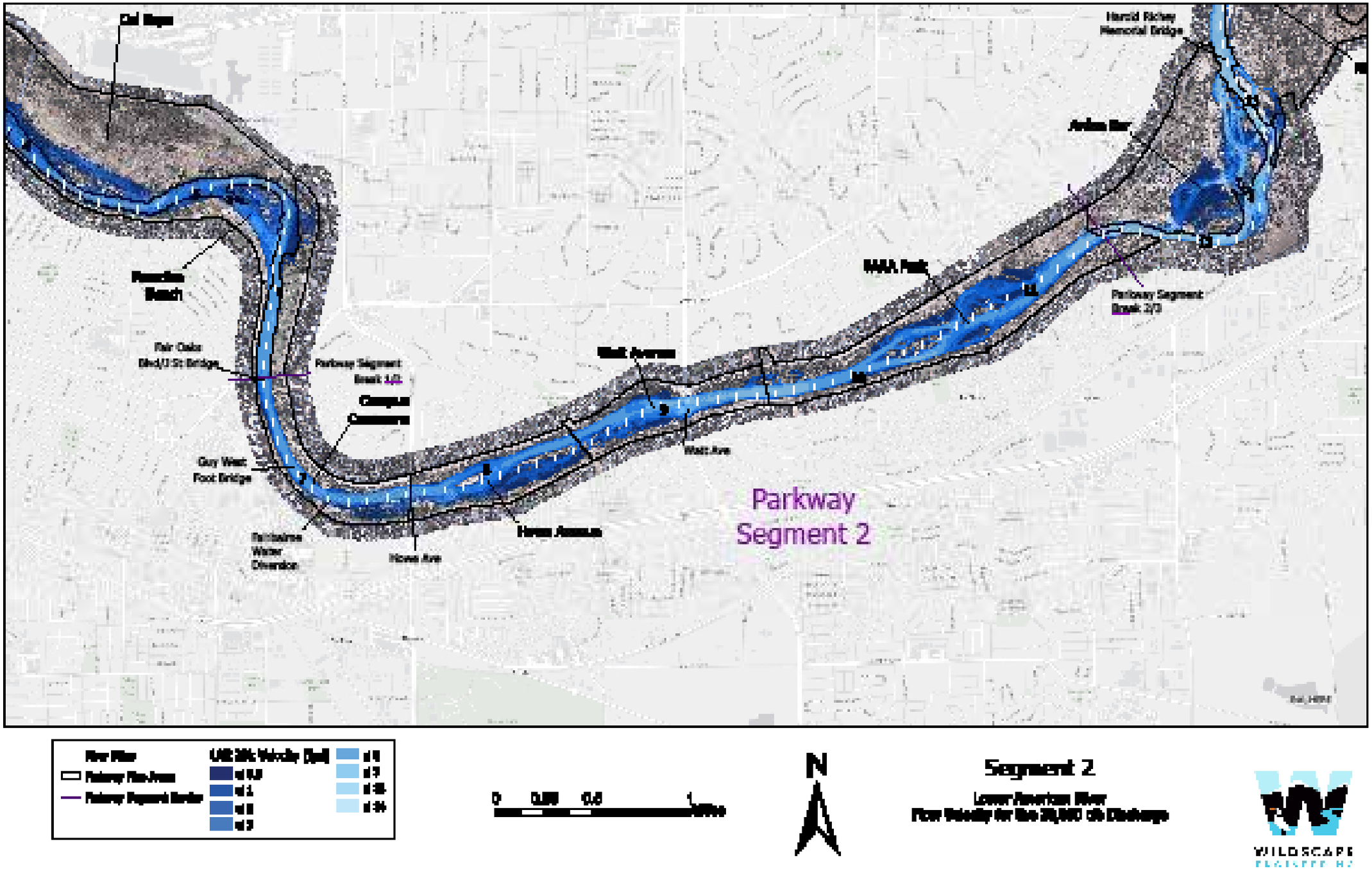

American River Parkway
NRCS Soils Map
Segment 3
River Miles
Segment Breaks
Parkway Plan Areas
Soils
MUNAME
AMERICANOS-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
KASSENDRO-PEDDYMENT-URBAN LAND COMPLEX, 2 TO 15 PERCENT SLOPES
ORANGEVALE-KASSENDRO-URBAN LAND COMPLEX, 2 TO 6 PERCENT SLOPES
ORANGEVALE-KASSENDRO-URBAN LAND COMPLEX, 6 TO 25 PERCENT SLOPES
REEF FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED
RIVERWASH
ROSSMOOR FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES
ROSSMOOR-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
WATER
XERAQUENTS, 0 TO 2 PERCENT SLOPES, FLOODED
XERORTHENTS, DREDGE TAILINGS, 2 TO 30 PERCENT SLOPES
XERORTHENTS, DREDGE TAILINGS-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
Labelled with MUSYM
N
0
0.25
0.5
1
Miles

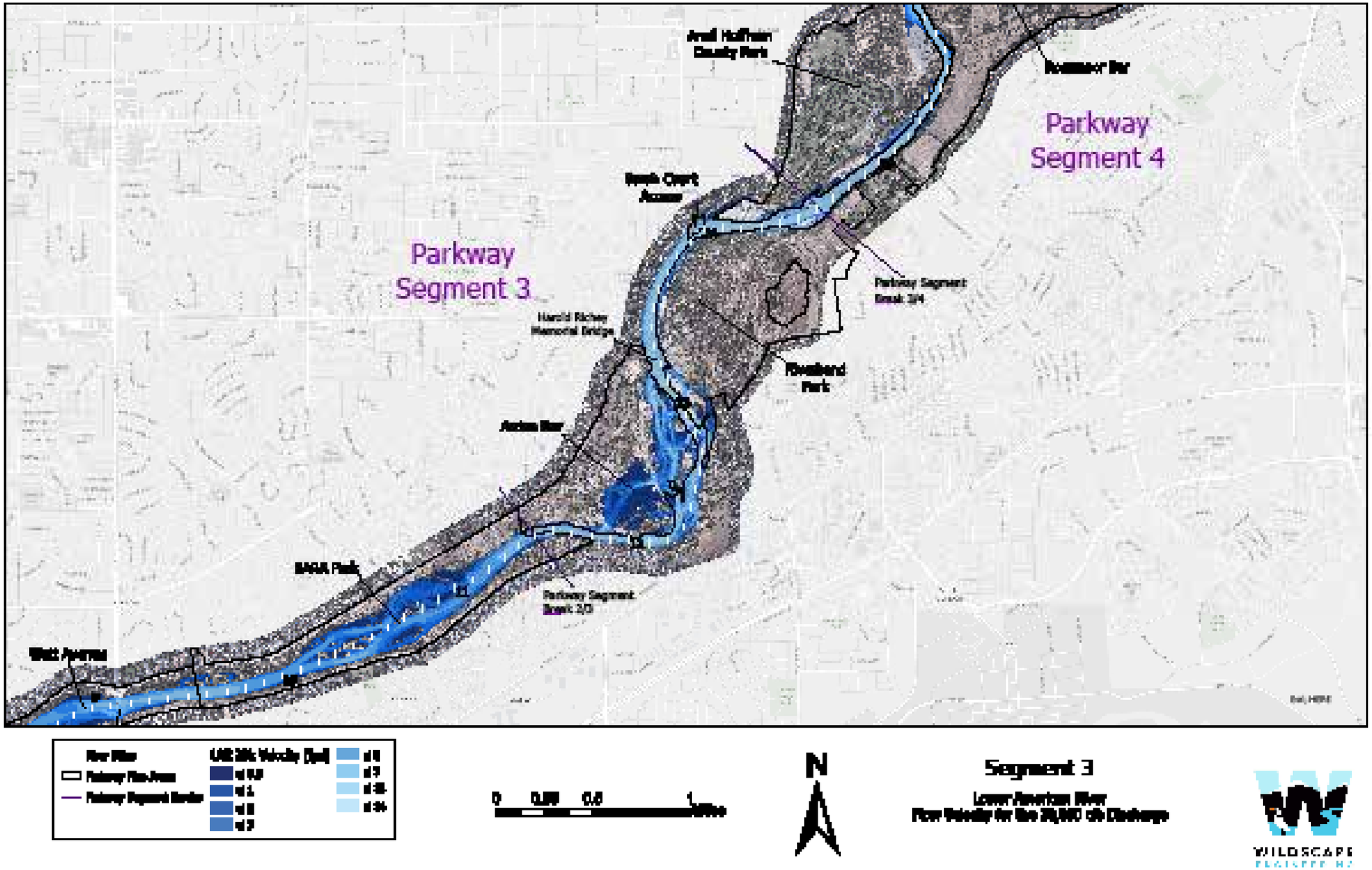

American River Parkway
NRCS Soils Map
Segment 4
River Miles
Segment Breaks
Parkway Plan Areas
Soils
MUNAME
AMERICANOS-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
KASEBERG-FIDDYMENT-URBAN LAND COMPLEX, 2 TO 15 PERCENT SLOPES
ORANGEVALE-KASEBERG-URBAN LAND COMPLEX, 2 TO 8 PERCENT SLOPES
ORANGEVALE-KASEBERG-URBAN LAND COMPLEX, 8 TO 25 PERCENT SLOPES
RIVERWASH
ROSSMOOR FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES
ROSSMOOR-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
WATER
XERANENTS-URBAN LAND-FIDDYMENT COMPLEX, 8 TO 15 PERCENT SLOPES
XEROFLUVENTS, 0 TO 2 PERCENT SLOPES, FLOODED
XEROLLS, 30 TO 70 PERCENT SLOPES
XERORTHENTS, DREDGE TAILINGS, 2 TO 50 PERCENT SLOPES
XERORTHENTS, DREDGE TAILINGS-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES
Labeled with MUSYM
N
0 0.25 0.5 1 Miles
Sailor Bar
Upper Sunrise
Sacramento Bar
Lower Sunrise
Roanoke Bar
Andi Hoffman County Park
Riverbend Park
Arden Bar
San Juan
Sarah Court Bridge
242
245
204
202
W

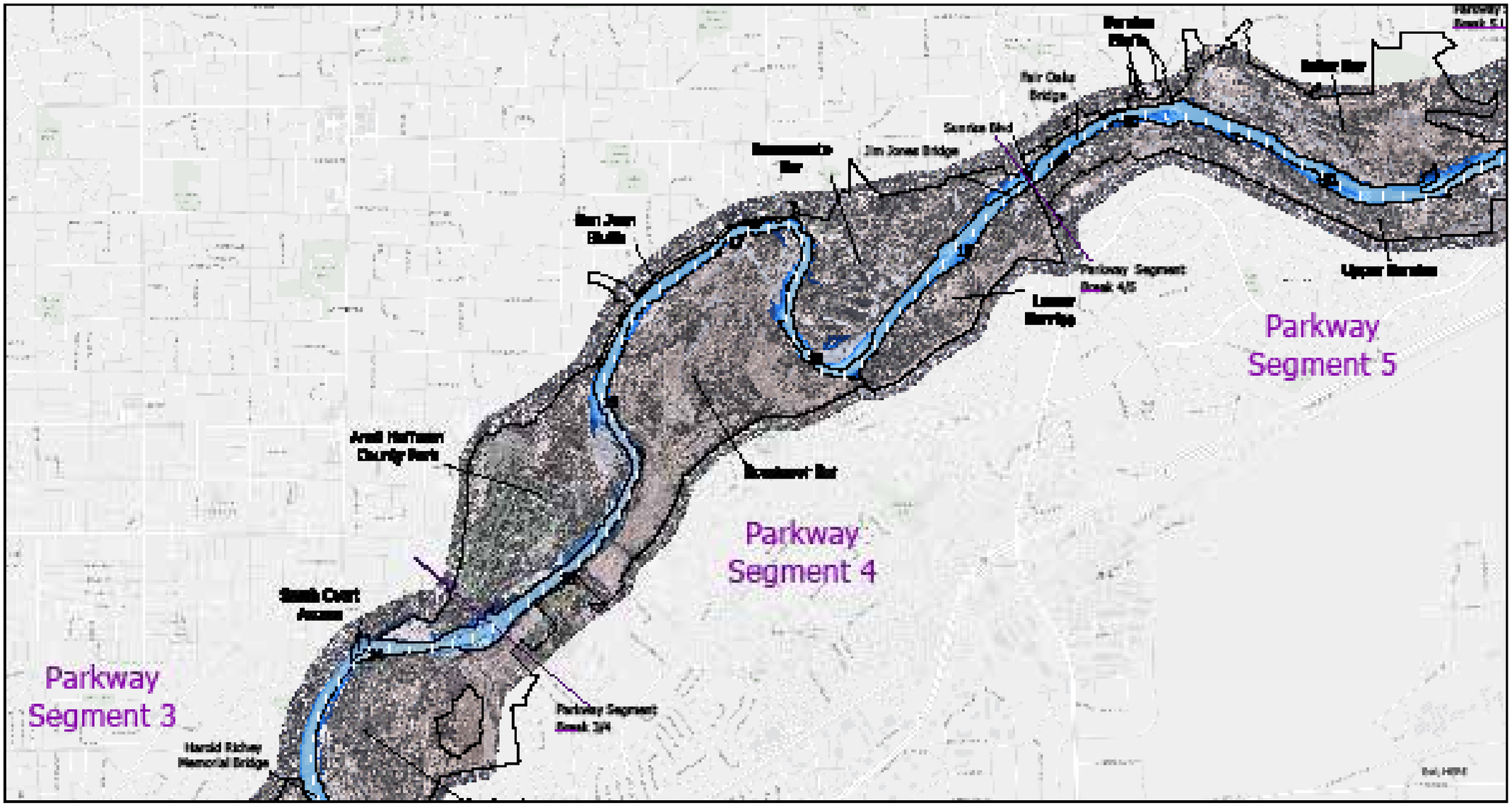

American River Parkway
NRCS Soils Map
Segment 5
Soils
MUNAME
Labeled with
MUSYM
N
0
0.25
0.5
1
Miles
245 Sailor Bar
Upper Sunrise
Lower Sunrise
Sacramento Bar
Rossmoor Bar

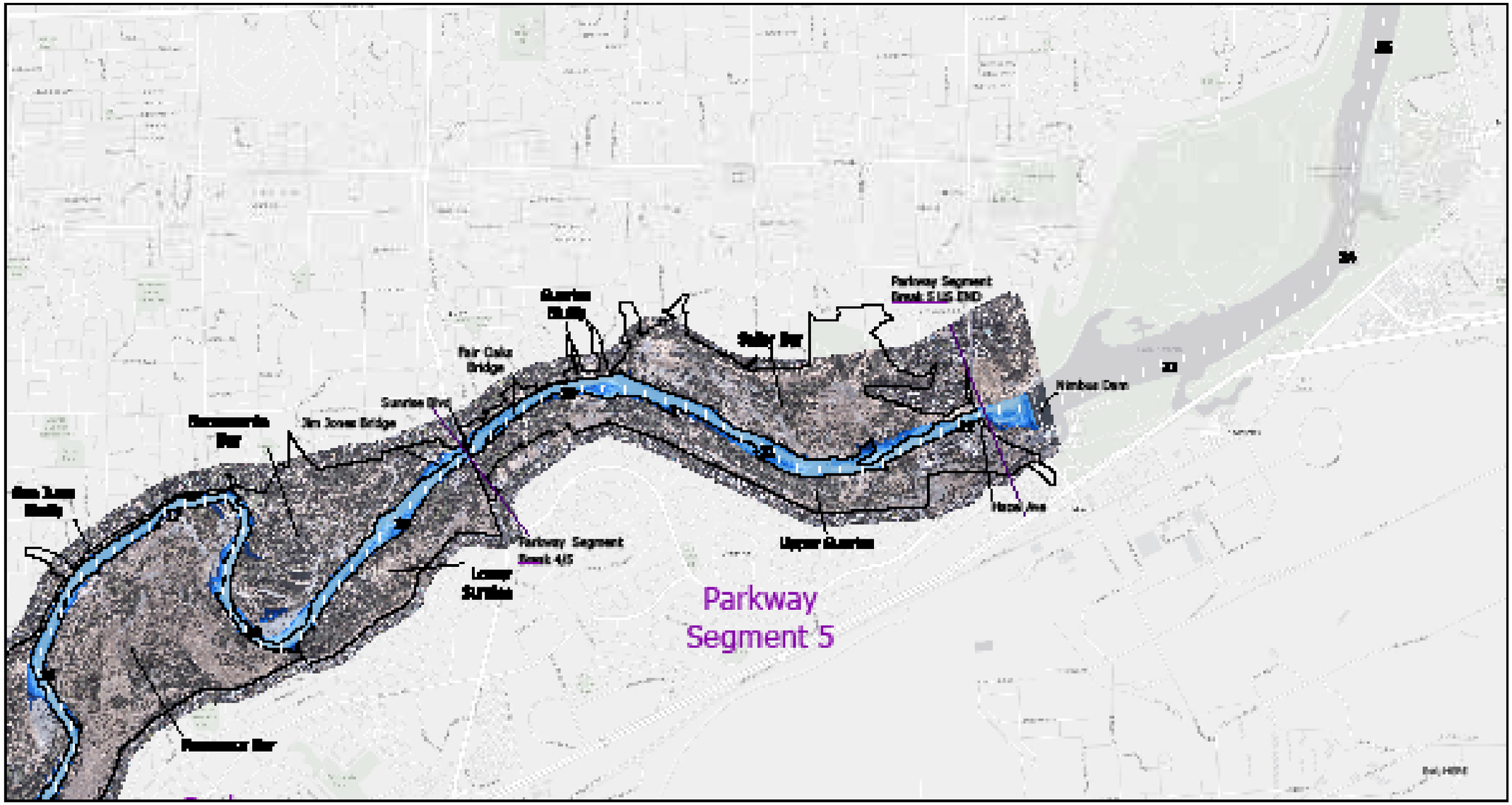
# Appendix 10
# Velocity/Shear Stress at 20.5k, 115k, and 160k cfs


Parkway
Segment 1
I-5
Parkway Segment
Break 1 DS END
Union Pacific
Hwy 160
Sacramento
Northern
Bikeway
Union Pacific
Hwy 80
Fair Oaks
Blvd/J St Bridge
Parkway Segment
Break 1/2
N
Segment 1
WILDSCAPE


Harold Richey Memorial Bridge
Parkway Segment Break 2/3
Fair Oaks Blvd/J St Bridge
Parkway Segment Break 1/2
Guy West Foot Bridge
Fairbairne Water Diversion
Howe Ave
Watt Ave
Parkway Segment 2
N
Segment 2
WILDSCAPE


Parkway
Segment 4
Parkway
Segment 3
Harold Richey
Memorial Bridge
Parkway Segment
Break 3/4
Parkway Segment
Break 2/3
Watt Avenue
N
Segment 3
WILDSCAPE

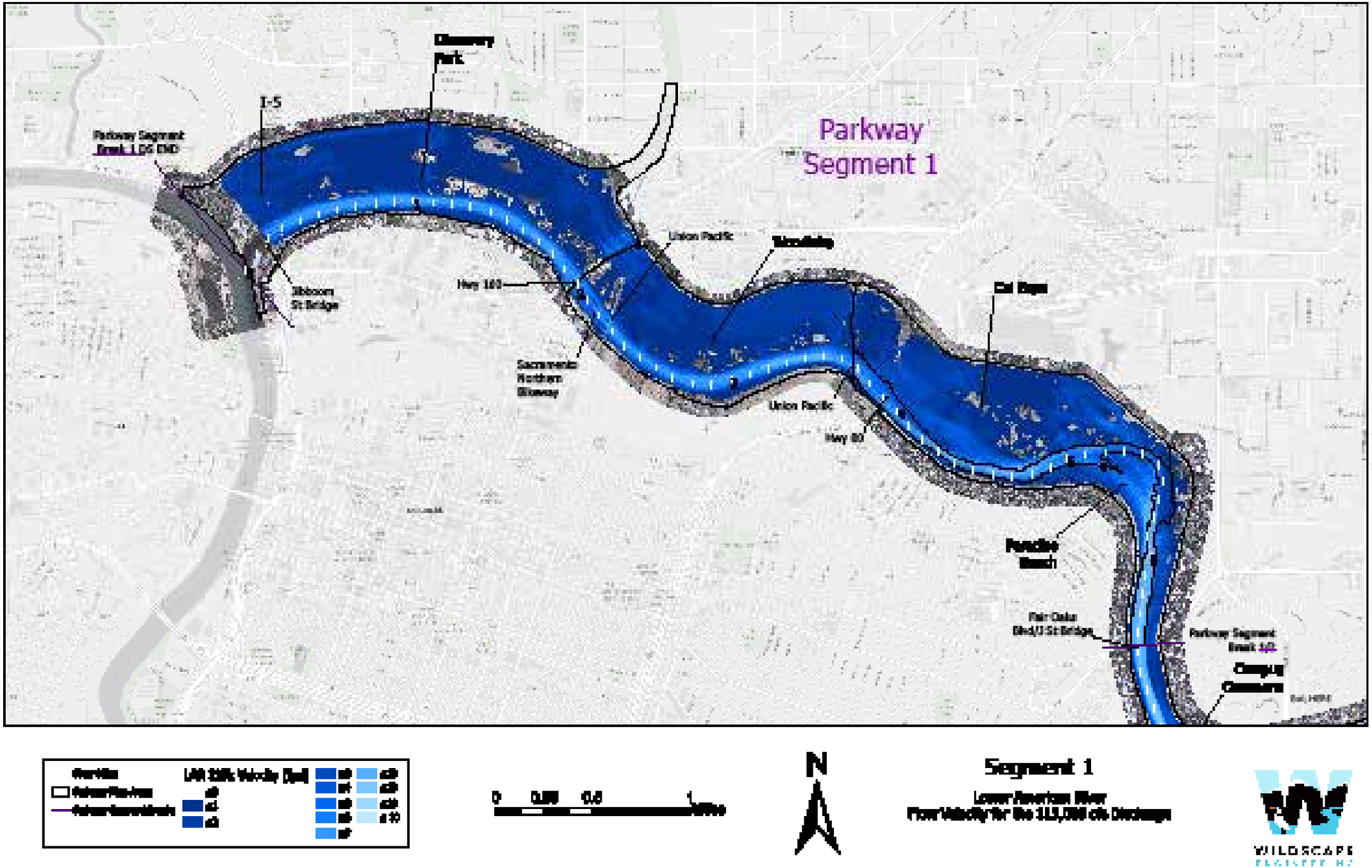

Parkway
Segment 5
Parkway
Segment 4
Parkway
Segment 3
Segment 4




Segment 5

Lower American River

WILDSCAPE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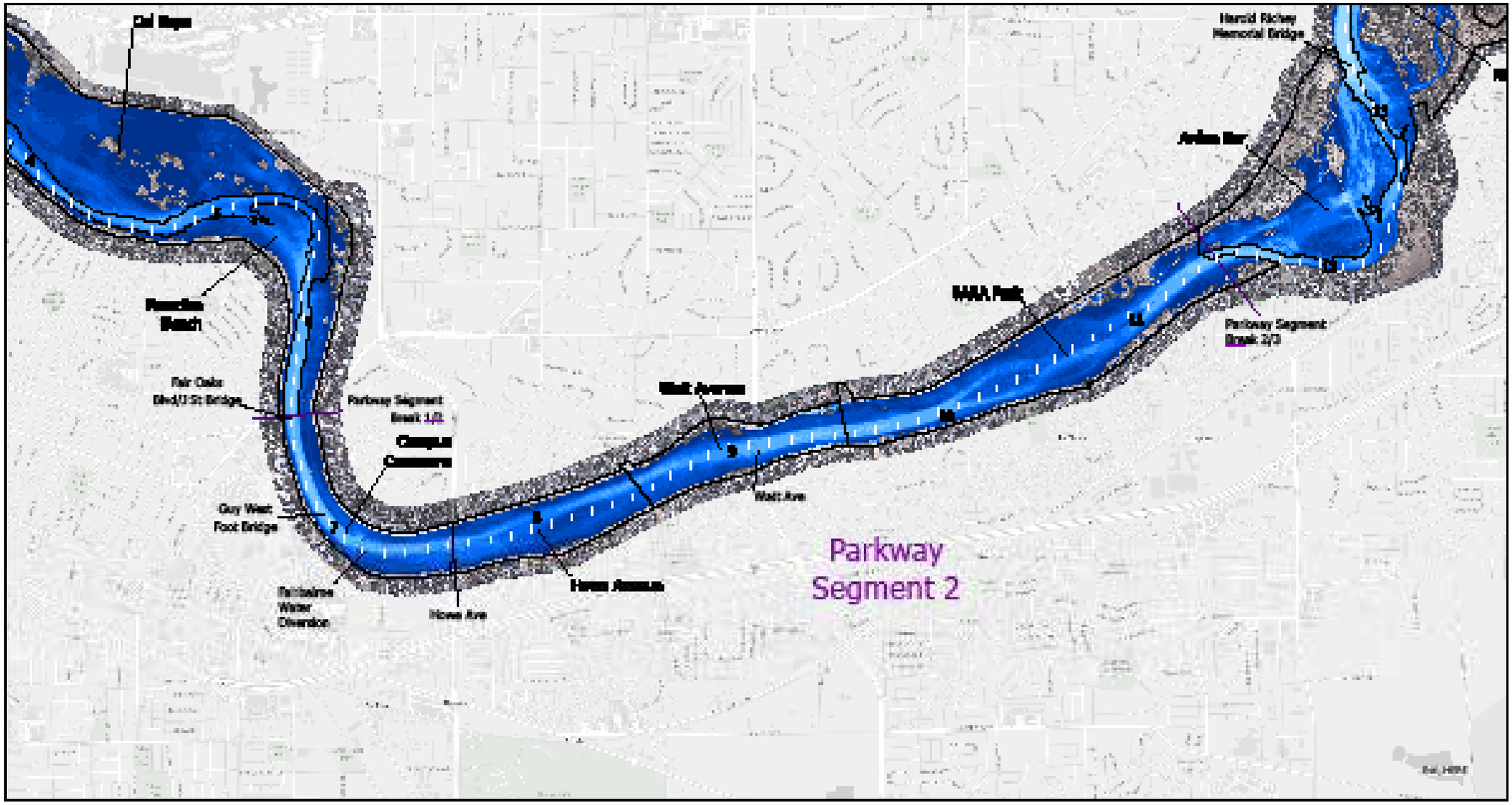
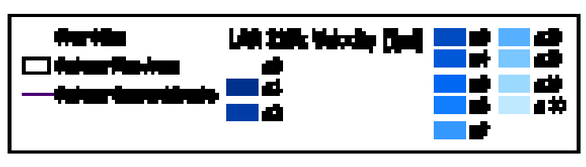
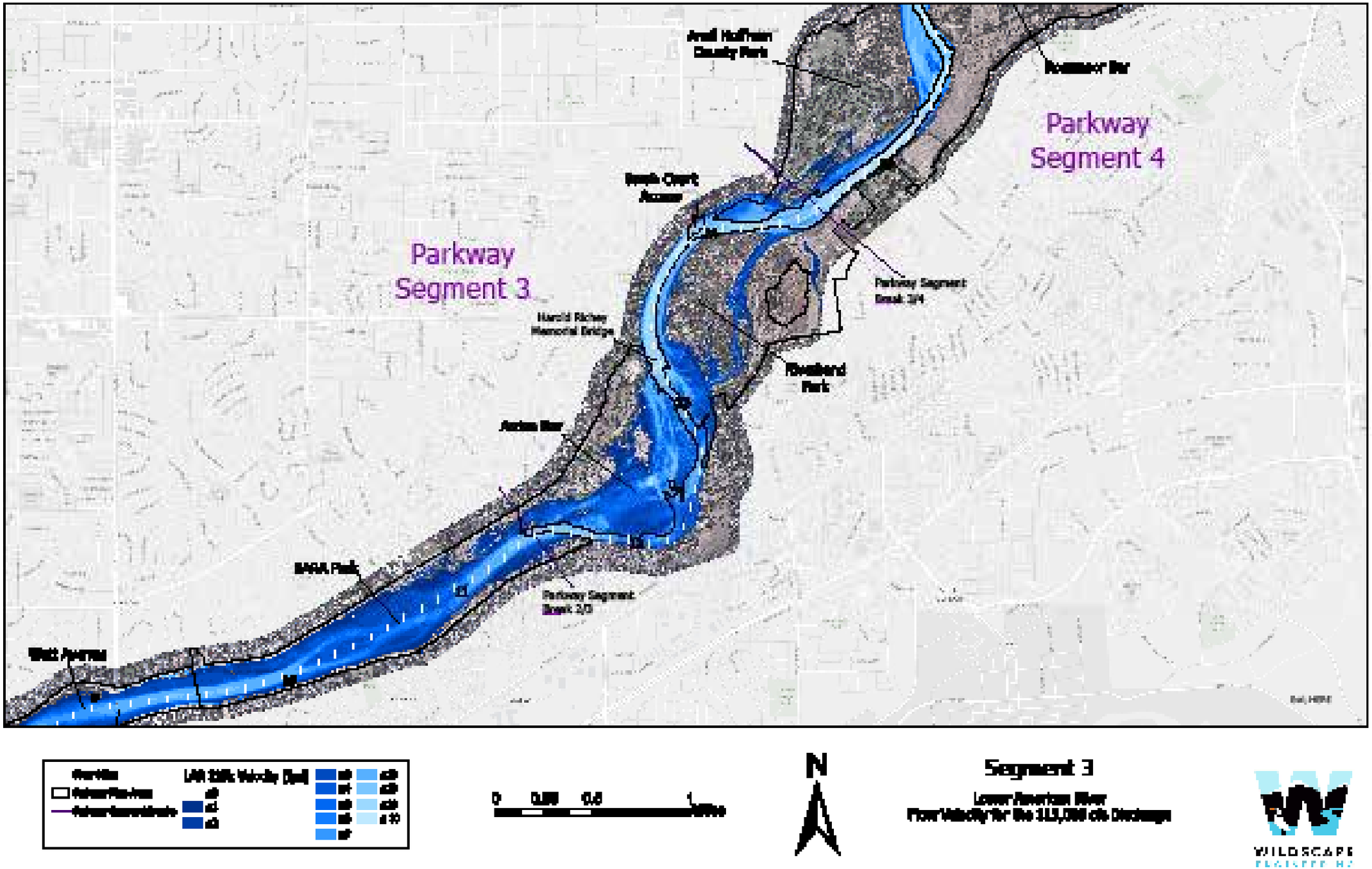
Segment 1
I-5
Parkway Segment
Break 1 DS END
Union Pacific
Hwy 160
Sacramento
Northern
Bikeway
Union Pacific
Hwy 80
Fair Oaks
Blvd/U St Bridge
Parkway Segment
Break 1/2
N
Segment 1
Lower American River
WILDSCAPE

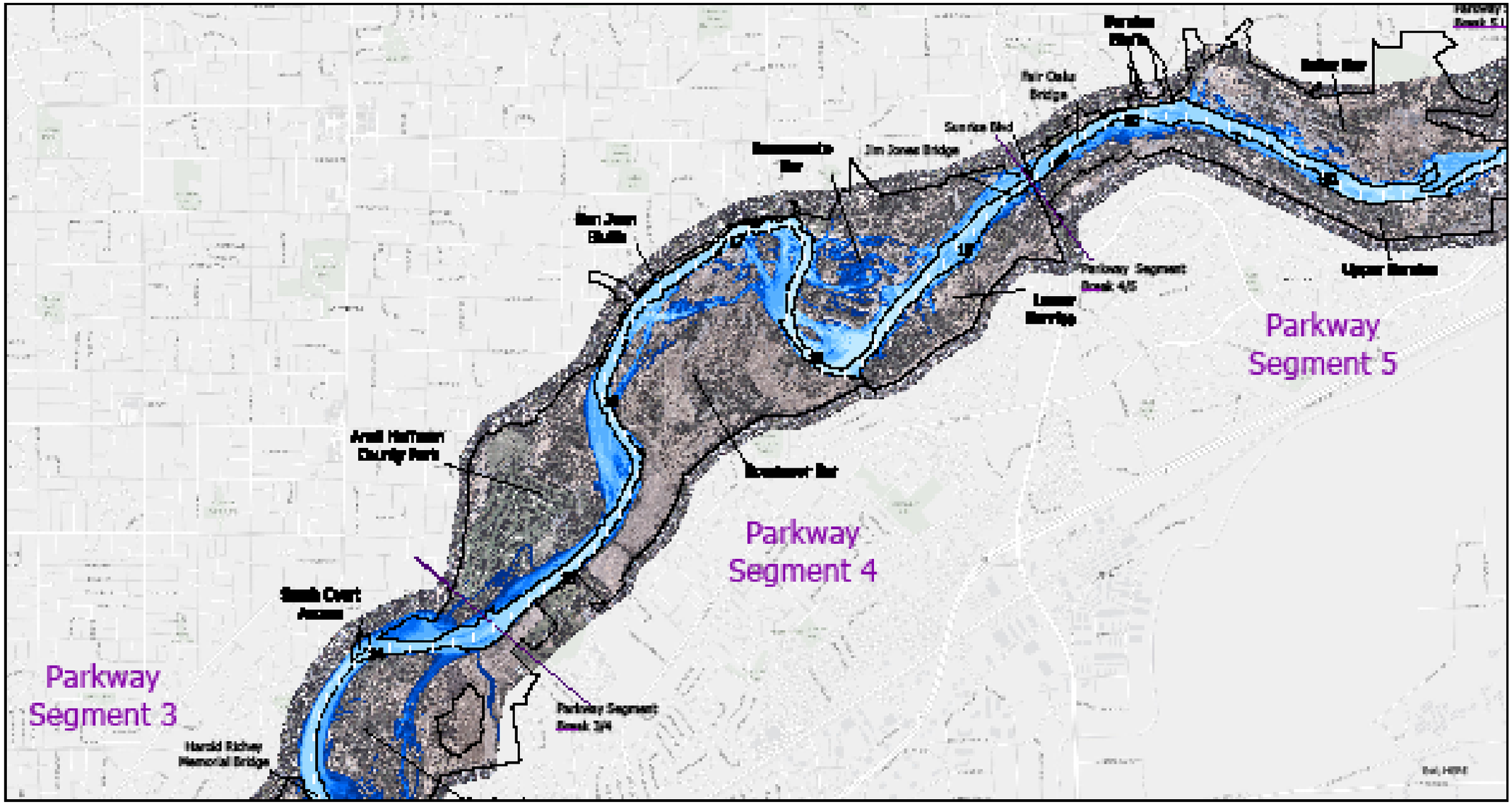


**Segment 2**

Lower American River
Flow Velocity for the 115,000 cfs Discharge


Parkway
Segment 4
Parkway
Segment 3
Harold Richey
Memorial Bridge
Parkway Segment
Break 3/4
Parkway Segment
Break 2/3
N
Segment 3
WILDSCAPE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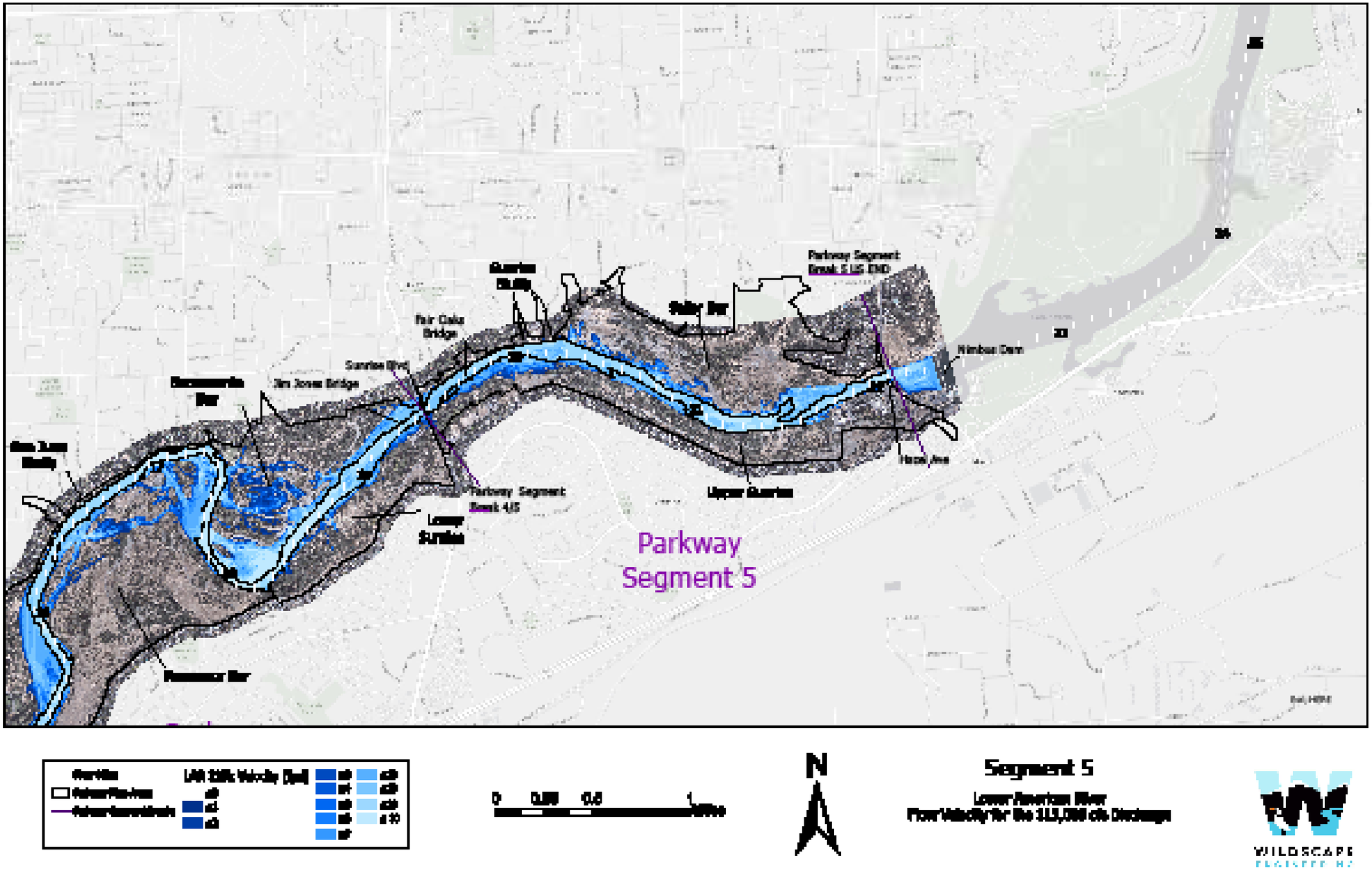
Segment 5
Parkway
Segment 4
Parkway
Segment 3
Segment 4
WILDSCAPE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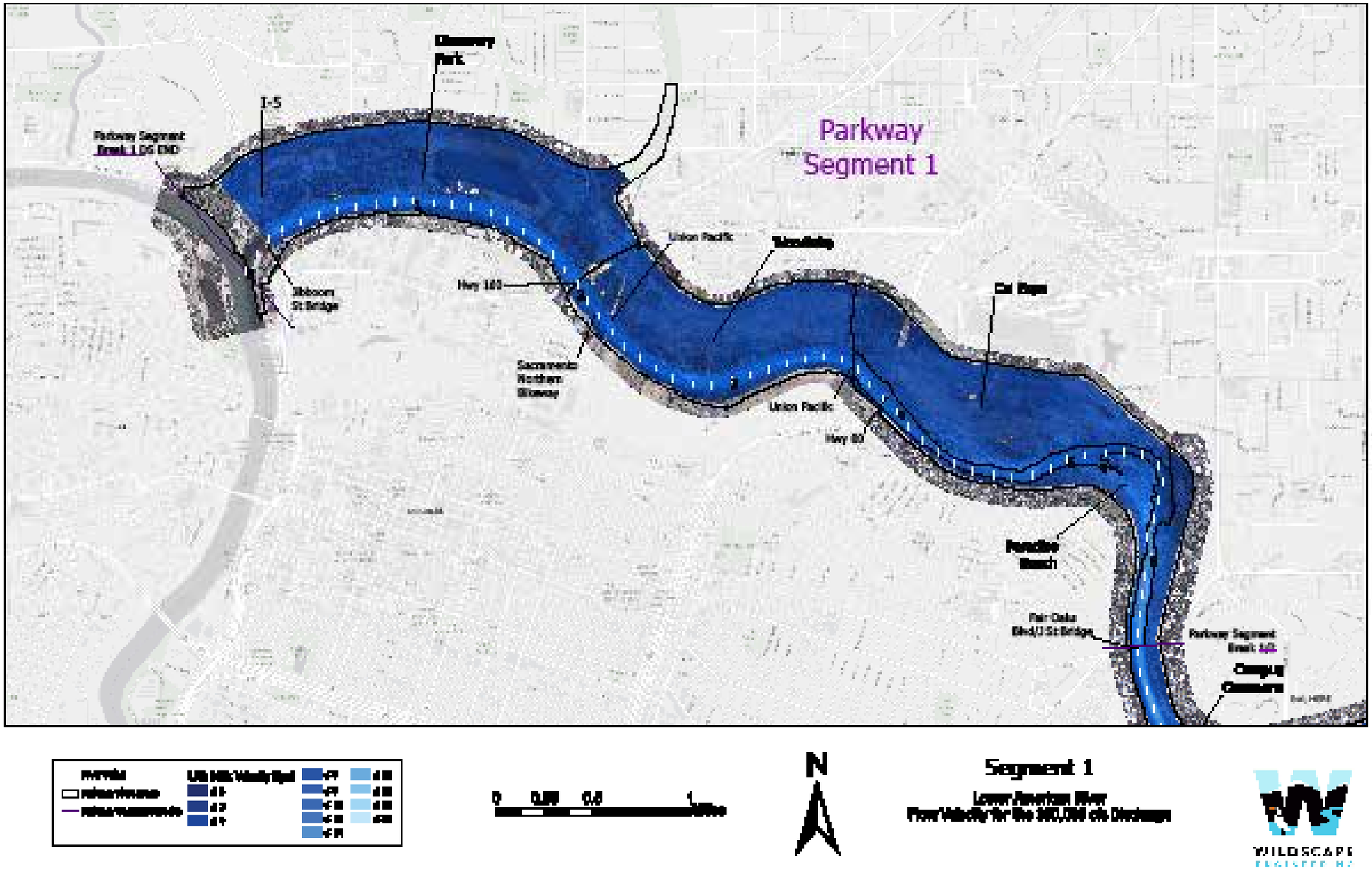
Break 5 US END
Fair Oaks
Bridge
Sunrise Blvd
Jim Jones Bridge
Nimbus Dam
Hazel Ave
Parkway Segment
Break 4/5
Parkway
Segment 5
N
Segment 5
WILDSCAPE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Segment 1
I-5
Parkway Segment
Break 1 DS END
Union Pacific
Hwy 160
Sacramento
Northern
Bikeway
Union Pacific
Hwy 80
Fair Oaks
Blvd/J St Bridge
Parkway Segment
Break 1/2
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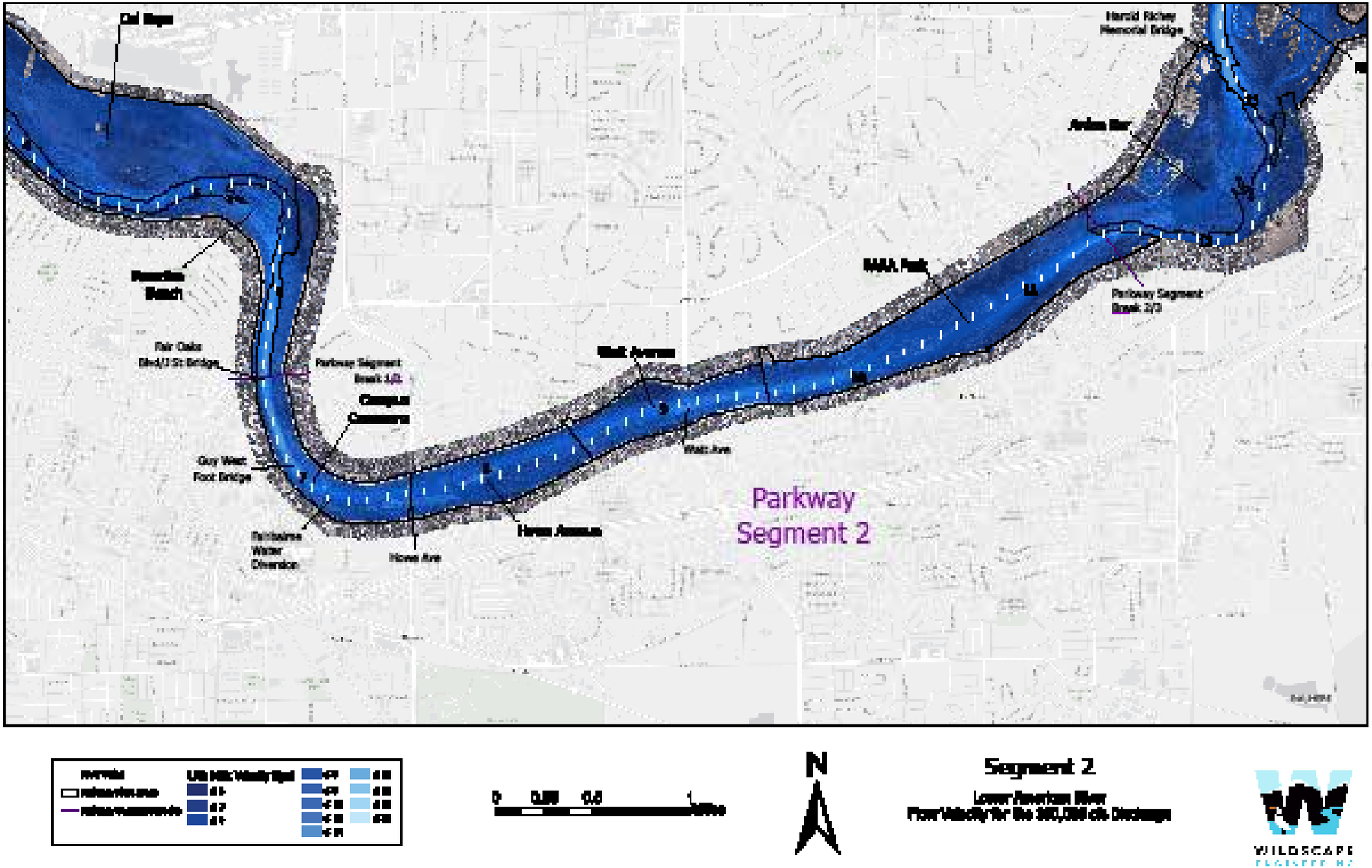
0.5
1
Miles
N
Segment 1
Lower American River
WILDSCAPE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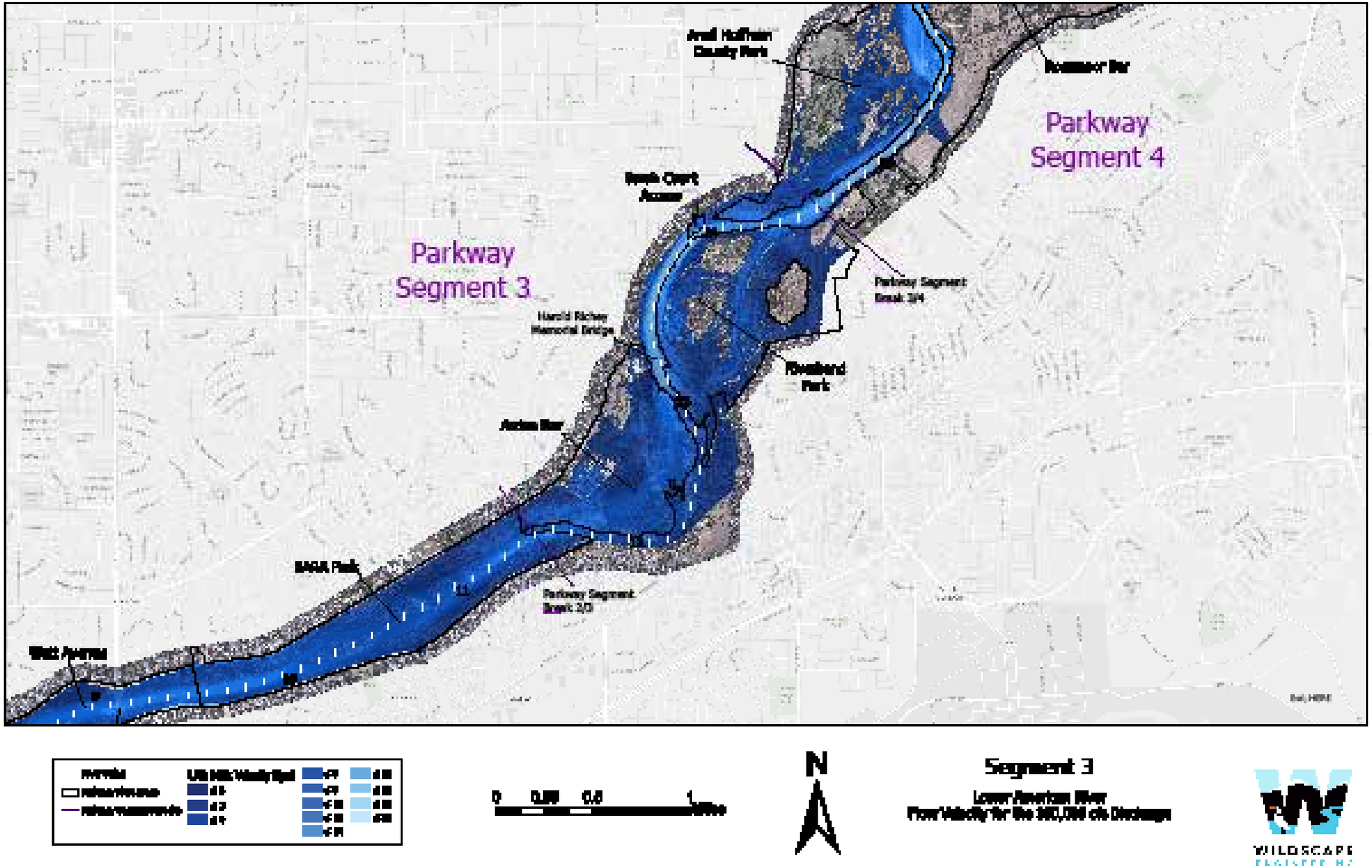
Memorial Bridge
Parkway Segment
Break 2/3
Fair Oaks
Blvd/1 St Bridge
Parkway Segment
Break 1/2
Guy West
Foot Bridge
Fairbairne
Water
Diversion
Howe Ave
Watt Ave
Parkway
Segment 2
N
Segment 2
Lower American River
WILDSCAPE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Parkway
Segment 3
Harold Richey
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Parkway Segment
Break 3/4
Parkway Segment
Break 2/3
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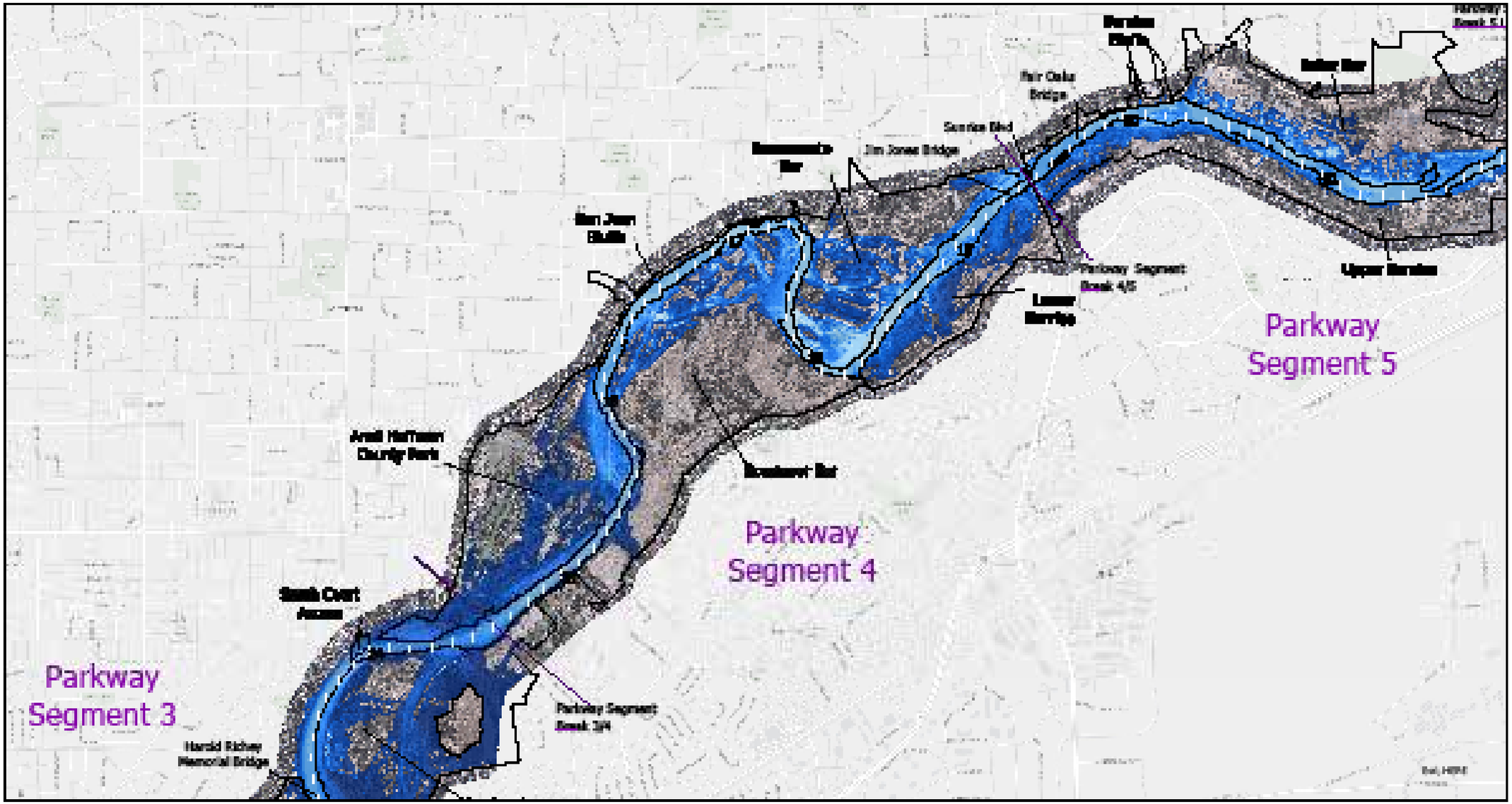
Segment 3
WILDSCAPE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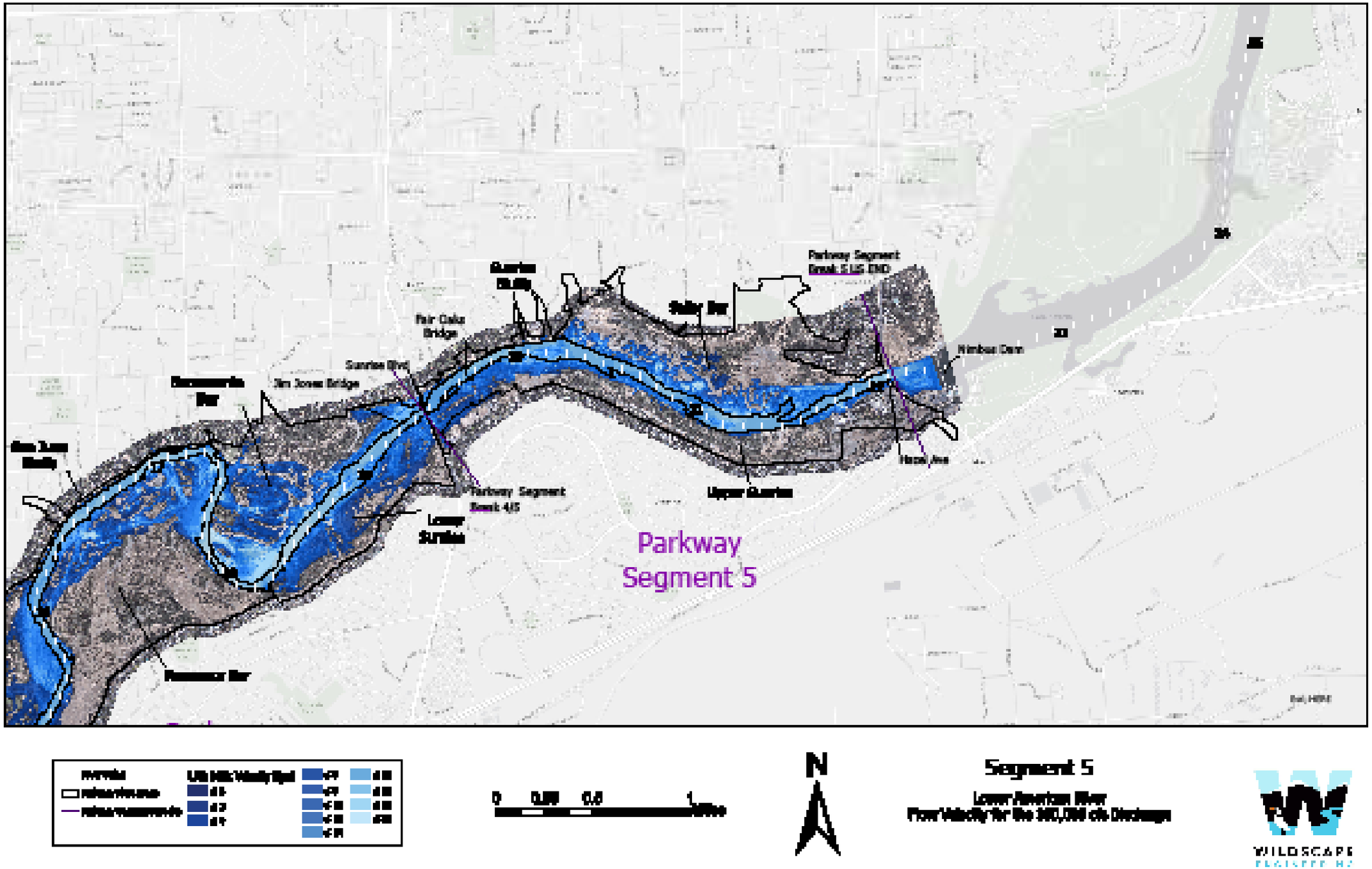
Segment 4
Parkway
Segment 3
Segment 4
WILDSCAPE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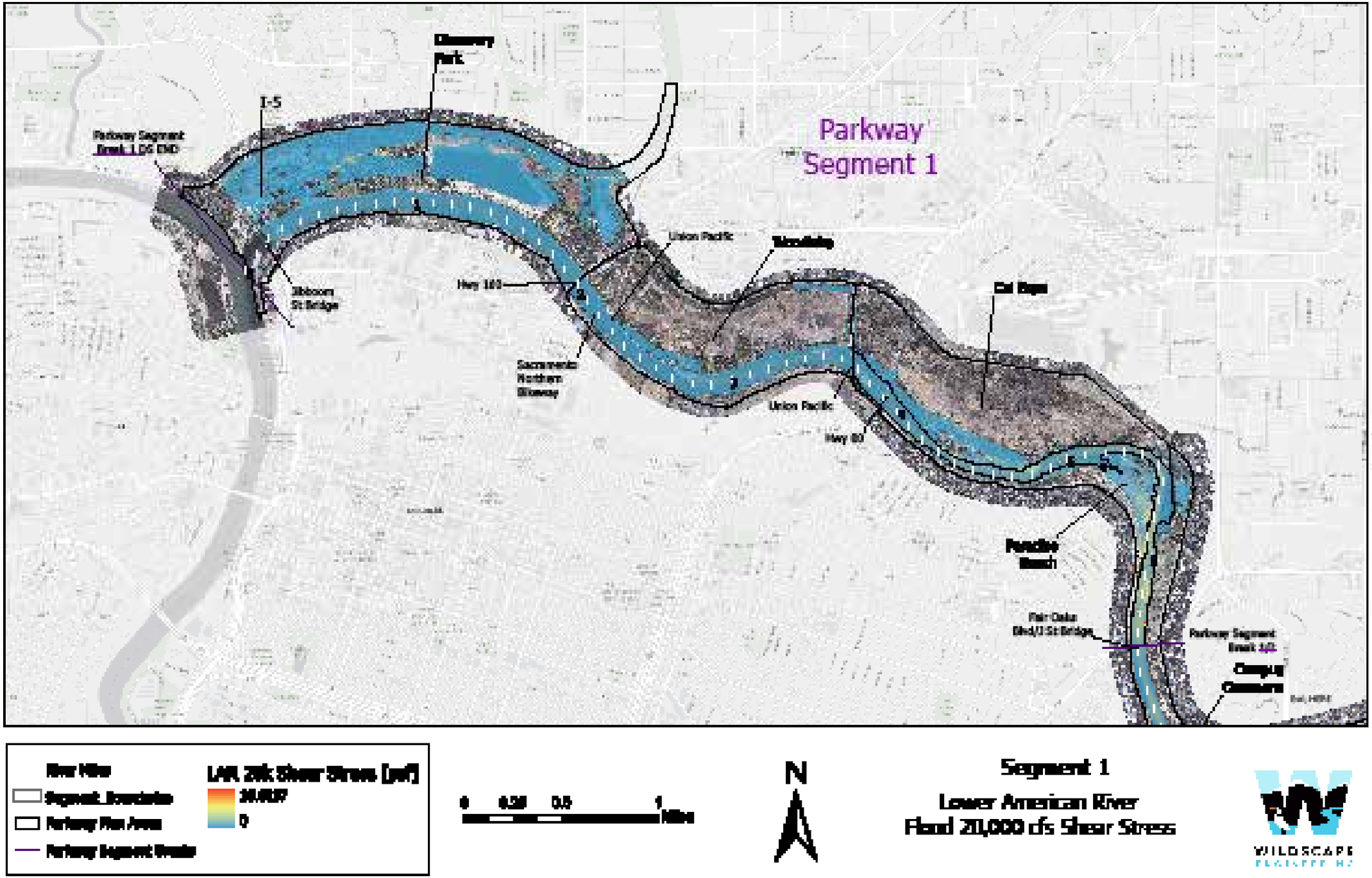
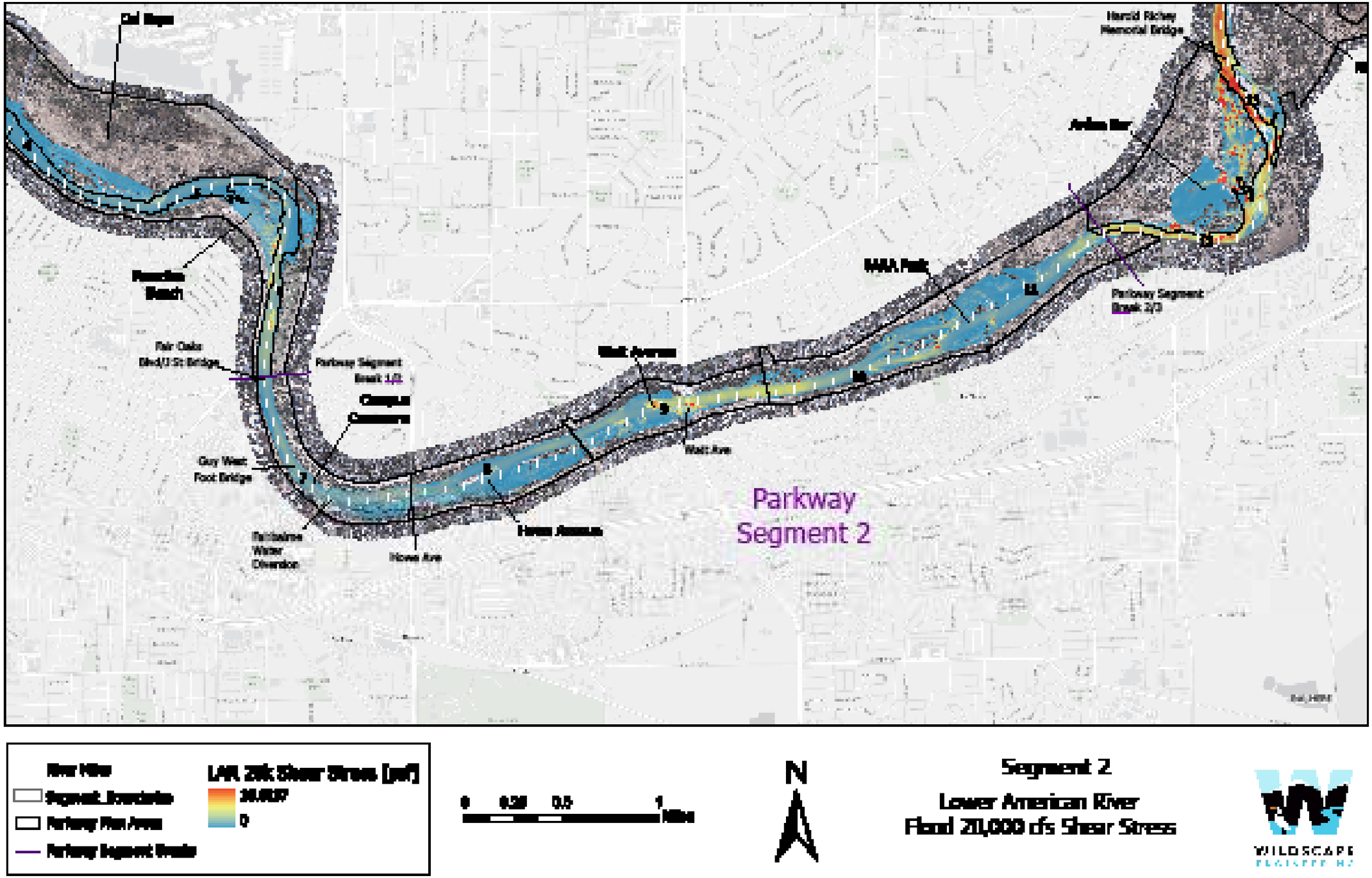
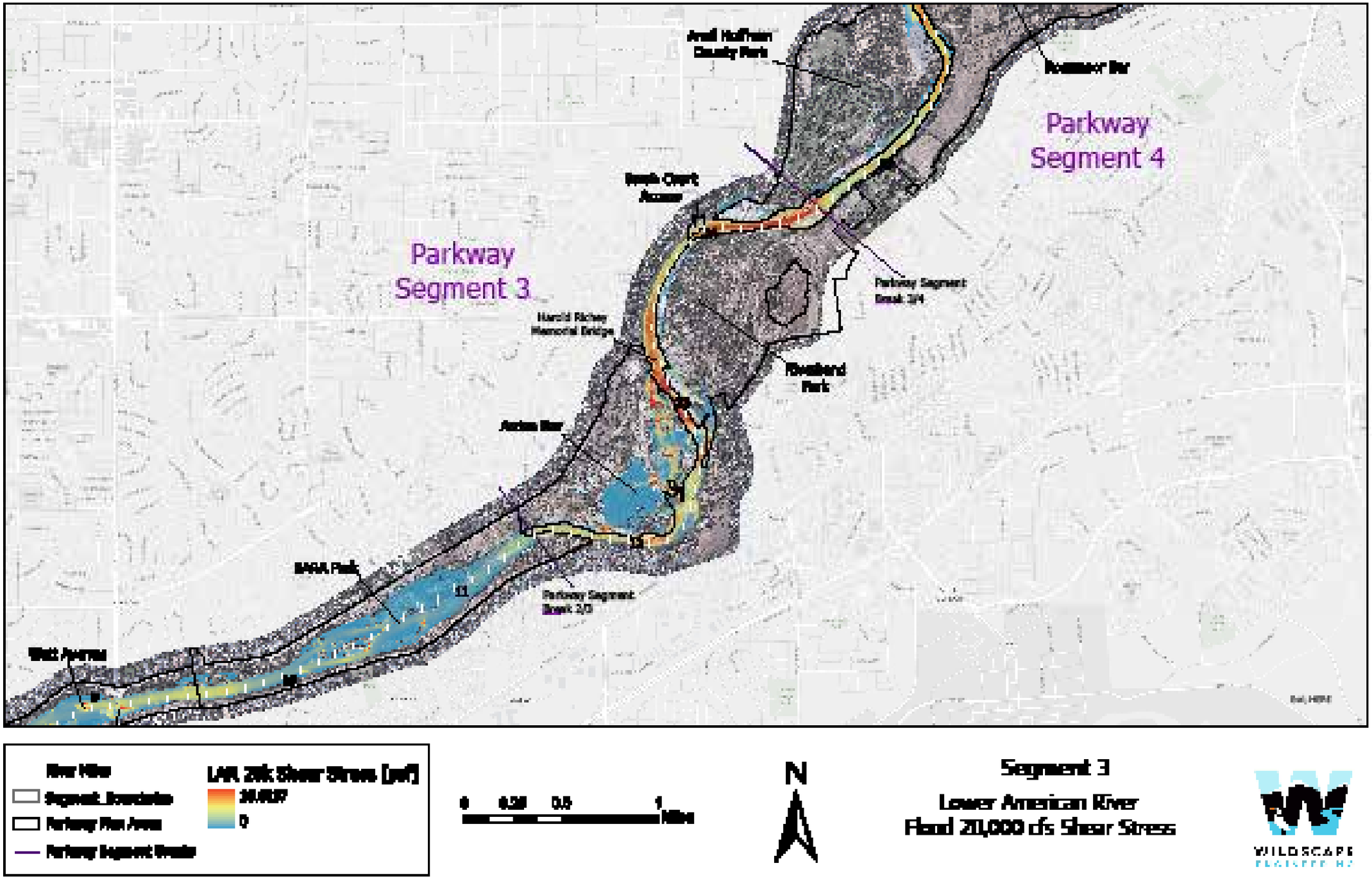
Break 5 US END
Fair Oaks
Bridge
Sunrise Blvd
Jim Jones Bridge
Nimbus Dam
Hazel Ave
Upper Sunrise
Parkway Segment
Break 4/5
Lower
Sunrise
Parkway
Segment 5
N
Segment 5
WILDSCAPE


Parkway
Segment 1
I-5
Parkway Segment
Break 1 DS END
Union Pacific
Hwy 160
Sacramento
Northern
Bikeway
Union Pacific
Hwy 80
Fair Oaks
Blvd/U St Bridge
Parkway Segment
Break 1/2
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
LAR 20k Shear Stress [psf]
0
0
0.25
0.5
1
Miles
N
Segment 1
Lower American River
Flood 20,000 cfs Shear Stress
WILDSCAPE


Harold Richey Memorial Bridge
Parkway Segment Break 2/3
Fair Oaks Blvd/1 St Bridge
Parkway Segment Break 1/2
Guy West Foot Bridge
Fairbairne Water Diversion
Howe Ave
Watt Ave
Parkway Segment 2
River Miles
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
LAR 20k Shear Stress [psf]
0
0 0.25 0.5 1 Miles
N
Segment 2
Lower American River
Flood 20,000 cfs Shear Stress
WILDSCAPE


Parkway
Segment 4
Parkway
Segment 3
Harold Richey
Memorial Bridge
Parkway Segment
Break 3/4
Parkway Segment
Break 2/3
Watt Avenue
LAR 20k Shear Stress [psf]
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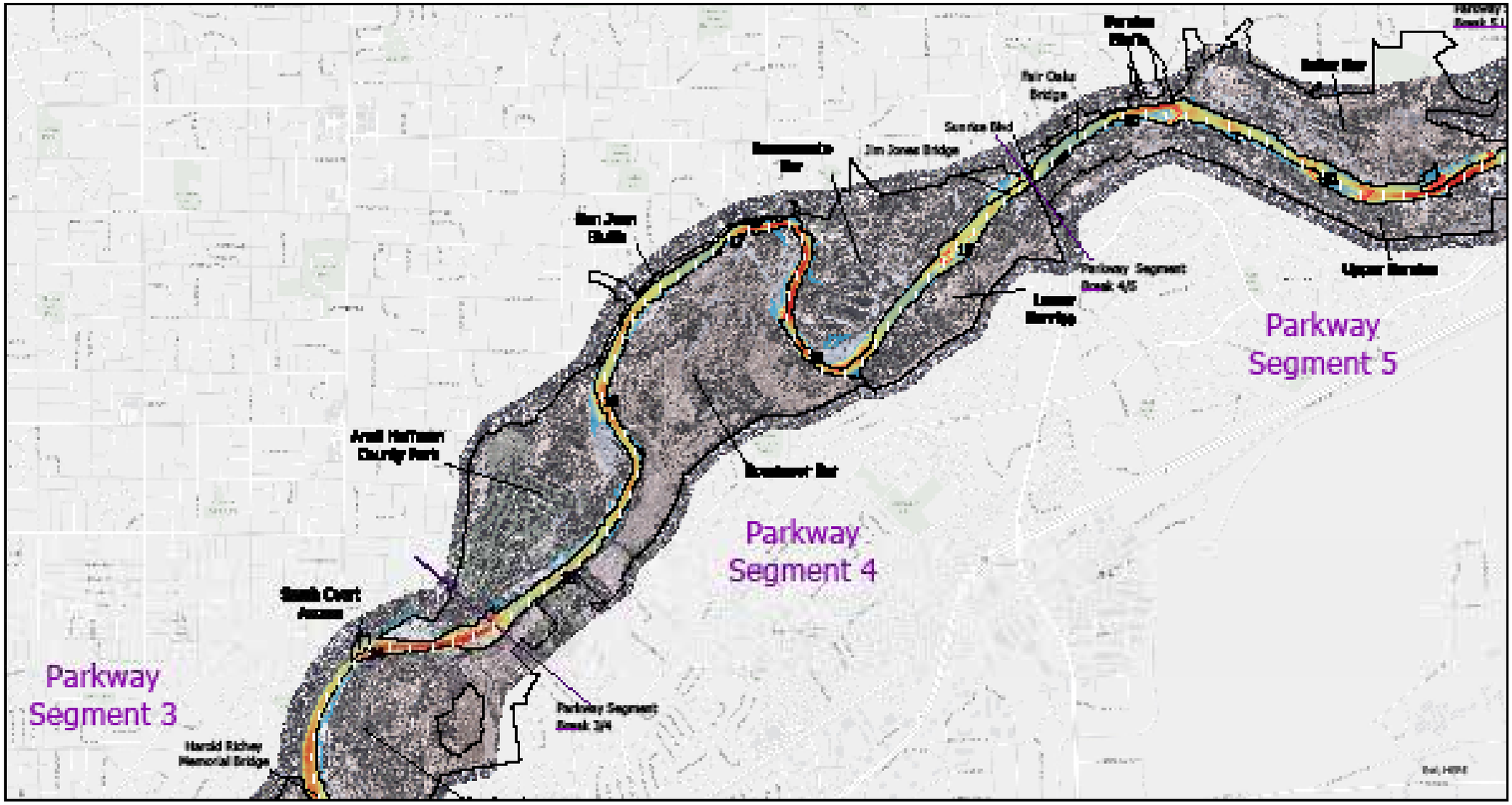
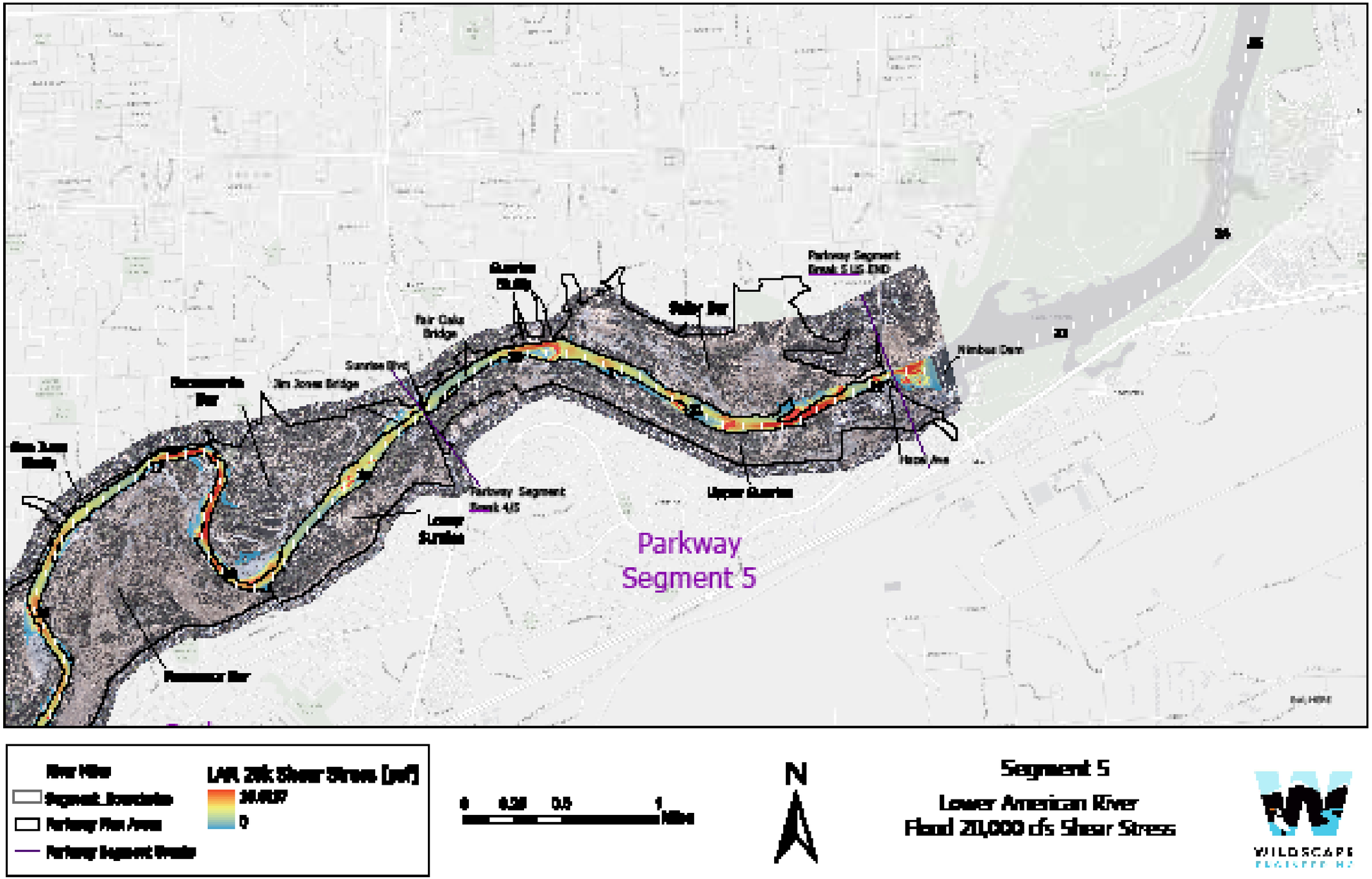
N
Segment 3
Lower American River
Flood 20,000 cfs Shear Stress
WILDSCAPE




**Segment 4**

**Lower American River**
**Flood 20,000 cfs Shear Stress**

WILDSCAPE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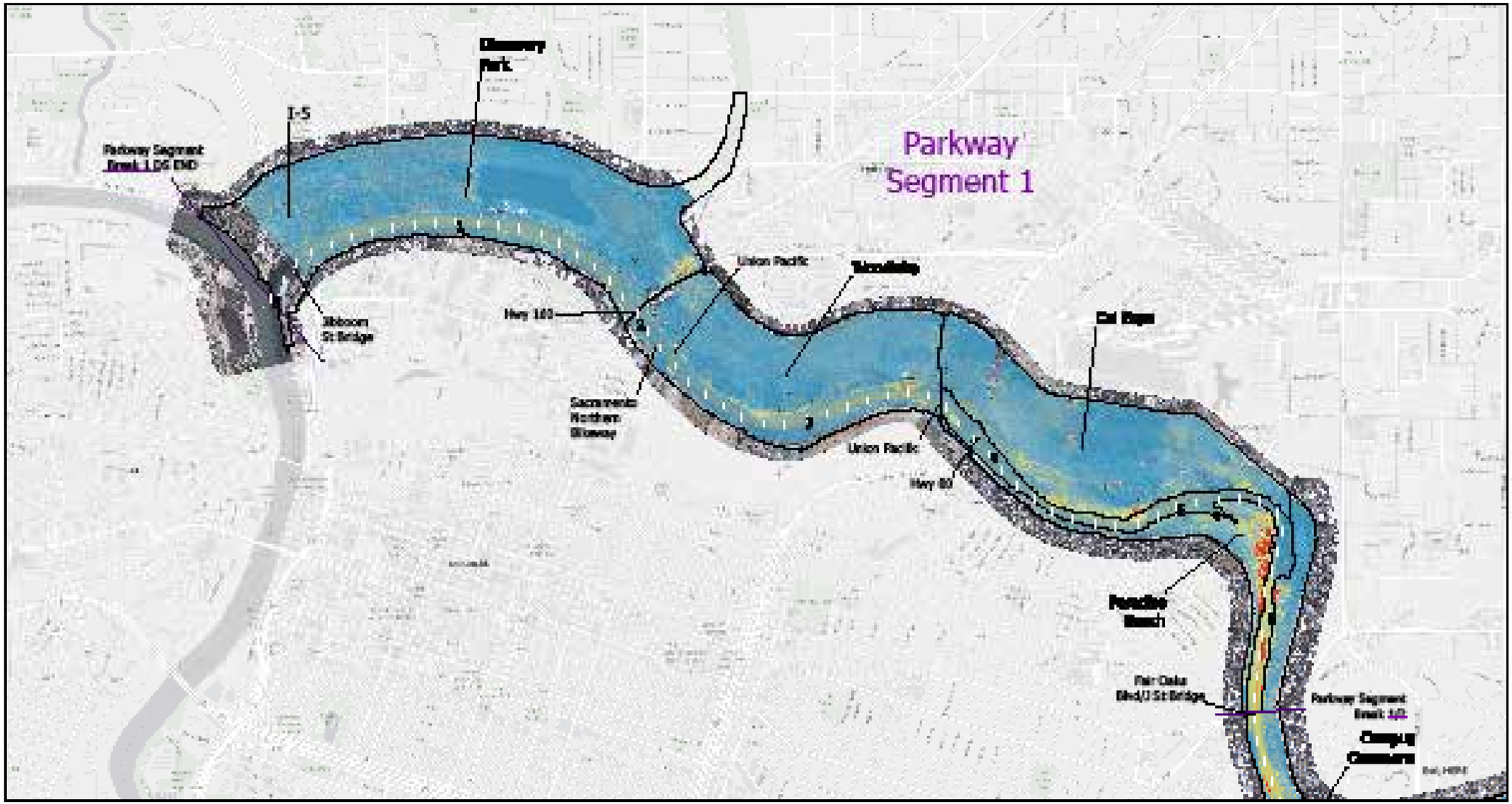
Break 5 US END
Fair Oaks
Bridge
Sunrise Blvd
Jim Jones Bridge
Nimbus Dam
Hazel Ave
Parkway Segment
Break 4/5
Parkway
Segment 5
N
Segment 5
Lower American River
Flood 20,000 cfs Shear Stress
WILDSCAPE




River Flow
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks

LAR 115k Shear Stress (psf)
Value
16.0979
0

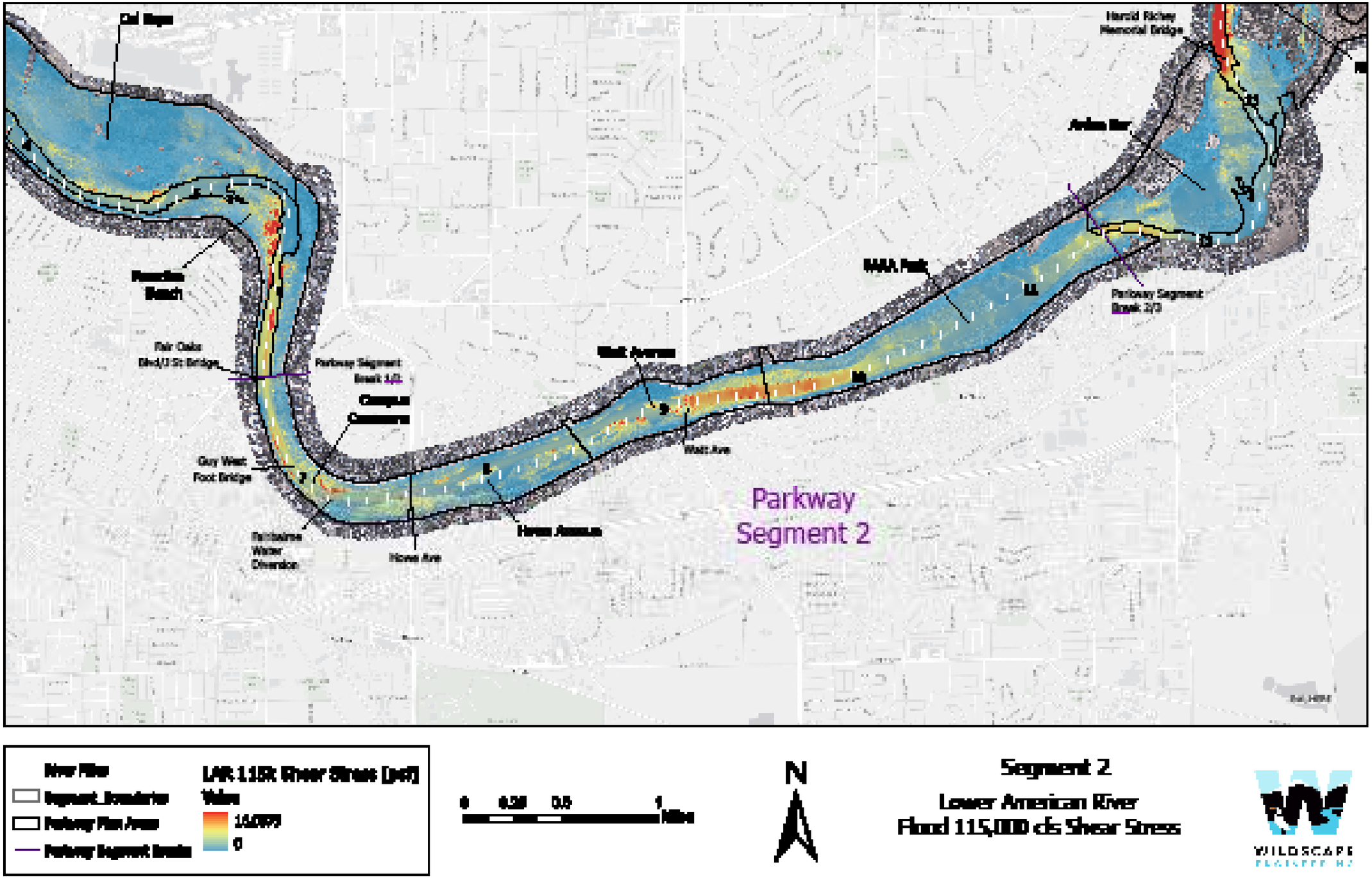
0 0.25 0.5 1 Miles

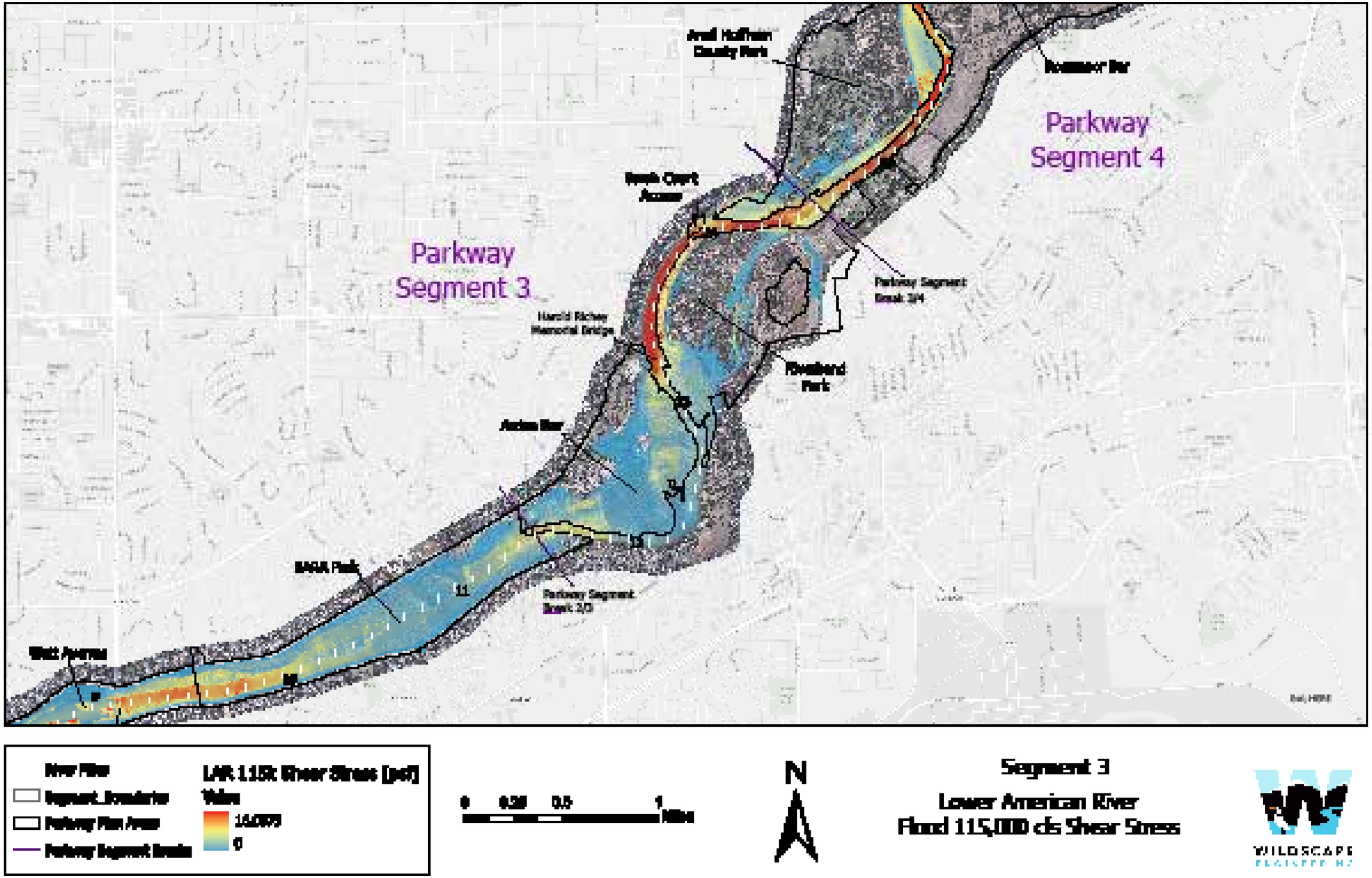
N

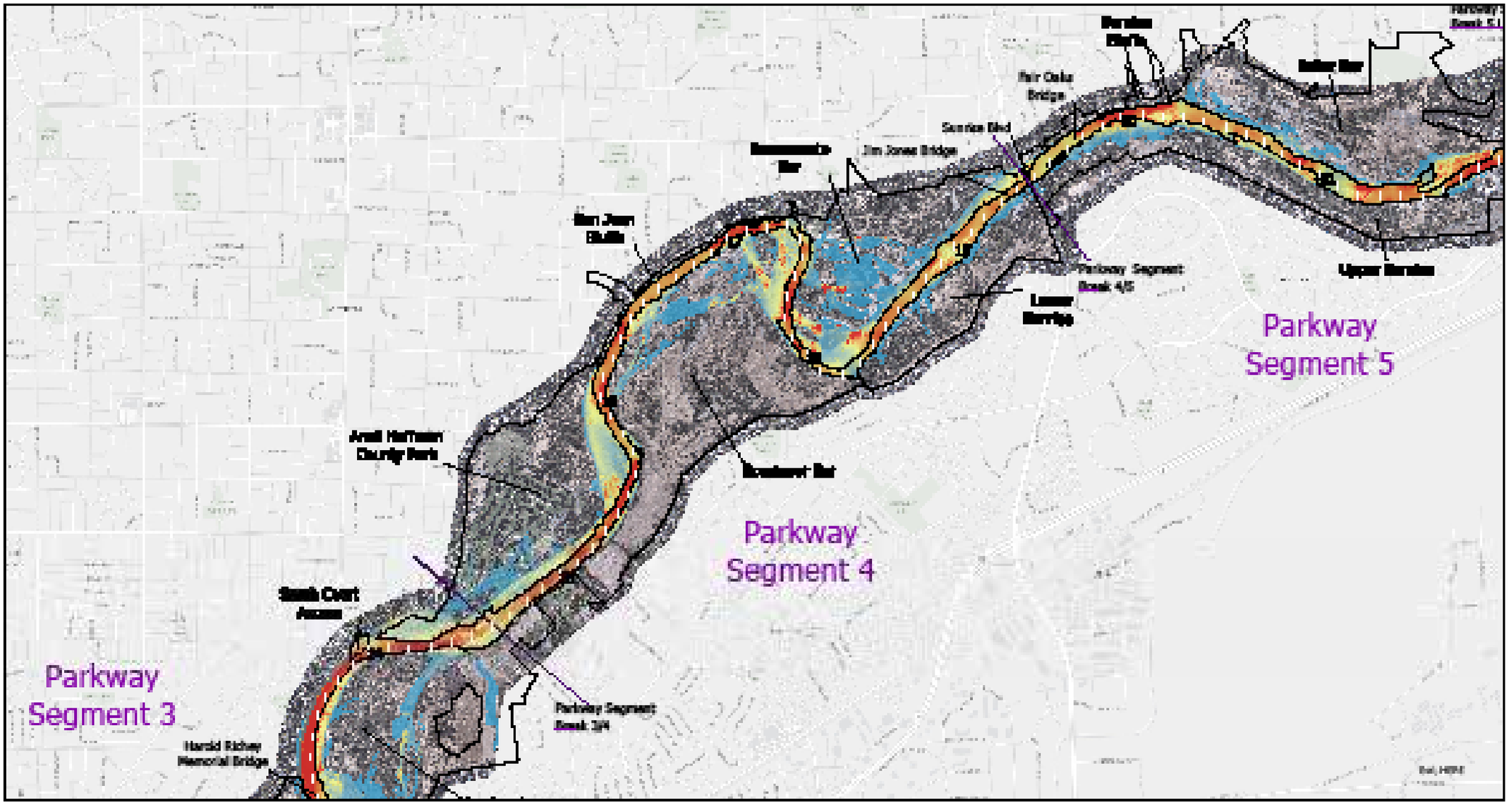
**Segment 1**

**Lower American River**
**Flood 115,000 cfs Shear Stress**

WILDSCAPE


Harold Richey Memorial Bridge
Parkway Segment Break 2/3
Fair Oaks Blvd/J St Bridge
Parkway Segment Break 1/2
Guy West Foot Bridge
Fairbairne Water Diversion
Howe Ave
Watt Ave
Parkway Segment 2
River Flow
Segment Boundaries
Parkway Plan Areas
Parkway Segment Breaks
LAR 115k Shear Stress [psf]
Value
0
0 0.25 0.5 1 Miles
N
Segment 2
Lower American River
Flood 115,000 cfs Shear Stress
WILDSCAPE


Parkway
Segment 4
Parkway
Segment 3
Harold Richey
Memorial Bridge
Parkway Segment
Break 3/4
Parkway Segment
Break 2/3
11
Segment 3
Lower American River
Flood 115,000 cfs Shear Stress
N
WILDSCAPE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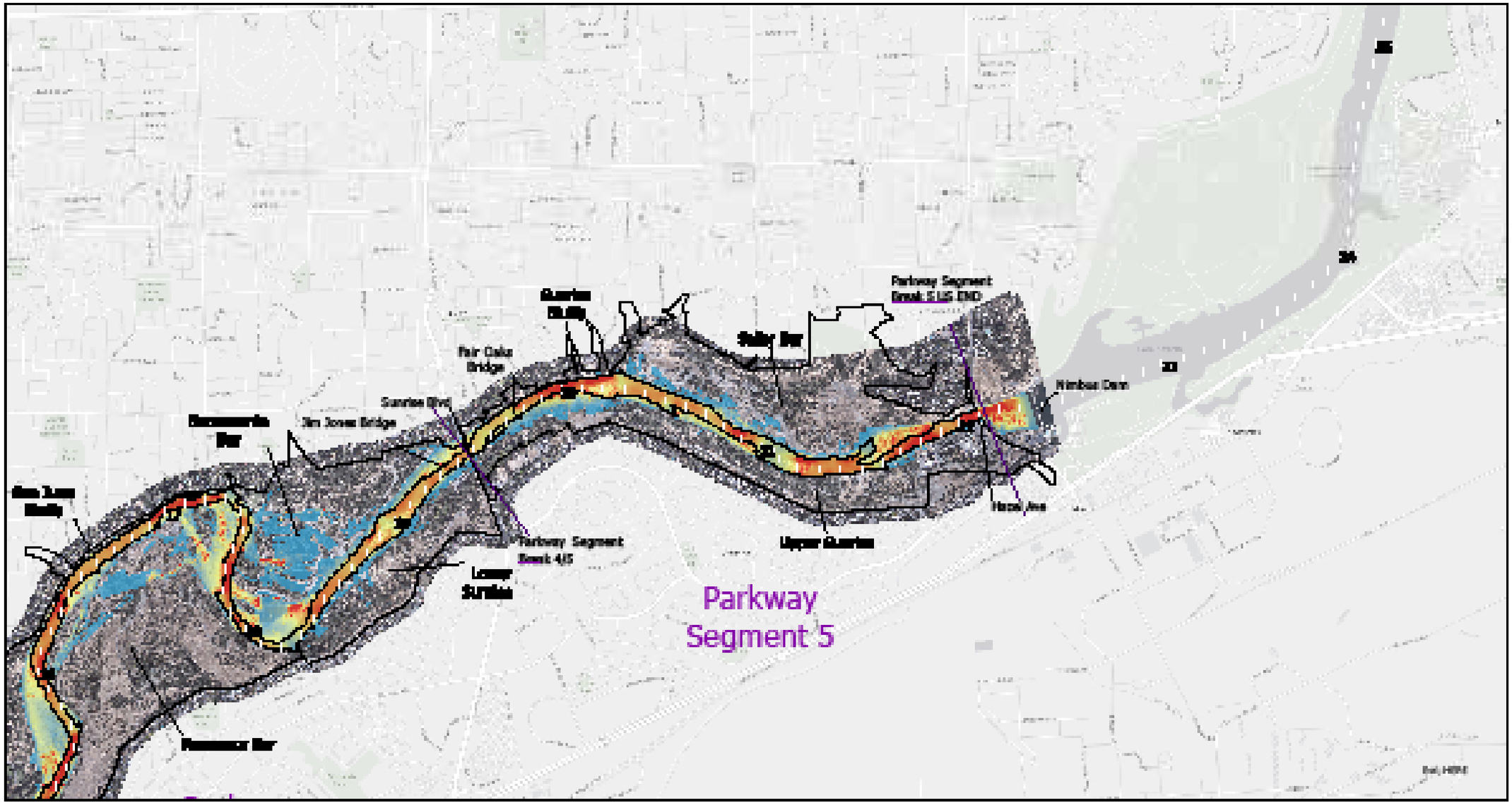
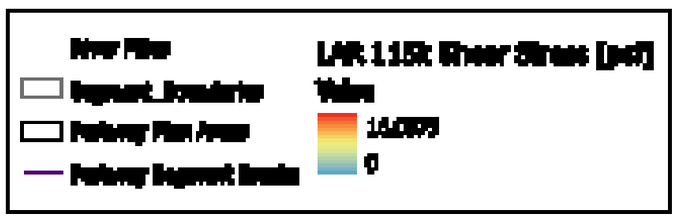
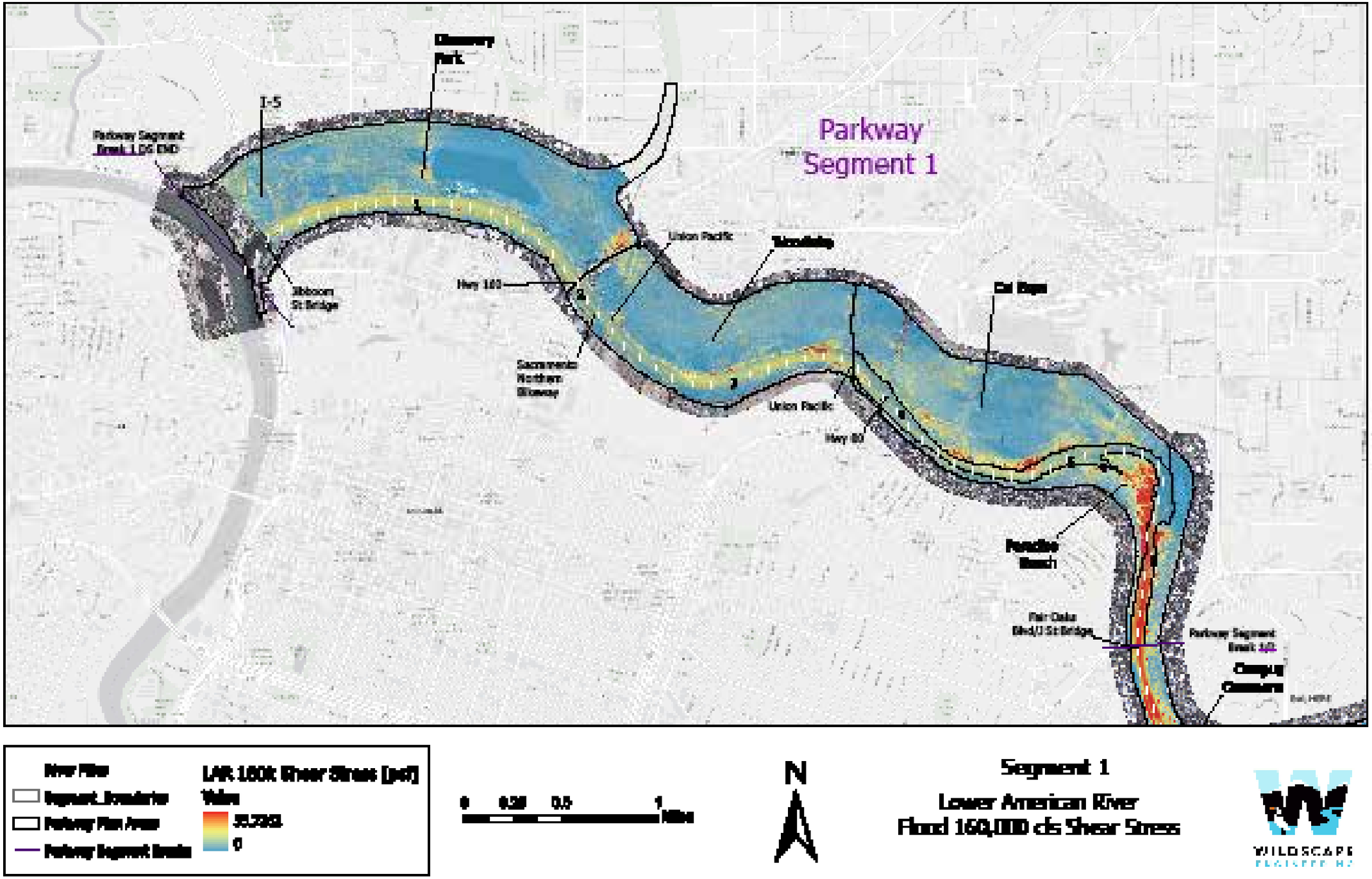
Segment 5
Parkway
Segment 4
Parkway
Segment 3
Segment 4
Lower American River
Flood 115,000 cfs Shear Stress
N

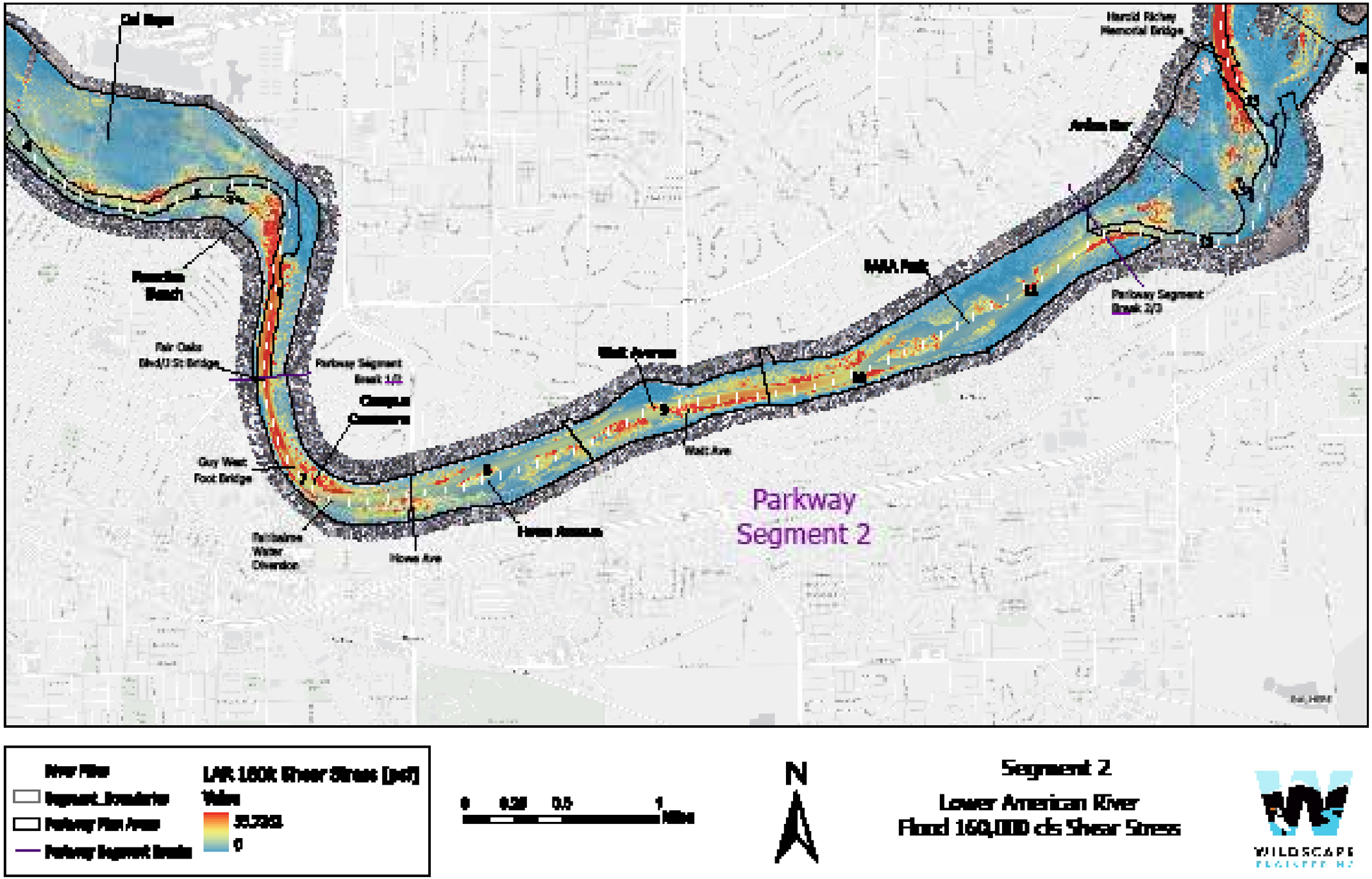


**Segment 5**

**Lower American River**
**Flood 115,000 cfs Shear Stress**


Parkway
Segment 1
I-5
Parkway Segment
Break 1 DS END
Union Pacific
Hwy 160
Sacramento
Northern
Bikeway
Union Pacific
Hwy 80
Fair Oaks
Blvd/J St Bridge
Parkway Segment
Break 1/2
Campus
Commons
River Flow
Segment_Boundaries
Parkway Plan Areas
Parkway Segment Breaks
LAR 160k Shear Stress [psf]
Value
0
0
0.25
0.5
1
Miles
N
Segment 1
Lower American River
Flood 160,000 cfs Shear Stress
WILDSCAPE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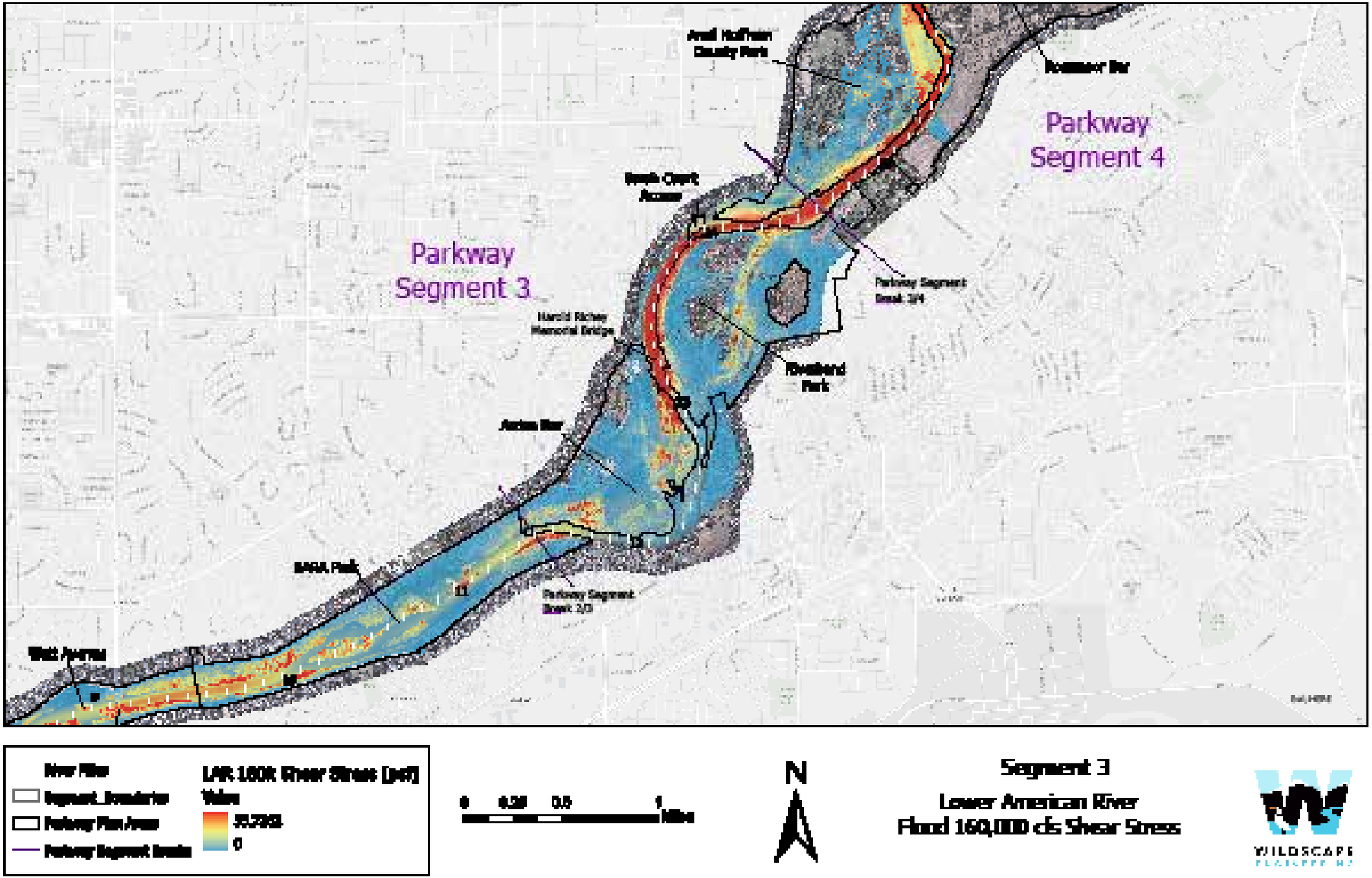
Segment 2
Fair Oaks
Blvd/J St Bridge
Parkway Segment
Break 1/2
Guy West
Foot Bridge
Fairbairne
Water
Diversion
Howe Ave
Watt Ave
Parkway Segment
Break 2/3
Harold Richey
Memorial Bridge
LAR 160k Shear Stress [psf]
Value
0
0
0.25
0.5
1
Miles
N
Segment 2
Lower American River
Flood 160,000 cfs Shear Stress
WILDSCAPE


Parkway
Segment 4
Parkway
Segment 3
Parkway Segment
Break 3/4
Harold Richey
Memorial Bridge
Riverbend
Park
Parkway Segment
Break 2/3
Watt Avenue
River Miles
Segment Boundaries
Parkway Plan Areas
Parkway Segment Breaks
LAR 160k Shear Stress [psf]
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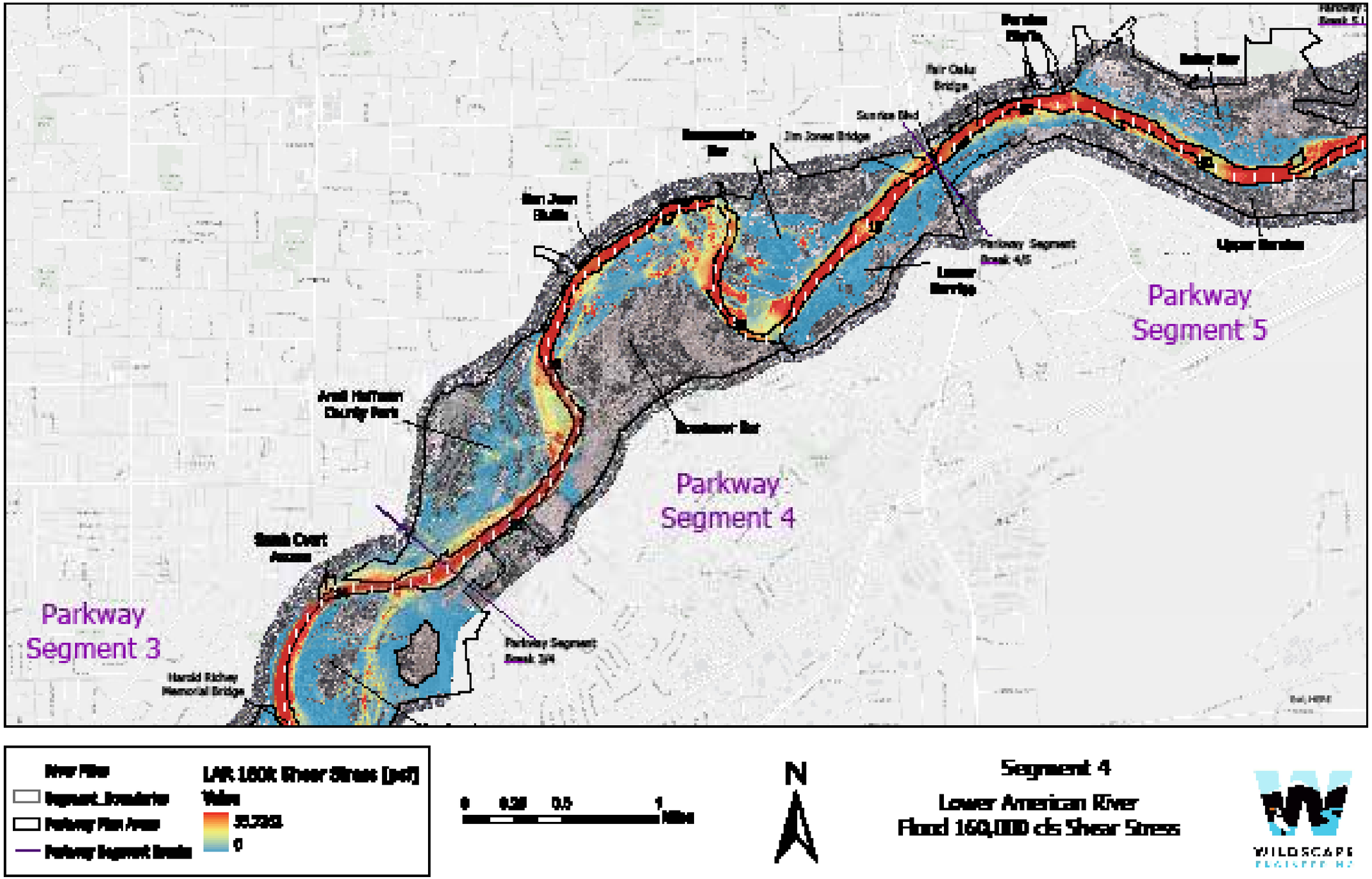
0
0
0.25
0.5
1
Miles
N
Segment 3
Lower American River
Flood 160,000 cfs Shear Stress
WILDSCAPE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Parkway Segment 4
Parkway Segment 3
Fair Oaks Bridge
Sunrise Blvd
Jim Jones Bridge
Parkway Segment Break 4/5
Lower Berrigo
Upper Berrigo
Arnold Hoffman County Park
Parkway Segment Break 3/4
Harold Richey Memorial Bridge
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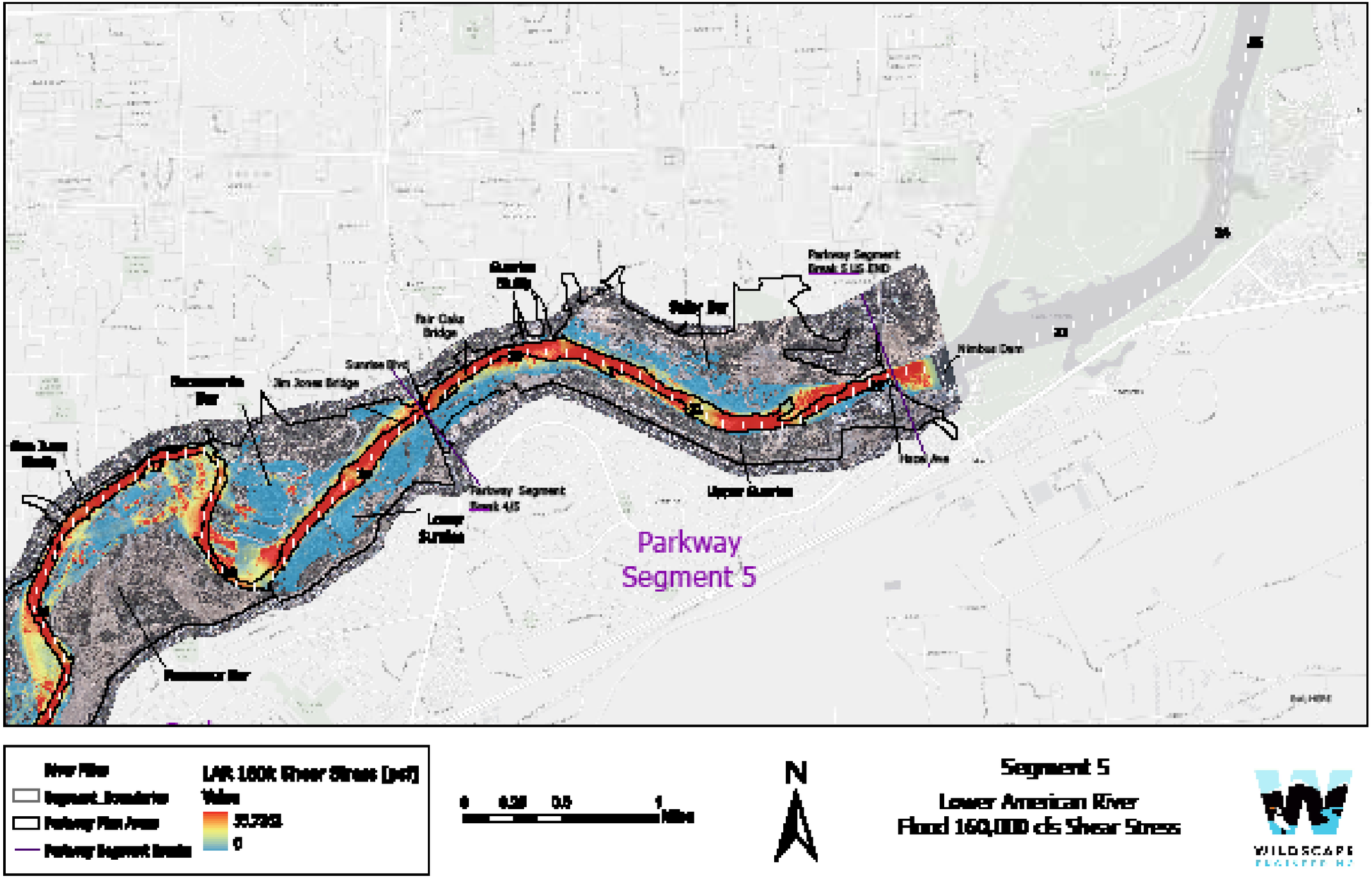
Value
0
0 0.25 0.5 1 Miles
N
Segment 4
Lower American River
Flood 160,000 cfs Shear Stress
WILDSCAPE


Parkway Segment
Break 5 US END
Fair Oaks
Bridge
Sunrise Blvd
Jim Jones Bridge
Nimbus Dam
Hazel Ave
Parkway Segment
Break 4/5
Parkway
Segment 5
N
Segment 5
Lower American River
Flood 160,000 cfs Shear Stress
WILDSCAPE

# Appendix 11
# Bank Inventory Report

DRAFT Lower American River Bank Erosion Inventory Report

Inventory Completed November 17th – 18th, 2019

From Nimbus Dam (RM 22.1) to Gristmill Recreation Area (RM 11.60)

Wildscape Engineering, Inc.

WILDSCAPE
ENGINEERING

May 14, 2020

**Purpose**

In support of the Lower American River (LAR) Natural Resource Management Plan (NRMP), the primary focus of this survey was to identify and document areas of streambank erosion in the upper reaches of the LAR. The secondary goal was to field truth outfall locations visible from the river and identify areas with existing bank protection measures. Only the upper ten miles of the LAR were surveyed since RM 0 to 14 are protected by levees and monitored annually to assess potential scour locations and bank condition (MBK 2007- 2016). The information collected during this streambank survey was used to inform the Streambanks section of Chapter 4 of the American River Parkway Natural Resource Management Plan and to provide preliminary data for future streambank erosion investigations and projects.

**Method**

As introduced above the survey covered approximately 10 miles of the upper LAR streambanks, in Sacramento County, CA. The area between the Sailor Bar Boat ramp (RM 21.55) and the Gristmill Recreation Area (RM 11.6) was surveyed riverside via boat and the streambanks between the Sailor Bar Boat ramp (RM 21.55) and Nimbus Dam (RM 22.1) were surveyed landside on foot. Data collection was conducted on November 17th and 18th 2019, on the first day the right bank was surveyed and on the second day the left bank was surveyed.

At locations where visible erosion, outfalls or existing bank protection measures were observed, GPS location data was collected, written descriptions were recorded, and photographs were taken. At observed erosion locations data regarding location, the level of recreational impact, length of disturbance, future erosion risk, and bank material type were recorded. The location, type, and whether the area was armored or exhibited erosion was recorded at observed outfalls. Information regarding the length of bank protection measures and type were also recorded.

**Location Data:** GPS data was collected using a smart tablet (Samsung, Galaxy Tab A) with horizontal accuracy of approximately 3-meters. It is important to note that all location data is approximate. Since the survey was done while navigating a moving river it was not always possible to collect location data exactly where the observation took place. Sites that were observed when river conditions demanded full navigational abilities were approximated as accurately as possible through notes taken further downstream and review of the aerial imagery.

Following data collection, the data was compiled into table and map format using Microsoft Excel and ArcGIS Pro software (see Results section).

**Documentation Criteria:** Data was collected regarding locations showing signs of erosive scour, recreation induced erosion, outfalls, and existing bank protection measures. Criteria used to identify erosion locations included: 1) bare/exposed soil, 2) vegetation leaning or fallen into channel, 3) undercutting of hard bank geomorphic units, 4) exposed/overhanging vegetation roots, and 5) scoured/lowered topography at unvegetated section compared to vegetated surroundings.

*Figure 1 Erosion Site E_L_2 near Fair Oaks Bridge*

*Figure 2 Erosion Site E_R_7 Arden Bar*

An important distinction was made to inventory locations associated with recreational erosion. An area was categorized as "recreational erosion" if human recreation activities were estimated to be the primary cause of the erosion. Criteria used to identify recreational erosion included: 1) human caused social trails distinguished by stunted or absent vegetation, 2) areas where bare soil was

exposed and compaction present, and 3) nearby recreational infrastructure such as bike trails, trash cans, and boat ramps.

*Figure 3 Recreational Erosion Site RE_L_7 Lower Sunrise*

*Figure 4 Recreational Erosion Site RE_R_3 Ancil Hoffman County Park*

At locations with observed erosion, the future erosion risk was rated on a qualitative scale using "none", "low", "med" and "high" as descriptors. The following factors were considered when assigning a future erosion risk level to an erosive location: extent and type of vegetation present, anticipated shear forces during high discharge events (outside bends, areas adjacent to "hard" bank material and flow contractions are locations where high shear forces typically occur), anticipated rates of foot traffic, current bank slope, and exposed bank material type. It is important to note that all risk levels were made without formal criteria guiding their assessment. Any future assessments of these areas should be done with specific agreed upon criteria for rating future erosion risk level to more clearly prioritize areas for protection or improvement and guide management actions.

An existing GIS outfall layer guided the outfall field truth effort. Only outfalls visible from the river channel were documented as many in the existing layer were set back from the river. While the relatively small watersheds that outfall into the LAR contribute a negligible amount of discharge from a flood-scale perspective, they may cause localized scour in the LAR channel.

Lastly, notable bank protection measures were documented by photograph, location, and description. Bank protection measures include cobble toe, angular rock (rip rap), retaining walls, shotcrete banks, gabion structures, concrete rubble, and sheet piles.

**Results**

Tables 1-4 (attached to end of document) show documented cases of erosion, recreational erosion, outfalls, and existing bank protection measures. The attached Bank Condition Map provides spatial reference for the documented instances of erosion, outfalls, and existing bank protection. It should be noted that the list of inventoried features is not exhaustive given the nature of potentially missing some aspects while "floating by" or for some features to be hidden. For example, the bank protection measures introduced above may have been overgrown by vegetation or covered in aggraded sediments and therefore no longer visible from the river.

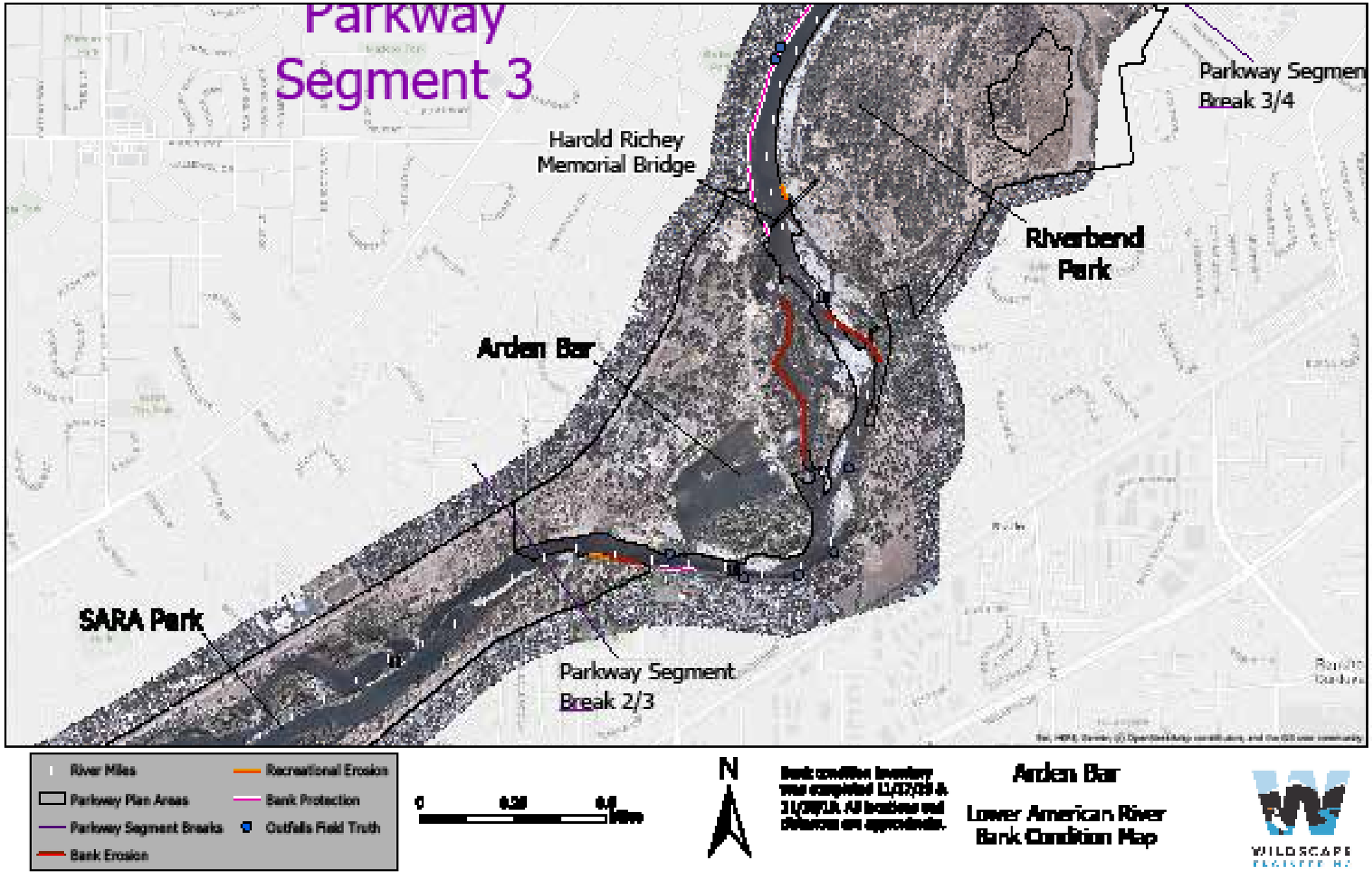
In total, 14 cases of erosion, 17 cases of recreational erosion, 19 outfalls, and 20 examples of existing bank protection measures were documented. In total, 7,800 feet or 7.5 percent of streambank surveyed was categorized as areas with non-recreational bank erosion and 15,000 feet or 14 percent of streambank surveyed was categorized as areas with recreational erosion. Seven out of 19 documented outfalls exhibited signs of scour and erosion. Rip rap was the most common form of existing bank protection type observed, accounting for 11 out of 20 occurrences.

**Summary**

Streambank condition along the LAR has the potential to affect existing or future infrastructure, wildlife habitat, outdoor recreation, flood protection levee condition and the scenic value of the river corridor. The purpose of this survey was to inform the writing of Section 4 of the Lower American River Natural Resource Management Plan and to provide preliminary data for future work involving streambanks on the LAR. The results presented should not be interpreted as exhaustive.

**References**

MBK Engineers. 2007. Lower American River Streambank Erosion Monitoring Report. Available at: http://www.safca.org/Protection/Environmental_Collaboration_EPWG.html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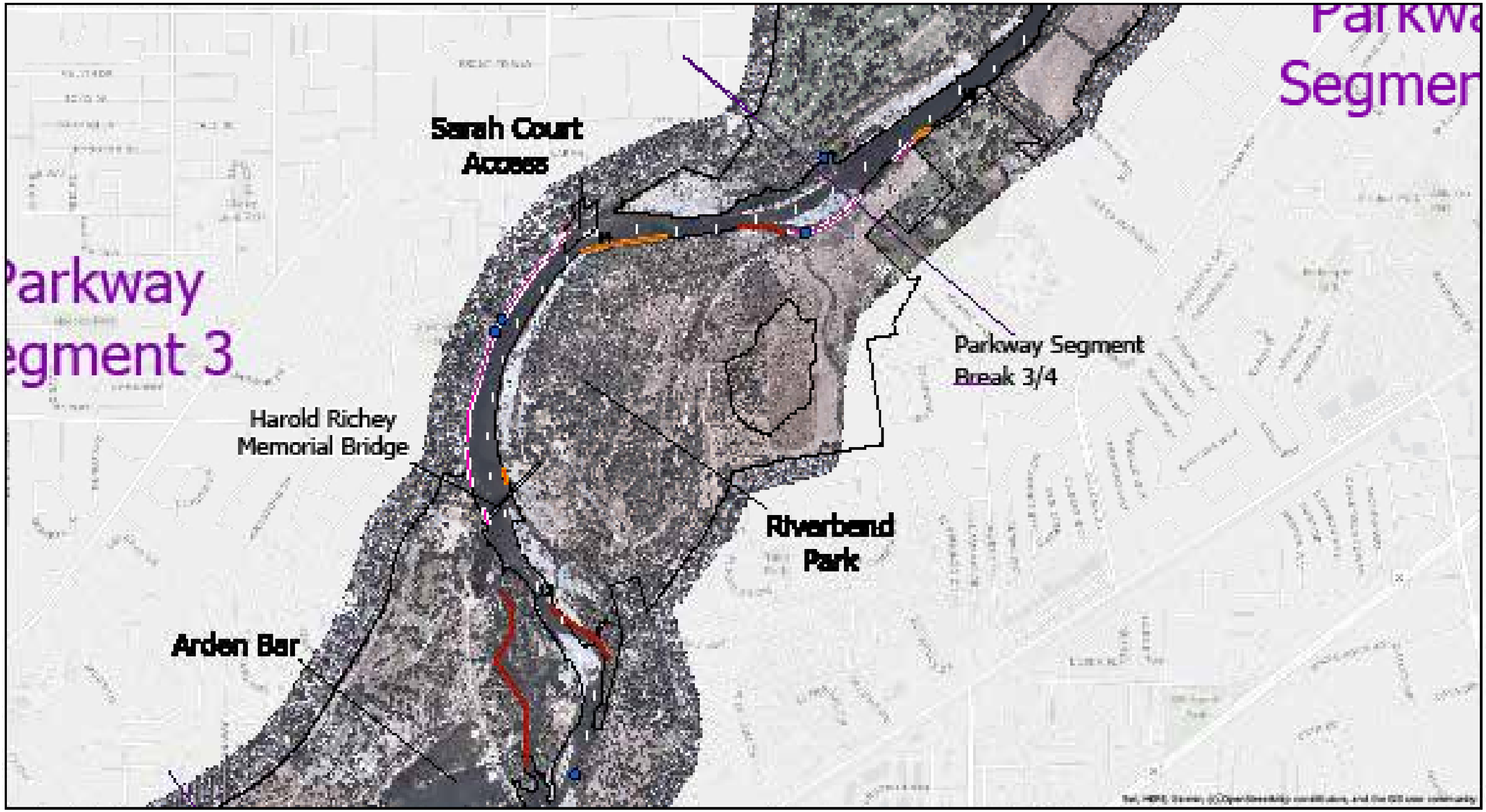
Segment 3
Harold Richey
Memorial Bridge
Parkway Segmen
Break 3/4
Riverbend
Park
Arden Bar
SARA Park
Parkway Segment
Break 2/3
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
N
Arden Bar
Lower American River
Bank Condition Map
WILDSCAPE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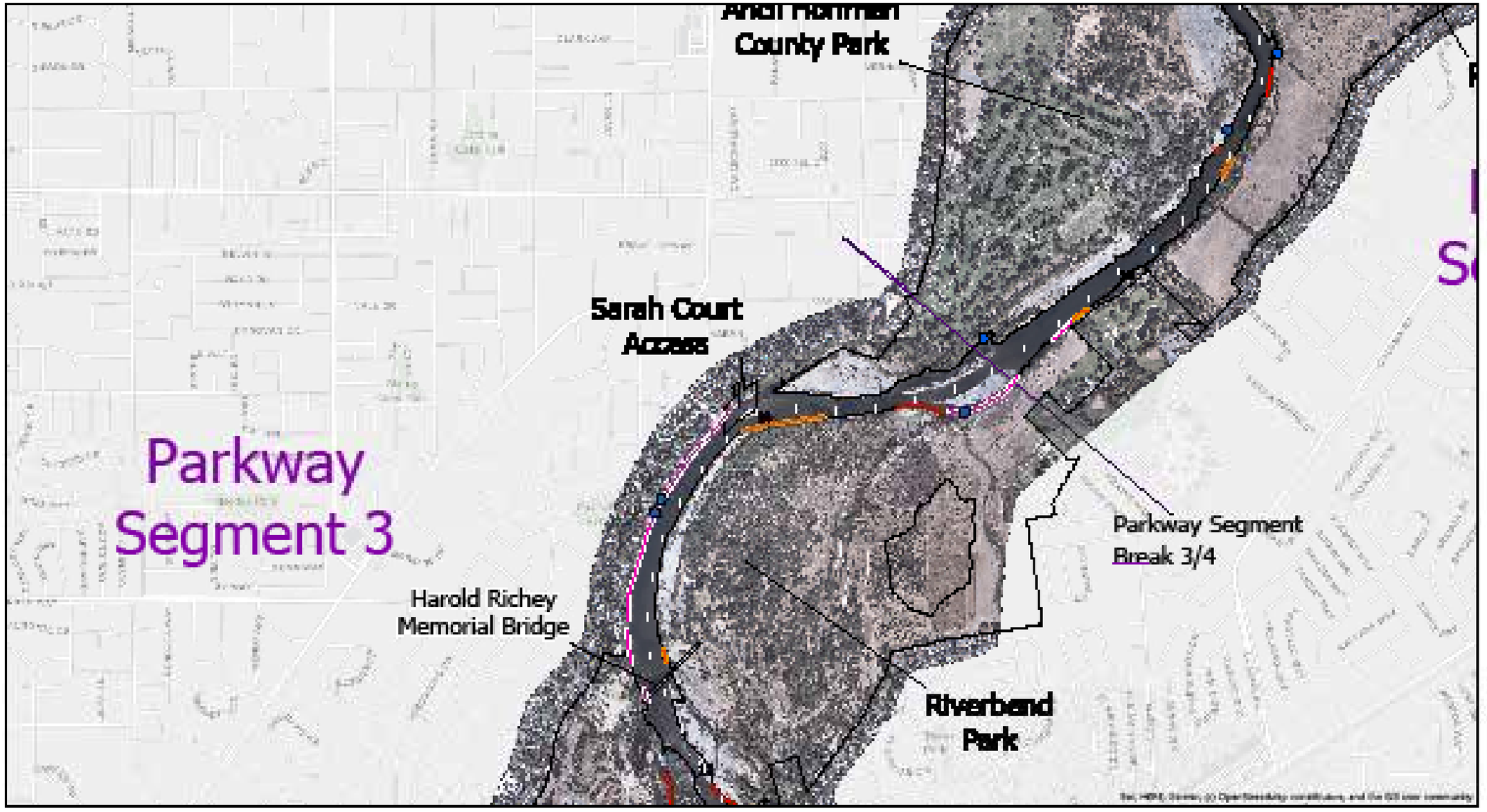
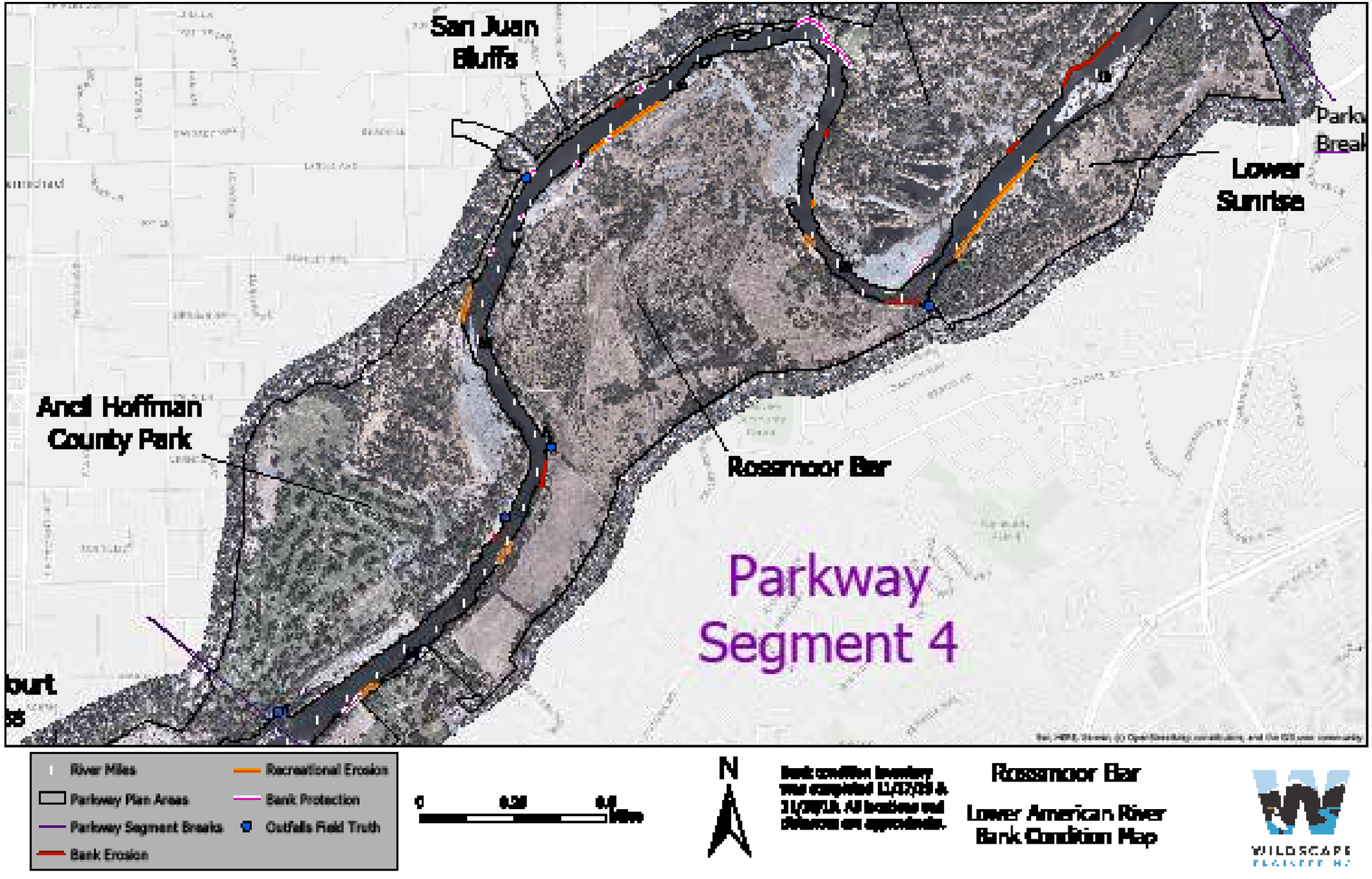
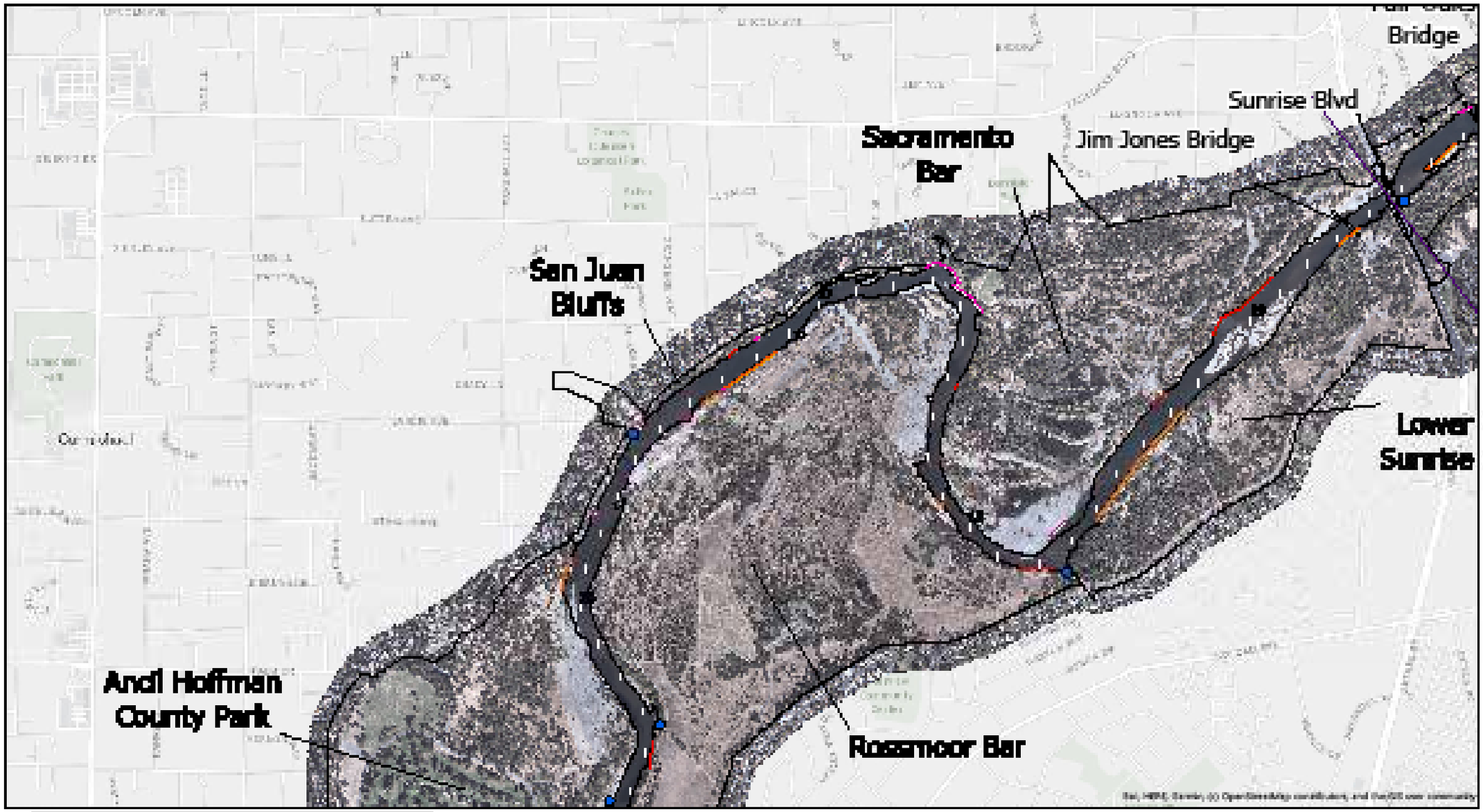
Segment 3
Parkway
Segmen
Sarah Court
Access
Harold Richey
Memorial Bridge
Parkway Segment
Break 3/4
Riverbend
Park
Arden Bar
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
0
0.25
0.5
Miles
N
Riverbend Park
Lower American River
Bank Condition Map
WILDSCAPE


Ancil Hoffman
County Park
Sarah Court
Access
Parkway
Segment 3
Parkway Segment
Break 3/4
Harold Richey
Memorial Bridge
Riverbend
Park
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
0
0.25
0.5 Miles
N
Bank condition inventory was completed 11/2020 & 3/2021. All locations and distances are approximate.
Sarah Court Access
Lower American River
Bank Condition Map
WILDSCAPE

Ancil Hoffman
County Park
Rosemoor Bar
Parkway
Segment 4
Sarah Court
Access
Parkway Segment
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
N
Ancil Hoffman County
Lower American River
Bank Condition Map


San Juan Bluffs
Lower Sunrise
Ancil Hoffman County Park
Rossmoor Bar
Parkway Segment 4
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
N
Rossmoor Bar
Lower American River Bank Condition Map
WILDSCAPE


Bridge
Sunrise Blvd
Sacramento Bar
Jim Jones Bridge
San Juan Bluffs
Lower Sunrise
Ancil Hoffman County Park
Rossmoor Bar
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
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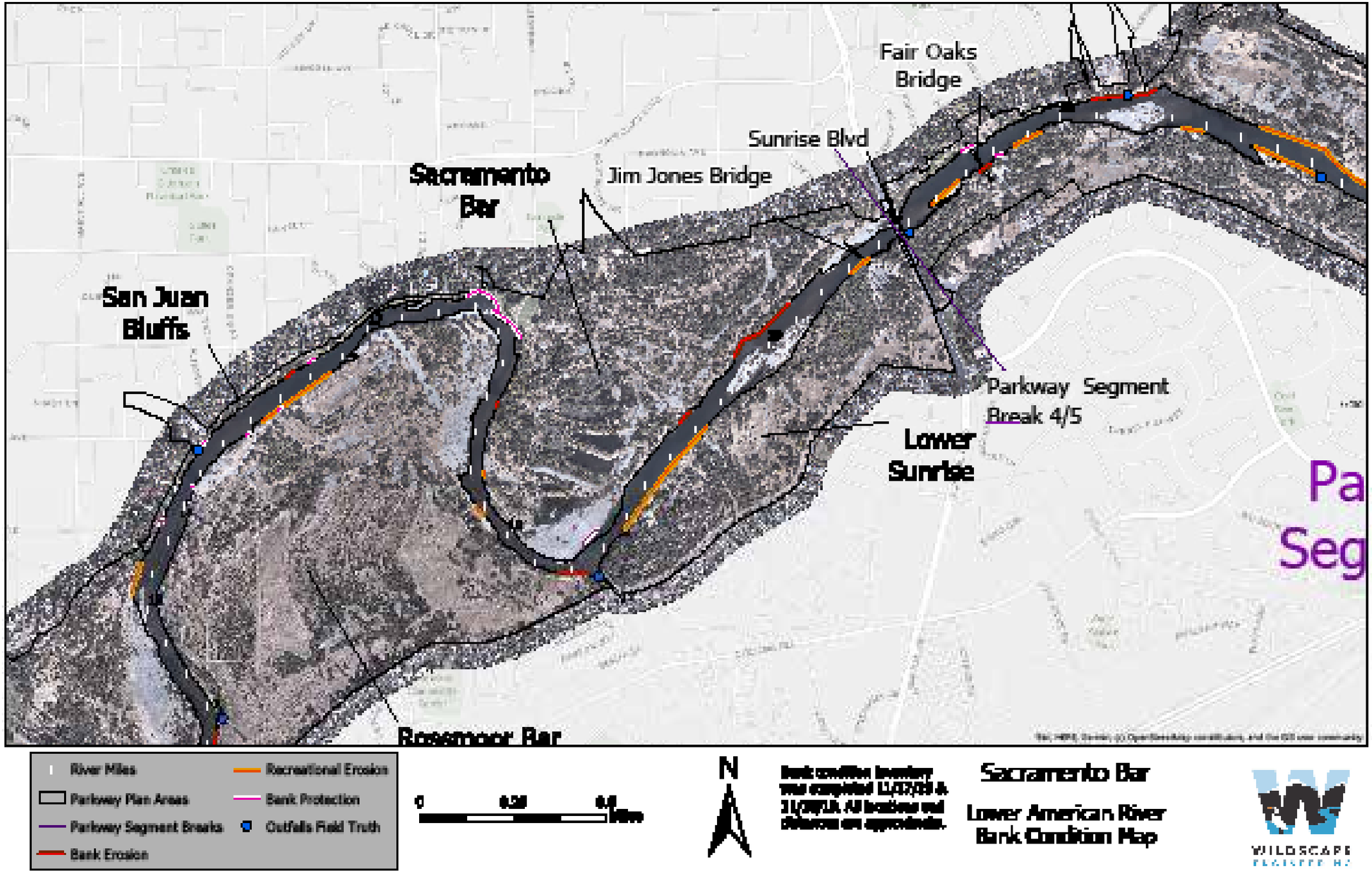
N
San Juan Bluffs
Lower American River
Bank Condition Map
WILDSCAPE


Fair Oaks Bridge
Sunrise Blvd
Jim Jones Bridge
Sacramento Bar
San Juan Bluffs
Parkway Segment Break 4/5
Lower Sunrise
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Seg
Rossmoor Bar
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
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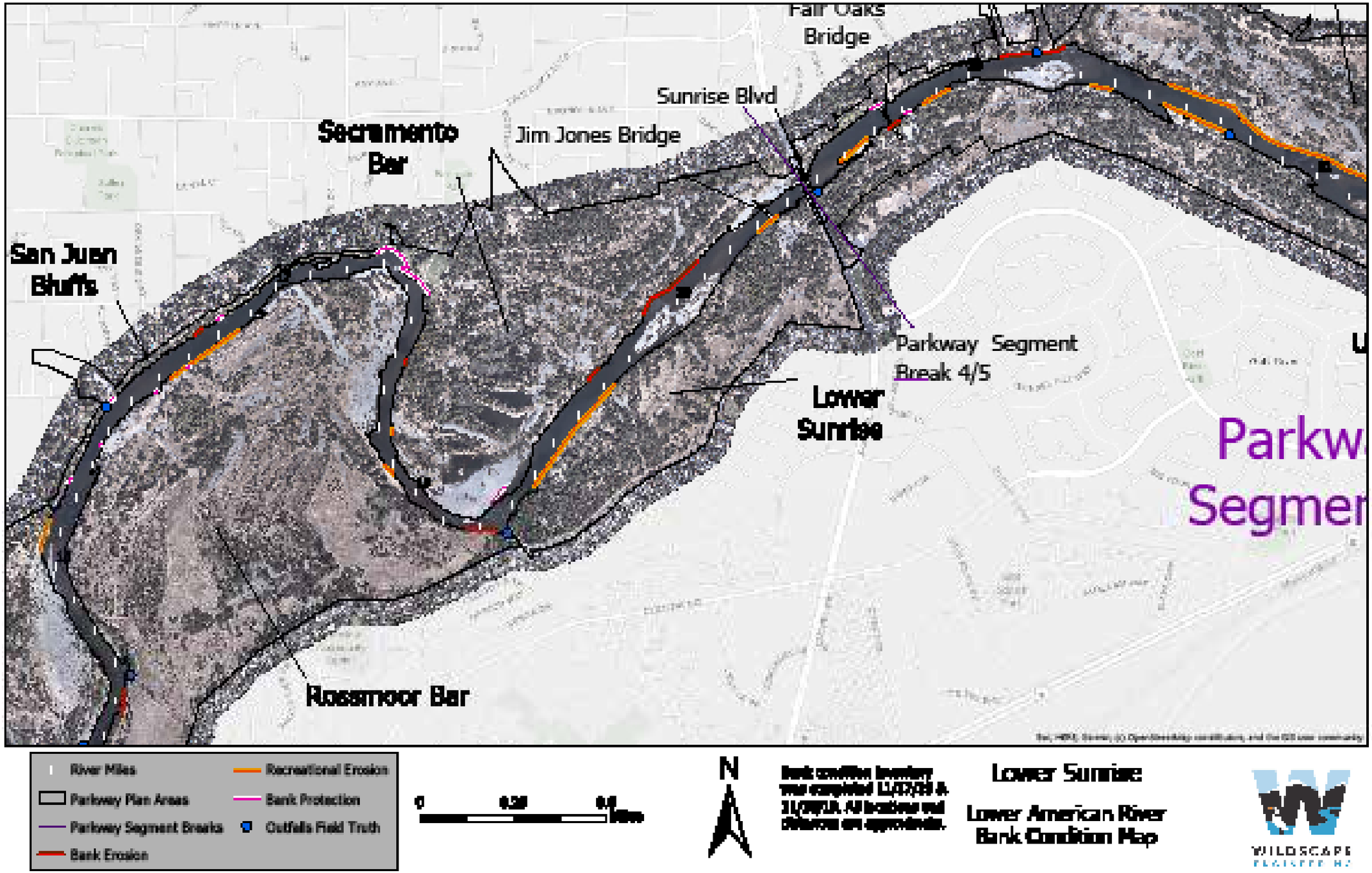
Sacramento Bar
Lower American River Bank Condition Map
WILDSCAPE


Fair Oaks Bridge
Sunrise Blvd
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San Juan Bluffs
Parkway Segment Break 4/5
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Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
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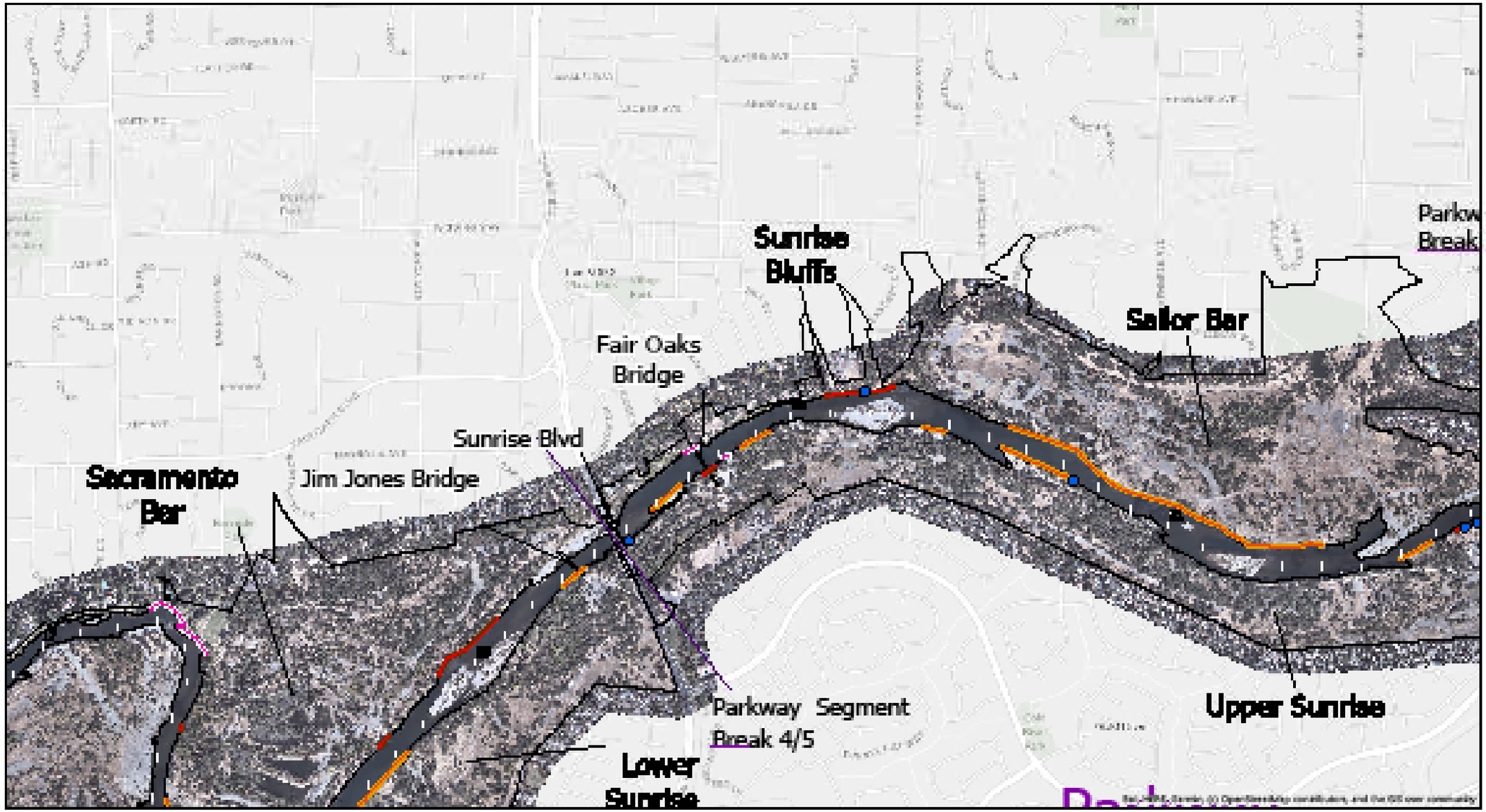
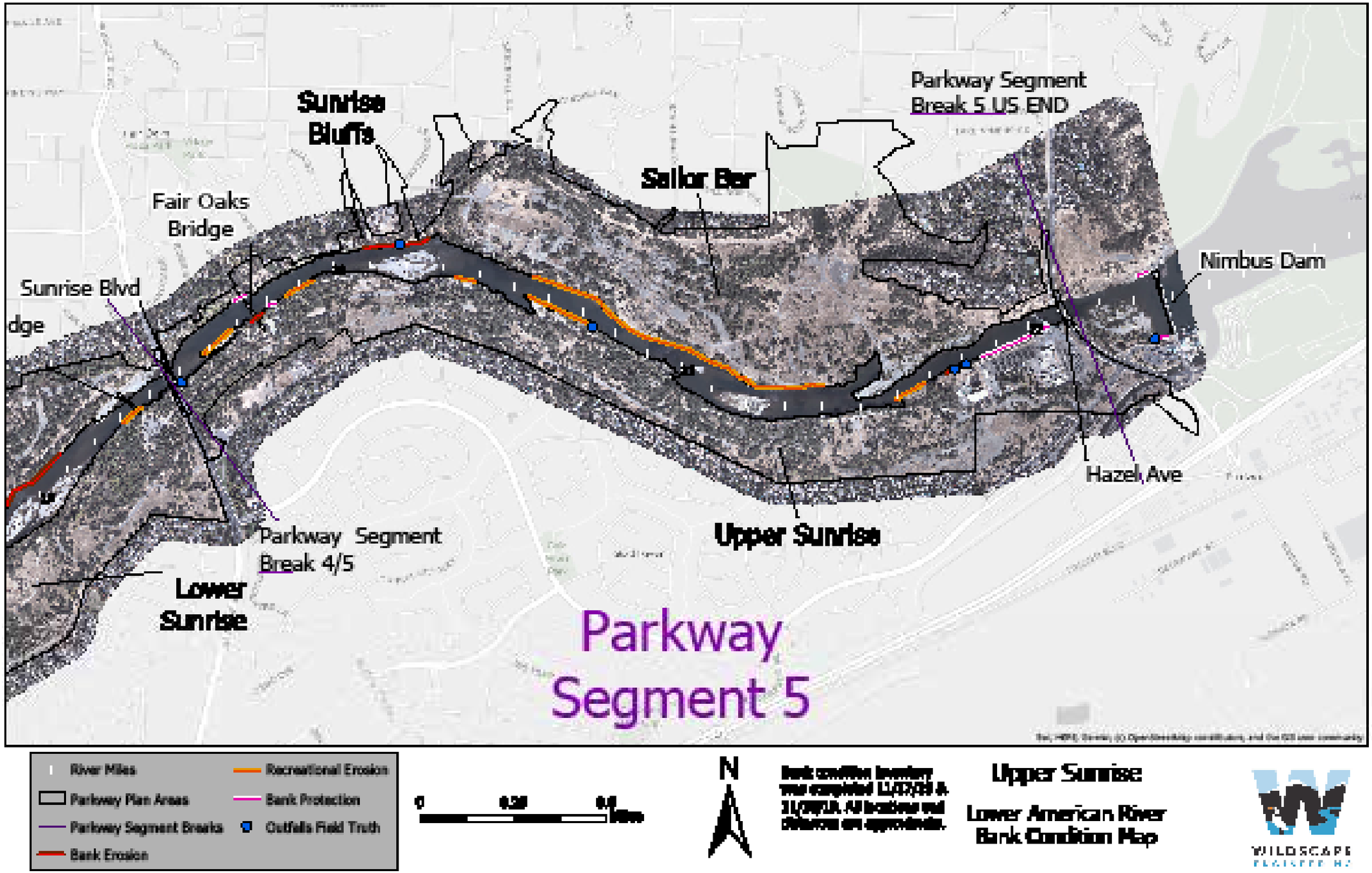
Lower Sunrise
Lower American River Bank Condition Map
WILDSCAPE


Sunrise Bluffs
Sailor Bar
Parkw
Break
Fair Oaks Bridge
Sunrise Blvd
Jim Jones Bridge
Sacramento Bar
Parkway Segment Break 4/5
Lower Sunrise
Upper Sunrise
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
0
0.25
0.5 Miles
N
Bank condition inventory was completed 11/2020 & 3/2021. All locations and distances are approximate.
Sunrise Bluffs
Lower American River Bank Condition Map
WILDSCAPE


Parkway Segment
Break 5 US END
Sunrise
Bluffs
Sailor Bar
Fair Oaks
Bridge
Nimbus Dam
Sunrise Blvd
dge
Hazel Ave
Parkway Segment
Break 4/5
Upper Sunrise
Lower
Sunrise
Parkway
Segment 5
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
0
N
Upper Sunrise
Lower American River
Bank Condition Map
WILDSCAPE

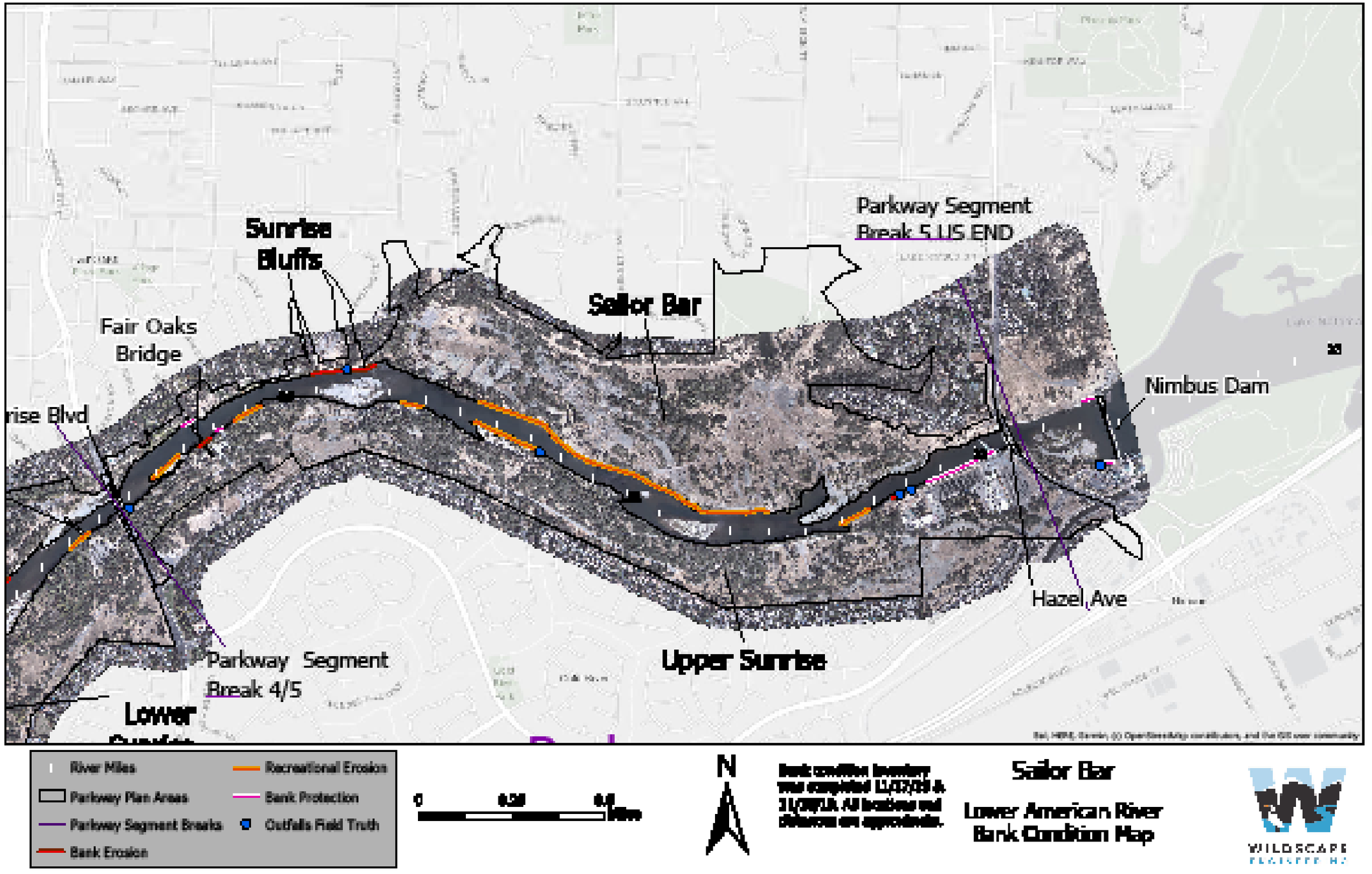

Sunrise Bluffs
Sailor Bar
Parkway Segment Break 5 US END
Fair Oaks Bridge
rise Blvd
Nimbus Dam
Hazel Ave
Parkway Segment Break 4/5
Upper Sunrise
Lower
River Miles
Parkway Plan Areas
Parkway Segment Breaks
Bank Erosion
Recreational Erosion
Bank Protection
Outfalls Field Truth
0
0.25
0.5 Miles
N
Bank condition inventory was completed 11/2020 & 3/2021. All locations and distances are approximate.
Sailor Bar
Lower American River Bank Condition Map
WILDSCAPE

**Table 3 Erosion Locations on the Lower American River in RM 26.4**
**RM = location where bank erosion is occurring mostly due to flow hydraulics or wave action from boats**

| ID | River STA (USACE, mi.) | | Approx. Length Disturbance (ft.) | Bank (L/R) | Level of Recreation Impact | Bank Material | Future Erosion Risk | Notes |
|---|---|---|---|---|---|---|---|---|
| | Start | End | | | | | | |
| E_L_1 | 21.75 | 21.74 | 60 | L | Low | unconsolidated alluvium | med | Just DS of end of bank protection along hatchery, slight outside bend. |
| E_L_2 | 19.76 | 19.76 | 110 | L | Low | clay and fine, semi-consolidated alluvium | med | US and DS pedestrian bridge. Prone to scour at higher flows due to flow constriction through bridge. |
| E_L_3 | 18.22 | 18.17 | 270 | L | None | clay overlain by vegetated, unconsolidated fine, alluvium | high | Outside bend, lateral scour pool. Trees fallen into channel show bank retreating. High shear. |
| E_L_4 | 15.53 | 15.51 | 640 | L | None | clay overlain by vegetated, unconsolidated alluvium | med | Outside bend, high shear. Trees have fallen into channel. Softer clay eroding over harder clay. |
| E_L_5 | 14.45 | 14.44 | 30 | L | None | recently deposited, sand alluvium underlain by gravels | med | Knick point could lead to back-cutting of lateral gravel bar with established vegetation. |
| E_L_6 | 12.95 | 12.78 | 900 | L | None | heavily vegetated topsoil underlain by gravel alluvium | high | Degradation of 2017 deposited material and vegetated banks. Several trees have fallen into channel. |
| E_L_7 | 11.77 | 11.69 | 430 | L | Low | steep, clay overlain by unconsolidated, fine, vegetated alluvium | high | Several trees have fallen into channel. |
| E_R_1 | 20.24 | 20.09 | 800 | R | Low | steep, clay bluff overlain by vegetated, upland slopes | med | Several erosion points in this stretch identified by steep banks, calved clay chunks, scoured vegetation roots. May have stormwater flow-path that has caused erosion at DS end. Hard bank material, high shear. |
| E_R_2 | 19.11 | 18.91 | 1060 | R | Low | sparsely vegetated, unconsolidated alluvium overlain by vegetated, upland slopes | med | 4 locations with erosion along this segment; un-eroded segments of banks are vegetated. Outside of mild bend and unconsolidated bank material. |
| E_R_3 | 18.72 | 18.69 | 160 | R | Low | heavily vegetated side slopes underlain by consolidated cobbles and gravels | med | Scour observed at vegetation roots, several trees have fallen into channel. |
| E_R_4 | 17.59 | 17.58 | 80 | R | None | heavily vegetated side slopes underlain by consolidated cobbles and gravels | low | Scour observed at vegetation roots, several trees have fallen into channel. |
| E_R_5 | 16.77 | 16.75 | 110 | R | None | heavily vegetated side slopes | med | Scour observed at vegetation roots, several trees have fallen into channel. |
| E_R_6 | 15.40 | 15.39 | 50 | R | Mod | unconsolidated alluvium overlain by grassy side slopes | low | Recreation trails down to gravel bar. Scour of material at tree roots on bank slope over gravel bar. |
| E_R_7 | 13.00 | 12.40 | 3170 | R | Low | cobbles overlain by fine, vegetated alluvium | high | Many degradation/aggradation locations observed. Active sediment transportation. |

**Notes**
- "Level of Recreation Impact" and "Future Erosion Risk" select as "none", "low", "med" (questionable), and "high"
- RM = mile marker, DS=downstream, L= left, R = right

**Table 3 Recreational Erosion Locations on the LAR/RD 2141 in Western Area**
**(RER erosion previously classified as recreational, recreational keywords (i.e. social trails, "beach" locations, river access)**

| ID | River STA (USACE, mi.) | | Approx. Length Disturbance (ft.) | Bank (L/R) | Bank Material | Future Erosion Risk | Notes |
|---|---|---|---|---|---|---|---|
| | Start | End | | | | | |
| RE_L_1 | 21.64 | 21.58 | 320 | L | unconsolidated alluvium | med | Social trails down steep, erodible bank. Outside of slight bend. |
| RE_L_2 | 20.72 | 20.53 | 1060 | L | unconsolidated, patchy-vegetated alluvium | low | 3 recreation locations along access road. Minor erosion observed at river access/homeless camp area where vegetation has been eradicated. |
| RE_L_3 | 20.39 | 20.34 | 270 | L | unconsolidated, patchy-vegetated alluvium | low | 2 recreation locations along bike path. One location where bike path leads to beach. |
| RE_L_4 | 19.93 | 19.85 | 430 | L | unconsolidated, patchy-vegetated, fine alluvium underlain by gravels | low | Consistent recreation erosion (trails, beaches, homeless camps) adjacent to network of single track trails. |
| RE_L_5 | 19.69 | 19.58 | 590 | L | unconsolidated, patchy-vegetated, lateral bar | low | Mature lateral bar with topsoil and established vegetation has gaps in vegetation caused by recreation use. |
| RE_L_6 | 19.36 | 19.19 | 370 | L | semi-consolidated, fine alluvium | med | Recreation access on either side of bridge causing erosion of sandy banks. |
| RE_L_7 | 18.72 | 18.38 | 1800 | L | unconsolidated, coarse alluvium overlain by fine-alluvium, patchy-vegetated slopes | med | Several recreation erosion locations, US of riffle crest. Outside of bend. |
| RE_L_8 | 17.91 | 17.90 | 40 | L | fair oaks clay | low | Recreation access at popular "Clay Banks" area. Fair oaks is eroded by foot traffic. |
| RE_L_9 | 16.85 | 16.63 | 1170 | L | unconsolidated alluvium overlain by vegetated slopes | low | Extensive recreation erosion adjacent to trails on Rossmore bar. Vegetation eradicated at several locations, but no extensive scour observed. |
| RE_L_10 | 15.49 | 15.35 | 270 | L | fair oaks clay with some gravel deposited overlain by vegetated slopes | low | Recreation area on fair oaks banks. Eroded by foot traffic, no vegetation present. Clay substrate high-resistance to shear. |
| RE_L_11 | 14.87 | 14.84 | 160 | L | unconsolidated, sparsely-vegetated alluvium | med | Vegetation eradicated by foot traffic, minor erosion observed. Susceptible to additional erosion at high flows. |
| RE_L_12 | 14.47 | 13.88 | 3280 | L | fair oaks clay overlain by unconsolidated alluvium | low | Extensive recreation trails adjacent to Riverbend Park. |
| RE_L_13 | 13.30 | 13.29 | 40 | L | gravel bar and unconsolidated alluvium | low | Recreation erosion just US of bridge. |
| RE_L_14 | 11.69 | 11.65 | 220 | L | vegetated, unconsolidated alluvium | low | Recreation trails and homeless camps observed. |
| RE_R_1 | 21.41 | 20.51 | 4760 | R | patchy-vegetated, unconsolidated alluvium | low | Recreation trails at Sailor Bar area along dirt trail. 20+ trails down to water observed. |
| RE_R_2 | 17.82 | 17.81 | 60 | R | patchy-vegetated, unconsolidated, fine alluvium | low | 2 recreation locations where vegetation has been eradicated. |
| RE_R_3 | 16.11 | 16.07 | 220 | R | patchy-vegetated, unconsolidated alluvium | low | Adjacent to trails at Ancil Hoffman Park. |

**Notes:**
- "Future Erosion Risk" rated as "none", "low", "med" (medium), and "high"
- RB=right bank, CB=channel bank, L = left, R = right

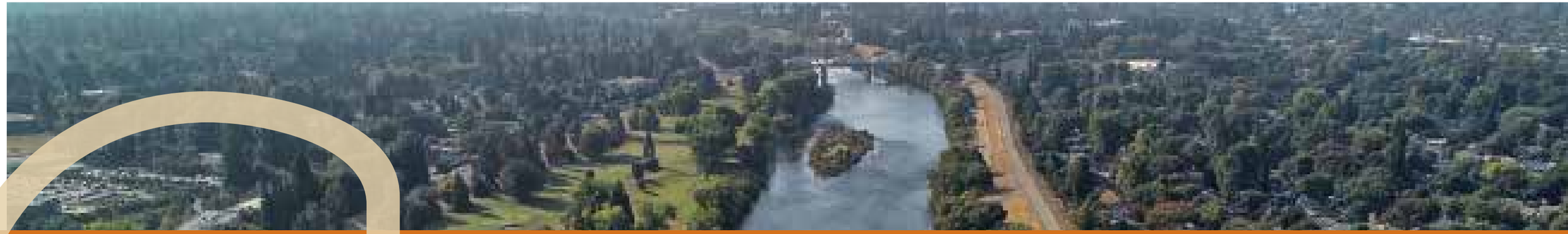
**Table F Outfalls on the LAR/SR 160/Sac Bee**

| ID | Type | River STA (USACE, mi.) | Causing erosion? Armor? | Notes/Comments |
|---|---|---|---|---|
| O_L_1 | concrete pipe | 22.84 | Outfall onto armored rock apron, then carves gully down bank to pool beneath dam. | Outfall high on bank; below Sacramento State Aquatic Center parking lot. |
| O_L_2 | | 21.91 | Outfall into small gully that flows down bank into river. | From hatchery property. |
| O_L_3 | | 21.76 | No erosion observed, armored with rip rap. | From hatchery property. |
| O_L_4 | large, screened concrete pipe | 20.76 | No erosion, flows through low gradient, vegetated channel. Concrete apron at outfall of pipe. | Stormwater. Water flows through vegetated channel into LAR. |
| O_L_5 | 4 corrugated metal pipes | 19.49 | Well armored with cobble. | Buffalo Creek. |
| O_L_6 | 2 large concrete pipes | 18.23 | Headcutting knick-point/scour observed at outfall (0-4' deep), despite armoring with rip rap and concrete. | |
| O_L_7 | concrete pipe | 15.67 | Armored with cobble and small rip rap. No erosion observed. | Outfall is high on bank then flows down armored bank. Likely stormwater. |
| O_L_8 | naturalized | 14.5 | Armored with cobble and rip rap. | Cordova Creek. Homeless camp observed at outfall. |
| O_L_9 | corrugated metal pipe (2') | 12.5 | No armor or erosion observed, free jet into river. | Perched above water surface on steep, bluff bank. |
| O_L_10 | large corrugated metal pipe | 12.27 | Concrete energy dissipation wall and cobble armor. No erosion observed. | |
| O_L_11 | corrugated metal pipe (2') | 12.18 | Rip rap armor at outfall. | |
| O_L_12 | corrugated metal pipe (2') | 12.07 | | |
| O_R_1 | rocked channel | 20.18 | Flowline armored with rip rap (1-2') then flows down gully into river. Mild scour observed. | |
| O_R_2 | rock weirs, out of corrugated metal arch culvert | 16.48 | Armored rock weirs. No visible erosion. | Routed under private property. Likely stormwater discharge. |
| O_R_3 | natural | 15.48 | | From golf course. |
| O_R_4 | corrugated metal pipe | 14.84 | No armor. No visible erosion. | From golf course. Discharge into backwater. |
| O_R_5 | pipe with cap | 13.72 | Adjacent bank armored with gunite. | |
| O_R_6 | concrete armored swale | 13.65 | Water flows over weir, down concrete swale. No erosion. | |
| O_R_7 | natural channel | 11.86 | No armor. Scour hole observed in LAR channel at outfall. | Flow from Arden Pond. |

**Table # Existing Bank Protection Measures on the Lower American River**

| ID | Type | River Mile (USACE, mi.) Start | End | Bank (L/R) | Notes |
|---|---|---|---|---|---|
| RP_L_1 | rip-rap (3-4 ft. rock) | 22.35 | NA | L | Adjacent to L wingwall/abutment of Nimbus Dam. |
| RP_L_2 | rip-rap | 22.04 | 21.85 | L | Rip rap bank adjacent to fish hatchery. |
| RP_L_3 | rip-rap (12-24 in. rock) | 19.82 | NA | L | Armored boat ramp. |
| RP_L_4 | gabion | 16.68 | NA | L | Poor condition, saggy. Protecting tower. |
| RP_L_5 | gabion | 16.57 | NA | L | Fair condition, some sagging observed. Protecting tower. |
| RP_L_6 | rip-rap (3-4 ft. rock) | 16.36 | NA | L | Protecting tower. |
| RP_L_7 | 4 rip-rap (1.5-5 ft. rock) groins, cobble armor between groins | 14.93 | 14.76 | L | |
| RP_L_8 | rip-rap bank (3-4 ft. rock) | 14.64 | 14.48 | L | |
| RP_L_9 | rip-rap (1-2 ft. rock), sheet piles and wooded retaining wall | 11.91 | 11.69 | L | Various bank protection measures at comprimised bluff section. |
| RP_R_1 | rip-rap | 22.35 | NA | R | Adjacent to R wingwall/abutment of Nimbus Dam. |
| RP_R_2 | rip-rap (1-3 ft. rock) and concrete rubble | 19.75 | 19.7 | R | Either side of ped bridge, at toe of bank. |
| RP_R_3 | Boulders (3-4 ft. rock) and keyed in logs (2' diameter) | 19.3 | NA | R | >7 log structures present, spaced ~10' apart. |
| RP_R_4 | rip-rap (3-5 ft. rock) | 17.42 | 17.28 | R | Outside bend of San Juan rapids. |
| RP_R_5 | retaining wall | 16.82 | NA | R | Private retaining wall 2/3 way up bluff. |
| RP_R_6 | cobble toe (6-10 in. rock) | 16.48 | NA | R | 50-60 ft. of cobble toe US of outfall. |
| RP_R_7 | matting | 16.23 | NA | R | Matting installed on short section of bluff (40 ft.). |
| RP_R_8 | retaining wall | 14.02 | 13.79 | R | |
| RP_R_9 | gunite bank stabilization | 13.79 | 13.4 | R | Compromised (cracked and collapsing) at far DS end. |
| RP_R_10 | rip-rap (6-24" in. rock) | 13.07 | 13.26 | R | |
| RP_R_11 | concrete rubble and gabion | 13.23 | NA | R | Poor condition, saggy gabions. DS of bridge abutment. |

**Notes**
- Polygons located using single US, mid-span or "End" river mile as reported.
- Wingwalls, CS=revetments, L = left, R = right, EL=flat, ls.= laying, sd. = roller



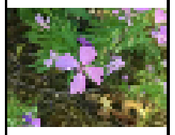
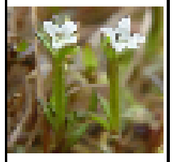
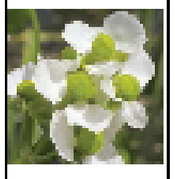
# APPENDIX C

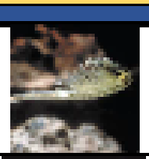
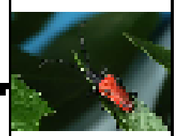
## SPECIAL-STATUS AND INVASIVE SPECIES IN THE PARKWAY

APPENDIX C

# SPECIAL-STATUS SPECIES IN PARKWAY

**SPECIAL-STATUS SPECIES OCCURRING OR HAVING THE POTENTIAL TO OCCUR IN THE PARKWAY**

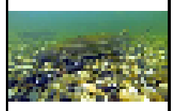
| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| PLANTS | | | | | | | |
| [redacted] |  | [redacted] | No | [redacted] | No | [redacted] | Yes |
| [redacted] |  | [redacted] | No | [redacted] | No | [redacted] | Yes |
| [redacted] | | [redacted] | No | [redacted] | No | [redacted] | Yes |
| [redacted] | | [redacted] | No | [redacted] | No | [redacted] | Yes |
| [redacted] |  | [redacted] | No | [redacted] | No | [redacted] | Yes |

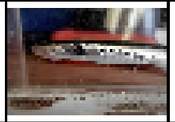
| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| **WILDLIFE** | | | | | | | |
| **INVERTEBRATES** | | | | | | | |
| **Invertebrates: Crustaceans** | | | | | | | |
| [redacted] |  | FT | No | [redacted] | Yes[1] | [redacted] | Yes |
| [redacted] | | T | No | [redacted] | Yes[1] | [redacted] | Yes |
| **Invertebrates: Insects** | | | | | | | |
| [redacted] | | T | No | [redacted] | No | [redacted] | Yes |
| [redacted] | | T | [redacted] | [redacted] | Yes[2] | [redacted] | No |
| [redacted] |  | FT | Yes | [redacted] | Yes[1] | [redacted] | Yes |
| **FISH** | | | | | | | |
| **Fish: Anadromous** | | | | | | | |

[redacted]

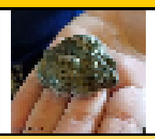
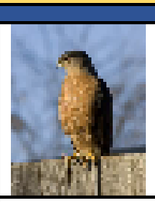
[1] Documented occurrence in USFWS Valley/Vernal Diversity Database, verified occurrence.
[2] Species considered extirpated from the region.

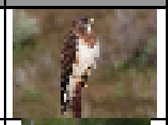
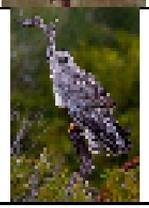
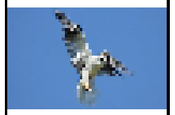
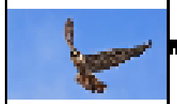
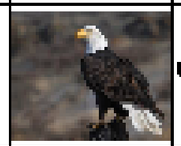
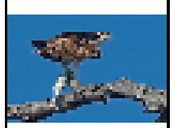
| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| [redacted] | | FT | Yes | [redacted] | Yes | [redacted] | No |
| [redacted] | | [redacted] | Yes | [redacted] | No | [redacted] | Yes |
| [redacted] |  | [redacted] | No | [redacted] | No | [redacted] | Yes |

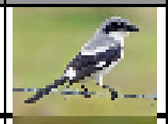
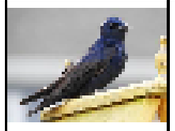
| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| |  | | | | | | |
| **Fish: Freshwater Only** | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| **REPTILES** | | | | | | | |

[3] Species considered likely extinct.

| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| **AMPHIBIANS** | | | | | | | |
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| **BIRDS** | | | | | | | |
| **Birds: Raptors** | | | | | | | |
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

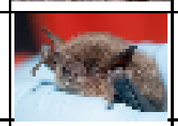
| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] |  | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| **Birds: Passerines** | | | | | | | |

[1] [redacted]

| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| [illegible] |  | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] |  | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| **Birds: Nightbirds/Hummingbirds/Cuckoos** | | | | | | | |
| [illegible] | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| **Birds: Landfowl/Waterfowl** | | | | | | | |
| [illegible] | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| **MAMMALS** | | | | | | | |
| **Mammals: Bats** | | | | | | | |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

[1] [redacted]

| Species | Image | Protection Status | Critical Habitat within Parkway? | Habitat Requirements | Documented within Parkway? | Documented and Potential for Occurrences within American River Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|---|---|
| [redacted] | | [redacted] | No | [redacted] | No | [redacted] | Yes |
| [redacted] |  | [redacted] | No | [redacted] | No | [redacted] | Yes |
| [redacted] | | [redacted] | No | [redacted] | No | [redacted] | Yes |

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

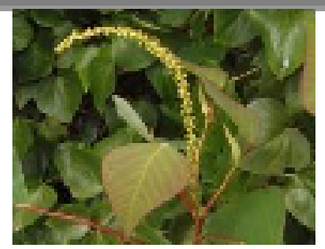
[redacted]

APPENDIX C

# INVASIVE SPECIES OF PRIMARY CONCERN IN PARKWAY

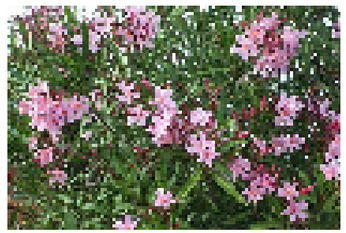
**INVASIVE SPECIES OF PRIMARY CONCERN WITHIN THE PARKWAY**

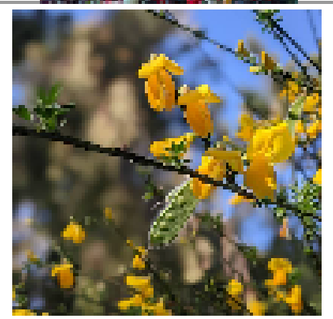
**Invasive Plant Species of Primary Concern within the Parkway**

| Species | Image[1] | CAL-IPC Ranking[2] | Description | Blooming Period | Management Method[3] |
|---|---|---|---|---|---|
| [illegible] |  | [illegible] | [illegible] | [illegible] | • [illegible]<br>• [illegible] |
| [illegible] | | High | [illegible] | [illegible] | • [illegible] |

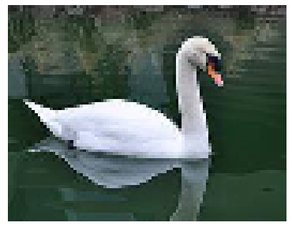
[illegible]

| | | | | | |
|---|---|---|---|---|---|
| [illegible] | | High | [illegible] | [illegible] | • [illegible]<br>• [illegible] |
| [illegible] | | High | [illegible] | [illegible] | • [illegible]<br>• [illegible]<br>• [illegible] |
| [illegible] | | High | [illegible] | [illegible] | • [illegible]<br>• [illegible] |

| | | | | | |
|---|---|---|---|---|---|
| [redacted] | | [redacted] | [redacted] | [redacted] | • [redacted] |
| [redacted] |  | | [redacted] | [redacted] | • [redacted]<br>• [redacted] |
| [redacted] | | [redacted] | [redacted] | [redacted] | • [redacted] |

| | | | | | |
|---|---|---|---|---|---|
| Sedges<br>(*Cyperaceae* spp.) | | Limited | Plantains are a cosmopolitan group of evergreen/deciduous alike genus *Cyperaceae*. They form characteristic bright rosettes and are frequently found in disturbed areas, along roadsides, wasteful ends, prairie, and riparian areas. Birds, small to water mammals (Blackcaps) and mammals, are dispersal distances widely. However, the reasons this dispersal method for Sedges is not well known. | Parkway/Drought Area | • Mowing<br>• Prevention/Weeding<br>• Removal through hand weeding, weed removers, rolling, and/or heavy equipment removal<br>• Herbicide |
| Bristle brome<br>(*Bromus vulgaris*) |  | High | Bristle brome is an invasive annual/winter annual grass between 6-18 inches in height, pre-flowers, and is many diversity dry, woody soil. Expands rapidly through pastures, borders of forests, and roadsides. Bristle brome can quickly spread and outcompete grasses. Spreads by moving, grazing livestock and browsing wildlife. It has a short lived but can remain dormant for up to 10 years. | Bank Drought Map | • Hand removal<br>• Mulling<br>• Mowing<br>• Encouraging of competitive/shading native<br>• Biological control agent/grazing |

**County of Sacramento Department of Regional Parks Survey Target Species, Invasive Wildlife Species of Primary Concern within the Parkway[1]**

| Species | Image[2] | Description | Documented within Parkway? | Potential Species' Habitat within Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|
| [redacted] |  | [redacted] | [redacted][3] | • [redacted]<br>• [redacted] | Yes |
| [redacted] | | [redacted] | [redacted][4] | • [redacted]<br>• [redacted] | Yes |
| [redacted] | | [redacted] | No | • [redacted] | Yes |

[redacted]

[redacted]

| Species | Image[1] | Description | Documented within Parkway? | Potential Species' Habitat within Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|
| [illegible] | | The northern rubber boa is a secretive, elusive species that is rarely encountered in the wild. It is distinguished by its smooth, shiny scales, which are typically dark brown or black on the dorsal surface and lighter brown or yellow on the ventral surface. The boa has a relatively small head and a cylindrical body, and it can grow to be up to 30 inches (76 cm) in length. The northern rubber boa is found in a variety of habitats, including forests, meadows, and rocky areas, and it is typically active at night. It is a constrictor, meaning that it kills its prey by wrapping its body around it and squeezing until the prey suffocates. The northern rubber boa is a solitary animal and is rarely seen in groups. It is also a relatively slow-moving snake, and it can be easily captured by predators. The northern rubber boa is a valuable species to the ecosystem, as it helps to control the populations of its prey species. It is also a popular species among reptile enthusiasts, and it is sometimes kept as a pet. However, it is important to note that the northern rubber boa is a protected species in many areas, and it is illegal to collect or keep them without a permit. | No | • Browsing native understory habitat along the American River<br>• Ubiquitous aquatic habitat | Yes, adult gravid female or young and is nonregular nesting alien |
| [illegible] | | The northern boa is a secretive, elusive species that is rarely encountered in the wild. It is distinguished by its smooth, shiny scales, which are typically dark brown or black on the dorsal surface and lighter brown or yellow on the ventral surface. The boa has a relatively small head and a cylindrical body, and it can grow to be up to 30 inches (76 cm) in length. The northern rubber boa is found in a variety of habitats, including forests, meadows, and rocky areas, and it is typically active at night. It is a constrictor, meaning that it kills its prey by wrapping its body around it and squeezing until the prey suffocates. The northern rubber boa is a solitary animal and is rarely seen in groups. It is also a relatively slow-moving snake, and it can be easily captured by predators. The northern rubber boa is a valuable species to the ecosystem, as it helps to control the populations of its prey species. It is also a popular species among reptile enthusiasts, and it is sometimes kept as a pet. However, it is important to note that the northern rubber boa is a protected species in many areas, and it is illegal to collect or keep them without a permit. | Yes[2] | • Browsing native understory habitat along the American River<br>• Ubiquitous aquatic habitat | Yes, adult gravid female or young and is nonregular nesting alien |
| Pacific pond [illegible] | | Pond turtles are medium-sized freshwater turtles with oval shells and webbed feet. They are found in lakes, ponds, and slow-moving streams. Pond turtles are omnivorous, eating a variety of plants and animals. They are active during the day and spend much of their time basking in the sun. Pond turtles are important members of their ecosystems, helping to control the populations of their prey and providing food for predators. They are also popular pets, but it is important to research their needs before getting one. Pond turtles can live for many years in captivity, but they can be difficult to care for. They require a large tank with plenty of water and a basking area. They also need a varied diet of both plants and animals. Pond turtles are not recommended for beginners, but they can be rewarding pets for experienced owners. | Yes[2] | • Browsing native understory habitat along the American River<br>• Shady banks may be used for nesting | Yes |

[1] Downloaded by Sacramento County Regional Parks Staff

| Species | Image[a] | Description | Documented within Parkway? | Potential Species' Habitat within Parkway | Species Able to Reproduce within Parkway? |
|---|---|---|---|---|---|
| [redacted] | | [redacted] | [redacted] | [redacted] | [redacted] |

# APPENDIX D
## MONITORING PLAN

APPENDIX D

# MONITORING PLAN

**American River Parkway**
*Natural Resources Management Plan*

# MONITORING PLAN

**Draft | September 2022**

## 1.0 Introduction

The American River Parkway Natural Resources Management Plan (NRMP) complements the American River Parkway Plan (Parkway Plan or ARPP) by establishing management guidelines for maintaining and enhancing the Parkway's natural resources. The NRMP describes the resources and outlines management goals and objectives across the American River Parkway (Parkway), as well as general and specific management actions within each of the ARPP Area Plans that contribute to meeting the overall goals and objectives.

This NRMP Monitoring Plan provides Regional Parks with a framework for monitoring and reporting the progress of general and specific management actions set forth in the NRMP. This will include ongoing coordination with stakeholders and/or project proponents to ensure that project implementation and monitoring activities are integrated into the overall monitoring and reporting goals of the NRMP. These monitoring and reporting goals cover biological resources, physical resources, cultural resources, human use impact reduction, as well as agency and community coordination.

### 1.1 Purpose and Need

This monitoring plan has been prepared to guide monitoring and reporting of progress towards achieving the goals of the NRMP. The specific objectives for each goal are provided along with the time frame for initial implementation and the details of what should be monitored and/or tracked annually both before and after initial implementation. Additionally, this plan provides the framework for reporting progress and adaptive management actions that were taken and/or are being recommended that should and/or have been made to achieve successful implementation of the NRMP goals and objectives. These monitoring and reporting tasks are essential for informing updates to the NRMP within 5-10 years.

### 1.2 Adaptive Management

Every year the implementation of the NRMP will be examined through the monitoring plan, and the annual monitoring report will identify what is working and what is not, whether progress is being made or if a different approach is needed.

Adaptive management is the term that describes how resource management is modified in response to what is happening in the field. Ideally, it will ensure that human usage of the Parkway complements its habitats, plants, and wildlife.

Adaptive management is a method of improving resource management by learning from past decisions and outcomes. It is essential in instances where existing management strategies have failed to meet success criteria or desired outcomes. Adaptive management is generally achieved by

1. Exploring alternative means to accomplish management objectives
2. Forecasting the outcomes of alternatives based on current knowledge derived from monitoring or literature
3. Applying one or more alternative methods to improve or replace existing management actions
4. Continuing monitoring to learn about the impacts of management action changes, then
5. Using the results from monitoring to update knowledge and adjust management actions.

It is important to consider the following principles of adaptive management:

1. All methods allow for flexibility. If a new, more effective, or more cost and time efficient monitoring method is discovered, it may be implemented instead of, or in addition to, the methods specified in this plan.
2. Data gathered during monitoring is interpreted and the results are used to assess and manage risks to assure desired goals and objectives are met. This is a high-level monitoring plan, but by using information gathered to follow how NRMP goals and objectives are being met, the annual reports can identify trends and detect the need for changes in management to meet the goals and objectives of the NRMP.
3. Decisions are informed by science and are evidence- based. If an alternate management strategy is proposed, scientific data will guide any changes made to methods or monitoring.
4. Phasing is an appropriate tool. A change in approach may be phased if a new strategy is proposed, to allow it to be tested in a stepwise manner. Phasing allows time for assessment and minimization of risk when alternative strategies are proposed.
5. Collaboration with stakeholders is critical to success. Many tasks included in the NRMP were guided by input and collaborations with regulatory agencies (e.g., USACE Ecosystem Restoration concept), research and educational institutions (e.g., CSUS planning for the Bushy Lake Conceptual Restoration Plan) and other entities to meet mutual goals and/or regulatory permit requirements. Any adaptive management changes to a given task must be reviewed by applicable stakeholders vested in the successful completion of a given task to ensure the consistency and likelihood of meeting the goals and objectives specified in the NRMP.

Adaptive management can also include updating the monitoring plan to reflect new information. For example, the NRMP Environmental Impact Report may identify additional monitoring tasks that would fit into this Monitoring Plan; or there may be new projects in the future that were not anticipated in the NRMP that need to be tracked through the Monitoring Plan.

## 1.3 Monitoring Plan Responsibilities

Regional Parks is responsible for conducting and/or coordinating the monitoring, tracking, and reporting associated with this plan, including management of a comprehensive database associated with NRMP and Parkway Plan elements. Since some monitoring may be conducted by others, it will be the responsibility of Regional Parks to coordinate and integrate those monitoring efforts into the monitoring and reporting associated with this plan.

## 1.4 Monitoring Plan Updates

The monitoring plan is based on an adaptive management method. The plan will therefore need to be periodically updated, in coordination with a technical advisory committee and the Recreation and Park Commission. Monitoring Plan updates may occur as often as annually, or less often as needed. However, it is recommended that this monitoring plan be updated in conjunction with achieving initial implementation of some of the objectives (e.g., mapping of vegetation communities is complete by 2024 and an update would detail ongoing monitoring needs).. Monitoring Plan updates will include the details of what changed between each of the versions in order to help inform updates to the NRMP.



# 2.0 Monitoring NMRP Goals, Objectives and Actions

This section identifies the monitoring activities associated with specific goals and objectives. Regional Parks is responsible for conducting annual monitoring to assess progress towards achieving the goals of the NRMP as outlined below. The NRMP recognized that some of the objectives will not be immediately achievable but have a targeted timeline for completion is stated. Monitoring will continue prior to implementation to track progress towards meeting the objective.

## 2.1 Biological Resources Goals and Objectives

The NRMP biological resources goals include assessing the existing resources, conserving, restoring and naturalizing high quality habitat including ensuring adequate connectivity for wildlife, controlling invasive non-native species, and rehabilitating areas that have been impacted by fires, encampments, and social trails. Specific objectives that help to evaluate the progress towards meeting the goals are aimed at assessing, mapping, and quantifying acreages.

### *2.1.1 Assessing, Mapping, and Tracking Biological Resources (Goal 1.1)*

The assessment of the biological resources in the Parkway is a critical component of monitoring because it will provide a basis of understanding the amount and location of various resources that will contribute to making informed decisions about current and future management actions. Table 1 below provides the specific objectives that contribute to meeting the NRMP goal of assessing biological resources within the Parkway

***Table 1 – Objectives for Assessing Biological Resources***

| | |
|---|---|
| **1.1 - Assess biological resources within the Parkway.** | |
| | 1.1a - Update vegetation community maps, including a frequently inundated floodplain/shaded riverine aquatic (SRA) habitat map. |
| | 1.1b - Complete Parkway-wide surveys for sensitive species habitat. |
| | 1.1c - Update invasive plant species surveys and maintain a tracking system. |
| | 1.1d - Develop and maintain tracking system for homeless encampments in the Parkway. |

Regional Parks will update its existing vegetation community maps, which was last done in 2009, and will include mapping of invasive plant species. Vegetation mapping may integrate or utilize new data collected by other agencies and stakeholders (e.g., SAFCA and Water Forum). This mapping data will contribute to creating maps for sensitive species habitat within the Parkway, including rearing habitat for juvenile salmonids (i.e., inundated floodplain where SRA habitat occurs). Another component of mapping will be tracking the location of homeless encampments in the Parkway. Due to the transient nature of encampments this element of the map will continually be updated. As data is collected it will be important to ensure that data is identified by each Area Plan so that evaluations can focus in on individual areas. Overall, this information will contribute to ongoing updates to the NRMP management categories and help maintain the desired condition of "conservation" for most Parkway areas (see discussion below).

The targeted completion timeline for this initial mapping exercise is within 2-years (2024). Thereafter, these maps will be updated annually as changes occur from implementation of new projects or disturbances, such as wildfire.

### *2.1.2 Tracking Management for High-Quality Habitat (Goals 1.2 through 1.7)*

In addition to baseline biological resources assessments in the Parkway, the NRMP also provides maps that represent the best estimate of the areas associated with the following NRMP management categories: conservation, restoration, and naturalization. These management categories identify the anticipated level of management that will be required. Areas in the "conservation" status require only minimal maintenance as they are currently in a high-quality state. Areas that do not yet provide high-quality

habitat are identified as “restoration” and “naturalization” and require a medium to high level of maintenance intensity to bring them into the “conservation” category, which is the desired condition for all Parkway habitats. Table 2 provides the goals and objectives as shown in the NRMP. Table 3 below provides a consolidated version of those initial objectives that support the goal of maintaining, enhancing, and creating high quality native riparian, grassland, woodland, and elderberry vegetation communities in the next 3-5 years, and provides a future projection of what might be expected in 6-10 years.

***Table 2 - Goals and Objectives for Conserving, Restoring, and Naturalizing High-Quality Habitat***

| Goal | Objectives |
|---|---|
| **1.2 - Conserve high- quality native habitats.** | |
| | 1.2a - Conserve high-quality native riparian vegetation communities. |
| | 1.2b - Conserve high-quality native grassland vegetation communities. |
| | 1.2c - Conserve high-quality native woodland vegetation communities. |
| | 1.2d - Conserve high-quality native elderberry vegetation communities. |
| **1.3 - Restore high-quality native habitats that require improvement.** | |
| | 1.3a - Restore 25 ac of high-quality native riparian vegetation. |
| | 1.3b - Restore 1 ac of high-quality native grassland vegetation communities. |
| | 1.3c - Restore 6 ac of high-quality native woodland vegetation communities. |
| | 1.3d - Restore 19 ac of high-quality native elderberry vegetation communities. |
| **1.4 - Naturalize habitats that have been altered by human activity.** | |
| | 1.4a - Naturalize 50 ac (3-5 years) and 40 ac (6-10 years) of native riparian vegetation communities. |
| | 1.4b - Naturalize 4 ac (3-5 years) and 45 ac (6-10 years) of native grassland vegetation communities. |
| | 1.4c - Naturalize 6 ac (3-5 years) and 86 ac (6-10 years) of native woodland vegetation communities. |
| | 1.4d - Naturalize 30 ac (3-5 years) of native elderberry vegetation communities. |
| | 1.4e - Coordinate with project proponents to implement 90 to 120 acres (3-5 years) of salmonid habitat enhancement projects. |

***Table 3 – Goals and Objectives for Conserving, Restoring, and Naturalizing High-Quality Habitat***

| | Conserve[1] | Restore (acres) | Naturalize (acres) | |
|---|---|---|---|---|
| **Habitat Types** | 3-5 Years | 3-5 Years | 3-5 Years | 6-10 Years |
| Riparian vegetation communities | TBD | 25 | 50 | 40 |
| Grassland vegetation communities | TBD | 1 | 4 | 45 |
| Woodland vegetation communities | TBD | 6 | 6 | 86 |
| Elderberry vegetation communities | TBD | 19 | 30 | 0 |
| Salmonid Habitat Enhancement | TBD | 0 | 30-65 | 0 |
| Total | TBD | 51 | 120 – 155 | 171 |

Notes: [1] The acreages for each of the vegetation communities under the conserve category will be provide under the effort associated with assessing biological resources (Goal 1.2).

The progress toward updating the acreages in the conservation category will be tracked annually. The first update to this category is tied to the biological assessment objectives outlined under Goal 1.2 above. After the initial acreages (i.e., baseline targets for conserved habitat) have been quantified they will be updated annually in response to changes that occur in relation to the actions in the restoration and naturalization categories or based on other unforeseen changes, such as wildfire or flooding. Monitoring of the conservation category will also include details of the management actions that were taken (e.g., noxious weeds targeted, acres mowed/grazed, herbicide used, ladder fuel removed, etc.) to ensure the associated lands remain in the conservation management category.



A decline in the conservation category acreage shall initiate adaptive management actions to prevent further decline and to increase the acreage of high-quality habitat as soon as possible to the previous level.

Additionally, the NRMP identified several specific monitoring and maintenance actions that should also be monitored annually:

- Maintain mature London plane trees in parking and picnic areas for nesting birds. *(Discovery)*
- Maintain created spawning and rearing habitat. This may include periodic replenishment of gravel to maintain suitable spawning habitat for salmonids. *(Arden Bar, Ancil Hoffman, Sacramento Bar, Lower Sunrise, Upper Sunrise, and Sailor Bar)*
- Monitor bluff erosion with consideration given to managing invasive plants. *(San Juan Bluff and Sunrise Bluff)*

Annual monitoring will also include tracking the details of the changes associated with the restoration and naturalization categories. This will include providing specific details of the project proponents, funding, location, project footprint, acres, long-term management plans, when implementation occurred or when it is expected, and other relevant details.

The initial acreages provided in the NRMP for the restoration and naturalization management categories were conservative based on what was reasonably likely to occur in the next 10 years. Potential actions associated with restoration and/or naturalization management categories were identified in each Area Plan of the NRMP (Appendix A) and some of them are expected to be implemented in the near future (3-5 years). It is important to note that the list of potential actions is subject to change in response to further evaluation and/or new information. Likewise, additional actions that may help meet the NRMP goals for these management categories may be added to the list overtime. Therefore, annual monitoring will also track changes to that list. All of the monitoring identified above will result in updates to the mapping assessments conducted for Goal 1.

### *2.1.3 Tracking Management to Address Degraded Habitat (Goals 1.5 – 1.7)*

Closely associated with Goals 2-4 discussed above are the goals and objectives associated with the rehabilitation of damaged habitat, expansion or connection of important wildlife corridors, and reduction of invasive non-native species. These objectives, shown in Table 4, will influence the changes in the habitat acreages monitored in each of the management categories discussed above and are expected to be implemented in 3-5 years.

***Table 4 - Goals and Objectives to Address Degraded Habitat***

| Goal | Objectives |
|---|---|
| **1.5 - Rehabilitate habitats damaged or degraded by fire or homeless populations.** | |
| | 1.5a - Preparation of a plan to rehabilitate wildfire- damaged areas, prioritizing vulnerable vegetation, to ensure a timely response to minimize wildfire impacts. Document and evaluate all areas damaged/degraded by wildfire. |
| | 1.5b - Parallel to Rehabilitation, identify areas requiring repair, which is different than rehabilitation, and include in annual O&M plans. |
| **1.6 - Expand corridors to connect native vegetation communities/wildlife habitat** | |
| | 1.6a - Complete Wildlife Connectivity Opportunity Plan. |
| | 1.6b - Reduction of barriers to fish and wildlife movement in the Parkway. |
| **1.7 - Reduce the prevalence of invasive, non-native species.** | |
| | 1.7a - Update Invasive Plant Management Project. |
| | 1.7b - Replacement of 5 acres of invasive, non-native species with native species identified in the NRMP. |

Regional Parks will annually monitor progress towards developing and implementing projects that addresses rehabilitation of areas damaged by wildfire. In addition, other areas that might be damaged but do not need full rehabilitation will be identified and included in Regional Parks' annual operation and maintenance activities.

In association with the annual monitoring for restored and naturalized habitat Regional Parks will track progress towards reducing wildlife barriers (including fish) in the lower Parkway and provide the status of developing a plan that address connectivity. This will include tracking opportunities to implement the potential actions related to improving and/or expanding wildlife connectivity listed below, which were identified in the NRMP:

- Trestles and Bridges in the Discovery and Woodlake areas: identify opportunities to improve or accommodate wildlife movement, as future improvements are made to Highway 160, State Route 51/Capital City Freeway, or the railroad trestles
- Future projects in the Woodlake Area, such as bridge widening (referred to as the Third Main Track Project) or anticipated developed recreation improvement near Highway-160 should integrate wildlife connectivity into the early design process.
- Northgate or Del Paso Boulevards in the Discovery Area: Identify opportunities for improving/expanding wildlife habitat connectivity as future improvements are made to these roadways.

Annual invasive plant management monitoring will include tracking progress towards converting 5-acres of lands with invasive non-native species into native vegetation communities. In addition, annual monitoring will provide details of the continued management, maintenance, and control of the targeted invasive weeds identified in the 2000 Invasive Plant Management Plan (IPMP). The key invasive weeds in each area are identified in Table 5 below but continued surveillance of any and all targeted weeds should occur in all areas. In addition, areas should be identified for restoration activities to help discourage re-invasion (i.e., planting native species in place of noxious weed species that were removed).

***Table 5 - Ongoing Invasive Plant Management by Area Identified in 2000 IPMP[1].***

| | Red Sesbania | Giant Reed | Chinese Tallow | Spanish Broom | Pampas Grass | French Broom | Scotch Broom | Tree of Heaven | Tamarisk |
|---|---|---|---|---|---|---|---|---|---|
| Discovery | X | X | | | | | | | X |
| Woodlake | X | X | | | | | | | |
| Cal Expo | X | X | | | | | | | |
| Paradise Beach | X | X | X | X | | | | | |
| Campus Commons | X | X | X | | | | | | |
| Howe Ave. | X | X | X | X | | | | | |
| Watt Ave. | X | X | X | | | | | | |
| SARA Park | X | X | X | X | X | | | | |
| Arden | X | X | X | X | X | | | | |
| River Bend | X | X | X | X | X | X | X | | |
| Sarah Court | X | | | | | | | | |
| Ancil Hoffman | X | | X | X | X | X | | | |
| Rossmoor | X | | | X | | | | X[2] | |
| San Juan Bluffs | | | | X | | X | | | |
| Sacramento Bar | X | | X | X | X | X | | | |
| Lower Sunrise | | X | | X | X | | X | | |
| Sunrise | | | | X | X | X | X | | |



| | Red Sesbania | Giant Reed | Chinese Tallow | Spanish Broom | Pampas Grass | French Broom | Scotch Broom | Tree of Heaven | Tamarisk |
|---|---|---|---|---|---|---|---|---|---|
| Upper Sunrise | | X | X | X | | | X | | |
| Sailor Bar | | | | X | X | X | X | | X |

**Notes**: [1] The NRMP discusses the targeted weeds for each area but may have missed a few that are incorporated into this table.
[2] This weed is a focus of the Phase III IPMP and has not yet been target

Regional Parks will document the progress towards updating the 2000 IPMP and subsequent to that update will provide annual monitoring of the progress to control the updated list of targeted weed species.

## 2.2 Physical Resources Goals and Objectives

There are two goals identified in the NRMP that are aimed at protecting levees and improving water quality. The specific objectives that help to evaluate the progress towards meeting the goals are coordination, tracking, and mapping (Table 6).

***Table 6 - Goals and Objectives for Physical Resources***

| Goals | Objectives |
|---|---|
| **2.1 - Protect levees throughout the Parkway.** | |
| | 2.1a - Stabilization of 100% of all levees throughout the Parkway consistent with maintaining a natural riverine environment. |
| **2.2 - Improve water quality.** | |
| | 2.2a - Coordination with SWQCB to monitor and map high *E. coli* levels. |
| | 2.2b - Identify reaches of the river that have chronic levels of high *E. coli* levels. |

Regional Parks will coordinate with the agencies responsible for flood risk management in the Parkway on an annual basis to track their ongoing activities and plans related to operations and maintenance and efforts to ensure the levees meet applicable federal, state, and local standards.

Regional Parks will also coordinate with the State Water Quality Control Board (SWQCB) regarding the water quality within the Parkway. Data gathered by SWQCB will continue to be shared including the mapped locations where there are high and chronic levels of E. coli.

## 2.3 Cultural Resources

The NRMP Cultural Resources goals are centered on partnering with tribal governments and protecting archaeological and historical resources. The specific objectives include ensuring protection of the officially designated cultural resources and meeting with representatives of tribal governments (Table 7).

*Table 7 –Goals and Objectives for Cultural Resources*

| Goal | Objectives |
|---|---|
| **3.1 - Protect archaeological and historical resources.** | |
| | 3.1a - Protection of 100% of the officially designated archaeological and historical resources (listing is provided in the data management system). |
| **3.2 - Form a partnership with tribal governments to protect and manage cultural resources in the Parkway.** | |
| | 3.2a - Establishment or participation in regular annual meetings with tribal government representatives. |

Regional Parks will track progress towards full protection of registered cultural resources and provide updates on their status thereafter. Annual updates on the progress of establishing regular partnership/coordination meetings with tribal government representatives within 2-year (2024) will be tracked and once partnerships established, monitoring will track the outcomes and potential recommended actions from those meetings.

## 2.4 Human Use Impact Reduction

The NRMP goals associated with reducing human use impacts includes, reducing encampment impacts, ensuring large group gatherings and special events are monitored, ensuring transmission line corridors provide environmental benefits, reducing impacts associated with ambient light, and ensuring active public engagement and education on the value of the Parkway resources to the region. The objectives to achieve these goals are centered on surveying, mapping, monitoring, updating plans, mitigating impacts, and entering into agreements. Table 8 lists the goals and objectives for human use impact reduction.

*Table 8 – Goals and Objectives for Human Use Impact Reduction*

| Goal | Objectives |
|---|---|
| **4.1 - Minimize human use impacts on all Parkway resources.** | |
| | 4.1a - Locate and design future recreational use areas and facilities with sensitivity to water resources. |
| | 4.1b - Documentation and mapping of social trails in the Parkway. |
| **4.2 - Reduce impacts associated with homeless encampments in the Parkway.** | |
| | 4.2a - Elimination or mitigation of the detrimental consequences associated with homeless encampments, such as: (1) accumulated debris; (2) environmental degradation; and (3) health and public safety issues including degradation of public infrastructure such as levees |
| **4.3 - Monitor impacts related to large group gatherings and special events.** | |
| | 4.3a - Continue practice of permitting large special event activities within developed recreational areas as per the policies of the American River Parkway Plan. |
| **4.4 - Maximize environmentally beneficial opportunities within transmission line corridors.** | |
| | 4.4a - Utilization of transmission line corridors for environmentally beneficial vegetation in accordance with an executed Vegetation Management Agreement. |
| | 4.4b - Execution of Vegetation Management Agreement with transmission corridor utility companies. |
| **4.5 - Reduce the amount of ambient light impacting biological resources in the Parkway while ensuring a safe park environment.** | |
| | 4.5a - Complete a baseline ambient night light survey to identify areas in the Parkway where there is an unnecessary amount of ambient light and create a plan for reducing the light, consistent with American River Parkway policies. |
| **4.6 - Interpret environmental, archaeological, and historical resources and educate the public on the significance of the Parkway in the greater Sacramento region.** | |
| | 4.6a - Update the interpretation plan for the American River Parkway. |
| | 4.6b - Inclusion of interpretive elements with large environmental enhancement projects including mitigation projects. |



Regional Parks will track the progress of concepts and designs of proposed or potential recreational facilities to ensure that sensitivity to water resources remains a key objective..

Regional Parks will monitor the progress toward documenting and mapping social trails. Trail mapping and surveys throughout the Parkway will be completed in each Area Plan and will include all social and maintained trails. The survey will include details about the general use of the trail (e.g., walking, biking, horse riding, etc.), characteristics of the trail (e.g., width, substrate, etc.), estimated level of use, and other details as appropriate. The trail survey is anticipated to be completed within 3-years and will be essential for determining which social trails may be negatively impacting natural resources and need to be remediated. Annual monitoring will then track progress toward remediating trails by planting and/or blocking these trails to discourage use.. Trails that are being utilized for off-trail bicycling will be identified and actions will be identified that could be employed to reduce impact from these activities in the Parkway.

Annual monitoring by Regional Parks will track the progress towards reducing the impacts associated with homeless encampments and rehabilitating areas as necessary to restore the areas to provide high-quality habitat.

Regional Parks will document and monitor the annual activities of large group gatherings and special events that are permitted in the Developed areas of the Parkway.

Annual monitoring by Regional Parks will track progress towards developing agreements with the utility companies for vegetation management agreements within their easements. These agreements will ensure vegetation management activities benefit Regional Parks' regular maintenance activities and facilitate restoration or naturalization of areas within the easements that support wildlife, including pollinator species. Transmission line undergrounding will be encouraged whenever possible. Once agreements are implemented annual monitoring will provide details of the management activities that are planned and have occurred.

Regional Parks will track annual progress towards achieving baseline surveys for ambient lighting within the Parkway and for developing a plan for reducing ambient light within the Parkway. The ambient light plan, which will likely require coordination with local jurisdictions, should be implemented within 3-5 years and annual monitoring will track progress towards reducing ambient light in the Parkway.

Annual monitoring by Regional Parks will track the progress towards updating the Parkway Interpretation Plan and include interpretive elements for the larger restoration and/or naturalization projects within the Parkway.

## 2.5 Agency and Community Coordination

The NRMP goals associated with agency and community coordination includes NRMP implementation oversight and monitoring, coordination with fire agencies to reduce fire risks, supporting scientific research engagement, implementing an NRMP monitoring program, and encouraging public outreach and educational activities (Table 9). The objectives to achieve these goals include forming an oversight committee for implementation of the NRMP and the monitoring plan, coordination with fire agencies, colleges, and local schools to help develop plans and programs.

*Table 9 – Goals and Objectives for Agency and Community Coordination*

| Goal | Objectives |
|---|---|
| **5.1 - Oversee implementation of NRMP.** | |
| | 5.1a - Create a sub-committee of the American River Parkway Advisory Committee to meet at least once per year with Regional Parks' staff to evaluate the implementation of the NRMP. |
| **5.2 - Coordinate with fire agencies to reduce wildfire fuel and hazards in the Parkway.** | |
| | 5.2a - Update and implement the wildfire prevention plan. Develop response, and recovery plans. |
| | 5.2b - Develop and maintain a tracking system for wildfires in the Parkway. |
| **5.3 - Support scientific research programs to increase the quantity and quality of data describing the condition of Parkway resources.** | |
| | 5.3a - Establishment of ongoing research and data collection programs with CSUS, UC Davis, and other local colleges. |
| | 5.3b - Development of a citizen science data program. |
| | 5.3c - Identify research needs to understand Parkway conditions and fill data gaps. |
| **5.4 - Implement a robust Natural Resource Management Plan Monitoring Program.** | |
| | 5.4a - Provide annual updates of monitoring data to the NRMP geodatabase. |
| **5.5 - Encourage public outreach and educational activities to increase the public's understanding and appreciation of Parkway resources.** | |
| | 5.5a - Establishment of one educational partnership, per year, with local school districts and community-based organizations to develop curriculum for teaching environmental stewardship and proper use of Parkway resources. |

Regional Parks will annually monitor and document the efforts of an NRMP implementation committee. This will include tracking progress towards and/or documenting the efforts of the NRMP monitoring plan and associated data that is collected.

Annual monitoring will track the progress towards development of a fire risk reduction and rehabilitation plan within 2-years (2025), as well as a tracking system of where wildfires have occurred annually.

Regional Parks will track the progress towards identifying research needs and coordinating with local colleges and stakeholders to develop research and citizen science programs. In addition, annual monitoring will track the progress towards establishing other partnerships with local school districts and community-based organizations to develop curriculum for teaching environmental stewardship and proper use of the Parkway. This particular action could potentially be merged with the update of the Parkway Interpretation Plan identified under Goal 1.4 above.



## 3.0 Reporting

Annual reports will be prepared by Regional Parks, or its contractors or assigns, to document management, monitoring, and progress towards meeting the goals and objectives of the NRMP. Reports will include a list of the individuals who prepared the report and participated in the monitoring activities, including titles and affiliations. Reports will be made available on Regional Parks' website and/or the website will indicate that reports are available upon request. The report will also include, at a minimum, the following sections and details:

1. Biological Resources Goals and Objectives
    a. Assessing Mapping, and Tracking (Goal 1.1)
        - Status towards completing mapping activities (Parkway-wide and by Area Plan) and estimated time of completion
        - Methods utilized for mapping each category and ongoing updates (e.g., survey dates/times, scale, equipment, etc.,)
        - Additional maps acquired or recommendations additional resource maps
        - The maps for the lower, middle, and upper Parkway reaches will be provided in the appendix of the monitoring report when this objective has been completed and when maps are updated (TBD).

    b. Habitat Management (Goal 1.2 – 1.4)
        - Document and discuss updated acreages for each of the management categories (i.e., conservation, restoration, and naturalization) and the four broad vegetation communities (i.e., riparian, grassland, woodland and elderberry) in each category compared to the baseline and/or previous year. A table with past and current acreages will be provided and when the acreages in each management category changes new maps will be included in the report.
        - Discuss the Conservation management actions taken in specific locations, include details about the outcomes or effectiveness of actions (i.e., weed control, fire suppression, periodic ladder fuel reduction, trail and encampment remediation, etc.), and provide details about the actions planned for the coming year. Provide applicable maps as necessary.
        - Discuss Restoration and Naturalization management actions. Details of implemented projects will be provided (i.e., who, where, what, when, why). Discuss the time periods and responsibilities associated with establishment and long-term management of the area(s). Discuss performance standards, monitoring, and reporting. Provide details about projects being planned for the near future.
        - Summarize habitat management activities generally across the Parkway, as well as lessons learned, and progress towards achieving the overall goal of increasing the area under conservation management by conducting restoration and naturalization management actions.

    c. Degraded Habitat Management (Goal 1.5 – 1.7)

- Discuss the progress towards initiating and/or completing preparation of a wildfire rehabilitation plan and a wildlife connectivity plan, as well as the update to the 2000 IPMP. When plans have been finalized they will be included in the appendices of the annual monitoring report. Additionally, as plans are finalized recommendations will be provided on what details should be updated in the monitoring plan to ensure the goals and objectives of those plans are adequately monitored in the future, if applicable.
- Discuss projects that were addressed under Goals 1.2-1.4 above that reduce/remove barriers to wildlife movement in the Parkway and/or removed large stands of non-native plants that may or may not be covered in the 2000 IPMP (e.g., black locust removal from Glenn Hall).
- Document activities associated with expanding wildlife connectivity, specifically as it relates to identifying opportunities specific bridges, rail trestles, and roads/highways (as noted in the NRMP under specific Area Plans as desired actions).
- Document and track the replacement of 5 acres of non-native invasive plants with native plants. This should also be discussed in the Habitat Management section and a map should be provided.

2. Physical Resources Goals and Objectives
    a. Document planned and recently completed flood risk reduction efforts. Include relevant details of who the project proponent is, the purpose and type of the project, when it will be or was implemented, and provide details of who is responsible for management of the site over the life of the project. If the project involves onsite mitigation the as-built designs should be included, as well as a long-term management plan. Provide timelines for construction and establishment and include graphics showing locations, if applicable.
    b. Document the coordination between Regional Parks and SWQCB. Discuss and summarize the data that was collected over the year and provide maps for the lower, middle, and upper river.
3. Cultural Resources Goals and Objectives
    a. Typically designated archaeological and historical resources are protected by confidentiality and public access is restricted. Therefore, the reported information will only indicate that these resources remain protected.
4. Human Use Impact Reduction Goals and Objectives
    a. Discuss upcoming recreational uses and facilities that are proposed, if any, and how sensitivity to water resources are being considered.
    b. Provide details about the progress towards completing the initial social trail mapping across the Parkway. Describe any trails that were mapped during the year and discuss issues that were observed and make recommendations for trails that should be closed and remediated, if applicable. Details about how trails will be closed and remediated will also be discussed. Once trail mapping has been completed and a recommendation is made to update the monitoring plan consideration will be given to continuing to map trails periodically.



    c. Discuss and document the progress towards reducing encampments and efforts that were made to rehabilitate areas. Details should include the area(s) cleaned and restored, the details of what was involved in site preparation and restoration and summarize the success of the efforts. If there are different strategies that could be employed that may be more successful for reducing damage to resources in association with encampments they will be included in the report.
    d. Discuss the number of events held during the year, where they occurred, what type of event, and the number that attended.
    e. Discuss the progress towards implementing agreements with the electrical utilities related to management of habitat under transmission corridor lines. Once agreements are established and a recommendation is made to update the monitoring plan consider on-going monitoring and reporting activities associated with these agreements. For example, ongoing coordination meetings that better time successful maintenance actions like mowing could be documented in relation to fire suppression and managing native shrubs, grasses, and or forbs.
    f. Discuss the progress towards completing a baseline ambient night light survey and the plan to reduce lighting within the Parkway. Once completed consider a recommendation to update the monitoring plan to include ongoing tracking of progress towards implementing a plan to reduce light within the Parkway.
    g. Discuss the progress towards updating the Parkway Interpretation Plan, including habitat mitigation elements. Once completed consider a recommendation to update the monitoring plan to include monitoring and reporting of the Interpretive Plan to ensure a successful and relevant program is provided..
5. Agency and Community Coordination Goals and Objectives
    a. Document the names and affiliation of the members of the NRMP committee and when meetings were held. Provide a summary of the discussions held during the annual meeting and actions that were recommended and/or implemented.
    b. Discuss progress towards updating and implementing the wildfire prevention plan, as well as response and recovery plans. Once completed consider a recommendation to update the monitoring plan to include ongoing monitoring and reporting of the plans.
    c. Discuss progress towards identifying potential research opportunities within the Parkway that would facilitate establishment of ongoing research and data collection programs with local colleges and a citizen science program. Once programs are established the monitoring plan will be updated to provide details for ongoing monitoring and reporting of these programs.
    d. Document the updates to the Parkway database. A list should be provided that documents what was updated, when it was updated, and how it can be accessed. A table similar to the one below should be provided as part of the report.

| | Location Available | Reason for Update | Last Update |
|---|---|---|---|
| Database Files (shp, kmz, xlsl) | | | |
| Parkway Land Uses | TBD | ARPP Update | 2008 |
| Parkway Inundation Areas | TBD | NRMP | 2021 |
| Parkway Land Alteration | TBD | NRMP | 2021 |

| | Location Available | Reason for Update | Last Update |
|---|---|---|---|
| Database Files (shp, kmz, xlsl) | | | |
| Parkway Vegetation Communities | TBD | NRMP | 2021 |
| Parkway Management Categories | TBD | NRMP | 2022 |
| IPMP 2000 (plan & treatments) | TBD | IPMP | 2000 |
| IPMP Update (plan & treatments) | TBD | | |
| Habitat, Rearing Inundated Floodplain | TBD | | |
| Habitat, Sensitive Species | TBD | | |
| Habitat, Spawning | TBD | | |
| Wildlife barriers and entrainment | TBD | | |
| Invasive Plants Surveys | TBD | | |
| Homeless Encampments | TBD | | |
| Mitigation Sites | TBD | | |
| Bank Protection Sites | TBD | | |
| Bluff Erosion | TBD | | |
| Restoration Sites | TBD | | |
| Native Riparian Communities | TBD | | |
| Native Grassland Communities | TBD | | |
| Native Woodland Communities | TBD | | |
| Wildfire Locations | TBD | | |
| E. Coli Data | TBD | | |
| Social Trail Mapping | TBD | | |
| Ambient Light Surveys | TBD | | |
| Plans (pdf) | | | |
| Ambient Light Reduction Survey | TBD | | |
| Interpretive Plan | TBD | | |
| Wildfire Prevention, Response, and Recovery Plan(s) | TBD | | |
| Mitigation Management Plans | TBD | | |

e. Discuss outreach and educational activities/partnerships that were pursued with local schools and school districts to develop curriculum based on teaching environmental stewardship centered on Parkway resources.

6. Report Summary

a. Provide and overall summary of issues and/or successes with implementation of the NRMP during the prior year. Indicate what specific areas and or management actions that should take priority in the coming year. Summarize recommendations that were made in each of the sections above. Provide an overall general status of appropriately managing the natural resources within the Parkway.



Appendix A – NRMP Potential Actions for Restoration and Naturalization

The list below is a consolidated list of the potential actions included in the NRMP under each Area Plan. These are specifically related to the NRMP restoration and naturalization management categories. The actions that are italicized are expected to occur within the first five-ten years of implementation of the NRMP.

| **Discovery** |
|---|
| Develop conceptual restoration plans for burned areas: Develop a wildfire rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing undesirable wildfire impacts. |
| Establish native riparian species/remove non-natives: Improve and expand riparian forest habitat along Bannon Slough and Steelhead Creek, including managing for growth and retention of tall overstory trees. Actions may include removal of nonnative invasive species, managing the density of wild grape, expanding the riparian corridor along the southern edge of Bannon Slough where conditions allow, and enhancing the understory with appropriate native species. Particular attention should be given to the point where Steelhead Creek enters the Parkway at El Camino Avenue; encampments and associated degradation are hampering wildlife connectivity to the stream corridors and associated wildlife habitat to the north. |
| Improve habitat at Camp Pollock: Continue to coordinate with Camp Pollock land managers to further integrate native habitat improvements, interpretive designs, and public access. |
| Purchase and naturalize Riverdale mobile home park: Identify appropriate use for the former Riverdale mobile home park if it is brought into public ownership (refer to Parkway Plan). |
| *Purchase and naturalize Urrutia property: Develop a Conceptual Naturalization Plan for the Urrutia Property if it is brought into public ownership. This should include the removal of rubble and restoration of the bank line in consideration of current and future conditions. (USACE Mitigation Project)* |
| **Woodlake** |
| Develop a Conceptual Naturalization Plan for storm-water runoff channel: Develop a plan to improve aquatic and riparian habitat within and along the channels that also may help improve water quality that flows into the river. Consideration should also be given to properly integrating the unpaved trail crossing through the area. |
| Develop plan to remove abandoned piping just downstream of island on RR. |
| Expand riparian corridor: Beyond the footprint of the USACE Ecosystem Restoration concept, improve and expand riparian forest habitat along the western-most portion of the naturalized canal, including managing for growth and retention of tall over-story riparian trees. Actions may include removal of nonnative invasive species, expanding the riparian corridor toward the south where conditions allow, enhancing the understory with appropriate native species, and enhancing the canal itself to increase wildlife values. In addition, remove "natural" levee at the top of RR bank, resulting from elevated hydraulic mining debris aggradation, to re-connect a moderately large area of high value riparian forest. |
| Identify a process to have old bridge debris removed as a part of future associated projects. |
| *Implement USACE ecosystem restoration project: Refine the existing USACE Ecosystem Restoration concept for Woodlake, which currently includes non-native invasive plant species eradication, planting native grassland, grading to improve floodplain connectivity (including removal of a berm that would allow remnant mining pits to be inundated more often and provide positive drainage to the LAR, seasonal wetlands, and fish-rearing habitat), grading and planting riparian forest, planting oak savanna and planting oak woodland. The goal is to naturalize the site to provide habitat for target species, including forage habitat for raptors and other avian species that rely on grasslands.* |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |

| **Cal Expo** |
|---|
| *Continue CSUS research and habitat development: Refinement of the USACE Ecosystem Restoration concept should be closely coordinated with efforts being undertaken by CSU Sacramento and the Wildlife Conservation Board to develop a Bushy Lake Conceptual Restoration Plan, as the efforts overlap and are generally consistent with one another. Consider methods to properly integrate the off-paved trail bicycle trails within the footprint of the ecosystem restoration concept. (In progress)* |
| Develop a conceptual plan to address deteriorating outfalls: Re-construct the engineered concrete drainage outfall aprons for Chicken Ranch and Strong Ranch sloughs to protect against ongoing and progressive bank erosion due to undercutting using a design approach and materials that can adjust to bank line changes without aggravating bank erosion; suggest removing the broken and undercut concrete members and replacing with large angular rock. |
| *Develop conceptual restoration plans for burned areas: To rehabilitate areas that have been damaged by previous fires and have not shown signs of recovery to pre-burn conditions. Increase tall tree overstory in burned areas: Develop a wildfire rehabilitation strategy for vulnerable mature vegetation to ensure a timely response for minimizing undesirable wildfire impacts.* |
| Identify a process to have old bridge debris removed as a part of future associated projects. |
| *Implement USACE ecosystem restoration project: Refine the existing USACE Ecosystem Restoration concept for Cal Expo/Bushy Lake, which currently includes non-native invasive plant species eradication, grading and planting riparian forest, constructing a side channel, grading to create seasonal wetlands, terracing steep banks and planting riparian vegetation, restoring emergent wetlands, and planting oak savanna. The current concept also includes routing water from Chicken and Strong Ranch sloughs via pump into a treatment wetland. However, given several complexities associated with the pumping and treatment wetland elements, they are not likely to be advanced for implementation. The overall goal is to naturalize the site to provide habitat for target species, including conservation of Bushy Lake and its associated habitats.* |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **Paradise** |
| *As the remainder of the Two Rivers Trail is implemented, identify opportunities for onsite planting to the extent consistent with flood control considerations and hydraulic limitations.* |
| *Develop a conceptual naturalization plan for the area of Paradise Beach adjacent to the levee. The naturalization plan may include elements to improve and expand riparian forest habitat in the area between the levee and river channel. (USACE Mitigation Project)* |
| Identify a process to have old bridge debris removed as a part of future associated projects. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **Campus Commons** |
| Improve floodplain connectivity to reduce fish stranding: Develop a plan to improve floodplain connectivity and minimize fish stranding at the downstream end of the plan area. |
| *Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. (USACE WRDA 16 Project)* |
| Replace declining black locust trees at Alumni Grove with native trees, such as Valley oak or California Sycamore. |
| **Howe Ave. and Watt Ave.** |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |



| **SARA Park** |
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| *Establish valley oak riparian woodland: Expand target habitats on the right bank upper berm by establishing valley oak riparian woodland and elderberry. (USACE Mitigation Project)* |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| Maintain flow through the drainage slough: Consistent with managing invasive weeds, identify opportunities to maintain water flow through the drainage slough. |
| **Arden Bar** |
| Develop conceptual naturalization plan for Arden Pond: Implement USACE plan for Arden Pond as appropriate in consideration of ongoing processes that would preserve existing habitat values while incorporating rearing salmonid habitat. *(USACE Mitigation Project – currently on hold contingent on Urrutia)* |
| Improve native riparian and oak woodland communities: In other areas identified for Naturalization, develop concepts for increasing oak riparian woodland, live oak/blue oak woodland, or where feasible grading areas to support willow riparian scrub/forest. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **River Bend** |
| *Develop conceptual naturalization plan for Cordova Creek confluence area: The plan should focus on providing improved connectivity and enhanced wildlife conditions to the upstream naturalized portion of Cordova Creek. It should also address the narrow bridge crossing and identify interpretive opportunities. (Water Forum Restoration Project)* |
| Develop conceptual naturalization plans for areas identified for naturalization: The plan for the central naturalization areas of River Bend should consider enhancement of woodland savanna and/or native grasslands and forbs. The plan in the upstream area adjacent to Hagan Park should consider providing improved native grasslands and forb habitat, as well as maintaining the narrow corridor to upstream areas and expanding it if opportunities arise. Collaborate with potential project partners (e.g., UC Davis) to incorporate suitable pollinator/butterfly habitat into naturalization plans, where appropriate |
| Improve spawning riffle: Construct gravel augmentation site to create suitable spawning habitat for salmonids. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **Sarah Court** |
| Improve degraded riparian habitats: Restore existing habitats in areas identified for Restoration. Restoration may include removal of non-native invasive species, managing social trails, improving riparian vegetation in areas where it has been degraded, and improving the understory with appropriate native species. |
| **Ancil Hoffman** |
| Develop a Conceptual Naturalization Plan for the areas identified for Naturalization. |
| Enhance native woodlands and grasslands: The area adjacent to the entrance should be considered for additional plantings, whether it be woodland savanna or enhancement of existing grasses and forbs. |
| Improve degraded riparian habitats: When considering proposals to transform channel conditions in this area, consider ongoing natural processes and the durability of proposed designs in light of natural processes. |
| Improve habitat values on Carmichael Creek: Consideration should be given to naturalizing and realigning Carmichael Creek if a modified alignment is feasible and would provide additional habitat values beyond what is possible within the current alignment. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |

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| *Support interpretive uses at Effie Yeaw Nature Center: Specific consideration should be given to conservation actions that support and balance ongoing interpretive uses at Effie Yeaw nature center.* |
| **Rossmoor Bar** |
| Enhance woodland savanna and/or grasslands: The areas in the southeast (along El Manto Drive) should be considered for additional plantings, whether it be woodland savanna or enhancement of existing grasses and forbs. |
| Improve degraded riparian habitats: Restore existing habitats in areas identified for Restoration. Restoration may include removal of non-native invasive species, managing social trails, improving riparian vegetation in areas where it has been degraded, and improving the understory with appropriate native species. |
| Improve fallow agricultural area fields with woodland savanna or grassland: Develop a Conceptual Naturalization Plan for the graded agricultural area in the RM 15.1—15.65 reach which incorporates native vegetation that is suited to the soils and geology in this reach. |
| Improve spawning riffle: Construct gravel augmentation site to create suitable spawning habitat for salmonids. |
| Recontour and improve substrate to support woody vegetation: Develop a Conceptual Naturalization Plan to address piles of aggregate material and lack of topsoil in a manner that would support native woody vegetation. |
| **Sacramento Bar** |
| Develop conceptual naturalization plan for open mining pits/ponds: Develop a Conceptual Naturalization Plan for the areas identified for Naturalization. A substantial portion of Sacramento Bar was highly altered for mining purposes. The remnant topography includes several open water pits, high ground created for mining access routes, and severing of high flow bypass channels. The naturalization plan should develop a concept that naturalizes these large areas in a manner that brings these elements together while improving habitat value. Material could be used to fill some ponds (e.g., the pond closest to the river channel which naturally wants to fill) while regrading and enhancing others. Recontouring and enhancing the substrate in mined areas would also provide areas to expand riparian and woodland habitats. |
| Improve degraded riparian habitats: Consider recontouring some areas and/or removing cobble to create conditions that would better support riparian vegetation and natural processes. Plan should consider that during high flows the area has a propensity to be depositional due to the widened channel in the area. |
| Improve spawning riffle: Construct gravel augmentation site to create suitable spawning habitat for salmonids. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **Lower Sunrise** |
| Develop a Conceptual Naturalization Plan for the areas identified for Naturalization, including improvements to riparian forest. |
| *Enhance woodland savanna and/or grasslands: Augment degraded native communities with plantings of woodland and grassland species to enhance habitat value. (Potential PG&E Mitigation Project)* |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **Sunrise Bluffs** |
| Improve degraded riparian habitat: Augment degraded native communities with plantings of riparian species to enhance habitat value. |
| Improve spawning riffle: Construct gravel augmentation site to create suitable spawning habitat for salmonids. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **Upper Sunrise** |
| Develop conceptual naturalization plan for areas altered by mining: Develop a Conceptual Naturalization Plan for the area identified for Naturalization. The area has been scraped clean in some manner and soils need to be assessed. These areas could ultimately support oak woodland/savanna or grassland with proper preparation. |
| Improve spawning riffle: Construct gravel augmentation site to create suitable spawning habitat for salmonids. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| **Sailor Bar** |
| Develop a Conceptual Naturalization Plan for the areas identified for Naturalization. Consider opportunities to naturalize Illinois Creek. |
| Expand oak habitats in conservation and naturalization areas: Augment degraded native communities with plantings of oak woodland species to enhance habitat value. |
| Lower Floodplain: Develop a plan to lower the floodplain to increase inundation frequency, increase SRA habitat to improve rearing conditions for target fish species and wildlife habitat. |
| Naturalize relict pools/remove gunite: The former “pool” in the northwest corner could be naturalized. Consideration should be given to removal of bentonite/gunite layer to facilitate establishment of native plant species. |
| Recontour mined areas to support oak habitats: Areas identified for naturalization have been highly disturbed from mining. Substantial effort is likely needed to grade, recontour, and supplement soils in order to support oak woodland and/or savanna. Specific consideration should be given to increasing woodland in the eastern end, not to high density, but could support more oaks. Areas recently used for gravel augmentation projects should be considered for further grading, contouring, and soil amendment prior to planting. |