

**Determination of
Biologically Equivalent or Superior Preservation
Report**

HORSESHOE LAKE PARK

City of Jurupa Valley
8930 Limonite Avenue
Jurupa Valley, California 92509

Jurupa Area Recreation and Park District
8621 Jurupa Road
Jurupa Valley, California 92509

Prepared By:

Jericho Systems, Inc.
47 1st Street, Suite 1
Redlands, California 92373
Contact: *Shay Lawrey*

and

ELMT Consulting, Inc.
2201 N. Grand Avenue #10098
Santa Ana, California 2711
Contact: *Travis J. McGill*

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1 EXECUTIVE SUMMARY

This report contains the results of the Determination of Biologically Equivalent or Superior Preservation (DBESP) analysis to demonstrate compliance with the requirements of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) for impacts to riparian/riverine resources. The Jurupa Area Recreation and Park District (District) proposes to upgrade and enhance the existing Horseshoe Lake Park, an approximately 13-acre site, that is graded and supports walking trails and an equestrian area. The Horseshoe Lake Park Project (“project site” or “site”) is located in the City of Jurupa Valley, Riverside County, California within Assessor’s Parcel Number (APN) 163-240-001.

Within the proposed project footprint, Horseshoe Lake, was the only jurisdictional feature observed that would qualify as riparian/riverine habitat under Section 6.1.2 of the MSHCP. Horseshoe Lake is an approximately 5.5-acre ephemeral lake, north of the Santa Ana River. Based on a review of historic topographic maps and aerials photographs, Horseshoe Lake historically received runoff from the hills to the northeast (prior to 1969) via a small blue-line drainage feature and overflowed into the Santa Ana River, approximately 1,000 feet to the south, prior to the residential developments that now surround the site. Per the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Wetlands Mapper, Horseshoe Lake supports of temporarily flooded, persistent freshwater emergent wetland habitat and freshwater forested/shrub wetland habitat. Surface water is typically present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for most of the season (USFWS 2018).

Based on the results of the Biological Resources Assessment/Jurisdictional Delineation and MSHCP Consistency Analysis Report (Jericho, 2018), the proposed project site supports approximately 2.63-acres of United States Army Corps of Engineers (USACE) wetland “Waters of the United States” and Regional Water Quality Control Board (Regional Board) “Waters of the State.” In addition, 5.5-acre of California Department of Fish and Wildlife (CDFW) jurisdictional streambed was observed onsite. The extent of the riparian/riverine habitat on the project site is synonymous with the jurisdiction of CDFW.

The proposed project design will avoid impacts to the horseshoe shaped depression (riparian/riverine habitat), with the exception of a 100 linear foot bridge on the northwest “prong” of the horseshoe-shaped lake, totaling 0.035 acre. In order to keep the trail system within the project footprint, minimal impacts to riparian/riverine feature will occur from installation of the bridge. To offset impacts to 0.035 acre of riparian/riverine habitat, the applicant proposes to restore/enhance the remaining 5.465 acres of riparian/riverine habitat (mitigation site) including the removal of the 0.25-acre horse ring, located on the southern portion of the horseshoe shaped depression. The project proposes to use onsite native vegetation for seed collection and cuttings in

order to plant riparian/riverine plant species throughout the horseshoe shaped depression. The mitigation site would be maintained in perpetuity by a third party approved by the regulatory agencies.

The post-project riparian/riverine function and values will be biologically superior by providing the following:

- The restoration/enhancement and long-term management of 5.465-acre of riparian/riverine habitat within the horseshoe shaped depression. This area currently contains limited riparian habitat, but would be enhanced to include riparian plant species that could be supported in this area throughout its limits. The restoration/enhancement of 5.465 acre of riparian/riverine habitat will provide biologically superior habitat to the riparian/riverine habitat within Horseshoe Lake that will be impacted. These activities will increase biological diversity and the ecological functions and values of the riparian/riverine habitats on the project site.
- Non-native plant species (i.e., eucalyptus, Arundo) would be removed from the mitigation site.
- Implementation of the minimization measures described in Section 3.3.2 of this report will ensure that all indirect project-related impacts to riparian/riverine habitat, including that which may result from fugitive dust, toxics, invasive plant species, and grading/land development, are avoided or minimized to the greatest extent feasible.

The above actions would result in a net increase in the function and ecological value of riparian/riverine habitat on the project site as compared to the existing onsite jurisdictional feature, which consist generally of a mixture of bare ground, non-native grasses, with very sparse riparian habitat. The mitigation site will be dominated by riparian scrub with upland scrub habitat along the upper banks. Horseshoe Lake will continue to be maintained as a natural filter for potentially contaminated water flowing from the upstream residential developments. As such, improvements to functions and values within the mitigation site include increased nutrient retention, biological filtration, sediment trapping, and wildlife habitat. The proposed mitigation site will provide a higher habitat quality and diversification, and will provide suitable habitat for riparian wildlife species.

2 INTRODUCTION

2.1 Project Area

The Site is identified on the *Riverside West* U. S. Geological Survey's (USGS) 7.5-minute topographic map in NE ¼ of Section 26, Township 2 South, Range 6 West. The project site is located within Assessor's Parcel Number (APN) 163-240-001, within the City of Jurupa Valley, Riverside County, California. The project site is approximately 13.5 acres and is specifically located on the southwest corner of Lakeview Avenue and Studio Place, just north (approximately 0.125 mile) of the Santa Ana River. The project site is bounded by Lakeview Avenue on the northeast, Studio Place on the southeast, Kennedy Street on the south, and Kelsey Place to the west. No offsite improvements, staging, or construction activities are proposed.

The walking trail is approximately 0.5-mile long and consists of decomposed granite and meanders within the site, forming a shape of the horseshoe. The trail forms the outline of a horseshoe shaped topographical depression that is approximately 5.25 acres that gently slopes from the walking trail to approximately 10 to 15 feet below the surrounding surface. On the southern portion of the horseshoe shaped depression, an approximately 0.25-acre raised flat area exists and contains a horse ring. Therefore, the total area of the topographical depression is approximately 5.5 acres.

Evidence of riverine/riparian and wetland habitat was found in various areas of the horseshoe-shaped topographical depression. Additionally, historic photos and topographic maps indicate that the topographical depression has been a lake. The remainder of the ground surface of the project site consists of brown clayey-silty loam and is disked and grubbed with scattered growth of typical weeds.

2.2 Project Description

The Jurupa Area Recreation and Park District (JARPD) is proposing various improvements to the existing Horseshoe Lake Park (Proposed Project) located at the southwest corner of Lakeview Avenue and Studio Place in the City of Jurupa Valley, approximately 0.125 mile north of the Santa Ana River. Proposed Project improvements include decomposed granite and concrete walkways, equestrian trail, exercise station, basketball court, corn hole, minor recreational structures (such as covered play area, picnic shelter, and game tables), interpretive signs, horseshoe pits and a bridge. The existing City of Jurupa Valley General Plan and Zoning land use designations are Country Neighborhood (LDR) and Rural Agricultural 1 (R-A), respectively.

The proposed project design will avoid impacts to the horseshoe shaped depression (riparian/riverine habitat), with the exception of a 100 linear foot bridge on the northwest "prong" of the horseshoe-shaped lake. In order to keep the trail system within the project footprint, minimal impacts to riparian/riverine feature will occur from installation of the bridge.

2.3 Existing Conditions

The project site is currently vacant and has been subject to historic human disturbances, evidenced by signs of tire tracks, walking trails, livestock enclosures (equestrian trail and horse ring), and disking. The entire project site with the exception of approximately 0.75 acre in the northwest corner of the site shows evidence of recent disking for invasive species control. The topography of the project site is relatively level with a slight undulation centered around the 5.5-acre horseshoe-shaped topographical depression with elevations ranging from approximately 700 to 720 feet above mean sea level.

The walking trail is approximately 0.5-mile long and consists of decomposed granite and meanders within the site, forming a shape of the horseshoe. The trail forms the outline of a horseshoe shaped topographical depression that is approximately 5.25 acres that gently slopes from the walking trail to approximately 10 to 15 feet below the surrounding surface. On the southern portion of the horseshoe shaped depression, an approximately 0.25-acre raised flat area exists and contains a horse ring. Therefore, the total area of the topographical depression is approximately 5.5 acres.

Adjacent and south of the horseshoe-shaped depression, between the walking trail and Kennedy Street (the south boundary), is bare and at roughly the same grade as the horse ring. Within the northern portion of the property, and between the two “prongs” of the horseshoe-shaped depression, the ground is higher than the depression, and a graded walking trail exists from the northern portion of the property, through the depression area, to the equestrian area. Evidence of riverine/riparian and wetland habitat was found in various areas of the horseshoe-shaped topographical depression. Additionally, historic photos and topographic maps indicate that the topographical depression has been a lake. The remainder of the ground surface of the project site consists of brown clayey-silty loam and is disked and grubbed with scattered growth of typical weeds.

The habitats within and adjacent the project site, as well as the dominant plant species within these habitats are detailed below:

Non-native Habitat

Most of the project site consists of non-native habitat and bare ground. Non-native vegetation within the herbaceous and shrub layers of the Study Area includes giant reed (*Arundo donax*), ripgut brome (*Bromus diandrus*), lamb’s quarters (*Chenopodium album*), field bindweed (*Convolvulus arvensis*), annual June grass (*Koeleria gerardi*), perennial pepperweed (*Lepidium latifolium*), dwarf mallow (*Malva neglecta*), castor bean (*Ricinus communis*), London rocket (*Sisymbrium irio*), saltcedar (*Tamarix ramosissima*) and golden crownbeard (*Verbesina*

encelioides). Additionally, there are numerous eucalyptus trees (*Eucalyptus* spp.) scattered throughout the site.

Riparian Habitat

There is an approximately 0.5-acre area of mixed non-native and riparian habitat located near the storm drain outlet at the northwestern most end of the project site. This habitat is dominated by non-native species including *Arundo* and eucalyptus, but also supports some native riparian vegetation including willow (*Salix* spp.) and mulefat (*Baccharis salicifolia*). There are also several individual willows, mulefat and Fremont cottonwoods (*Populus fremontii*) scattered throughout other portions of the site, within Horseshoe Lake. However, the sparse canopy, dominance of eucalyptus trees (non-riparian) and other non-native species, and human disturbance, including disking and grading, has resulted in a degradation of the remnant riparian habitat that exists on site.

Freshwater Emergent Wetland

There is a small area (approximately 0.01 acre) of freshwater emergent wetland located at the City's storm drain outlet located adjacent the northeast corner of the park. As with the remnant riparian habitat found on site, the freshwater emergent vegetation that exists at the storm drain outlet is dominated by non-native, ruderal species including *Arundo* and narrow leaf cattail (*Typha angustifolia*). Native freshwater emergent vegetation found within the immediate vicinity of the City's storm drain consists mostly of cyperus (*Cyperus* sp.).

3 RIPARIAN/RIVERINE MITIGATION (SECTION 6.1.2)

3.1 Methods

Riparian/Riverine

Section 6.1.2 of the MSHCP, identifies Riparian/Riverine resources as lands which contain habitat dominated by trees, shrubs, persistent emergent vegetation, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from nearby fresh water sources, or areas with freshwater flow during all or a portion of the year. Riverine habitat includes all wetlands and deep-water habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Riverine habitat is bounded on the landward side by upland, by the channel bank (including natural and man-made levees), or by wetlands dominated by trees, shrubs, persistent emergents, mosses, or lichens. In braided streams, the system is bounded by the banks forming the outer limits of the depression within which the braiding occurs. Springs discharging into a channel are considered part of the riverine habitat. The term riparian is used to define the type of wildlife habitat found along the banks of a river, stream, lake or other body of water. Riparian habitats are ecologically diverse and can be found in many types of environments including grasslands, wetlands and forests.

As previously noted, approximately 0.5-acre area of mixed non-native and riparian habitat was observed near the storm drain outlet at the northwestern most end of the project site. However, the sparse canopy, dominance of eucalyptus trees (non-riparian) and other non-native species, and human disturbance, including disking and grading, has resulted in a degradation of the remnant riparian habitat that exists on site. Given the sparse distribution of riparian species and poorly defined canopy and structure within the small area of mixed non-native and riparian habitat on site, the remnant riparian habitat would not be considered suitable to support any riparian obligate species that may occur within the regional vicinity, including as the State- and federally-listed as endangered least Bell's Vireo (*Vireo bellii pusillus* [LBVI]), southwestern willow flycatcher (*Empidonax traillii extimus*), or yellow-billed cuckoo (*Coccyzus americanus*). As a result, no focused surveys were conducted or recommended.

Vernal Pools

One of the factors for determining the suitability of the habitat for fairy shrimp would be demonstrable evidence of seasonal ponding in an area of topographic depression that is not subject to flowing waters. These astatic pools are typically characterized as vernal pools. More specifically, vernal pools are seasonal wetlands that occur in depression areas without a continual source of water. They have wetland indicators of all 3 parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate

hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season. The determination that an area exhibits vernal pool characteristics and the definition of the watershed supporting vernal pool hydrology is made on a case-by-case basis. Such determinations should be considered the length of time the areas exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. The seasonal hydrology of vernal pools provides for a unique environment, which supports plants and invertebrates specifically adapted to a regime of winter inundation, followed by an extended period when the pool soils are dry.

Vernal pools are seasonally inundated, ponded areas that only form in regions where specialized soil and climatic conditions exist. During fall and winter rains typical of Mediterranean climates, water collects in shallow depressions where downward percolation of water is prevented by the presence of a hard pan or clay pan layer (duripan) below the soil surface. Later in the spring when rains decrease and the weather warms, the water evaporates and the pools generally disappear by May. The shallow depressions remain relatively dry until late fall and early winter with the advent of greater precipitation and cooler temperatures. Vernal pools provide unusual "flood and drought" habitat conditions to which certain plant and wildlife species have specifically adapted as well as invertebrate species such as fairy shrimp.

The MSHCP lists two general classes of soils known to be associated with listed and special-status plant species; clay soils and Traver-Domino Willow association soils. The specific clay soils known to be associated with listed and special-status species within the MSHCP plan area include Bosanko, Auld, Altamont, and Porterville series soils, whereas Traver-Domino Willows association includes saline-alkali soils largely located along floodplain areas of the San Jacinto River and Salt Creek. Without the appropriate soils to create the impermeable restrictive layer, none of the special-status plant or wildlife species associated with vernal pools can occur on the project site. None of these soils have been documented within the project site.

A review of recent and historic aerial photographs (1994-2018) of the project site found evidence of riparian/riverine and wetland habitat within various areas of the horseshoe shaped topographical depression. Additionally, historic aerials and topographic maps indicate that the topographical depression has been a lake, displaying astatic conditions, and drainage patterns currently occurring on the project site follow hydrologic regimes need to support vernal pools. However, the underlying soils within the project site do not support the clay or Traver-Domino Willow association soils, typically associated with vernal pools.

Due to the astatic ponding within the horseshoe shaped topographical depression onsite, both dry and wet season vernal pool branchiopod surveys were conducted. Both of these surveys were negative for federally and state listed fairy shrimp (refer to Appendix B).

3.2 Results/Impacts

The proposed project will result in permanent impacts to approximately 0.035-acre of riparian/riverine habitat within the northwestern portion of Horseshoe Lake.

Table 1: Impacts to Riparian/Riverine Habitat

Jurisdictional Feature	Riparian/Riverine Habitat	
	Onsite Jurisdiction	Project Impacts
Horseshoe Lake	5.5	0.035
TOTAL	5.5	0.035

The proposed project design will avoid impacts to the horseshoe shaped depression (riparian/riverine habitat), with the exception of a 100 linear foot bridge on the northwest “prong” of the horseshoe-shaped lake, totaling 0.035 acre. In order to keep the trail system within the project footprint, minimal impacts to riparian/riverine feature will occur from installation of the bridge.

3.3 Mitigation and Equivalency

3.3.1 *Direct Effects*

To offset impacts to 0.035 acre of riparian/riverine habitat, the applicant proposes to restore/enhance the remaining 5.465 acres of riparian/riverine habitat (mitigation site) including the removal of the 0.25-acre horse ring, located on the southern portion of the horseshoe shaped depression. The project proposes to use onsite native vegetation for seed collection and cuttings in order to plant riparian/riverine plant species throughout the horseshoe shaped depression. The mitigation site would be maintained in perpetuity by a third party approved by the regulatory agencies.

The post-project riparian/riverine function and values will be biologically superior by providing the following:

- The restoration/enhancement and long-term management of 5.465-acre of riparian/riverine habitat within the horseshoe shaped depression. This area currently contains limited riparian habitat, but would be enhanced to include riparian plant species that could be supported in this area throughout its limits. The restoration/enhancement of 5.465 acre of riparian/riverine habitat will provide biologically superior habitat to the riparian/riverine habitat within Horseshoe Lake that will be impacted. These activities will increase biological diversity and the ecological functions and values of the riparian/riverine habitats on the project site.

- Non-native plant species (i.e., eucalyptus, Arundo) would be removed from the mitigation site.
- Implementation of the minimization measures described in Section 3.3.2 of this report will ensure that all indirect project-related impacts to riparian/riverine habitat, including that which may result from fugitive dust, toxics, invasive plant species, and grading/land development, are avoided or minimized to the greatest extent feasible.

Habitat “enhancement” activities shall include the removal of all non-native plant species from the entire mitigation site and non-riparian/wetland plant species (establishment only) from within the streambed, the removal of trash and debris; the installation of temporary irrigation; and the installation of appropriate container stock and seed mixes. Native plant materials (including seeds) that are proposed for removal during project activities will be used for restoration purposes, as will native riparian vegetation that is not proposed for removal but is already located within the mitigation site. The restoration/enhancement of 5.465-acre of riparian scrub habitat within Horseshoe Lake will provide biologically superior habitat to the riparian/riverine habitat existing within Horseshoe Lake, including that which will be directly impacted by site development.

All plant species installed within the mitigation site shall include only local California native container plants and cuttings and shall be typical of the existing native plant species present in the existing riparian/riverine areas within and adjacent to the project site. The bottom of Horseshoe Lake is proposed to be revegetated with native riparian vegetation, and the streambanks are proposed to be revegetated/enhanced with native Riversidean Sage Scrub plant species. Plant material should be installed between October 1 and April 30 to maximize the benefits of the winter rainy season. The planted area (5.465 mitigation site) would have a conservation easement placed over it and would be maintained by a third party approved by the regulatory agencies that would provide for the long-term management and maintenance in perpetuity.

The Applicant will be responsible for implementing the requirements of a Habitat Mitigation and Monitoring Plan and initial establishment. The HMMP will describe the methods used for invasive species and trash removal, fencing and signage replacement, will identify success criteria and reporting requirements, and will define responsibilities, adaptive management, and expected maintenance. The long-term management and maintenance costs would transfer to a third party as approved by the regulatory agencies. The mitigation site would be off-limits to the public and residents. Furthermore, signage and education materials would be provided to local residents, as well as the staff and members maintaining the remainder of the site, regarding these restrictions.

The above actions would result in a net increase in the function and ecological value of riparian/riverine habitat on the project site as compared to the existing onsite jurisdictional feature, which consist generally of a mixture of bare ground, non-native grasses, with very sparse riparian habitat. The mitigation site will be dominated by riparian scrub with upland scrub habitat along

the upper banks. Horseshoe Lake will continue to be maintained as a natural filter for potentially contaminated water flowing from the upstream residential developments. As such, improvements to functions and values within the mitigation site include increased nutrient retention, biological filtration, sediment trapping, and wildlife habitat. The proposed mitigation site will provide a higher habitat quality and diversification, and will provide suitable habitat for riparian wildlife species.

3.3.2 Indirect Effects

Include a written description of project design features and mitigation measures that reduce indirect effects, such as edge treatments, landscaping, elevation difference, and minimization and/or compensation through restoration or enhancement.

- It is important to also consider and evaluate noise impacts to adjacent riparian/riverine resources and provide appropriate measures to attenuate these impacts. This may include committing to only constructing outside of nesting season, the use of sound walls that are installed outside of nesting season, etc.
- Applicant should also evaluate whether hydrology in the area is expected to change with project implementation. Will this change (caused by the project) result in cutting off the hydrologic support to the riparian, riverine, or vernal pool resource?

The following minimization measures have been incorporated into the project design to ensure that all indirect project-related impacts to riparian/riverine habitat, including impacts from fugitive dust, toxics, invasive plant species, and grading/land development, are avoided or minimized to the greatest extent feasible.

Fugitive Dust

During soil excavation, grading, or other subsurface disturbance within 100 feet of conserved riparian/riverine habitat onsite, the construction superintendent shall supervise provision and maintenance of all standard dust control best management practices (BMPs) to reduce fugitive dust emissions, including but not limited to the following actions:

- Water any exposed soil areas a minimum of twice per day, or as allowed under any imposed drought restrictions. On windy days or when fugitive dust can be observed leaving the construction site, additional water shall be applied at a frequency to be determined by the on-site construction superintendent.
- Pave, periodically water, or apply chemical stabilizer to construction access/egress points.
- Minimize the amount of area disturbed by clearing, grading, earthmoving, or excavation operations at all times.

- Operate all vehicles on graded areas at speeds less than 15 miles per hour.
- Cover all stockpiles that will not be utilized within three days with plastic or equivalent material, to be determined by the on-site construction superintendent, or spray them with a non-toxic chemical stabilizer.

Runoff - Toxics

To address potential short-term impacts to water quality within Horseshoe Lake from construction runoff that may carry storm water pollutants, a Storm Water Pollution Prevention Program (SWPPP) shall be implemented by the construction contractor as required by the California General Construction Storm Water Permit pursuant to State Water Quality Control Board and Regional Board regulations. The SWPPP shall identify BMPs related to the control of toxic substances, including construction fuels, oils, and other liquids. These BMPs will be implemented by the Applicant's contractor prior to the start of any ground clearing activity, shall be subject to periodic inspections by the County and the project's hydrological consultant, and shall be maintained throughout the construction period and remain in place until all landscape and permanent BMPs are in place. BMPs shall be monitored and repaired if necessary to ensure maximum erosion, sediment, and pollution control.

- Permittee shall prohibit the use of erosion control materials potentially harmful to fish and wildlife species, such as mono-filament netting (erosion control matting) or similar material, within and adjacent to CDFW jurisdictional areas.
- All fiber rolls¹, straw waddles, and/or hay bales utilized within and adjacent to the project site shall be free of non-native plant materials.
- Permittee shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws and it shall be the responsibility of Permittee to ensure compliance.
- Permittee shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter a lake, streambed, or flowing stream or be placed in locations that may be subjected to high storm flows.
- Spoil sites shall not be located within a lake, streambed, or flowing stream or locations that may be subjected to high storm flows, where spoil shall be washed back into a lake, streambed, or flowing stream where it will impact streambed habitat and aquatic or riparian vegetation.

¹ Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Non-welded weaves reduce entanglement risks to wildlife by allowing animals to push through the weave, which expands when spread.

- Raw cement/concrete or washings thereof, asphalt, paint, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to fish and wildlife resources resulting from project related activities shall be prevented from contaminating the soil and/or entering the waters of the State. These materials, placed within or where they may enter a lake, streambed, or flowing stream by Permittee or any party working under contract or with the permission of Permittee, shall be removed immediately.
- No equipment maintenance shall be done within or near any lake, streambed, or flowing stream where petroleum products or other pollutants from the equipment may enter these areas under any flow.
- No broken concrete, cement, debris, soil, silt, sand, bark, slash, sawdust, rubbish, or washings thereof, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the edge of any lake, streambed, or flowing stream.

Accidental Encroachments During Construction

The following measures shall also be incorporated into the construction documents and specifications, and implemented by the contractor, to avoid potential construction-related impacts to conserved riparian/riverine habitat outside of the approved disturbance limits:

- Construction worker training shall be provided by a qualified biologist at the first pre-construction meeting;
- Exclusionary fencing and signs shall be erected near the top of slope adjacent to conserved riparian/riverine habitat to prevent accidental/unauthorized intrusions during construction;
- No equipment shall be operated in areas of flowing water;
- Construction access and staging areas for storage of materials and heavy equipment, and for fueling, cleaning, or maintenance of construction vehicles or equipment, shall be prohibited within 20 feet from the top of slope adjacent to conserved riparian/riverine habitat; and
- A qualified biologist shall be onsite during initial clearing/grubbing, grading, and/or construction activities within the riparian/riverine habitat that will be impacted within Horseshoe Lake, or within 100 feet of the habitat to be avoided, and shall periodically monitor these activities to ensure they do not exceed the fenced construction limits.

Post-Construction Human Disturbances

The project shall incorporate special edge treatments designed to minimize edge effects by providing a safe transition between developed areas and conserved riparian/riverine habitat, and which would be compatible with project operation and the protection and sustainability of conserved areas. Special edge treatments shall include native landscaping on manufactured slopes within the conserved areas and fencing/signage near the top of slope adjacent to conserved areas to prevent unauthorized public access, vandalism, illegal dumping, and other adverse human disturbances.

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SUPPORTING APPENDICES

Appendix A – Biological Resources Assessment

Appendix B – Fairy Shrimp Wet Seasons Survey

Appendix A

Biological Resources Assessment

Biological Resources Assessment and
MSHCP Consistency Analysis
Horseshoe Lake Park
Jurupa Valley, Riverside County, California

APN #'s: 163-240-001

USGS 7.5' *Riverside West*, Quadrangle

NE ¼ of Section 26, Township 2 South, Range 6 West, San Bernardino Base Meridian.

Prepared for:

The Altum Group
73-710 Fred Waring Drive, Suite 219
Palm Desert, CA 92260

October 2018

Revised May 23, 2019

Prepared by:



Jericho Systems, Inc
Shay Lawrey, President
47 1st Street, Suite 1
Redlands, California 92373

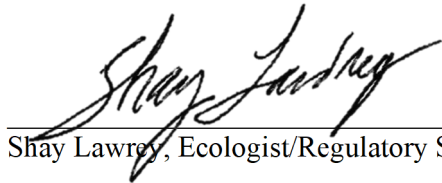
Certification

Jericho Systems, Inc
47 N 1st ST, STE 1
Redlands, California 92373
(909) 915-5900



Contact: Shay Lawrey, President, and Ecologist/Regulatory Specialist

Certification: I hereby certify that the statements furnished herein, and in the attached exhibits present data and information required for this analysis to the best of my ability, and the facts, statements, and information presented are true and correct to the best of my knowledge and belief. This report was prepared in accordance with professional requirements and standards. Fieldwork conducted for this assessment was directed and overseen by me. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project proponent and that I have no financial interest in the project.


Shay Lawrey, Ecologist/Regulatory Specialist

REVISION NOTE:

The City of Jurupa Valley provided comments to this report on May 13, 2019. Additions to this report as requested are identified in underline type and deletions are identified in strikethrough (~~strikethrough~~) type.

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1 Summary Information

Date report prepared: October 22, 2018

Project site location: Riverside West U. S. Geological Survey's (USGS) 7.5-minute topographic map in NE ¼ of Section 26, Township 2 South, Range 6 West

Assessor's Parcel Numbers: 163-240-001

Owner/Applicant: Jurupa Area Recreation and Park District, 4810 Pedley Road, Jurupa Valley, CA 92509

Principal Investigator: Todd White, Daniel Smith

Name of person preparing report: Todd White

Address: 47 N 1st ST, STE 1 Redlands, CA 92373

Phone: (909) 915-5900

Report Summary: The site is not located within any MSHCP Criteria cell or subunit, is not located in an area where surveys are required for any Amphibian, Mammal, Burrowing Owl, Narrow Endemic Plant Species, Urban/Wildlands Interface or other criteria species, nor does it provide wildlife connectivity between blocks of habitat. According to the habitat assessment conducted by Jericho Systems in August 2018, the Project may have unavoidable impacts to Riverine/Riparian areas due to the presence of riparian and emergent wetland species and evidence of flows and/or inundation. No vernal pools occur on site. The project design has not yet been determined.

2 Introduction

Jericho Systems, Inc. (Jericho) is pleased to provide this Biological Resources Assessment/Jurisdictional Delineation (BRA/JD) and Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Consistency Analysis prepared for the development of Parcel 163-240-001 (Project).

The MSHCP is a criteria-based plan and identification of planning units on which to base the Criteria is necessary for such a criteria-based plan. The MSHCP Conservation Area is comprised of a variety of existing and proposed Cores, Extensions of Existing Cores, Linkages, Constrained Linkages and Non-contiguous Habitat Blocks. The MSHCP coverage area is divided into Area Plans (AP) based on the Riverside County's General Plan Area Plan boundaries. Each of the AP's has: established conservation criteria, species specific surveys that may be required based on on-site Habitat Assessment, and resources and areas identified for conservation. In each Area Plan text, applicable Cores and Linkages are identified.

There are 146 species covered by the MSHCP. Surveys are not required for 106 of these covered species. The remaining 40 covered species may require focused surveys for proposed development projects and include 4 birds, 3 mammals, 3 amphibians, 3 crustaceans, 14 Narrow Endemic Plants, and 13 other sensitive plants within the Criteria Area. The need to conduct focused surveys for all but six of these 40 species are determined by the presence of suitable habitat within designated 'survey areas' mapped for each of the species.

Field surveys for this BRA/JD/MSHCP Consistency Analysis occurred in August 2018. The project site was assessed for sensitive species known to occur locally. Attention was focused on those State- and/or federally-listed as threatened or endangered species and those identified by the Riverside County MSHCP that have been documented in the project vicinity, whose habitat requirements are present within or adjacent the project site. Results of the survey and habitat assessment are intended to provide sufficient baseline information to the project proponent and, if required, to federal and State regulatory agencies, including the U.S. Fish and Wildlife Service (USFWS) and CDFW, respectively, to determine if impacts will occur to sensitive biological resources and to identify mitigation measures to offset those impacts.

The project site is located within the Jurupa Area Plan of the Western Riverside County Multiple Species Habitat Plan (MSHCP) area. The MSHCP requires that a project comply with the MSHCP policies identified in Section 6 of the MSHCP. The project site is not located within the portion of the MSHCP that requires focused surveys for amphibians, burrowing owl (*Athene cunicularia* [BUOW]), mammal, or narrow endemic plants. It is not located in within any cell designated as a “criteria” area for potential or existing conservation.

In addition to the BRA and habitat assessment, Jericho biologists Daniel Smith and Todd White also conducted the August field survey to include Riverine/Riparian/Vernal Pool resources consistent with Section 6.1.2 of the MSHCP and a Jurisdictional Delineation (JD) of the project site.

The purpose of the JD is to determine the extent of State and federal jurisdictional waters within the project area potentially subject to regulation by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA), Regional Water Quality Control Board (RWQCB) under Section 401 of the CWA and Porter Cologne Water Quality Control Act, and CDFW under Section 1602 of the California Fish and Game Code (FGC), respectively.

2.1 Project Description

Horseshoe Lake Park is an approximate 13-acre site which is primarily graded, and contains walking trails and equestrian arena, and is operated by the Jurupa Area Recreation and Park District (District). The District seeks to construct various upgrades to the park (Figure 3), however, the final design is not yet complete.

2.2 Project Location

The Site is identified on the *Riverside West* U. S. Geological Survey’s (USGS) 7.5-minute topographic map in NE ¼ of Section 26, Township 2 South, Range 6 West (Figure 1). The subject property is located on Assessor’s Parcel Numbers (APN) 163-240-001, within the City of Jurupa Valley, Riverside County, California. The Site is approximately 13.5 acres and is specifically located on the southwest corner of Lakeview Avenue and Studio Place, just north (approximately 0.125 mile) of the Santa Ana River (Figure 2).

2.3 Environmental Setting

The Project site is in the City of Jurupa Valley, which is situated just north of the Santa Ana River, between the Jurupa Mountains and Chino Hills. The local Jurupa Valley area is subject to both seasonal and annual variations in temperature and precipitation. Average annual maximum temperatures typically peak at 94 degrees Fahrenheit (°F) in July and August and fall to an average annual minimum temperature of 41°F in December. Average annual precipitation is greatest from December through March and reaches a peak in February (3.62 inches). Precipitation is lowest in the month of June (0.3 inches). Annual precipitation averages 16.24 inches.

The general project vicinity consists of residential development. The site is bounded on the west, south, and east sides and commercial to the north along 64th Street, which is south of the major thoroughfare Van Buren Blvd. Specifically, the site is bounded on the north by 64th Street, along the west by Kelsey Place, on the south by Kennedy Street and on the east by Studio Place.

3 Assessment Methodology

All work was conducted considering the State and Federal guidelines. No limitations significantly affected the results and conclusions given herein. Surveys were conducted during the appropriate season to observe the target species, in good weather conditions, by qualified biologists who followed all pertinent protocols.

3.1 Biological Survey Area

The Biological Survey Area (Survey Area) for the Project site consists of the 13.3-acre site, plus a 200 foot buffer, where appropriate, accommodating for barriers such as fences and roads and terrain.

3.2 Biological Resources Assessment

Data regarding biological resources on the Study Area were obtained through literature review and field investigations. The project site is identified on the *Riverside West* U. S. Geological Survey's (USGS) 7.5-minute topographic map in NE ¼ of Section 26, Township 2 South, Range 6 West. The *Corona North*, *Guasti*, and *Fontana* Quads were included in the database search due to the site's proximity to the *Riverside West* quad.

Prior to performing the field surveys, available databases and documentation relevant to the project site were reviewed for documented occurrences of sensitive species in the area. The USFWS threatened and endangered species occurrence data overlay, as well as the most recent versions of the California Natural Diversity Database (CNDDDB), Biogeographic Information and Observation System (BIOS), Calflora, and California Native Plant Society Electronic Inventory (CNPSEI) databases, were searched for sensitive species. These databases contain records of reported occurrences of State- and federally-listed species or otherwise sensitive species and habitats that may occur within the vicinity of the subject property. Additionally, the Riverside County Regional Conservation Authority (RCA) MSHCP Information Tool was utilized to determine requirements for MSHCP compliance.

The field surveys were conducted on August 31, 2018 by Jericho biologists Todd White and Daniel Smith. Mr. White and Mr. Smith have advanced degrees in Biology and vast experience in conducting biological surveys throughout Riverside and San Bernardino Counties. They conducted comprehensive surveys with complete coverage of the entire site and adjacent areas (when appropriate and feasible).

The assessment survey consisted of walking transects spaced approximately 30 feet apart to provide 100 visual coverage of the project site. Adjacent areas that were not accessible on foot were surveyed with binoculars. The field survey was structured, in part, to also detect burrowing owl (BUOW) because a BUOW survey area exists approximately 0.12 mile to the south of the Project site.

Plant communities were identified and mapped on aerial photographs plant communities within the project area. The mapped plant communities were digitized using Geographic Information System (GIS) software, and acreages were calculated based on the vegetation types within the Study Area. All plant and alliance classifications will in accordance with Sawyer, John O., Keeler-Wolf, Todd, and Evens, Julie M. 2009, *A Manual of California Vegetation. Second Edition*, California Native Plant Society, Sacramento, California.

Wildlife species were detected during field surveys by sight, calls, tracks, scat, or other sign. In addition to species observed, expected wildlife usage of the site was determined per known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. The focus of the faunal species surveys was to identify potential habitat for special status wildlife within the project area. Disturbance characteristics and all animal sign encountered on the site are recorded in the results section. During the site walk over, Mr. White and Mr. Smith also looked for BUOW sign including, burrows, molted feathers, cast pellets, prey remains, owl white wash, and suitable surrogate burrows. The area was also assessed for soil type and level of friability as well as habitat type and habitat structure.

3.3 Riverine/Riparian/Vernal Pool and Jurisdictional Waters Assessment

Also on August 31, 2018, Jericho biologists Todd White and Daniel Smith evaluated the property for the presence of riverine/riparian/vernal pool and jurisdictional waters i.e. waters of the U.S. as regulated by the U.S.

Army Corps of Engineers (USACE) and Regional Water Quality Control (RWQCB), and/or jurisdictional streambed and associated riparian habitat as regulated by the California Department Fish and Wildlife (CDFW).

Prior to the field visit, aerial photographs of the site were viewed and compared with the surrounding USGS 7.5-minute topographic quadrangle maps to identify drainage features within the survey area as indicated from topographic changes, blue-line features, or visible drainage patterns. The Environmental Protection Agency (EPA) Water Program “My Waters” data layer was also reviewed to determine whether any hydrologic features had been documented within the vicinity of the site. Similarly, the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) soil maps for Riverside County were used to identify the soil series in the area and to check these soils to determine whether they are regionally identified as hydric soils. Upstream and downstream connectivity of waterways (if present) were reviewed on aerial photographs and topographic maps, and verified in the field to determine jurisdictional status.

During the field visit on August 31, 2018, Mr. Smith and Mr. White carefully assessed the site for depressions, inundation, presence of hydrophytic vegetation, staining, cracked soil, ponding, and indicators of active surface flow and corresponding physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris. Suspected jurisdictional areas were checked for the presence of definable channels, soils, and hydrology. Measurements and global positioning system (GPS) data were collected of necessary features identified.

Riparian/Riverine Areas and Vernal Pools

The MSHCP describes the protection of Riparian/Riverine Areas and Vernal Pools within the MSHCP Plan Area as important to the conservation of certain amphibian, avian, fish, invertebrate and plant species. The MSHCP describes guidelines to ensure that the biological functions and values for species inside the MSHCP Conservation Area are maintained, as outlined in Volume 1, Section 6.1.2.

Section 6.1.2 of the MSHCP, identifies Riparian/Riverine resources as lands which contain habitat dominated by trees, shrubs, persistent emergent vegetation, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from nearby fresh water sources, or areas with freshwater flow during all or a portion of the year. Riverine habitat includes all wetlands and deep-water habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Riverine habitat is bounded on the landward side by upland, by the channel bank (including natural and man-made levees), or by wetlands dominated by trees, shrubs, persistent emergents, mosses, or lichens. In braided streams, the system is bounded by the banks forming the outer limits of the depression within which the braiding occurs. Springs discharging into a channel are considered part of the riverine habitat. The term riparian is used to define the type of wildlife habitat found along the banks of a river, stream, lake or other body of water. Riparian habitats are ecologically diverse and can be found in many types of environments including grasslands, wetlands and forests.

Further, in the MSHCP functions and values assessment in for Section 6.1.2 analysis focuses on those areas that should be considered for priority acquisition for the MSHCP Conservation Area, as well as those functions that may affect downstream values related to Conservation of Covered Species within the MSHCP.

Clean Water Act – US Army Corps of Engineers Jurisdiction

The lateral extent of potential USACE jurisdiction was measured at the Ordinary High Watermark (OHWM) in accordance with regulations set forth in 33CFR part 328 and the USACE guidance documents.

To be considered a *jurisdictional wetland* under the federal CWA, Section 404, an area must possess three (3) wetland characteristics: hydrophytic *vegetation*, hydric *soils*, and wetland *hydrology*.

- ***Hydrophytic vegetation***: Hydrophytic vegetation is plant life that grows, and is typically adapted for life, in permanently or periodically saturated soils. The hydrophytic vegetation criterion is met if more than 50 percent of the dominant plant species from all strata (tree, shrub, and herb layers) is considered hydrophytic. Hydrophytic species are those included on the *2016 National Wetland Plant List (Arid West Region)* (Lichvar, 2016). Each species on the list is rated per a wetland indicator category, as shown in Table 2. To be considered hydrophytic, the species must have *wetland indicator status*, i.e., be rated as OBL, FACW or FAC.

Table 1
Wetland Indicator Vegetation Categories

Category	Probability
Obligate Wetland (OBL)	Almost always occur in wetlands (estimated probability >99%)
Facultative Wetland (FACW)	Usually occur in wetlands (estimated probability 67 to 99%)
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands (estimated probability 34 to 66%)
Facultative Upland (FACU)	Usually occur in non-wetlands (estimated probability 67 to 99%)
Obligate Upland (UPL)	Almost always occur in non-wetlands (estimated probability >99%)

- ***Hydric Soil***: Soil maps from the USDA-NRCS Web Soil Survey (USDA 2018) were reviewed for soil types found within the project area. Hydric soils are saturated or inundated long enough during the growing season to develop anaerobic conditions that favor growth and regeneration of hydrophytic vegetation. There are several indirect indicators that may signify the presence of hydric soils including hydrogen sulfide generation, the presence of iron and manganese concretions, certain soil colors, gleying, and the presence of mottling. Generally, hydric soils are dark in color or may be gleyed (bluish, greenish, or grayish), resulting from soil development under anoxic (without oxygen) conditions. Bright mottles within an otherwise dark soil matrix indicate periodic saturation with intervening periods of soil aeration. Hydric indicators are particularly difficult to observe in sandy soils, which are often recently deposited soils of flood plains (entisols) and usually lack sufficient fines (clay and silt) and organic material to allow use of soil color as a reliable indicator of hydric conditions. Hydric soil indicators in sandy soils include accumulations of organic matter in the surface horizon, vertical streaking of subsurface horizons by organic matter, and organic pans.

The hydric soil criterion is satisfied at a location if soils in the area can be inferred or observed to have a high groundwater table, if there is evidence of prolonged soil saturation, or if there are any indicators suggesting a long-term reducing environment in the upper part of the soil profile. Reducing conditions are most easily assessed using soil color. Soil colors were evaluated using the Munsell Soil Color Charts (Gretag/Macbeth, 2000). Soil pits were dug to an approximate depth of 18 inches to evaluate soil profiles for indications of anaerobic and redoximorphic (hydric) conditions in the subsurface.

- ***Wetland Hydrology***: The wetland hydrology criterion is satisfied at a location based upon conclusions inferred from field observations that indicate an area has a high probability of being inundated or saturated (flooded, ponded, or tidally influenced) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (USACE, 1987 and 2008b).

California Department of Fish and Wildlife

CDFW jurisdiction would occur where a stream has a definite course showing evidence of where waters rise to their highest level and to the extent of associated riparian vegetation. Evaluation of CDFW jurisdiction followed

guidance in the Fish and Game Code and *A Review of Stream Processes and Forms in Dryland Watersheds* (CDFW, 2010).

3.4 MSHCP Consistency

The MSHCP coverage area is divided into Area Plans (APs) based on Riverside County's General Plan Area Plan boundaries. Each of the AP's has: established conservation criteria; species-specific surveys that may be required based on on-site Habitat Assessment; and resources and areas identified for conservation. In each AP text, applicable Cores and Linkages are identified.

The MSHCP Conservation Area is comprised of a variety of existing and proposed Cores, Extensions of Existing Cores, Linkages, Constrained Linkages and Non-contiguous Habitat Blocks. There are 146 species covered by the MSHCP. Surveys are not required for 106 of these covered species. The remaining 40 covered species may require focused surveys for proposed development projects and include 4 birds, 3 mammals, 3 amphibians, 3 crustaceans, 14 Narrow Endemic Plants, and 13 other sensitive plants within the Criteria Area. The need to conduct focused surveys for all but six of these 40 species is determined by the presence of suitable habitat within designated 'survey areas' mapped for each of the species. The remaining six species that require focused surveys throughout the entire MSHCP area are associated with riparian/riverine areas and vernal pools and include least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, Riverside fairy shrimp, Santa Rosa Plateau fairy shrimp, and vernal pool fairy shrimp.

Jericho utilized the Regional Conservation Authority (RCA) Western Riverside County, *RCA MSHCP Information Tool* to obtain MSHCP information and survey requirements for the Study Area.

4 Results and Discussion

4.1 Biological Resources

4.1.1 Site Conditions

The project site is currently vacant and has been subject to historic human disturbances, evidenced by signs of tire tracks, walking trails, livestock enclosures and disking. The entire project site with the exception of approximately 0.75 acre in the northwest corner of the site shows evidence of recent disking for invasive species control.

The topography of the site is generally flat, with a mild gradient from north to south.

The site is generally bare, consisting of an approximately 0.5-mile decomposed granite walking trail that meanders within the site, forming a shape of the horseshoe. The trail forms the outline of a horseshoe shaped topographical depression that is approximately 5.25 acres that gently slopes from the walking trail to approximately 10 to 15 feet below the surrounding surface. Within the south end of the horseshoe shaped depression, an approximately 0.25-acre raised flat area exists and contains an equestrian round-pen. Therefore, the total area of the topographical depression is approximately 5.5 acres.

Adjacent and south of the horseshoe-shaped depression, between the walking trail and Kennedy Street (the south boundary), is bare and at roughly the same grade as the equestrian round pen.

Within the northern portion of the property, and between the two "prongs" of the horseshoe-shaped depression, the ground is higher than the depression, and a graded walking trail exists from the northern portion of the property, through the depression area, to the equestrian area.

4.1.2 Habitat

The habitats within and adjacent the project site, as well as the dominant plant species within these habitats are detailed below:

- Non-native Habitat – Most of the project site consists of non-native habitat and bare ground. Non-native vegetation within the herbaceous and shrub layers of the Study Area includes giant reed (*Arundo donax*), ripgut brome (*Bromus diandrus*), lamb's quarters (*Chenopodium album*), field bindweed (*Convolvulus arvensis*), annual June grass (*Koeleria gerardi*), perennial pepperweed (*Lepidium latifolium*), dwarf mallow (*Malva neglecta*), castor bean (*Ricinus communis*), London rocket (*Sisymbrium irio*), saltcedar (*Tamarix ramosissima*) and golden crownbeard (*Verbesina encelioides*). Additionally, there are numerous eucalyptus trees (*Eucalyptus* spp.) scattered throughout the site.
- Riparian Habitat – There is an approximately 0.5-acre area of mixed non-native and riparian habitat located near the storm drain outlet at the northwestern most end of the project site. This habitat is dominated by non-native species including *Arundo* and eucalyptus, but also supports some native riparian vegetation including willow (*Salix* spp.) and mulefat (*Baccharis salicifolia*). There are also several individual willows, mulefat and Fremont cottonwoods (*Populus fremontii*) scattered throughout other portions of the site, within Horseshoe Lake. However, the sparse canopy, dominance of eucalyptus trees (non-riparian) and other non-native species, and human disturbance, including disking and grading, has resulted in a degradation of the remnant riparian habitat that exists on site. Furthermore, given the sparse distribution of riparian species and poorly defined canopy and structure within the small area of mixed non-native and riparian habitat on site, the remnant riparian habitat would not be considered suitable to support any riparian obligate species that may occur within the regional vicinity, including as the State- and federally-listed as endangered least Bell's Vireo (*Vireo bellii pusillus* [LBVI]) or southwestern willow flycatcher (*Empidonax traillii extimus*).
- Freshwater Emergent Wetland – There is a small area (approximately 0.01 acre) of freshwater emergent wetland located at the City's storm drain outlet located adjacent the northeast corner of the park. As with the remnant riparian habitat found on site, the freshwater emergent vegetation that exists at the storm drain outlet is dominated by non-native, ruderal species including *Arundo* and narrow leaf cattail (*Typha angustifolia*). Native freshwater emergent vegetation found within the immediate vicinity of the City's storm drain consists mostly of cyperus (*Cyperus* sp.).

4.1.3 Wildlife

4.1.3.1 Amphibians and Reptiles

No amphibian or reptile species were observed or otherwise detected within the project area during reconnaissance survey.

4.1.3.2 Birds

Birds were the most observed wildlife group during survey and species observed or otherwise detected in the project area during the reconnaissance-level survey included savannah sparrow (*Passerculus sandwichensis*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), and Anna's hummingbird (*Calypte anna*).

4.1.3.3 Mammals

Identification of mammals within the project area was generally determined by physical evidence rather than direct visual identification. This is because 1) many of the mammal species that potentially occur onsite are nocturnal and would not have been active during the survey and 2) no mammal trapping was performed.

No mammal species were observed or otherwise detected during the reconnaissance-level survey.

4.1.4 Special Status Species and Habitats

No State- and/or federally-listed threatened or endangered species, or other sensitive species were observed on site during the field survey. Additionally, based on the level of human activity and poor condition of the habitat and vegetation, there is no probability for any threatened, endangered or species of special concern, or its related habitat or critical habitat to be found within the Study Area.

The adjacent areas are developed, and there is no probability for sensitive species or habitats to exist within the buffer area of the Study Area.

The only sensitive habitat found on-site includes the approximately 2.6 acres of riparian species and other hydrophitic emergent vegetation that occurs within the non-disked areas.

The site was not suitable for burrowing owl due to the lack of potential surrogate burrows, and the surrounding area being residential with dogs and cats.

4.1.5 Hydrology and Soils

Hydrologically, the Project site is within the Chino (Split) Hydrologic Sub-Area (HSA 801.21) which comprises a 190,515-acre drainage area within the larger Santa Ana Watershed (HUC 18070203).

Soils on site are comprised of two different soils types:

- Madera fine sandy loam (MaB2) – Soil in this series is alluvium derived from granite and is well drained. This soil is considered farmland of statewide importance (USDA Soil Survey, 2018).
- Terrace escarpments (TeG) – This soil consists of alluvium derived from mixed sources, drainage variable. No irrigated land capability classification (USDA Soil Survey, 2018).

4.2 MSHCP Consistency

Based on the MSHCP GIS overlay, the Project site falls within the Jurupa Area Plan. The MSHCP requires that a project comply with the MSHCP policies identified in Section 6 of the MSHCP.

The MSHCP describes the protection of Riparian/Riverine Areas and Vernal Pools (see MSHCP Sections 6.1.2 – Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools) within all MSHCP Plan Areas as important to the conservation of certain amphibian, avian, fish, invertebrate and plant species, and all projects are subject to the protection of Riparian/Riverine Areas and Vernal Pools compliance.

Per the RCA MSHCP Information Tool, the Study Area is not identified within a criteria cell or subunit area. Additionally, the identified that the Study Area is not subject to compliance with any of the following MSHCP polices regarding; Narrow Endemic Plant Species; Urban/Wildlands Interface; or appropriate surveys; 6.1.3 – Protection of Narrow Endemic Plant Species; 6.1.4 – Guidelines Pertaining to the Urban/Wildlands Interface; and 6.3.2 – Additional Survey Needs and Procedures).

A summary of the MSHCP Conservation Goals and Policies as they relate to this project is provided below in Table 2.

Table 2
Conservation Goals

Conservation Goals	Within/Adjacent	Not Within / Adjacent
Proposed Constrained Linkages: None		X
Core Areas: None		X
Linkages: None		X
Constrained Linkage:		X
Habitat Block:		X
Core: None		X
Criteria Cell:		X
Pre-existing conservation Area		X
Riparian/Riverine or Vernal Pool Habitat		X
Narrow Endemic Plant Survey Area		X
Urban/Wildlife Interface		X
Mammal Survey Area		X
Amphibian Survey Area		X
Burrowing Owl Survey Area		X

Because the Study Area was not within an area identified for any special studies, no further discussion is required.

4.2.1 Riparian/Riverine Areas and Vernal Pools

Per the Western Riverside County MSHCP GIS overlay, the Study Area is not located in an area where riparian/riverine areas and vernal pools have been identified to exist, or studies required. However, based on site conditions, this category is being addressed.

The MSHCP describes the protection of Riparian/Riverine Areas and Vernal Pools within the MSHCP Plan Area as important to the conservation of certain amphibian, avian, fish, invertebrate and plant species. The MSHCP describes guidelines to ensure that the biological functions and values for species inside the MSHCP Conservation Area are maintained, as outlined in Volume 1, Section 6.1.2.

Pursuant to Section 6.1.2 of the MSHCP, Riparian/Riverine areas are lands which contain habitat dominated by trees, shrubs, persistent emergent vegetation, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from nearby fresh water sources, or areas with freshwater flow during all or a portion of the year. Riverine habitat includes all wetlands and deep-water habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Riverine habitat is bounded on the landward side by upland, by the channel bank (including natural and man-made levees), or by wetlands dominated by trees, shrubs, persistent emergents, mosses, or lichens. In braided streams, the system is bounded by the banks forming the outer limits of the depression within which the braiding occurs. Springs discharging into a channel are considered part of the riverine habitat. The term riparian is used to define the type of wildlife habitat found along the banks of a river, stream, lake or other body of water. Riparian habitats are ecologically diverse and can be found in many types of environments including grasslands, wetlands, and forests.

- *Findings:* Evidence of riverine/riparian and wetland habitat was found in various areas throughout the 5.5-acre horseshoe-shaped topographical depression. Additionally, historic photos and topographic maps indicate that the topographical depression has been a lake. Therefore, approximately 5.5 acres of of the topographic depression is considered potential Riparian/Riverine habitat.

Pursuant to Section 6.1.2 of the MSHCP, Vernal Pools are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics should consider (1) the length of time the area exhibits upland and wetland characteristics, and (2) the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses to which it has been subjected, and weather and hydrologic records.

- *Findings:* There was no evidence of Vernal Pools within the topographic depression or within the Study Area. No further discussion on this subject is required in this analysis.

4.3 Jurisdictional Delineation

The Project site is within the Chino (Split) Hydrologic Sub-Area (HSA 801.21) which comprises a 190,515-acre drainage area within the larger Santa Ana Watershed (HUC 18070203). This watershed is primarily within San Bernardino County and includes Riverside and Orange Counties with a small portion of Los Angeles Counties. The Santa Ana Watershed is bound on the north by the Mojave and Southern Mojave Watersheds, on the southeast by the Whitewash and San Jacinto Watersheds, and on the west by the San Gabriel, Seal Beach, Newport Bay, and Aliso-San Onofre Watersheds. The Santa Ana Watershed encompasses a portion of the San Gabriel and San Bernardino Mountains in the south and is approximately 3,000 square miles in area. The Santa Ana River is the major hydrogeomorphic feature within the Santa Ana Watershed. The Project site is situated approximately 1,000 feet north of the Santa Ana River floodplain.

4.3.1 Waters of the U.S.

The USACE has authority to permit the discharge of dredged or fill material in WoUS under Section 404 CWA. WoUS are defined as: “All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters” (Section 404 of the CWA; 33 CFR 328.3 (a). CWA jurisdiction exists over the following:

1. all traditional navigable waters (TNWs);
2. all wetlands adjacent to TNWs;
3. non-navigable tributaries of TNWs that are relatively permanent waters (RPWs) i.e., tributaries that typically flow year-round or have continuous flow at least seasonally; and
4. every water body determined to have a significant nexus with TNWs.

The horseshoe-shaped depression on site is documented by historical topographic maps as Horseshoe Lake. Based on historical aerial photos and topography maps, Horseshoe Lake is an approximately 5.5-acre ephemeral lake, located approximately 0.12 mile north of the Santa Ana River.

Prior to approximately 1969, according to historic topographic maps and aerials photographs, Horseshoe Lake used to receive runoff from the hills to the northeast, now the site of the Indian Hills Golf Course, via a blue-line drainage feature. The lake then overflowed into the Santa Ana River, approximately 1,000 feet to the south, via a blue-line drainage feature existing on the southeast side of the lake. There is no evidence of flow from the southeast side of the lake or the southeast side of the property, and no evidence of drainage culverts or flow along the residential development that exists south and adjacent to the site. Per the USFWS Wetlands Mapper, Horseshoe Lake consists of temporarily flooded, persistent freshwater emergent and scrub-shrub wetland

habitat. Surface water is typically present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for most of the season (USFWS 2018).

Currently, Horseshoe Lake receives urban runoff from a storm drain outlet located at the northernmost end of the site, adjacent the south side of Lakeview Avenue. The runoff that enters Horseshoe Lake from the storm drain outlet is lost through percolation and evaporation and does not outlet from the lake. Additionally, the existence of the equestrian arena partially blocks any flows that enter on the northwest, from following the natural horseshoe shape to feed the eastern “prong” of the horseshoe.

Horseshoe Lake is currently completely isolated due to surrounding development and no longer overflows into the Santa Ana River to the south. There are no overflow structures, drains, culverts or other outlets for runoff to occur from Horseshoe Lake to any adjacent lands or water bodies, nor are there any natural or man-made drainages that would convey drainage from Horseshoe Lake to any adjacent lands or water bodies. Horseshoe Lake is not a TNW or RPW and does not have a significant nexus to any TNWs.

4.3.2 USACE Wetlands

Areas meeting all three wetland parameters would be designated as USACE wetlands, if they are adjacent to jurisdictional WoUS, or otherwise determined to have a significant nexus to a TNW. All three required parameters, *hydrophytic vegetation*, *hydric soils* and *wetland hydrology*, are present within Horseshoe Lake (see Data Sheets in Attachment B).

Currently, Horseshoe Lake is dry for most of the year, consisting mostly of bare ground and weedy, ruderal vegetation. This feature has been subject to significant disturbance, including regular disking and historic grading, which has disturbed the soil, vegetation and hydrology within this feature. Additionally, Horseshoe Lake currently receives a lower volume of flow than it did prior to 1969 when surrounding development eliminated natural runoff flow to the lake.

The approximately 1.35 acre area located within the southwestern portion of Horseshoe Lake that was graded and filled for an equestrian arena, also does not support hydrophytic vegetation or wetland hydrology. Furthermore, except for the area immediately surrounding the storm drain outlet, the rest of the lake is disked regularly. Therefore, hydrophytic vegetation is problematic within most of the feature, which is currently dominated by non-wetland ruderal vegetation and bare ground.

However, hydrophytic vegetation still dominates within the undisturbed portion of Horseshoe Lake (i.e. adjacent the storm drain outlet), and some hydrophytic vegetation persists within other portions of the feature as well, including several scattered Fremont cottonwood (*Populus fremontii*) and willow (*Salix* sp.). These tree species have root systems that reach below the disturbed soils and are not impacted by disking, which is likely why they persist. Hydric soils and wetland hydrology are still present within the portions of Horseshoe Lake that have not been graded and filled. In total, Horseshoe Lake contains approximately 2.63 acres of wetland features that would meet the definition of USACE wetlands (Figure 4).

As previously described, Horseshoe Lake receives sporadic flows, likely only following storm events, that enter the north end of the feature via a storm drain outlet located on the south side of Lakeview Avenue. Horseshoe Lake is approximately 0.12 mile north of the Santa Ana River and used to overflow into the Santa Ana River prior to the construction of the residential development on the south side of Kennedy Street (prior to 1994), which now separates Horseshoe Lake from the Santa Ana River. The Santa Ana River is a TNW. Therefore, since Horseshoe Lake is a wetland that is adjacent a TNW, this feature would likely be considered a wetland WoUS subject to USACE jurisdiction under the CWA, even though there is no longer a significant nexus to a TNW.

4.3.3 California Lake/Streambed

Horseshoe Lake is a wetland feature subject to regulation by the CDFW under Section 1602 of the FGC. This feature has a definable bed and bank, as well as associated riparian vegetation including freshwater emergent habitat, mulefat thicket habitat and willow thicket habitat. Therefore, the development of the Project will likely result in permanent and temporary impacts to CDFW jurisdictional lakebed (Figure 4).

4.4 Impacts and Permitting Requirements

4.4.1 USACE Jurisdictional Permit

The two most common types of permits issued by USACE under Section 404 of the CWA to authorize the discharge of dredged or fill material into WoUS are: a nation-wide permit (NWP) or an individual permit (IP). NWPs are general permits for specific categories of activities that result in minimal impacts to aquatic resources. The discharge must not cause the loss of greater than ½ acre to WoUS, including the loss of no more than 300 linear feet of streambed.

Horseshoe Lake contains approximately 2.63 acres of USACE jurisdictional wetland WoUS, some of which could potentially be impacted by the Project. The acreage of impacts are unknown at this time as the design features of the final project will determine the actual temporary and permanent impacts.

4.4.2 Regional Water Quality Control Board Jurisdictional Permit

The Project area is within the jurisdiction of the Santa Ana RWQCB. Under Section 401 of the CWA, the RWQCB must certify that the discharge of dredged or fill material into WUS does not violate state water quality standards. The RWQCB also regulates impacts to WSC under the Porter Cologne Water Quality Control Act through issuance of a Construction General Permit, State General Waste Discharge Order, or Waste Discharge Requirements, depending upon the level of impact and the waterway. In addition to the formal application materials and fee (based on area of impact), a copy of the appropriate California Environmental Quality Act (CEQA) documentation must be included with the application.

4.4.3 Streambed Alteration Agreement

The approximately 5.5-acre Horseshoe Lake, including the freshwater emergent habitat, mulefat thicket habitat and willow thicket habitat that is primarily concentrated around the storm drain outlet at the northernmost end of the site, is entirely subject to regulation by the CDFW under Section 1602 of the FGC. Therefore, any Project-related impacts to Horseshoe Lake would likely require a FGC Section 1602 Streambed Alteration Agreement, which is required for all activities that alter streams and lakes and their associated riparian habitat. In addition to the formal application materials and fee (based on cost of the Project), a copy of the appropriate CEQA documentation must be included with the application.

Within the approximately 5.5-acre CDFW jurisdictional feature that comprises Horseshoe Lake, there is approximately 0.5 acres of mixed non-native and riparian (mulefat and willow thicket) habitat and approximately 0.01 acres of freshwater emergent wetland habitat. However, these habitats, where they occur within Horseshoe Lake, are dominated by non-native species including *Arundo*, eucalyptus trees, saltcedar and other non-native, invasive species. The riparian habitat on site is of low quality due to human disturbances, non-native species and sparse distribution on site, and is not suitable to support riparian obligate species such as LBVI or SWFL. Therefore, the project will not impact sensitive riparian obligate species and any impacts to the remnant riparian habitat on site would be considered less than significant.

4.4.4 MSCHP Consistency

The project is consistent with the MSHCP policies found Section 6 as follows:

- 1) The site is **not** mapped within any MSHCP Criteria Cell or subunit.
- 2) The site is **not** located in an area where additional surveys are required for any Amphibian, Mammal or other Criteria Area Species.
- 3) The project **may have unavoidable** impacts to Riparian/Riverine areas 4 0

Due to the presence of some riparian vegetation, Riverine/Riparian resources are present on the project site, and the proposed project may impact portions of this resource. If all impacts to riparian/riverine habitat cannot be avoided, the Riverside County MSHCP mitigation strategy, Determination of Biologically Equivalent or Superior Preservation (DBESP), must be developed that addresses the replacement of lost functions of habitats in regards to the listed species. This analysis is reviewed and approved by the Regional Conservation Authority, Western Riverside County and is separate from any regulatory review/permitting by the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and CDFW.

- 4) The Project will **not** impact Vernal Pool areas because the no vernal pools occur on site, and the proposed project will not affect vernal pools. No further analysis is recommended or required.
- 5) The site is **not** within or adjacent to any MSHCP Conservation Areas and therefore does not require mitigation measures pursuant Section 6.1.4 (pertaining to Urban/ Wildlands Interface) of the MSHCP, which presents guidelines to minimize indirect effects of projects in proximity to the MSCHP Conservation Areas.
- 6) The site is **not** located within a BUOW survey area, as required by the MSHCP. However, general BUOW surveys were conducted during general site assessment and the result of survey was that no BUOW or sign was detected on site and this species is currently considered **absent** from the project area.
- 7) The site is **not** located within a Narrow Endemic Plant Species survey area.

4.4.5 Sensitive Species

Due to historic and ongoing human disturbances, including disking, livestock and vehicle use, the subject property does not contain suitable habitat for any State- or federally-listed species and no further focused surveys are warranted or recommended.

4.4.6 Migratory Birds

Although the subject property is completely disturbed, there is sufficient vegetation on site to provide suitable nesting bird habitat. Therefore, the following recommendation is made to reduce impacts to nesting birds:

1. *Bird nesting season generally extends from February 1 through September 15 in southern California and specifically, April 15 through August 31 for migratory passerine birds. To avoid impacts to nesting birds (common and special status) during the nesting season, a qualified Avian Biologist will conduct pre-construction Nesting Bird Surveys (NBS) prior to project-related disturbance to nestable vegetation to identify any active nests. If no active nests are found, no further action will be required. If an active nest is found, the biologist will set appropriate no-work buffers around the nest which will be based upon the nesting species, its sensitivity to disturbance,*

nesting stage and expected types, intensity and duration of disturbance. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved no-work buffer zone shall be clearly marked in the field, within which no disturbance activity shall commence until the qualified biologist has determined the young birds have successfully fledged and the nest is inactive.

5 Conclusions

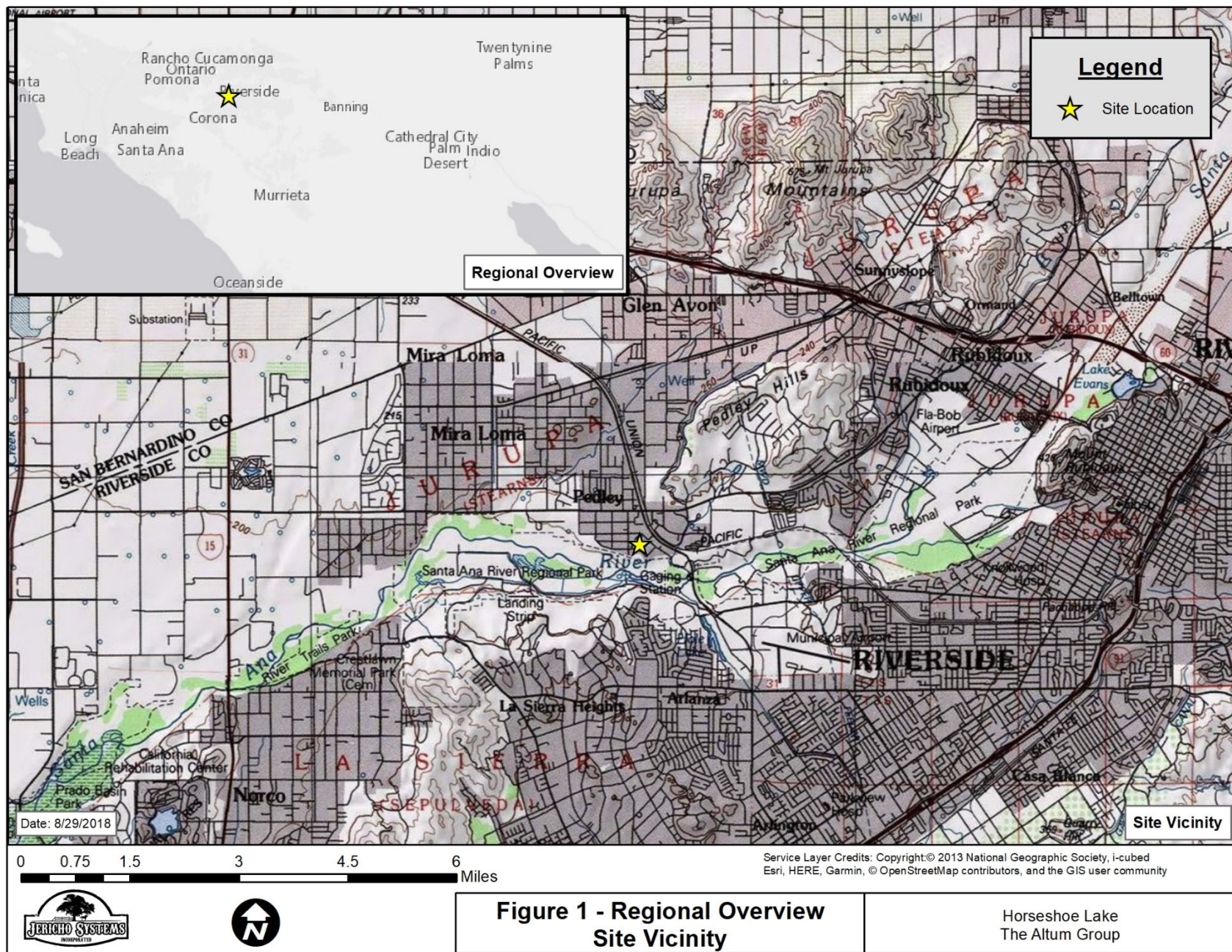
Based on the presence of soils and vegetation and a review of historical topographic and aerial maps, the 5.5 acre horseshoe-shaped topographic depression is known as Horseshoe Lake and is considered a historic ephemeral lake, which is considered a Riverine/Riparian resource by the County of Riverside. Therefore, development must seek alternatives to minimize the impacts to this resource. The Regional Conservation Authority, Western Riverside County is required to oversee and approve the Project and mitigation.

If there are unavoidable impacts to Riverine/Riparian Resources, then a DBESP must be prepared to identify avoidance and conservation measures. The determination of impacts cannot be made at this time, until final design plans are complete to allow for a complete determination of the impacts to determine if the impacts are unavoidable, and the level of permits and mitigation. ~~The County of Riverside Transportation and Land Management Agency (TLMA) Environmental Programs Department (EPD) City of Jurupa Valley Planning Department~~ requires a DBESP Report as required by the MSHCP for impacts to Riparian/Riverine Areas/Vernal Pools as defined by the WRMSHCP (see Section 6.1.2, pages 6-21 and 6-22). Projects that prepare a DBESP are still subject to all other State and Federal regulations related to wetland habitats, streambeds and “waters”. ~~An information sheet regarding the requirements of the DBESP is provided in Appendix C.~~

Horseshoe Lake is also a jurisdictional lake/wetland feature that is subject to the CWA and FGC under the jurisdictions of USACE, RWQCB, and CDFW, respectively. Any proposed permanent or temporary impacts to Horseshoe Lake will likely require a Streambed Alteration Agreement from the CDFW, as well as CWA Sections 401/404 permits from the RWQCB and Corps, respectively.

6 References

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- County of Riverside, Land Information System. APNs 331-150-018 and 331-150-027 searches for site-specific information and maps.
- Dudek & Associates, Inc. June 17, 2003. Riverside County Integrated Project. Final Western Riverside County Multiple Species Habitat Conservation Plan. Volume I, The Plan, and II.
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- Knecht, A. 1971. *Soil Survey of Western Riverside Area, California*. United States Department of Agriculture, Soil Conservation Service, Washington, D.C.
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- Sawyer, John O., and Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society, Sacramento, California. 471pp.
- USDA Web Soil Survey, 2018, <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>





0 0.035 0.07 0.14 0.21 0.28 Miles

Imagery Date: 8/6/2017

Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,



1 inch = 373 feet

Figure 2
Site Location

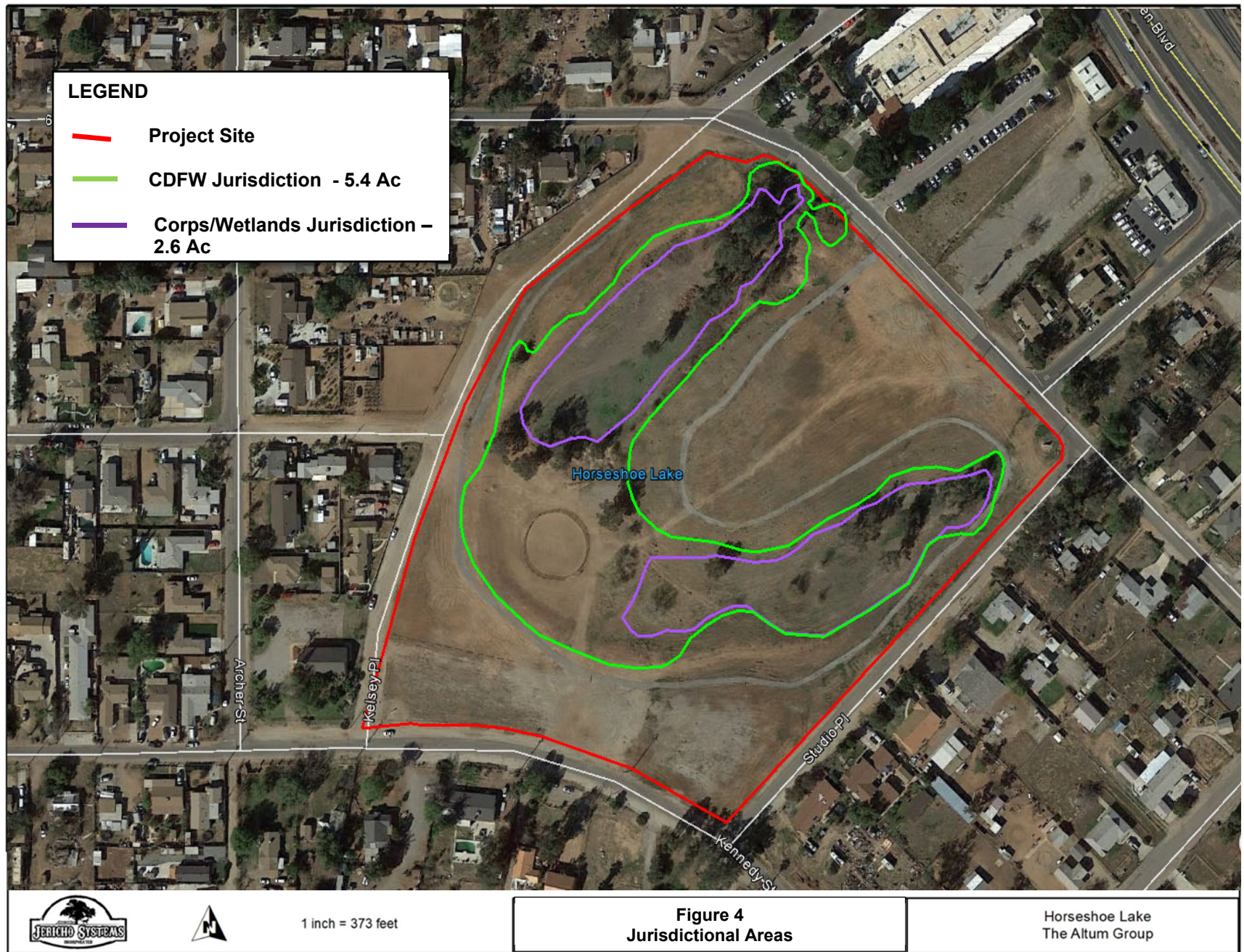
Horseshoe Lake
The Altum Group



1 inch = 373 feet

Figure 3
Proposed Project Development Concept

Horseshoe Lake
The Altum Group



ATTACHMENT A
PHOTOS



Photo 1 – Looking west
from Lakeview Drive east
of culvert inlet.



Photo 2 – Looking northeast
upstream towards culver
inlet at Kelsey Place and
Lakeview.



Photo 3 – Looking northeast towards Lakeview from horse arena.



Photo 4 – Looking west from south end of Studio Place towards Kelsey Place.



Photo 5 – Looking southwest along north side of Studio Place..



Photo 6 – Looking northeast along north side of Studio Place..



Photo 7 – Looking south thru center of Project site from Lakeview..



Photo 8 – Culvert discharge point flowing south under Lakeview at northwest corner of Project site just east of intersection with Kelsey Place.



Photo 9 – UAV photo looking south across entire site from corner of Lakeview and Kelsey.



Photo 10 – UAV photo looking southeast across site from Kelsey.



Photo 11 – UAV photo looking north from corner of Kennedy Street and Studio.



Photo 12 – UAV photo looking southwest from corner of Lakeview and Studio.

ATTACHMENT B
SOILS DATA SHEETS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____
Hydric Soil Present? Yes _____ No _____	
Wetland Hydrology Present? Yes _____ No _____	
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 ¹ ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No _____
% Bare Ground in Herb Stratum _____	% Cover of Biotic Crust _____			
Remarks:				

SOIL

Sampling Point: _____

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____
Applicant/Owner: _____ State: _____ Sampling Point: _____
Investigator(s): _____ Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____
Hydric Soil Present? Yes _____ No _____	
Wetland Hydrology Present? Yes _____ No _____	
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 ¹ ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No _____
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				
Remarks:				

SOIL

Sampling Point: _____

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

Appendix C

DBESP Information Sheet



Carolyn Syms Luna
Director

COUNTY OF RIVERSIDE
TRANSPORTATION AND LAND MANAGEMENT AGENCY

Environmental Programs Department

**Determination of Biologically Equivalent or
Superior Preservation Report Guidelines**
(MSHCP Section 6.1.2)

Revised: October 5, 2005

Environmental Programs Department (EPD) requires a Determination of Biologically Equivalent or Superior Preservation (DBESP) Report as required by the Western Riverside Multiple-Species Habitat Conservation Plan (WRMSHCP) for impacts to Riparian/Riverine Areas/Vernal Pools as defined by the WRMSHCP (see Section 6.1.2, pages 6-21 and 6-22). Projects that prepare a DBESP are still subject to all other State and Federal regulations related to wetland habitats, streambeds and "waters".

The DBESP Report shall include, but not be limited, to the following:

1. Definition of project area
2. A written project description, demonstrating why an avoidance alternative is not feasible.
3. A written description of biological information available for the project site including the results of resource mapping.
4. Map(s) of Riparian/Riverine/Vernal Pool areas as defined by the WRMSHCP indicating area(s) of impact (i.e. proposed project overlaid on the Riparian/Riverine/Vernal Pool areas).
5. Analysis in the following areas should be addressed:
 - a. 100% avoidance
 - b. Alternatives
 - c. Minimization of direct and indirect effects.
 - d. Hydrologic regime
 - e. Flood storage
 - f. Flood flow modification
 - g. Nutrient retention and transformation
 - h. Sediment trapping and transport
 - i. Toxic trapping
 - j. Public use
 - k. Wildlife habitat
 - l. Aquatic habitat
6. Quantification of unavoidable impacts to riparian/riverine areas and vernal pools associated with the project, including direct and indirect effects. Indicate the amount of habitat left intact on the site, if any.
7. Functions and values assessment shall focus on how they will affect downstream values related to Conserved Species.
8. Habitat assessments for least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, Riverside fairy shrimp, and vernal pool fairy shrimp. If the site supports suitable habitat focused surveys will also be required.
9. A written description of project design features and mitigation measures that reduce indirect effects, such as edge treatments, landscaping, elevation difference, minimization and/or compensation through restoration or enhancement.

10. Written discussion of edge treatments (WRMSHP, Section 6.1.4) and their relation to the functions and values to be conserved. The discussion should consider:
 - a. Lighting
 - b. Noise
 - c. Trash/debris
 - d. Urban and storm water runoff
 - e. Toxic material
 - f. Exotic plant and animal infestations
 - g. Dust
 - h. Trampling and unauthorized recreational use
11. Mitigation measures should ensure long-term conservation through deed restriction, conservation easement or other appropriate mechanism. Mitigation measures may coincide with State and Federal regulations. Mitigation measures should consider:
 - a. Restoration and/or enhancement of on-site habitat
 - b. Restoration and/or enhancement of off-site habitat
 - c. Habitat that is restored or enhanced will be able to provide biological, hydrological, and biogeochemical functions to a level consistent with those being lost on-site.
 - d. Upon reaching maturity and satisfying the criteria established for mitigation areas, the goals for mitigation shall include:
 - i. All habitat mitigation areas will be self-sustaining in perpetuity and contribute to regional biodiversity
 - ii. All habitat mitigation will not require outside input for recruitment and propagation of plant species
 - iii. Nutrients will be cycled within the mitigation areas through natural processes
 - iv. The entire range of biological components, processes, and interactions will be present in each community.
 - v. Natural processes of ecological succession will be allowed to occur
12. A finding demonstrating that although the proposed project would not avoid impacts, with proposed design and compensation measures, the project would be biologically equivalent or superior to that which would occur under an avoidance alternative without these measures, based on one or more of the following factors:
 - a. effects on Conserved Habitats;
 - b. effects on the species listed in section 6.1.2 of the WRMSHCP; and
 - c. effects on riparian Linkages and function of the MSHCP Conservation Area.
13. Topography/Hydrology assessment
14. USGS 7.5' Quadrangle, Section, Township, Range
15. Soils Description/analysis/Map
16. Site Photographs
17. Observed Species List
18. Acreage of Site Surveyed
19. Surveyor Name(s)
20. Survey Date(s) and Time(s)
21. Case #(s)
22. APN(s)

Please refer to the EPD web site, <http://www.tlma.co.riverside.ca.us/epd>, for the most up-to-date policies and procedures. To view the WRMSHCP online go to <http://www.rcip.org/conservation.htm>.

The EPD requires biological consultants to have a Memorandum of Understanding (MOU) on file with the County prior to any work being performed for an applicant.

3 original wet-signed copies of any reports shall be submitted to the assigned Planner for this case along with the transmittal from the consultant who prepared the reports, which will be forwarded to the EPD to review and clear.

Appendix B

Fairy Shrimp Wet Season Surveys



August 1, 2019

U.S. Fish and Wildlife Service
Attn: Ms. Stacey Love
Carlsbad Fish and Wildlife Office
2177 Salk Ave., Ste. 250
Carlsbad, CA 92008

Subject: 90-Day Wet Season Vernal Pool Branchiopod Survey Results, Horseshoe Lake Park Project, Riverside County, California

Ms. Love:

This letter presents the results of the 2018-2019 wet season vernal pool branchiopod (fairy shrimp) surveys that Rocks Biological Consulting (RBC) conducted for the Horseshoe Lake Park Project (project) in Riverside County, California. The project site supports a total of two mapped seasonally ponded areas that were sampled for vernal pool branchiopods during the 2018-2019 wet season. One individual female *Branchinecta* fairy shrimp was collected, but it was dead and immature and unable to be identified to species level.

Introduction

The approximately 13.5-acre project site is in the City of Jurupa Valley, Riverside County, California. The site is located on the southwest corner of Lakeview Avenue and Studio Place, just north (approximately 0.125 mile) of the Santa Ana River (Figure 1). The project occurs on the U.S. Geological Survey (USGS) 7.5' quadrangle map Riverside West, Township 02S, Range 06W, unsectioned land in the Jurupa (Stearns) land grant. The project site is operated by the Jurupa Area Recreation and Park District and is primarily graded and contains walking trails and an equestrian arena.

Methods

Survey methodology followed the U.S. Fish and Wildlife Service (USFWS) *Survey Guidelines for Listed Large Branchiopods* (Guidelines), revised November 13, 2017, for wet season vernal pool branchiopod surveys. According to the Guidelines, the wet season usually occurs in California between October and June. Surveys were conducted from March 15, 2019 to May 28, 2019. Beginning on March 15, 2019 each feature was sampled at seven-day intervals until dry, and sampling was reinitiated within seven days of the feature becoming re-inundated.

RBC biologists Lee Ripma (TE-221290-4) and Garrett Huffman (TE-20168A-0) conducted all wet season vernal pool sampling on the project site. Data collected for each feature included average and maximum water depth, water and air temperature, length, width, degree and form of disturbance, a population estimate of fairy shrimp present, and observations of any other pool-dwelling species. Each feature was sampled using a standard 50-micron hand-held net swept through the water and examined for invertebrates. Please note that surveys began late in the rainy

season because the potential for the site to support listed fairy shrimp species was identified late in the planning process.

Results

Two seasonally ponded areas were sampled during the 2018-2019 wet season (Figure 2). North Pond was inundated during one survey day and one dead unidentified *Branchinecta* female was found while sampling the pond. South Pond was inundated during six survey days and surveys were negative for all fairy shrimp. A summary of surveys conducted on site is presented in Table 1. Site photographs are provided as Attachment A.

Table 1: Summary Wet Season Fairy Shrimp Surveys for Horseshoe Lake Park Project

Survey Number	Survey Date	Biologist	Permit Number
1	3/15/19	Garrett Huffman	TE-20168A-0
2	3/22/19	Garrett Huffman	TE-20168A-0
3	3/29/19	Garrett Huffman	TE-20168A-0
4	4/5/19	Garrett Huffman	TE-20168A-0
5	4/12/19	Garrett Huffman	TE-20168A-0
6	4/19/19	Garrett Huffman	TE-20168A-0
7	4/26/19	Lee Ripma	TE-221290-4
8	5/28/19	Garrett Huffman	TE-20168A-0

Full survey results are included as Table 2. Surveyor field data sheets are provided as Attachment B.

Table 2: Wet Season Fairy Shrimp Survey Results for Horseshoe Lake Park Project

Date	2018-2019 Wet Season Fairy Shrimp Results
3/15/19	Both ponds inundated, one <i>Branchinecta</i> female found dead in North Pond
3/22/19	South Pond inundated, no fairy shrimp
3/29/19	South Pond inundated, no fairy shrimp
4/5/19	South Pond inundated, no fairy shrimp
4/12/19	South Pond inundated, no fairy shrimp
4/19/19	South Pond inundated, no fairy shrimp
4/26/19	Both ponds dry
5/28/19	Both ponds dry

Conclusion

During 2018-2019 wet season surveys at the Horseshoe Lake Park Project, RBC did not confirm the presence of federally-listed as endangered or threatened fairy shrimp species. One dead *Branchinecta* female was found during surveys but could not be identified to the species level.

Please don't hesitate to contact us at (619) 701-6798 if you have any questions or concerns regarding this report.

We certify that the information in this survey report and attached exhibits fully and accurately represent our work.



Lee Ripma
Senior Biologist
Permit Number TE-221290-4



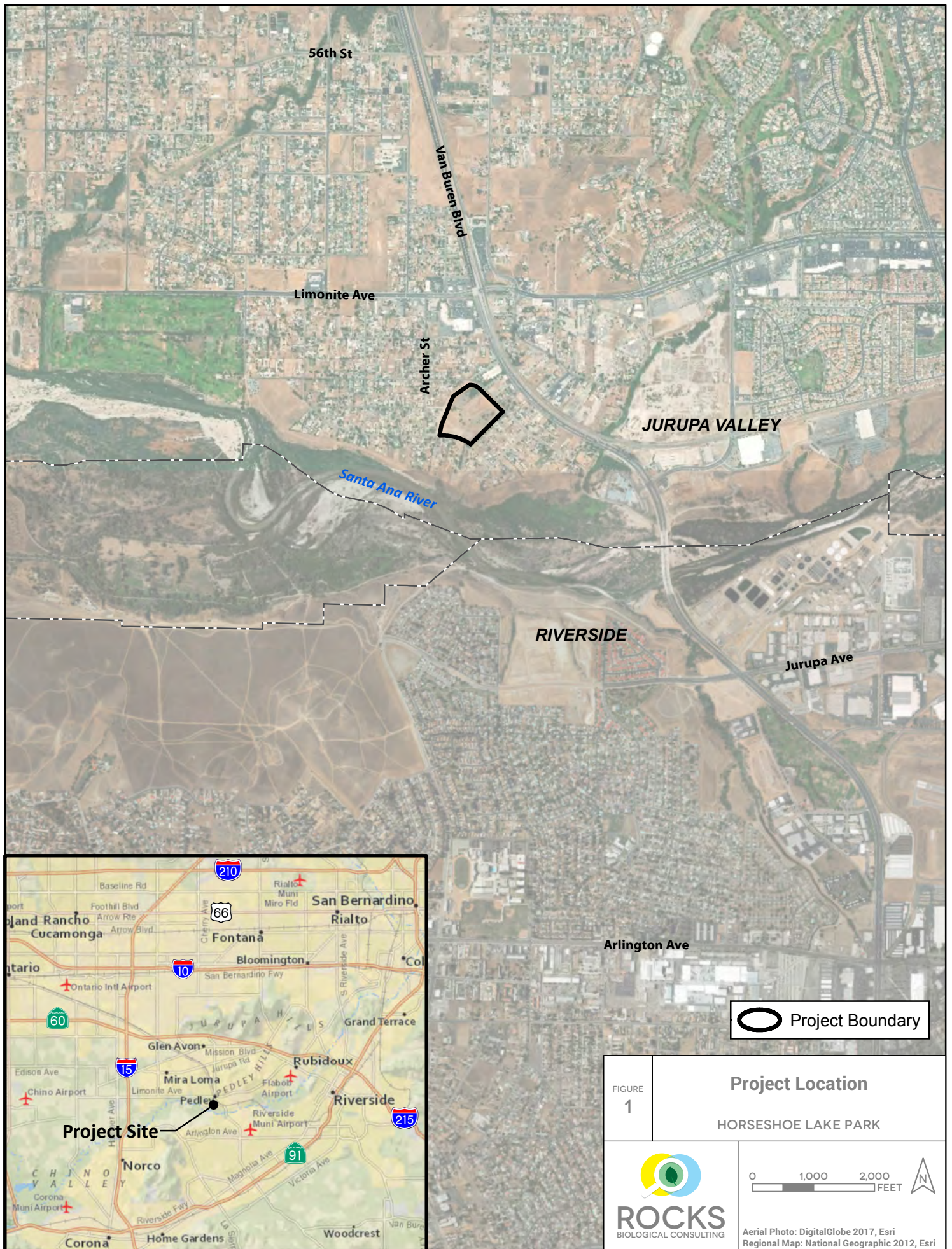
Garrett Huffman
Senior Biologist
Permit Number TE-20168A-0

Attachments: Figure 1 – USGS Topographical Map
Figure 2 – Fairy Shrimp Sampling Locations
Attachment A – Site Photographs
Attachment B – Surveyor Field Data Sheets

References

Eriksen, C.H. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press.

U.S. Fish and Wildlife Service. 2017. Survey Guidelines for Listed Large Branchiopods. November 13, 2017.





Attachment A:

Site Photographs

Attachment A
Site Photographs



Photo 1. Overview of North Pond ponded on March 15, 2019. One dead *Branchinecta* female was found during sampling at this pond.



Photo 2. Overview of North Pond dry on March 29, 2019.



Photo 3. Overview of South Pond ponded on March 15, 2019. No fairy shrimp were documented in this feature.



Photo 4. Overview of South Pond ponded on March 29, 2019. No fairy shrimp were documented in this feature.



Photo 5. Overview of South Pond ponded on April 5, 2019. No fairy shrimp were documented in this feature.



Photo 6. Overview of South Pond ponded on April 19, 2019. No fairy shrimp were documented in this feature.

Attachment B:

Surveyor Field Data Sheets



Fairy Shrimp Survey Form

Name: Garrett Huffman Add'l Persons: _____ Date: Mar 15, 2019

Project: Horseshoe Lake Survey _____ of _____

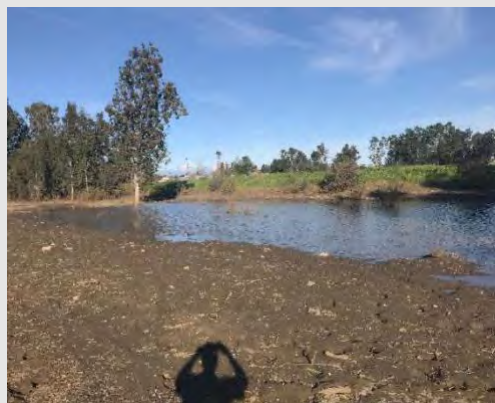
Start Time: 16:00 T: 71 CC: 5 Wind Sp/Dir: Clear General Weather Condition: _____

End Time: 18:00 T: 69 CC: 5 Wind Sp/Dir: Clear General Weather Condition: _____

Pool or Area ID	Latitude*	Longitude*	Air Temp. (°C)	Water Temp. (°C)	Average Depth (cm)	Max. Depth (cm)	Pool length (m)	Pool width (m)
North Pond	-117.47643	33.97077	21	16		4.5 ft	75	30
Fairy Shrimp Present (Species)	Voucher # Male (♂)	Voucher # Female (♀)	Population Estimate	Other species present in pool				
				Water Fleas (Cladocera) , Mosquito Larvae (Culicidae) , Fly Larvae (Diptera)				

Habitat condition: Disturbed (tire tracks, etc)

Additional Comments: One dead *Branchinecta* female found during sampling. No live fairy shrimp sampled.



Pool or Area ID	Latitude*	Longitude*	Air Temp. (°C)	Water Temp. (°C)	Average Depth (cm)	Max. Depth (cm)	Pool length (m)	Pool width (m)
South Pond	-117.47692	33.97028	19	15	2 ft	4.5 ft	100	90
Fairy Shrimp Present (Species)	Voucher # Male (♂)	Voucher # Female (♀)	Population Estimate	Other species present in pool				
No				Seed Shrimp (Ostracods) , Water Fleas (Cladocera) , Fly Larvae (Diptera) , Mosquito Larvae (Culicidae)				

Habitat condition: Disturbed (tire tracks, etc)

Additional Comments:





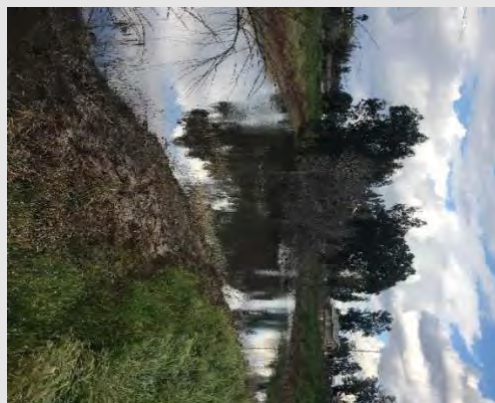
Fairy Shrimp Survey Form

Name: Garrett Huffman Add'l Persons: _____ Date: Mar 22, 2019
 Project: Horseshoe Lake Survey _____ of _____
 Start Time: 15:30 T: 56 CC: 50 Wind Sp/Dir: Partial Cloudy General Weather Condition: _____
 End Time: 17:30 T 55 CC: 50 Wind Sp/Dir: Partially Cloudy General Weather Condition: _____

Pool or Area ID	Latitude*	Longitude*	Air Temp. (°C)	Water Temp. (°C)	Average Depth (cm)	Max. Depth (cm)	Pool length (m)	Pool width (m)
South Pool	-117.47618	33.96980	14	15.5	25	4 ft	100	50
Fairy Shrimp Present (Species)	Voucher # Male (♂)	Voucher # Female (♀)	Population Estimate	Other species present in pool				
No				Water Fleas (Cladocera) , Mosquito Larvae (Culicidae) , Water Boatmen, etc (Hemiptera) , Copepods Midges; tadpoles				

Habitat condition: Disturbed (tire tracks, etc)

Additional Comments:





Fairy Shrimp Survey Form

Name: Garrett Huffman Add'l Persons: _____ Date: Mar 29, 2019
 Project: Horseshoe Lake Survey _____ of _____
 Start Time: 17:00 T: 65 CC: 10 Wind Sp/Dir: Clear General Weather Condition: _____
 End Time: 18:06 T 64 CC: 10 Wind Sp/Dir: Clear General Weather Condition: _____

Pool or Area ID	Latitude*	Longitude*	Air Temp. (°C)	Water Temp. (°C)	Average Depth (cm)	Max. Depth (cm)	Pool length (m)	Pool width (m)
South pond	-117.47618	33.96986	17	19	8	4 ft	40	30
Fairy Shrimp Present (Species)	Voucher # Male (♂)	Voucher # Female (♀)	Population Estimate	Other species present in pool				
No				Seed Shrimp (Ostracods) , Water Fleas (Cladocera) , Mosquito Larvae (Culicidae) Midge				

Habitat condition: Disturbed (tire tracks, etc)

Additional Comments:





Fairy Shrimp Survey Form

Name: Garrett Huffman Add'l Persons: _____ Date: Apr 5, 2019
 Project: Horseshoe Lake Survey _____ of _____
 Start Time: 17:30 T: 60 CC: 90 Wind Sp/Dir: Cloudy General Weather Condition: _____
 End Time: 18:30 T 57 CC: 90 Wind Sp/Dir: Cloudy General Weather Condition: _____

Pool or Area ID	Latitude*	Longitude*	Air Temp. (°C)	Water Temp. (°C)	Average Depth (cm)	Max. Depth (cm)	Pool length (m)	Pool width (m)
South Pool	-117.47598	33.96967	12.5	16	15	50	50	35
Fairy Shrimp Present (Species)	Voucher # Male (♂)	Voucher # Female (♀)	Population Estimate	Other species present in pool				
No				Seed Shrimp (Ostracods) , Mosquito Larvae (Culicidae) , Fly Larvae (Diptera) Midg				

Habitat condition: Disturbed (tire tracks, etc)

Additional Comments:





Fairy Shrimp Survey Form

Name: Garrett Huffman Add'l Persons: _____ Date: Apr 12, 2019

Project: Horseshoe Lake Survey _____ of _____

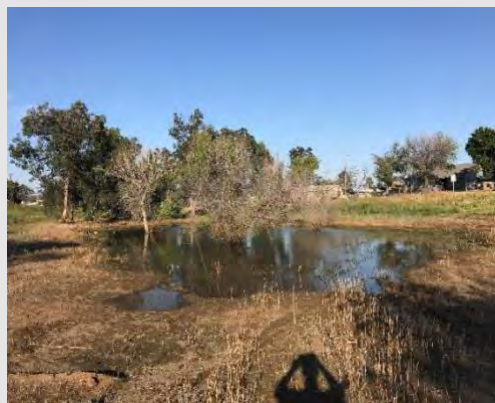
Start Time: 16:00 T: 74 CC: 0 Wind Sp/Dir: Clear General Weather Condition: _____

End Time: 17:30 T 72 CC: 0 Wind Sp/Dir: Clear General Weather Condition: _____

Pool or Area ID	Latitude*	Longitude*	Air Temp. (°C)	Water Temp. (°C)	Average Depth (cm)	Max. Depth (cm)	Pool length (m)	Pool width (m)
South pond	-117.47611	33.96984	26.1	23.6	20	2 ft	35	10
Fairy Shrimp Present (Species)	Voucher # Male (♂)	Voucher # Female (♀)	Population Estimate	Other species present in pool				
No				Seed Shrimp (Ostracods) , Water Fleas (Cladocera) , Water Beetles (Coleoptera) Water Boatmen, etc (Hemiptera) , Fly Larvae (Diptera) , Mosquito Larvae (Culicida				

Habitat condition: Disturbed (tire tracks, etc)

Additional Comments:





Fairy Shrimp Survey Form

Name: Garrett Huffman Add'l Persons: _____ Date: 041919 _____
 Project: Horseshoe Lake Survey _____ of _____
 Start Time: 15:30 T: 90 CC: 10 Wind Sp/Dir: Clear General Weather Condition: _____
 End Time: 16:42 T 88 CC: 10 Wind Sp/Dir: Clear General Weather Condition: _____

Pool or Area ID	Latitude*	Longitude*	Air Temp. (°C)	Water Temp. (°C)	Average Depth (cm)	Max. Depth (cm)	Pool length (m)	Pool width (m)
South pool	-117.47583	33.96969	32	36.4	20	2 ft	30	15
Fairy Shrimp Present (Species)	Voucher # Male (♂)	Voucher # Female (♀)	Population Estimate	Other species present in pool				
No				Seed Shrimp (Ostracods) , Water Fleas (Cladocera) , Water Beetles (Coleoptera) Water Boatmen, etc (Hemiptera) , Fly Larvae (Diptera) , Mosquito Larvae (Culicida				

Habitat condition: Disturbed (tire tracks, etc)

Additional Comments:

