

**RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT
FOR THE
LAKE WOHLFORD DAM REPLACEMENT PROJECT**

**City Case No. ENV 13-0005
State Clearinghouse No. 2015041091**

Prepared for:

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PREFACE

The City of Escondido (City), as lead agency pursuant to the California Environmental Quality Act (CEQA, California Public Resources Code Section 21000, et seq.), prepared an Environmental Impact Report (EIR) to evaluate the environmental effects of the proposed Lake Wohlford Dam Replacement Project (“the project” or “the proposed project”). The project proposes to construct a replacement for the existing Lake Wohlford Dam downstream (west) of the existing dam and partially deconstruct the existing dam. The Draft EIR for the project (State Clearinghouse No. 2015041091) was previously circulated for public review from October 4, 2016 to November 17, 2016. Public comments were received from the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW), and the San Diego County Archaeological Society, Inc. In response to USFWS and CDFW public comments, the City has revised the Biological Resources Section of the EIR (Section 3.3). The City has also revised the Greenhouse Gas Emissions Section (Section 3.6) and the Effects Found Not to be Significant Chapter (Chapter 4.0) of the EIR due to new regulatory requirements since the Draft EIR was circulated for public review. The Executive Summary and the Project Description Chapter (Chapter 2.0) are also being recirculated for public review to reflect the changes to the mitigation measures in the biological resources section and clarify two changed existing conditions related to the proposed project. Specifically, the Draft Revised Biological Resources Section (Section 3.3), Draft Revised Greenhouse Gas Emissions Section (Section 3.6), Draft Revised Effects Found Not to be Significant Chapter (Chapter 4.0), Draft Revised Executive Summary, and Draft Revised Project Description Chapter (Chapter 2.0) are being recirculated for public review, per CEQA Guidelines 15088.5.

Due to the additions and changes made to the Draft EIR, the City has decided to recirculate these revised portions of the Draft EIR for the project. Pursuant to CEQA Guidelines Section 15088.5(f)(2), reviewers should limit their comments to the revised chapters or portions of the recirculated EIR only. The comments submitted during the original circulation period (October 4, 2016 to November 17, 2016) that relate to chapters or portions of the document that are not being recirculated at this time (cultural resources) will be responded to as part of the Final EIR. Comments from the original circulation period that pertained to biological resources will not be responded to. However, the City will respond to comments submitted on this Draft Revised Biological Resources Section, in addition to the other recirculated sections and chapters. Both sets of comments (comments on the Draft EIR circulated from October 4, 2016 to November 17, 2016 and comments on these recirculated portions) will be combined and included with the Final EIR.

Comments on the recirculated Draft Revised EIR must be received no later than August 3, 2020 (45-day public review period) and should reference the project name. Comments must be sent to the City of Escondido Planning Division address listed below or via email to mstrong@escondido.org.

Mike Strong, Director of Community Development
City of Escondido, Planning Division
201 North Broadway
Escondido, CA 92025

The revised sections and chapters and the previous Draft EIR circulated from October 4, 2016 to November 17, 2016 are available on the Planning Division website: <https://www.escondido.org/lake-wohlford-dam-.aspx>

The major additions or revisions in the Biological Resources Section (Section 3.3), Greenhouse Gas Emissions Section (Section 3.6), and the Effects Found Not to be Significant Chapter (Chapter 4.0), and the clarifications in the Executive Summary and the Project Description Chapter (Chapter 2.0) are summarized below.

Biological Resources Section (Section 3.3)

- Added existing condition information related to sensitive species and updated surveys conducted in 2017.
- Refined the maximum inundation acreages based on updated light detection and ranging (LiDAR) data.
- Updated impact analysis to consider the project's inundation impacts to habitat as permanent, direct impacts requiring off-site mitigation. Note, the Draft EIR determined the project's inundation impacts to habitat as less than significant.
- Updated mitigation measures to reflect new classification of the project's inundation impacts.

Greenhouse Gas Emissions Section (Section 3.6)

- Added updated regulatory framework since circulation of the Draft EIR, including Senate Bill 32, California Renewables Portfolio Standards, California's 2017 Climate Change Scoping Plan, and Safer Affordable Fuel Efficient Vehicle Rule.
- Added analysis of potential GHG impacts associated with dewatering activities during construction.

- Revised the construction analysis to incorporate the use of a threshold consistent with Senate Bill 32 legislative mandate.
- Added analysis of the project's long-term benefits related to hydroelectric power generation.

Effects Found Not to be Significant Chapter (Chapter 4.0)

- Added analysis of the project's energy impacts, pursuant to new CEQA Guidelines Appendix G (Environmental Checklist Form).
- Added analysis of the project's wildfire impacts, pursuant to new CEQA Guidelines Appendix G (Environmental Checklist Form).
- Added analysis of project's impacts as it relates to vehicle miles traveled (VMT), pursuant to new CEQA Guidelines Appendix G (Environmental Checklist Form)

Executive Summary and Project Description Chapter (Chapter 2.0)

- Updated Table ES-1 to reflect the reclassification of the project's inundation impacts and corresponding mitigation measure revisions.
- Updated to clarify that the Federal Energy Regulatory Commission no longer has regulatory involvement in matters pertaining to Lake Wohlford and will no longer serve as the project's federal lead agency under the National Environmental Policy Act.

As summarized above, the CEQA Guidelines Appendix G (Environmental Checklist Form) has been updated since the Draft EIR was circulated for public review. The updated Environmental Checklist Form included new sections that require analysis of Energy and Wildfire, but also includes several other editorial and organization changes in various other environmental issue areas. Those editorial and organization changes are not reflected in the non-recirculated Draft EIR sections because they would not result in a substantial change in the analysis or new significant impacts. The updated Environmental Checklist Form also requires analysis of a project's transportation impacts based on VMT pursuant to CEQA Guidelines Section 15064.3. Pursuant to CEQA Guidelines Section 15064.3, the use of VMT to determine the significance of transportation impacts will begin on July 1, 2020, and is therefore not required at this time. However, the project is not anticipated to have significant impacts as it relates to VMT, and a brief qualitative discussion of this has been included in Chapter 4.

Under State CEQA Guidelines Section 15088.5(c), if a revision to an EIR is limited to a few chapters or portions of the EIR, only chapters or portions that have been modified need to be

recirculated. Consistent with CEQA Guidelines Section 15088.5(c), this recirculation package contains only the portions of the originally circulated Draft EIR for the Lake Wohlford Dam Replacement Project that have been revised and/or replaced.

EXECUTIVE SUMMARY

ES.1 PURPOSE OF THE EIR/EA

The City of Escondido (City), as lead agency pursuant to the California Environmental Quality Act (CEQA, California Public Resources Code Section 21000, et seq.), has prepared this Environmental Impact Report (EIR) to evaluate the environmental effects of the proposed Lake Wohlford Dam Replacement Project (“the project” or “the proposed project”). The project proposes to construct a replacement for the existing Lake Wohlford Dam downstream (west) of the existing dam and partially deconstruct the existing dam. The project’s location is shown in regional context in Figure ES-1.

ES.2 PROJECT BACKGROUND

Lake Wohlford Dam was constructed in 1895 to create Lake Wohlford, a reservoir that is an important part of the City’s municipal water supply. In 1924, the dam was enlarged and raised using hydraulic fill to expand the reservoir’s capacity to approximately 6,500 acre-feet and a surface area of approximately 225 acres. Most of the water released from Lake Wohlford passes through the Wohlford Penstock to the Bear Valley Hydroelectric Generating Facility (HGF), which until May 17, 2017, was operated by the City under a license granted by the Federal Energy Regulatory Commission (FERC). On May 17, 2017, FERC issued an exemption to that license and no longer has regulatory involvement in matters pertaining to Lake Wohlford, including seismic safety. The California Department of Water Resources, Division of Safety of Dams also regulates the safety of the dam under Division 3 of the California Water Code.

A seismic analysis of the dam conducted in 2007 identified a stability concern for the portion of the dam that was raised in 1924. Based on the results of the seismic analysis and report recommendations, FERC, in a September 19, 2007, letter, directed the City to reduce the Lake Wohlford reservoir level to a maximum of 1,460 feet above mean sea level (AMSL), which was 20 feet below its prior spillway crest elevation. Since then, the City has been operating Lake Wohlford with a reduced water storage capacity.

To alleviate seismic safety concerns with the existing dam and regain the Lake Wohlford reservoir’s lost water storage capability for the City’s municipal water system, the City is planning to replace Lake Wohlford Dam.



0 3.75 7.5 15 Miles
1" = 7.5 Miles

ES-1 Regional Location Map

Lake Wohlford Dam Replacement Project EIR

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ES.3 PROJECT CHARACTERISTICS

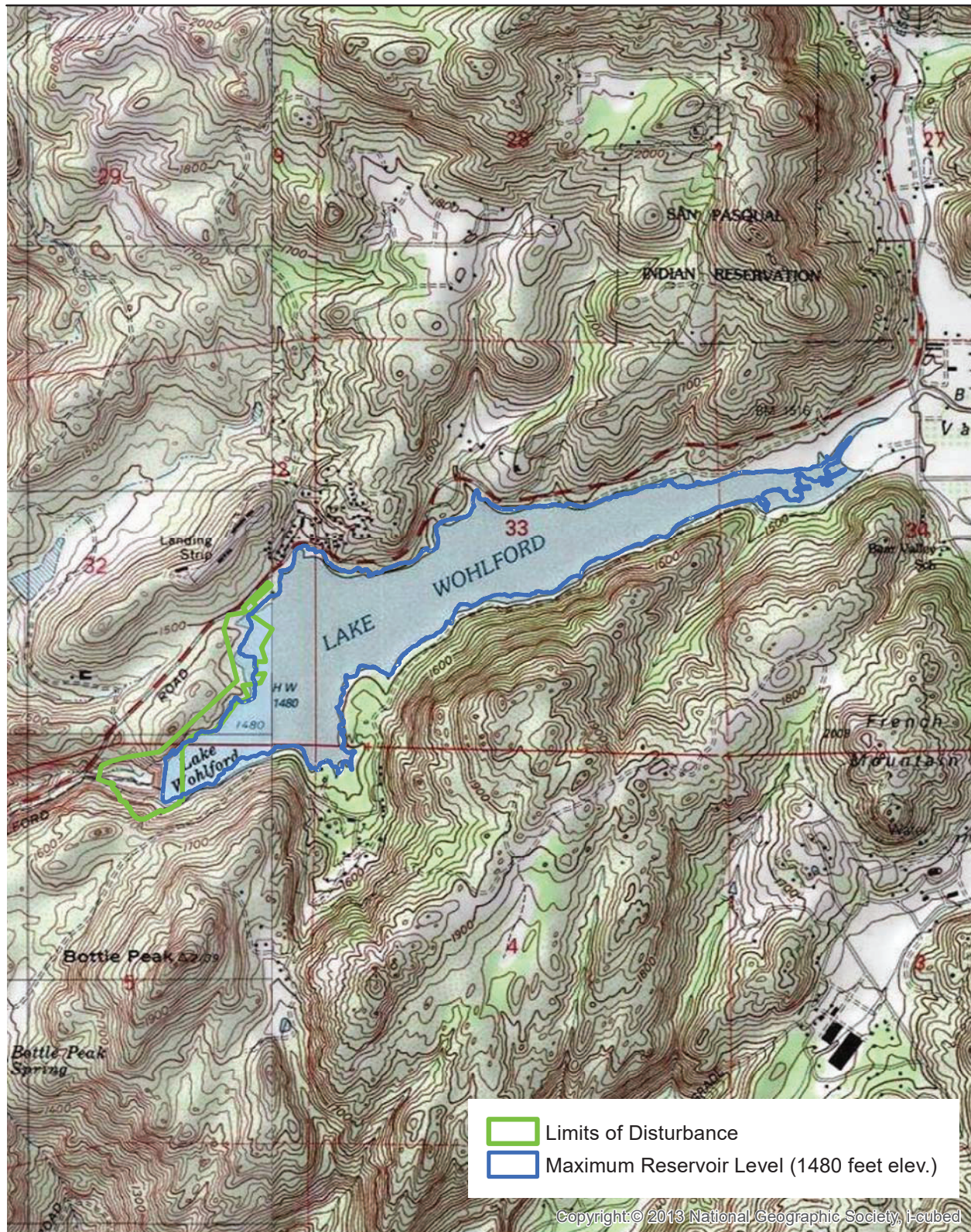
The project entails constructing a replacement dam immediately downstream (west) of the existing dam and partially deconstructing the existing dam by removing the hydraulic fill material that is at a higher elevation than the original rockfill. The replacement dam would feature an outlet tower that is integrated into the dam's upstream face; the top of the existing outlet tower would be demolished, and the bottom of the existing outlet tower and the outlet pipe would be filled with sand and abandoned in place. The project would entail improvement and extension of an existing unpaved access road located west of the Lake Wohlford Marina, extending it to the right (north) abutment of the replacement dam. The road would provide equipment and material access to the dam construction zone and, following completion of the project, would provide permanent maintenance and inspection access to the right abutment and the dam crest. To accommodate the replacement dam's configuration, the project also entails realignment of the portion of Oakvale Road near the dam's left (south) abutment. This portion of the road would be realigned south of its current location, requiring excavation into the adjacent hillside.

The replacement dam would be constructed so the resultant storage capacity and maximum reservoir level would be equal to the capacity and elevation prior to the water level restriction, at 6,500 acre-feet and 1,480 feet AMSL, respectively, so the project proposes no changes to Lake Wohlford's historic high water level or storage capacity.

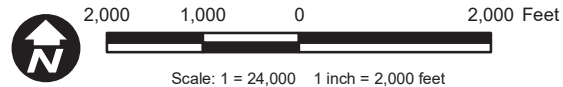
ES.4 ENVIRONMENTAL SETTING

Lake Wohlford is located in unincorporated San Diego County, in the rural foothills approximately 0.5 mile east of the City's incorporated boundaries and 5 miles northeast of the City's downtown center. Lake Wohlford is within the County's unincorporated Valley Center Community Planning Area, on land owned by the City. The lake, which is situated on Escondido Creek, stores water for use by the City's municipal system and is also a regional recreational amenity offering fishing areas, trails, and opportunities for active and passive recreation. The study area falls within the Valley Center and Rodriquez Mountain U.S. Geological Survey 7.5-minute quadrangles. The project site is located approximately 7 miles east of Interstate 15 and 2 miles east of Valley Center Road, as shown in Figure ES-2. Lake Wohlford can be accessed via east Valley Parkway and Lake Wohlford Road. Other main roadways in the vicinity of the lake include Oakvale Road and Guejito Road.

The proposed new dam site is situated within a narrow, steep, rocky canyon immediately downstream of the existing Lake Wohlford Dam. Geology in the vicinity of the project site includes surficial units composed of artificial fill, unconsolidated Holocene to late Pleistocene



Source: USGS 7.5' Topo Quads Rodriguez Mtn 1988 and Valley Center 1975



ES-2
Vicinity Map

Lake Wohlford Dam Replacement Project EIR

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alluvium and colluvium/creep affected rock, overlying granitic bedrock. Soils in the project area include Cienega very rocky coarse sandy loam, Las Posas fine sandy loam, and Fallbrook-Vista sandy loams.

The project area supports a variety of vegetative communities and habitats. Riparian and wetland vegetation communities in the area include emergent wetland, freshwater marsh, lakeshore, open water, southern willow scrub, and southern coast live oak riparian forest. Upland vegetation communities around the lake include Engelmann oak woodland, coast live oak woodland, Diegan coastal sage scrub, eucalyptus woodland, nonnative grasslands, ornamental woodland, southern mixed chaparral, and valley needlegrass grassland.

ES.5 ENVIRONMENTAL ANALYSIS

Environmental analysis conducted pursuant to CEQA concluded that the project would result in significant environmental impacts with respect to the following issue areas:

- Air Quality
- Biological Resources
- Cultural Resources
- Noise

Table ES-1 summarizes the results of the environmental analysis completed for these issue areas. Where significant impacts were identified, feasible mitigation measures are proposed to reduce impacts to less-than-significant levels. The environmental analysis concluded that mitigation for the project's impacts on air quality, biological resources, and cultural resources would reduce the identified impacts to a less-than-significant level. Analysis of the project's noise impacts concluded that temporary construction impacts would be significant and unavoidable.

As described further in Chapters 3 and 4 of this EIR, the following issue areas were determined to have less-than-significant impacts:

- | | |
|-------------------------------|---------------------------------|
| • Aesthetics | • Mineral Resources |
| • Agricultural Resources | • Paleontological Resources |
| • Energy | • Population and Housing |
| • Geology/Soils | • Public Services |
| • Greenhouse Gas Emissions | • Recreation |
| • Hazards and Public Safety | • Traffic/Circulation |
| • Hydrology and Water Quality | • Utilities and Service Systems |
| | • Wildfire |

ES.6 AREAS OF KNOWN CONTROVERSY

The City is not aware of any areas of controversy associated with project implementation.

Table ES-1
Summary of Significant Environmental Impacts and Mitigation Measures

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
Air Quality Impact AQ-1: Construction-generated PM ₁₀ emissions would exceed the County's applicable mass emission threshold of 100 lbs per day; therefore, construction impacts related to violation of an ambient air quality standard would be significant.		
	Mitigation Measure AQ-1.1: The following measures shall be implemented by the construction contractor to reduce fugitive dust emissions associated with off-road equipment and heavy-duty vehicles: <ul style="list-style-type: none"> • Water the grading areas a minimum of twice daily to minimize fugitive dust; • Stabilize graded areas as quickly as possible to minimize fugitive dust; • Apply chemical stabilizer or pave the last 100 feet of internal travel path within the construction site prior to public road entry; • Remove any visible track-out into traveled public streets within 30 minutes of occurrence; • Wet wash the construction access point at the end of each workday if any vehicle travel on unpaved surfaces has occurred; • Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads; • Cover haul trucks or maintain at least 12 inches of freeboard to reduce blow-off during hauling; • Suspend all soil disturbance activities if winds exceed 25 mph; • Cover/water on-site stockpiles of excavated material; • Enforce a 15-mph speed limit on unpaved surfaces; • On dry days, dirt and debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of PM caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction-related dirt in dry weather; and • Disturbed areas shall be hydroseeded, landscaped, or developed as quickly as possible and as directed by the contractor to reduce dust generation. 	Less than significant.

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<p>Mitigation Measure AQ-1.2: Minimize idling time by shutting equipment off when not in use or reducing the time of idling to no more than 5 minutes (5-minute limit is required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site.</p> <p>Mitigation Measure AQ-1.3: Maintain construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic at least once per month and determined to be running in proper condition before it is operated.</p>	
<p>Impact AQ-2: Because the proposed project would exceed the project-level air quality significance thresholds for PM₁₀ emissions, the proposed project's construction emissions would have a cumulatively considerable contribution to the region's air quality.</p>	<p><i>See Mitigation Measures AQ-1.1 through AQ-1.3 above.</i></p>	<p>Less than significant.</p>
Biological Resources		
<p>Impact BIO-1: The project would potentially result in direct and indirect impacts on special-status bird species or species covered by the MBTA if nests are established in the project area prior to construction.</p>	<p>Mitigation Measure BIO-1.1: If vegetation clearing or earthwork is proposed to commence within the bird breeding season (February 15 through September 15), a qualified biologist shall conduct pre-construction nest surveys of the project site and a 500-foot buffer (a 1-mile buffer for bald eagle) to identify any listed species or bird breeding activity in the vicinity. The pre-construction survey shall be performed within 2 weeks of the start of construction activity. If the pre-construction surveys identify active nests or bird-breeding activity within the 500-foot buffer (a 1-mile buffer for bald eagle), a qualified biologist shall prepare a nest avoidance plan and, if necessary, a noise attenuation plan, to identify site-specific measures that shall be incorporated into the project to reduce construction-related impacts on the applicable bird species.</p> <p>Mitigation Measure BIO-1.2: All construction lighting shall be directed onto the construction work area and away from adjacent habitat. Light shields shall be used to reduce the extent of illumination into adjoining areas.</p>	<p>Less than significant.</p>

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
<p>Impact BIO-2: The project would entail direct impacts on Engelmann oaks, a special-status plant species, due to clearing for construction work.</p>	<p>Mitigation Measure BIO-2.1: Engelmann oaks outside the limits of disturbance will be identified as Environmentally Sensitive Areas on project plans. A qualified biologist will attend a pre-construction field meeting with the construction contractor to identify Engelmann oaks and refine the limits of disturbance to avoid unneeded clearing in areas supporting Engelmann oaks. Orange construction fencing will be installed around the locations of Engelmann oaks outside the agreed-upon limits of disturbance. Fencing shall remain in place until construction is complete to avoid inadvertent disturbance of sensitive resources.</p>	<p>Less than significant.</p>
<p>Impact BIO-3: Project construction would result in direct impacts on sensitive vegetation communities due to clearing for construction.</p>	<p>Mitigation Measure BIO-3.1: The City shall ensure that an on-site habitat restoration plan covering all areas disturbed during construction is prepared in consultation with a qualified restoration ecologist. The restoration plan will delineate all temporary impact areas subject to habitat restoration and establish standards for application of hydroseed and installation of container plants, as appropriate. The restoration plan shall include an appropriate native species planting palette to blend in with the existing and surrounding habitats. No nonnative species shall be incorporated into the restoration plan. Acreage of impacts that can be restored on-site after completion of the project will not be subject to acquisition of off-site mitigation listed in Mitigation Measures BIO-3.3 through BIO-3.6.</p> <p>Mitigation Measure BIO-3.2: A restoration maintenance and monitoring plan shall be prepared for the project by a qualified restoration ecologist outlining yearly success criteria and remedial measures in case the mitigation effort falls short of the success criteria.</p> <p>Mitigation Measure BIO-3.3: The City shall mitigate for permanent impacts to sensitive upland habitats within the LOD and 1,480-foot maximum inundation area per the ratios in Table 3.3-7 through creation and enhancement of suitable habitat or acquisition of suitable habitat credits at an approved mitigation bank (e.g., Daley Ranch).</p>	<p>Less than significant.</p>

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<p>Mitigation Measure BIO-3.4: The City shall mitigate for permanent impacts to sensitive riparian/wetland habitats within the LOD and 1,464-foot seasonal inundation area per the ratios in Table 3.3-8 through creation and enhancement of suitable habitat or acquisition of suitable habitat credits at an agency-approved mitigation bank.</p> <p>Mitigation Measure BIO-3.5: The City shall mitigate for potential permanent impacts to riparian/wetland habitats between the seasonal (1,464-foot) and maximum (1,480-foot) inundation limits through development of a Lake Wohlford Long-Term Habitat Management Plan in consultation with the resource agencies. The plan shall at a minimum provide for the following:</p> <ol style="list-style-type: none"> 1. Long-term Vegetation Management –The plan shall include methods, schedules, and success criteria for weed control including hand weeding, mechanical weeding, and herbicide application. 2. Cowbird Control – Several non-native wildlife species currently adversely impact native fauna at the reservoir. A brown-headed cowbird trapping program shall be included in the plan. 3. A cost analysis to implement the Long-Term Habitat Management Plan and identify funding sources for the long-term commitments will be required under the Plan. <p>Mitigation Measure BIO-3.6: To avoid incidental loss of sensitive habitat types during construction activities, Environmentally Sensitive Area fencing shall be installed along the limits of disturbance prior to the start of construction. In addition, grading limits shall be flagged or fenced, and grading shall not occur beyond this flagging/fencing. Location of fencing shall be confirmed by a qualified biological monitor. Construction crews shall be made fully aware of this boundary.</p>	

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
Impact BIO-4: The project would result in indirect impacts to sensitive vegetation communities adjacent to construction work areas.	<p>Mitigation Measure BIO-4.1: Storage of soil or fill material from the project site shall be within the LOD or developed areas. The contractor shall delineate stockpile areas on the grading plans for review by the City.</p> <p>Mitigation Measure BIO-4.2: If additional access routes are determined necessary, these areas shall be surveyed for biological resources prior to their use and, if any sensitive resources are identified, determine appropriate avoidance and minimization measures. The contractor shall clearly mark all access routes (i.e., flagged and/or staked) prior to the onset of construction.</p> <p>Mitigation Measure BIO-4.3: The contractor shall periodically monitor the work area to ensure that construction-related activities do not generate excessive amounts of fugitive dust. Water shall be applied to the construction right-of-way, dirt roads, trenches, spoil piles, and other areas where ground disturbance has taken place to minimize dust emissions and topsoil erosion.</p>	
Impact BIO-5: The project would result in direct impacts on jurisdictional wetlands and waters due to clearing for construction.	Implement habitat-based mitigation stated in Mitigation Measures BIO-3.3, BIO-3.4, and BIO-3.5. No additional habitat-based mitigation for jurisdictional wetlands is warranted.	Less than significant.
Impact BIO-6: Project construction would occur within and adjacent to delineated wetlands and waters and potentially result in indirect impacts to jurisdictional areas.	<p>Mitigation Measure BIO-6.1: A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared to comply with RWQCB requirements. The SWPPP shall identify the design features and best management practices (BMPs) that will be used to manage drainage-related issues (e.g., erosion and sedimentation) during construction. Erosion-control measures shall be regularly checked by the contractor, the project biologist, and/or City staff. Specific BMP plans shall be reviewed by the City and the project biologist, and be modified, if necessary, prior to implementation. Fencing and erosion-control measures of all project areas shall be inspected a minimum of once per week.</p> <p>Mitigation Measure BIO-6.2: Staging areas and project activities, including equipment access and disposal or temporary placement of excess fill, shall be prohibited within off-site drainages.</p>	Less than significant.

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
<p>Cultural Resources</p> <p>Impact CR-1: The past discovery of resources in the vicinity of the Oakvale Road project impact area indicates sensitivity for the potential presence of unknown archaeological resources.</p>		
	<p>Mitigation Measure CR-1.1: The City of Escondido Planning Division (“City”) recommends the applicant enter into a Tribal Cultural Resource Treatment and Monitoring Agreement (also known as a pre-excavation agreement) with a tribe that is traditionally and culturally affiliated with the Project Location (“TCA Tribe”) prior to issuance of a grading permit. The purposes of the agreement are (1) to provide the applicant with clear expectations regarding tribal cultural resources, and (2) to formalize protocols and procedures between the Applicant/Owner and the TCA Tribe for the protection and treatment of, including but not limited to, Native American human remains, funerary objects, cultural and religious landscapes, ceremonial items, traditional gathering areas and cultural items, located and/or discovered through a monitoring program in conjunction with the construction of the proposed project, including additional archaeological surveys and/or studies, excavations, geotechnical investigations, grading, and all other ground disturbing activities.</p> <p>Mitigation Measure CR-1.2: Prior to issuance of a grading permit, the applicant shall provide written verification to the City that a qualified archaeologist and a Native American monitor associated with a TCA Tribe have been retained to implement the monitoring program. The archaeologist shall be responsible for coordinating with the Native American monitor. This verification shall be presented to the City in a letter from the project archaeologist that confirms the selected Native American monitor is associated with a TCA Tribe. The City, prior to any pre-construction meeting, shall approve all persons involved in the monitoring program.</p> <p>Mitigation Measure CR-1.3: The qualified archaeologist and a Native American monitor shall attend the pre-grading meeting with the grading contractors to explain and coordinate the requirements of the monitoring program.</p> <p>Mitigation Measure CR-1.4: During the initial grubbing, site grading, excavation or disturbance of the ground surface, the qualified archaeologist and the Native American monitor shall be</p>	<p>Less than significant.</p>

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<p>on site full-time. The frequency of inspections shall depend on the rate of excavation, the materials excavated, and any discoveries of tribal cultural resources as defined in California Public Resources Code Section 21074. Archaeological and Native American monitoring will be discontinued when the depth of grading and soil conditions no longer retain the potential to contain cultural deposits. The qualified archaeologist, in consultation with the Native American monitor, shall be responsible for determining the duration and frequency of monitoring.</p> <p>Mitigation Measure CR-1.5: In the event that previously unidentified tribal cultural resources are discovered, the qualified archaeologist and the Native American monitor, shall have the authority to temporarily divert or temporarily halt ground disturbance operation in the area of discovery to allow for the evaluation of potentially significant cultural resources. Isolates and clearly non-significant deposits shall be minimally documented in the field and collected so the monitored grading can proceed.</p> <p>Mitigation Measure CR-1.6: If a potentially significant tribal cultural resource is discovered, the archaeologist shall notify the City of said discovery. The qualified archaeologist, in consultation with the City, the TCA Tribe and the Native American monitor, shall determine the significance of the discovered resource. A recommendation for the tribal cultural resource's treatment and disposition shall be made by the qualified archaeologist in consultation with the TCA Tribe and the Native American monitor and be submitted to the City for review and approval.</p> <p>Mitigation Measure CR-1.7: The avoidance and/or preservation of the significant tribal cultural resource and/or unique archaeological resource must first be considered and evaluated as required by CEQA. Where any significant tribal cultural resources and/or unique archaeological resources have been discovered and avoidance and/or preservation measures are deemed to be infeasible by the City, then a research design and data recovery program to mitigate impacts shall be prepared by the qualified archaeologist (using professional archaeological methods), in consultation with the TCA Tribe and the Native American monitor, and shall be</p>	

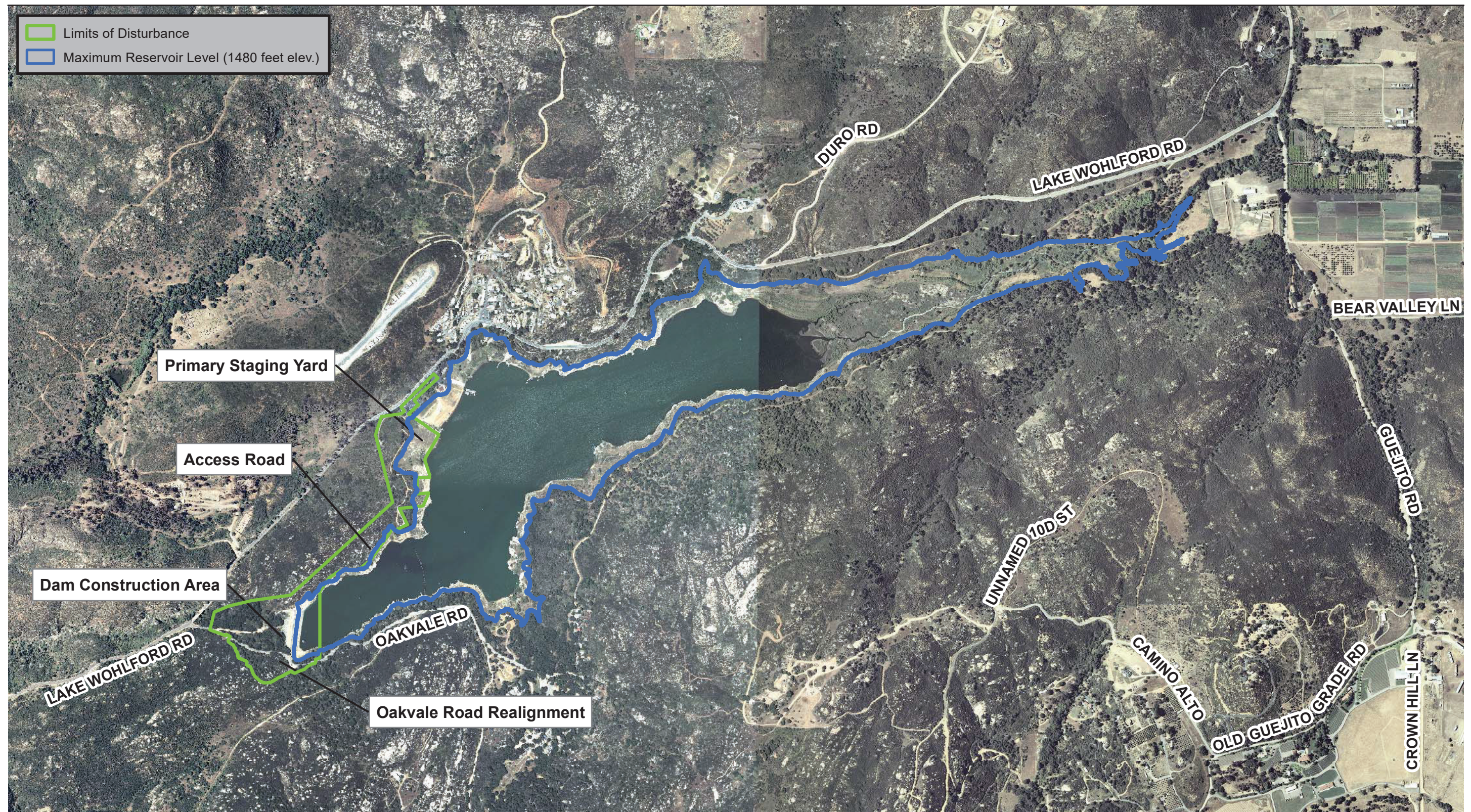
Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<p>subject to approval by the City. The archaeological monitor, in consultation with the Native American monitor, shall determine the amount of material to be recovered for an adequate artifact sample for analysis. Before construction activities are allowed to resume in the affected area, the research design and data recovery program activities must be concluded to the satisfaction of the City.</p> <p>Mitigation Measure CR-1.8: As specified by California Health and Safety Code Section 7050.5, if human remains are found on the project site during construction or during archaeological work, the person responsible for the excavation, or his or her authorized representative, shall immediately notify the San Diego County Coroner's office. Determination of whether the remains are human shall be conducted on-site and in situ where they were discovered by a forensic anthropologist, unless the forensic anthropologist and the Native American monitor agree to remove the remains to an off-site location for examination. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the Coroner has made the necessary findings as to origin and disposition. A temporary construction exclusion zone shall be established surrounding the area of the discovery so that the area would be protected, and consultation and treatment could occur as prescribed by law. In the event that the remains are determined to be of Native American origin, the Most Likely Descendant, as identified by the Native American Heritage Commission, shall be contacted in order to determine proper treatment and disposition of the remains in accordance with California Public Resources Code section 5097.98. The Native American remains shall be kept in-situ, or in a secure location in close proximity to where they were found, and the analysis of the remains shall only occur on-site in the presence of a Native American monitor.</p> <p>Mitigation Measure CR-1.9: If the qualified archaeologist elects to collect any tribal cultural resources, the Native American monitor must be present during any testing or cataloging of those resources. Moreover, if the qualified Archaeologist does not collect the cultural resources that are unearthed during the ground</p>	

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<p>disturbing activities, the Native American monitor, may at their discretion, collect said resources and provide them to the TCA Tribe for respectful and dignified treatment in accordance with the Tribe's cultural and spiritual traditions. Any tribal cultural resources collected by the qualified archaeologist shall be repatriated to the TCA Tribe. Should the TCA Tribe or other traditionally and culturally affiliated tribe decline the collection, the collection shall be curated at the San Diego Archaeological Center. All other resources determined by the qualified archaeologist, in consultation with the Native American monitor, to not be tribal cultural resources, shall be curated at the San Diego Archaeological Center.</p> <p>Mitigation Measure CR-1.10: Prior to the release of the grading bond, a monitoring report and/or evaluation report, if appropriate, which describes the results, analysis and conclusion of the archaeological monitoring program and any data recovery program on the project site shall be submitted by the qualified archaeologist to the City. The Native American monitor shall be responsible for providing any notes or comments to the qualified archaeologist in a timely manner to be submitted with the report. The report will include California Department of Parks and Recreation Primary and Archaeological Site Forms for any newly discovered resources.</p>	
<p>Impact CR-2: There is potential for accidental disturbance or damage to known and unknown cultural resources in the dam construction area and access road construction area.</p>	<p><i>See Mitigation Measures CR-1.1 through 1.10 above.</i></p> <p>Mitigation Measure CR-2.1: The following actions shall be taken to ensure avoidance of known cultural resources:</p> <ul style="list-style-type: none"> Existing cultural resource sites shall be designated as Environmentally Sensitive Areas on all construction drawings and the limits of disturbance identified in the drawings shall not overlap with these Environmentally Sensitive Areas. Prior to the start of construction, under direction of the project archaeological monitor, orange construction fencing shall be placed around the known cultural resource sites. Fencing shall remain in place until construction is complete to avoid inadvertent disturbance of the site. 	<p>Less than significant.</p>

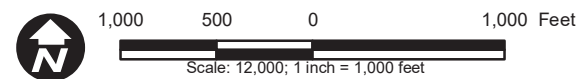
Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<ul style="list-style-type: none"> Environmental training will be provided for all contractors to educate them on awareness of cultural resources protection requirements. 	
Noise		
<p>Impact NOI-1: The dam construction phase of the project would generate noise at night that would be received by residences in excess of the County's 45 dBA nighttime noise standard.</p>	<p>Mitigation Measure NOI-1.1: <u>Implement Noise Complaint Reporting</u> – The project (via construction contractor) would establish a telephone hot-line for use by the public to report any significant adverse noise conditions associated with the construction of the project. If the telephone is not staffed 24 hours per day, the contractor shall be required to include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This hot-line telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been considered commissioned and ready for operation.</p> <p>Mitigation Measure NOI-1.2: <u>Implement Noise Complaint Investigation</u> – Throughout the construction of the project, the contractor shall be required to document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The contractor or its authorized agent shall be required to:</p> <ul style="list-style-type: none"> Use a Noise Complaint Resolution Form to document and respond to each noise complaint; Contact the person(s) making the noise complaint within 24 hours; Conduct an investigation to attempt to determine the source of noise related to the complaint; and Take all reasonable measures to reduce the noise at its source. <p>Mitigation Measure NOI-1.3: <u>Implement Construction Practices</u> – The following are typical field techniques for reducing noise from construction activities, with the purpose of reducing aggregate construction noise levels at nearby noise-sensitive receivers. The contractor or its authorized agent shall be required to:</p> <ul style="list-style-type: none"> Adjust all audible back-up alarms downward in sound level, reflecting locations that have expected lower background level, while still maintaining adequate signal-to-noise ratio for 	Significant and unavoidable

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<p>alarm effectiveness. Consider signal persons and strobe lights, or alternative safety equipment and/or processes as allowed, for reducing reliance on high-amplitude sonic alarms.</p> <ul style="list-style-type: none"> Place stationary noise sources, such as generators and air compressors, away from affected noise-sensitive receivers to the farthest extent practical on the project site. Place non-noise-producing mobile equipment such as trailers in the direct sound pathways between suspected major noise-producing sources and these sensitive receivers. To minimize flanking underneath or through vertical gaps, the construction contractor shall cover the openings with at least 0.5-inch-thick plywood, hay bales, or other sufficiently dense material. <p>Mitigation Measure NOI-1.4: <u>Equipment Noise Reduction</u> – The following are typical practices for construction equipment selection (or preferences) and expected function that can help reduce noise and shall be implemented:</p> <ul style="list-style-type: none"> Use concrete crushers or pavement saws rather than impact devices such as jackhammers, pavement breakers, and hoe rams for tasks such as concrete or asphalt demolition and removal. Pneumatic impact tools and equipment used at the construction site shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations. Provide impact noise-producing equipment (i.e., jackhammers and pavement breaker[s]) with noise attenuating shields, shrouds or portable barriers or enclosures, to reduce operating noise. Line or cover hoppers, storage bins, and chutes with sound-deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces). Provide upgraded mufflers, acoustical lining, or acoustical paneling for other noisy equipment, including internal combustion engines. 	

Significant Environmental Impacts	Mitigation Measures	Level of Significance after Mitigation
	<ul style="list-style-type: none">• Use alternative procedures of construction and select a combination of techniques that generate the least overall noise and vibration.• Use construction equipment manufactured or modified to reduce noise and vibration emissions, such as:<ul style="list-style-type: none">○ Electric instead of diesel-powered equipment.○ Hydraulic tools instead of pneumatic tools.○ Electric saws instead of air- or gasoline-driven saws.• Locate construction staging area as far as feasible from occupied residences.	



Source: SanGIS 2012; Black & Veatch 2014; USGS 2013



ES-3

Limits of Disturbance and Maximum Reservoir Level

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CHAPTER 2.0

PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

Lake Wohlford is a man-made reservoir owned and operated by the City and located in the rural foothills of unincorporated San Diego County, approximately 0.5 mile east of the City's incorporated boundaries and 5 miles northeast of the City's downtown center. Lake Wohlford is within the County's unincorporated Valley Center Community Planning Area, on land owned by the City. The reservoir is formed by Lake Wohlford Dam, which is a 100-foot-high embankment dam composed primarily of rockfill on the downstream side and hydraulically placed fill on the upstream side. Lake Wohlford, located along Escondido Creek, is filled by runoff from its 7.3-square-mile drainage area, as well as water released from the Lake Henshaw reservoir, which is diverted from the San Luis Rey River through the 13-mile-long Escondido Canal.

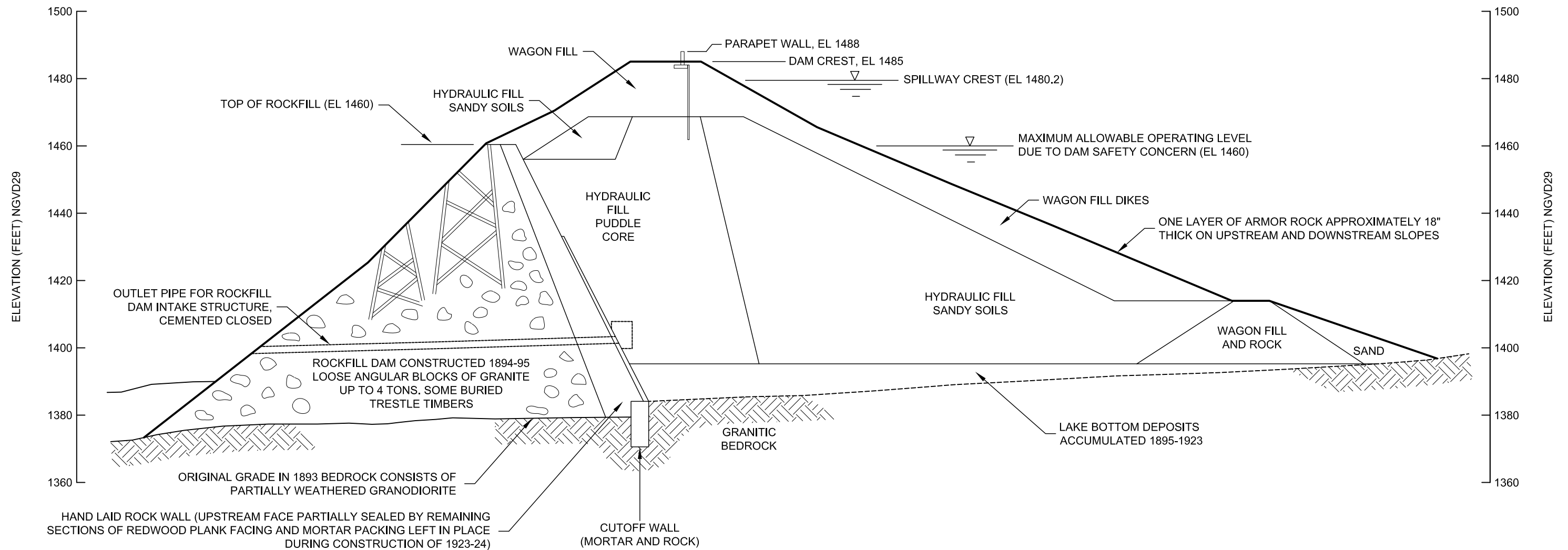
Lake Wohlford Dam was originally constructed of rockfill in 1895 at a height of approximately 76 feet, creating an important component of the City's initial municipal water supply. In 1924, the City enlarged the dam using hydraulic fill, pumping earth from the lake bottom through a pipe and placing this material on the upstream side of the existing dam. The enlargement of the dam increased the dam's height to 100 feet and expanded Lake Wohlford's storage capacity to serve the City's growing population (GEI Consultants, Inc. 2008). A cross section of the existing dam is shown in Figure 2-1. When the water level is at the existing spillway crest elevation of 1,480 feet above mean sea level (AMSL), the dam has a storage capacity of approximately 6,500 acre-feet and covers a surface area of approximately 225 acres. The reservoir's beneficial uses include municipal and agricultural water supply; flood control; non-contact water recreation, including fishing; and wildlife habitat.

Most of the water released from Lake Wohlford passes through the Wohlford Penstock to the Bear Valley Hydroelectric Generating Facility (HGF), which until May 17, 2017, was operated by the City under a license granted by the Federal Energy Regulatory Commission (FERC) (Escondido Project, FERC No. 176). FERC issued an exemption to the HGF's federal license to the City on that date and is therefore no longer involved in regulation of the Bear Valley HGF or connected components such as the dam. The Bear Valley HGF generates electricity that is sold to San Diego Gas & Electric. After passing through the Bear Valley HGF, the Lake Wohlford water is transported to the Escondido-Vista Water Treatment Plant, where it is treated and distributed to the municipal customers of the City and the Vista Irrigation District. Due to the connection to the HGF, FERC had regulatory involvement in matters pertaining to Lake Wohlford, including

seismic safety, until they issued an exemption to the City in May 2017. The California Department of Water Resources, Division of Safety of Dams (DSOD) also regulates the safety of the dam under Division 3 of the California Water Code.

A seismic analysis of the dam conducted in 2007, prepared in compliance with a directive from FERC, identified a stability concern for the portion of the dam that was raised in 1924. The 2007 report concluded that the method used to place the hydraulic fill during the dam raise, in addition to its placement overtop of new lake-bottom sediment that had accumulated at the base of the rockfill dam, resulted in inconsistency of the fill material's coarseness and created conditions where the fill could liquefy during a strong earthquake on the Elsinore Fault. Liquefaction of the fill material could result in a structural failure of the dam's upstream slope, including the material that was raised above the elevation of the original rockfill dam (GEI Consultants, Inc. 2007). This failure could, in turn, cause flood inundation downstream in Escondido Creek and lead to public safety concerns. Because of these conditions, the U.S. Army Corps of Engineers (USACE) designated Lake Wohlford Dam as a "high risk" facility on the National Inventory of Dams, reflecting a potential for significant human and economic consequences in the event of a dam failure (GEI Consultants, Inc. 2007).

Based on the results of the seismic analysis and report recommendations, FERC, in a September 19, 2007, letter, directed the City to reduce the Lake Wohlford reservoir level to 1,460 feet AMSL, which is 20 feet below its prior spillway crest elevation, corresponding to the top of the stable downstream rockfill section of the dam. The City has continued to maintain that lowered level since the FERC directive. Figure 2-2 is a line graph plotting monthly reservoir elevation data from 2001 to present (City of Escondido 2015a). As the graph shows, prior to 2007, the reservoir was subject to semiregular fluctuations in water level. Before the mandatory drawdown, the average elevation was 1462.2 feet, with a maximum of 1479.1 feet in November 2003, and a minimum of 1453.1 feet in October 2002. Since the drawdown, the reservoir has averaged approximately 1455.5 feet, or 6.6 feet below the previous average, with a maximum of 1459.1 feet in March 2009, and a minimum of 1450.6 feet in October 2008. However, the levels since the mandatory drawdown are not far outside the range of the typical low range experienced under normal conditions before the drawdown.



NOTES:

1. BASE MAP DERIVED FROM PLATE 2 OF MAY 6, 1976 DAMES & MOORE REPORT WITH MODIFICATIONS OF OUTER BOUNDARY BY GEI BASED ON SURVEY PERFORMED BY CITY OF ESCONDIDO IN FEBRUARY 2007.
2. APPROXIMATE LOCATION OF PARAPET WALL ADDED BY GEI.

Source: GEI, 2008



Figure 2-1
Simplified Maximum Cross Section of Existing Dam

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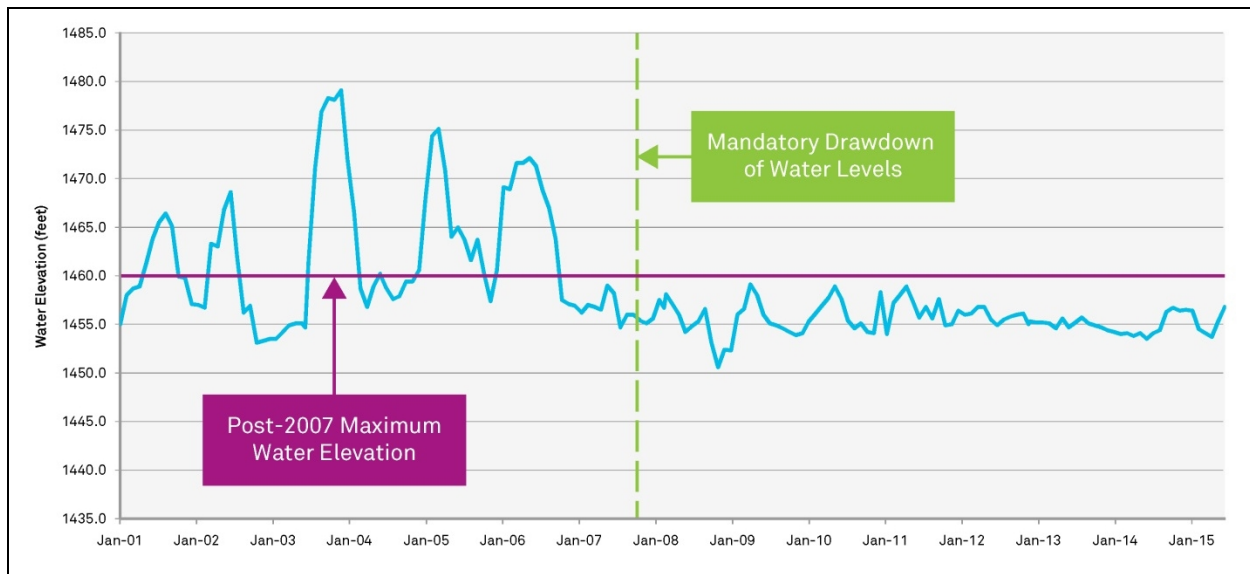


Figure 2-2. Historic Reservoir Elevation

To alleviate seismic safety concerns with the existing dam and regain the Lake Wohlford reservoir's lost water storage capability for the City's municipal water system, the City is planning to construct a replacement dam immediately downstream (west) of the existing dam and deconstruct the problematic portion of the existing dam, as further described in this chapter of the EIR. The proposed dam design is the result of an exhaustive engineering analysis conducted since 2008 that considered and compared several alternatives for their feasibility, safety, longevity, environmental impact, and cost. Additional discussion of the alternatives analysis process is provided in Section 5.2 of this EIR.

The City of Escondido and USACE are the lead agencies under CEQA and NEPA, respectively. USACE plans to comply with NEPA by preparing an EA that will be published separately from this EIR. Permits or agreements will be required from the U.S. Fish and Wildlife Service (USFWS), USACE, Regional Water Quality Control Board (RWQCB), and CDFW.

2.2 PROJECT OBJECTIVES

The project is intended to achieve the following primary objectives:

1. Restore the City's municipal water-storage capacity in Lake Wohlford to its historic capacity of 6,500 acre-feet.
2. Alleviate public safety and flooding concerns due to seismic instability of the existing Lake Wohlford Dam.

3. Provide a dam facility with a life expectancy of 100 years.
4. Minimize the project's temporary and long-term impact on the environment.

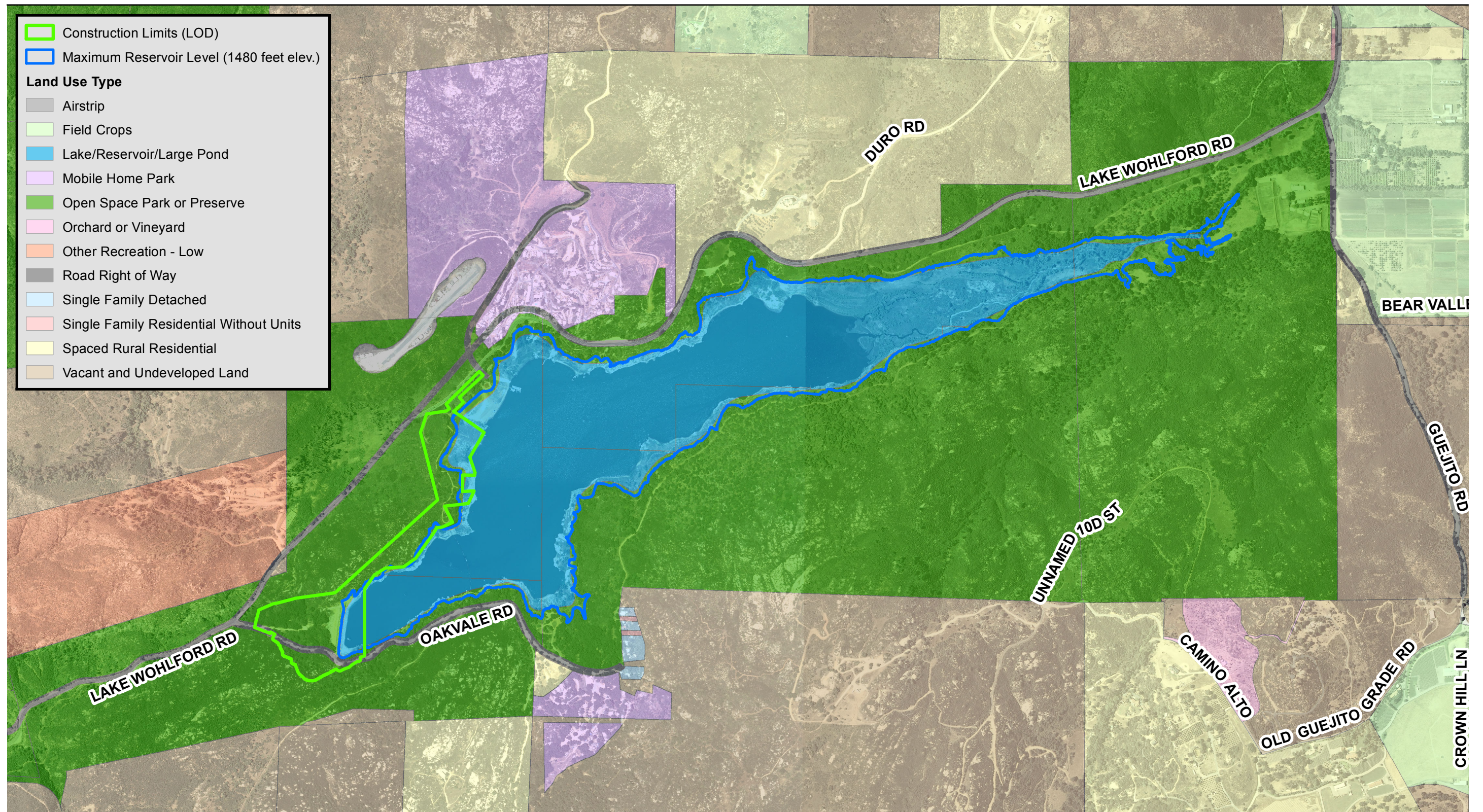
2.3 ENVIRONMENTAL SETTING

Lake Wohlford is a man-made reservoir first formed by the construction of the Lake Wohlford Dam in 1895 and expanded by raising the dam in 1924. The project site is located approximately 7 miles east of Interstate 15 (I-15) and 2 miles east of Valley Center Road. Lake Wohlford can be accessed via east Valley Parkway and Lake Wohlford Road. Other main roadways in the vicinity of the lake include Oakvale Road and Guejito Road. The area around the reservoir is primarily rural in character. Figure 2-3 shows the County land use designations in the vicinity of Lake Wohlford. A mobile home residential community, known as Lake Wohlford Resort, is located north of the reservoir off Lake Wohlford Road, and features homes situated on hilly terrain overlooking the reservoir. A restaurant, Smokey's Lake Wohlford Cafe, is located within this community. Another small group of residences is located south of the reservoir off Oakvale Road. The Lake Wohlford Resort airport, a private airstrip, is located on a hill north of the reservoir. The Escondido Fish and Game Association gun club operates a range located east of the reservoir, off Guejito Road.

The majority of the land immediately around the lake is within unincorporated San Diego County but is owned by the City (Figure 2-4). To the north, Lake Wohlford is surrounded by City, private, and San Pasqual Band of Diegueno Indians properties. To the south, the reservoir is surrounded by City, private, and Bureau of Land Management (BLM) properties. County zoning in the land surrounding the reservoir is A72-General Agriculture.

Lake Wohlford, which is situated on Escondido Creek, stores water for use by the City's municipal system. Escondido Creek drains into the lake from a small drainage area of approximately 7 square miles. The lake also receives water from the Lake Henshaw reservoir, which is diverted from the San Luis Rey River through the 13-mile Escondido Canal. Water is then routed from Lake Wohlford through the Bear Valley HGF to the Escondido-Vista Water Treatment Plant. Escondido Creek ultimately drains into San Elijo Lagoon, approximately 17 miles downstream and southwest of the reservoir.

Lake Wohlford is a regional recreational amenity offering fishing areas, trails, and opportunities for active and passive recreation. Access to the lake is based around a marina facility located to



Source: SanGIS 2012; Black & Veatch 2014; USGS 2013

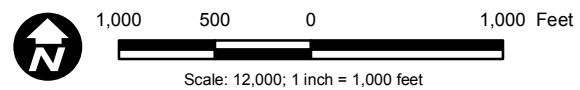
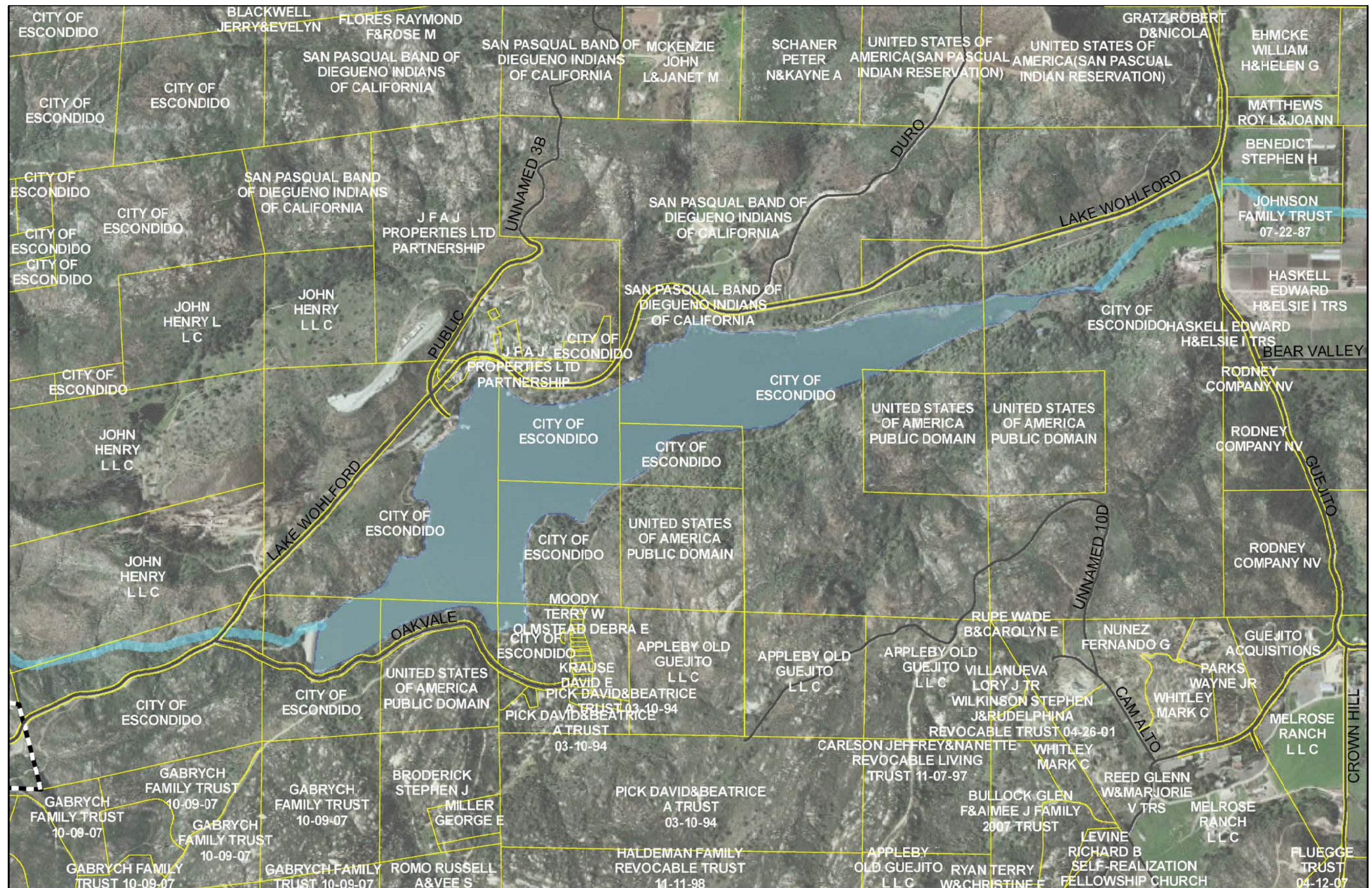


Figure 2-3
Land Use Map

Lake Wohlford Dam Replacement Project EIR

Path: P:\2012\60278081_Lk_Wohlford\06GIS\6.3_Layout\EIR\Fig2_3_LandUse.mxd, 4/28/2020, hannah.duffy,



Source: ICF Jones & Stokes 2008



the north of the lake off Lake Wohlford Road. Boat rentals are available to the public, but due to the threat of invasive Quagga mussels and a resultant ban on private boats, the facility's launch ramp is currently inactive. The complex also includes a public park with picnic facilities and a ranger station, as well as the lake's main parking areas.

Lake Wohlford supports a variety of vegetative communities and habitats. Emergent wetland, freshwater marsh, lakeshore, open water, southern willow scrub, and southern coast live oak riparian forest are the riparian and wetland vegetation communities around Lake Wohlford. Upland vegetation communities around the lake include Engelmann oak woodland, coast live oak woodland, Diegan coastal sage scrub, eucalyptus woodland, nonnative grasslands, ornamental woodland, southern mixed chaparral, and valley needlegrass grassland. Engelmann oak is a California Rare Plant Rank List 4.2 species, and a species covered under the Escondido Subarea Plan. No other federally listed, state-listed or other state sensitive or special-status plant species are known to occur in the vicinity of the lake.

2.4 PROJECT CHARACTERISTICS

The project entails constructing a replacement dam immediately downstream (west) of the existing dam and partially deconstructing the existing dam by removing the hydraulic fill material that is at a higher elevation than the original rockfill (Figures 2-6, 2-7, and 2-8). The replacement dam would feature an outlet tower that is integrated into the dam's upstream face; the top of the existing outlet tower would be demolished, and the bottom of the existing outlet tower and the outlet pipe would be filled with concrete and abandoned in place. To accommodate the replacement dam's configuration, the project also entails realignment of the portion of Oakvale Road that passes the southern dam abutment. This portion of the road would be realigned south of its current location, requiring excavation into the adjacent hillside (Figure 2-9).

The replacement dam would be constructed so the resultant storage capacity and maximum reservoir level would be equal to the capacity and elevation prior to the water level restriction, at 6,500 acre-feet and 1,480 feet AMSL, respectively, so the project proposes no changes to Lake Wohlford's historic high water level or storage capacity.

The following sections present additional detail on the proposed project components and a discussion of anticipated construction methods and construction activity.

2.4.1 Project Components

Replacement Dam

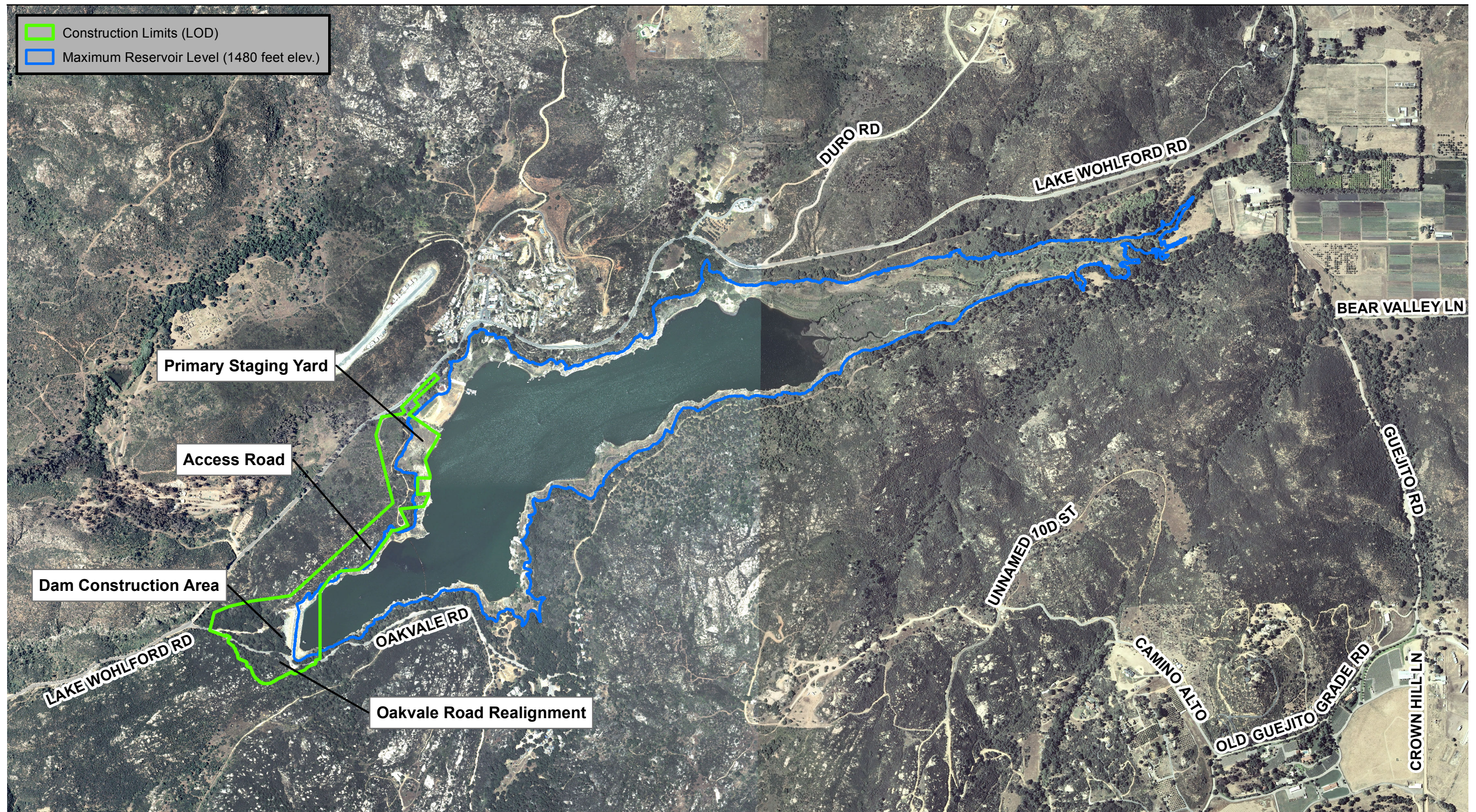
The replacement Lake Wohlford Dam would be constructed immediately downstream of the existing dam, with the replacement dam's crest approximately 200 feet downstream of the existing dam's crest. The replacement dam's crest would rise approximately 125 feet above the foundation grade, to an elevation of 1,490 feet AMSL, and the crest would span approximately 650 feet from the right (north) abutment to the left (south) abutment. The dam crest would feature a pedestrian and vehicle access path with a pedestrian access bridge constructed over the spillway. This access would be for maintenance purposes only and would not be open to the public. Based on regulatory requirements of DSOD, the dam is being designed to handle site-specific seismic conditions based on a maximum magnitude 7.64 earthquake occurring on the Elsinore Fault, which is approximately 11 miles east of the project site.

The dam would be constructed of RCC, which is a modern method of placing mass concrete for gravity dams that has recently been employed by the San Diego County Water Authority for construction of its Olivenhain Dam and San Vicente Dam Raise projects. This method utilizes the materials of conventionally placed concrete (cement, coarse aggregate, sand, and water), but minimizes the water content to allow material handling with conventional soil-placing methods. RCC is placed using conveyors, dump trucks, dozers, and roller compactors. Like engineered soil placement, RCC is placed in thin layers starting from the base of the dam (usually 12 inches thick), as opposed to conventionally placed mass concrete, which is poured in large sections that are typically 5 feet thick (SDCWA 2008). The RCC method reduces water content such that the mix is dry enough to prevent roller equipment from sinking, but wet enough to permit adequate distribution of the material in each layer. Placement of approximately 100,000 cubic yards of RCC concrete is anticipated to form the dam.

A drainage gallery would be installed during construction of the dam. The gallery is designed to be 8 feet wide by 10 feet high, with a floor elevation of 1,400 feet AMSL.

Dam Foundation

Material would be excavated from the downstream canyon floor and rocky slopes to create a solid foundation and suitable surfaces to place the abutments. Preliminary location and depth of the foundation have been identified using the results of geotechnical investigation, and the preliminary foundation has been designed such that all soil, decomposed rock, and rock generally excavated using large earthwork equipment would be removed, leaving solid bedrock



Source: SanGIS 2012; Black & Veatch 2014; USGS 2013

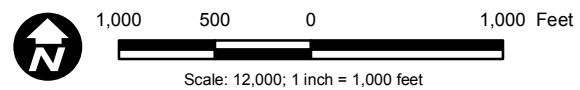


Figure 2-5

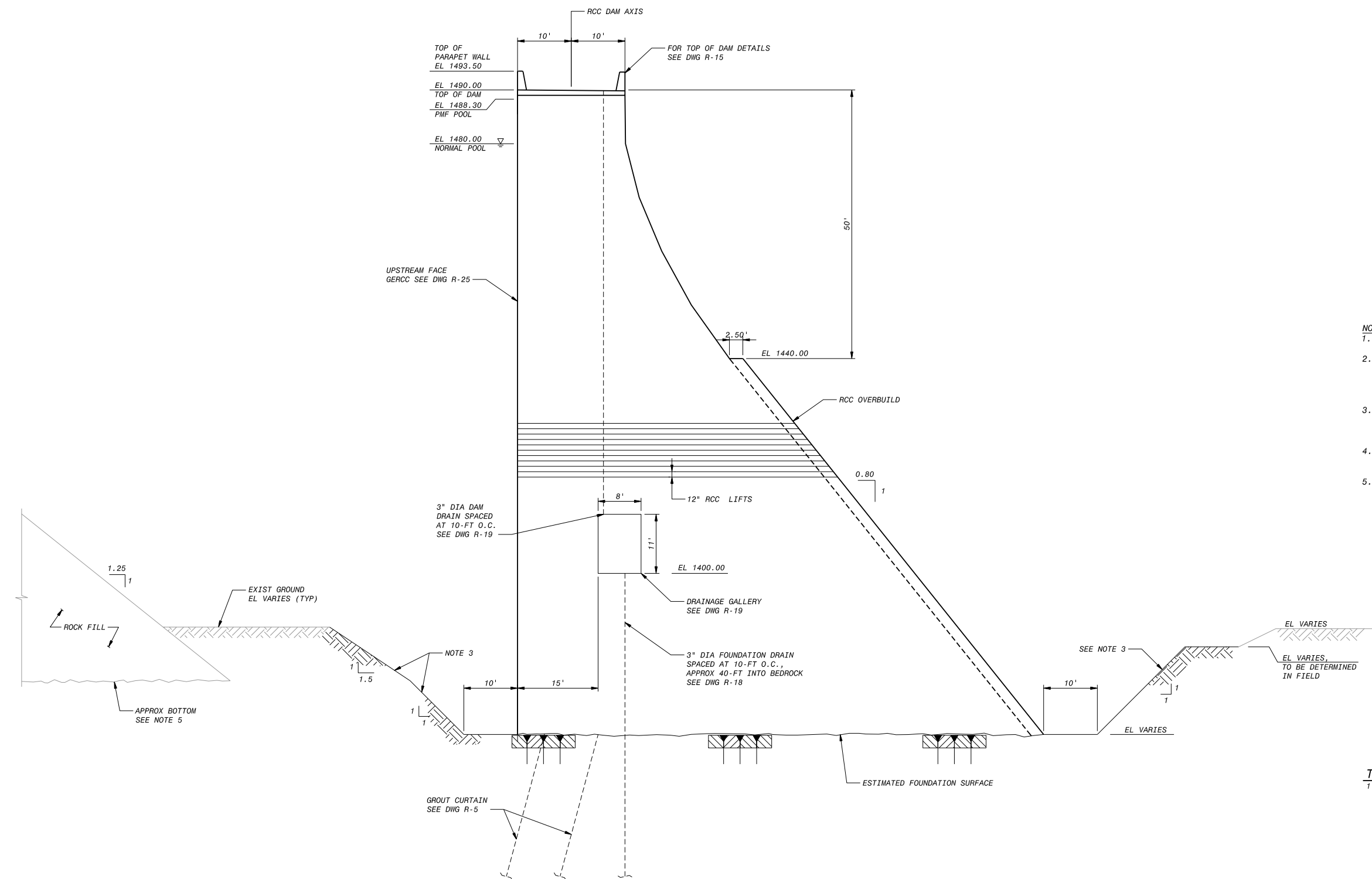
Limits of Disturbance and Maximum Reservoir Level



Source: GoogleEarth 2015; Black & Veatch 2015



Figure 2-6
Plan Drawing of Dam Site



- NOTE:**
1. GERCC UPSTREAM AND DOWNSTREAM DETAILS NOT DEPICTED.
 2. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE REQUIRED STABLE SLOPE GEOMETRY FOR EXCAVATION. CONTRACTOR WILL PROVIDE TEMPORARY EXCAVATION SUPPORT AS NECESSARY. TEMPORARY EXCAVATION SUPPORT SHALL BE SUBMITTED FOR REVIEW.
 3. EXCAVATION SLOPES SHOWN ARE APPROXIMATE. THE ACTUAL EXCAVATION SLOPES SHALL BE DEVELOPED BY THE CONTRACTOR BASED ON THE MATERIALS ENCOUNTERED AND OSHA REQUIREMENTS.
 4. CONTRACTOR TO SUBMIT APPROACH FOR CHIMNEY SECTION TO OWNER'S REPRESENTATIVE.
 5. EXISTING DAM SECTION SHOWN AT CLOSEST CROSS-SECTION.

TYPICAL NON-OVERFLOW SECTION
1" = 10'-0"

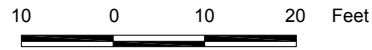
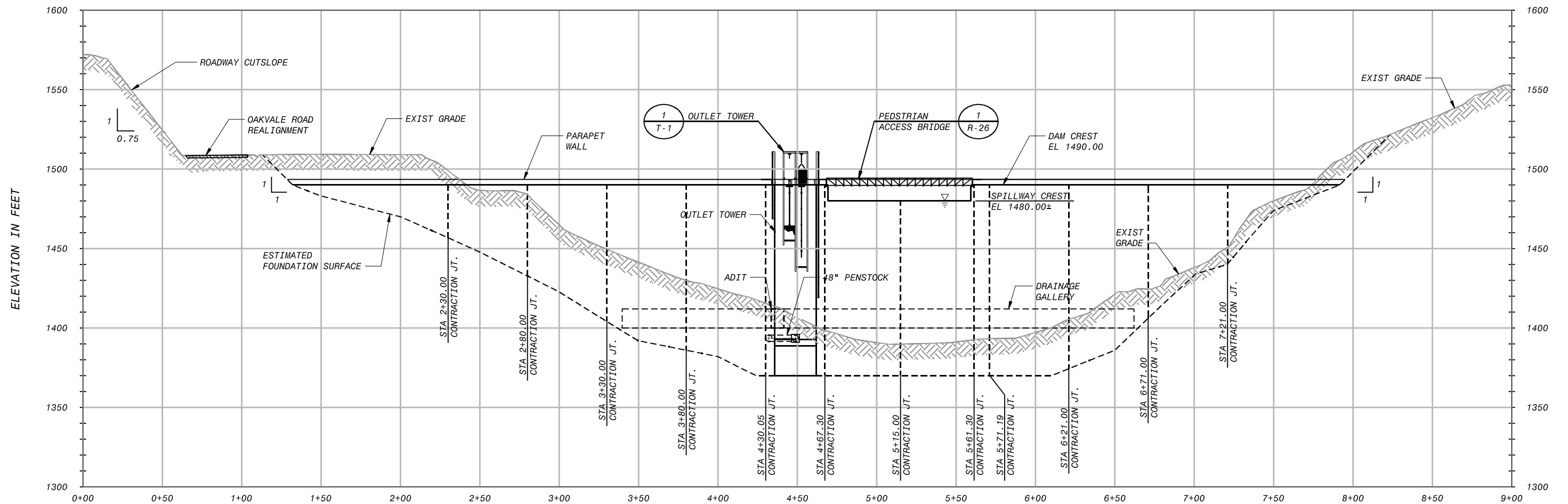


Figure 2-7
Replacement Dam Cross Section



- NOTES:**
1. CONTRACTION JOINT LOCATIONS SHALL BE FIELD VERIFIED BY THE OWNER'S REPRESENTATIVE.
 2. CONTRACTION JOINT LOCATION MAY CHANGE BASED ON FINAL FOUNDATION CONSTRUCTION.
 3. DOWNSTREAM CHIMNEY SECTION SLOPE NOT SHOWN FOR CLARITY.

PROFILE 1

Source: GoogleEarth 2015

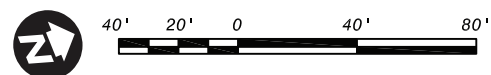


Figure 2-8
Replacement Dam Elevation



Source: SanGIS 2012; Black & Veatch 2014

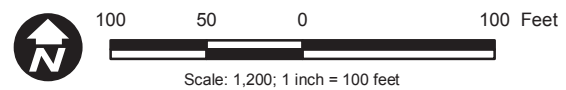


Figure 2-9
Oakvale Road Project Plan

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for placing the dam's foundation. Consolidation grouting would be provided to ensure a more uniform foundation modulus for support of the dam. A double-row grout curtain would be installed in the foundation to strengthen the foundation and reduce seepage.

Approximately 113,430 cubic yards of earth and rock is anticipated to be excavated for establishment of the dam foundation. Of this excavated material, approximately 53,914 is anticipated to be reused on site and approximately 59,516 is anticipated to be hauled off site. Due to its high quality, reuse of the off-hauled rock is anticipated and disposal at a landfill is unlikely. For purposes of environmental analysis, this EIR assumes the excess material would be hauled to a nearby quarry for processing and reuse as aggregate. Additional discussion of materials hauling is included below.

Spillway, Stilling Basin, and Outlet Tower

A spillway would be constructed in the center of the dam, built of cast-in-place concrete, with an elevation of 1,480 feet AMSL. The dam's central spillway has been designed to handle the maximum storm events approved by FERC, including the General Storm "All Season" Probable Maximum Flood (PMF) and the Local Storm PMF. The spillway is designed to flow into an energy dissipation stilling basin at the downstream foot of the dam, constructed of reinforced concrete, which catches water that overtops the dam before it discharges into the downstream river channel. The spillway would be stepped on the dam's downstream slope to dissipate energy along the entire spillway length and reduce the stilling basin size at the end of the spillway. The stilling basin would be approximately 90 feet wide by 70 feet long. Riprap would be installed at the transition from the stilling basin to the existing channel to prevent erosion and protect the stilling basin.

A new outlet tower would be constructed on the upstream side of the dam, built as a cast-in-place, reinforced concrete structure anchored to the dam's face and extending to the dam crest at elevation of 1,490 feet AMSL. The outlet tower would be connected to the proposed dam's downstream emergency release valve and appurtenances located on the south side of the new stilling basin and spillway. Releases would be projected into the stilling basin for discharge to Escondido Creek. The emergency release valve would enable reservoir water releases in the event of a dam safety event, in accordance with DSOD requirements that 10% of the reservoir volume could be released within 7 days and the entire contents of the reservoir could be released within 90 days.

Oakvale Road Improvements

Oakvale Road skirts a steep rock face just southwest of the existing left abutment of the existing dam and conflicts with the proposed location for the replacement dam's left abutment. The project entails realigning approximately 1,200 feet of the road toward the south and straightening the road. To create enough of a surface that would accommodate the realignment, the project requires excavation into the hillside to the south at a slope of 0.75:1 (H:V) and removal of approximately 56,000 cubic yards of rock and earth. The maximum height of the proposed finished slope is 110 feet, though much of the slope would be shorter. Figure 2-9 shows the proposed grading plan for the project and other impact areas. A 30-foot-wide work area is assumed around grading areas to enable equipment access.

The excess materials would be hauled off-site for reuse, with the contractor having the option of selling the excess material to a nearby quarry for processing and reuse as aggregate. Due to its quality, reuse of the rock is anticipated and disposal at a landfill is unlikely. Accordingly, for purposes of assessing environmental impacts pursuant to CEQA, this report assumes the material would be sold and hauled to a nearby quarry.

The new road would be constructed to County standards and would be 28 feet wide, including two 12-foot lanes in each direction, a 10-foot lane for nonmotorized traffic on the road's westbound (northern) shoulder, and a 3-foot bench constructed on the downhill (northern) side. Drainage improvements would include reconstruction of a storm drain beneath the western end of the roadway improvements, and a new 18-inch storm drain beneath the road on the eastern side of the project limits. A brow ditch would be constructed at the top of the slope that would divert storm flows down the slope. The brow ditch on the western side would carry water to an existing ditch situated at the toe of the slope along the road's southern edge and into a storm drain that flows beneath the road. This storm drain is located at the far western end of the roadway improvements and would be reconstructed as part of the project. The brow ditch on the eastern side would carry water to a proposed storm drain that would be constructed beneath the road and empty into an earthen swale on the northern side of the road.

Realignment of Oakvale Road was the subject of the Oakvale Road Realignment and Improvement Project Initial Study and Mitigated Negative Declaration (City of Escondido 2015b), which was adopted by the City in March 2015. For full disclosure of the dam project's environmental effects, the impacts of the Oakvale Road realignment are being addressed in this EIR as a part of the dam project.

Right Abutment Access Road

The project would entail construction of a gravel access road from the Lake Wohlford Marina to the right (north) abutment of the replacement dam (Figure 2-10). The road would provide construction access to the dam construction zone and, following completion of the project, would provide permanent maintenance and inspection access to the right abutment and the dam crest, as requested by the Division of Safety of Dams. Constructing the access road would require excavation into the hillside to create a level surface for installation of the road. A locked gate would be installed to prevent trespassing and unauthorized access to the dam crest. The road has been designed to fully avoid cultural resources sites recorded in the area, based on input from the archaeological research and field survey.

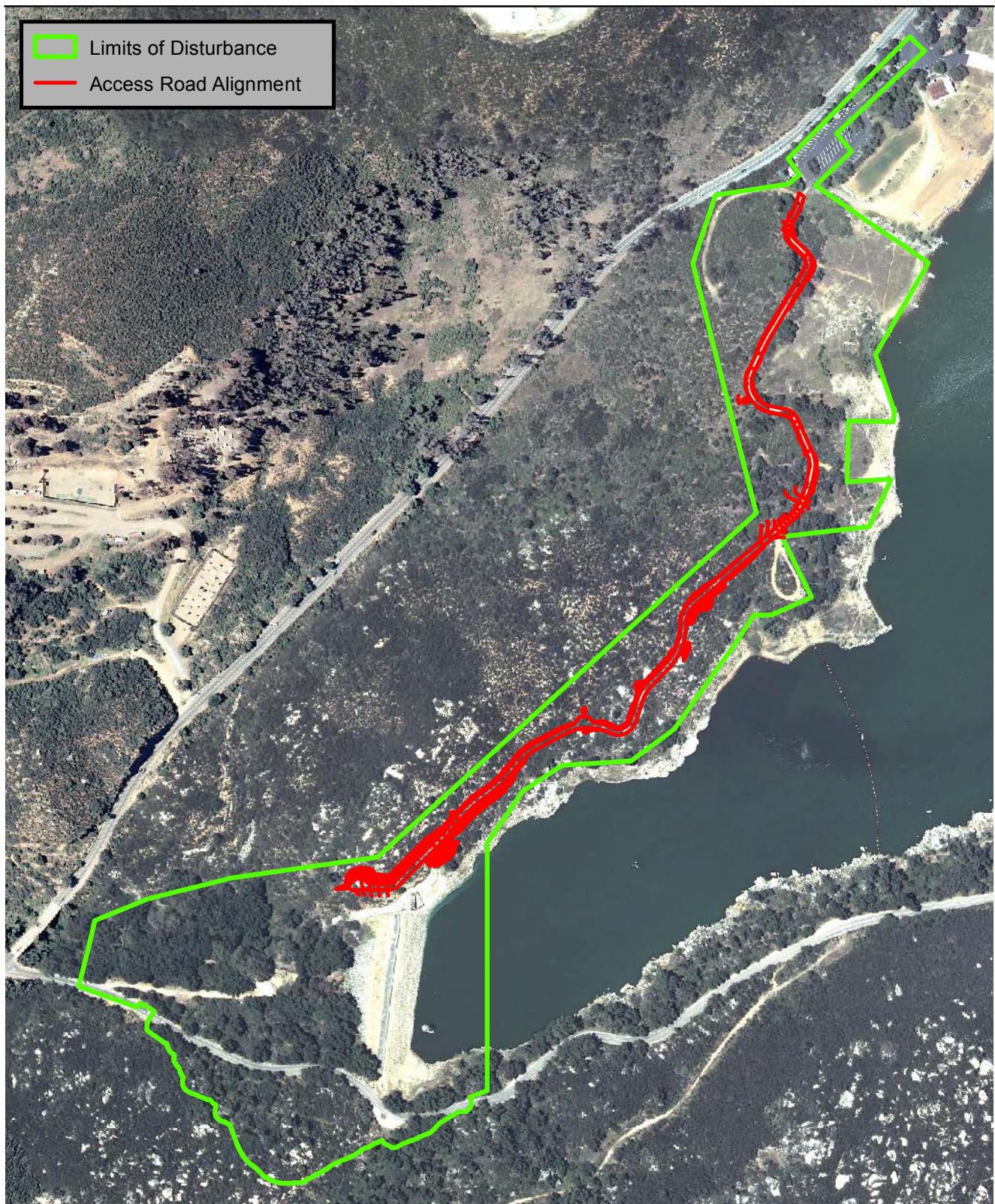
2.4.2 Construction Activity and Features of Project Construction

This section describes the temporary activities that would occur during project construction and the temporary features required to construct the project. Many aspects of project construction will be subject to the discretion of the contracting team that is selected to do the work. For purposes of project disclosure environmental impact analysis pursuant to CEQA, this EIR is based on assumptions of likely scenarios for construction work, as indicated by the project's design engineers and their construction management team.

Oakvale Road Realignment Excavation

Project construction would start with excavation of the slope adjacent to Oakvale Road and roadway realignment. The excavation process would first entail vegetation removal, then rock scaling and earth movement using backhoes, loaders, and dozers staged from the toe of the slope. In areas of large rocks that cannot be easily moved by a backhoe, the project would entail blasting and hydraulic splitting to loosen rock for off-hauling. The specific methods of work, including use of any heavy equipment, would be specified in a detailed work plan prepared by the contractor and approved by the City prior to project implementation. The contractor's work plan would identify potential hazard areas due to steep slopes and would specify appropriate protective actions to ensure safe conditions throughout this work. The work plan would identify areas where temporary protective fences would be installed to safely collect falling debris and prevent impacts to the road, the dam, and the reservoir. Where blasting and/or hydraulic splitting is required, the contractor's work plan would specify a detailed plan for this work.

Once rock and earth are removed from the hillside, these materials would be temporarily stockpiled on-site and loaded into 10-cubic yard dump trucks for hauling to a nearby quarry.



Source: SanGIS 2012; Black & Veatch 2014; USGS 2013



400 200 0 400 Feet



Scale: 4,800; 1 inch = 400 feet

Figure 2-10
Proposed Access Road Alignment

Lake Wohlford Dam Replacement Project EIR

Path: P:\2012\60278081_Lk_Wohlford\05Graphics\5.4_Proj_Graphics\Report_Graphics\PDF, 8/18/2015, delapazd

Based on current estimates of the excavation area, the amount of rock to be removed and exported would be 56,000 cubic yards, equating to 5,600 truckloads of 10 cubic yards each. For planning and environmental review purposes, project engineers have estimated that the hauling phase would entail approximately 70 trips per day over a 4-month period. The destination of excavated material would ultimately be determined by the contractor; however, for purposes of planning and environmental analysis, this EIR assumes haul trucks would travel from the project site through Escondido to I-15. A portion of the excavated rock may be hauled to the north shore of Lake Wohlford and deposited at the water's edge to create recreational fishing features. If this alternate placement occurs, a very small percentage of haul traffic would travel up Lake Wohlford Road to the marina rather than to the freeway.

After completion of excavation, the project would entail slope stabilization using a combination of rock bolts and wire netting to keep the rock in place. Rock bolts are long metal rods drilled into the rock face to stabilize the rock mass and prevent toppling or sliding along existing tension cracks. The bolts would also be used to anchor wire mesh to the rock surface. Bolts would be placed at locations and depths determined by additional site-specific geotechnical testing conducted by the contractor, allowing the contractor to fully address conditions as they are encountered in the field. Preliminary geotechnical engineering conducted for planning purposes indicates that the bolts would be approximately 30 to 40 feet long and would be placed about every 10 to 12 feet.

Oakvale Road would remain open to traffic during project construction, though the eastbound lane could be periodically closed to enable more room for construction vehicle access or construction staging. A traffic control plan would be prepared by the contractor that would identify measures to maintain traffic safety and ensure maintenance of adequate emergency access throughout the project construction period.

The City intends to construct the Oakvale Road realignment as a separate construction package prior to the dam construction. The separate bid packages will ensure a better understanding of the existing geotechnical conditions and material composition prior to implementing the dam foundation work, which in turn will allow refinement of the foundation design and dam design.

Foundation Development

Excavation of the dam's foundation and the adjacent slopes for placement of the abutments would begin with tree removal and vegetation clearing from the downstream work area and side slopes. Earth and rock would be removed from the dam foundation zone and rock would be scaled from the slopes using backhoes, loaders, and dozers staged from the area downstream of the existing dam. In areas where large rocks cannot be easily moved by a backhoe, the project

would entail blasting and hydraulic splitting, as discussed above in the Oakvale Road Realignment section. Identification of a suitable foundation would be performed by an experienced, licensed engineering geologist, with the approval of DSOD, and would be deemed adequate when rock is reached that is too hard to excavate with large equipment; when rock joints are generally slightly weathered or less; and when the surface is rough and generally level in an upstream to downstream direction.

The entire foundation surface would be cleaned by barring and prying loose rock, using an air/water jet to remove as much loose material as possible. As with the Oakvale Road work, the contractor would be required to prepare a detailed work plan to identify potential hazard areas and specify appropriate protective actions ensuring safe conditions. Foundation and side slope excavation would require blasting and hydraulic drilling, which also would be addressed in the contractor's work plan.

A double-row grout curtain would be installed in the foundation to strengthen the foundation and reduce seepage. Grout would be used to fill open fractures, voids, and irregularities within the rock foundation, reducing secondary permeability and providing more homogeneous foundation conditions.

Consolidation grouting would be performed to fill open cracks, joints, and other geologic discontinuities below the foundation surface to provide more consistent and predictable foundation conditions in the shallow zone. The consolidation grouting would improve the modulus of deformation of bedrock in the shallow dam foundation, helping to mitigate the chance for differential settlement that could result from the added stress increase to the shallow foundation due to construction. Consolidation grouting is the injection of grout from the rock surface at low pressures into an evenly spaced pattern of shallow grout holes (15 to 20 feet in depth for this dam) for the purpose of treating the near surface dam foundation and abutments.

Dewatering will be required during excavation and construction of the dam foundation. Dewatering would be conducted in compliance with all applicable regulations, and the contractor would be required to obtain permission from the San Diego RWQCB under General Order R9-2008-0002.

As with the material excavated from the Oakvale Road slope, material from the foundation and abutment slopes would be temporarily stockpiled on-site and then hauled to a nearby quarry. Based on current estimates of the excavation area, the amount of excavated rock to be exported for this phase of work would be approximately 59,516 cubic yards, equating to approximately 5,952 truckloads of 10 cubic yards each. Trucks with capacity to haul 20 cubic yards may be used, but environmental analysis conducted for this EIR assumes smaller loads to allow for a

more conservative estimate of the number of haul trips. It is estimated that approximately 960 cubic yards would be excavated in each work day during this phase of the project, resulting in 96 haul trips per day. For planning and environmental review purposes, it is estimated this hauling would occur over a 9-week period. The destination of excavated material would ultimately be determined by the contractor; however, for purposes of planning and environmental analysis, this EIR assumes haul trucks would travel from the project site through Escondido to I-15.

Staging Yards and Construction Work Areas

The primary staging area for project construction is anticipated to be located west of the Lake Wohlford Marina, as shown in Figure 2-5. This is referred to as the marina staging area throughout this EIR. A chain-link fence would be installed around the staging yard to prevent trespassing. Lake Wohlford and the Lake Wohlford Marina are planned to remain open to the public during project construction, with the exception of the existing dam demolition, during which the reservoir and marina would be closed due to additional reservoir drawdown.

An additional area of construction staging and project construction activity would also occur in the canyon immediately downstream of the dam. Establishment of this downstream staging and work area would require removal of vegetation, including mature oak trees, rock removal, and grading to create level surfaces and usable space for equipment movement and temporary stockpiling of excavated materials.

A temporary staging area for the Oakvale Road excavation and realignment would be developed and utilized on the eastern side of the proposed slope and south of the proposed road. This staging area could require some grading to establish a suitable work area.

Dam Construction

Once the foundation is completed, consecutive layers of RCC would be placed to form the dam structure. The RCC placement method is described above in Section 2.4.1. This phase of project construction is anticipated to involve 24-hour work (weather permitting) to maximize the effectiveness of placing the RCC layers.

Project engineers are in the process of developing an RCC mix design appropriate for this project, and initially considered both on-site aggregate sources (e.g., materials that would be excavated from the Oakvale Road slope and the dam foundation) and off-site sources from local quarries. Due to limited space available in the project work areas and staging areas, the project engineers determined it would be more feasible to use an off-site source. Accordingly, the project would entail hauling of concrete materials to the project site. Project engineers estimate

the 100,000 cubic yards of RCC would require 175,000 tons of aggregate material, 9,250 tons of fly ash, and 8,750 tons of cement, or a total of 193,000 total tons of RCC material that would be delivered to the site. Assuming a 25-ton capacity per 20-cubic-yard truck, hauling of RCC materials is anticipated to require 7,720 total truck trips. This hauling is anticipated to be distributed over approximately 13 weeks during the 4- to 5-month period of dam construction.

An RCC batch plant would be established at the primary staging yard located southwest of the Lake Wohlford Marina. Concrete would be mixed at the staging yard and then transported to the dam construction area via the access road to the right abutment, which is discussed below. For concrete mixing, the contractor would establish three material stockpiles, one for each of the three constituent materials. These piles would be replenished by haul trucks transporting materials from off-site. Material would be transferred to three silos that in turn would feed material into the batch mixer. Deliveries of material to the staging yard would be limited to daytime work hours, Monday through Saturday, to prevent nighttime noise from haul trucks at the staging yard access point.

Two temporary retention ponds would be located downstream of the stockpiles, silos, and batch mixer to catch storm water runoff from the construction operation and prevent it from entering the reservoir. The retention ponds would require shallow excavation to ensure adequate capacity to handle this construction runoff.

RCC can be transported via truck or conveyor, or some combination of the two, and the project engineers intend to maintain flexibility in the transport mode, giving the contractor the option of establishing a conveyor or using trucks. However, the project is likely to include a conveyor system for transporting material along the access road and placing the material onto the dam. This would minimize the amount of equipment traveling on and off of the lift surface to prevent contamination of the material, minimize lift joint cleaning, and increase the shear strength between successive lifts. Conveyor operation would also limit the number of on-site hauling trips. Truck hauling is unlikely due to limited space available for haul trucks to pass each other and turn around. Therefore, this EIR assumes RCC material would be transported along the access road via conveyor.

Construction of the new outlet tower would occur while the existing dam is still in place, so no cofferdams or in-the-wet construction would be required.

Flood Control and Temporary Outlet Bypass

Lake Wohlford will be kept at its current water level, between 1,450 and 1,460 feet AMSL, during project construction, and the existing dam will serve as the cofferdam during construction

of the replacement dam. Flood protection during the construction period will be provided by a temporary bypass pumping system that will be installed by the contractor with a minimum capacity of 30 cubic feet per second (cfs) to convey seasonal flows to the City's water treatment plant. The temporary bypass system will pump water from the reservoir into the existing penstock downstream of the construction area. In the event that the flows cannot be conveyed to the water treatment plant or they exceed the capacity of the existing penstock, they will be released to Escondido Creek downstream of the construction area. The temporary system will also be used to maintain the water level within the reservoir when not being used to convey the seasonal flows.

Hydraulic model runs performed by the project design team indicate that by maintaining reservoir levels at or below 1,460 feet AMSL and by allowing releases through the temporary bypass works, Lake Wohlford can accommodate the Local Storm PMF and all smaller storm events, including the 100-year event. Should the storms exceed these events, the contractor will be required to provide additional pumping through the temporary system with disposal to Escondido Creek to maintain or return the reservoir levels to the elevations noted above.

Demolition of Existing Dam and Existing Outlet Tower

After the new dam construction is complete and the City receives regulatory approval by DSOD to impound water at the new dam, the reservoir will be lowered to elevation 1,440 AMSL to allow for the demolition and breaching of the existing dam and demolition of the existing tower. The hydraulic fill portion of the existing dam would be removed down to 1,450 feet AMSL. A notch would be constructed in the existing dam to 1,420 feet AMSL to allow full flow access from the reservoir to the new outlet tower. The left abutment of the existing dam will be removed in its entirety to existing natural grade. For purposes of environmental analysis, this EIR assumes the excavated material would be hauled off-site for reuse. Excavation quantity for the existing dam removal is estimated at approximately 37,100 cubic yards, which would require 3,710 truck trips in 10-cubic-yard trucks. This hauling is anticipated to entail approximately 96 haul trips per day over an approximately 6-week period.

The City intends to issue a bid alternative for this construction contract that would involve full removal of the existing dam. This would require additional excavation and off-hauling of material. The full demolition excavation is estimated at 22,000 additional cubic yards beyond that described above for the top part of the dam, for a total of 59,100 cubic yards of excavated material that would be hauled off-site. Off-hauling of this material would extend the number of days of 96 haul trips by another 3 weeks. For purposes of conservative environmental review, this EIR assumes the full dam removal option would be implemented.

The existing outlet tower east of the dam would be demolished above 1,442 feet AMSL and the material would be removed. Below 1,442 feet AMSL, the existing outlet tower would be filled with concrete and abandoned in place. The outlet tunnel leading to the existing dam would also be filled with concrete and abandoned in place.

Haul Routes

Haul routes for disposal of excavated materials and delivery of equipment and aggregate materials will be determined by the contractor and will not be dictated by the City in the construction specifications. For purposes of analysis in this EIR, the haul route is anticipated to travel from the project site to I-15 through Escondido, rather than north or east through Valley Center. The Traffic Impact Analysis prepared for the project by Linscott Law and Greenspan (see Section 3.11) assumed routes based on truck routes identified in the City General Plan Circulation Element, and concluded hauling would be performed on a combination of three routes: El Norte Parkway, Valley Parkway, and Bear Valley Parkway.

Construction Schedule

Total project construction is anticipated to take 32 months, including the Oakvale Road and dam replacement components of the project. The Oakvale Road realignment excavation is anticipated to take approximately 4 months, followed by another month to construct the realigned road. Dam construction, excluding reservoir dredging but including contractor mobilization and demobilization, is expected to require approximately 27 months. Excavation and preparation of the dam foundation is anticipated to take 14 months. Establishment of the access road is anticipated to take 1 to 2 months. The dam raise construction is anticipated to take 5 months. The reservoir dredging work is anticipated to take another 7 months but may not be implemented immediately after the completion of the dam construction project.

2.4.3 Refilling Reservoir

After completion of the project and following DSOD authorization to fill the reservoir beyond the mandated 1,460 feet AMSL restricted level, the City would have the ability to fill the reservoir up to its 1,480 feet AMSL capacity. This does not mean the City would immediately fill to that level; most likely, the reservoir would return to its pre-drawdown conditions, in which it was subject to seasonal and temporal fluctuation in water levels, as shown above in Figure 2-2. Initial refilling of the reservoir and subsequent maintenance of reservoir elevation will depend on rainfall within the reservoir's watershed, the availability of water deliveries from Lake Henshaw, and demand for municipal water in the reservoir's service area. The actual schedule for filling the reservoir after completion of the project is unknown at this time.

This EIR shows the 1,480-foot maximum inundation level for informational purposes; this is not intended to imply that the reservoir would be filled to this level following construction and held at this level. The maximum level at which the reservoir could eventually be filled under normal operations would include some freeboard beneath the spillway, to prevent unnecessary release of water over the top of the dam.

2.5 INTENDED USE OF THE EIR

In compliance with CEQA, this EIR is intended to assess potential environmental impacts that would result from implementing the proposed project and to make the impact analysis available for review by the general public and public agencies. Before making a final determination on project approval, the Escondido City Council will review and certify the Final EIR after the Draft EIR has been made available for public review.

2.5.1 List of Agencies Expecting to Use This EIR for Decision Making

Any public agency with a potential stake in the proposed project would be given an opportunity to review and comment on this EIR. In addition to the City of Escondido, the following agencies would use this EIR to inform one or more discretionary actions under the regulatory jurisdiction:

- USFWS
- RWQCB, Region 9
- CDFW
- USACE
- State Historic Preservation Officer (SHPO)
- California Department of Water Resources DSOD

2.5.2 List of Approvals Necessary for the Proposed Project

The dam construction would require multiple approvals from local governments and from federal, state, and local regulatory agencies. The contractor would be responsible for submitting a Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) for coverage by the general National Pollutant Discharge Elimination System (NPDES) permit for construction. In addition, project improvements would occur within designated “waters of the U.S.” and would affect a jurisdictional stream, Escondido Creek. This action would require permits under the California Fish and Game Code and the federal Clean Water Act (CWA). County permits and approvals would be required related to the Oakvale Road realignment for work in County right-of-way. There is no discretionary action of the County associated with the project.

The City of Escondido is the Lead Agency for the project, as it is the agency with primary authority over the project's discretionary approvals. Several other agencies, identified as responsible agencies, will also use the EIR for their consideration of approvals or permits under their respective authorities. For the purpose of CEQA, the term "responsible agency" includes all public agencies other than a lead agency that may have discretionary actions associated with the implementation of the proposed project or an aspect of subsequent implementation of the project.

Table 2-1 identifies the list of permits and approvals that would be required from the lead agency and responsible agencies. The necessary permits and approval are listed in sequential order with notes related to timing and process.

**Table 2-1
Matrix of Required Permits and Approvals**

Permit/Action Required	Approving Agency	Lead/ Responsible Agency Designation	Timing and Process Notes
EIR Certification	City of Escondido (City)	Lead Agency	To occur concurrent with City discretionary approval of the project.
Design Approval	DSOD	Responsible Agency	Following City approval and prior to construction
Roadway Design Approval (Oakvale Road)	County of San Diego (County)	N/A (ministerial permit)	Following City approval and prior to construction
Encroachment Permit (Oakvale Road)	County	N/A (ministerial permit)	Following City approval and prior to construction
Section 1601 Streambed Alteration Agreement	CDFW	Responsible Agency	Following City approval and prior to construction.
CWA Section 404 Dredge and Fill Permit ¹	USACE	Responsible Agency	Following City approval and prior to construction.
CWA Section 401 Water Quality Certification	RWQCB, Region 9	Responsible Agency	Following City approval and prior to construction.
Dewatering Permit	RWQCB, Region 9	Responsible Agency	Following City approval and prior to construction.
Construction General Permit	RWQCB, Region 9	Responsible Agency	Following City approval and prior to construction.
NPDES Permit	SWRCB	Responsible Agency	Following City approval and prior to construction.
Grading Permit	City	Lead Agency	Following City approval and prior to construction.
Certificate of Approval (Reservoir Fill Authorization)	DSOD	Responsible Agency	Following completion of construction and prior to restoration of water levels.

¹ Section 7 Consultation between the USACE and USFWS will be completed in accordance with the Endangered Species Act.

CHAPTER 3.0

ENVIRONMENTAL IMPACT ANALYSIS

3.3 BIOLOGICAL RESOURCES

This section replaces, in full, Section 3.3 from the previously circulated Draft EIR (October 2016) for the project. This section has been revised in response to comments received from the circulation of the Draft EIR, updated LiDAR survey data for detailed inundation analysis, updated bird surveys conducted in 2017, and an updated bald eagle survey in 2020.

This section describes existing biological resources conditions and identifies potential impacts during project construction and operation. Information provided in this section is derived from the *Lake Wohlford Dam Replacement Project Biological Technical Report* (BTR) (AECOM 2014a) and the *Lake Wohlford Dam Replacement Project Jurisdictional Delineation Report* (JDR) (AECOM 2014b). These reports are provided in this EIR as Appendices C and D, respectively. Additional biological resources information specific to the Oakvale Road realignment is taken from the Oakvale Road Realignment and Improvement Project MND (City of Escondido 2015b). A 45-day report submitted to USFWS documenting the results of updated protocol surveys conducted during the 2017 breeding season, in response to a request from USFWS and CDFW submitted during the Draft EIR public review period, is provided as Appendix C-1.

3.3.1 Existing Conditions

This section describes the existing biological setting of the Biological Study Area (BSA), including the regional context of the site, vegetation communities, plant species, wildlife species, rare and sensitive plant and wildlife species either known or potentially occurring in the proposed project site, jurisdictional waters, and wildlife corridors.

Methods and Definitions

Biological Study Area

The BSA addressed in this report consists of the project's impact area plus an approximately 500-foot buffer. The project's impact areas include approximately 33.64 acres that are assumed disturbed by project construction (referred to herein as the limits of disturbance or LOD) and 208.06 acres that would be disturbed as the water level increases and returns to pre-2007 levels

(1,480-foot elevation) following project construction (referred to herein as the maximum inundation area). The BSA is shown in Figure 3.3-1.

The majority of the BSA is within the boundaries of San Diego County's Multiple Habitat Conservation Program (MHCP) Final Plan (County of San Diego 2003), while a small portion of the BSA lies within lands subject to the draft North County Multiple Species Conservation Program (NCMSCP). Since the NCMSCP is in draft form, there is no regulatory applicability to the project. Accordingly, the City has elected to apply the mitigation ratios of the MHCP, where appropriate, in assessing the project's habitat impacts pursuant to CEQA and identifying habitat-based mitigation.

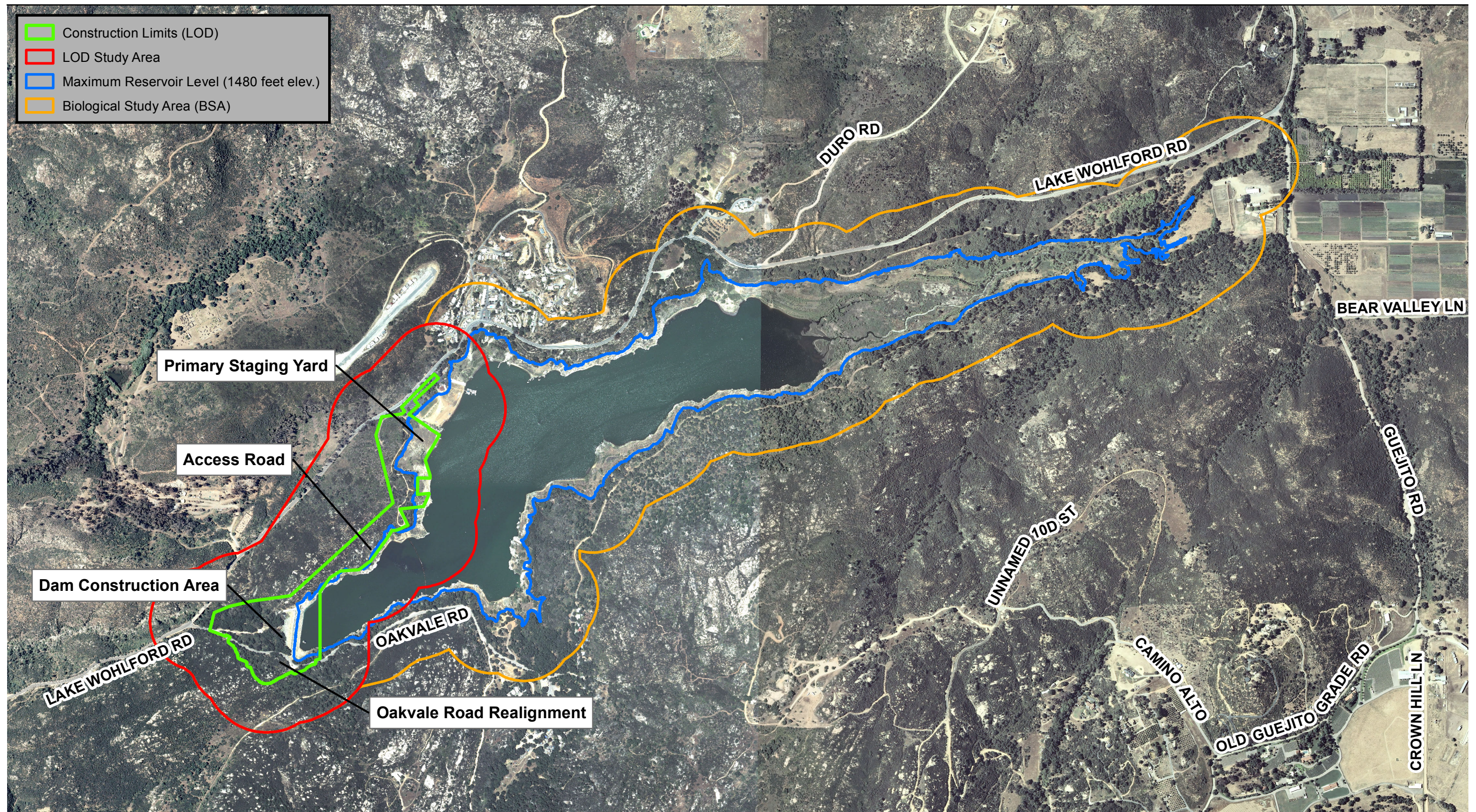
Special-Status Species

For purposes of this analysis, species are considered to have special status if they meet at least one of the following criteria:

- Listed as threatened or endangered under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA)
- California Department of Fish and Wildlife (CDFW) Species of Special Concern or Watch List (CDFW 2013)
- CDFW fully protected species (CDFW 2013)
- Listed as sensitive by the California Native Plant Society (CNPS 2013)
- Covered under the draft NCMSCP and/or the County of San Diego Multi-Habitat Conservation Program (MHCP)

Biological Resources Surveys

Biological field surveys completed for the project included a vegetation mapping survey; general wildlife reconnaissance surveys; rare plant surveys; USFWS protocol surveys for coastal California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher; focused bat surveys; a delineation of wetlands and waters that are jurisdictional of federal and state agencies; and a focused bald eagle nest survey. Prior to the initiation of biological field surveys and the environmental analyses, existing data were compiled and reviewed for the BSA. This process included a review of the available data on past observation from the CNPS California Rare Plant Rank (CRPR) List, California Natural Diversity Database (CNDDDB), and SanGIS (CNPS 2013; CDFW 2013).



Source: SanGIS 2012; Black & Veatch 2014; USGS 2013

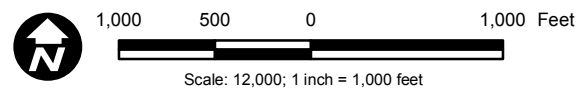
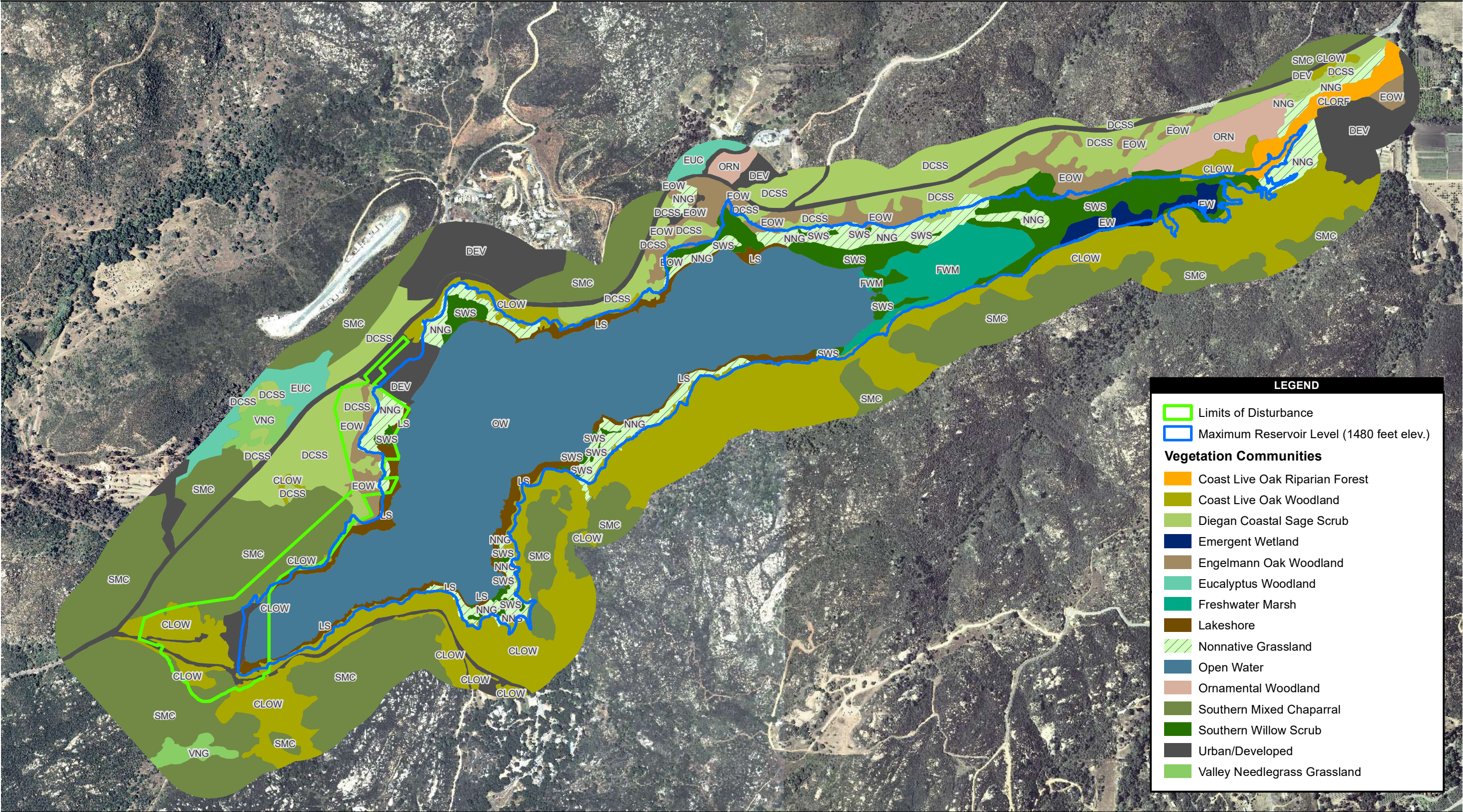


Figure 3.3-1
Biological Study Area

Lake Wohlford Dam Replacement Project EIR

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Source: ; AECOM 2014; SanGIS 2012.



Figure 3.3-2
Vegetation Communities

Vegetation mapping was conducted concurrently with rare plant surveys, which occurred during the appropriate blooming periods for local sensitive plant species in January, March, and June 2013. General wildlife surveys coincided with USFWS protocol surveys for the three bird species identified above during spring and summer 2013, and as updated in 2017 in response to a comment on the Draft EIR. Focused bat surveys were conducted in the summer and fall of 2013. In 2020, a focused survey for a bald eagle nest was conducted. Survey details for surveys prior to 2017, and USFWS protocols, are described in Section 2.2 of the BTR (Appendix C). The 2017 and 2020 surveys, conducted after initial public review, are summarized herein.

Environmental Setting

Vegetation Communities

Fourteen native and naturalized vegetation communities were determined present in the BSA. This includes the wetlands communities emergent wetland, freshwater marsh, lakeshore, open water, southern willow scrub, and coast live oak riparian forest; and the upland communities Diegan coastal sage scrub, southern mixed chaparral, nonnative grassland, Engelmann oak woodland, coast live oak woodland, and eucalyptus woodland, ornamental woodland, and valley needlegrass grassland. One additional unvegetated cover type, urban/developed, was also mapped. Of these vegetation communities and cover types, all were detected within the LOD and maximum inundation area, with the exception of eucalyptus woodland, ornamental woodland, and valley needlegrass grassland. The mapped locations of the vegetation communities within the BSA are shown in Figure 3.3-2. Detailed descriptions of each vegetation community are provided in Section 3.1 of Appendix C. The MHCP classifies vegetation communities into groups that reflect their relative biological resource values, ranging from Group A (highest value) to Group F (lowest value). Table 3.3-1 details the acreage of the vegetation communities within the LOD and maximum inundation area, along with their MHCP group designations. In this table, areas that are in both the LOD and maximum inundation area are shown as LOD acreage impacts, and not in the inundation acreages.

Table 3.3-1
Vegetation Communities and Cover Types within the
LOD and Maximum Inundation Area

Vegetation Community	MHCP Group Designation	Holland Code ¹	LOD (acres)	Maximum Inundation Area (acres) ²	Total (acres)
Wetlands					
Emergent Wetland	A	N/A	0.00	3.97	3.97
Freshwater Marsh	A	52400	0.00	13.69	13.69
Lakeshore	A	N/A	1.25	11.47	12.73
Open Water	A	N/A	2.12	126.84	128.96
Southern Willow Scrub	A	63320	0.41	25.31	25.72
Coast Live Oak Riparian Forest	A	61000	0.00	0.76	0.76
Subtotal Riparian and Wetlands			3.78	182.04	185.83
Uplands					
Engelmann Oak Woodland	B	71181	2.36	0.70	3.06
Coast Live Oak Woodland	B	71162	8.01	3.55	11.55
Diegan Coastal Sage Scrub	C	32500	4.32	0.82	5.14
Southern Mixed Chaparral	D	37121	8.58	0.09	8.67
Nonnative Grassland	E	42200	2.60	17.97	20.57
Subtotal Uplands			25.86	23.13	48.99
Other Cover Types					
Urban/Developed	N/A	12000	4.00	2.88	6.89
Subtotal Other Cover Types			4.00	2.88	6.89
Total (acres)			33.64	208.05	241.71

¹ Based on the *Draft Vegetation Communities of San Diego County* (Oberbauer et al. 2008).

² Acreages in this column only include areas within the 1,480-foot elevation that are outside the LOD; there is no overlap. Acreages were updated in the Recirculated EIR based on LiDAR survey information.

Note: All acreages are rounded to the nearest hundredth, which may account for minor rounding error in totals.

Jurisdictional Waters and Wetlands

Wetlands were delineated within the LOD and the maximum inundation area of 1,480-foot elevation. In the inundation area, the approximate spatial extent of the 4-month inundation area (1,464-foot elevation) was also mapped and quantified separately. The 4-month inundation mapping was completed in consultation with the wildlife agencies to approximate the area where wetland habitats such as southern willow scrub may not persist post-project. As presented in Table 3.3-2, a total of 188.26 acres of waters of the U.S.¹ and state² were delineated for the project, within the LOD and inundation area. Of those acres, 166.58 acres are waters of the U.S. and state under the purview of USACE, RWQCB, and CDFW consisting of Escondido Creek

¹ Jurisdictional waters of the U.S. include jurisdictional waters of the state.

² State jurisdictions often exceed, in lateral extent and area, federal jurisdiction. Therefore, jurisdictional waters of the U.S. include waters of the state. Although federal and state jurisdictions do overlap, they remain distinct for regulatory administration and permitting purposes.

and Lake Wohlford and their abutting wetlands. Also, several small ephemeral channels that are tributary to Escondido Creek and Lake Wohlford were delineated. The additional 21.68 acres are exclusively waters of the state under the purview of CDFW, which consists of the outer limits of the riparian corridor that surrounds Escondido Creek and Lake Wohlford. The jurisdictional delineation results are shown in Figure 3.3-3.

Table 3.3-2
Summary of Waters of the U.S. and State Occurring within
the Limits of Disturbance, 4-Month Inundation Limit, and Maximum Inundation

Type of Habitat	LOD ¹	LOD to 1464 Elevation ²	1464 to 1480 Elevation ³	TOTAL
Waters of the U.S. & State (USACE, RWQCB, & CDFW)				
Wetland	0.04	15.23	11.91	27.18
Other Waters	3.04	132.90	3.46	139.4
<i>Subtotal Waters of the U.S.</i>	<i>3.08</i>	<i>148.13</i>	<i>15.37</i>	<i>166.58</i>
Waters of the State (CDFW)				
Riparian Component	6.85	0.42	11.64	18.91
Other Waters	0.73	0.05	2.0	2.78
<i>Subtotal Waters of the State</i>	<i>7.57</i>	<i>0.47</i>	<i>13.64</i>	<i>21.68</i>
Grand Total Jurisdictional Waters	10.65	148.60	29.01	188.26

¹ Jurisdictional waters acreage of the survey area was determined by using ArcGIS. All acreages are rounded to the nearest hundredth (which may account for minor rounding error).

² Acreages in this column only include areas within the 1,464-foot elevation that are outside the LOD (4-month inundation limit); there is no overlap. Acreages were updated in the Recirculated EIR based on LiDAR survey information.

Acreages in this column only include areas within between the 1,464 and 1,480-foot elevation that are outside the LOD (maximum inundation area); there is no overlap. Acreages were updated in the Recirculated EIR based on LiDAR survey information.

Sensitive Plant Species

In total, 224 plant species were detected in the BSA during vegetation mapping and rare plant surveys (Appendix F of the BTR, which is included in this document as Appendix C). The CNDDDB search identified 49 special-status plant species that have potential to occur within the BSA based on the project's regional location. Table 4 of Appendix C lists the plants, their sensitivity status, whether suitable habitat for the plant is present in the BSA, and the determination of species presence or absence in the BSA. See Section 3.3 of Appendix C for additional detail and rationale of presence/absence determination for these species.

Only one sensitive plant species, Engelmann oak (*Quercus engelmannii*), was observed within the BSA. Engelmann oak is present in the LOD, the proposed inundation area, and areas of the project's buffer. This species does not have listing status under the federal ESA or CESA, but is considered sensitive by CNPS and classified as CRPR List 4.2 (i.e., a plant of limited

distribution, moderately threatened in California). It is also a species covered under the draft Escondido Subarea Plan. The locations of Engelmann oak woodlands within the BSA are shown in Figure 3.3-4.

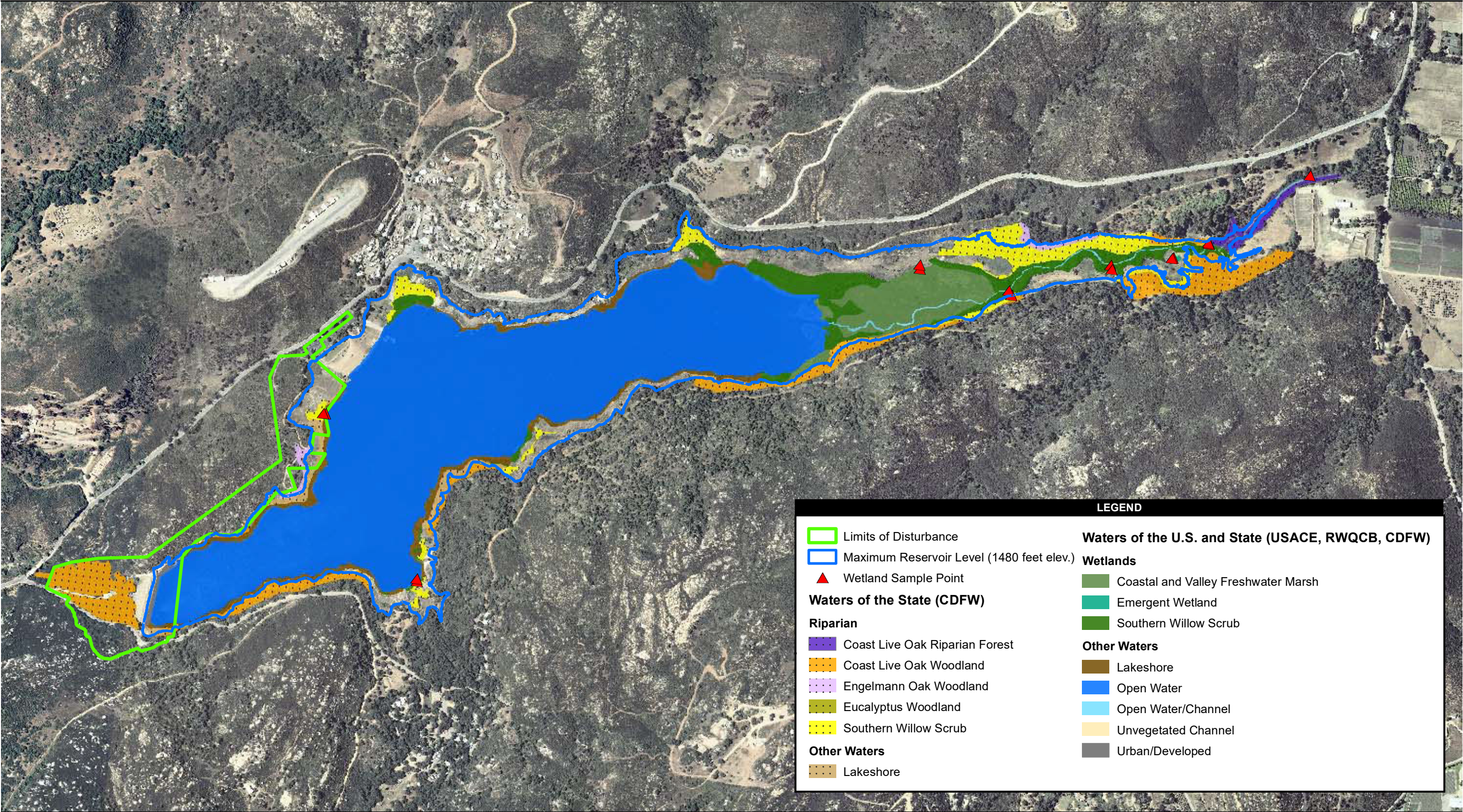
Sensitive Wildlife Species

According to the CNDDDB search and the USFWS species list, 41 special-status wildlife species have potential to occur within the BSA based on the project's regional location and prior observation data. Table 5 of Appendix C lists the wildlife species from the CNDDDB search, their sensitivity status, the results of the project surveys indicating detection or nondetection of the species, and the probability of occurrence in the BSA. See Section 3.4 of Appendix C for additional detail and rationale of presence/absence determination for these species.

Based on habitat conditions in the BSA observed during initial reconnaissance surveys, USFWS protocol surveys were conducted for coastal California gnatcatcher (CAGN), least Bell's vireo (LBV), and southwestern willow flycatcher (SWFL) in 2013. Focused bat surveys were also conducted in 2013. No CAGN, LBV, or SWFL were detected in the BSA during the 2013 protocol surveys or other surveys conducted that year. In response to a request from CDFW and USFWS in their joint comment letter submitted on the Draft EIR, the City conducted updated protocol surveys for these bird species during the 2017 breeding season. The 45-day report to USFWS documenting the results of these surveys is included as Appendix C-1. No CAGN or SWFL were detected during these updated surveys. One LBV pair was detected during three of the early survey visits, but was not detected in the final four survey visits occurring in June and July. This pair was observed shifting locations during the early survey visits, apparently investigating areas to determine an ideal nesting site, but no nests were observed. Once they could no longer be detected, it was assumed that they had ultimately moved outside the survey area to nest. Suitable habitats for CAGN and SWFL within the BSA were concluded to be unoccupied. AECOM concluded in the 45-day report that the habitat in the LBV survey area is generally too open to be ideal for LBV breeding. AECOM also observed many brown-headed cowbirds (*Molothrus ater*) during multiple survey visits for LBV and SWFL, indicating a significant presence of this nest parasite, similar to observations made during the prior surveys in 2013, which represents a constraint on occupation of the site by LBV.

In response to information provided by the USFWS, AECOM conducted a focused survey of a documented nest location for the bald eagle in 2020. Active nesting was observed just outside of the BSA, north of Lake Wohlford Road and approximately 0.75 mile east of the LOD.

Focused bat surveys identified two CDFW Species of Special Concern bat species in the BSA, but no roosting sites were documented.



Source: SANDAG 2012; AECOM 2014

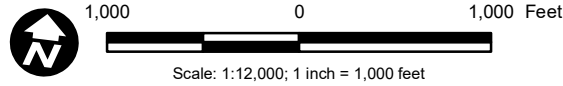
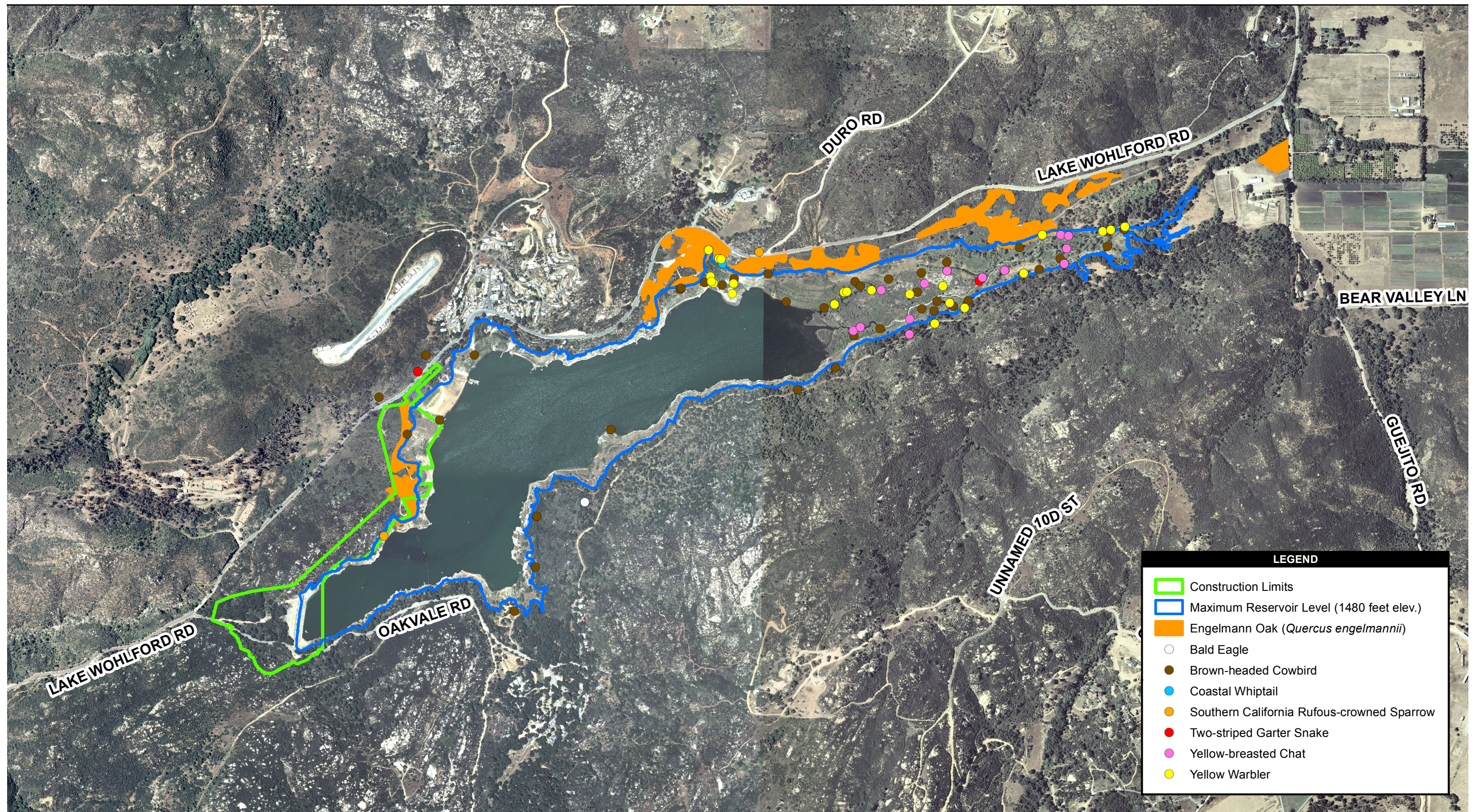


Figure 3.3-3
Jurisdictional Delineation



Source: ; AECOM 2014

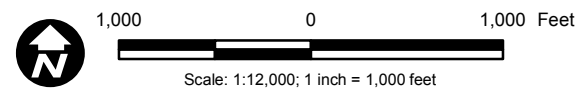


Figure 3.3-4
Sensitive Biological Resources with the BSA

The following seven sensitive wildlife species were detected within the BSA during surveys:

- bald eagle (*Haliaeetus leucocephalus*), endangered species per CESA, CDFW Fully Protected species, protected under federal Bald and Golden Eagle Protection Act
- Cooper's hawk (*Accipiter cooperii*), CDFW Watch List species
- southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), CDFW Watch List species
- yellow warbler (*Dendroica petechia brewsteri*), CDFW Species of Special Concern
- yellow-breasted chat (*Icteria virens*), CDFW Species of Special Concern
- pallid bat (*Antrozous pallidus*), nonlisted CDFW Species of Special Concern
- western mastiff bat (*Eumops perotis californicus*), nonlisted CDFW Species of Special Concern
- least Bell's vireo (*Vireo bellii pusillus*), endangered species per federal ESA and CESA

The locations of the sensitive wildlife species observations within the BSA during 2013 surveys are shown in Figure 3.3-4. Locations of sensitive wildlife species observations within the respective protocol survey areas during the 2017 surveys are shown in Figure 3.3-4a.

In addition to special-status species listed above, several non-special-status bird species were detected that are subject to the federal Migratory Bird Treaty Act (MBTA).

Wildlife Corridors

Water impounded within Lake Wohlford represents a high-value resource to wildlife species, and the presence of undeveloped land within and adjacent to the BSA makes the area important to local wildlife movement. In general, wildlife species are likely to use habitat in the BSA for movements related to home range activities (foraging for food and water, defending territories, searching for mates, breeding, and cover). Movement would likely be concentrated in the riparian and wetland habitat because these areas may provide greater foraging opportunities and cover.

Regulatory Setting

Federal Regulations

Federal Endangered Species Act

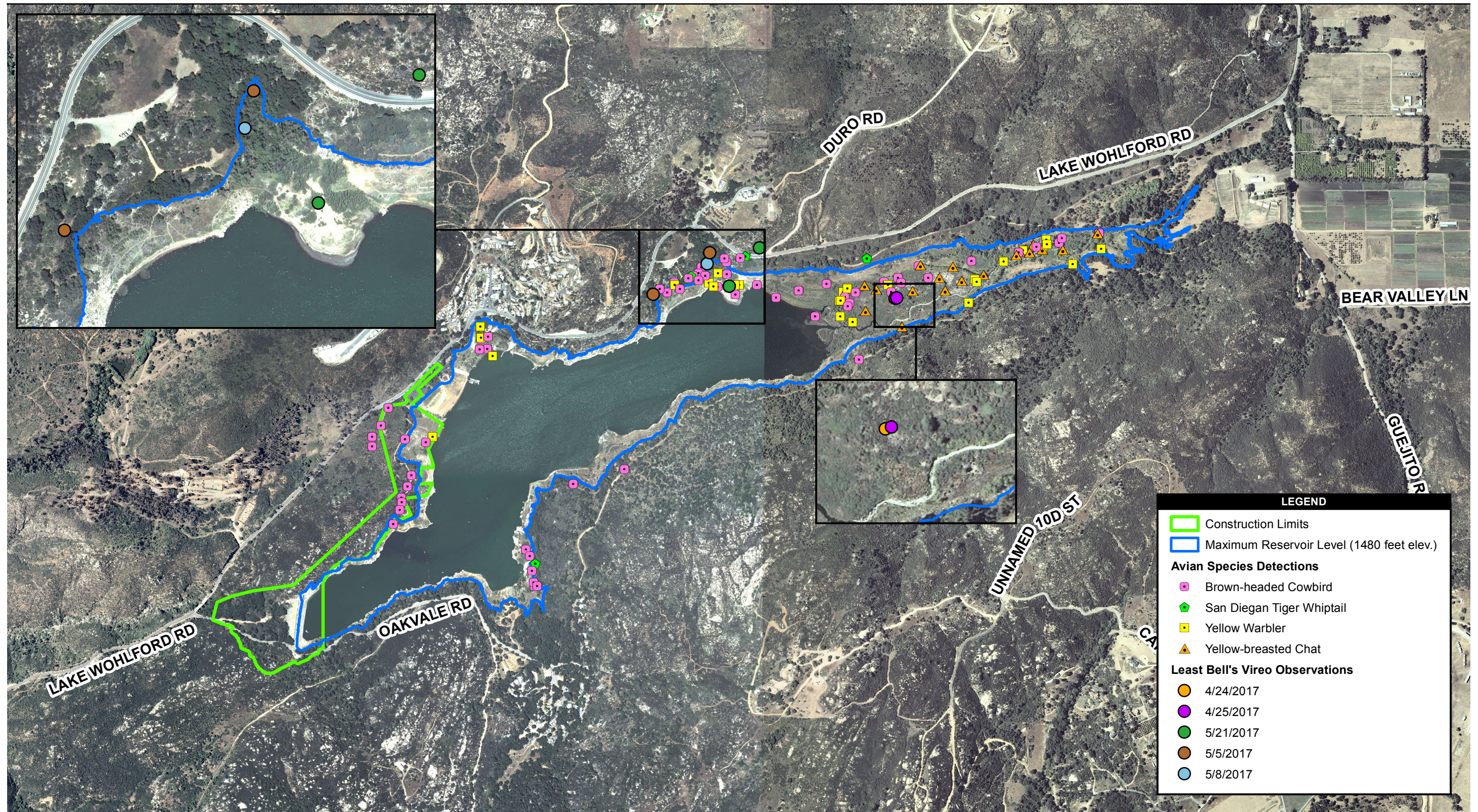
Congress passed the federal ESA (16 United States Code [U.S.C.] 1531 et seq.) in 1973 to protect species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range, including all regulations made public pursuant to that act. ESA provides for the protection, recovery, and conservation of fish, wildlife, and plants that have been federally listed as threatened or endangered. ESA prohibits the take, harm, or harassment of, species listed as threatened or endangered by USFWS or the National Marine Fisheries Service.

Bald and Golden Eagle Protection Act

The federal Bald and Golden Eagle Protection Act of 1940, with multiple amendments, provides for protection of the golden eagle nationwide by prohibiting the taking of eagles, including their parts, nests, or eggs. The act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.” This act is relevant to the project because bald eagles are known to nest and forage in the area. The portion of the act most relevant to this project is “disturb.” “Disturb” is defined in the Bald and Golden Eagle Protection Act as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.”

Clean Water Act of 1972

The Clean Water Act (CWA) is the primary federal law dealing with surface water quality control and protection of beneficial uses of the nation’s waters, including lakes, rivers, aquifers, and coastal areas. Section 404 of the CWA establishes a permit program, administered by USACE, regulating discharge of dredged or fill materials into waters of the U.S., including wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. CWA Section 404 permits are issued by USACE. Pursuant to Section 401 of the CWA, RWQCB



Source: SanGIS 2012; Black & Veatch 2014; AECOM 2017

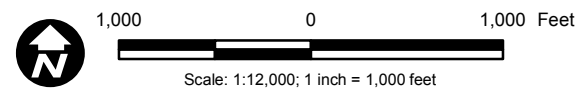
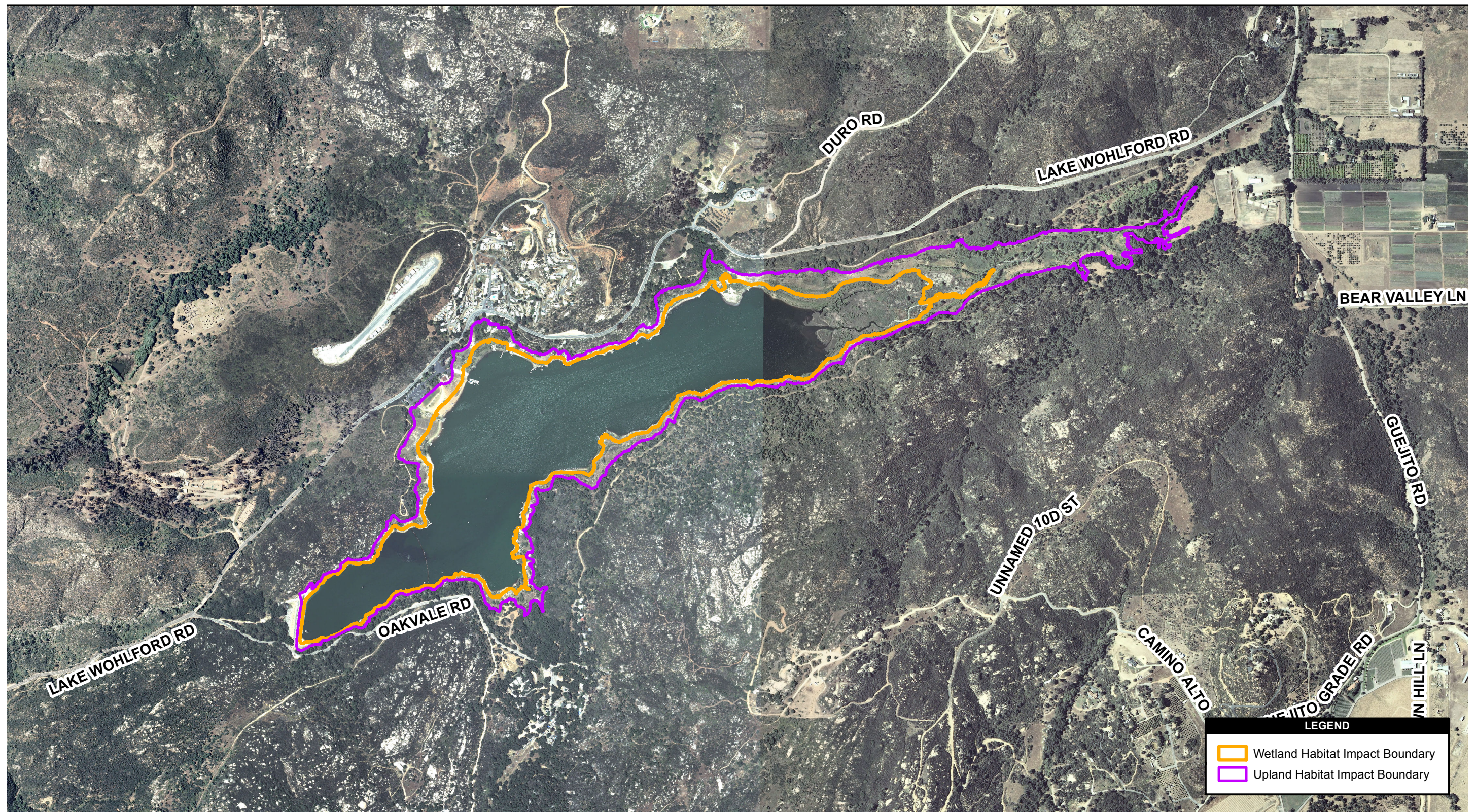


Figure 3.3-4a
2017 Avian Survey Results



Source: ; AECOM 2020

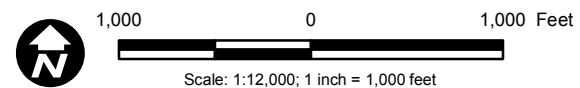


Figure 3.3-5
Wetland and Upland Habitat Impact Boundaries

certifies that any discharge into jurisdictional waters of the U.S. will comply with state water quality standards. RWQCB, as delegated by USEPA, has the principal authority to issue a CWA Section 401 water quality certification or waiver.

Migratory Bird Treaty Act

The MBTA (16 USC Sections 703–712) makes it unlawful to take or possess migratory birds, except as permitted by USFWS. The MBTA protects all migratory bird, their eggs, their body parts, or their nests. “Take” under the MBTA is defined “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect” protected birds (50 Code of Federal Regulations [CFR] 10.12). The current list of species protected by the MBTA includes several hundred species. Nearly all native birds in the San Diego region are considered migratory. No permit is issued under the MBTA.

Executive Order 11990 – Protection of Wetlands

Executive Order (EO) 11990 is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. EO 11990 requires that when a construction project involves wetlands, a finding must be made by the federal agency that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize impacts to wetlands resulting from such use.

State Regulations

California Endangered Species Act of 1970

CESA was established by CDFW in Sections 2050 through 2068 of the California Fish and Game Code. CESA provides for the conservation, protection, restoration, and enhancement of any state endangered or threatened species and its habitat while allowing for the lawful take of such species provided that the take is incidental, minimized, fully mitigated for with adequate funding and does not jeopardize the continued existence of the listed species. The requirements of an application for incidental take under CESA are described in Section 2081 of the California Fish and Wildlife Code. Incidental take of state-listed species may be authorized if an applicant submits an approved plan that minimizes and “fully mitigates” the impacts of the take.

California Natural Community Conservation Planning Act of 1991

The Natural Community Conservation Planning Act takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity by the state, and numerous

private and public partners. A Natural Community Conservation Plan (NCCP) identifies and provides for the regional or areawide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity through an agreement between CDFW and the local jurisdiction.

California Fish and Game Code

Section 1600. Pursuant to Section 1600 et seq. of the California Fish and Game Code, CDFW is authorized to regulate any activity that would alter the flow, bed, channel, or bank of streams and lakes. Jurisdictional waters of the state include the channel, bed, or bank of a lake, river, or stream. Riparian habitats do not always have identifiable hydric soils, or clear evidence of wetland hydrology as defined by USACE. Therefore, CDFW wetland boundaries often include, but extend beyond, USACE wetland boundaries. Jurisdictional boundaries under California Fish and Game Code Section 1600–1616 (CDFW’s Lake and Streambed Alteration Program) may encompass an area that is greater than that under the jurisdiction of the CWA Section 404. Therefore, jurisdictional waters of the state include jurisdictional waters of the U.S.; federal and state jurisdictions do overlap, but would remain distinct for regulatory administration and permitting purposes.

Section 3503. Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. This statute does not provide for the issuance of any type of incidental take permit.

Fully Protected Species. Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species and do not provide for authorization of incidental take of fully protected species.

Porter-Cologne Water Quality Control Act of 1969

Pursuant to Section 13000 et seq. of the California Water Code (Porter-Cologne Water Quality Control Act), RWQCB is authorized to regulate activity that would result in discharges of waste and fill material into waters of the state, including “isolated” waters and wetlands. Waters of the state include any surface or groundwater within the boundaries of the state (California Water Code Section 13050[e]).

Local Regulations

City of Escondido General Plan, Resource Conservation Element

The Resource Conservation Element's purpose is to identify biologically important open space areas and establish policies for developing a comprehensive system that includes natural areas in concert with the NCCP as well as existing and planned park and trail recreational amenities (City of Escondido 2012a).

Policies most relevant to the project are listed in the Biological and Open Space Resources Section:

Biological and Open Space Resources Policy 1.6: Preserve and protect significant wetlands, riparian, and woodland habitats as well as rare, threatened or endangered plants and animals and their habitats through avoidance. If avoidance is not possible, require mitigation of resources either on- or off-site at ratios consistent with State and federal regulations, and in coordination with those agencies having jurisdiction over such resources.

Biological and Open Space Resources Policy 1.7: Require that a qualified professional conduct a survey for proposed development projects located in areas potentially containing significant biological resources to determine their presence and significance. This shall address any flora or fauna of rare and/or endangered status, declining species, species and habitat types of unique or limited distribution, and/or visually prominent vegetation.

Additionally applicable policies are listed in the Water Resources and Quality Section:

Water Resources and Quality Policy 6.2: Protect the surface water resources in the city including Lake Wohlford, Dixon Lake, Lake Hodges, Escondido Creek, and other waterways.

Water Resources and Quality Policy 6.6: Control encroachments into wetlands and designated floodways to protect the community's water resources.

Water Resources and Quality Policy 6.7: Prohibit development in the areas around Lake Wohlford, Dixon Lake, or Lake Hodges that would detract from their use as watershed areas or as visual and recreational amenities.

County of San Diego Multiple Habitat Conservation Program, Final Plan

The MHCP is a comprehensive, multiple jurisdictional planning program designed to develop an ecosystem preserve in northwestern San Diego County. The MHCP is used in this EIR to assess the project's habitat impacts and identify habitat-based mitigation (see discussion in Biological Study Area portion of Section 3.3.1). The MHCP assigns habitat a group according to their ecological value, and assigns mitigation ratios to those groups. If the location of impacted habitat occurs inside a Focused Planning Area (FPA), the mitigation ratios are higher; if the location of the impacted habitat occurs outside of an FPA, the mitigation ratios are lower.

3.3.2 Significance Criteria

The guidelines used for the determination of significance for biological resources impacts are based on City guidelines. The effects of a project on biological resources would be considered significant if the project would do the following:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service.
3. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Project impacts can be considered direct or indirect, and permanent or temporary, as defined below.

Direct: Direct impacts are caused by the project and occur at the same time and place as the project. Any alteration, disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact. Direct impacts could include injury, death, or harassment of listed and/or sensitive species, or destruction of habitats necessary for species breeding, feeding, or sheltering. Direct impacts to plants can include crushing of adult plants, bulbs, or seeds.

Indirect: Indirect impacts may occur later in time or at a place that is farther removed in distance from the project than direct impacts, but are still reasonably foreseeable and attributable to project-related activities. Examples include habitat fragmentation; elevated noise, dust, and lighting levels; changes in hydrology, runoff, and sedimentation; decreased water quality; soil compaction; increased human activity; and the introduction of invasive wildlife or plants.

Permanent: All impacts that result in the irreversible removal of biological resources are considered permanent. Impacts are considered irreversible if filling activities result in an elevation (gradient) change or an impervious surface. Examples include constructing a building or permanent road on an area containing biological resources.

Temporary: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. For the purpose of this project, if preconstruction contours are maintained and the area can be revegetated in place, then the impact is considered temporary. Examples include the generation of fugitive dust during construction or removing vegetation and then allowing the natural vegetation to recolonize the impact area.

3.3.3 Impact Analysis

This section addresses project-related impacts on sensitive biological resources. For purposes of this CEQA analysis, impacts are considered direct and permanent where vegetation will be cleared during construction and replaced by a permanent facility or feature, including the replacement dam and downstream infrastructure, the Oakvale Road excavation and road realignment, and the access road. Impacts are considered direct and temporary in areas that will be disturbed by project construction activity, but where revegetation will occur as part of the project. Temporary indirect impacts would occur in the 500-foot buffer surrounding the construction LOD as a result of construction activity. Direct impacts would also occur as a result of reestablishing the reservoir to its prior condition where vegetation will be inundated.

Criterion 1: Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Oakvale Road Realignment

Plant Species

No sensitive plant species were observed within the Oakvale Road realignment project area during the general and rare plant surveys. Thus, no significant direct or indirect adverse effects to sensitive or special-status plant species would occur during this aspect of the project.

Wildlife Species

No special-status wildlife species were observed within the Oakvale Road impact area during surveys conducted for the project. The Oakvale Road portion of the project area was not included in any of the USFWS protocol bird surveys performed for the project due to lack of appropriate habitat. No bird nests were observed in the Oakvale Road project area. One individual bald eagle, which is listed as endangered pursuant to CESA, was observed flying overhead along the edge of the reservoir approximately 0.6 mile northeast of the Oakvale Road project area. Eagles that nest in Ramona are known to visit Lake Wohlford to fish but are not known to nest in the vicinity of Lake Wohlford.

Although no special-status bird species were identified in the Oakvale Road impact area during project biological resources surveys, significant direct and indirect impacts on listed bird species and other bird species protected by the federal MBTA may occur if their nests are established in the impact area prior to initiating construction activities. These species may include the state-listed endangered bald eagle, which is also protected under the federal Bald and Golden Eagle Protection Act. If nests are established in the Oakvale Road impact area prior to construction, this aspect of the project could result in direct construction-related impacts to birds in the form of habitat destruction, and potentially death, injury, or harassment of nesting birds, their eggs, and their young. Indirect impacts would potentially result from construction noise affecting breeding activity in nests established adjacent to the limits of disturbance. Additionally, use of lighting during nighttime construction could disrupt species in adjacent habitat or cause increased predation rates. Indirect impacts from these construction-related activities would be temporary, as these impacts would end with cessation of project construction. Potential direct and indirect impacts to special-status species and birds protected by the MBTA would be considered significant (**Impact BIO-1**) and warrant mitigation, as discussed below in Section 3.3.4.

Direct impacts on special-status reptiles and mammals are not anticipated as a result of this phase of the project because none were observed in the vicinity of the proposed construction area during project surveys. Therefore, this impact would be less than significant.

Replacement Dam and Access Road

Plant Species

One special-status plant species, Engelmann oak, was identified in the LOD for this phase of the project. Based on the current LOD, approximately 2.36 acres of Engelmann oak woodland are located in the anticipated disturbance area for the staging yard and east portion of the access road, as shown in Figure 3.3-3. Engelmann oaks exist in the area of the LOD that is anticipated to be cleared for the batch plant and along the portion of existing trail that would be improved for the access road. Removal of Engelmann oaks would be considered a significant impact (**Impact BIO-2**) and warrants mitigation, as discussed below in Section 3.3.4. Mitigation for Engelmann oaks removed for project construction would be provided by the habitat-based mitigation for this vegetation community, as discussed below under Criterion 2. Additional mitigation is identified in Section 3.3.4 under Impact BIO-2 to limit the amount of Engelmann oaks cleared for project construction, which may reduce the actual acreage subject to direct impact and acreage-based mitigation.

As shown in Figure 3.3-3, there are Engelmann oaks just outside the LOD that are not anticipated to be cleared for project construction. These individuals are on the fringes of the populations that would be cleared, and are located both upslope and downslope of the proposed construction area. Accordingly, the project may result in indirect impacts on these special-status plant species during construction. Grading has the potential to create airborne dust, sedimentation, and erosion that would affect these species. Construction-generated fugitive dust can adversely affect plants by reducing the rates of metabolic processes such as photosynthesis and respiration. Runoff, sedimentation, and erosion can adversely impact plant populations by damaging individuals or by altering site conditions so as to favor other species, including exotic nonnatives, that could competitively displace native plants. Construction activity adjacent to sensitive plant communities is a significant impact, as addressed further under Criterion 2.

Wildlife Species

Coastal sage scrub areas in the LOD, in the vicinity of the access road and staging yard, were identified as suitable habitat for CAGN and were included in the USFWS protocol survey area for this species, as shown in Figure 3.3-4. CAGN were not documented during the protocol

surveys for this species conducted during the 2013 and 2017 seasons. Therefore, this habitat is not considered occupied, and the project would not result in an impact on occupied CAGN habitat.

An individual rufous-crowned sparrow, a CDFW Watch List species, was observed in the LOD, south of the proposed access road alignment during protocol-level CAGN surveys. Suitable nesting/breeding habitat for rufous-crowned sparrow is present in the construction LOD. The project would result in a direct impact on habitat for this species by removing Diegan coastal sage scrub in the LOD. Cooper's hawks were observed during project surveys in riparian habitat on the eastern side of the reservoir, but not in the LOD. Cooper's hawks are known to nest in oak woodlands, and suitable habitat for Cooper's hawk is located in the LOD, including in the dam construction area and the staging yard site. The project would result in a direct impact on habitat for this species by removing oak woodland. These habitat-based impacts are addressed below under Criterion 2, and habitat-based mitigation for that impact is addressed in Section 3.3.4. Potential direct and indirect impacts on individuals, nests, and breeding activity on these species are the same impacts previously identified as Impact BIO-1 discussed above for the Oakvale Road component of the project, and would require implementation of Mitigation Measure BIO-1.1. With incorporation of these mitigation measures, the project's impact on rufous-crowned sparrow and Cooper's hawk would be reduced to a less than significant level.

Similar to the Oakvale Road realignment, the access road and dam construction phase has the potential to result in direct and indirect construction-related impacts to birds subject to the MBTA. Direct impacts to birds protected by the MBTA for this phase of the project are the same as those identified for the Oakvale Road component (Impact BIO-1), which is addressed above.

Bald eagle, a state-listed endangered species, has been documented at Lake Wohlford. Its known roosting area at the reservoir is on the south side and outside of the construction LOD, and the active nest detected in 2020 is located north of Lake Wohlford Road, approximately 0.75 mile away from the LOD and just outside of the project BSA. . The current nest is far enough away from project construction activities that it would not be significantly impacted. However, potential nesting in closer proximity to construction activities has the potential to result in a significant direct or indirect impact. Potential direct and indirect impacts on individuals, nests, and breeding activity for the bald eagle are similar to the nesting bird impact identified as Impact BIO-1 discussed above and would require implementation of Mitigation Measure BIO-1.1. Project-related construction activities may occur when foraging bald eagles are present at the reservoir, but construction would be limited to the west/northwest end of the reservoir, leaving the vast majority of fishing territory around the reservoir available for eagle use. The project's impact on foraging bald eagle would be less than significant.

The pallid bat and the western mastiff bat are considered CDFW Species of Special Concern at roosting sites. These two species of bats were detected flying and foraging within the BSA, but they were not documented roosting within the LOD, and it is anticipated that these species do not roost within the BSA. Therefore, the project's impact on pallid bat and western mastiff bat would be less than significant.

Restoration of Water Levels

Plant Species

Engelmann oak woodland is identified along the northern fringes of the maximum inundation. The oaks in the maximum inundation area are part of populations located farther north. After the replacement dam is built, the reservoir would return to its prior state and be subject to seasonal and temporal fluctuation in water levels. Oak roots, particularly Engelmann oaks, are adversely affected by constantly saturated soil. If the reservoir reaches its maximum level, the roots of some Engelmann oaks would become submerged, but this full extent of inundation would be rare and, based on historic data provided in Figure 2-2 in the Project Description Chapter, would be short term. Furthermore, these oaks in this part of the reservoir were subject to similar conditions prior to the mandatory drawdown. After completion of the project, reservoir levels would continue their seasonal and temporal fluctuation, reverting to pre-drawdown conditions. Therefore, restoration of water levels would have a less than significant impact on special-status plant species.

Wildlife Species

Certain areas of coastal sage scrub in the maximum inundation area were identified as suitable habitat for CAGN and were included in the USFWS protocol survey area for this species, as shown in Figure 8 of Appendix C for the 2013 survey, and in Figure 3 of Appendix C-1 for the 2017 survey. CAGN were not documented during the protocol surveys for this species conducted during the 2013 and 2017 seasons. Therefore, this habitat is not considered occupied, and the project is not expected to result in an impact on occupied CAGN habitat.

Certain areas of the riparian habitat in the maximum inundation area were identified as suitable habitat for LBV and SWFL and were included in the USFWS protocol survey area for these species, as shown in Figure 8 of Appendix C for the 2013 survey, and in Figure 3 of Appendix C-1 for the 2017 survey. In accordance with the current USFWS survey protocol, the project site was surveyed five times for SWFL and eight times for LBV. LBV and SWFL were not documented during the 2013 survey, and SWFL was again not documented during the 2017 update. One LBV pair was detected during three of the early 2017 survey visits but was not

detected in the final four survey visits occurring in June and July. This pair was observed shifting locations during the early survey visits, apparently investigating areas to determine an ideal nesting site, but no nests were observed. Once the pair could no longer be detected during the subsequent visits, it was reasonably concluded that they had ultimately moved outside the survey area to nest.

Suitable habitats for CAGN and SWFL within the BSA were concluded to be unoccupied. AECOM concluded in the 45-day report that the suitable LBV habitat in the BSA is generally too open to be ideal for LBV breeding. Therefore, this habitat is not considered occupied, and the project would not result in an impact on occupied LBV or SWFL habitat. Cowbird observations were noted during LBV and SWFL surveys, since presence of this nest parasite can often indicate a negative influence on breeding success by LBV and SWFL.

Cooper's hawks were observed in the riparian and oak woodland habitat in the maximum inundation area and are also potentially breeding on-site. Yellow warblers and yellow-breasted chats were found in the riparian habitat present in the maximum inundation area and are potentially breeding on-site. After the replacement dam is built, the reservoir would return to its condition prior to the mandatory drawdown and be subject to seasonal and temporal fluctuation in water levels. As such, the project would result in a direct impact on habitat for these species by removing oak woodland and riparian habitat. These habitat-based impacts are addressed below under Criterion 2, and habitat-based mitigation for that impact is addressed in Section 3.3.4. Potential direct and indirect impacts on individuals, nests, and breeding activity for these species are similar to the nesting bird impact identified as Impact BIO-1 discussed above for the Oakvale Road and Replacement Dam and Access Road components of the project, and would require implementation of Mitigation Measure BIO-1.1. With incorporation of Mitigation Measure BIO-1.1, the project's impact on Cooper's hawk, yellow warbler, and yellow-breasted chat would be reduced to a less than significant level.

As noted above, bald eagle nesting was documented north of Lake Wohlford Road, just outside of the BSA. Restoration of water levels is expected to benefit the species with expanded foraging opportunities. No significant impact to bald eagles would result from the restoration of water levels.

Criterion 2: Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS?

Sensitive natural communities for purposes of this analysis are those habitat types identified as Group A, B, C, D, or E in the MHCP, as described above in Section 3.3.1, and wetlands and

non-wetland communities under jurisdiction of USACE, RWQCB, and CDFW. Impacts on these communities are described below.

Oakvale Road Realignment; Replacement Dam and Access Road

The project would clear existing habitat within the LOD to create areas suitable for construction work. Permanent direct impacts would occur where vegetation would be removed within the construction LOD and replaced with a permanent feature such as the dam and its appurtenant structures, the access road, and the graded slope adjacent to Oakvale Road. Where vegetation is removed from work areas that do not include permanent project features, revegetation would occur on-site, as conditions allow. Cleared areas would include the Oakvale Road excavation, the construction zone west of the existing dam, the slope northeast of the existing dam for construction of the access road, and the batch plant area in the staging yard.

Table 3.3-3 provides a summary of potential direct impacts that would occur to vegetation communities, including sensitive and riparian habitats and other cover types within the LOD.

**Table 3.3-3
Direct Impacts to Vegetation Communities and
Cover Types within the Limits of Disturbance**

Vegetation Community	Sensitive Habitat	Impacts within the LOD (acres)
Riparian and Wetlands (jurisdictional waters)		
Lakeshore	Yes	1.25
Open Water	Yes	2.12
Southern Willow Scrub	Yes	0.41
Subtotal Riparian and Wetlands		3.78
Uplands		
Engelmann Oak Woodland	Yes	2.36
Coast Live Oak Woodland	Yes	8.01
Diegan Coastal Sage Scrub	Yes	4.31
Nonnative Grassland	Yes	2.60
Southern Mixed Chaparral	Yes	8.58
Subtotal Uplands		25.86
Other Cover Types		
Urban/Developed	No	4.00
Subtotal Other Cover Types		4.00
Total Acres		33.64

As shown in Table 3.3-3, project implementation within the LOD would result in direct, permanent impacts to seven sensitive vegetation communities including 1.25 acres of lakeshore, 0.41 acre of southern willow scrub, 2.36 acres of Engelmann oak woodland, 8.01 acres of coast live oak woodland, 4.31 acres of Diegan coastal sage scrub, 2.60 acres of nonnative grassland,

and 8.58 acres of southern mixed chaparral. As noted in the Oakvale Road MND, that component of the project would result in impacts on two sensitive vegetation communities: coast live oak woodland (1.71 acres) and chaparral (1.52 acres). The remaining project impacts listed above are related to dam and access road construction. Direct impacts from the removal or disturbance of sensitive habitats are a significant impact (**Impact BIO-3**), and mitigation is listed in Section 3.3.4. An exception to this is open water impacts, which are not considered significant because this habitat type would be fully replaced on-site by open water habitat after completion of construction, and because open water acreage would expand as the existing dam is removed and this area is inundated. Therefore, no mitigation would be provided for open water impacts in the LOD.

As outlined in the discussion of potential temporary indirect impacts to Engelmann oak woodland adjacent to the LOD, construction work elsewhere in the LOD would be conducted adjacent to sensitive communities and result in similar indirect impacts as described for Engelmann oak woodland, including dust, sedimentation, and erosion. Construction activity adjacent to sensitive plant communities is a significant impact (**Impact BIO-4**), and mitigation is provided in Section 3.3.4.

Restoration of Water Levels

In addition to these direct habitat impacts due to construction, the project would inundate habitat around the rim of the reservoir as water levels increase following project construction. In the 20 years since the water levels of the lake were lowered, a variety of upland and wetland habitats have developed in the previously inundated area. As the reservoir level increases and the area of inundation expands, similar upland and wetland communities are expected to reform along the edge of the expanded water level, but this habitat type-conversion is a complicated process and the ultimate composition and distribution of vegetation adjacent to the new shoreline cannot be predicted with certainty. As such, permanent direct impacts would occur where habitat would be inundated to restore the water level.

In consultation with the wildlife agencies, upland habitat conversion is expected to occur up to the maximum inundation level of 1,480-foot elevation and impacts to 23.13 acres of upland habitats are anticipated within the restoration of water levels are detailed in Table 3.3-4.

Table 3.3-4
Direct Impacts to Sensitive Upland Vegetation Communities within the
Maximum Inundation Area

Vegetation Community	Sensitive Habitat	Impacts within the 1,480-foot Inundation Area (acres)
Uplands		
Engelmann Oak Woodland	Yes	0.70
Coast Live Oak Woodland	Yes	3.55
Diegan Coastal Sage Scrub	Yes	0.82
Southern Mixed Chaparral	Yes	0.09
Nonnative Grassland	Yes	17.97
Total Uplands		23.13

Wetland habitats are also expected to convert with restoration of water levels. However, between 1,464 and 1,480 feet in elevation, riparian habitats such as southern willow scrub would be inundated for 4 months of the year or less and are expected to persist over time, as the shoreline recedes seasonally and wetland habitat communities return. As such, significant direct conversion impacts to 16.07 acres of riparian/wetland habitat communities are anticipated within the restoration of water levels as detailed in Table 3.3-5. While habitat conversion is not anticipated for riparian habitats above the 1,464-foot elevation, some impacts between the seasonal (1,464-foot) and maximum (1,480-foot) inundation limits may result, and any potential impacts to riparian habitats may be considered significant.

Table 3.3-5 provides a summary of potential direct impacts that would occur to vegetation communities, including sensitive and riparian habitats and other cover types within the inundation area.

Lakeshore impacts are not considered significant because the areas of lakeshore are primarily bare ground that is located in an active fishing area maintained by the City for public use, and are not located in the reservoir's primary upstream wetland area. Open water impacts are not considered significant because this habitat type would be fully replaced on-site by open water habitat after completion of construction, and because open water acreage would expand as the existing dam is removed and this area is inundated.

Direct impacts from conversion of sensitive habitats as described above are a significant impact (**Impact BIO-3**), and mitigation is listed in Section 3.3.4. While habitat conversion is not anticipated for riparian habitats above the 1,464-foot elevation, some impacts between the

Table 3.3-5
Direct Impacts to Riparian/Wetland Vegetation Communities and
Cover Types within the 1,464-foot Inundation Area

Vegetation Community	Sensitive Habitat	Maximum Inundation Area (acres)	Impact Anticipated
Riparian and Wetlands (jurisdictional waters)			
Emergent Wetland	Yes	3.97	No conversion impacts to 1,464-foot elevation. All 3.97 acres are above this elevation.
Freshwater Marsh	Yes	13.69	Direct impacts to 1,464-foot elevation (approximately 8.90 acres). No conversion impacts to remaining 4.79 acres.
Lakeshore	Yes	11.47	No impact, lakeshore is unvegetated
Open Water	Yes	126.84	No impact, open water would remain and expand
Southern Willow Scrub	Yes	25.31	Direct impacts to 1,464-foot elevation (approximately 7.17 acres). No conversion impacts to remaining 18.14 acres.
Coast Live Oak Riparian Forest	Yes	0.76	No conversion impacts to 1,464-foot elevation. All 0.76 acre is above this elevation.
Subtotal Riparian and Wetlands			<i>16.07 direct; 23.69 no conversion anticipated</i>

seasonal (1,464-foot) and maximum (1,480-foot) inundation limits may result. Any impacts to these riparian habitats are a potentially significant impact (**Impact BIO-3**) and mitigation is listed in Section 3.3.4.

There is currently neither an outflow from the reservoir nor anticipated outflow during construction or future operation of the project. The only exception to this condition would be in the rare instance where reservoir levels overtop the dam spillway or during a dam safety event, in which case the emergency outlet would be utilized to release flow from the reservoir. Therefore, no potential impacts would occur to downstream habitats.

Criterion 3: Would the project have a substantial adverse effect on federally protected wetlands through direct removal, filling, hydrological interruption, or other means?

Oakvale Road Realignment

No wetlands occur on the project site for the Oakvale Road realignment components of the project. Thus, no adverse direct or indirect impacts would result to federally protected wetlands due to the Oakvale Road realignment.

Replacement Dam and Access Road

Potential impacts to jurisdictional waters in the LOD as a result of dam construction are listed in Table 3.3-6. Some of these impacts overlap with the impacts to similar vegetation community

impacts noted in Table 3.3-3, but represent only the jurisdictional wetlands and waters as delineated in the field. The primary impact on wetlands occurs in the downstream construction area, where the project would result in impacts on approximately 6.10 acres of coast live oak woodland, which is jurisdictional exclusively of CDFW. Some of these impacts would be permanent due to the placement of new downstream facilities and would be considered permanent loss of jurisdictional waters of the state (including wetlands). Impacted areas that are cleared for construction staging and access purposes and do not feature permanent structures would be subject to on-site restoration and would be considered temporary. Acreages of permanent and temporary impacts would be solidified during the project's permitting phase.

Table 3.3-6
Impacts to Waters of the U.S. and State in the LOD

Type of Jurisdictional Waters	Type of Habitat (Holland 1986; Oberbauer et al. 2008)	Impacts (Acres) ¹
Waters of the U.S. (USACE, RWQCB, and CDFW)		
Wetland	Southern Willow Scrub	0.04
Other Waters	Open Water	2.12
Other Waters	Lakeshore	0.44
Other Waters	Urban/Developed (Dam)	0.48
<i>Subtotal Waters of the U.S.</i>		<i>3.08</i>
Waters of the State, Exclusively CDFW		
Riparian Canopy	Southern Willow Scrub	0.37
Riparian Canopy	Coast Live Oak Woodland	6.10
Riparian Canopy	Engelmann Oak Woodland	0.37
Other Waters	Lakeshore	0.73
<i>Subtotal Waters of the State, Exclusively CDFW</i>		<i>7.57</i>
Grand Total Jurisdictional Waters		10.65

¹ Jurisdictional waters acreage of the BSA was determined by using ArcGIS. All acreages are rounded to the nearest hundredth (which may account for minor rounding error).

Impacts to riparian habitats, wetlands, and jurisdictional waters within the LOD shall require the following permits by regulatory federal and state agencies: (1) USACE CWA Section 404 permit for placement of dredged or fill material within waters of the U.S.; (2) RWQCB CWA Section 401 state water quality certification/waiver for an action that may result in degradation of waters of the state; and (3) CDFW California Fish and Game Code Section 1602 agreement for alteration of a streambed.

The project's potential to have direct impacts on wetlands is significant (**Impact BIO-5**), and mitigation is provided below in Section 3.3.4.

Potential indirect impacts to the jurisdictional waters surrounding the LOD would occur as a result of construction activity, which would occur within and upslope from jurisdictional areas, including Escondido Creek in the downstream construction area and the reservoir in the access

road construction area and staging yard. Potential temporary, indirect impacts would occur as a result of grading activities creating airborne dust and potentially off-site erosion and sedimentation. Water quality in jurisdictional areas can be adversely affected by surface water runoff and sedimentation during construction. The use of petroleum products (e.g., fuels, oils, and lubricants) and erosion of cleared land during construction could potentially impact surface water in the reservoir. Temporary retention basins have been incorporated into the project to capture construction runoff before it can flow into jurisdictional areas, which will limit the project's impact on these jurisdictional features. The project's potential to have an indirect impact on jurisdictional waters is a significant impact (**Impact BIO-6**), and mitigation is provided below in Section 3.3.4.

Restoration of Water Levels

After the replacement dam is built, the reservoir would return to its prior state and be subject to seasonal and temporal fluctuation in water levels. Some wetlands established at the fringe of the reservoir would become submerged and others would be subject to the occasional inundation and exposure as the water level rises and recedes, similar to conditions before the mandatory drawdown. This would likely lead to a gradual shifting in wetland habitat types, primarily in the reservoir's long eastern arm. There would be no loss of jurisdictional wetland habitat from returning the reservoir to this prior condition, but rather wetlands types would be converted to other wetlands types. As discussed above in Criterion 2, as the reservoir level increases and the area of inundation expands, similar wetland communities are expected to reform along the edge of the expanded water level, but this habitat type-conversion is a complicated process and the ultimate composition and distribution of vegetation adjacent to the new shoreline cannot be predicted with certainty. As such, permanent direct impacts would occur where habitat would be inundated to restore the water level. The project's potential to have direct impacts on wetlands is significant (**Impact BIO-5**), and mitigation is provided below in Section 3.3.4.

Criterion 4: Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Oakvale Road Realignment; Replacement Dam and Access Road

Local wildlife movement in the immediate vicinity of the new dam construction may experience temporarily direct impacts due to construction activities. Construction would entail activity in a location currently open and available for wildlife to use and move through. Construction would include installation of fencing in some areas, presence of people and equipment, and noise generation, all of which could interfere with or discourage the movement of wildlife through the

immediate area. However, these activities would be generally located along the fringe of a currently developed area, including the existing dam and areas of human activity such as the marina and Lake Wohlford Road. The open nature of the area beyond the LOD would allow for continued movement of wildlife through the area and would not substantially restrict access to the reservoir or associated habitats. For these reasons, potential temporary impacts to wildlife movement due to project construction would be considered not adverse and less than significant.

The proposed project may result in a minor permanent impact on local wildlife movement due to the expanded footprint of the developed area downstream of the dam and by the associated realignment of Oakvale Road. However, these project areas do not represent large-scale migratory wildlife corridors, so this impact would be less than significant. Lake Wohlford is not habitat for migratory fish and the BSA does not support any wildlife nursery sites, so there would be no impact with respect to those features. The Oakvale Road project would realign an existing feature that local wildlife must currently traverse, and realignment would not add a new hazard or barrier to wildlife movement. Permanent direct impacts to wildlife movement would be less than significant.

Restoration of Water Levels

Raising the water level within the reservoir would inundate riparian and wetland vegetation along the fringe of the reservoir, which would have a minor effect on localized wildlife movement for resident species. Areas beyond the inundation limits would continue to be available for wildlife movement, so this aspect of the project would not result in a significant impact. From the perspective of regional wildlife movement, the project is anticipated to provide a moderate increase to regional corridor values as the surface area of the reservoir increases. For these reasons, the project's impacts on wildlife movement would be less than significant.

Criterion 5: Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Oakvale Road Realignment; Replacement Dam and Access Road; Restoration of Water Levels

Project compliance with the City General Plan policies listed above in the Regulatory Setting section is discussed below.

Biological and Open Space Resources Policy 1.6: The project proposes an important infrastructure project located in an area that features significant biological resources, as described throughout this section. Full avoidance of these resources is not possible, so the project

will entail mitigation at ratios stated in the MHCP. The project complies with this General Plan policy.

Biological and Open Space Resources Policy 1.7: Biological resources surveys of the BSA were conducted by qualified professionals, who identified sensitive resources requiring mitigation. The project complies with this General Plan policy.

Water Resources and Quality Policy 6.2: The project is intended in part to return the City's water storage capacity at Lake Wohlford. The project complies with this General Plan policy.

Water Resources and Quality Policy 6.6: The project would entail construction impacts in wetlands that are necessary to implement this water resources infrastructure project, which would protect the community's water resources. The project complies with this General Plan policy.

Water Resources and Quality Policy 6.7: The project does not propose development around Lake Wohlford. The project complies with this General Plan policy.

The project would not conflict with any of the applicable local policies protecting biological resources; therefore, this impact would be less than significant.

The discussion provided under the Oakvale Road realignment would also be applicable to the restoration of water levels in the reservoir. The restoration of water to historic levels would require that some sensitive resources, including mature Engelmann oak trees and emergent wetlands, be inundated and the resource lost. However, the project would provide mitigation at the appropriate ratios to reduce the effects. Thus, the restoration of water levels would not conflict with any local policies or ordinances protecting biological resources and the impact would not be adverse and would be less than significant.

Criterion 6: Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Oakvale Road Realignment; Replacement Dam and Access Road; Restoration of Water Levels

The project is within the boundaries of the MHCP, the draft NCMSCP, and the draft City of Escondido Subarea Plan. However, because the NCMSCP and City of Escondido Subarea Plan are in draft form and have not been adopted and implemented, mitigation for impacts would not be covered by these plans. In the absence of an approved subarea plan or Habitat Loss Permit

process in the City, this project's impacts on sensitive habitat and its relationship to the City's habitat conservation planning efforts are addressed through the CEQA process. Adequate mitigation per the MHCP is required for significant biological resource impacts and in coordination with the wildlife agencies as part of this CEQA document. Thus, the Oakvale Road realignment would not conflict with the provisions of an adopted habitat conservation plan; NCCP; or other approved local, regional, or state habitat conservation plan and would result in a not adverse and less than significant impact.

3.3.4 Significant Impacts and Mitigation Measures

Impact BIO-1: The project would potentially result in direct and indirect impacts on special-status bird species or species covered by the MBTA if nests are established in the project area prior to construction (Criterion 1).

Mitigation Measure BIO-1.1: If vegetation clearing or earthwork is proposed to commence within the bird breeding season (February 15 through September 15), a qualified biologist shall conduct pre-construction nest surveys of the project site and a 500-foot buffer (a 1-mile buffer for bald eagle) to identify any listed species or bird breeding activity in the vicinity. The pre-construction survey shall be performed within 2 weeks of the start of construction activity. If the pre-construction surveys identify active nests or bird-breeding activity within the 500-foot buffer (a 1-mile buffer for bald eagle), a qualified biologist shall prepare a nest avoidance plan and, if necessary, a noise attenuation plan, to identify site-specific measures that shall be incorporated into the project to reduce construction-related impacts on the applicable bird species.

Mitigation Measure BIO-1.2: All construction lighting shall be directed onto the construction work area and away from adjacent habitat. Light shields shall be used to reduce the extent of illumination into adjoining areas.

Impact BIO-2: The project would entail direct impacts on Engelmann oaks, a special-status plant species, due to clearing for construction work (Criterion 1).

Mitigation Measure BIO-2.1: Engelmann oaks outside the limits of disturbance will be identified as Environmentally Sensitive Areas on project plans. A qualified biologist will attend a pre-construction field meeting with the construction contractor to identify Engelmann oaks and refine the limits of disturbance to avoid unneeded clearing in areas supporting Engelmann oaks. Orange construction fencing will be installed around the locations of Engelmann oaks outside the agreed-upon limits of disturbance. Fencing shall remain in place until construction is complete to avoid inadvertent disturbance of sensitive resources.

Impact BIO-3: Project construction would result in direct impacts on sensitive vegetation communities due to clearing for construction (Criterion 2).

Mitigation Measure BIO-3.1: The City shall ensure that an on-site habitat restoration plan covering all areas disturbed during construction is prepared in consultation with a qualified restoration ecologist. The restoration plan will delineate all temporary impact areas subject to habitat restoration and establish standards for application of hydroseed and installation of container plants, as appropriate. The restoration plan shall include an appropriate native species planting palette to blend in with the existing and surrounding habitats. No nonnative species shall be incorporated into the restoration plan. Acreage of impacts that can be restored on-site after completion of the project will not be subject to acquisition of off-site mitigation listed in Mitigation Measures BIO-3.3 through BIO-3.6.

Mitigation Measure BIO-3.2: A restoration maintenance and monitoring plan shall be prepared for the project by a qualified restoration ecologist outlining yearly success criteria and remedial measures in case the mitigation effort falls short of the success criteria.

Because there is no approved subarea plan governing the project's impacts, the City proposes to mitigate for this project's permanent habitat impacts from construction of the dam and habitat conversion as a result of restoration of water levels pursuant to the MHCP, which assigns mitigation ratios based on habitat groups. For permanent impacts that cannot be mitigated by on-site restoration, the City plans to mitigate for project impacts by purchasing credits at the City's Daley Ranch Conservation Bank. Mitigation acreage for each habitat type impacted by project construction is discussed below.

Tables 3.3-7 and 3.3-8 list the mitigation acreages at ratios in accordance with the MHCP and direction from the wildlife agencies. Mitigation measures specific to habitat types are provided below.

Mitigation Measure BIO-3.3: The City shall mitigate for permanent impacts to sensitive upland habitats within the LOD and 1,480-foot maximum inundation area per the ratios in Table 3.3-7 through creation and enhancement of suitable habitat or acquisition of suitable habitat credits at an approved mitigation bank (e.g., Daley Ranch).

Mitigation Measure BIO-3.4: The City shall mitigate for permanent impacts to sensitive riparian/wetland habitats within the LOD and 1,464-foot seasonal inundation area per the ratios in Table 3.3-8 through creation and enhancement of suitable habitat or acquisition of suitable habitat credits at an agency-approved mitigation bank.

Table 3.3-7
Mitigation for Direct Impacts to
Sensitive Upland Vegetation Communities (acres)

Vegetation Community (MHCP Group)	LOD Impacted Acreage¹	Inundation Area Impacted Acreage	Total Impacted Acreage	Mitigation Ratio	Mitigation Required
Uplands					
Engelmann Oak Woodland (Group B)	2.36	0.70	3.06	3:1	9.18
Coast Live Oak Woodland (Group B)	8.01	3.55	11.55	3:1	34.65
Diegan Coastal Sage Scrub (Group C)	4.32	0.82	5.14	2:1	10.28
Southern Mixed Chaparral (Group D)	8.58	0.09	8.67	1:1	8.67
Nonnative Grassland (Group E)	2.60	17.97	20.57	0.5:1	10.29
Total Uplands	25.86	23.13	48.99	–	73.07

¹ Impacts within the LOD which are temporary in nature may be restored at 1:1, reducing the total impacts requiring offsite mitigation at the mitigation ratios outlined herein.

Table 3.3-8
Mitigation for Direct Impacts to
Sensitive Wetland/Riparian Vegetation Communities (acres)

Vegetation Community (MHCP Group)	LOD Impacted Acreage¹	Inundation Area Impacted Acreage	Total Impacted Acreage (1464 Inundation)	Mitigation Ratio	Mitigation Required
Riparian and Wetlands (jurisdictional waters)					
Freshwater Marsh (Group A)	0.00	8.90	8.90	1:1	8.90
Southern Willow Scrub (Group A)	0.41	7.48	7.89	1:1-3:1 ²	8.71
Total Riparian/Wetland	0.41	16.38	16.79	–	17.61

¹ Impacts within the LOD which are temporary in nature may be restored at 1:1, reducing the total impacts requiring offsite mitigation at the mitigation ratios outlined herein.

² Impacts to Southern Willow Scrub within the LOD shall be mitigated at 3:1, if they cannot be restored onsite. Impacts to Southern Willow Scrub from inundation shall be mitigated at 1:1.

Mitigation Measure BIO-3.5: The City shall mitigate for potential permanent impacts to riparian/wetland habitats between the seasonal (1,464-foot) and maximum (1,480-foot) inundation limits through the development of a Lake Wohlford Long-Term Habitat Management Plan in consultation with the resource agencies. The plan shall at a minimum provide for the following:

1. Long-term Vegetation Management –The plan shall include methods, schedules, and success criteria for weed control including hand weeding, mechanical weeding, and herbicide application.
2. Cowbird Control – Several non-native wildlife species currently adversely impact native fauna at the reservoir. A brown-headed cowbird trapping program shall be included in the plan.

3. A cost analysis to implement the Long-Term Habitat Management Plan and identify funding sources for the long-term commitments will be required under the Plan.

Mitigation Measure BIO-3.6: To avoid incidental loss of sensitive habitat types during construction activities, Environmentally Sensitive Area fencing shall be installed along the limits of disturbance prior to the start of construction. In addition, grading limits shall be flagged or fenced, and grading shall not occur beyond this flagging/fencing. Location of fencing shall be confirmed by a qualified biological monitor. Construction crews shall be made fully aware of this boundary.

Impact BIO-4: The project would result in indirect impacts to sensitive vegetation communities adjacent to construction work areas (Criterion 2).

In addition to the measures stated below specific to Impact BIO-4, Mitigation Measure BIO-3.6, stated above, would be implemented to ensure sensitive areas are identified in the field and flagged or fenced to prevent unauthorized access. Additional measures are listed below.

Mitigation Measure BIO-4.1: Storage of soil or fill material from the project site shall be within the LOD or developed areas. The contractor shall delineate stockpile areas on the grading plans for review by the City.

Mitigation Measure BIO-4.2: If additional access routes are determined necessary, these areas shall be surveyed for biological resources prior to their use and, if any sensitive resources are identified, determine appropriate avoidance and minimization measures. The contractor shall clearly mark all access routes (i.e., flagged and/or staked) prior to the onset of construction.

Mitigation Measure BIO-4.3: The contractor shall periodically monitor the work area to ensure that construction-related activities do not generate excessive amounts of fugitive dust. Water shall be applied to the construction right-of-way, dirt roads, trenches, spoil piles, and other areas where ground disturbance has taken place to minimize dust emissions and topsoil erosion.

Impact BIO-5: The project would result in direct impacts on jurisdictional wetlands and waters due to clearing for construction (Criterion 3).

The vegetation communities that make up the jurisdictional wetlands are included in the habitat-based mitigation listed pursuant to Mitigation Measures BIO-3.3, BIO-3.4, and BIO-3.5; this mitigation adequately accounts for the project's direct impacts on wetlands and waters. No additional habitat-based mitigation for jurisdictional wetlands is warranted.

Impact BIO-6: Project construction would occur within and adjacent to delineated wetlands and waters and potentially result in indirect impacts to jurisdictional areas (Criterion 3).

Mitigation Measure BIO-6.1: A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared to comply with RWQCB requirements. The SWPPP shall identify the design features and best management practices (BMPs) that will be used to manage drainage-related issues (e.g., erosion and sedimentation) during construction. Erosion-control measures shall be regularly checked by the contractor, the project biologist, and/or City staff. Specific BMP plans shall be reviewed by the City and the project biologist, and be modified, if necessary, prior to implementation. Fencing and erosion-control measures of all project areas shall be inspected a minimum of once per week.

Mitigation Measure BIO-6.2: Staging areas and project activities, including equipment access and disposal or temporary placement of excess fill, shall be prohibited within off-site drainages.

With the implementation of Mitigation Measures BIO-1.1 through BIO-6.2, as described above, all impacts related to biological resources would be reduced to less than significant.

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3.6 GREENHOUSE GAS EMISSIONS

This section replaces, in full, Section 3.6 from the previously circulated Draft EIR (October 2016) for the project. The section has been modified to incorporate updated environmental setting information; regulatory setting, including Senate Bill 32, since the October 2016 Draft EIR; and evaluation of the project's long-term benefits related to hydroelectric power generation. New references have been added to the end of this section; all other references are included in the previously circulated Draft EIR (Chapter 9.0, References).

This portion of the EIR focuses on the potential greenhouse gas (GHG) emissions impacts of the project. Specifically, this assessment includes a discussion on global climate change and existing GHG emissions sources; a summary of the applicable federal, state, and local regulations; and an analysis of the impacts from construction and operation of the project.

3.6.1 Existing Conditions

Environmental Setting

Scientific Basis of Climate Change

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on the earth.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic (generated by human activities) sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals and plants; decomposition of organic matter; and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following GHGs are widely accepted as the principal contributors to human-induced global climate change:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)

- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF₆)
- Nitrogen Trifluoride (NF₃)

The majority of CO₂ emissions are byproducts of fossil fuel combustion. CH₄ is the main component of natural gas and is associated with agricultural practices and landfills. N₂O is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices. HFCs are synthetic chemicals used as a substitute for chlorofluorocarbons in automobile air conditioners and refrigerants. PFCs are produced as a byproduct of various industrial processes associated with aluminum production and the manufacturing of semiconductors. SF₆ is an inorganic, odorless, colorless, nontoxic, nonflammable GHG used for insulation in electric power transmission and distribution equipment, and in semiconductor manufacturing. NF₃ is used in the electronics industry during the manufacturing of consumer items, including photovoltaic solar panels and liquid crystal display (LCD) television screens.

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO₂. The GWP of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere (“atmospheric lifetime”). The reference gas for GWP is CO₂; therefore, CO₂ has a GWP of 1. The other main GHGs that have been attributed to human activity include CH₄, which has a GWP of 28, and N₂O, which has a GWP of 265 (IPCC 2013). For example, 1 ton of CH₄ has the same contribution to the greenhouse effect as approximately 28 tons of CO₂. GHGs with lower emissions rates than CO₂ may still contribute to climate change, because they are more effective at absorbing outgoing infrared radiation than CO₂ (i.e., high GWP). The concept of CO₂ equivalents (CO₂e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

Although the exact lifetime of any particular GHG molecule is dependent on multiple variables, it is understood by scientists who study atmospheric chemistry that more CO₂ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. GHG emissions related to human activities have been determined as “extremely likely” to be responsible (indicating 95% certainty) for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth’s atmosphere and oceans, with corresponding effects on global circulation patterns and climate (ARB 2014a).

GHG Emission Sources

GHG emissions contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, electric utility, residential, commercial, and agricultural categories. The majority of CO₂ emissions are byproducts of fossil fuel combustion, and CH₄, a highly potent GHG, is the primary component in natural gas and is associated with agricultural practices and landfills. N₂O is also largely attributable to agricultural practices and soil management.

For the purposes of accounting for and regulating GHG emissions, sources of GHG emissions are grouped into emission categories. ARB identifies the following main GHG emission categories that account for most anthropogenic GHG emissions generated within California:

- **Transportation:** On-road motor vehicles, recreational vehicles, aviation, ships, and rail
- **Electric Power:** Use and production of electrical energy
- **Industrial:** Mainly stationary sources (e.g., boilers and engines) associated with process emissions
- **Commercial and Residential:** Area sources, such as landscape maintenance equipment, fireplaces, and consumption of natural gas for space and water heating
- **Agriculture:** Agricultural sources that include off-road farm equipment; irrigation pumps; crop residue burning (CO₂); and emissions from flooded soils, livestock waste, crop residue decomposition, and fertilizer volatilization (CH₄ and N₂O)
- **High GWP:** Refrigerants for stationary and mobile-source air conditioning and refrigeration, electrical insulation (e.g., SF₆), and various consumer products that use pressurized containers
- **Recycling and Waste:** Waste management facilities and landfills; primary emissions are CO₂ from combustion and CH₄ from landfills and wastewater treatment

California

ARB performs an annual GHG inventory for emissions and sinks of the six major GHGs. California produced 424 million metric tons (MMT) of CO₂e in 2017. Combustion of fossil fuel in the transportation category was the single largest source of California's GHG emissions in 2017, accounting for 40% of total GHG emissions in the state. The transportation category was followed by the industrial category, which accounts for 21% of total GHG emissions in

California, and the electric power category (including in-state and out-of-state sources), which accounts for 15% of California's total GHG emissions (ARB 2019).

San Diego County

On February 14, 2018, the County of San Diego adopted the County Climate Action Plan (CAP). The CAP includes a GHG baseline emissions inventory, which estimates the GHG emissions associated with County facilities and operations. The baseline year for the adopted CAP is 2014, the year for which complete data were available when the CAP was being prepared. In 2014, 3,211,505 metric tons (MT) CO₂e were emitted by activities in the unincorporated County (County of San Diego 2018). The largest source of emissions was the on-road transportation sector (i.e., gasoline and diesel consumption in on-road transportation), which accounted for 45% of the emissions. The electricity sector accounted for approximately 24% of the emissions (County of San Diego 2018).

City of Escondido

In February 2011, the City of Escondido completed a 2005 GHG emissions inventory of both municipal and community-wide GHG emissions through participation in the San Diego Foundation's Regional Climate Protection Initiative. In 2013, the City developed the Escondido Climate Action Plan (E-CAP) that revised the 2005 inventory and also developed emission estimates for 2010, 2020, and 2035. As a result of changes to assumptions for VMT and water estimates, the revised community-wide inventory estimated the 2005 emissions at 927,266 MT CO₂e.

The GHG emissions for 2010 were 886,118 MT CO₂e from community-wide activities and 18,143 MT CO₂e from municipal operations. Energy consumption is the largest source of emissions in the 2010 GHG inventory, at 45% of the total. Transportation is the next largest emissions sector, accounting for approximately 42% of total emissions. Accounting for future population and economic growth, the City estimated that GHG emissions would increase to approximately 992,583 MT CO₂e in 2020 and 1,230,182 MT CO₂e in 2035.

At the end of 2017, the City initiated an effort in collaboration with the San Diego Association of Governments (SANDAG) to reevaluate the City's E-CAP to ensure compliance with updated state policies and regulations. The Draft GHG Emissions Inventory and Projections was prepared by the Energy Policy Initiatives Center for the City in July 2018. The Draft GHG Emissions Inventory and Projections estimates the total GHG emissions in 2014 to be 874,000 MT CO₂e. The total GHG emissions in 2020 are projected to be 831,000 MT CO₂e, 5% lower than the 2014 emissions level. The total GHG emissions in 2030, 2035, and 2050 are projected to be

approximately 833,000 MT CO₂e, 842,000 MT CO₂e, and 836,000 MT CO₂e, respectively (City of Escondido 2018a). The July 2018 Draft GHG Emissions Inventory and Projections has not been adopted at this time.

Global Climate Change Trends

The Intergovernmental Panel on Climate Change (IPCC) concluded that variations in natural phenomena, such as solar radiation and volcanoes, produced most of the warming of the earth from pre-industrial times to 1950. These variations in natural phenomena also had a small cooling effect. From 1950 to the present, increasing GHG concentrations resulting from human activity, such as fossil fuel burning and deforestation, have been responsible for most of the observed temperature increase.

Global surface temperature has increased by approximately 1.53 degrees Fahrenheit (°F) over the last 140 years (IPCC 2013); however, the rate of increase in global average surface temperature has not been consistent. The last three decades have warmed at a much faster rate per decade (IPCC 2013).

During the same period when increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen; precipitation patterns throughout the world have shifted, with some areas becoming wetter and others drier; snowlines have increased in elevation, resulting in changes to the snowpack, runoff, and water storage; and numerous other conditions have been observed. Although it is difficult to prove a definitive cause-and-effect relationship between global warming and other observed changes to natural systems, there is a high level of confidence in the scientific community that these changes are a direct result of increased global temperatures caused by the increased presence of GHGs in the atmosphere (IPCC 2013).

Additional changes related to climate change can be expected by the year 2050 and on to the end of the century, including the following:

- California's mean temperature may rise by 2.7°F by 2050 and by 4.1°F to 8.6°F by the end of the century (CEC 2012). Temperatures in San Diego County may rise by 3.2°F to 5.7°F during that same period (CEC 2014).
- A consistent rise in sea level has been recorded worldwide over the last 100 years. Rising average sea level over the past century has been attributed primarily to warming of the world's oceans, the related thermal expansion of ocean waters, and the addition of water to the world's oceans from the melting of land-based polar ice (IPCC 2007). Sea level

rise is expected to continue, and the most recent climate science report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*, has estimated that sea levels along the U.S. Pacific coast will increase by up to 66 inches by 2100 (NRC 2012). The project area would not be subject to flooding as a result of sea level rise related to climate change.

- Various California climate models provide mixed results regarding forecasted changes in total annual precipitation in the state through the end of this century. However, recent projections suggest that the 30-year statewide average precipitation will decline by more than 10% (CEC 2012).
- Historically, extreme warm temperatures in the San Diego region have mostly occurred in July and August, but as climate warming continues, the occurrences of these events will likely begin in June and could continue to take place into September. All simulations indicate that hot daytime and nighttime temperatures (heat waves) will increase in frequency, magnitude, and duration (San Diego Foundation 2008).

Regulatory Setting

A description of the regulatory setting applicable to GHG emissions for this project is provided below. The following federal and State of California laws, regulations, policies, and plans are applicable to this resource area:

- **Federal Clean Air Act (CAA).** On December 7, 2009, EPA signed two distinct findings regarding GHGs under Section 202(a) of the CAA:
 - **Endangerment Finding:** The director of the EPA (Administrator) finds that the current and projected concentrations of the six key well-mixed greenhouse gases—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations.
 - **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.
- **EPA Final Mandatory Greenhouse Gas Reporting Rule.** On September 22, 2009, EPA published the Final Mandatory Greenhouse Gas Reporting Rule (Reporting Rule) in the Federal Register. The Reporting Rule requires reporting of GHG data and other relevant information from fossil fuel and industrial GHG suppliers, vehicle and engine manufacturers, and all facilities that would emit 25,000 MT or more of CO₂e per year.

Facility owners are required to submit an annual report with detailed calculations of facility GHG emissions on March 31 for emissions from the previous calendar year. The Reporting Rule also mandates recordkeeping and administrative requirements to enable EPA to verify the annual GHG emissions reports.

- **California Assembly Bill (AB) 1493.** AB 1493, signed in July 2002, requires ARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. In June 2009, the EPA Administrator granted a CAA waiver of preemption to California. This waiver allowed California to implement its own GHG emissions standards for motor vehicles beginning with model year 2009. California agencies worked with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger car model years 2017 through 2025. On September 19, 2019, EPA issued a press release announcing the formal waiver revocation. In response, California and 23 other states and the cities of Los Angeles and New York filed a lawsuit against the National Highway Traffic Safety Administration (NHTSA).
- **California EO S-3-05.** EO S-3-05, signed in June 2005, proclaimed that California is vulnerable to the impacts of climate change. EO S-3-05 declared that increased temperatures could reduce the Sierra Nevada's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established total GHG emissions targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050.
- **California AB 32.** In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in EO S-3-05 to reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies ARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target. AB 32 also established several programs to achieve GHG emission reductions, including the Low Carbon Fuel Standard (LCFS) and the Cap-and-Trade program. As of 2017, California has reduced emissions below the revised AB 32 limit of 427 MMT CO₂e (ARB 2019).
- **California EO S-1-07.** EO S-1-07, which was signed by then California Governor Arnold Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at more than 40% of statewide emissions. EO S-1-07 establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10% by 2020. ARB adopted the LCFS on

April 23, 2009. On September 27, 2018, ARB approved amendments requiring a 20% reduction in carbon intensity by 2030, the most stringent requirement in the nation.

- **California Senate Bill (SB) 97.** SB 97 required the Governor's Office of Planning and Research to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

This Recirculated EIR also incorporates updated regulatory setting adopted since the October 2016 Draft EIR, as follows:

- **Safer Affordable Fuel Efficient Vehicle Rule.** On March 31, 2020, NHTSA and EPA finalized the Safer Affordable Fuel Efficient (SAFE) Vehicle Rule for Model Years 2021-2026. The SAFE Rule revokes California's authority and vehicle waiver to set its own emissions standards and set zero emission vehicle mandates in California for passenger cars and light trucks and establish new standards, covering model years 2021 through 2026. The final rule will increase stringency of CO₂ emissions standards by 1.5% each year through model year 2026, as compared with the CO₂ standards issued in 2012, which would have required increases of about 5% per year.
- **SB 32.** In September 2016, SB 32 was approved, which extended the provisions of AB 32 from 2020 to 2030, with a new target of reducing statewide GHG emissions 40% below 1990 levels by 2030. The companion bill, AB 197, added two nonvoting members to ARB; created the Joint Legislative Committee on Climate Change Policies, consisting of at least three senators and three Assembly members; required additional annual reporting of emissions; and required that Scoping Plan updates include alternative compliance mechanisms for each statewide reduction measure, along with market-based compliance mechanisms and potential incentives.
- **California Renewables Portfolio Standards (RPS).** California's RPS was established in 2002 under SB 1078 and accelerated in 2006 under SB 107, by requiring that 20% of electricity retail sales be served by renewable energy sources by 2010. Subsequent recommendations in California energy policy reports advocated a goal of 33% by 2020, and on November 17, 2008, then governor Arnold Schwarzenegger signed EO S-14-08 requiring retail sellers of electricity to serve 33% of their load with renewable energy by 2020. In April 2011, SB X1-2 codified EO S-14-08, setting the new RPS targets at 20% by the end of 2013, 25% by the end of 2016, and 33% by the end of 2020 for all electricity retailers. In October 2015, Governor Edmund Brown signed SB 350, which extended the RPS target by requiring retail sellers to procure 50% of their electricity from renewable energy resources by 2030. This was followed by SB 100 in 2018, which further increased the RPS target to 60% by 2030, along with the requirement that all of the state's electricity come from carbon-free resources by 2045.

- **California's 2017 Climate Change Scoping Plan.** In response to SB 32, ARB released the 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target (2017 Scoping Plan Update) in November 2017. The 2017 Scoping Plan Update establishes a plan of action consisting of a variety of strategies to be implemented, rather than a single solution, for California to reduce statewide emissions by 40% by 2030 compared to 1990 levels (ARB 2017). ARB, in the 2017 Scoping Plan Update, described the Under2Coalition, a global climate pact, among states, provinces, countries, and cities all committing to do their part to limit the increase in global average temperatures below the dangerous levels. Signatories of the Under2Coalition commit to either reducing GHG emissions 80 to 95% below 1990 levels by 2050 or achieving a per capita annual emission target of less than 2 MT by 2050. However, it should be noted that the per capita annual emission target of less than 2 MT by 2050 is not a CEQA project-level threshold.

Discussion of applicable local regulations pertinent to this project is provided below. ARB acknowledges that local governments have broad influence and, in some cases, exclusive jurisdiction over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. In San Diego County, the SDAPCD is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws and policies. The SDAPCD has no regulations relative to GHG emissions.

City of Escondido

General Plan

The City of Escondido adopted an updated General Plan in 2012 (City of Escondido 2012a). The following policies contained in the Resource Conservation Element of the General Plan are applicable to the project:

- Goal 6: Preservation and protection of the City's surface water and groundwater quality and resources.
- Water Resources and Quality Policy 6.2: Protect the surface water resources in the city including Lake Wohlford, Dixon Lake, Lake Hodges, Escondido Creek, and other waterways.
- Goal 7: Improved air quality in the city and the region to maintain the community's health and reduce [GHG] emissions that contribute to climate change.

- Air Quality and Climate Protection Policy 7.1: Participate in regional planning efforts and coordinate with the San Diego Air Pollution Control District and San Diego Association of Governments in their efforts to reduce air quality impacts and attain state and federal air quality standards.
- Air Quality and Climate Protection Policy 7.2: Reduce regional [GHG] emissions through the following measures including, but not limited to:
 - a) Implementing land use patterns that reduce automobile dependence (compact, mixed-use, pedestrian, and transit-oriented development, etc.);
 - b) Reducing the number of vehicular miles traveled through implementation of Transportation Demand Management programs, jobs-housing balance, and similar techniques;
 - c) Supporting public transportation improvements;
 - d) Encouraging the use of alternative modes of transportation by expanding public transit, bicycle, and pedestrian networks and facilities;
 - e) Participating in the development of park-and-ride facilities;
 - f) Maintaining and updating the City's traffic signal synchronization plan;
 - g) Promoting local agriculture;
 - h) Promoting the use of drought-tolerant landscaping; and
 - i) Encouraging the use of non-polluting alternative energy systems.
- Air Quality and Climate Protection Policy 7.3: Require that new development projects incorporate feasible measures that reduce construction and operational emissions.
- Air Quality and Climate Protection Policy 7.4: Locate uses and facilities/operations that may produce toxic or hazardous air pollutants an adequate distance from each other and from sensitive uses such as housing and schools as consistent with California Air Resources Board recommendations.
- Air Quality and Climate Protection Policy 7.7: Encourage businesses to alter local truck delivery schedules to occur during non-peak hours, when feasible.
- Air Quality and Climate Protection Policy 7.8: Require that government contractors minimize [GHG] emissions in building construction and operations, which can be accomplished through the use of low or zero-emission vehicles and equipment.

- Air Quality and Climate Protection Policy 7.10: Purchase low-emission vehicles for the City's fleet and use clean fuel sources for trucks and heavy equipment, when feasible.
- Air Quality and Climate Protection Policy 7.11: Educate the public about air quality, its effect on health, and efforts the public can make to improve air quality and reduce [GHG] emissions.

Climate Protection Plans

The City of Escondido has taken steps to address climate change impacts at a local level. The City adopted the E-CAP in December 2013. The development of the E-CAP coincided with the City's General Plan Update. The E-CAP provides an analysis of GHG emissions and sources attributable to the City of Escondido, estimates on how those emissions are expected to increase with the General Plan, recommended policies and actions that can reduce GHG emissions to meet state and federal targets, a timeline of implementation, and a defined tracking and reporting mechanism that measures progress toward the goals.

Pursuant to the state's adopted AB 32 GHG reduction target, Escondido has set a goal to reduce emissions back to 1990 levels by the year 2020. This target was calculated as a 15% decrease from 2005 levels, as recommended in the AB 32 Scoping Plan. To reach the reduction target, the City would implement additional local reduction measures that encourage energy efficiency and renewable energy in buildings, transit-oriented planning, water conservation, and increase waste diversion. After 2020, many of the E-CAP and statewide reduction measures would continue to reduce GHG emissions. In 2017, the City of Escondido initiated an effort with the help of SANDAG to reevaluate the E-CAP to ensure compliance with updated state policies and regulations (City of Escondido 2018b). The updated Draft E-CAP has not been released at the time of this analysis.

3.6.2 Significance Criteria

Criteria used to evaluate potential GHG emissions impacts are based on Appendix G of the State CEQA Guidelines. The effects of a project related to greenhouse gas emissions would be considered significant if the project would do the following:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
2. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

The City of Escondido has established a threshold of 2,500 MT CO₂e per year as a project-level GHG significance threshold that would apply to land use development projects (City of Escondido 2013a). The threshold was set at a level that would account for both operational and construction emissions attributable to new development projects through 2020, in concert with AB 32 statewide goals. The emissions level is considered a threshold above which a project would require “project-specific technical analysis to quantify and mitigate project emissions” (City of Escondido 2013a). However, given that project construction and operation would occur beyond 2020, construction-related GHG emissions should also be analyzed in the SB 32 statewide framework, which requires a greater reduction in emissions than under AB 32 (a 2030 GHG emissions reduction target of 40% below 1990 levels). As mentioned above, the City of Escondido is in the process of updating the E-CAP to ensure compliance with updated state policies and regulations; however, the updated E-CAP has not been adopted at this time and a threshold consistent with the SB 32 legislative mandate has not been adopted.

To put the project-generated GHG emissions in the appropriate statewide context, this analysis presumes that a 40% reduction in the City’s existing threshold (resulting in 1,500 MT CO₂e) is necessary to demonstrate consistency with California’s 2030 GHG reduction goal (which is a 40% reduction below 1990 GHG emissions levels). This analysis also reviewed guidelines used by other public agencies. Few public agencies and air pollution control districts have adopted project-level mass emissions thresholds consistent with California’s 2030 GHG reduction goals. One agency that has is the Sacramento Metropolitan Air Quality Management District (SMAQMD), which adopted a significance threshold for GHG emissions of 1,100 MT CO₂e per year that applies for the construction phase of all project types (SMAQMD 2018). Although SMAQMD recognizes that, although there is no known level of emissions that determines if a single project will substantially impact overall GHG emission levels in the atmosphere, a threshold must be set to trigger a review and assessment of the need to mitigate project GHG emissions. The threshold set by SMAQMD was developed considering the AB 32 and SB 32 statewide GHG reduction goals.

Direct comparison of construction GHG emissions with long-term thresholds would not be appropriate because these emissions cease upon completion of construction. The SMAQMD guidance notes that, in order to assess the significance of impacts for projects with primarily construction-related emissions, lead agencies can “amortize the level of short-term construction emissions over the expected (long-term) operational life of a project” (SMAQMD 2018, page 6-14). Therefore, this analysis utilizes the 1,100 MT CO₂e threshold developed by SMAQMD for the construction phase of all project types for conservative purposes.

It is not the intent of this CEQA document to cause the adoption of these thresholds as mass emissions limits for this or other projects, but rather to provide this additional information to put the project-generated GHG emissions in the appropriate statewide legislative framework.

3.6.3 Impact Analysis

Methodology

Construction-related exhaust emissions for the project were estimated for construction worker commutes, haul trucks, and the use of off-road equipment. GHG emissions generated by construction activities would be primarily associated with construction equipment exhaust emissions. Project construction is estimated to occur over approximately 32 months. Construction-related emissions for the project were estimated using emission factors from ARB's OFFROAD and EMFAC2014 inventory models (ARB 2013). Construction emissions from the operation of diesel-fueled off-road equipment were estimated by multiplying daily usage (i.e., hours per day) and total days of construction by OFFROAD equipment-specific emission factors. GHG emissions from on-road motor vehicles were estimated using vehicle trips, VMT, and EMFAC2014 mobile source emission factors. The emission factors represent the fleet-wide average emission factors within San Diego County. Since the October 2016 Draft EIR, ARB has released an updated version of EMFAC, EMFAC2017. In general, due to methodology improvements and regulatory updates, CO₂ emission rates are about 10% lower in EMFAC2017 than EMFAC2014; thus, this analysis (performed with EMFAC2014) presents a conservative estimate of on-road vehicle emissions. Consistent with SMAQMD methodology, construction-related emissions were amortized over the life expectancy of the project, which is estimated to be 100 years.

The restoration of water levels will not generate any GHG emissions. In addition, the project is not anticipated to generate new vehicle trips and would not generate any additional activities related to maintenance or operations that would exceed existing levels. The project would not significantly increase the generation or use of electricity, water, wastewater, or solid waste. Therefore, operational GHG emissions were not estimated for the project. The project would alleviate public safety and flooding concerns due to seismic instability of the existing Lake Wohlford Dam and provide a dam facility with a life expectancy of 100 years. Most of the water released from Lake Wohlford passes through the Wohlford Penstock to the Bear Valley HGF and generates renewable electricity that is sold to San Diego Gas & Electric. The HGF is small hydroelectric power technology contributing to San Diego Gas & Electric's achievement of the RPS goals and requirement that all the state's electricity come from carbon-free resources by 2045 (SDG&E 2019). Thus, the continued operation of the project would continue providing water storage and flow for uses downstream, including hydroelectric power production, which is

a renewable and zero emission energy resource. The analysis conservatively does not account for the operational GHG reductions achieved via hydroelectric power generation associated with the continued operation of Lake Wohlford Dam.

Analysis

Criterion 1: Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

As discussed previously, construction-related GHG exhaust emissions would be generated by sources such as heavy-duty off-road equipment, trucks hauling materials to the site, and construction worker commutes. In addition, dewatering would be required during excavation and construction of the dam foundation. As such, there is potential for loss in hydroelectric power generation during construction activities. However, the potential loss in hydroelectric power generation would largely depend on the weather patterns for that particular year. For example, in a dry year, spillage would be less (and the potential loss in hydroelectric power would be lower), than what could be seen in a median or wet year. As stated in San Diego Gas & Electric's Power Content Label, the power mix delivered in 2018 primarily included solar (20%), wind (21%), natural gas (29%) energy resources, and unspecified sources of power (27%) (CEC 2019). As such, any potential loss in hydroelectric power would not substantially affect the power grid mixture of energy sources and would not result in substantial GHG emissions from a temporary reduction in hydroelectric power generation.

As shown in Table 3.6-1, the total construction-related emissions over the construction period for the project would be approximately 6,656 MT CO₂e. The amortized GHG emissions associated with construction of the project would be approximately 67 MT CO₂e per year.

**Table 3.6-1
Construction-Related GHG Emissions (MT CO₂e/Year)**

Year	Emissions (MT CO₂e)
Staging (Mobilization)	227
Oakvale Road	771
Dam Foundation	3,323
Access Road	90
Replacement Dam	1,871
Demolition of Existing Dam	375
Total	6,656
Amortized GHG Emissions¹	67
SMAQMD Significance Threshold	1,100

Year	Emissions (MT CO ₂ e)
Adjusted City of Escondido Threshold ²	1,500
Exceeds Threshold?	No

MT CO₂e = metric tons of carbon dioxide equivalent

Notes: Totals may not add due to rounding.

¹ Amortized GHG emissions calculated by dividing the total GHG emissions over the life of the project (assumed to be 100 years).

² The adjusted City of Escondido threshold of 1,500 MT CO₂e was developed presuming that a 40% reduction in the City's existing threshold of 2,500 MT CO₂e is necessary to achieve the state's 2030 GHG reduction goal (which is a 40% reduction below 1990 GHG emissions levels).

Modeling inputs and outputs are provided in Appendix G.

Source: AECOM 2016b

As shown in Table 3.6-1, the amortized construction-related GHG emissions associated with the project would be less than the annual 1,100 MT CO₂e threshold of significance recommended by SMAQMD for the construction phase for all project types. The amortized construction-related GHG emissions would also be less than the adjusted City of Escondido annual threshold of 1,500 MT CO₂e. In addition, the project would not result in an increase in long-term operational emissions because the purpose of the proposed project is to improve the safety of the dam and provide a dam facility with a life expectancy of 100 years. In contrast, the project would allow for continued long-term operation of the Lake Wohlford Dam, providing water storage and flow for hydroelectric power production. As such, the long-term operation of Lake Wohlford Dam would offset any GHG emissions associated with temporary construction activities and any potential loss in hydroelectric power generation experienced during construction activities. Therefore, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. This impact would be less than significant.

Criterion 2: Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions GHGs?

At the time of this writing, the E-CAP is considered an approved plan designed to fulfill the requirements identified in CEQA Guidelines Section 15183.5. One of the goals of the E-CAP is to allow program-level review and mitigation of GHG emissions that allows streamlining of CEQA review for subsequent development projects. Therefore, for the purposes of this analysis, the applicable GHG reduction plans to evaluate the project against are the statewide AB 32 Scoping Plan, Scoping Plan updates, and the E-CAP. Projects that would be consistent with the goals and strategies of the AB 32 Scoping Plan, Scoping Plan updates, and the E-CAP would be considered not to conflict with the state's purpose of reducing GHG emissions.

ARB's *First Update to the Climate Change Scoping Plan: Building on the Framework* (2014a) includes measures to meet California's goal of reducing emissions to 1990 levels by 2020 and

also reiterates the state's role in the long-term goal established in EO S-3-05, which is to reduce GHG emissions to 80% below 1990 levels by 2050. In response to SB 32, ARB released the 2017 Scoping Plan Update in November 2017. The 2017 Scoping Plan Update includes GHG reduction strategies and actions in six key sectors: low carbon energy, industry, transportation sustainability, natural and working lands, waste management, and water (ARB 2017). The Scoping Plans did not directly create any regulatory requirements for construction of the project. However, measures included in the Scoping Plan and 2017 Scoping Plan Update would indirectly address GHG emissions levels associated with construction activities, including the phasing-in of cleaner technology for diesel engine fleets (including construction equipment) and the development of a low-carbon fuel standard. The 2017 Scoping Plan Update includes low carbon energy strategies of reducing fossil fuel use for electricity and increasing renewable energy generation per RPS mandates. Thus, because the project would allow for the continued safe operation of Lake Wohlford Dam, which provides water to the Bear Valley HGF, the project would be consistent with California's RPS targets and Scoping Plan strategies.

The City of Escondido's General Plan also includes implementation tools that are presented as separate policies and documents related to the project. The Resource Conservation Element of the General Plan has goals to preserve and protect the City's surface water (Goal 6) and protect the surface water resources in the City, including Lake Wohlford (Water Resources and Quality Policy 6.2). The General Plan also includes policies to require that new development projects incorporate feasible measures that reduce construction and operational emissions (Air Quality and Climate Protection Policy 7.3) and to encourage businesses to alter local truck delivery schedules to occur during non-peak hours, when feasible (Air Quality and Climate Protection Policy 7.7). In addition, because the project would allow for the continued safe operation of Lake Wohlford Dam, which provides water to the Bear Valley HGF, the project would be consistent with General Plan Air Quality and Climate Protection Policy 7.2, which encourages the use of non-polluting alternative energy systems.

The E-CAP is an implementation tool of the General Plan to guide development in Escondido by focusing on attaining the various goals and policies of the General Plan while also achieving GHG reduction goals. The E-CAP includes actions that encourage energy efficiency and renewable energy in buildings, transit-oriented planning, water conservation, and increased waste diversion. As described in the E-CAP, the purpose of the E-CAP CEQA Thresholds and Screening Tables is to provide guidance in measuring the reduction of GHG emissions attributable to certain design and construction measures incorporated into development projects (City of Escondido 2013a). Since this project is not a typical land use development project and, as shown in Table 3.6-1, project construction would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, the project would not be required to implement any Screening Table measures. In addition, implementation of the project

would allow for the continued safe operation of Lake Wohlford Dam, which provides water to the Bear Valley HGF. Thus, the project would be consistent with E-CAP goals and reduction strategies of encouraging renewable energy production.

The purpose of the project is to restore the City's municipal water-storage capacity and alleviate a public safety concern. The project would protect infrastructure and resources by proactively improving and upgrading Lake Wohlford Dam and providing a facility with a life expectancy of 100 years. The project would thus help avoid reactive rebuilding and repairing expenditures as a result of natural disasters or infrastructure failure, which would lead to losses and disruptions to economic activities and reduction in the quality of life of local residents if a flood event impacted the area. In addition, the project would allow for the long-term continued operation of Lake Wohlford Dam, which releases water into the Bear Valley HGF; thereby, generating renewable energy. Thus, the intent, purpose, and functions of the project are consistent with the goals of the AB 32 Scoping Plan and Scoping Plan updates to protect against the detrimental effects of climate change.

As discussed earlier, the project does not exceed the threshold of significance for GHG emissions. The approach to developing a threshold of significance for GHG emissions is to identify the level of emissions for which a project would not be expected to substantially conflict with existing California legislation that has been adopted to reduce statewide GHG emissions. The project would be consistent with the goals and strategies of the ARB Scoping Plan, Scoping Plan update, and the E-CAP. Therefore, the project would not conflict with any applicable plan, policy, or regulation for the purpose of reducing GHG emissions. This impact would be less than significant.

3.6.4 Significant Impacts and Mitigation Measures

No significant impacts related to GHG emissions were identified for the project. Therefore, no mitigation is required.

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CHAPTER 4.0

EFFECTS FOUND NOT TO BE SIGNIFICANT

This chapter replaces, in full, Chapter 4.0 from the previously circulated Draft EIR (October 2016) for the project. This chapter has been revised to address new environmental issues (energy, wildfire, and VMT) that were added to CEQA Guidelines Appendix G (Environmental Checklist Form) after the October 2016 Draft EIR was circulated.

As allowed by Section 15128 of the CEQA Guidelines, effects found not to be significant need not be discussed in detail in an EIR. Rather, a brief discussion as to why various possible effects of a project were determined not to be significant is appropriate. The following 10 issue areas were determined, based on preliminary review, not to have a significant effect on the environment: Agricultural Resources, Land Use, Mineral Resources, Paleontological Resources, Population and Housing, Public Services, Utilities and Service Systems, Energy, Wildfire, and Vehicle Miles Traveled (VMT). The rationale for these conclusions is outlined below.

4.1 AGRICULTURAL RESOURCES

The project site is not currently used for agricultural purposes; rather it is open, generally undeveloped land due in part to the rocky slopes, rock outcroppings, and dense vegetation found in the vicinity. The California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) designates the project vicinity and majority of surrounding area as Other Land. However, there is some land north of the project site along and to the north of Lake Wohlford Road that is designated as Farmland of Local Importance (Department of Conservation 2014). The land with this designation is not currently in agricultural production. The County of San Diego zones the project site as A72 (General Agriculture) and surrounding areas as A70 (Limited Agriculture) (County of San Diego 2014b), both of which are common zoning for the large areas of undeveloped land in the vicinity. The Escondido General Plan, Resource Conservation Element does not designate the Lake Wohlford vicinity or surrounding area as an Agricultural Area (City of Escondido 2012a). The project site is not within a Williamson Act Contract (Department of Conservation 2013). The project site is not within a timberland or forest land zone.

A portion of the Lake Wohlford Marina is mapped with the FMMP designation Farmland of Local Importance. However, this appears to be an outdated mapping anomaly, as this land is not used for agriculture, and project activities on this land would not be considered an impact on agricultural resources. The relocation of the dam would not impact agricultural resources,

conflict with the agricultural zoning of the area, or preclude the use of surrounding land for agricultural uses. The MND for the Oakvale Road Realignment and Improvement Project found no impact to agricultural resources as a result of that project. Therefore, the project would not have a significant effect on agricultural resources.

4.2 LAND USE AND PLANNING

The project site is immediately downstream (southwest) of Lake Wohlford on unincorporated land owned by the City. The Escondido General Plan identifies the project site as Public Land/Open Space with Rural I residential land use designated in surrounding areas (City of Escondido 2012a). The County's North County Metropolitan Subregional Plan shows the site mapped as Public/Semi-Public Facilities with Rural Lands (RL-40) surrounding the area (County of San Diego 2011d). The North County Metro Resource Conservation Area Map also shows areas south of Lake Wohlford designated as the Bottle Peak-Lake Wohlford Resource Conservation Area and areas to the northwest designated as the Valley Center Ridge Resource Conservation Area (County of San Diego 2011d). The project site is surrounded by lands within the planning area of the North County Subregion of the County of San Diego's MSCP, which remains in draft form and does not govern project activities. The project site is included within the City of Escondido's MHCP Subarea. The Escondido MHCP Subarea Plan, which is also in draft form, includes the incorporated city limits plus approximately 3,000 acres owned by the City in the unincorporated areas, such as Lake Wohlford.

Implementation of the project would relocate the existing Lake Wohlford Dam approximately 200 feet downstream from its current location, in an area currently used for maintenance access. Because of the existing dam, the project site is not developed and the construction of the replacement dam would not alter land uses in a way that could divide an established community or conflict with planning documents or policies as the dam and reservoir are existing elements of the area and the project would only modify the location within a very nearby area. The MND for the Oakvale Road Realignment and Improvement Project found no significant impact to land use as a result of that project. Therefore, the project would not have a significant effect related to land use.

4.3 MINERAL RESOURCES

According to the USGS Mineral Resources Data System, past and present mining operations and prospect areas are located in the general vicinity of the project (Lake Wohlford Road Pit [Wickoff Quarry], A.M.E. Quarry, Bear Deposit, Langer Deposit). Mineral extraction from these locations generally includes crushed stone (USGS 2014). The project site is not within a Mineral Resource Zone as designated by the County. Areas west of the project are designated as Mineral

Resource Zone 3 (MRZ-3) (County of San Diego 2011e). MRZ-3 indicates areas containing mineral deposits whose significance cannot be evaluated from available data. The existing Escondido General Plan does not include a designation for mineral resources or extraction operations (City of Escondido 2012a).

Mining or mineral extraction does not currently take place within the project site or immediate vicinity. It is likely that some of the aggregate needed for project construction may come from project excavation operations, as feasible. This on-site reuse would provide high-quality aggregate necessary for the project and minimize the need for hauling rock material on- and/or off-site. The shifting of the dam from its current location to the proposed site 200 feet downstream would not substantially change the existing availability of mineral resources that would be of value to the region and residents of California or result in the loss of availability of a locally important mineral resource recovery site delineated on a land use plan. The project would not alter or hinder existing or future mineral extraction operations. The MND for the Oakvale Road Realignment and Improvement Project found no impact to mineral resources as a result of that project. Therefore, the project would not have a significant effect on mineral resources.

4.4 PALEONTOLOGICAL RESOURCES

Evaluation of sensitivity for potential presence of paleontological resources in unincorporated County land is provided in the County of San Diego Guidelines for Determining Significance, Paleontological Resources (County of San Diego 2009). As shown in Figure 2 of the referenced guidelines, the project area is mapped as having a sensitivity level of “none.” Therefore, there would be no impact on paleontological resources.

4.5 POPULATION AND HOUSING

The project would not displace existing housing or people as there are no residential developments within the project site or immediate vicinity. The project does not include the development of new housing or any population-generating uses. Construction of the project is anticipated to take approximately 32 months and could employ up to approximately 88 workers at a time (two daily shifts of up to 44 workers); however, the workforce is expected to be drawn from the local region and would not cause a substantial influx of new population growth to the area. The project would result in increased capacity of the reservoir, which is used in part by the City for municipal water supply. However, the increase in capacity would be a return to historic levels necessary to serve existing and planned City needs and not be an infrastructure expansion that could induce substantial new population growth. The MND for the Oakvale Road Realignment and Improvement Project found no impact to population and housing as a result of

that project. Therefore, the project would not have a significant effect on population and housing in the area.

4.6 PUBLIC SERVICES

Emergency services are provided to the project site by the Valley Center Fire Protection District (fire and medical) and Valley Center Sheriff's Substation (police), both of which are located approximately 4.5 miles northeast of the project site on North Lake Wohlford Road. Construction and operation of the project would not generate a need for increased emergency services or new facilities as the new dam would replace the existing seismically unstable dam and would not create a new or substantially altered use of the area or reservoir that could generate an increase in the need for services or effect the ability of the service providers to maintain adequate service ratios. The traffic control plan required by the City for construction activities would outline all requirements to ensure that emergency access is maintained at all times and project construction would not impact acceptable response times and would require coordination and notification of emergency service providers.

Other public services such as schools, parks, and other public services and facilities would not experience an increase in demand or need for services as the project would not generate population growth or other community changes that might increase demand or availability of those public services or create the need for new or expanded facilities. The MND for the Oakvale Road Realignment and Improvement Project found no impact to public services as a result of that project. Therefore, the project would not have a significant effect on public services.

4.7 UTILITIES AND SERVICE SYSTEMS

Lake Wohlford is an important component of the City's initial municipal water supply, serving as a storage reservoir where discharged water is treated and distributed to the City's municipal customers. As described in Chapter 2, due to seismic stability concerns with the existing dam, the City had to decrease the reservoir's capacity to approximately 40% of its prior capacity. Additionally, most of the water released from Lake Wohlford passes through the Wohlford Penstock to the Bear Valley HGF and generates electricity that is sold to San Diego Gas & Electric.

Construction of the replacement dam would occur while the existing dam is still in place; thus, any utilities that need to be relocated in association with the replacement dam would be installed prior to demolition of the existing dam and minimal impacts to utilities and service systems are anticipated. Water supply would be necessary during construction, most specifically during the concrete dam construction. However, the RCC method of placing concrete minimizes water

content. Demand for water during construction activities would cease at the end of the construction period. Once operational, the project would not require a substantial volume of water as project components are static infrastructure features. The project would not result in the need for new or expanded water entitlements, but rather would regain the Lake Wohlford reservoir's lost water storage capability for the City's municipal water system. The replacement dam would provide a seismically safe and long-term (expected lifespan of 100 years) component of the City's water infrastructure system. Discharged water would continue to pass through the Wohlford Penstock to the Bear Valley HGF for electricity generation, similar to existing conditions. Because the permanent facilities would basically replace similar existing facilities (i.e., the existing dam and Oakvale Road), there would not be a substantial difference in the volume of runoff generated by the project or a need for increased stormwater treatment facilities. Thus, the project would not have a significant effect on utilities and service systems.

Approximately 59,516 cubic yards of excavated earth and rock from the dam foundation area would be hauled off site, and Oakvale Road reconstruction would require approximately 56,000 cubic yards of material to be removed from the project site. It is anticipated that this material would be transported to a local quarry for processing and resale. Due to the quality of the rock, it is not expected to be disposed of in a landfill. Material from demolition of the existing dam, approximately 37,100 cubic yards would be hauled off-site for reuse, rather than disposal in a landfill. Thus, the project would not result in impacts to local landfills.

4.8 ENERGY

Project construction is anticipated to take a total of 32 months during which energy would be consumed to power equipment and vehicles. Once construction is complete, the use of equipment would not consume additional energy related to maintenance and operations that would exceed existing levels. The project would also not involve consumption of other sources of energy such as electricity or natural gas, above existing conditions. Once the project is complete and water levels are restored, discharged water would continue to pass through the Wohlford Penstock to the Bear Valley HGF for electricity generation. The electricity generated is sold to San Diego Gas & Electric. While construction of the project would consume energy to power equipment and vehicles, consumption would not be wasteful, inefficient, or unnecessary as consumption would cease following construction and return to existing operation-related consumption conditions. There would be no negative change to electricity generation; in fact, there may be additional water that could be used for electricity generation.

The California Public Utilities Commission's Energy Efficiency Strategic Plan sets forth a roadmap to achieve energy savings across all major sectors (residential, commercial, industrial, and agricultural) in the state, and the San Diego Association of Governments Regional Energy

Strategy identifies several actions to meet the region's energy goals. These plans focus on changing industry standards such as through building retrofit programs, and supporting land use and transportation planning strategies to reduce energy use. Since the project involves replacement of an existing dam and the project's energy consumption is limited to construction activities and fuel consumption, the project would not conflict with or obstruct the state's Energy Efficiency Strategic Plan or San Diego Association of Governments Regional Energy Strategy. Therefore, the project would not have a significant effect related to energy.

4.9 WILDFIRE

As discussed in Section 3.7, the project site, as well as the majority of the Lake Wohlford area, is designated as a Very High Fire Hazard Severity Zone as identified by the California Department of Forestry and Fire Protection. The fire protection responsibility for the project site is mapped within a State Responsibility Area, with some portions mapped as a Federal Responsibility Area. Wildland fire safety concerns in these areas exist due to the presence of dense native and exotic vegetation in proximity to residences.

As discussed in Section 3.7, Oakvale Road realignment and dam construction would necessitate that construction vehicles use roadways that have been designated as evacuation routes in the City's General Plan Community Protection Element. The construction traffic would not interfere or create unacceptable roadway operating conditions or preclude the roads from serving as emergency evacuation routes. The traffic control plan required by the City would identify measures to maintain traffic safety and emergency access. Access to all areas affected by project construction would be maintained throughout construction allowing for evacuation of the area if necessary. For these reasons, project construction would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. In addition, the rise in water levels would affect the water body and shoreline immediately surrounding that has been historically inundated and is not used for emergency operations.

The reservoir is an existing feature and the project proposes to restore water levels, which would not exacerbate wildfire risks. The use of construction equipment, similar to any powered equipment or vehicle, can be a source of potential fire, due to electrical sparks and use of flammable materials that could ignite and spread quickly to surrounding areas and fuel sources. However, as discussed in Section 3.7, the City would require the contractor to prepare a Fire Prevention and Response Plan specific to the project, and all construction crewmembers would be trained in the requirements of the plan. The Fire Prevention and Response Plan would reduce the potential for accidental wildfires through requirements and measures that minimize potential for accidental ignition as well as ensure quick response if a fire were to occur. Such measures and requirements may include fire suppression equipment to be located on board construction

equipment and/or at the worksite; heavy equipment operators to be trained in appropriate responses to accidental fires; emergency communication equipment available to site personnel; and requirements for vegetation clearing and buffers around active work and staging areas, among others. Once construction is complete, the dam would return to pre-drawdown conditions, which would have no effect on wildfire risk. In fact, the restored water levels could be used as an increased water source to fight fires in the surrounding area should the need for water arise.

The project would realign existing Oakvale Road because its current alignment skirts a steep rock face and conflicts with the proposed location of the replacement dam. The realigned road would be constructed to County standards and include storm drain improvements and a brow ditch to divert storm flows down the slope. The project would also construct a gravel access road from the Lake Wohlford Marina to the right (north) side of the replacement dam to provide construction access and, following completion of the project, provide permanent maintenance and inspection access, as requested by the DSOD. Use of the access road would be limited to maintenance and inspection crews. Neither the realigned Oakvale Road nor the new access road would directly exacerbate fire risk; however, during project construction and operation, heavy equipment and vehicles driving along the road near vegetated areas could increase the fire danger. As discussed above, a project-specific Fire Prevention and Response Plan would be prepared and adhered to by all construction crewmembers. No other infrastructure such as power lines or other mechanized utilities are proposed.

When Oakvale Road is realigned, the existing drainage flow would be altered to divert storm flows down the slope. The reconstruction of storm drains, construction of brow ditches, and incorporation of earthen swales and energy dissipaters would be implemented into the realigned road design to improve and protect drainage. This would provide beneficial drainage changes and would not expose people or structures to flooding or landslide risk as a result of post-fire instability. For dam replacement, the redesigned spillway would reduce the occurrence of spillover events relative to existing conditions and correspondingly reduce the lake-related discharges to Escondido Creek. Furthermore, the dam's emergency release valve would enable reservoir water releases to Escondido Creek in the event of a dam safety event to minimize flooding impacts. Since post-construction peak runoff flow would be reduced over existing conditions, the potential for flooding hazards as a result of post-fire conditions would also be reduced. Therefore, the project would not have a significant effect related to wildfire.

4.10 VEHICLE MILES TRAVELED

Pursuant to new CEQA Guidelines Section 15604.3, VMT is the most appropriate measure of transportation impacts. "Vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. As described in CEQA Guidelines Section 15064.3(b)(3), for

many projects, a qualitative analysis of construction traffic may be appropriate. The discussion herein builds on the existing traffic and circulation analysis in Section 3.11 of the EIR, which focuses on level of service, CEQA's previous appropriate measure of transportation impacts.

The proposed project is solely a construction project and would not develop any land uses that would result in a long-term increase of VMT. The restoration of water levels within Lake Wohlford to historic levels at the completion of the dam replacement would not generate traffic. Once completed, the lake and new dam would continue to operate in a manner similar to current status and not require substantially more maintenance operations that could produce vehicle trips or generate a high volume of new trips to the lake area.

Construction of the project would result in a temporary increase in traffic utilizing local roads to access the project site, which would temporarily increase VMT. As described in Section 3.11, trip generation associated with both the Oakvale Road realignment and dam construction would consist of heavy truck trips making multiple round-trips per day and trips to and from the site by workers. It is anticipated that the Oakvale Road realignment hauling phase would entail approximately 70 round-trips per day over a 4-month period with approximately 35 workers on-site daily. As further described in Section 3.11, the Oakvale Road realignment is calculated to generate the equivalent of 497 daily trips. Dam construction would not begin until the Oakvale Road realignment construction was complete and construction-generated traffic would not combine or overlap. Dam construction assumed that construction of the project would employ a maximum of 44 workers on-site during any one shift. Dam construction is calculated to generate the equivalent of 898 daily trips.

The project would not result in new additional traffic above existing conditions, once construction is complete. Therefore, while a temporary increase in VMT would occur, it is unlikely this increase would result in a significant impact because it would only be for the duration of construction.

APPENDIX A

PUBLIC REVIEW DRAFT EIR
(ON CD)

APPENDIX C-1

LAKE WOHLFORD 45-DAY SUMMARY REPORT

October 20, 2017

Ms. Stacey Love
Recovery Permit Coordinator
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

**RE: 2017 Lake Wohlford Dam Replacement Project Focused Species Surveys
45-Day Summary Report, San Diego County, California**

Dear Ms. Love:

In compliance with the Special Terms and Conditions for Endangered and Threatened Wildlife Species Permit TE-820658-7 (AECOM biologists Andrew Fisher, Brennan Mulrooney, and James McMorran) and TE-101151-3 (AECOM biologist Eric “Rick” Bailey), AECOM submits this letter report summarizing the results of focused surveys conducted during 2017 for the federally endangered southwestern willow flycatcher (*Empidonax trailii eximius*; SWFL), federally endangered least Bell’s vireo (*Vireo bellii pusillus*; LBV), and federally threatened coastal California gnatcatcher (*Poliophtila californica californica*; CAGN) at the City of Escondido (City) Lake Wohlford Reservoir, San Diego County, California. Surveys were conducted under contract with the City. Surveys for the same three species were previously conducted by AECOM in 2013 (AECOM 2013a, 2013b, and 2013c), and therefore this survey report serves as an update to that historical data. This report includes the project description; site description; and a discussion of species background, survey methodology, and results for each species separately. The raw field data (dates, survey personnel, weather, species detection information, etc.) collected during the 2017 surveys are presented in Appendix A, and a list of all wildlife species detected across all surveys is presented in Appendix B.

Project Description and Background

The City is planning to construct a replacement dam immediately downstream (west) of the existing dam and partially deconstruct the existing dam. Replacing the dam requires replacement or modification of the existing dam’s outlet tower and associated pipes beneath the dam. To accommodate the replacement dam’s configuration, the project also entails realignment of the portion of Oakvale Road that passes the southern dam abutment. The project is intended to improve the dam’s seismic safety and return the reservoir to its previous height, allowing the City to regain the lost water storage capacity in this component of its municipal water supply. No changes to the 1,480-foot spillway crest elevation of the existing dam are proposed. Therefore, no changes to the historical high water level of Lake Wohlford are proposed.

In a joint comment letter written by U.S. Fish and Wildlife and California Department of Fish and Wildlife on the dam replacement project’s Draft Environmental Impact Report, dated December 1, 2016, the agencies suggested performing an additional round of protocol

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surveys for the three bird species in the 2017 survey period. The City agreed to do this, and the results are documented in this letter.

Site Description

The project is located approximately 7 miles east of Interstate 15 and 2 miles east of Valley Center Road. The project is located in unincorporated San Diego County, on land owned by the City (Figures 1 and 2). Most of the topography within the project area consists of granitic hills that gently slope toward Lake Wohlford, which is a surface water impoundment used as part of the City's municipal water supply. The surface of the reservoir has a historical average elevation of 1,480 feet above mean sea level. The main vegetation communities documented within the project area are coast live oak woodland, southern mixed chaparral, Diegan coastal sage scrub, southern willow scrub, wetlands, woodlands, various types of grasslands, and urban/developed (Figure 3). Most of the Diegan coastal sage scrub is located on south-facing hillsides along the north side of the reservoir. The majority of the riparian vegetation is located along the reservoir edge and within a few small drainages the feed into the reservoir at the east end. The primary source of water comes into the reservoir from the east. The east end of the reservoir has a gently westward-sloping sandy floodplain where the main creek that feeds the reservoir meanders west before emptying into the reservoir. The majority of the riparian, wetland, and freshwater marsh occurs at the east end of the reservoir. The reservoir is surrounded by a few residential areas to the north and southeast, with the remaining area undeveloped natural habitat.

The project is located within both the County of San Diego North County Multiple Species Conservation Program and the Multiple Habitat Conservation Program planning areas (County of San Diego 2009).

Southwestern Willow Flycatcher

Background Information

SWFL, a subspecies of willow flycatcher (*Empidonax traillii*), was listed by the California Department of Fish and Game (CDFG) (now the California Department of Fish and Wildlife [CDFW]) as endangered in California in 1991 (CDFG 1991) as part of the state endangered listing of the full species (willow flycatcher). SWFL was federally listed as endangered in 1995 (USFWS 1995). This subspecies can only be separated from other willow flycatcher subspecies in the field geographically by breeding range. SWFL breeds in New Mexico, Arizona, Southern California, Nevada, Utah, and possibly west Texas (Rourke et al. 1999). According to Unitt (2004), fewer than 90 pairs breed in San Diego County. In 2005, the U.S. Fish and Wildlife Service (USFWS) issued the final ruling to designate critical habitat for SWFL, which includes portions of San Diego County (USFWS 2005). There is no critical habitat for SWFL within the project area or immediate vicinity. The closest critical habitat is located approximately 6.5 miles to the east of the project area within Pamo Valley in Ramona.

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The primary factor responsible for the decline of SWFL is habitat loss, exacerbated by nest predation and brood parasitism by brown-headed cowbird (*Molothrus ater*) (Rourke et al. 1999). SWFL is a neotropical migrant that breeds in riparian forests with a distinct vegetation structure: a dense understory where nests are built, a moderately closed canopy, and an open foraging area at midstory. SWFL breeding habitat is also characterized by actively changing hydrology, frequently including standing water, but also dry areas that have flooded within the past few years and retain the appropriate vegetation structure. In California, less than 5% of appropriate riparian habitat remains from when California achieved statehood in 1850 (Kus 2003).

SWFL begins arriving on breeding territories in San Diego County in early May, but the northern subspecies (*E. t. brewsteri*) may migrate through southern breeding areas through mid-June. Both male and female migrant willow flycatchers frequently sing, and determining whether an individual is a resident (SWFL) or a migrant (willow flycatcher) cannot be accomplished from a single detection. Therefore, a survey protocol for SWFL has been adopted by USFWS (Sogge et al. 2010).

Historically, there are no recorded SWFL from Lake Wohlford, and the closest known location is approximately 7.5 miles south along the San Dieguito River that flows into the eastern end of Lake Hodges, Escondido (CDFW 2017a). Southwestern willow flycatchers are also known to breed approximately 10 to 12 miles northeast along the south side of State Route 76 along the San Luis Rey River downstream of Lake Henshaw. Previous protocol SWFL surveys conducted in 2013 did not document any SWFL (AECOM 2013a).

Survey Methodology

The SWFL survey area includes all potentially suitable habitat within the project area, plus an adjacent 500-foot survey buffer. Before surveys, AECOM biologists conducted a habitat assessment within the survey area to outline potentially suitable SWFL habitat. This habitat was then digitized onto maps to establish an SWFL survey area of approximately 25 acres (Figure 4). Potentially suitable SWFL habitat included southern willow scrub and oak woodland with a small flowing stream or standing water. The majority of the SWFL survey area is located on the north and east sides of the reservoir, with a small section at the west side of the reservoir right below the existing dam. All areas of potential SWFL habitat contained some of the traits that could support SWFL, including the presence of water (usually as a small stream), an overstory of mature willows or oaks, and a semi-open understory with nearby dense vegetation such as willows, stinging nettle (*Urtica dioica*), poison oak (*Toxicodendron diversilobum*), or other shrub-like vegetation.

AECOM biologists Andrew Fisher, Brennan Mulrooney, and James McMorran conducted protocol SWFL surveys under Endangered Species Permit TE-820658-7. Surveys followed the current survey protocol adopted by USFWS (Sogge et al. 2010) and were conducted from May 21 through July 11, 2017. The SWFL survey area depicted in Figure 4 was surveyed once during the first survey period (May 15 through May 31), twice during the

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second survey period (June 1 through June 24), and twice during the third survey period (June 25 through July 17). Surveys were conducted at least 5 days apart between dawn and 11 a.m. SWFL surveys were occasionally conducted on the same day as LBV surveys, however the surveys were not conducted concurrently, and they were conducted by separate biologists. Often times, one survey was conducted as biologists walked upstream away from Lake Wohlford, and then the survey for the other species was conducted during the walk downstream. Biologists walked through suitable habitat, stopping frequently to listen. After a few minutes of passive listening, if no SWFL were heard, a playback recording of SWFL calls was played (active surveys) to elicit a response from SWFL within or adjacent to the property. This survey activity “takes” SWFL through harassment with playback of recorded SWFL vocalizations. No individual SWFL were captured.

Results

No willow flycatcher or SWFL were detected. Table 1 details each survey, including the survey number, date, time, weather conditions, personnel, and observations. During surveys, temperature ranged from 55 to 87 degrees Fahrenheit, and wind speed ranged from 0 to 3 miles per hour.

Table 1
Southwestern Willow Flycatcher Survey
Dates, Times, Weather Conditions, Personnel, and Observations

Survey Number	Date	Time	Weather	Personnel	SWFL Observations
1	5/21/2017	0646–1100	Start: 55°F, wind 2 mph, 0% cover End: 79°F, wind 0 mph, 0% cover	Andrew Fisher ¹ , Rick Bailey ²	No SWFL detected
2	6/1/2017	0644–1000	Start: 58°F, wind 1 mph, 100% cover End: 64°F, wind 0 mph, 100% cover	Brennan Mulrooney ¹ , James McMorran ¹	No SWFL detected
3	6/19/2017	0601–0952	Start: 69°F, wind 0 mph, 0% cover End: 81°F, wind 3 mph, 0% cover	Brennan Mulrooney ¹ , James McMorran ¹	No SWFL detected
4	6/29/2017	0712–0954	Start: 61°F, wind 2 mph, 100% cover End: 76°F, wind 2 mph, 0% cover	Brennan Mulrooney ¹ , James McMorran ¹	No SWFL detected
5	7/11/2017	0610–0929	Start: 63°F, wind 0 mph, 0% cover End: 87°F, wind 2 mph, 0% cover	Brennan Mulrooney ¹ , Rick Bailey ²	No SWFL detected

°F = degrees Fahrenheit; mph = miles per hour, ¹ permitted biologist; ² supervised trainee

During the surveys, brown-headed cowbirds were detected flying, foraging, calling, and perching. Table 2 details the survey date and observation information for all brown-headed cowbirds detected during SWFL surveys.

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Table 2
Brown-Headed Cowbird Detections

Survey Number	Date	Observation Type
1	5/21/2017	7 males, 7 females, 4 unknown individuals
2	6/1/2017	16 males, 8 females
3	6/19/2017	28 unknown individuals
4	6/29/2017	4 males, 2 females, 6 unknown individuals
5	7/11/2017	10 males, 10 females
<i>Total</i>		102 birds

On average, 20 brown-headed cowbirds (known willow flycatcher/SWFL brood parasites) were detected per survey. They were usually seen perched near the east end of the reservoir or flying overhead toward the east end. The locations where brown-headed cowbirds were detected during surveys are displayed in Figure 4. An important thing to note is that the number of brown-headed cowbirds detected in Table 2 on SWFL surveys may differ from the number of cowbirds detected during LBV surveys when surveys were conducted on the same day, since the surveys were not conducted concurrently, and the cowbirds were often times actively flying around.

The following CDFW species of special concern were observed within the survey area during SWFL surveys: yellow-breasted chat (*Icteria virens*) and yellow warbler (*Setophaga petechia brewsteri*) (CDFW 2017b). Locations of these species are depicted in Figure 4. LBV was also detected during the first SWFL survey, and that information is included later in this report within the LBV discussion. Field data collected during 2017 SWFL surveys are presented in Appendix A, and a list of all wildlife species detected is presented in Appendix B.

Discussion

No SWFL were detected during protocol surveys within the survey area in 2013 or 2017. The southern willow scrub habitat along the lake shore and at the east end of the reservoir is fairly young and immature. There are a few patches with a dense overstory of trees but with little understory of willows and mulefat. It appears that, as reservoir levels have receded every few years, a new row of willows (*Salix* species) has grown up around the edge of the reservoir. This created several rings of willows that have grown as the reservoir levels receded. Within the southern willow scrub, there is little mulefat (*Baccharis salicifolia*) mixed in. Generally, the habitat is not mature and extensive enough to support breeding SWFL. There are a few tall willow trees along the stream that feeds into the reservoir, but there is no dense understory around these willow trees.

Additionally, there is a small patch of potential SWFL habitat directly below the existing dam (on the west side of the project area) where a small stream flows from the base of the dam. The area is surrounded by mature coast live oak (*Quercus agrifolia*) and sycamore

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(*Platanus racemosa*) trees, but the amount of habitat is too small and isolated to support breeding SWFL.

Least Bell's Vireo

Background Information

LBV was listed as endangered by USFWS on May 2, 1986 (*Federal Register* 51[85]:16474–16481), with designated critical habitat (*Federal Register* 59[22]:4845–4867). This listing status applies to the entire population of LBV. A draft recovery plan was written by USFWS and circulated for review in 1998 (USFWS 1998). No critical habitat occurs within the project area. CDFW listed this subspecies as endangered on October 2, 1980.

Historically, this subspecies was a common summer visitor to riparian habitat throughout much of California. Currently, LBV is found only in riparian woodlands in Southern California, with the majority of breeding pairs in San Diego, Santa Barbara, and Riverside Counties. LBV is restricted to riparian woodland and is most frequent in areas that combine an understory of dense young willows (*Salix* species) or mulefat (*Baccharis salicifolia*) with a canopy of tall willows. Since LBV build their nests in dense shrubbery 3 to 4 feet above the ground (Salata 1984), they require young successional riparian habitat or older habitat with a dense understory. Therefore, riparian plant succession is an important factor in maintaining LBV habitat. Nests are also often placed along internal or external edges of riparian thickets (Unitt 2004). LBV is migratory and arrives in Southern California in late March and early April, and leaves for its wintering ground in September.

LBV's decline is attributed to loss, degradation, and fragmentation of riparian habitat combined with brood/nest parasitism by brown-headed cowbird. Due to concerted programs focused on preserving, enhancing, and creating suitable nesting habitat, the LBV population has steadily increased in size along several of its breeding drainages in Southern California (USFWS 2006). For example, the number of male LBV territories in the Prado Basin of western Riverside County increased from 20 in 1987 to 538 in 2009 (Pike et al. 2010).

There is no USFWS-designated critical habitat for LBV within the project area or the immediate vicinity. The closest critical habitat is located approximately 14 miles to the north along the San Luis Rey River. According to the California Natural Diversity Database, there are few historical LBV locations around the project area. The closest breeding population of LBV is located at the east end of Lake Hodges along the San Dieguito River, approximately 7 miles to the southwest. The closest and most recent LBV was detected within the project area in June 2009 on the northeast side of the reservoir (CDFW 2017a). During protocol surveys for LBV in 2013, AECOM did not detect any LBV (AECOM 2013b).

Survey Methodology

The LBV survey area includes all potentially suitable habitat within the project area, plus an adjacent 500-foot survey buffer. Before surveys, AECOM biologists conducted a habitat

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assessment within the survey area to outline potentially suitable LBV habitat. This habitat was then digitized onto maps to establish an LBV survey area of approximately 38 acres (Figure 4). Potentially suitable LBV habitat included southern willow scrub. The majority of the LBV survey area is located on the north and east sides of the reservoir, with a few small areas on the south side of the reservoir.

LBV surveys were completed during the breeding season of 2017. Focused surveys followed the current USFWS survey guidelines for the species, dated January 19, 2001 (USFWS 2001). Surveys were conducted by AECOM biologists Andrew Fisher, Brennan Mulrooney, James McMorran, Rick Bailey, and Sheila Madrak. The survey consisted of walking meandering transects through potential LBV habitat and conducting passive surveillance (i.e., listening and looking for the species). No taped LBV vocalizations were played. Per USFWS guidelines, the area was surveyed eight times during 2017. Surveys were conducted at least 10 days apart and typically completed between dawn and 11 a.m. All surveys occurred between April 12 and July 11, 2017. Surveys were not conducted during periods of inclement weather such as extreme wind or during a rain event. LBV surveys were occasionally conducted on the same day as SWFL surveys, however the surveys were not conducted concurrently, and they were conducted by separate biologists. Often times, one survey was conducted as biologists walked upstream away from Lake Wohlford, and then the survey for the other species was conducted during the walk downstream.

Results

One pair of LBV was detected during the first few protocol surveys but was not detected again on subsequent surveys. The pair was first detected during a CAGN survey on April 24, 2017 (since the male LBV was calling loudly, it could clearly be heard while biologists were standing in the CAGN survey area), and again during the LBV survey on April 25, 2017 (Figure 4). The pair was located east of the reservoir in scattered willows surrounded by stinging nettle. After 11 days (on May 5, 2017), the pair was observed at a new location near the northeast end of the reservoir, and the male was observed placing the first strands of nest material on a small oak branch about 3 feet above the ground. The pair discontinued nest building that same day, and moved to a new location about 400 feet to the east. The pair remained at that location until May 21, 2017, but was not detected in subsequent survey visits, and therefore the fate of this LBV pair is unknown. The locations where the LBV pair was detected during both CAGN and LBV surveys are shown on Figure 4. All the locations shown on Figure 4 represent the same pair of LBV as they moved around the habitat at the east end of the reservoir looking for a suitable nesting location. The pair moved around between surveys, but was generally found in riparian vegetation within the northeastern and eastern part of Lake Wohlford.

A summary of survey dates, times, weather conditions, permitted biologists, and observations are presented in Table 3. During surveys, temperature ranged from 55 to 87 degrees Fahrenheit, and wind speed ranged from 0 to 3 miles per hour.

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Table 3
Least Bell's Vireo Survey
Dates, Times, Weather Conditions, Personnel, and Observations

Survey Number	Date	Time	Weather	Personnel	LBV Observations
1	4/12/2017	0654–1033	Start: 56°F, wind 1 mph, 0% cover End: 74°F, wind 2 mph, 0% cover	Andrew Fisher, Sheila Madrak	No LBV detected
2	4/25/2017	0651–1100	Start: 59°F, wind 3 mph, 100% cover End: 65°F, wind 2 mph, 60% cover	Andrew Fisher, Rick Bailey	1 pair LBV detected
3	5/5/2017	0644–1130	Start: 55°F, wind 1 mph, 40% cover End: 68°F, wind 2 mph, 80% cover	Brennan Mulrooney, Rick Bailey	1 pair LBV detected
4	5/21/2017	0642–1111	Start: 55°F, wind 0 mph, 0% cover End: 85°F, wind 1 mph, 0% cover	Rick Bailey, Andrew Fisher	1 pair LBV detected
5	6/1/2015	0611–1100	Start: 58°F, wind 0 mph, 100% cover End: 86°F, wind 0 mph, 0% cover	James McMorran, Brennan Mulrooney	No LBV detected
6	6/19/2015	0601–0952	Start: 69°F, wind 0 mph, 0% cover End: 81°F, wind 3 mph, 0% cover	James McMorran, Brennan Mulrooney	No LBV detected
7	6/29/2015	0614–1030	Start: 61°F, wind 1 mph, 100% cover End: 74°F, wind 3 mph, 10% cover	James McMorran	No LBV detected
8	7/11/2015	0650–1035	Start: 77°F, wind 0 mph, 0% cover End: 87°F, wind 3 mph, 0% cover	Rick Bailey, Brennan Mulrooney	No LBV detected

°F = degrees Fahrenheit; mph = miles per hour

During the surveys, several brown-headed cowbirds were detected flying, foraging, calling, and perching. Table 4 details the date and observation information for all brown-headed cowbirds detected during LBV surveys.

Table 4
Brown-Headed Cowbird Detections

Survey Number	Date	Observation Type
1	4/12/2017	8 males, 4 females, 4 unknown individuals
2	4/25/2017	8 males, 8 females, 4 unknown individuals
3	5/5/2017	10 males, 6 females
4	5/21/2017	Observations in SWFL Survey only
5	6/1/2017	6 males, 5 females
6	6/19/2017	Observations in SWFL Survey only
7	6/29/2017	6 males, 8 females
8	7/11/2017	1 male, 1 female, 1 unknown individual
<i>Total</i>		80 birds

On average, 10 brown-headed cowbirds were detected per survey. They were usually seen perched near the east end of the reservoir or flying overhead toward the east end. The locations where brown-headed cowbirds were detected during surveys are displayed in Figure 4. An important thing to note is that the number of brown-headed cowbirds detected

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in Table 4 on LBV surveys may differ from the number of cowbirds listed previously in Table 2 (for days when both LBV and SWFL surveys were conducted), since the surveys were not conducted concurrently, and the cowbirds were often times actively flying around.

The following CDFW species of special concern were observed within the survey area during LBV surveys: yellow warbler, yellow-breasted chat, and San Diegan tiger whiptail (*Aspidoscelis tigris stejnegeri*) (CDFW 2017b). Locations of these species within the survey area are depicted in Figure 4. Field data collected during 2017 LBV surveys are presented in Appendix A; a list of all wildlife species detected is presented in Appendix B.

Discussion

Potential LBV habitat includes southern willow scrub in scattered pockets around the reservoir shore but is the most dense and extensive at the east end of the reservoir. While the pockets of southern willow scrub on the north and south sides of the reservoir may serve as migration habitat for LBV, the patches are generally too small to support a breeding pair of LBV. The most extensive area of suitable habitat is located at the east end of the reservoir where there are pockets of taller trees intermixed with mid-story vegetation and an understory of dense stinging nettle (*Urtica dioica*), and freshwater marsh vegetation. While small patches of dense understory of mulefat and willows are present, the overall appearance of the habitat is fairly open, with multiple trails used by fishermen throughout the survey area. There are a few sections of dense brush, but generally the habitat is too open for LBV to breed.

One pair of LBV was detected during the first few protocol surveys within the 38-acre survey area in 2017, but was no longer detected after May 21, 2017. AECOM biologists observed the LBV pair shift locations for several weeks, but they could not be relocated after May 21, 2017. The pair appeared to be investigating multiple areas to determine the ideal nesting location, but eventually they could no longer be found and it is assumed that they vacated the site. Most of the habitat lacked dense vegetation of 3 feet in height, which is the average height of vegetation where LBV nest. Without a layer of dense vegetation around this height, there is limited nesting area. There are a few tall willow trees along the stream that feeds into the reservoir; however, there is no dense understory around these willow trees. Despite the presence of southern willow scrub, the majority of habitat appears to lack the traits necessary to support nesting LBV.

Coastal California Gnatcatcher

Background Information

CAGN, a subspecies of the California gnatcatcher (*Poliioptila californica*), is federally listed as threatened by USFWS (1993), and is considered a species of special concern by CDFW (2017b). No recovery plan has been drafted for CAGN. CAGN is an uncommon year-round resident of Southern California. This species is declining proportionately with the continued

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loss of coastal sage scrub habitat in the six Southern California counties (San Bernardino, Ventura, Los Angeles, Orange, San Diego, and Riverside) located within the coastal plain.

The primary cause of the decline of CAGN is the cumulative loss of coastal sage scrub vegetation to urban and agricultural development. Studies suggest that CAGN may be highly sensitive to the effects of habitat fragmentation and development activity (Atwood 1990; ERCE 1990). USFWS has estimated that coastal sage scrub habitat has been reduced by 70 to 90% of its historical extent (USFWS 1991), and little of what remains is protected in natural open space.

CAGN generally inhabits Diegan coastal sage scrub and Riversidian coastal sage scrub dominated by California sagebrush (*Artemisia californica*) and flat-topped buckwheat (*Eriogonum fasciculatum*), usually at lower than 1,500 feet in elevation along the coastal slope. When nesting, CAGN typically avoid slopes greater than 25% with tall, dense vegetation. CAGN pairs will attempt several nests each year, each placed in a different location inside their breeding territory, but most nest attempts are unsuccessful due to depredation by a variety of species (Atwood and Bontrager 2001). Clutch size ranges from one to five eggs, with three or four eggs most common. CAGN typically experiences a high rate of nest failure, with an annual mean number of four nest attempts per pair in San Diego County (Grishaver et al. 1998). CAGN tends to have slightly smaller clutches in years with poor rainfall, and will experience a higher rate of mortality during cold winters (Atwood and Bontrager 2001; Grishaver et al. 1998). CAGN will remain paired through the nonbreeding season and will generally expand its home range when not breeding.

CAGN is particularly vulnerable to habitat destruction and fragmentation because of poor dispersal, reliance on a specific habitat type, and difficulty in successful breeding. On average, juvenile CAGN disperse less than 1.2 miles from their natal territories, making colonization of distant habitat patches difficult. CAGN is closely tied to coastal sage scrub and has been described as “obligate residents of coastal sage scrub” (Atwood and Bontrager 2001).

Critical habitat was originally designated for CAGN by USFWS in 2000, but this was revised, and a final rule was published in 2007 (USFWS 2007). Although there is no USFWS designated critical habitat for CAGN within the project area, critical habitat is located approximately 2,300 feet to the west of the project area. The closest known CAGN location is approximately 1.5 miles to the west of the project area between Dixon Lake and Valley Center Road (CDFW 2017b). The species has been detected around Lake Wohlford by citizen scientists and reported on eBird, with one bird on February 12, 2010, and one on November 17, 2012 (eBird 2017). While these data are somewhat useful, the information shows that the species likely moves through the area during the nonbreeding season but does not seem to occur immediately around Lake Wohlford during the breeding season. During protocol surveys for CAGN in 2013, AECOM did not detect any CAGN (AECOM 2013c).

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Survey Methodology

The CAGN survey area included all potentially suitable habitat within the project area, plus an adjacent 500-foot survey buffer. Before surveys, AECOM biologists conducted a habitat assessment within the survey area to outline potentially suitable CAGN habitat. This habitat was then digitized onto maps to establish a CAGN survey area of approximately 41 acres (Figure 4). Potentially suitable CAGN habitat includes Diegan coastal sage scrub, Diegan coastal sage scrub intermixed with southern mixed chaparral, and Diegan coastal sage scrub intermixed with grassland. All of the CAGN survey area is located on the north side of the reservoir.

CAGN surveys were completed during the breeding season of 2017 per USFWS guidelines (USFWS 1997). Surveys were conducted within the survey area in potentially suitable CAGN habitat. All surveys followed the current USFWS protocol for the species, dated February 28, 1997 (and as amended July 28, 1997) (USFWS 1997). AECOM biologists Andrew Fisher and Brennan Mulrooney conducted the surveys under Endangered Species Permits TE-820658-7 and Rick Bailey conducted surveys under TE-101151-3. Additional AECOM staff Emma Fraser accompanied the permitted biologist on the fourth and sixth CAGN surveys. CAGN surveys were conducted during morning hours when conditions were suitable to detect CAGN and continued until noon when bird activity usually decreased. Surveys were not conducted during periods of inclement weather such as extreme wind or during a rain event.

The 2017 effort included six protocol surveys separated by a minimum of 7 days, which were conducted from April 17 through May 29, 2017. Approximately 41 acres of potentially suitable CAGN habitat spread across the project area were surveyed per protocol (Figure 4).

The survey consisted of walking meandering transects through potential CAGN habitat, including all scrub associations, uplands, and canyons. Biologists conducted passive surveillance (i.e., listening and looking for the species) in all habitats with potential to support CAGN. If an observation was not made after approximately 5 to 10 minutes of passive survey activity, a recorded vocalization of CAGN was played for approximately 5 to 10 seconds (i.e., active survey activity), followed by another period of passive observation. As allowed under endangered species permits TE-820658-7 and TE-101151-3, this survey activity “takes” CAGN through harassment with playback of taped CAGN vocalizations. No individual CAGN were captured.

Results

No CAGN were detected in the survey area during protocol surveys. A summary of survey dates, times, weather conditions, permitted biologists and observations are presented in Table 5. During surveys, temperature ranged from 49 to 79 degrees Fahrenheit and wind speed ranged from an average of 0 to 3 miles per hour.

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Table 5
Protocol Coastal California Gnatcatcher Survey
Dates, Times, Weather Conditions, Personnel, and Observations

Survey Number	Date	Time	Weather	Personnel	CAGN Observations
1	4/17/2015	0645–1055	Start: 51°F, wind 0 mph, 10% cover End: 68°F, wind 3 mph, 10% cover	Andrew Fisher ¹ , Rick Bailey ¹	No CAGN detected
2	4/24/2015	0644–1054	Start: 59°F, wind 0 mph, 100% cover End: 65°F, wind 0 mph, 60% cover	Andrew Fisher ¹ , Rick Bailey ¹	No CAGN detected
3	5/1/2015	0637–1005	Start: 49°F, wind 2 mph, 0% cover End: 76°F, wind 3 mph, 0% cover	Brennan Mulrooney ¹ , Rick Bailey ¹	No CAGN detected
4	5/8/2017	0814–1125	Start: 49°F, wind 1 mph, 80% cover End: 73°F, wind 3 mph, 10% cover	Rick Bailey ¹ , Emma Fraser ²	No CAGN detected
5	5/22/2017	0607–1032	Start: 51°F, wind 0 mph, 0% cover End: 79°F, wind 1 mph, 0% cover	Rick Bailey ¹	No CAGN detected
6	5/29/2017	0634–0856	Start: 58°F, wind 0 mph, 100% cover End: 61°F, wind 0 mph, 100% cover	Rick Bailey ¹ , Emma Fraser ²	No CAGN detected

¹F = degrees Fahrenheit; mph = miles per hour, ¹permitted biologist; ²supervised trainee

The CAGN survey area included 41 acres of potentially suitable habitat that was spread along the north side of Lake Wohlford. The majority of the Diegan coastal sage scrub habitat was a mixture of black sage (*Salvia mellifera*), laurel sumac (*Malosma laurina*), chamise chaparral (*Adenostoma fasciculatum*), flat-topped buckwheat (*Eriogonum fasciculatum*), and various types of ceanothus. There was very little California sagebrush within the Diegan coastal sage scrub. Most of the habitat was more xeric and exhibited vegetation structural traits more similar to southern mixed chaparral. Overall, the habitat quality was fairly low for CAGN.

During the protocol surveys, at least 54 brown-headed cowbirds were detected as detailed in Table 6. This species is a potential CAGN nest parasite.

Table 6
Brown-Headed Cowbird Detections

Survey Number	Date	Observation Type
1	4/17/2017	18 individuals including males and females
2	4/24/2017	6 individuals
3	5/1/2017	None
4	5/8/2017	2 individuals
5	5/22/2017	14 individuals
6	5/29/2017	14 individuals
<i>Total</i>		54 birds

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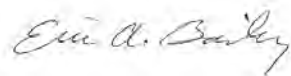
Three special-status wildlife species were detected during protocol surveys within or adjacent to the CAGN survey area: the CDFW species of special concern San Diegan tiger whiptail, the federally delisted and state listed as endangered bald eagle (*Haliaeetus leucocephalus*), and the CDFW species of special concern yellow-breasted chat (CDFW 2017b). Locations of these species are depicted in Figure 4. LBV was also detected during the second CAGN survey on 4/24/2017 and the fourth CAGN survey on 5/8/2017, and that information is included above within the LBV discussion. Field data collected during 2017 CAGN surveys is presented in Appendix A, and a list of all wildlife species detected is presented in Appendix B.

Discussion

No CAGN were detected during protocol surveys for the proposed project in 2013 or 2017. According to historical data, there are no known CAGN breeding locations within the project area or immediate vicinity. Overall, habitat quality is low for CAGN due to small sections of dry Diegan coastal sage scrub that is adjacent to and intermixed with southern mixed chaparral interspersed with patches of grassland and adjacent to oak woodlands and riparian areas. There are no large sections of California sagebrush, or other similar habitat capable of supporting breeding CAGN.

If you have any questions or comments regarding this letter report, please call me at (619) 610-7600.

Sincerely,



Eric "Rick" Bailey
Wildlife Biologist

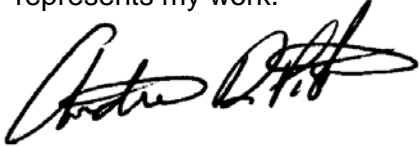
Attachments:

- Figure 1 – Regional Map
- Figure 2 – Vicinity Map
- Figure 3 – Species Survey Areas
- Figure 4 – Sensitive Species Locations
- Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys
- Appendix B – Wildlife Species Detected during SWFL, LBV, and CAGN Surveys

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Certification Statement for Permitted Biologists

"I certify that the information in this survey report and attached exhibits fully and accurately represents my work."




Andrew Fisher
TE-820658-7
August 25, 2017

"I certify that the information in this survey report and attached exhibits fully and accurately represents my work."



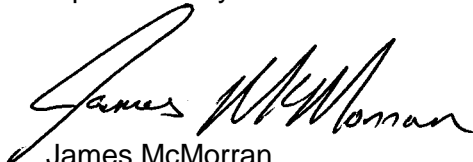
Brennan Mulrooney
TE-820658-7
August 25, 2017

"I certify that the information in this survey report and attached exhibits fully and accurately represents my work."



Eric "Rick" Bailey
TE-101151-3
August 25, 2017

"I certify that the information in this survey report and attached exhibits fully and accurately represents my work."



James McMorran
TE-820658-7
August 25, 2017

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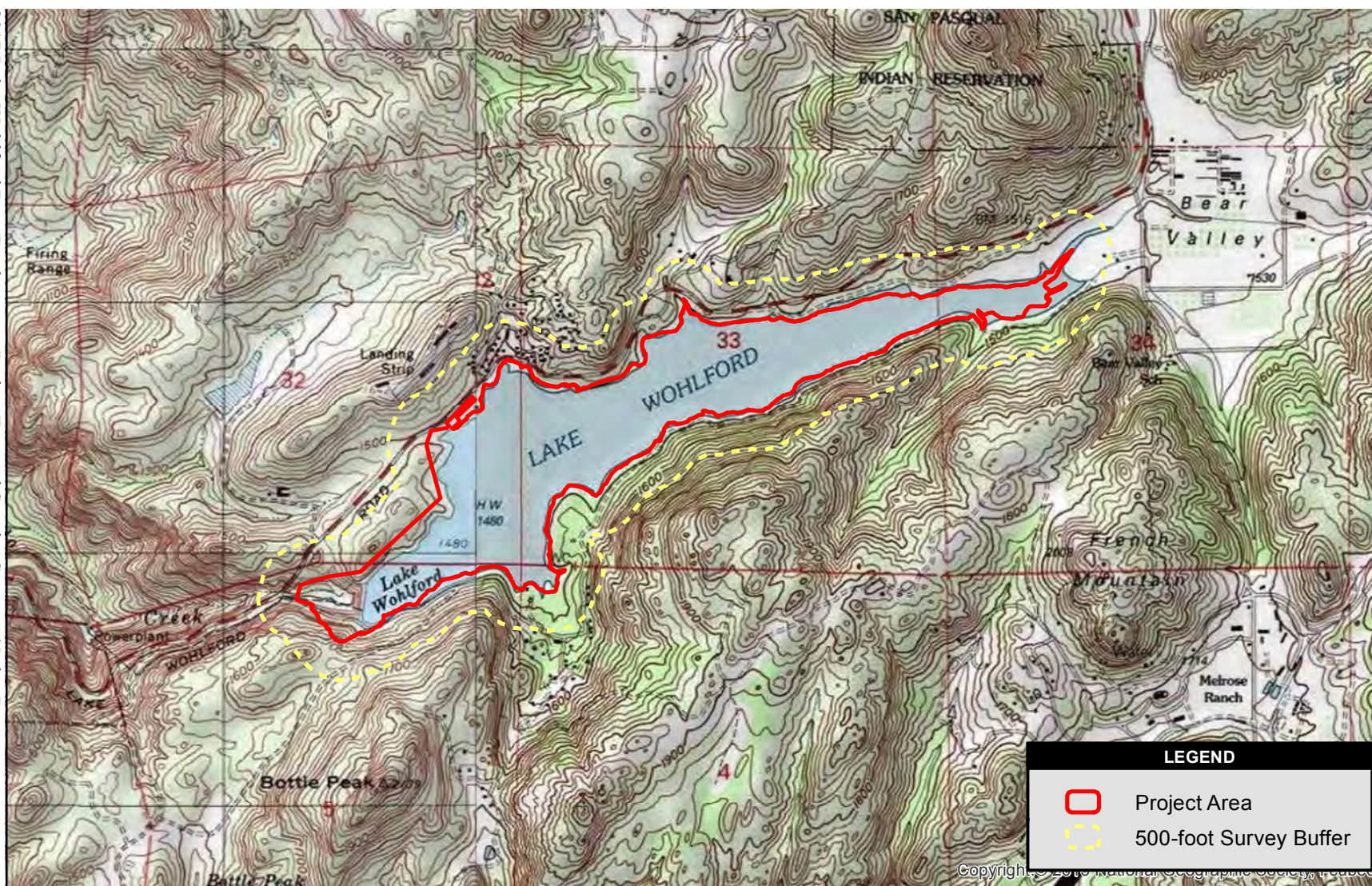
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FIGURES



Figure 1
Regional Map



Source: USGS 7.5' Quad Valley Center 1975; USGS 7.5' Quad Rodriguez Mtn. 1988

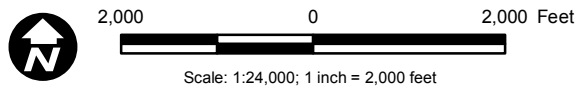
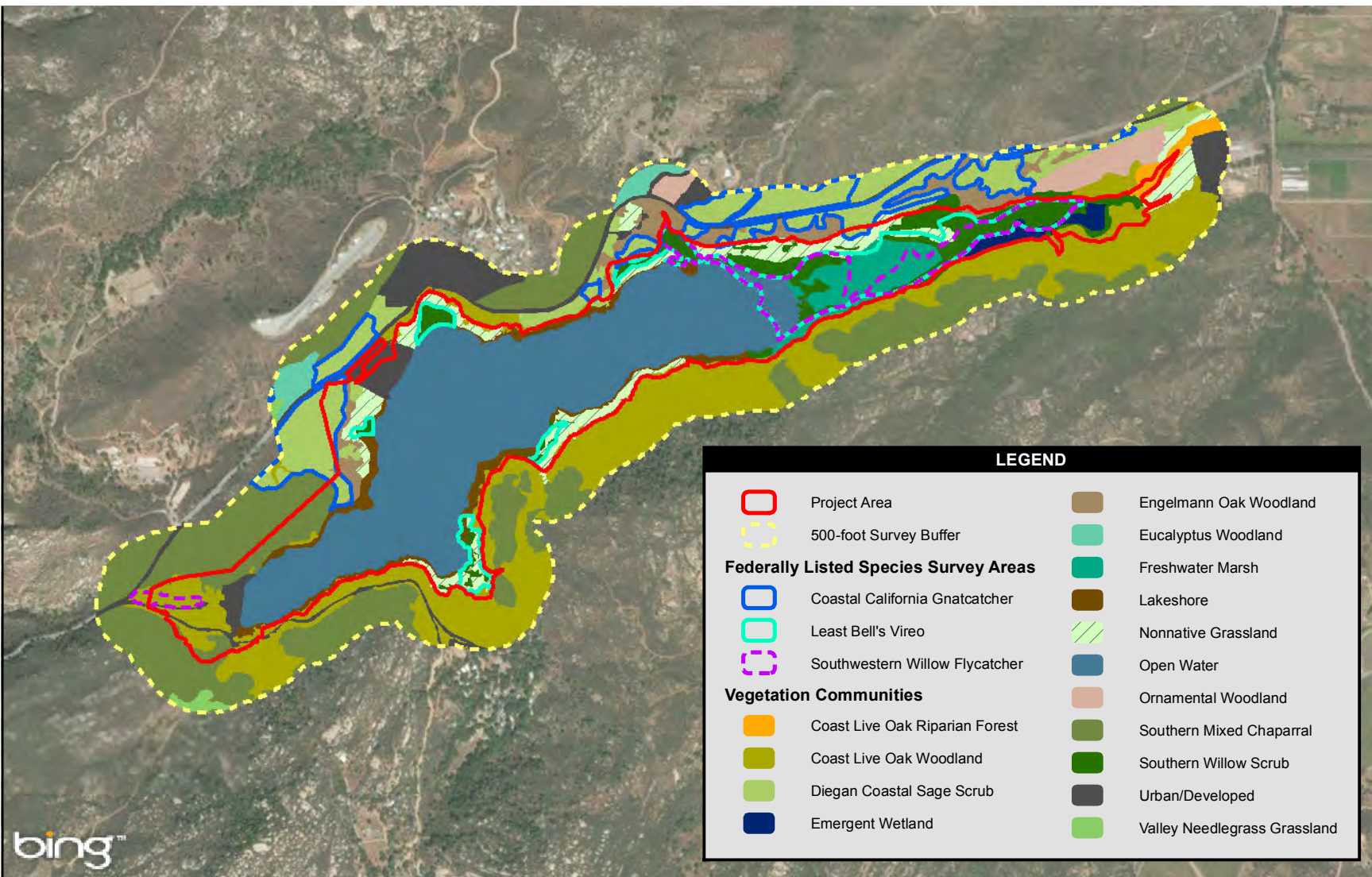


Figure 2
Vicinity Map



Source: Microsoft 2010; Black & Veatch 2014

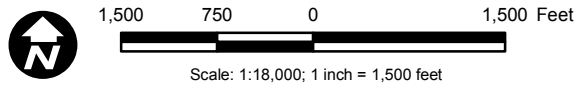


Figure 3
Species Survey Areas

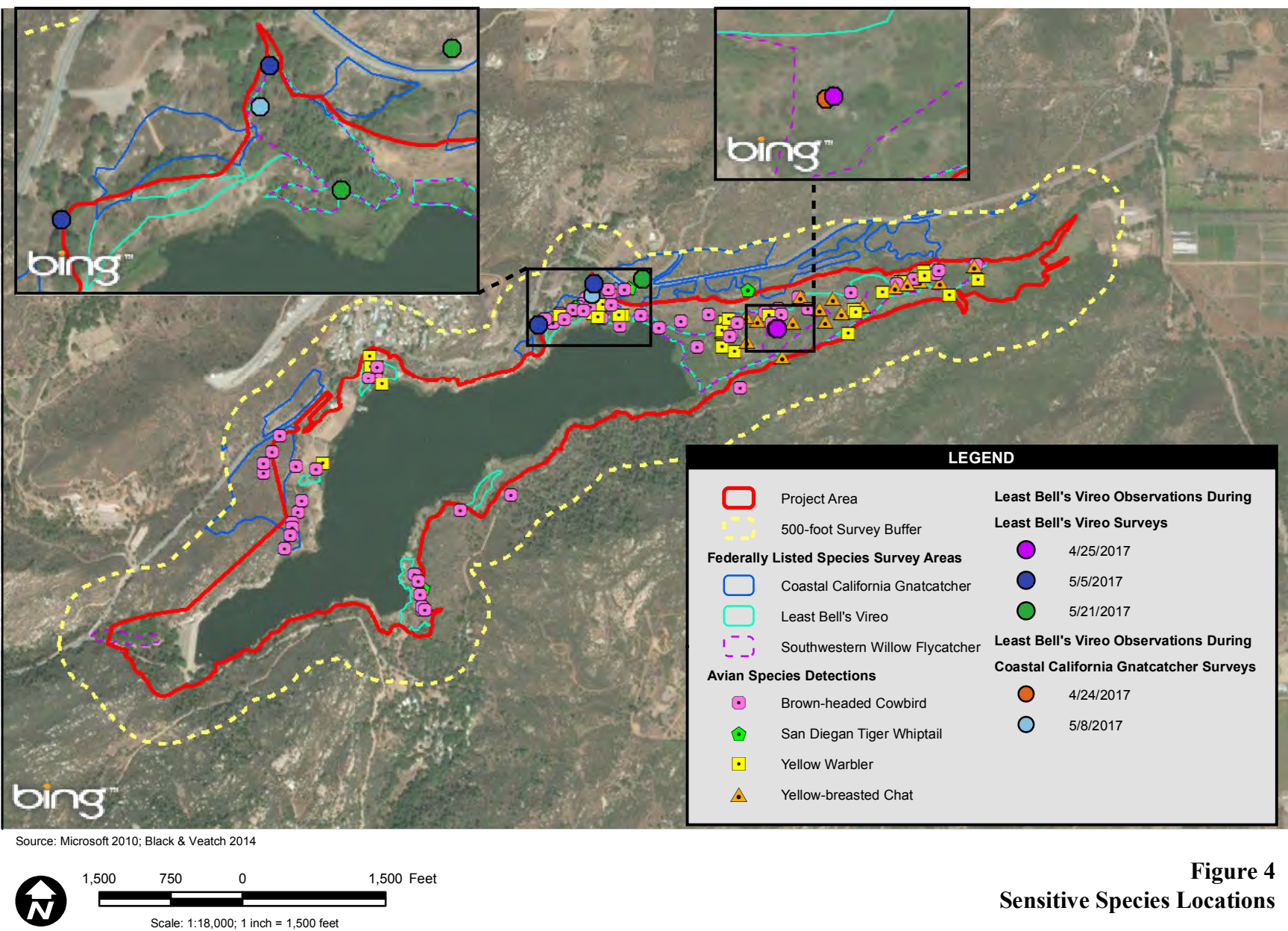


Figure 4
Sensitive Species Locations

APPENDIX A

FIELD DATA COLLECTED DURING SWFL, LBV, and CAGN SURVEYS

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17460534	-116.998383	Calling,Singing Solo, Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Costa's Hummingbird	Calypste costae				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Anna's Hummingbird	Calypste anna				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Red-winged Blackbird	Agelaius phoeniceus				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Black-headed Grosbeak	Pheucticus melanocephalus				1	33.17664605	-116.9904407		Nesting pair
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Red-shouldered Hawk	Buteo lineatus				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Common Yellowthroat	Geothlypis trichas				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	American Crow	Corvus brachyrhynchos				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Mallard	Anas platyrhynchos				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Nuttall's Woodpecker	Picoides nuttalli				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Black-crowned Night-Heron	Nycticorax nycticorax				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Bushtit	Psaltirparus minimus				1	33.17463126	-116.9986865		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Cassin's Kingbird	Tyrannus vociferans				1	33.17463126	-116.9986865		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Great-tailed Grackle	Quiscalus mexicanus				1	33.17463369	-116.9986917		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Oak Titmouse	Baeolophus inornatus				1	33.17460368	-116.9987785		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	California Towhee	Melospiza crissalis				1	33.17718572	-116.9923585		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	California Thrasher	Toxostoma redivivum				1	33.17713728	-116.9922623		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Hutton's Vireo	Vireo huttoni				1	33.17770079	-116.9910446		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Lesser Goldfinch	Spinus psaltria				1	33.17766454	-116.991035		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	House Finch	Haemorhous mexicanus				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Black-chinned Hummingbird	Archilochus alexandri				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Acorn Woodpecker	Melanerpes formicivorus				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	House Wren	Troglodytes aedon				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Least Bell's Vireo	Vireo bellii pusillus	Pair	Adult	Male and Female	2	33.17661322	-116.9904641	Calling,Singing Solo, Territorial behavior	"Recorded during LBV survey, possibly nesting low in mulefat scrub"
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17666176	-116.9902807	Singing Solo	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Spotted Towhee	Pipilo maculatus				1	33.17628031	-116.9870116		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	3	33.17622511	-116.9867831	Calling,Foraging,Heard only, Singing Solo,Territorial behavior	Many YWAR heard and previously recorded on LBV surveys
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	3	33.17622062	-116.986708	Foraging,Heard only,Singing Solo,Territorial behavior	Many heard in same places recorded during LBV surveys
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	5	33.1763368	-116.9865897	Heard only,Perching,Singing Solo,Territorial behavior	Several individuals heard
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Song Sparrow	Melospiza melodia				1	33.17482838	-116.994656		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Brown-headed Cowbird	Molothrus ater	Pair	Adult	Male and Female	2	33.17648301	-116.9850343	Courtship display	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Blue Grosbeak	Passerina caerulea				1	33.17678297	-116.9851226		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17680348	-116.9826767	Heard only,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow-breasted Chat	Icteria virens	Pair	Adult	Male and Female	2	33.17653015	-116.9832329	Foraging,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Myiitta crescent	Phyciodes myiitta				1	33.17482797	-116.9946606		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Western Tiger Swallowtail	Papilio rutulus				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Red Admiral	Vanessa atalanta				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Mourning Dove	Zenaidura macroura				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Mourning Cloak	Nymphalis io				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Western Scrub-Jay	Aphelocoma californica				1	33.17482947	-116.9946497		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17784396	-116.9802896	Singing Solo,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	2	33.17777779	-116.9801749	Heard only	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17775366	-116.9780117	Singing Solo,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Phainopepla	Phainopepla nitens				1	33.17843748	-116.9808701		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Barn Owl	Tyto alba				1	33.17843559	-116.9810103		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Orange-crowned Warbler	Oreothlypis celata				1	33.1784796	-116.9811516		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Spotted Towhee	Pipilo maculatus				1	33.17850277	-116.9813019		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Red-tailed Hawk	Buteo jamaicensis				1	33.17870427	-116.9817189		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Turkey Vulture	Cathartes aura				1	33.17867062	-116.9818619		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Wrentit	Chamaea fasciata				1	33.16743569	-116.9975104		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Black Phoebe	Sayornis nigricans				1	33.16800876	-116.9965591		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Common Raven	Corvus corax				1	33.16804647	-116.9964884		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Marine Blue	Leptotes marina				1	33.16860924	-116.997256		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Acmon Blue	Icaricia acmon acmon				1	33.16856464	-116.9972443		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Spring (California) White	Pontia sisymbrii				1	33.16856464	-116.9972443		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Harford's Sulphur	Colias harfordii				1	33.16856464	-116.9972443		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.1	0	2	E	Pacific-slope Flycatcher	Empidonax difficilis				1	33.16721612	-117.007547		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	55.													

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>				1	33.17664605	-116.9904407		Nesting pair
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Red-shouldered Hawk	<i>Buteo lineatus</i>				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Common Yellowthroat	<i>Geothlypis trichas</i>				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	American Crow	<i>Corvus brachyrhynchos</i>				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Mallard	<i>Anas platyrhynchos</i>				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Nuttall's Woodpecker	<i>Picoides nuttalli</i>				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>				1	33.17459442	-116.9986844		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Bushtit	<i>Psaltiriparus minimus</i>				1	33.17463126	-116.9986865		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Cassin's Kingbird	<i>Tyrannus vociferans</i>				1	33.17463126	-116.9986865		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Great-tailed Grackle	<i>Quiscalus mexicanus</i>				1	33.17463369	-116.9986917		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Oak Titmouse	<i>Baeolophus inornatus</i>				1	33.17460368	-116.9987785		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	California Towhee	<i>Melospiza crissalis</i>				1	33.17718572	-116.9923585		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	California Thrasher	<i>Toxostoma redivivum</i>				1	33.17713728	-116.9922623		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Hutton's Vireo	<i>Vireo huttoni</i>				1	33.17770079	-116.9910446		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Lesser Goldfinch	<i>Spinus psaltria</i>				1	33.17766454	-116.991035		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	House Finch	<i>Haemorhous mexicanus</i>				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Black-chinned Hummingbird	<i>Archilochus alexandri</i>				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Acorn Woodpecker	<i>Melanerpes formicivorus</i>				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	House Wren	<i>Troglodytes aedon</i>				1	33.17769384	-116.9910417		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Least Bell's Vireo	<i>Vireo bellii pusillus</i>	Pair	Adult	Male and Female	2	33.17661322	-116.9904641	Calling,Singing Solo,Territorial behavior	"Recorded during LBV survey, possibly nesting low in mulefat scrub"
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Yellow Warbler	<i>Setophaga petechia brewsteri</i>	Individual(s)	Adult	Male	1	33.17666176	-116.9902807	Singing Solo	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Spotted Towhee	<i>Pipilo maculatus</i>				1	33.17628031	-116.9870116		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Yellow Warbler	<i>Setophaga petechia brewsteri</i>	Individual(s)	Adult	Male	3	33.17622511	-116.9867831	Calling,Foraging,Heard only, Singing Solo,Territorial behavior	Many YWAR heard and previously recorded on LBV surveys
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Yellow-breasted Chat	<i>Icteria virens</i>	Individual(s)	Adult	Male	3	33.17622062	-116.986708	Foraging,Heard only,Singing Solo,Territorial behavior	Many heard in same places recorded during LBV surveys
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Brown-headed Cowbird	<i>Molothrus ater</i>	Individual(s)	Adult	Male and Female	5	33.1763368	-116.9865897	Heard only,Perching,Singing Solo,Territorial behavior	Several individuals heard
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Song Sparrow	<i>Melospiza melodia</i>				1	33.17482838	-116.994656		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Brown-headed Cowbird	<i>Molothrus ater</i>	Pair	Adult	Male and Female	2	33.17648301	-116.9850343	Courtship display	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Blue Grosbeak	<i>Passerina caerulea</i>				1	33.17678297	-116.9851226		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Yellow-breasted Chat	<i>Icteria virens</i>	Individual(s)	Adult	Male	1	33.17680348	-116.9826767	Heard only,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Yellow-breasted Chat	<i>Icteria virens</i>	Pair	Adult	Male and Female	2	33.17653015	-116.9832329	Foraging,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Mylitta crescent	<i>Phycidides mylitta</i>				1	33.17482797	-116.9946606		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Western Tiger Swallowtail	<i>Papilio rutulus</i>				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Red Admiral	<i>Vanessa atalanta</i>				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Mourning Dove	<i>Zenaidura macroura</i>				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Mourning Cloak	<i>Nymphalis antiopa</i>				1	33.17711146	-116.9816696		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Western Scrub-Jay	<i>Aphelocoma californica</i>				1	33.17482947	-116.9946497		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Yellow-breasted Chat	<i>Icteria virens</i>	Individual(s)	Adult	Male	1	33.17784396	-116.9802896	Singing Solo,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Brown-headed Cowbird	<i>Molothrus ater</i>	Individual(s)	Adult	Unknown	2	33.17777779	-116.9801749	Heard only	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Yellow Warbler	<i>Setophaga petechia brewsteri</i>	Individual(s)	Adult	Male	1	33.17775366	-116.9780117	Singing Solo,Territorial behavior	
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Phainopepla	<i>Phainopepla nitens</i>				1	33.17843748	-116.9808701		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Barn Owl	<i>Tyto alba</i>				1	33.17843559	-116.9810103		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Orange-crowned Warbler	<i>Oreothlypis celata</i>				1	33.1784796	-116.9811516		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Spotted Towhee	<i>Pipilo maculatus</i>				1	33.17850277	-116.9813019		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Red-tailed Hawk	<i>Buteo jamaicensis</i>				1	33.17870427	-116.9817189		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Turkey Vulture	<i>Cathartes aura</i>				1	33.17867062	-116.9818619		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Wrentit	<i>Chamaea fasciata</i>				1	33.16743569	-116.9975104		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Black Phoebe	<i>Sayornis nigricans</i>				1	33.16800876	-116.9965591		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Common Raven	<i>Corvus corax</i>				1	33.16804647	-116.9964884		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Marine Blue	<i>Leptotes marina</i>				1	33.16860924	-116.997256		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Acmon Blue	<i>Icaricia acmon acmon</i>				1	33.16856464	-116.9972443		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Spring (California) White	<i>Pontia sisymbrii</i>				1	33.16856464	-116.9972443		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Harford's Sulphur	<i>Colias harfordii</i>				1	33.16856464	-116.9972443		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Pacific-slope Flycatcher	<i>Empidonax difficilis</i>				1	33.16721612	-117.007547		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Nuttall's Woodpecker	<i>Picoides nuttalli</i>				1	33.16721612	-117.007547		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	American Bullfrog	<i>Lithobates catesbeiana</i>				1	33.16711625	-117.0062066		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Coyote	<i>Canis latrans</i>				1	33.16710938	-117.0062639		
5/21/2017	Andrew Fisher	Rick Bailey	1	Southwestern Willow Flycatcher	6:46:00 AM	11:19:00 AM	First SWFL survey. Same species as LBV survey	Clear, Calm	79	0	0	NE	Mule Deer	<i>Odocoileus hemionus</i>				1	33.16709303	-117.0062874		
5/21/2017																						

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Red-winged Blackbird	Agelaius phoeniceus				1	33.17377358	-117.0008316		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Desert Cottontail	Sylvilagus audubonii				1	33.17252782	-117.0007098		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17223512	-117.0012976	Calling	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.16812698	-116.9968258	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	American Crow	Corvus brachyrhynchos				1	33.17074779	-116.9950169		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Common Yellowthroat	Geothlypis trichas				1	33.17074779	-116.9950169		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Costa's Hummingbird	Calypte costae				1	33.17079503	-116.9950525		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Oak Titmouse	Baeolophus inornatus				1	33.17642737	-116.9927822		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Ash-throated Flycatcher	Myiarchus cinerascens				1	33.17642737	-116.9927822		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Cassin's Kingbird	Tyrannus vociferans				1	33.17642389	-116.9927124		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Northern Flicker	Colaptes auratus				1	33.17642389	-116.9927124		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.1765902	-116.9908604	Flying	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17697494	-116.9908494	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Red-shouldered Hawk	Buteo lineatus				1	33.17728777	-116.9864952		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	2	33.17616113	-116.9864338	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Black-headed Grosbeak	Pheucticus melanocephalus				1	33.17725006	-116.9864633		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Violet-green Swallow	Tachycineta thalassina				1	33.17725006	-116.9864633		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Tree Swallow	Tachycineta bicolor				1	33.17725006	-116.9864633		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.17721795	-116.9841247	Calling	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17720308	-116.9829737	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17764842	-116.9807482	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Pacific-slope Flycatcher	Empidonax difficilis				1	33.17838543	-116.980687		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Orange-crowned Warbler	Oreothlypis celata				1	33.17838543	-116.980687		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Hutton's Vireo	Vireo huttoni				1	33.17838543	-116.980687		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17623213	-116.9867389	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17514226	-116.9985402	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.17514226	-116.9985402	Calling	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, From the WSW at 1.0 MPH	57.8	100	1	WSW	Cliff Swallow	Petrochelidon pyrrhonota				1	33.17514712	-116.9985632		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Nuttall's Woodpecker	Picoides nuttallii				1	33.17377358	-117.0008316		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Great-tailed Grackle	Quiscalus mexicanus				1	33.17377358	-117.0008316		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	House Finch	Haemorrhous mexicanus				1	33.17377358	-117.0008316		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Lesser Goldfinch	Spinus psaltria				1	33.17377358	-117.0008316		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	House Wren	Troglodytes aedon				1	33.17377358	-117.0008316		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Red-winged Blackbird	Agelaius phoeniceus				1	33.17377358	-117.0008316		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Desert Cottontail	Sylvilagus audubonii				1	33.17252782	-117.0007098		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17223512	-117.0012976	Calling	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.16812698	-116.9968258	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	American Crow	Corvus brachyrhynchos				1	33.17074779	-116.9950169		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Common Yellowthroat	Geothlypis trichas				1	33.17074779	-116.9950169		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Costa's Hummingbird	Calypte costae				1	33.17079503	-116.9950525		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Oak Titmouse	Baeolophus inornatus				1	33.17642737	-116.9927822		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Ash-throated Flycatcher	Myiarchus cinerascens				1	33.17642737	-116.9927822		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Cassin's Kingbird	Tyrannus vociferans				1	33.17642389	-116.9927124		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Northern Flicker	Colaptes auratus				1	33.17642389	-116.9927124		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.1765902	-116.9908604	Flying	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17697494	-116.9908494	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Red-shouldered Hawk	Buteo lineatus				1	33.17728777	-116.9864952		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	2	33.17616113	-116.9864338	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Black-headed Grosbeak	Pheucticus melanocephalus				1	33.17725006	-116.9864633		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Violet-green Swallow	Tachycineta thalassina				1	33.17725006	-116.9864633		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Tree Swallow	Tachycineta bicolor				1	33.17725006	-116.9864633		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.17721795	-116.9841247	Calling	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17720308	-116.9829737	Singing Solo	

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17764842	-116.9807482	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Pacific-slope Flycatcher	Empidonax difficilis				1	33.17838543	-116.980687		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Orange-crowned Warbler	Oreothlypis celata				1	33.17838543	-116.980687		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Hutton's Vireo	Vireo huttoni				1	33.17838543	-116.980687		
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17623213	-116.9867389	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17514226	-116.9985402	Singing Solo	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.17514226	-116.9985402	Calling	
6/1/2017	Brennan Mulrooney	James McMorran	2	Southwestern Willow Flycatcher	6:44:00 AM	10:00:00 AM		Overcast, Calm	63.6	100	0	SW	Cliff Swallow	Petrochelidon pyrrhonota				1	33.17514712	-116.9985632		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17650377	-116.9881471		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17607919	-116.9864911		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17695698	-116.990559		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	4	33.17761952	-116.9807807		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17819086	-116.978078		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17650377	-116.9881471		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17607919	-116.9864911		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17695698	-116.990559		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	4	33.17761952	-116.9807807		
6/19/2017	Brennan Mulrooney	James McMorran	3	Southwestern Willow Flycatcher	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17819086	-116.978078		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	House Wren	Troglodytes aedon				1	33.17687199	-116.9920594		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Common Yellowthroat	Geothlypis trichas				1	33.17700581	-116.9913745		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	White-breasted Nuthatch	Sitta carolinensis				1	33.17755507	-116.9914747		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	2	33.17739607	-116.9906319		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17666541	-116.9895371		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Unknown	Unknown	2	33.17657842	-116.9865102	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow-breasted Chat	Icteria virens	Individual(s)	Unknown	Unknown	1	33.17666373	-116.9859309	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17550531	-116.9846736	Singing Solo	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17724489	-116.9840631	Singing Solo	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Northern Flicker	Colaptes auratus				1	33.17834612	-116.9830245		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Nuttall's Woodpecker	Picoides nuttallii				1	33.17839222	-116.9828588		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Acorn Woodpecker	Melanerpes formicivorus				1	33.1785941	-116.9790269		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17817093	-116.9781347	Singing Solo	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Bushtit	Psaltiriparus minimus				1	33.17838874	-116.9777185		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Song Sparrow	Melospiza melodia				1	33.17838874	-116.9777185		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Oak Titmouse	Baeolophus inornatus				1	33.17834565	-116.9777425		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Barn Owl	Tyto alba				1	33.17852067	-116.9782226		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Red-shouldered Hawk	Buteo lineatus				1	33.17647856	-116.986702		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Unknown	Unknown	1	33.17799001	-116.9798505	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Hooded Oriole	Icterus cucullatus				1	33.17820584	-116.9792082		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	1	33.17790182	-116.9794269	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Ash-throated Flycatcher	Myiarchus cinerascens				1	33.1778217	-116.9804075		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.1775461	-116.9808538	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Unknown	Unknown	1	33.17737538	-116.9812749	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Cooper's Hawk	Accipiter cooperii				1	33.17866794	-116.9818787		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17737482	-116.9823582	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Canyon Wren	Catherpes mexicanus				1	33.17674844	-116.986088	Singing Solo	On south slope
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Black-headed Grosbeak	Pheucticus melanocephalus				1	33.17667908	-116.9865954		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Costa's Hummingbird	Calypte costae				1	33.17664681	-116.9866349		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	Lesser Goldfinch	Spinus psaltria				1	33.17589707	-116.9866537		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Overcast, From the NE at 2.0 MPH	61.1	100	2	NE	American Crow	Corvus brachyrhynchos				1	33.1755693	-116.9866484		

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	House Wren	Troglodytes aedon				1	33.17687199	-116.9920594		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Common Yellowthroat	Geothlypis trichas				1	33.17700581	-116.9913745		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	White-breasted Nuthatch	Sitta carolinensis				1	33.17755507	-116.9914747		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	2	33.17739607	-116.9906319		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17666541	-116.9895371		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Unknown	Unknown	2	33.17657842	-116.9865102	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Unknown	Unknown	1	33.17666373	-116.9859309	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17550531	-116.9846736	Singing Solo	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17724489	-116.9840631	Singing Solo	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Northern Flicker	Colaptes auratus				1	33.17834612	-116.9830245		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Nuttall's Woodpecker	Picoides nuttallii				1	33.17839222	-116.9828588		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Acorn Woodpecker	Melanerpes formicivorus				1	33.1785941	-116.9790269		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17817093	-116.9781347	Singing Solo	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Bushtit	Psaltiriparus minimus				1	33.17838874	-116.9777185		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Song Sparrow	Melospiza melodia				1	33.17838874	-116.9777185		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Oak Titmouse	Baeolophus inornatus				1	33.17834565	-116.9777425		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Barn Owl	Tyto alba				1	33.17852067	-116.9782226		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Red-shouldered Hawk	Buteo lineatus				1	33.17647856	-116.986702		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Unknown	Unknown	1	33.17799001	-116.9798505	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Hooded Oriole	Icterus cucullatus				1	33.17820584	-116.9792082		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	1	33.17790182	-116.9794269	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Ash-throated Flycatcher	Myiarchus cinerascens				1	33.1778217	-116.9804075		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.1775461	-116.9808538	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Unknown	Unknown	1	33.17737538	-116.9812749	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Cooper's Hawk	Accipiter cooperii				1	33.17866794	-116.9818787		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17737482	-116.9823582	Calling	
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Canyon Wren	Catherpes mexicanus				1	33.17674844	-116.986088	Singing Solo	On south slope
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Black-headed Grosbeak	Pheucticus melanocephalus				1	33.17667908	-116.9865954		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Costa's Hummingbird	Calypte costae				1	33.17664681	-116.9866349		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	Lesser Goldfinch	Spinus psaltria				1	33.17589707	-116.9866537		
6/29/2017	Brennan Mulrooney	James McMorran	4	Southwestern Willow Flycatcher	7:12:00 AM	9:54:00 AM		Clear, From the SW at 2.0 MPH	76.4	0	2	SW	American Crow	Corvus brachyrhynchos				1	33.1755693	-116.9866484		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17678355	-116.9915012	Singing Solo	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Nuttall's Woodpecker	Picoides nuttallii				1	33.17701968	-116.9913956		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Ash-throated Flycatcher	Myiarchus cinerascens				1	33.17701968	-116.9913956		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Lawrence's Goldfinch	Spinus lawrencei				1	33.17785288	-116.9908123		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17659666	-116.9910006	Singing Solo	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.17741383	-116.990096	Perching	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Bewick's Wren	Thryomanes bewickii				1	33.1773063	-116.9905489		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17670092	-116.9872027	Perching	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17646561	-116.9862326	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	2	33.17594786	-116.985894	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17690029	-116.9838039	Perching	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17689159	-116.9834257	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	White-breasted Nuthatch	Sitta carolinensis				1	33.1771123	-116.9817263		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17785664	-116.9798356	Singing Solo	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Yellow-breasted Chat	Icteria virens	Individual(s)	Unknown	Unknown	1	33.17762766	-116.9804095	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Blue Grosbeak	Passerina caerulea				1	33.17837533	-116.9800956		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17803351	-116.9793317	Singing Solo	

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Downy Woodpecker	Picoides pubescens				1	33.1780719	-116.9785957		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Common Yellowthroat	Geothlypis trichas				1	33.17820748	-116.9779811		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Song Sparrow	Melospiza melodia				1	33.17839004	-116.9769767		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Red-winged Blackbird	Agelaius phoeniceus				1	33.17613784	-116.9922874		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Partly Cloudy, Calm	63.4	0	0	SE	Rufous/Allen's Hummingbird	Selasphorus rufus/sasin				1	33.17655746	-116.9924864		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17678355	-116.9915012	Singing Solo	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Nuttall's Woodpecker	Picoides nuttallii				1	33.17701968	-116.9913956		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Ash-throated Flycatcher	Myiarchus cinerascens				1	33.17701968	-116.9913956		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Lawrence's Goldfinch	Spinus lawrencei				1	33.17785288	-116.9908123		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17659666	-116.9910006	Singing Solo	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.17741383	-116.990096	Perching	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Bewick's Wren	Thryomanes bewickii				1	33.1773063	-116.9905489		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17670092	-116.9872027	Perching	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17646561	-116.9862326	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	2	33.17594786	-116.985894	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17690029	-116.9838039	Perching	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17689159	-116.9834257	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	White-breasted Nuthatch	Sitta carolinensis				1	33.1771123	-116.9817263		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17785664	-116.9798356	Singing Solo	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Yellow-breasted Chat	Icteria virens	Individual(s)	Unknown	Unknown	1	33.17762766	-116.9804095	Calling	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Blue Grosbeak	Passerina caerulea				1	33.17837533	-116.9800956		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17803351	-116.9793317	Singing Solo	
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Downy Woodpecker	Picoides pubescens				1	33.1780719	-116.9785957		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Common Yellowthroat	Geothlypis trichas				1	33.17820748	-116.9779811		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Song Sparrow	Melospiza melodia				1	33.17839004	-116.9769767		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Red-winged Blackbird	Agelaius phoeniceus				1	33.17613784	-116.9922874		
7/11/2017	Brennan Mulrooney	Rick Bailey	5	Southwestern Willow Flycatcher	6:10:00 AM	9:29:00 AM		Clear, From the SW at 2.0 MPH	86.7	0	2	SW	Rufous/Allen's Hummingbird	Selasphorus rufus/sasin				1	33.17655746	-116.9924864		

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Date	Primary Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17542926	-116.9987961	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17666092	-116.9901342	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17637343	-116.9902519	Heard only	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17630185	-116.9888902	Heard only	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17577551	-116.9875805	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17648085	-116.9866483	Counter Singing	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17564057	-116.9863272	Counter Singing	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17654811	-116.9855388	Calling	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17768034	-116.9806319	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17689571	-116.9916758	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	San Diegan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.17690066	-116.9917499	Foraging	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	San Diegan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.16875487	-116.9969025		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.1714432	-116.9939349	Flying	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17731367	-116.9789611	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Turkey Vulture	Cathartes aura	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Red-winged Blackbird	Agelaius phoeniceus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Western Grebe	Aechmophorus occidentalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Song Sparrow	Melospiza melodia	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	House Wren	Troglodytes aedon	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Ruddy Duck	Oxyura jamaicensis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Black Phoebe	Sayornis nigricans	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Great Blue Heron	Ardea herodias	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Northern Rough-winged Swallow	Stelgidopteryx serripennis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Tree Swallow	Tachycineta bicolor	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Common Yellowthroat	Geothlypis trichas	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Marsh Wren	Cistothorus palustris	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	American White Pelican	Pelecanus erythrorhynchos	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Eared Grebe	Podiceps nigricollis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Bushtit	Psaltiriparus minimus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	House Finch	Haemorhous mexicanus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	California Towhee	Melospiza crissalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Red-shouldered Hawk	Buteo lineatus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Great Egret	Ardea alba	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Mallard	Anas platyrhynchos	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Western Kingbird	Tyrannus verticalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Anna's Hummingbird	Calypte anna	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Rufous Hummingbird	Selasphorus rufus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Black Phoebe	Sayornis nigricans	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Black-throated Gray Warbler	Setophaga nigrescens	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Costa's Hummingbird	Calypte costae	Individual(s)			1	33.17412637	-117.000105		

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Primary Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Nuttall's Woodpecker	Picoides nuttallii	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Black-headed Grosbeak	Pheucticus melanocephalus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Northern Flicker	Colaptes auratus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Orange-crowned Warbler	Oreothlypis celata	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Hutton's Vireo	Vireo huttoni	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Wrentit	Chamaea fasciata	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Mourning Dove	Zenaida macroura	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Lesser Goldfinch	Spinus psaltria	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Yellow-rumped Warbler	Setophaga coronata	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Oak Titmouse	Baeolophus inornatus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Lincoln's Sparrow	Melospiza lincolni	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Spotted Towhee	Pipilo maculatus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Western Fence Lizard	Sceloporus occidentalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Granite Spiny Lizard	Sceloporus orcutti	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Western Tiger Swallowtail	Papilio rutulus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Pale Swallowtail	Papilio eurymedon	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Sara Orangetip	Anthocharis sara sara	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Common Buckeye	Junonia coenia	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Painted Lady	Vanessa cardui	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Coyote	Canis latrans	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Mule Deer	Odocoileus hemionus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	California Ground Squirrel	Spermophilus beecheyi	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Botta's Pocket Gopher	Thomomys bottae	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Desert Cottontail	Sylvilagus audubonii	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Red-tailed Hawk	Buteo jamaicensis	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Western Bluebird	Sialia mexicana	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	American Coot	Fulica americana	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	Acorn Woodpecker	Melanerpes formicivorus	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		56	0	1	E	American Crow	Corvus brachyrhynchos	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17542926	-116.9987961	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17666092	-116.9901342	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17637343	-116.9902519	Heard only	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17630185	-116.9888902	Heard only	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17577551	-116.9875805	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17648085	-116.9866483	Counter Singing	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17564057	-116.9863272	Counter Singing	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Unknown	1	33.17654811	-116.9855388	Calling	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17768034	-116.9806319	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17689571	-116.9916758	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	San Diegan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.17690066	-116.9917499	Foraging	

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Primary Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	San Diegan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.16875487	-116.9969025		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.1714432	-116.9939349	Flying	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17731367	-116.9789611	Singing Solo	
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Turkey Vulture	Cathartes aura	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Red-winged Blackbird	Agelaius phoeniceus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Western Grebe	Aechmophorus occidentalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Song Sparrow	Melospiza melodia	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	House Wren	Troglodytes aedon	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Ruddy Duck	Oxyura jamaicensis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Black Phoebe	Sayornis nigricans	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Great Blue Heron	Ardea herodias	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Northern Rough-winged Swallow	Stelgidopteryx serripennis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Tree Swallow	Tachycineta bicolor	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Common Yellowthroat	Geothlypis trichas	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Marsh Wren	Cistothorus palustris	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	American White Pelican	Pelecanus erythrorhynchos	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Eared Grebe	Podiceps nigricollis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Bushtit	Psaltirparus minimus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	House Finch	Haemorrhous mexicanus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	California Towhee	Melozone crissalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Red-shouldered Hawk	Buteo lineatus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Great Egret	Ardea alba	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Mallard	Anas platyrhynchos	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Western Kingbird	Tyrannus verticalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Anna's Hummingbird	Calypte anna	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Rufous Hummingbird	Selasphorus rufus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Black Phoebe	Sayornis nigricans	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Black-throated Gray Warbler	Setophaga nigrescens	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Costa's Hummingbird	Calypte costae	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Nuttall's Woodpecker	Picoides nuttallii	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Black-headed Grosbeak	Pheucticus melanocephalus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Northern Flicker	Colaptes auratus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Orange-crowned Warbler	Oreothlypis celata	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Hutton's Vireo	Vireo huttoni	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Wrentit	Chamaea fasciata	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Mourning Dove	Zenaida macroura	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Lesser Goldfinch	Spinus psaltria	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Yellow-rumped Warbler	Setophaga coronata	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Oak Titmouse	Baeolophus inornatus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Lincoln's Sparrow	Melospiza lincolni	Individual(s)			1	33.17412637	-117.000105		

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Primary Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Spotted Towhee	Pipilo maculatus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Western Fence Lizard	Sceloporus occidentalis	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Granite Spiny Lizard	Sceloporus orcutti	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Western Tiger Swallowtail	Papilio rutulus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Pale Swallowtail	Papilio eurymedon	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Sara Orangetip	Anthocharis sara sara	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Common Buckeye	Junonia coenia	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Painted Lady	Vanessa cardui	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Coyote	Canis latrans	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Mule Deer	Odocoileus hemionus	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	California Ground Squirrel	Spermophilus beecheyi	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Botta's Pocket Gopher	Thomomys bottae	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Desert Cottontail	Sylvilagus audubonii	Individual(s)			1	33.17412637	-117.000105		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Red-tailed Hawk	Buteo jamaicensis	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Western Bluebird	Sialia mexicana	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	American Coot	Fulica americana	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	Acorn Woodpecker	Melanerpes formicivorus	Individual(s)			1	33.1741247	-117.0001007		
4/12/2017	Andrew Fisher	Sheila Madrak	1	Least Bell's Vireo	6:54:00 AM	10:33:00 AM	First LBVI survey and Arroyo toad habitat assessment. No suitable arroyo toad habitat.		74	0	2	E	American Crow	Corvus brachyrhynchos	Individual(s)			1	33.1741247	-117.0001007		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Bald Eagle	Haliaeetus leucocephalus	Individual(s)	Adult	Unknown	1	33.17145732	-117.0003636	4th year bird, flying	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17480237	-116.9985648	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17101044	-116.9956469	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	6	33.17457598	-116.9860991	Perching	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Tree Swallow	Tachycineta bicolor	Individual(s)		Male and Female	1	33.17466047	-116.986014		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Northern Rough-winged Swallow	Stelgidopteryx serripennis	Individual(s)			1	33.17466047	-116.986014		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Violet-green Swallow	Tachycineta thalassina	Individual(s)			1	33.17466047	-116.986014		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17578004	-116.9867476	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17651079	-116.9843242	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male and Female	2	33.17631912	-116.9848473	Foraging,Perching, Singing Solo,Unbanded	Male following female around.
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17619955	-116.9824398	Foraging	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17698616	-116.9819508	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17686746	-116.9822455	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17769557	-116.979977	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17771633	-116.9799811	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Blue Grosbeak	Passerina caerulea	Individual(s)			1	33.17725135	-116.979703		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Orange-crowned Warbler	Oreothlypis celata	Individual(s)			1	33.17719474	-116.9788502		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Northern Flicker	Colaptes auratus	Individual(s)			1	33.17493438	-116.9945165		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17688829	-116.9848095	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Bullock's Oriole	Icterus bullockii	Individual(s)			1	33.17773222	-116.9910271		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Lazuli Bunting	Passerina amoena	Individual(s)			1	33.1777173	-116.9910841		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Lesser Goldfinch	Spinus psaltria	Individual(s)			1	33.1777173	-116.9910841		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Costa's Hummingbird	Calypte costae	Individual(s)			1	33.1777173	-116.9910841		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Overcast and cool	59	100	3	W	Anna's Hummingbird	Calypte anna	Individual(s)			1	33.1777173	-116.9910841		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Bald Eagle	Haliaeetus leucocephalus	Individual(s)	Adult	Unknown	1	33.17145732	-117.0003636	Flying	4th year bird with no green tags.
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17480237	-116.9985648	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17101044	-116.9956469	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	6	33.17457598	-116.9860991	Perching	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Tree Swallow	Tachycineta bicolor	Individual(s)			1	33.17466047	-116.986014		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Northern Rough-winged Swallow	Stelgidopteryx serripennis	Individual(s)			1	33.17466047	-116.986014		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Violet-green Swallow	Tachycineta thalassina	Individual(s)			1	33.17466047	-116.986014		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17578004	-116.9867476	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17651079	-116.9843242	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male and Female	2	33.17631912	-116.9848473	Foraging,Perching, Singing Solo,Unbanded	Male following female around.
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17619955	-116.9824398	Foraging	

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Primary Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17698616	-116.9819508	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17686746	-116.9822455	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17769557	-116.979977	Singing Solo	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17771633	-116.9799811	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Blue Grosbeak	Passerina caerulea	Individual(s)			1	33.17725135	-116.979703		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Orange-crowned Warbler	Oreothlypis celata	Individual(s)			1	33.17719474	-116.9788502		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Northern Flicker	Colaptes auratus	Individual(s)			1	33.17493438	-116.9945165		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Unknown	1	33.17688829	-116.9848095	Heard only	
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Bullock's Oriole	Icterus bullockii	Individual(s)			1	33.17773222	-116.9910271		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Lazuli Bunting	Passerina amoena	Individual(s)			1	33.1777173	-116.9910841		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Lesser Goldfinch	Spinus psaltria	Individual(s)			1	33.1777173	-116.9910841		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Costa's Hummingbird	Calypte costae	Individual(s)			1	33.1777173	-116.9910841		
4/25/2017	Andrew Fisher	Rick Bailey	2	Least Bell's Vireo	6:51:00 AM	11:00:00 AM	One pair of LBV	Partly cloudy	65	60	2	W	Anna's Hummingbird	Calypte anna	Individual(s)			1	33.1777173	-116.9910841		
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.1723083	-117.0003767	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17024949	-117.0014578	Perching,Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17507365	-116.9987703	Perching,Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male and Female	2	33.17511791	-116.9987776	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Wilson's Warbler	Cardellina pusilla	Individual(s)	Adult	Male	1	33.1750698	-116.9988116	Perching,Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Oak Titmouse	Baeolophus inornatus	Individual(s)	Adult	Unknown	1	33.16861108	-116.9970157	Calling	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.16855936	-116.9970047	Calling,Perching	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Least Bell's Vireo	Vireo bellii pusillus	Pair	Adult	Male and Female	2	33.17636599	-116.9930143	Carrying nest material, Flying,Perching, Singing Solo	Nesting 3 feet off ground in live oak branch. Located next to fisherman's trail. Cucumber vines also present. Just a few fibers present as the nest building is just beginning.
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Black-chinned Hummingbird	Archilochus alexandri	Individual(s)	Adult	Male	1	33.17655993	-116.9927801		
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17664807	-116.9922963	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17682153	-116.9918434		
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17670554	-116.9911494	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17668085	-116.985147	Counter Singing	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17673809	-116.9847101	Calling,Flying	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Cooper's Hawk	Accipiter cooperii	Individual(s)	Adult	Male	1	33.17675493	-116.98192	Calling	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17679094	-116.9821698	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM			55	40	1	SE	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male	1	33.17755694	-116.9911216	Singing Solo	"Brennan went to Oak territory, and no vireos there during the time I stayed here with this singing male. Eventually the male became quiet here & was no longer seen."
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.1723083	-117.0003767	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17024949	-117.0014578	Perching,Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17507365	-116.9987703	Perching,Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male and Female	2	33.17511791	-116.9987776	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Wilson's Warbler	Cardellina pusilla	Individual(s)	Adult	Male	1	33.1750698	-116.9988116	Perching,Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Oak Titmouse	Baeolophus inornatus	Individual(s)	Adult	Unknown	1	33.16861108	-116.9970157	Calling	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.16855936	-116.9970047	Calling,Perching	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Least Bell's Vireo	Vireo bellii pusillus	Pair	Adult	Male and Female	2	33.17636599	-116.9930143	Carrying nest material, Flying,Perching, Singing Solo	Nesting 3 feet off ground in live oak branch. Located next to fisherman's trail. Cucumber vines also present. Just a few fibers present as the nest building is just beginning.
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Black-chinned Hummingbird	Archilochus alexandri	Individual(s)	Adult	Male	1	33.17655993	-116.9927801		
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17664807	-116.9922963	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17682153	-116.9918434		
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17670554	-116.9911494	Singing Solo	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17668085	-116.985147	Counter Singing	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17673809	-116.9847101	Calling,Flying	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Cooper's Hawk	Accipiter cooperii	Individual(s)	Adult	Male	1	33.17675493	-116.98192	Calling	
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Yellow Warbler	Setophaga petechia brewsteri	Individual(s)	Adult	Male	1	33.17679094	-116.9821698	Singing Solo	

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Primary Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes	Comments
5/5/2017	Brennan Mulrooney	Rick Bailey	3	Least Bell's Vireo	6:44:00 AM	11:30:00 AM		Mostly Cloudy, From the South at 2.0 MPH	68.4	80	2	South	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male	1	33.17755694	-116.9911216	Singing Solo	"Brennan went to Oak territory, and no vireos there during the time I stayed here with this singing male. Eventually the male became quiet here & was no longer seen. "
5/21/2017	Rick Bailey	Andrew Fisher	4	Least Bell's Vireo	6:42:00 AM	11:11:00 AM	BHCO Locations were recorded today during SWFL survey.	Clear, Calm	55.1	0	0	SSE	Least Bell's Vireo	Vireo bellii pusillus	Pair	Adult	Male and Female	2	33.17770314	-116.9894587	Foraging,Perching, Singing Solo	"Male foraging and singing, female seen perched on a branch about 1 meter high. "
5/21/2017	Rick Bailey	Andrew Fisher	4	Least Bell's Vireo	6:42:00 AM	11:11:00 AM	BHCO Locations were recorded today during SWFL survey.	Clear, From the SSW at 1.0 MPH	85	0	1	SSW	Least Bell's Vireo	Vireo bellii pusillus	Pair	Adult	Male and Female	2	33.17770314	-116.9894587	Foraging,Perching, Singing Solo	"Male foraging and singing, female seen perched on a branch about 1 meter high. "
6/1/2017	James McMorran	Brennan Mulrooney	5	Least Bell's Vireo	6:11:00 AM	11:00:00 AM		Overcast, Calm	57.8	100	0	WNW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.16812539	-116.9969336		
6/1/2017	James McMorran	Brennan Mulrooney	5	Least Bell's Vireo	6:56:00 AM	10:49:00 AM	Not CAGN survey area. Form requiring this field	Clear, calm	68.8	5	0	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.17215486	-117.0005982		
6/1/2017	James McMorran	Brennan Mulrooney	5	Least Bell's Vireo	6:56:00 AM	10:49:00 AM	Not CAGN survey area. Form requiring this field	Clear, calm	68.8	5	0	WSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Male and Female	2	33.17653015	-116.9921248	Heard only	
6/1/2017	James McMorran	Brennan Mulrooney	5	Least Bell's Vireo	6:56:00 AM	10:49:00 AM	Not CAGN survey area. Form requiring this field	Clear, Calm	86	0	0	East	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.17215486	-117.0005982		
6/1/2017	James McMorran	Brennan Mulrooney	5	Least Bell's Vireo	6:56:00 AM	10:49:00 AM	Not CAGN survey area. Form requiring this field	Clear, Calm	86	0	0	East	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Male and Female	2	33.17653015	-116.9921248	Heard only	
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17650377	-116.9881471		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17607919	-116.9864911		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17695698	-116.990559		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	4	33.17761952	-116.9807807		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		69	0	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17819086	-116.978078		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17650377	-116.9881471		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17607919	-116.9864911		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	2	33.17695698	-116.990559		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	4	33.17761952	-116.9807807		
6/19/2017	Brennan Mulrooney	James McMorran	6	Least Bell's Vireo	6:01:00 AM	9:52:00 AM	survey conducted on 6/19/17		81	0	3	SW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Unknown	3	33.17819086	-116.978078		
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Overcast, From the South at 1.0 MPH	61.3	100	1	South	Violet-green Swallow	Tachycineta thalassina	Individual(s)	Unknown	Male	4	33.16821302	-116.9968553		
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Overcast, From the South at 1.0 MPH	61.3	100	1	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Female	1	33.16915593	-116.9972236	Calling	
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Overcast, From the South at 1.0 MPH	61.3	100	1	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Male	1	33.16896846	-116.9970895	Calling	
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Overcast, From the South at 1.0 MPH	61.3	100	1	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17689833	-116.9912748		
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Clear, From the South at 3.4 MPH Gusting to 4.9 MPH	74.2	10	3.4	South	Violet-green Swallow	Tachycineta thalassina	Individual(s)	Unknown	Male	4	33.16821302	-116.9968553		
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Clear, From the South at 3.4 MPH Gusting to 4.9 MPH	74.2	10	3.4	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Female	1	33.16915593	-116.9972236	Calling	
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Clear, From the South at 3.4 MPH Gusting to 4.9 MPH	74.2	10	3.4	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Unknown	Male	1	33.16896846	-116.9970895	Calling	
6/29/2017	James McMorran		7	Least Bell's Vireo	6:14:00 AM	10:30:00 AM		Clear, From the South at 3.4 MPH Gusting to 4.9 MPH	74.2	10	3.4	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17689833	-116.9912748		
7/11/2017	Rick Bailey	Brennan Mulrooney	8	Least Bell's Vireo	6:50:00 AM	10:35:00 AM		Partly Cloudy, Calm	76.9	0	0	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.16822396	-116.9969556		
7/11/2017	Rick Bailey	Brennan Mulrooney	8	Least Bell's Vireo	6:50:00 AM	10:35:00 AM		Partly Cloudy, Calm	76.9	0	0	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17478691	-116.9988165		
7/11/2017	Rick Bailey	Brennan Mulrooney	8	Least Bell's Vireo	6:50:00 AM	10:35:00 AM		Partly Cloudy, Calm	76.9	0	0	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17652791	-116.9927987		
7/11/2017	Rick Bailey	Brennan Mulrooney	8	Least Bell's Vireo	6:50:00 AM	10:35:00 AM		Clear, From the SSW at 3.0 MPH	87	0	3	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.16822396	-116.9969556		
7/11/2017	Rick Bailey	Brennan Mulrooney	8	Least Bell's Vireo	6:50:00 AM	10:35:00 AM		Clear, From the SSW at 3.0 MPH	87	0	3	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17478691	-116.9988165		
7/11/2017	Rick Bailey	Brennan Mulrooney	8	Least Bell's Vireo	6:50:00 AM	10:35:00 AM		Clear, From the SSW at 3.0 MPH	87	0	3	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17652791	-116.9927987		

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Black Phoebe	Sayornis nigricans	Individual(s)			1	33.17381817	-117.0008623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Cassin's Kingbird	Tyrannus vociferans	Individual(s)			1	33.17381817	-117.0008623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	European Starling	Sturnus vulgaris	Individual(s)			1	33.17262165	-117.0021085	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	California Towhee	Melospiza crissalis	Individual(s)			1	33.17262165	-117.0021085	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Song Sparrow	Melospiza melodia	Individual(s)			1	33.17262165	-117.0021085	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17262165	-117.0021085	CallingFlying
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Red-tailed Hawk	Buteo jamaicensis	Individual(s)			1	33.17262459	-117.0021016	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	California Quail	Callipepla californica	Individual(s)			1	33.17244299	-117.0022618	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Greater Roadrunner	Geococcyx californianus	Individual(s)			1	33.17244299	-117.0022618	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Mourning Dove	Zenaida macroura	Individual(s)			1	33.17244299	-117.0022618	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Tree Swallow	Tachycineta bicolor	Individual(s)			1	33.17244299	-117.0022618	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Anna's Hummingbird	Calypte anna	Individual(s)			1	33.17244299	-117.0022618	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Bullock's Oriole	Icterus bullockii	Individual(s)			1	33.17219782	-117.0023875	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	White-crowned Sparrow	Zonotrichia leucophrys	Individual(s)			1	33.17195936	-117.0026588	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	California Thrasher	Toxostoma redivivum	Individual(s)			1	33.17195936	-117.0026588	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Wrentit	Chamaea fasciata	Individual(s)			1	33.17195902	-117.0026635	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Bewick's Wren	Thryomanes bewickii	Individual(s)			1	33.17195902	-117.0026635	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Acorn Woodpecker	Melanerpes formicivorus	Individual(s)			1	33.1719506	-117.00267	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Ash-throated Flycatcher	Myiarchus cinerascens	Individual(s)			1	33.1716929	-117.0028063	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Mule Deer	Odocoileus hemionus	Individual(s)			1	33.17170383	-117.002864	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Great Egret	Ardea alba	Individual(s)			1	33.17170383	-117.002864	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	2	33.1709011	-117.001196	Perching
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Blue-gray Gnatcatcher	Polioptila caerulea	Individual(s)			1	33.17086787	-117.0011919	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Lincoln's Sparrow	Melospiza lincolni	Individual(s)			1	33.17086703	-117.0011958	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Turkey Vulture	Cathartes aura	Individual(s)			1	33.17086703	-117.0011958	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Bullock's Oriole	Icterus bullockii	Individual(s)			1	33.17086703	-117.0011958	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Bushtit	Psaltiriparus minimus	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Orange-crowned Warbler	Oreothlypis celata	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Wrentit	Chamaea fasciata	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Double-crested Cormorant	Phalacrocorax auritus	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Nuttall's Woodpecker	Picoides nuttallii	Individual(s)			1	33.17406363	-117.0009104	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.17642859	-116.9925481	CallingPerching
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Forster's Tern	Sterna forsteri	Individual(s)			1	33.17551441	-116.9930865	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Western Grebe	Aechmophorus occidentalis	Individual(s)			1	33.17556005	-116.9931703	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	White-breasted Nuthatch	Sitta carolinensis	Individual(s)			1	33.17742578	-116.9909122	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Red-tailed Hawk	Buteo jamaicensis	Individual(s)			1	33.17746254	-116.9908164	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Marine Blue	Leptotes marina	Individual(s)			1	33.17728115	-116.9905623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Sara Orangetip	Anthocharis sara sara	Individual(s)			1	33.17728115	-116.9905623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	House Wren	Troglodytes aedon	Individual(s)			1	33.17728865	-116.9905677	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17728865	-116.9905677	Calling
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Spotted Towhee	Pipilo maculatus	Individual(s)			1	33.17712328	-116.9894713	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Western Scrub-Jay	Apelocoma californica	Individual(s)			1	33.17707014	-116.989472	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Hutton's Vireo	Vireo huttoni	Individual(s)			1	33.17707014	-116.989472	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Eared Grebe	Podiceps nigricollis	Individual(s)			1	33.17707014	-116.989472	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Black-headed Grosbeak	Pheucticus melanocephalus	Individual(s)			1	33.17725374	-116.9885418	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	California Ground Squirrel	Spermophilus beecheyi	Individual(s)			1	33.17723857	-116.9885937	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	American Bullfrog	Lithobates catesbeiana	Individual(s)			1	33.17720572	-116.9886117	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Lesser Goldfinch	Spinus psaltria	Individual(s)			1	33.17720572	-116.9886117	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Common Yellowthroat	Geothlypis trichas	Individual(s)			1	33.17719306	-116.9886159	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Oak Titmouse	Baeolophus inornatus	Individual(s)			1	33.17719306	-116.9886159	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	San Diegan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.17742897	-116.9858609	Foraging
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Lazuli Bunting	Passerina amoena	Individual(s)			1	33.1781056	-116.9839088	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17770314	-116.9792917	Calling
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.	Clear and calm	51	10	0	W	Pacific-slope Flycatcher	Empidonax difficilis	Individual(s)			1	33.17989027	-116.9768937	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Black Phoebe	Sayornis nigricans	Individual(s)			1	33.17381817	-117.0008623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Cassin's Kingbird	Tyrannus vociferans	Individual(s)			1	33.17381817	-117.0008623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	European Starling	Sturnus vulgaris	Individual(s)			1	33.17262165	-117.0021085	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	California Towhee	Melospiza crissalis	Individual(s)			1	33.17262165	-117.0021085	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Song Sparrow	Melospiza melodia	Individual(s)			1	33.17262165	-117.0021085	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17262165	-117.0021085	CallingFlying
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Red-tailed Hawk	Buteo jamaicensis	Individual(s)			1	33.17262459	-117.002	

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Blue-gray Gnatcatcher	Polioptila caerulea	Individual(s)			1	33.17086787	-117.0011919	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Lincoln's Sparrow	Melospiza lincolni	Individual(s)			1	33.17086703	-117.0011958	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Turkey Vulture	Cathartes aura	Individual(s)			1	33.17086703	-117.0011958	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Bullock's Oriole	Icterus bullockii	Individual(s)			1	33.17086703	-117.0011958	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Bushtit	Psaltiriparus minimus	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Orange-crowned Warbler	Oreothlypis celata	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Wrentit	Chamaea fasciata	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Double-crested Cormorant	Phalacrocorax auritus	Individual(s)			1	33.16958229	-117.0019572	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Nuttall's Woodpecker	Picoides nuttallii	Individual(s)			1	33.17406363	-117.0009104	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.17642859	-116.9925481	Calling,Perching
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Forster's Tern	Sterna forsteri	Individual(s)			1	33.17551441	-116.9930865	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Western Grebe	Aechmophorus occidentalis	Individual(s)			1	33.17556005	-116.9931703	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	White-breasted Nuthatch	Sitta carolinensis	Individual(s)			1	33.17742578	-116.9909122	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Red-tailed Hawk	Buteo jamaicensis	Individual(s)			1	33.17746254	-116.9908164	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Marine Blue	Leptotes marina	Individual(s)			1	33.17728115	-116.9905623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Sara Orangetip	Anthocharis sara sara	Individual(s)			1	33.17728115	-116.9905623	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	House Wren	Troglodytes aedon	Individual(s)			1	33.17728865	-116.9905677	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17728865	-116.9905677	Calling
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Spotted Towhee	Pipilo maculatus	Individual(s)			1	33.17712328	-116.9894713	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Western Scrub-Jay	Aphelocoma californica	Individual(s)			1	33.17707014	-116.989472	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Hutton's Vireo	Vireo huttoni	Individual(s)			1	33.17707014	-116.989472	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Eared Grebe	Podiceps nigricollis	Individual(s)			1	33.17707014	-116.989472	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Black-headed Grosbeak	Pheucticus melanocephalus	Individual(s)			1	33.17725374	-116.9885418	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	California Ground Squirrel	Spermophilus beecheyi	Individual(s)			1	33.17723857	-116.9885937	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	American Bullfrog	Lithobates catesbeiana	Individual(s)			1	33.17720572	-116.9886117	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Lesser Goldfinch	Spinus psaltria	Individual(s)			1	33.17720572	-116.9886117	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Common Yellowthroat	Geothlypis trichas	Individual(s)			1	33.17719306	-116.9886159	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Oak Titmouse	Baeolophus inornatus	Individual(s)			1	33.17719306	-116.9886159	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	San Diegan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.17742897	-116.9858609	Foraging
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Lazuli Bunting	Passerina amoena	Individual(s)			1	33.1781056	-116.9839088	
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Yellow-breasted Chat	Icteria virens	Individual(s)	Adult	Male	1	33.17770314	-116.9792917	Calling
4/17/2017	Andrew Fisher	Rick Bailey	1	California Gnatcatcher	6:45:00 AM	10:55:00 AM	No CAGN first survey of six.		68	10	3	W	Pacific-slope Flycatcher	Empidonax difficilis	Individual(s)			1	33.17989027	-116.9768937	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17202872	-117.0024025	Flying
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Bullock's Oriole	Icterus bullockii	Individual(s)			1	33.1720314	-117.0024012	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Bald Eagle	Haliaeetus leucocephalus	Individual(s)	Adult	Unknown	1	33.169582	-117.0019059	Flying
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.16985219	-117.0016721	Perching
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Blue Grosbeak	Passerina caerulea	Individual(s)			1	33.17708154	-116.989393	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	American Bullfrog	Lithobates catesbeiana	Individual(s)			1	33.17703711	-116.9894229	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male	1	33.17630229	-116.98491	Singing Solo
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17671676	-116.9923041	Perching
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Southern Pacific Rattlesnake	Crotalus oreganus helleri	Individual(s)			1	33.17569521	-116.9931704	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.		59	100	0	Not Applicable	Western Side-blotched Lizard	Uta stansburiana elegans	Individual(s)			1	33.17569857	-116.9931679	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17202872	-117.0024025	Flying
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Bullock's Oriole	Icterus bullockii	Individual(s)			1	33.1720314	-117.0024012	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Bald Eagle	Haliaeetus leucocephalus	Individual(s)	Adult	Unknown	1	33.169582	-117.0019059	Flying
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.16985219	-117.0016721	Perching
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Blue Grosbeak	Passerina caerulea	Individual(s)			1	33.17708154	-116.989393	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	American Bullfrog	Lithobates catesbeiana	Individual(s)			1	33.17703711	-116.9894229	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male	1	33.17630229	-116.98491	Singing Solo
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Female	1	33.17671676	-116.9923041	Perching
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Southern Pacific Rattlesnake	Crotalus oreganus helleri	Individual(s)			1	33.17569521	-116.9931704	
4/24/2017	Andrew Fisher	Rick Bailey	2	California Gnatcatcher	6:44:00 AM	10:54:00 AM	Wear Safety vest along Lake Wohlford road and many ticks are out.	Partly cloudy	65	60	0	Not Applicable	Western Side-blotched Lizard	Uta stansburiana elegans	Individual(s)			1	33.17569857	-116.9931679	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			49	0	2	E	Killdeer	Charadrius vociferus				1	33.17324556	-117.001476	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			49	0	2	E	Clark's Grebe	Aechmophorus clarkii				1	33.17559153	-116.9933189	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			49	0	2	E	Wilson's Warbler	Cardellina pusilla				1	33.17846137	-116.9822195	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			49	0	2	E	American White Pelican	Pelecanus erythrorhynchos				1	33.17754971	-116.9895083	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			49	0	2	E	San Diegan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.17746924	-116.9899427	

Appendix A – Field Data Collected during SWFL, LBV, and CAGN Surveys

Date	Permitted Biologist	Assistant Biologist	Survey #	Survey Type	Start Time	End Time	Notes	Weather Summary	Temp (F)	% Cloud Cover	Wind (mph)	Wind Direction	Common Name	Scientific Name	Detection Type	Age	Sex	# of Individuals	Latitude	Longitude	Behavior Notes
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			49	0	2	E	San Diegoan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.1768266	-116.9918749	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			76	0	3	W	Killdeer	Charadrius vociferus				1	33.17324556	-117.001476	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			76	0	3	W	Clark's Grebe	Aechmophorus clarkii				1	33.17559153	-116.9933189	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			76	0	3	W	Wilson's Warbler	Cardellina pusilla				1	33.17846137	-116.9822195	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			76	0	3	W	American White Pelican	Pelecanus erythrorhynchos				1	33.17754971	-116.9895083	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			76	0	3	W	San Diegoan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.17746924	-116.9899427	
5/1/2017	Brennan Mulrooney	Rick Bailey	3	California Gnatcatcher	6:37:00 AM	10:05:00 AM			76	0	3	W	San Diegoan Tiger Whiptail	Aspidoscelis tigris stejnegeri	Individual(s)	Adult	Unknown	1	33.1768266	-116.9918749	
5/8/2017	Rick Bailey	Emma Fraser	4	California Gnatcatcher	8:14:00 AM	11:25:00 AM		Overcast, just rained during the night	49	80	1	NE	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17059214	-117.0014003	Perching,Singing Solo
5/8/2017	Rick Bailey	Emma Fraser	4	California Gnatcatcher	8:14:00 AM	11:25:00 AM		Overcast, just rained during the night	49	80	1	NE	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male	1	33.17724181	-116.9912068	Singing Solo, No LBVI over at nest location from 5/5/2017
5/8/2017	Rick Bailey	Emma Fraser	4	California Gnatcatcher	8:14:00 AM	11:25:00 AM		Clear, From the SSW at 3.0 MPH	73.4	10	3	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17059214	-117.0014003	Perching,Singing Solo
5/8/2017	Rick Bailey	Emma Fraser	4	California Gnatcatcher	8:14:00 AM	11:25:00 AM		Clear, From the SSW at 3.0 MPH	73.4	10	3	SSW	Least Bell's Vireo	Vireo bellii pusillus	Individual(s)	Adult	Male	1	33.17724181	-116.9912068	Singing Solo, No LBVIover at nest location from 5/5/2017
5/22/2017	Rick Bailey		5	California Gnatcatcher	6:07:00 AM	10:32:00 AM		Partly Cloudy, Calm	50.9	0	0	West	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.1722977	-117.0023973	
5/22/2017	Rick Bailey		5	California Gnatcatcher	6:07:00 AM	10:32:00 AM		Partly Cloudy, Calm	50.9	0	0	West	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17714507	-116.9914079	
5/22/2017	Rick Bailey		5	California Gnatcatcher	6:07:00 AM	10:32:00 AM		Partly Cloudy, Calm	50.9	0	0	West	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.17677064	-116.9852798	
5/22/2017	Rick Bailey		5	California Gnatcatcher	6:07:00 AM	10:32:00 AM		Clear, From the South at 1.0 MPH	79	0	1	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.1722977	-117.0023973	
5/22/2017	Rick Bailey		5	California Gnatcatcher	6:07:00 AM	10:32:00 AM		Clear, From the South at 1.0 MPH	79	0	1	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17714507	-116.9914079	
5/22/2017	Rick Bailey		5	California Gnatcatcher	6:07:00 AM	10:32:00 AM		Clear, From the South at 1.0 MPH	79	0	1	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	4	33.17677064	-116.9852798	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Overcast, Calm	58.4	100	0	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17311489	-117.0018619	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Overcast, Calm	58.4	100	0	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.1712282	-117.0010717	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Overcast, Calm	58.4	100	0	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17045568	-117.0013977	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Overcast, Calm	58.4	100	0	SSW	Canyon Wren	Catherpes mexicanus	Individual(s)			1	33.17557791	-116.9932587	Singing Solo
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Overcast, Calm	58.4	100	0	SSW	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17697873	-116.9914981	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Mostly Cloudy, Calm	61	100	0	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17311489	-117.0018619	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Mostly Cloudy, Calm	61	100	0	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	3	33.1712282	-117.0010717	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Mostly Cloudy, Calm	61	100	0	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male	1	33.17045568	-117.0013977	
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Mostly Cloudy, Calm	61	100	0	South	Canyon Wren	Catherpes mexicanus	Individual(s)			1	33.17557791	-116.9932587	Singing Solo
5/29/2017	Rick Bailey	Emma Fraser	6	California Gnatcatcher	6:34:00 AM	8:56:00 AM		Mostly Cloudy, Calm	61	100	0	South	Brown-headed Cowbird	Molothrus ater	Individual(s)	Adult	Male and Female	2	33.17697873	-116.9914981	

APPENDIX B

WILDLIFE SPECIES DETECTED DURING SWFL, LBV, and CAGN SURVEYS

Appendix B
Wildlife Species Detected During SWFL, LBV, and CAGN Surveys

Order	Family	Scientific Name	Common Name	Sensitivity Status ¹
Butterflies				
Lepidoptera	Lycaenidae	<i>Icaricia acmon acmon</i>	Acmon Blue	none
		<i>Leptotes marina</i>	Marine Blue	none
Lepidoptera	Nymphalidae	<i>Adelpha californica</i>	California Sister	none
		<i>Junonia coenia</i>	Common Buckeye	none
		<i>Nymphalis antiopa</i>	Mourning Cloak	none
		<i>Phyciodes mylitta</i>	Mylitta crescent	none
		<i>Vanessa cardui</i>	Painted Lady	none
		<i>Vanessa atalanta</i>	Red Admiral	none
Lepidoptera	Papilionidae	<i>Papilio eurymedon</i>	Pale Swallowtail	none
		<i>Papilio rutulus</i>	Western Tiger Swallowtail	none
Lepidoptera	Pieridae	<i>Pontia sisymbrii</i>	Spring (California) White	none
		<i>Colias harfordii</i>	Harfords Sulphur	none
		<i>Anthocharis sara sara</i>	Sara Orangetip	none
Reptiles and Amphibians				
Anura	Ranidae	<i>Lithobates catesbeiana</i>	American Bullfrog	none
Squamata	Phrynosomatidae	<i>Sceloporus occidentalis</i>	Western Fence Lizard	none
		<i>Sceloporus orcutti</i>	Granite Spiny Lizard	none
		<i>Uta stansburiana elegans</i>	Western Side-blotched Lizard	none
	Teiidae	<i>Aspidoscelis tigris stejnegeri</i>	San Diegan Tiger Whiptail	SSC
Squamata	Viperidae	<i>Crotalus oreganus helleri</i>	Southern Pacific Rattlesnake	none
Terrestrial Mammals				
Artiodactyla	Cervidae	<i>Odocoileus hemionus fuliginata</i>	Southern Mule Deer	none
Carnivora	Canidae	<i>Canis latrans</i>	Coyote	none
Lagomorpha	Leporidae	<i>Sylvilagus audubonii</i>	Desert Cottontail	none
Rodentia	Geomyidae	<i>Thomomys bottae</i>	Botta's Pocket Gopher	none
Rodentia	Sciuridae	<i>Spermophilus beecheyi</i>	California Ground Squirrel	none
Birds				
Accipitriformes	Accipitridae	<i>Accipiter cooperii</i>	Cooper's Hawk	none
		<i>Buteo lineatus</i>	Red-shouldered Hawk	none
		<i>Buteo jamaicensis</i>	Red-tailed Hawk	none
		<i>Haliaeetus leucocephalus</i>	Bald Eagle	SE, FP
	Cathartidae	<i>Cathartes aura</i>	Turkey Vulture	none
Anseriformes	Anatidae	<i>Anas platyrhynchos</i>	Mallard	none
		<i>Oxyura jamaicensis</i>	Ruddy Duck	none
Apodiformes	Trochilidae	<i>Calypte anna</i>	Anna's Hummingbird	none
		<i>Calypte costae</i>	Costa's Hummingbird	none
		<i>Archilochus alexandri</i>	Black-chinned Hummingbird	none

Order	Family	Scientific Name	Common Name	Sensitivity Status ¹
		<i>Selasphorus rufus/sasin</i>	Rufous/Allen's Hummingbird	none
		<i>Selasphorus rufus</i>	Rufous Hummingbird	none
Charadriiformes	Charadriidae	<i>Charadrius vociferus</i>	Killdeer	none
	Laridae	<i>Sterna forsteri</i>	Forster's Tern	none
Columbiformes	Columbidae	<i>Zenaida macroura</i>	Mourning Dove	none
Cuculiformes	Cuculidae	<i>Geococcyx californianus</i>	Greater Roadrunner	none
Galliformes	Odontophoridae	<i>Callipepla californica</i>	California Quail	none
Gruiformes	Rallidae	<i>Fulica americana</i>	American Coot	none
Passeriformes	Aegithalidae	<i>Psaltriparus minimus</i>	Bushtit	none
	Cardinalidae	<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	none
		<i>Passerina caerulea</i>	Blue Grosbeak	none
		<i>Passerina amoena</i>	Lazuli Bunting	none
	Corvidae	<i>Corvus brachyrhynchos</i>	American Crow	none
		<i>Corvus corax</i>	Common Raven	none
		<i>Aphelocoma californica</i>	Western Scrub-Jay	none
	Emberizidae	<i>Melospiza crissalis</i>	California Towhee	none
		<i>Melospiza melodia</i>	Song Sparrow	none
		<i>Melospiza lincolnii</i>	Lincoln's Sparrow	none
		<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	none
		<i>Pipilo maculatus</i>	Spotted Towhee	none
	Fringillidae	<i>Haemorhous mexicanus</i>	House Finch	none
		<i>Spinus lawrencei</i>	Lawrence's Goldfinch	none
		<i>Spinus psaltria</i>	Lesser Goldfinch	none
	Hirundinidae	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	none
		<i>Tachycineta bicolor</i>	Tree Swallow	none
		<i>Tachycineta thalassina</i>	Violet-green Swallow	none
		<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	none
	Icteridae	<i>Icterus bullockii</i>	Bullock's Oriole	none
		<i>Quiscalus mexicanus</i>	Great-tailed Grackle	none
		<i>Molothrus ater</i>	Brown-headed Cowbird	none
		<i>Icterus cucullatus</i>	Hooded Oriole	none
		<i>Agelaius phoeniceus</i>	Red-winged Blackbird	none
	Mimidae	<i>Toxostoma redivivum</i>	California Thrasher	none
	Paridae	<i>Baeolophus inornatus</i>	Oak Titmouse	none
	Parulidae	<i>Setophaga nigrescens</i>	Black-throated Gray Warbler	none
		<i>Oreothlypis celata</i>	Orange-crowned Warbler	none
		<i>Cardellina pusilla</i>	Wilson's Warbler	none
		<i>Setophaga petechia brewsteri</i>	Yellow Warbler	SSC
		<i>Setophaga coronata</i>	Yellow-rumped Warbler	None
		<i>Geothlypis trichas</i>	Common Yellowthroat	None

Order	Family	Scientific Name	Common Name	Sensitivity Status ¹
		<i>Icteria virens</i>	Yellow-breasted Chat	SSC
	Poliophtidae	<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher	none
	Ptilonotidae	<i>Phainopepla nitens</i>	Phainopepla	none
	Sittidae	<i>Sitta carolinensis</i>	White-breasted Nuthatch	none
	Sturnidae	<i>Sturnus vulgaris</i>	European Starling	none
	Sylviidae	<i>Chamaea fasciata</i>	Wrentit	none
	Troglodytidae	<i>Thryomanes bewickii</i>	Bewick's Wren	none
		<i>Troglodytes aedon</i>	House Wren	none
		<i>Catherpes mexicanus</i>	Canyon Wren	none
		<i>Cistothorus palustris</i>	Marsh Wren	none
	Turdidae	<i>Sialia mexicana</i>	Western Bluebird	none
	Tyrannidae	<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	none
		<i>Sayornis nigricans</i>	Black Phoebe	none
		<i>Tyrannus verticalis</i>	Western Kingbird	none
		<i>Tyrannus vociferans</i>	Cassin's Kingbird	none
		<i>Empidonax difficilis</i>	Pacific-slope Flycatcher	none
	Vireonidae	<i>Vireo huttoni</i>	Hutton's Vireo	none
		<i>Vireo bellii pusillus</i>	Least Bell's Vireo	FE, SE
Pelecaniformes	Ardeidae	<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	none
		<i>Ardea herodias</i>	Great Blue Heron	none
		<i>Ardea alba</i>	Great Egret	none
	Pelecanidae	<i>Pelecanus erythrorhynchos</i>	American White Pelican	none
	Phalacrocoracidae	<i>Phalacrocorax auritus</i>	Double-crested Cormorant	none
Piciformes	Picidae	<i>Melanerpes formicivorus</i>	Acorn Woodpecker	none
		<i>Picoides nuttallii</i>	Nuttall's Woodpecker	none
		<i>Picoides pubescens</i>	Downy Woodpecker	none
		<i>Colaptes auratus</i>	Northern Flicker	none
Podicipediformes	Podicipedidae	<i>Aechmophorus clarkii</i>	Clark's Grebe	none
		<i>Podiceps nigricollis</i>	Eared Grebe	none
		<i>Aechmophorus occidentalis</i>	Western Grebe	none
Strigiformes	Tytonidae	<i>Tyto alba</i>	Barn Owl	none

¹Sensitive Status taken from:

California Department of Fish and Wildlife. 2017. Natural Diversity Database. Special Animals List. Periodic publication. 51 pp. July.

FE = U.S. Fish and Wildlife Federally Endangered Species

SE = California Department of Fish and Wildlife Endangered Species

SSC = California Department of Fish and Wildlife Species of Special Concern

FP = California Department of Fish and Wildlife Fully Protected Species

APPENDIX G

GHG CALCULATIONS

Lake Wohlford Dam
Construction Emissions Summary

Unmitigated

Construction Phase/Source	Maximum Daily Emissions (lbs/day)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Staging	1.71	21.23	10.57	7.07	4.17
Construction Equipment	1.60	20.81	6.84	0.89	0.79
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				6.02	3.32
Oakvale Road	7.17	96.89	35.79	65.58	17.29
Construction Equipment	7.06	96.47	32.06	3.54	3.04
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				61.89	14.18
Dam Foundation	8.29	121.24	43.67	244.89	37.08
Construction Equipment	8.18	120.81	39.94	3.92	3.30
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				240.81	33.72
Temporary Access Road	3.90	42.68	22.33	91.36	20.22
Construction Equipment	3.79	42.25	18.61	1.99	1.83
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				89.22	18.32
Replacement Dam	14.27	164.85	63.14	108.80	17.69
Construction Equipment	14.16	164.42	59.42	5.80	5.23
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				102.85	12.40
Demolition of Existing Dam	1.86	44.91	9.87	61.39	9.87
Construction Equipment	1.75	44.48	6.15	1.12	0.70
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				60.12	9.10
Maximum Daily	14.27	164.85	63.14	244.89	37.08
Average Annual					

VOC	Annual Emissions (tons/year)				Metric Tons
	NO _x	CO	PM ₁₀	PM _{2.5}	CO ₂ e
0.07	0.69	0.78	0.23	0.13	227
0.05	0.62	0.21	0.03	0.02	64
0.02	0.07	0.58	0.02	0.01	164
			0.18	0.10	
0.43	5.50	2.20	2.70	0.76	771
0.43	5.48	2.01	0.22	0.19	718
0.01	0.02	0.19	0.01	0.00	53
			2.48	0.57	
1.28	18.73	6.75	7.85	1.53	3,323
1.26	18.67	6.17	0.61	0.51	3,159
0.02	0.07	0.58	0.02	0.01	164
			7.22	1.01	
0.08	0.85	0.45	1.83	0.40	90
0.08	0.84	0.37	0.04	0.04	69
0.00	0.01	0.07	0.00	0.00	21
			1.78	0.37	
1.07	12.37	4.81	8.16	1.33	1,871
1.06	12.33	4.46	0.43	0.39	1,771
0.01	0.04	0.35	0.01	0.01	101
			7.71	0.93	
0.07	1.57	0.35	2.15	0.35	375
0.06	1.56	0.22	0.04	0.02	337
0.00	0.01	0.13	0.01	0.00	37
			2.10	0.32	
2.99	39.72	15.33	22.92	4.50	6,656
1.12	14.90	5.75	8.60	1.69	2,496

Lake Wohlford Dam
Construction Emissions Summary
Mitigated

Construction Phase/Source	Maximum Daily Emissions (lbs/day)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Staging	1.71	21.23	10.57	3.46	2.18
Construction Equipment	1.60	20.81	6.84	0.89	0.79
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				2.41	1.33
Oakvale Road	7.17	96.89	35.79	28.45	8.77
Construction Equipment	7.06	96.47	32.06	3.54	3.04
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				24.75	5.67
Dam Foundation	8.29	121.24	43.67	85.57	15.37
Construction Equipment	8.18	120.81	39.94	3.92	3.30
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				81.50	12.01
Temporary Access Road	3.90	42.68	22.33	37.83	9.22
Construction Equipment	3.79	42.25	18.61	1.99	1.83
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				35.69	7.33
Replacement Dam	14.27	164.85	63.14	40.11	10.82
Construction Equipment	14.16	164.42	59.42	5.80	5.23
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				34.16	5.53
Demolition of Existing Dam	1.86	44.91	9.87	25.32	4.41
Construction Equipment	1.75	44.48	6.15	1.12	0.70
Construction Worker Vehicles	0.11	0.43	3.72	0.15	0.06
Fugitive Dust				24.05	3.64
Maximum Daily	14.27	164.85	63.14	85.57	15.37

VOC	Annual Emissions (tons/year)				Metric Tons
	NO _x	CO	PM ₁₀	PM _{2.5}	CO ₂ e
0.07	0.69	0.78	0.12	0.07	227.12
0.05	0.62	0.21	0.03	0.02	63.55
0.02	0.07	0.58	0.02	0.01	163.57
			0.07	0.04	
0.43	5.50	2.20	1.21	0.42	770.64
0.43	5.48	2.01	0.22	0.19	717.70
0.01	0.02	0.19	0.01	0.00	52.94
			0.99	0.23	
1.28	18.73	6.75	3.07	0.88	3,322.85
1.26	18.67	6.17	0.61	0.51	3,159.28
0.02	0.07	0.58	0.02	0.01	163.57
			2.44	0.36	
0.08	0.85	0.45	0.76	0.18	89.84
0.08	0.84	0.37	0.04	0.04	68.67
0.00	0.01	0.07	0.00	0.00	21.17
			0.71	0.15	
1.07	12.37	4.81	3.01	0.81	1,871.16
1.06	12.33	4.46	0.43	0.39	1,770.58
0.01	0.04	0.35	0.01	0.01	100.58
			2.56	0.41	
0.07	1.57	0.35	0.89	0.15	374.54
0.06	1.56	0.22	0.04	0.02	337.48
0.00	0.01	0.13	0.01	0.00	37.05
			0.84	0.13	
2.99	39.72	15.33	9.06	2.52	6,656.15

Staging

Equipment Type	Equipment Category	Number	Usage Factor (hrs/day or miles/day)	Power Rating (hp)	Total Days/VMT	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)								Total GHG Emissions (MT CO2e)
						VOC	NOX	CO	PM10	PM2.5	VOC	NOX	CO	PM10	PM2.5	CO ₂	CH4		
Dam Foundation																			
Tractors/Loaders/Backhoes > 175 and <= 250	Loader - 962	1	8	211	60	0.43	6.09	1.85	0.20	0.18	0.01	0.18	0.06	0.01	0.01	20.84	0.01	19.12	
Rubber Tired Dozers > 121 and <175	Dozer - D6	1	8	145	60	0.99	10.08	4.35	0.58	0.53	0.03	0.30	0.13	0.02	0.02	15.58	0.00	14.30	
Total	Highway Truck (25,000 lbs)	1	300		18,000	0.18	4.63	0.64	0.12	0.07	0.01	0.14	0.02	0.00	0.00	33.11	0.00	30.13	
						1.60	20.81	6.84	0.89	0.79	0.05	0.62	0.21	0.03	0.02	69.53	0.01	63.55	

On Road Construction Emissions

						Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							Total GHG Emissions (MT CO2e)				
						ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄					
Worker Trips	Total Trips	88	Distance	16.8	Average Daily Mileage	1,478	Calculated Time - Rounded (days)	309	Total Mileage	456,826	0.11	0.43	0.06	0.15	0.02	0.07	0.58	0.02	0.01	179.35	0.01	163.57

Note: Assumes a total of 44 workers per day.

											Emissions Summary (lbs/day)					Emissions Summary (tons per phase)										
Total											ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)			
Maximum Daily Emissions											1.71	21.23	10.57	1.05	0.85											
Maximum Annual Emissions																			0.07	0.69	0.78	0.05	0.03	248.88	0.03	227.12

						Emissions Summary (lbs/day)					Emissions Summary (tons per phase)								
Equipment Type	Equipment Category	Number	Usage Factor (hrs/day or miles/day)	Power Rating (hp)	Total Days/VMT	VOC	NOX	CO	PM10	PM2.5	VOC	NOX	CO	PM10	PM2.5	CO ₂	CH4	Total GHG Emissions (MT CO ₂ e)	
Vegetation Removal																			
Rubber Tired Dozers > 176 and <250	Dozer - D7	1	8	240	15	1.25	13.54	4.62	0.67	0.62	0.01	0.10	0.03	0.01	0.00	6.47	0.00	5.94	
Excavators > 50 and <= 120	Excavator - 1CY, 40,000 lbs	1	8	110	15	0.35	3.47	2.70	0.25	0.23	0.00	0.03	0.02	0.00	0.00	2.77	0.00	2.54	
Water Truck	3,000 gal water truck	1	8	230	15	0.69	7.44	2.81	0.32	0.29	0.01	0.06	0.02	0.00	0.00	5.81	0.00	5.33	
Other Construction Equipment > 120 and <= 175	Brush Chipper	1	8	174	15	0.68	7.50	4.33	0.39	0.36	0.01	0.06	0.03	0.00	0.00	4.87	0.00	4.47	
	Highway Truck (25,000 lbs)	1	120		1,800	0.07	1.85	0.26	0.05	0.03	0.00	0.01	0.00	0.00	0.00	3.31	0.00	3.01	
Total						3.03	33.80	14.71	1.68	1.54	0.02	0.25	0.11	0.01	0.01	23.23	0.01	21.29	
Rock Scaling																			
Bore/Drill Rigs > 175 and <= 250	Bore/Drill Rig	1	8	175	20	0.42	6.40	2.50	0.19	0.17	0.00	0.06	0.02	0.00	0.00	11.07	0.00	10.16	
Excavators > 50 and <= 120	Excavator - 1CY, 40,000 lbs	1	8	110	20	0.35	3.47	2.70	0.25	0.23	0.00	0.03	0.03	0.00	0.00	3.69	0.00	3.39	
Total						0.78	9.87	5.20	0.44	0.41	0.01	0.10	0.05	0.00	0.00	14.76	0.00	13.55	
Material Excavation																			
Bore/Drill Rigs > 175 and <= 250	Bore/Drill Rig	2	8	175	80	0.85	12.80	5.00	0.38	0.35	0.03	0.51	0.20	0.02	0.01	88.56	0.03	81.27	
Excavators > 250 and <= 500	Excavator - 3.5 CY	2	8	384	80	1.10	14.49	6.35	0.47	0.43	0.04	0.58	0.25	0.02	0.02	103.83	0.03	95.28	
Tractors/Loaders/Backhoes > 175 and <= 250	Loader - 962	1	8	211	80	0.43	6.09	1.85	0.20	0.18	0.02	0.24	0.07	0.01	0.01	27.78	0.01	25.49	
Rubber Tired Dozers > 121 and <175	Dozer - D6	2	8	145	80	1.98	20.16	8.69	1.16	1.06	0.08	0.81	0.35	0.05	0.04	41.55	0.01	38.13	
Generator Sets > 25 and <= 50	Generators	1	8	50	80	0.75	3.06	2.88	0.21	0.21	0.03	0.12	0.12	0.01	0.01	14.83	0.00	13.57	
Water Truck	3,000 gal water truck	1	8	230	80	0.69	7.44	2.81	0.32	0.29	0.03	0.30	0.11	0.01	0.01	30.98	0.01	28.43	
	Highway Truck (25,000 lbs)	10	2,100		168,000	1.27	32.43	4.48	0.82	0.51	0.05	1.30	0.18	0.03	0.02	309.05	0.00	281.26	
Total						7.06	96.47	32.06	3.54	3.04	0.28	3.86	1.28	0.14	0.12	616.59	0.09	563.44	
Slope Stabilization																			
Bore/Drill Rigs > 175 and <= 250	Bore/Drill Rig	2	8	175	20	0.85	12.80	5.00	0.38	0.35	0.01	0.13	0.05	0.00	0.00	22.14	0.01	20.32	
Tractors/Loaders/Backhoes > 175 and <= 250	Loader - 962	1	8	211	20	0.43	6.09	1.85	0.20	0.18	0.00	0.06	0.02	0.00	0.00	6.95	0.00	6.37	
Generator Sets > 25 and <= 50	Generators	1	8	50	20	0.75	3.06	2.88	0.21	0.21	0.01	0.03	0.03	0.00	0.00	3.71	0.00	3.39	
Total						2.02	21.95	9.73	0.78	0.74	0.02	0.22	0.10	0.01	0.01	32.79	0.01	30.08	
Road Construction																			
Tractors/Loaders/Backhoes > 120 <= 175	Loader - 160	1	8	128	40	0.33	3.66	2.70	0.19	0.17	0.01	0.07	0.05	0.00	0.00	8.40	0.00	7.71	
Plate Compactors	Compactor	2	8	15	40	0.15	0.94	0.79	0.04	0.04	0.00	0.02	0.02	0.00	0.00	2.59	0.00	2.36	
Rubber Tired Dozers > 121 and <175	Dozer - D6	1	8	145	40	0.99	10.08	4.35	0.58	0.53	0.02	0.20	0.09	0.01	0.01	10.39	0.00	9.53	
Graders > 120 and <= 175	Grader - 120	1	8	135	40	0.79	8.05	3.82	0.45	0.42	0.02	0.16	0.08	0.01	0.01	10.08	0.00	9.25	
Paving Equipment >121 and <175	Paving Equipment	1	8	128	40	0.30	3.51	2.50	0.17	0.16	0.01	0.07	0.05	0.00	0.00	8.21	0.00	7.53	
Rollers > 175 and <= 250	Roller BW 190AD4	2	8	205	40	0.85	12.08	4.14	0.41	0.38	0.02	0.24	0.08	0.01	0.01	27.90	0.01	25.60	
Water Truck	3,000 gal water truck	1	8	230	40	0.69	7.44	2.81	0.32	0.29	0.01	0.15	0.06	0.01	0.01	15.49	0.00	14.22	
Total						4.09	45.76	21.11	2.16	1.99	0.08	0.92	0.42	0.04	0.04	83.05	0.02	76.20	
Demolition																			
Rubber Tired Dozers > 121 and <175	Dozer - D6	1	8	145	10	0.99	10.08	4.35	0.58	0.53	0.00	0.05	0.02	0.00	0.00	2.60	0.00	2.38	
Tractors/Loaders/Backhoes > 175 and <= 250	Loader - 962	1	8	211	10	0.43	6.09	1.85	0.20	0.18	0.00	0.03	0.01	0.00	0.00	3.47	0.00	3.19	
Water Truck	3,000 gal water truck	1	8	230	10	0.69	7.44	2.81	0.32	0.29	0.00	0.04	0.01	0.00	0.00	3.87	0.00	3.55	
	Highway Truck (25,000 lbs)	2	240		2,400	0.15	3.71	0.51	0.09	0.06	0.00	0.02	0.00	0.00	0.00	4.41	0.00	4.02	
Total						2.25	27.32	9.52	1.19	1.07	0.01	0.14	0.05	0.01	0.01	14.36	0.00	13.14	

Notes:
Vegetation removal includes one truck operating at 15 miles per hour for 8 hours per day.
Estimates for material excavation assumes 70 truck trips (round trip) per day at a distance of 30 miles.

On Road Construction Emissions

						Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							
	Total Trips	Distance	Average Daily Mileage	Calculated Time - Rounded (days)	Total Mileage	ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)
Worker Trips	88	16.8	1,478	100	147,840	0.11	0.43	3.72	0.15	0.06	0.01	0.02	0.19	0.01	0.00	58.04	0.00	52.94

Note: Assumes a total of 44 workers per day.

						Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							
Total	ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)					
Maximum Daily Emissions	7.17	96.89	35.79	3.69	3.10													
Maximum Annual Emissions						0.43	5.50	2.20	0.22	0.19	842.82	0.14	770.64					

Temporary Access Road

Equipment Type	Equipment Category	Number	Usage Factor (hrs/day or miles/day)	Power Rating (hp)	Total Days/VMT	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							Total GHG Emissions (M t CO2e)
						VOC	NOX	CO	PM10	PM2.5	VOC	NOX	CO	PM10	PM2.5	CO ₂	CH4	
Temporary Access Road																		
Tractors/Loaders/Backhoes > 120 <= 175	Loader - 160	1	8	128	40	0.33	3.66	2.70	0.19	0.17	0.01	0.07	0.05	0.00	0.00	8.40	0.00	7.71
	Compactor	2	8	19	40	0.15	0.98	0.79	0.04	0.04	0.00	0.02	0.02	0.00	0.00	2.59	0.00	2.36
Rubber Tired Dozers > 121 and <175	Dozer - D6	1	4	106	40	0.98	4.36	0.58	0.53	0.02	0.20	0.01	0.01	0.01	10.39	0.00	9.53	
Graders > 120 and <= 175	Grader - 120	1	8	135	40	0.79	8.05	3.82	0.45	0.42	0.02	0.16	0.08	0.01	0.01	10.08	0.00	9.25
Rollers > 175 and <= 250	Roller BW 190AD4	2	8	205	40	0.85	12.08	4.14	0.41	0.38	0.02	0.24	0.08	0.01	0.01	27.90	0.01	25.60
Water Truck	3,000 gal water truck	1	8	230	40	0.69	7.44	2.81	0.32	0.29	0.01	0.15	0.06	0.01	0.01	15.49	0.00	14.22
Total						3.79	42.25	18.61	1.99	1.83	0.08	0.84	0.37	0.04	0.04	74.84	0.02	68.67

On Road Construction Emissions

					Emissions Summary (lbs/day)					Emissions Summary (tons per phase)								
	Total Trips	Distance	Average Daily Mileage	Calculated Time - Rounded (days)	Total Mileage	ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)
Worker Trips	88	16.8	1,478	40	59,136	0.11	0.43	3.72	0.15	0.06	0.00	0.01	0.07	0.00	0.00	23.22	0.00	21.17

Note: Assumes a total of 44 workers per day.

Total	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							Total GHG Emissions (MT CO2e)
	ROG	NOx	CO	PM10	PM2.5	ROG	NOx	CO	PM10	PM2.5	CO2	CH4	
Maximum Daily Emissions	3.90	42.68	22.33	2.14	1.89								
Maximum Annual Emissions						0.08	0.85	0.45	0.04	0.04	98.06	0.02	89.84

Dam Foundation

Equipment Type	Equipment Category	Number	Usage Factor (hrs/day or miles/day)	Power Rating (hp)	Total Days/VMT	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							
						VOC	NOX	CO	PM10	PM2.5	VOC	NOX	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)
Dam Foundation																		
Bore/Drill Rigs > 175 and <= 250	Bore/Drill Rig	1	8	175	309	0.42	6.40	2.50	0.19	0.17	0.07	0.99	0.39	0.03	0.03	171.03	0.05	156.95
Excavators > 250 and <= 500	Excavator - 3.5 CY	7	8	384	309	3.84	50.70	22.22	1.63	1.50	0.59	7.83	3.43	0.25	0.23	1,403.61	0.42	1,289.07
Tractors/Loaders/Backhoes > 175 and <= 250	Loader - 962	1	8	211	309	0.43	6.09	1.85	0.20	0.18	0.07	0.94	0.29	0.03	0.03	107.30	0.03	98.47
Rubber Tired Dozers > 121 and <175	Dozer - D6	1	8	145	309	0.99	10.08	4.35	0.58	0.53	0.15	1.56	0.67	0.09	0.08	80.25	0.02	73.65
Generator Sets > 25 and <= 50	Generator	1	8	50	309	0.75	3.06	2.88	0.21	0.21	0.12	0.47	0.44	0.03	0.03	57.30	0.01	52.40
	Highway Truck (25,000 lbs)	6	2,880		889,920	1.75	44.48	6.15	1.12	0.70	0.27	6.87	0.95	0.17	0.11	1,637.07	0.00	1,489.74
Total						8.18	120.81	39.94	3.92	3.30	1.26	18.67	6.17	0.61	0.51	3,456.57	0.55	3,159.28

Note:
Estimates for material excavation assumes 96 truck trips (round trip) per day at a distance of 30 miles.

On Road Construction Emissions

						Emissions Summary (lbs/day)						Emissions Summary (tons per phase)						
	Total Trips	Distance	Average Daily Mileage	Calculated Time - Rounded (days)	Total Mileage	ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO2e)
Worker Trips	88	16.8	1,478	309	456,826	0.11	0.43	3.72	0.15	0.06	0.02	0.07	0.58	0.02	0.01	179.35	0.01	163.57

Note: Assumes a total of 44 workers per day.

Total	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							Total GHG Emissions (MT CO2e)
	ROG	NOx	CO	PM10	PM2.5	ROG	NOx	CO	PM10	PM2.5	CO2	CH4	
	8.29	121.24	43.67	4.08	3.36	1.28	18.73	6.75	0.63	0.52	3,635.91	0.56	
Maximum Daily Emissions													
Maximum Annual Emissions													

Replacement Dam

Equipment Type	Equipment Category	Number	Usage Factor (hrs/day or miles/day)	Power Rating (hp)	Total Days/VMT	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							
						VOC	NOX	CO	PM10	PM2.5	VOC	NOX	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)
Dam Construction																		
Tractors/Loaders/Backhoes > 175 and <= 250	Loader - 962	1	20	211	150	1.07	15.24	4.64	0.50	0.46	0.08	1.14	0.35	0.04	0.03	130.22	0.04	119.50
Cranes > 120 and <= 175	Crane, 30 Ton	1	20	152	150	1.45	15.33	7.51	0.83	0.76	0.11	1.15	0.56	0.06	0.06	74.19	0.02	68.08
Rollers > 175 and <= 250	Roller BW 190AD4	2	20	205	150	2.12	36.18	10.33	1.03	0.95	0.16	1.08	0.85	0.07	0.08	281.57	0.08	240.04
Plate Compactors	Compactor	1	20	15	150	0.19	1.18	0.99	0.05	0.05	0.01	0.09	0.07	0.00	0.00	12.12	0.00	11.06
Cement and Mortar Mixers	Concrete mixer	1	20	10	150	0.16	1.03	0.86	0.04	0.04	0.01	0.08	0.06	0.00	0.00	10.52	0.00	9.60
Pumps > 175 and <= 250	Concrete pump	2	20	210	150	3.84	45.40	15.06	1.29	1.29	0.29	3.41	1.13	0.10	0.10	584.10	0.03	532.18
Generator Sets > 25 and <= 50	Generator	2	20	50	150	3.74	15.29	14.39	1.04	1.04	0.28	1.15	1.08	0.08	0.08	139.07	0.03	127.20
	Highway Truck (25,000 lbs)	14	2,640		396,000	1.60	40.77	5.63	1.03	0.64	0.12	3.06	0.42	0.08	0.05	728.47	0.00	662.91
Total						14.16	164.42	59.42	5.80	5.23	1.06	12.33	4.46	0.43	0.39	1,940.27	0.20	1,770.58

Note:
Estimates for material excavation assumes 88 truck trips (round trip) per day at a distance of 30 miles.

On Road Construction Emissions

						Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							
	Total Trips	Distance	Average Daily Mileage	Calculated Time - Rounded (days)	Total Mileage	ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)
Worker Trips	88	16.8	1,478	190	280,896	0.11	0.43	3.72	0.15	0.06	0.01	0.04	0.35	0.01	0.01	110.28	0.01	100.58

Note: Assumes a total of 44 workers per day. Schedule includes 40 days of electrical testing and monitoring.

Total	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							
	ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	Total GHG Emissions (MT CO ₂ e)
	14.27	164.85	63.14	5.95	5.29	1.07	12.37	4.81	0.45	0.40	2,050.55	0.20	1,871.16
Maximum Daily Emissions													
Maximum Annual Emissions													

Demolition - Existing Dam

Equipment Type	Equipment Category	Number	Usage Factor (hrs/day or miles/day)	Power Rating (hp)	Total Days/VMT	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)					Total GHG Emissions (MT CO2e)		
						VOC	NOX	CO	PM10	PM2.5	VOC	NOX	CO	PM10	PM2.5		CO ₂	CH4
Tractors/Loaders/Backhoes > 120 <= 175	Loader - 924	1	8	128	70	0.33	3.66	2.70	0.19	0.17	0.01	0.13	0.09	0.01	0.01	14.69	0.00	13.48
Cranes > 120 and <= 175	Crane - 30 Ton	1	8	152	70	0.58	6.13	3.00	0.33	0.31	0.02	0.21	0.11	0.01	0.01	13.85	0.00	12.71
	Highway Truck (25,000 lbs)	6	2,880		201,600	1.75	44.48	6.15	1.12	0.70	0.06	1.56	0.22	0.04	0.02	370.86	0.00	337.48
Total						1.75	44.48	6.15	1.12	0.70	0.06	1.56	0.22	0.04	0.02	370.86	0.00	337.48
Note:																		

Note:
Estimates assume 96 truck trips (round trip) per day at a distance of 30 miles.

On Road Construction Emissions

						Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							Total GHG Emissions (MT CO2e)	
						ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄		
Worker Trips	Total Trips	88	Distance 16.8	Average Daily Mileage 1,478	Calculated Time - Rounded (days) 70	Total Mileage 103,488	0.11	NO _x 0.43	CO 3.72	PM10 0.15	PM2.5 0.06	0.00	NO _x 0.01	CO 0.13	PM10 0.01	PM2.5 0.00	CO ₂ 40.63	CH ₄ 0.00	37.05

Note: Assumes a total of 44 workers per day.

	Emissions Summary (lbs/day)					Emissions Summary (tons per phase)							Total GHG Emissions (MT CO2e)
	ROG	NO _x	CO	PM10	PM2.5	ROG	NO _x	CO	PM10	PM2.5	CO ₂	CH ₄	
Total													
Maximum Daily Emissions	1.86	44.91	9.87	1.27	0.77								
Maximum Annual Emissions						0.07	1.57	0.35	0.04	0.03	411.49	0.00	374.54