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Conservation and Development Commission

In the Matter of: Application for Certification for the PUENTE POWER PROJECT	Docket No. 15-AFC-01 APPLICANT'S RESPONSES TO COMMENTS ON PROPOSED BIOLOGICAL RESOURCES SURVEY METHODOLOGY AND FINAL BIOLOGICAL RESOURCES SURVEY METHODOLOGY

Applicant hereby responds to comments received from agency staff and other parties on its proposed Biological Resources Survey Methodology ("Proposed Survey Methodology"), and submits its revised Biological Resources Survey Methodology ("Final Survey Methodology").

Background

On March 10, 2017, the Committee issued its "Committee Orders for Additional Evidence and Briefing Following Evidentiary Hearings" (CEC TN # 216505) (the "Committee Order"). Among other things, the Committee Order directs Applicant to provide results from focused biological resources surveys of the "proposed project site" for five specified special status wildlife and plant species. (Committee Order at 1). The Committee Order directs Applicant to file a survey plan for party and public comment and invite and allow for the participation of California Energy Commission ("CEC") staff, California Coastal Commission ("CCC") staff, and California Department of Fish and Wildlife ("CDFW") staff in the design and conduct of the biological resources surveys. (Id.).

On March 21, 2017, interveners filed a "Joint Motion To Modify The California Energy Commission's Committee Orders For Additional Evidence And Briefing Following Evidentiary Hearings" dated March 21, 2017 (CEC TN #216641) ("Interveners' Motion"). Interveners' Motion requests certain modifications to the Committee Order related to the biological resources surveys, including expansion of the biological study area ("BSA"), inclusion of surveys for additional species not identified in the Committee Order, and expansion of the time period over which the surveys are to be conducted. (Interveners' Motion at 2-4).

On March 27, 2017, Applicant filed its Proposed Survey Methodology (CEC TN #216641). The Proposed Survey Methodology responded to the requests in Interveners' Motion by including all of the species identified in both the Committee Order and the Interveners' Motion, expanding the BSA to include both the project site and the areas potentially affected by removal of the existing outfall structure, and clarifying that the proposed survey periods are biologically appropriate and scientifically recommended.

Consistent with the requirements of the Committee Order that Applicant provide at least seven days for agency and party comment on the Proposed Survey Methodology, Applicant requested comments by 5:00 pm on April 7, 2017. Comments on the Proposed Survey Methodology were docketed by the CEC staff (CEC TN #216886) ("CEC Comments"), CDFW staff (CEC TN #216901) ("CDFW Comments"), CCC staff (CEC TN #216908) ("CCC Comments"), and interveners Environmental Defense Center, Sierra Club Los Padres Chapter, Ventura County Environmental Coalition, and Center for Biological Diversity (CEC TN # 216914) ("Intervener Comments") (collectively, "Agency/Party Comments"). Applicant hereby responds to the Agency/Party Comments as follows:

- general responses to certain recurring comments related to the scope and timing of the surveys are provided below;
- specific responses to comments are provided in the attached table (Attachment A);
- the Proposed Survey Methodology has been revised, and a "redline" version showing the revisions is attached (Attachment B); and

- a "clean" version of the Final Survey Methodology is also attached (Attachment C).

General Responses to Comments Regarding Scope and Timing of Surveys

1. *Scope of the BSA*

The CCC Comments and the Interveners' Comments requested further expansion of the BSA. In response to these comments, Applicant further expands the BSA to include all of the following:

- the approximately three-acre project site, including a 100-foot "buffer area" surrounding the project site, except where such buffer area would include areas outside the fence line of the Mandalay Generating Station ("MGS") or areas that are covered with impervious surfaces;
- the areas potentially affected by removal of the existing outfall structure, including a 25-foot buffer area surrounding the potentially affected areas; and
- temporary construction parking, laydown and materials storage areas, including a 100-foot buffer area surrounding such areas, except for any areas outside the fence line of the MGS or covered with impervious surfaces.

2. *Time Period for Conducting Surveys*

Several of the Agency/Party Comments requested that additional surveys be conducted within the time period covered by the Proposed Survey Methodology (April 10 – May 30, 2017). Applicant agrees to most, if not all, of these requests as reflected in the attached responses to comments and the Final Survey Methodology.

With respect to burrowing owls, the CEC Comments suggested that the Committee might want to consider that an additional survey for burrowing owls be conducted after June 15, 2017. Applicant agrees to conduct an additional burrowing owl survey after June 15, 2017. This will delay submission of the Final Survey Report until June 23, 2017. In addition, CDFW Comments and CCC Comments recommend that burrowing owl surveys be conducted during the winter months. Applicant cannot agree to delaying the CEC proceedings for the extended period of time that would be required to conduct surveys during the winter, which would be at least six

months beyond the outside window identified in the Committee Order for conducting additional surveys (July 31, 2017). However, Applicant notes that it previously conducted reconnaissance surveys during March 2015, November 2015 and October 2016, during which no burrowing owls or signs of burrowing owls were observed. Furthermore, proposed Conditions of Certification BIO-8 and BIO-10 require preconstruction surveys to determine if any breeding birds are present, as well as monitoring throughout demolition and construction.

Revised Schedule for Biological Surveys

The overall schedule for completing the additional biological resource surveys and submitting the Final Survey Report is as follows:

Date	Event
March 27, 2017	Applicant Files Survey Methodology
April 7, 2017	Deadline for Agency/Party/Public Comments on Survey Methodology
March through April 9, 2017	Preparation for Conducting Surveys
April 10, 2017	Applicant Files Final Survey Methodology
April 11, 2017 through June 17, 2017	Conduct Surveys
May 1, 2017 through June 23, 2017	Prepare Survey Report
June 23, 2017	Applicant Files Final Survey Report

Applicant invites the participation of CEC staff, CCC staff and CDFW staff in the conduct and/or observation of the surveys. Any agency staff member wishing to visit the MGS property during the conduct of the surveys should contact George Piantka of NRG at george.piantka@nrg.com.

DATED: April 10, 2017

Respectfully submitted,

/s/ Michael J. Carroll

Michael J. Carroll
LATHAM & WATKINS LLP
Counsel to Applicant

ATTACHMENT A

Puente Power Project Agency and Party Comments on Biological Survey Methodology and Response Matrix			
Commenter	**Topic or Species**	**Content of Comment**	**Response**
CEC	General	Any detection of special status wildlife should also be submitted to CNDDB.	Will be implemented. As noted in Section 2.3, data will be noted on CNDDB forms. These forms will be submitted. Survey methodology has been modified accordingly.
CEC	Globose Dune Beetle	Daytime surveys should be conducted during early morning hours and focused under native plants.	Will be implemented. Survey schedule and methodology has been modified accordingly.
CEC	California Legless Lizard - Cover board	Ensure cover boards placed over iceplant mats have solid contact with the ground (to maximize attraction of legless lizard).	Installed boards do have solid contact with the ground.
CEC	California Legless Lizard - Raking Survey	Rake deeper than 6 inches as lizards may be found as deep as 18-22 inches.	Applicant will attempt to rake below 6 inches to the extent feasible; however, please note that the soils on the project site are compacted and therefore it may not be possible to rake below 6-inches.
CEC	California Legless Lizard - Raking Survey	Do not disturb habitat which may contain special status plants or the globose dune beetle.	Surveyors will take care to minimize disturbance of habitat which may contain special status plants or the globose dune beetle. Please note, however, that the surveyors need to search in the most likely habitat locations to increase the chances of finding the species if present so complete avoidance of habitat disturbance may not be feasible.

Puente Power Project Agency and Party Comments on Biological Survey Methodology and Response Matrix			
CEC	California Legless Lizard - Raking Survey	Initial survey for special status plants should take place before soil disruption occurs.	Will be implemented. Plant surveys will occur at each grid prior to raking. Survey methodology has been modified accordingly.
CEC	Burrowing Owl	The CEC Committee did not request burrowing owl surveys. Staff believes currently proposed methodology combined with pervious survey work would be substantive information as to the presence or absence of burrowing owl. Defers to Committee if they desire breeding season protocol level surveys. If Committee desires agency approved protocol-level surveys to be conducted for the burrowing owl during the breeding season that one survey be conducted after June 15 (which would extend after June 15, and thus delay report till after June 15, 2017).	Applicant agrees to conduct one of the four burrowing owl surveys after June 15. Survey schedule and methodology have been modified accordingly. In order to incorporate the findings of this survey into the final survey report, Applicant proposes changing submittal of final survey report from May 31, 2017 to June 23, 2017.
CEC	Rare Plants	Please also adhere to federal guidelines for rare plant surveys (USFWS 1996).	Will be implemented. Survey methodology has been modified accordingly.
CEC	Rare Plants	Ventura marsh milkvetch would most likely occur in the area as seedlings or very small juveniles; CDFW reports seedlings this year 100 feet north of Project site fence (Meyer 2017, personal communication).	Noted.
CEC	Rare Plants	May not be feasible to visit reference sites as all known milkvetch populations are on private land or in restricted area without public access.	The survey methodology has been revised to state that reference population sites will be visited subject to accessibility.
CEC	Rare Plants	Orcutt's pincushion reference population is near LAX only and this year's blooms are uncertain in temporal/spatial scope (Meyer 2017). Attending a reference population may be difficult to achieve.	The survey methodology has been revised to state that reference population sites will be visited subject to accessibility.

Puente Power Project Agency and Party Comments on Biological Survey Methodology and Response Matrix			
CDFW	Rare Plants	Rare plant surveys should follow CDFW protocols (2009).	As described in Section 2.2.2, this protocol will be used.
CDFW	Rare Plants	Ventura marsh milkvetch could occur in the area as seedlings or very small juveniles which could be difficult to find/ID - surveyors should move slowly to cover the area well	Noted. Will be implemented.
CDFW	Rare Plants	Ventura marsh milkvetch reference sites are private, CDFW may be able to assist in accessing	The survey methodology has been revised to state that reference population sites will be visited subject to accessibility.
CDFW	Burrowing Owl	Recommends protocol wintering surveys (CDFW 2012 Staff Report on borrowing owl) even if no previously used burrows are observed during this focused survey period, since wintering owls have been documented immediately north of the Project area and in other nearby areas.	Applicant's proposed survey methodology was designed to meet the Committee Order which stated: "These focused surveys shall be conducted during the period beginning with the issuance of this order and ending July 31, 2017, at time(s) within that period that are appropriate for detecting the identified species. If the appropriate time for detecting the species would normally be after July 2017, the survey will nonetheless be conducted during the above-specified period, modified as necessary to account for observable information available during that period." In response to other agency comments received, Applicant has agreed to modify the survey schedule to conduct one burrowing owl survery after June 15, 2017.
CDFW	Globose Dune Beetle	Recommends increasing amount of surveys to 2 day surveys, 2 night surveys, and 4 nights of pitfall trapping (for more thorough surveys)	Will be implemented. Survey methodology has been modified accordingly.

Puente Power Project Agency and Party Comments on Biological Survey Methodology and Response Matrix			
CDFW	California Legless Lizard	Recommends including systematically searching for legless lizard under iceplant mats by lifting portions of each mat and lightly raking duff under mat down to approximately 6 inches or deeper, if conditions warrant.	Will be implemented. Survey methodology has been modified accordingly.
CDFW	Northern Harrier/White-tailed Kite	Notes that both species have been observed using habitat on and adjacent to Project site for foraging. Additional losses of foraging habitat are likely cumulatively substantial under CEQA in coastal areas of Ventura County	Noted.
CCC	Expanded Survey Area	BSA should include additional areas: (a) both onsite "Site Reconfiguration" alternative project footprints identified in the FSA; (b) any habitat areas within the MGS property boundary adjacent to the proposed and alternative site footprints; and (c) any habitat areas outside the MGS property boundary and within 100 feet of the proposed and alternative site footprints with potential to support the target species - particularly the dunes and vegetated areas to the west and north of the proposed Project site. Surveys for all species should be conducted within expanded survey area. General area surveys should be conducted in full area and focused species surveys should be conducted in appropriate habitats within the expanded area.	The BSA has been revised in the survey methodology as follows: 1) addition of all construction parking, laydown and material storage areas; 2) addition of a 100-foot buffer around the P3 project site and proposed construction parking, laydown and material storage areas, except where limited by the presence of pavement or the Manadalay Generating Station property line; and 3) addition of a 25-foot buffer to the oufall survey area and outfall access survey area.
CCC	Globose Dune Beetle and Reptiles	Timing and scheduling of surveys should take into account the temperature and insolation conditions under which target species are likely to be active and can be found above ground. Surveys should only be conducted if weather and light conditions are suitable and should be rescheduled if weather conditions would reduce likelihood of detection	This was previously addressed in the survey methodology (Section 2.3.1.1).
CCC	Globose Dune Beetle	Recommend one daytime and one nighttime survey each week for a minimum of four weeks; if beetles are observed during the day or night before completing all surveys, additional surveys are not necessary.	Survey methodology has been modified to adress the frequency proposed by the CEC.
CCC	Two-Striped Garter Snake and Blainville's Horned Lizard	Visual and cover board surveys once a week for minimum of four weeks. If/when a species is observed, additional surveys are not necessary.	Applicant agrees to conduct the recommended number of surveys; the survey methodology has been modfied accordingly.

Puente Power Project Agency and Party Comments on Biological Survey Methodology and Response Matrix			
CCC	California Legless Lizard	Visual, cover board, and raking surveys once a week for a minimum of four weeks. If/when a lizard is observed, additional surveys are not necessary.	Applicant agrees to conduct the recommended number of surveys; the survey methodology has been modfied accordingly.
CCC	California Legless Lizard	Raking should only occur in habitat likely to support legless lizard in order to minimize adverse habitat impacts. Raking clearly involves disrupting legless lizard habitat and should be done cautiously by a qualified biologist who has field experience with legless lizard	Surveyors will take care to minimize disturbance of habitat.
CCC	Avian	To maximize the chances of detecting active nests, minimum of five general nesting surveys, one week apart, should be conducted	Applicant agrees to conduct the recommended number of surveys; the survey methodology has been modfied accordingly.
CCC	Burrowing Owl	Surveys for over-wintering burrowing owl should be conducted in the BSA winter 2017-2018	Applicant's proposed survey methodology was designed to meet the Committee Order which stated: "These focused surveys shall be conducted during the period beginning with the issuance of this order and ending July 31, 2017, at time(s) within that period that are appropriate for detecting the identified species. If the appropriate time for detecting the species would normally be after July 2017, the survey will nonetheless be conducted during the above-specified period, modified as necessary to account for observable information available during that period." In response to other agency comments received, Applicant has agreed to modify the survey schedule to conduct one burrowing owl survery after June 15, 2017.
CCC	Plants	Reference population surveys are important for getting a search image of the respective rare plant and should be conducted prior to performing rare plant surveys in BSA. Minimum of four surveys, scheduled one week apart, should be conducted for each rare plant species. If/when a rare plant is observed, additional surveys for that species are not necessary.	Applicant agrees to conduct the recommended number of surveys; the survey methodology has been modfied accordingly. Reference population sites will be visited subject to accessibility.

Puente Power Project Agency and Party Comments on Biological Survey Methodology and Response Matrix			
CCC	General	Biologists performing surveys for state and federally listed T&E species, particularly those surveys with potential to result in "take," must have all required authorizations and permits from CDFW and USFWS.	Species that are state and/or federally threatened and/or endangered are: Ventura marsh milkvetch, salt marsh bird's beak, western snowy plover, California least tern, least Bell's vireo, white-tailed kite (FP), California black rail. Surveys for these species are not invasive and would not result in take.
EDC/Sierra Club/CBD	General	The survey plan's description of the project site is inaccurate.	Refer to response above to the Coastal Commision's comment regarding an expanded survey area.
EDC/Sierra Club/CBD	General	Survey plan timing and duration is too short and too infrequent to detect rare species.	Applicant has made revisions to the number and timing of surveys in response to agency comments. Refer to responses above and revised survey methodology.
EDC/Sierra Club/CBD	Expanded Survey Area	The proposed survey plan area is too small and does not cover enough of the project site for rare species detection.	Please see response above to the Coastal Commision's comment regarding an expanded survey area.
EDC/Sierra Club/CBD	Avian and Plants	Survey plan methodology for rare and sensitive bird species and plants must be modified to ensure accurate results.	Applicant has made revisions to the methodology, number, and timing of surveys in response to agency comments. Refer to responses above and revised survey methodology. It is Applicant's position that with these revisions, the survey methodology is sufficient and no further changes to the methodology are warranted.

Puente Power Project Agency and Party Comments on Biological Survey Methodology and Response Matrix			
EDC/Sierra Club/CBD	Agency Participation	The survey plan must inlcude detail for resource agency participation and site visits.	The Energy Commission, Coastal Commission and California Department of Fish and Wildlife are welcome to participate in the field surveys and should contact Applicant should they wish to participate. The general schedule for surveys is presented in the survey methodology.

ATTACHMENT B

Application for Certification (15-AFC-01)

Puente Power Project

Oxnard, California

Final Biological Resources Survey Methodology

Prepared For:

NRG Energy Center Oxnard LLC

~~March 27~~April 10, 2017

Table of Contents

List of Acronyms

AECOM	AECOM Technical Services, Inc.
AFC	Application for Certification
BCC	Bird of Conservation Concern
BSA	Biological Study Area
CDFW	California Department of Fish and Wildlife
CCC	California Coastal Commission
CEC	California Energy Commission
CCH	Consortium of California Herbaria
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
ESRP	Endangered Species Recovery Program
FR	Federal Register
FSA	Final Staff Assessment
GGNRA	Golden Gate National Recreation Area
MGS	Mandalay Generating Station
NRG	NRG Energy Center Oxnard LLC
P3	Puente Power Project
SSC	Species of Special Concern
SCE	Southern California Edison
SFNPS	San Francisco Bay Area National Parks Science and Learning
USFWS	United States Fish and Wildlife Service

1 Introduction

1.1 Purpose

This Final Biological Resources Survey Methodology (Survey Methodology) has been prepared by AECOM Technical Services, Inc. (AECOM), on behalf of NRG Energy Center Oxnard LLC (NRG or Applicant) in support of the Puente Power Project (P3 or project). Specifically, this Survey Methodology serves to address the directive for additional biological resource surveys in the "Committee Orders for Additional Evidence and Briefing Following Evidentiary Hearings," dated March 10, 2017 (California Energy Commission [CEC] TN # 216505 [the Committee Order]). In addition, this Survey Methodology addresses the requests for additional biological resource surveys in the Interveners' Joint Motion to Modify the CEC's Committee Orders for Additional Evidence and Briefing Following Evidentiary Hearings dated March 21, 2017 (CEC TN #216641 [the Interveners' Motion]. Finally, this Survey Methodology has been revised in response to comments received from agency staff and interveners on the initial version submitted by Applicant on March 27, 2017 (TN # 216641).

The Committee Order directeds Applicant to prepare and submit results from one or more focused biological surveys, conducted before July 31, 2017, of the proposed project site to determine the likelihood for the presence of the following species: Ventura marsh milkvetch (*Astragalus pycnostachyus* var. *lanosissimus*), globose dune beetle (*Coelus globosus*), two-striped garter snake (*Thamnophis hammondii*), California legless lizard (*Anniella pulchra* [hereafter referred to as *Anniella* sp.[1]]), and Blainville's horned lizard (*Phrynosoma blainvillii*).

The Interveners' Motion requesteds that the Committee modify the Committee Order to require biological surveys of additional species, which according to the Interveners, will result in "a complete and legally adequate assessment of the biological resources on the Project site . . ." (Interveners' Motion, p. 2). The Interveners' Motion requesteds additional surveys for the following species: western snowy plover (*Charadrius nivosus nivosus*), California least tern (*Sterna antillarum browni*), least Bell's vireo (*Vireo bellii pusillus),* burrowing owl (*Athene cunicularia*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), California black rail (*Laterallus jamaicensis coturnic-ulus*), salt marsh birds beak (*Chloro-pyron maritimum* ssp. ~~*Maritimum*~~*maritimum*), and Orcutt's pincushion (*Chaenactis glabruiscula orcuttiana*).

Comments on the initial version of this Survey Methodology were provided by CEC staff (TN # 216886) ("CEC Comments"), California Department of Fish and Wildlife (CDFW) staff (TN # 216901) ("CDFW Comments"), California Coastal Commission (CCC) staff (TN # 216908) ("CCC Comments"), and interveners Environmental Defense Center, Sierra Club Los Padres Chapter, Ventura County Environmental Coalition, and Center for Biological Diversity (TN # 216914) ("Intervener Comments") (collectively, "Agency/Party Comments"). Changes

[1] The species traditionally recognized as California legless lizard (*Anniella pulchra*) has been split into five species, following Papenfuss and Parham (2013). The Ventura County coast lies in a zone that has not been sampled; therefore, it is unknown whether legless lizards with potential to occur in the BSA would be *Anniella pulchra* or *Anniella stebbinsi*.

made to the initial version of this Survey Methodology in response to the Agency/Party Comments are reflected in a "redline" version submitted concurrently herewith.

This Final Survey Methodology outlines the proposed methods of the surveys Applicant intends to conduct for all of the species identified in the Committee Order and the Interveners' Motion. As directed by the Committee Order, surveys will be conducted on the approximately 3-acre project site. In addition, as requested in the Interveners' Motion and the Agency/Party Comments, ~~surveys will be conducted on the approximately 3-acre project site,~~ surveys will be conducted in the areas described in Section 1.3 below.~~as well as the area potentially affected by removal of the existing outfall.~~

As explained further below, all surveys will be completed in April, ~~and early~~ May, and June, and the final survey report will be filed by ~~the end of May~~June 23, 2017.

1.2 Project Background

In September 2013, Southern California Edison (SCE) issued the 2013 Local Capacity Requirements Request for Offers for the Moorpark Sub-Area (Track 1). SCE was authorized to procure between 215 and 290 megawatts of electrical capacity in the Moorpark Sub-Area of the Big Creek/Ventura local reliability area to meet long-term local capacity requirements by 2021. In November 2014, NRG was awarded a contract by SCE to develop the project and entered into a 20-year Resource Adequacy Purchase Agreement with SCE.

P3 will be developed on approximately 3 acres of previously disturbed vacant brownfield land within the existing boundaries of Mandalay Generating Station (MGS) on Assessor's Parcel Number 183-0-022-025; Township 2 North, Range 23 West, on the U.S. Geological Survey Oxnard/Oxnard OE Topographic Map Quadrangles (Latitude: 34.207115; Longitude: 119.250000).

In April 2015, NRG filed an Application for Certification (AFC) for the project with the CEC. In December 2016, the CEC Staff issued the Final Staff Assessment (FSA), which concluded that the project as proposed, with implementation of the proposed Conditions of Certification, would comply with all applicable laws, ordinances, regulations and standards, and would not result in any unmitigated significant environmental impacts. The Committee assigned to review the project conducted Evidentiary Hearings on February 7 through 10, 2017.

1.2.1 Scope of Biological Surveys and Reports Completed to Date

Several biological surveys and associated reports have been conducted and prepared throughout the AFC process. A summary of the biological surveys and associated reports is included herein to provide an understanding of what biological data have been previously collected, and how these data were used to assess the potential for special-status species and analyze potential impacts to biological resources.

Previous surveys and analysis are documented in the following reports: AFC Section 4.2, Biological Resources (CEC TN #204219-9); AFC Appendix D, Biological Resources (CEC TN

#204220-4); and Puente Power Project (P3), Project Enhancement – Outfall Removal and Beach Restoration (Section 3.2) (CEC TN #213802).

A reconnaissance survey of the project site was conducted on January 12, 2015.

Focused surveys of the project site, ~~and~~ construction parking and laydown areas, and construction material storage areas, were conducted on March 12 and 31, 2015. During the surveys, a wetland delineation/jurisdictional determination, focused botanical survey, vegetation community mapping, and a wildlife survey (including sensitive species) were conducted. In the dunes adjacent to the project site and at the edge of McGrath Lake, a focused botanical survey, vegetation community mapping, and a wildlife survey (including sensitive species) were conducted. Vegetation mapping was conducted from public roads for the offsite areas in the project vicinity.

For the beach outfall area, a portion of the area was surveyed in March 2015. During the survey, a focused botanical survey, vegetation community mapping, and a wildlife survey (including sensitive species) were conducted. A reconnaissance-level follow-up survey was conducted on October 18, 2016. At this time, the proposed wastewater discharge area was also surveyed. A botanical survey (although it was not conducted during the spring blooming period), vegetation community mapping, and a wildlife survey (including sensitive species) were conducted at that time (CEC TN #215441) (Latham & Watkins LLP 2017).

The results of the field efforts were analyzed in conjunction with the species known from the literature review to occur in the project vicinity, to determine the potential of those species to occur on the project site and beach outfall area. The project site and beach outfall area are highly disturbed, are continually used for operations, or are adjacent to site activities, and therefore do not support habitat for special-status species. Focused surveys for individual special-status species were therefore deemed not necessary and not conducted. It should be noted that pre-construction surveys and a mechanism to avoid and mitigate impacts to special-status species are outlined in the proposed Conditions of Certification (please see the CEC Staff FSA, Part 1, Section 4.3, Biological Resources [CEC TN #214712]).

1.3 Biological Study Area

For purposes of the surveys to be completed pursuant to this Survey Methodology, as directed by the Committee Order, the Biological Study Area (BSA) includes the approximately 3-acre site on which the project will be constructed (referred to herein as the project site) ~~(see Subsection 1.3.1)~~. In addition, as requested in the Interveners' Motion and the Agency/Party Comments, the BSA includes the following areas:

- **a 100-foot "buffer area" surrounding the project site, except where such a buffer area would extend outside the fence line of the MGS or into areas that are covered with impervious surfaces;**

- the area potentially affected by removal of the existing outfall, including the temporary access road that will be used to reach the outfall area, and a 25-foot "buffer area" surrounding the potentially affected area; and

- temporary construction parking and laydown areas, and construction material storage areas, including a 100-foot "buffer area" surrounding such areas, except for any areas outside the fence line of the MGS or covered with impervious surfaces.

~~, the overflow material storage and laydown area (See Subsection 1.3.4), and, as requested in the Interveners' Motion, the area potentially affected by removal of the existing outfall (see Subsection 1.3.2), including the temporary access road that will be used to reach the outfall area (see Subsection 1.3.3). In addition, the survey area includes a 100-foot buffer surrounding the project site and overflow material storage and laydown area, and a 25-foot buffer surrounding the existing outfall and access road to the existing outfall.~~ The BSA excludes ~~paved~~ areas covered by impervious surfaces, lands outside the MGS fenceline~~not owned by or accessible to NRG~~, and areas of open water. Please see Figure 1 for the extent of the BSA.

Relevant local biological resources and environmental conditions in the BSA and surrounding areas are summarized below. Additionally, Figure 1 shows vegetation communities and land cover types in the BSA and adjacent areas. Please see the AFC, Section 4.2, Biological Resources (CEC TN #204219-9) for further descriptions of these vegetation communities and land cover types.

1.3.1 Project Site

The project site is situated within the fenced boundary of the existing MGS. The project site encompasses approximately 3 acres of significantly disturbed land.

The habitats contained in the project site include iceplant mats, woolly seablite/iceplant mats, coyote brush scrub, and ruderal vegetation. The project site has been graded and subjected to various human uses. Dominant plants include many invasive weeds, including iceplant (*Carprobrotus edulis* and *Mesembryanthemum nodiflorum*), Russian thistle (*Salsola tragus*), and horticultural species such as lollypop tree (*Myoporum laetum*). Native coyote brush scrub habitat occurs in the southern portion of the project site; however, even this area is disturbed and invasive species are prevalent. Soils on the project site have been artificially compacted. With the exception of woolly seablite (*Sueda taxifolia*), a sensitive species with a California Rare Plant Rank (CRPR) of 4.2 (limited distribution), no special-status plants or wildlife were observed on the project site during all previous biological surveys.

1.3.2 Outfall Area

The habitats contained in and immediately adjacent to the outfall area include open water, sandy beach, and dune mats. Open water is found at the mouth of the outfall structure and continues as a dynamic channel to the Pacific Ocean. Sandy beach is situated between the ocean and the dunes. Dune mats are located along the dunes between the outfall structure

and MGS. Dune mats are identified as a ~~California Department of Fish and Wildlife (~~CDFW~~)~~ sensitive natural community.

1.3.3 Outfall Access Road

The habitats contained in and immediately adjacent to the outfall access road include iceplant mats and dune mats.

1.3.4 Construction Parking and Laydown Areas and Overflow Material Storage and Laydown Areas

Construction parking and laydown areas are within the fenced boundary of the existing MGS and currently paved for the most part. The overflow material storage and laydown area is situated within the fenced boundary of the existing MGS. The area encompasses approximately 1 acre of significantly disturbed land containing iceplant mats.

1.4 Sensitive Species Covered by Survey Methodology

1.4.1 Species Identified in Committee Order

1.4.1.1 Ventura Marsh Milkvetch

The Ventura marsh milkvetch (*Atragalus pycnostachyus* var. *lanosissimus*) is listed by the State of California as Endangered and by the federal government as Endangered. It is ranked by the California Native Plant Society (CNPS) as a 1B.1 species. Ventura marsh milkvetch is endemic to the south-central coast of California. Historically, the variety occurred in several populations in Ventura and Los Angeles counties (CCH 2017), and possibly even Orange County (Barneby 1964). Its habitat requirements are not well-known, but it appears to have been restricted to well-drained sandy-clay soils on swales, coastal meadows, and coastal marsh habitats along back dunes on the coast (Wilken and Wardlaw 2001, CCH 2017, Baldwin et al. 2012, Jensen 2007). It may have a tolerance for brackish or alkaline conditions (69 Federal Register [FR] 29081, Jensen 2007).

The species was considered extinct since the early 1900s, but was rediscovered in 1997 on the North Shore at Mandalay Bay,[2] the proposed development at Harbor Boulevard and Fifth Street that was formerly an oil-waste dump site on the Oxnard Plain in Ventura County (Impact Sciences, Inc. 1997, in 69 FR 29081). Currently, 30 to 50 adult plants (CNPS 2017) remain on these roughly 6 acres of semi-ruderal back dunes (69 FR 29081, USFWS 2010). Even with reseeding efforts and site management by the CDFW, fewer than 400 individuals (as few as 30 to 40 in some years) are known in the wild (69 FR 29081, 66 FR 54808, USFWS 2010), and offsite planting areas appear to have mixed success (Jensen 2007). Introduced localities include areas in or adjacent to Mandalay State Beach, McGrath State Beach, Ormond Beach, Carp~~e~~i~~n~~t~~a~~e~~ria Salt Marsh, and Coal Oil Point Reserve (USFWS 2010). These require careful management, and Jensen (2007) recommends weekly monitoring from March through October, which is the growing season. In 2004, critical habitat for the species was established on roughly 420 acres of coastal dune habitat in Santa Barbara and Ventura Counties (69 FR 29081). No critical habitat occurs in the BSA.

[2] SunCal is developing the former North Shore at Mandalay, which is now called Beachwalk on the Mandalay Coast. The plans include 30 acres of native dune restoration (Ventura County Star 2015).

Based on the habitat requirements of the species, the Ventura marsh milkvetch has a low potential to occur on the project site. Previously conducted focused botanical surveys (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]) did not detect this species in the project site. Two records occur within a 1-mile radius of the BSA.

1.4.1.2 Globose Dune Beetle

The globose dune beetle is a federal Species of Special Concern (SSC). The United States Fish and Wildlife Service (USFWS) has considered it for listing since 1978 (43 FR 35636), but there appears to have been too little data to conclude a designation (59 FR 58982).

The globose dune beetle is restricted to dune ecosystems along the coastline from Northern Baja California to Bodega Head. It prefers foredunes and hummocks, and is found within 200 feet of the ocean in northern and Central California, but may extend up to roughly 1,000 feet inland in the south (Doyen 1976, NatureServe 2015).

The globose dune beetle feeds on detritus in the sand, though evidently it may climb shrubs to feed. It has a strong preference for native species. Invasive iceplant is considered one of the main threats to the beetle and its habitat (Nagano 1982). Larvae of the globose dune beetle live in sand or under vegetation and cover items (Doyen 1976). Adults that can be found year-round are mostly nocturnal. They may appear on the surface on foggy or very cool, overcast days (NatureServe 2015).

Based on the habitat requirements of the species, the globose dune beetle has a low potential to occur on the project site. No globose dune beetles were observed during previous biological surveys (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]), and no records fall within a 1-mile radius of the BSA. Three records are known from within a 10-mile radius.

1.4.1.3 Two-Striped Garter Snake

The two-striped garter snake is a California SSC and has no federal status. This snake occurs along the California coast from Monterey County to northern Baja California (Jennings and Hayes 1994). Two-striped garter snakes are found in or near permanent or intermittent fresh water, often along streams with rocky beds bordered by willows or other streamside growth (Stebbins 2003). The two-striped garter snake is highly aquatic and is considered among the most aquatic of the garter snakes (Thomson et al. 2016). This species is primarily active from spring to late fall; it is often active at dusk or night, but can be found during the day (Stebbins 2003). Two-striped garter snakes breed between March and April and live young are born from July to August. Their diet consists of tadpoles, newt larvae, small fish, and even worms (Jennings and Hayes 1994). The two-striped garter snake has a variety of predators, such as raptors, herons, raccoons, and coyotes, as well as introduced exotic species.

Based on the species requirements, the two-striped garter snake has a low potential to occur on the project site and other areas of the BSA, because there is no pooled or standing fresh water. Previous biological surveys did not detect this species on the project site (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]). There are no California Natural

Diversity Database (CNDDB) records of this species within a 1-mile radius of the BSA and only one record within a 10-mile radius.

1.4.1.4 California Legless Lizard

The California legless lizard is a California SSC and has no federal status. It is endemic to California and northern Baja California, and is found from Contra Costa County south through the Coast Ranges down through northern Baja California. This species is typically found approximately 60 miles from the coast and occurs in parts of the San Joaquin Valley, the western edge of the Sierra Nevada Mountains, and the western edge of the Mohave Desert (Jennings and Hayes 1994). This species receives it listing status due to extensive loss of habitat resulting from urban and agricultural development.

The California legless lizard is typically restricted to undisturbed moist, loose, mulchy, sandy soils such as sand, loam, or humus, and frequents sparse vegetation of beaches, chaparral, pine-oak woodlands, and stream sides (Stebbins 2003). They burrow in loose sand and must live where they can reach conditions with moisture content (Kuhnz 2000, Miller 1944). They have been found at soil depths from a few to 20 inches below the surface (Kuhnz 2000). Because they are a fossorial animal (primarily burrowing underground), their feeding ecology is not well known. They are insectivores, and as a fossorial animal are generalist sit-and-wait feeders. Recorded diets consist of larval insects, adult beetles, termites, and spiders (Stebbins 2003). They forage in leaf litter by day and may emerge on the surface at dusk or night, with peak activity patterns in the morning and evening.

The California legless lizard is reported to have a high tolerance for cooler temperatures (Bury and Balgooyen 1976), and requires moisture in its environment (Miller 1944). Although the species is supposedly active all year, with little seasonal changes in movement being predicted (Morey in Zeiner et al. 1988-1990), it would seem that spring may be the best time to locate the species, when temperatures are cooler and the soils are more moist.

Based on the soil requirements of the species, it has a low to moderate potential to occur on the project site, because much of the site has densely vegetated mats of iceplant. Kuhnz et al. (2005) found California legless lizards at lower densities in disturbed soils and areas where iceplant had replaced native vegetation compared to undisturbed areas where natives were dominant. Previous biological surveys, which included raking for this species, did not observe any individuals in the project site (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]). Records in the CNDDB for this species occur approximately 0.5 mile to the north and 1.5 miles to the south of the BSA.

1.4.1.5 Blainville's Horned Lizard

The Blainville's (or California) horned lizard, formerly known as the coast horned lizard, is a California SSC and has no federal status. It is found from the northern Sacramento Valley to northwest Baja California (Brattstrom 2013). The species has decreased to fewer than 30 percent of its population in the last century, due to habitat conversion (Hollingsworth and Hammerson 2007); collection pressure (Jennings 1987); and the displacement of its native prey base, harvester ants, to nonnative Argentine ants (Stebbins 2003).

Blainville's horned lizard occurs in habitats with scrubby or open areas with sandy soils. Pristine or high-quality native communities in chaparral, coastal scrub, valley and foothill grassland, juniper desert, coastal dunes, and washes are used by the species (Brattstrom 1997, Stebbins 2003, Nafis 2017); although they may also be found on dirt roads surrounded by natural lands (Nafis 2017). Although the Blainville's horned lizard evidently eats a variety of invertebrates (Nafis 2017), the presence of its main prey base, harvester ants, is either a requirement or an important indicator for suitable habitat (Suarez and Case 2002, Suarez et al. 2000, Brattstrom 2001).

Based on the range and habitat requirements of the species, the Blainville's horned lizard has a low potential to occur in the project site. It was not detected during previous biological surveys (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]), and there are no records within a 1-mile radius of the BSA. However, there is a record within a 5-mile radius of the BSA.

1.4.2 Species Identified in Interveners' Motion

1.4.2.1 Western Snowy Plover

The western snowy plover is listed by the federal government as Threatened, and designated as an SSC by the State of California. During fall and winter months, this species is common along estuarine shores and sandy marine areas (CDFW 2017a). Predators (crows, opossums, raccoons, and coyotes) and people and their unleashed dogs are the most significant threats to western snowy plovers at local state beaches (California State Parks 2013).

Western snowy plovers nest along estuarine shores and sandy marine areas from April to August. Nesting areas are generally shallow depressions, typically found in sandy, gravelly, or friable soils (CDFW 2017a). Nest sites are generally unobstructed from the wrack line along the seashore.

No western snowy plovers were detected during previous biological surveys. Critical habitat for the western snowy plover is designated on the beaches and dunes west, northwest, and southwest of the BSA. In addition, the beaches and sand dunes in Mandalay State Beach and McGrath State Beach in the immediate vicinity of the BSA support both wintering populations and breeding populations of this species. The nesting areas are delineated with semi-permanent or seasonal symbolic fencing (California State Parks 2013).

1.4.2.2 California Least Tern

The California least tern is listed by the federal government as Endangered and by the State of California as Endangered. This species migrates to California during the breeding season, typically arriving in southern California in late April or mid-May. Breeding habitat generally includes estuarine and marine shores. This species generally forages for fish over open water where small fish are abundant. Population declines for this species are attributed to human disturbance at areas historically used as coastal nesting (CDFW 2017b). Nest sites are usually in open expanses of light-colored sand, dirt, or dried mud, close to a lagoon or estuary with a dependable food supply (USFWS 1985a).

Based on vegetative cover in the BSA and the relatively small area available, suitable nesting habitat quality is low and potential nesting is unlikely to occur in the BSA. No California least terns were detected during previous biological surveys. Known nesting sites have been identified along the beach between the Santa Clara River Mouth and McGrath Lake; and Ormond Beach, between Ormond Beach Generating Station and Perkins Road (CDFW 2015). This species is also known to nest on the beach in the vicinity of the BSA. It may also forage over Edison Canal.

1.4.2.3 Least Bell's Vireo

The least Bell's vireo is listed by the federal government as Endangered and by the State of California as Endangered. This species is a locally rare summer resident from Santa Barbara County south to northern Baja California (Birds of North America Online 2017). The least Bell's vireo has experienced a drastic decline in numbers throughout California in recent decades, due primarily to brood parasitism by the brown-headed cowbird (*Molothrus ater*) and habitat degradation and destruction (Birds of North America Online 2017).

The least Bell's vireo occurs in dense, valley foothill riparian habitat, particularly willow thickets, as well as cottonwood stands, coyote brush, and wild blackberry shrubland, at elevations below 600 meters (2,000 feet). They are considered an obligate riparian breeder and typically inhabit structurally diverse woodlands along watercourses (USFWS 1998). Two features appear to be the most critical for occupied habitat are summarized as 1) the presence of dense cover within 3 to 6 feet of the ground and 2) dense stratified canopy for foraging (USFWS 1998). Although nests are frequently found in willow-dominated areas, a diverse habitat structure appears to be as important as plant species composition (USFWS 1998). Least Bell's vireos primarily take insect prey, gleaning prey items from foliage and branches of dense vegetation (Birds of North America Online 2017).

Least Bell's vireos generally migrate from their wintering grounds in Mexico to arrive at their summer breeding territory by the end of March. Monogamous pairs build an open cup nest of fine grasses, pieces of bark, plant down, and animal hair approximately 0.6 to 0.9 meter (2 to 3 feet) from the ground in a willow or other small tree. Peak egg laying occurs from May into early June; an average of four eggs are laid and incubated by both parents. Incubation is generally approximately 14 days. Young are cared for by both parents and generally fledge 11 to 12 days after hatching. Least Bell's vireos usually depart the summer breeding ground by the end of August (CDFW 2017c).

Based on the absence of dense willow thickets or other densely growing shrub or tree cover, suitable nesting habitat is not present in the BSA. The least Bell's vireo has a low potential to occur in the BSA. No least Bell's vireos were detected during previous biological surveys, and no records fall within 1 mile of the BSA. Nine records are known from within a 10-mile radius.

1.4.2.4 Burrowing Owl

The burrowing owl is listed by the federal government as a Bird of Conservation Concern (BCC) and by the State of California as an SSC. Burrowing owls are year-long residents in the Central Valley and desert regions of California, with wintering migrants and smaller year-round populations occurring in coastal California. This species occurs in dry, open grassland

and desert habitats, from sea level up to 1,600 meters in elevation (CDFW 2017d). Burrowing owls are primarily threatened by conversion of suitable habitat to agriculture, other forms of habitat destruction, and the reduction in ground squirrel populations due to poisoning and other eradication efforts (CDFW 2017d).

Burrowing owls forage for invertebrates and small vertebrate prey, including insects, lizards, birds, and mammals (Cornell 2017). Burrowing owls use burrows for shelter and breeding; typically, burrowing owls prefer to use burrows dug by other species, including California ground squirrels (*Otospermophilus beecheyi*), but they may dig their own burrows in suitable friable soils. Manmade structures including open pipes and culverts, debris piles, and nest boxes also may be used. Breeding typically occurs in the Central Valley; individuals may reside year-round in Central Valley habitats or migrate to coastal California or further south during the winter. Breeding occurs from March through August, with a peak in April and May.

Based on the habitat requirements for this species, burrowing owls have a low potential to occur in the BSA. The BSA occurs within the wintering range for this species. Four historical records occur within 10 miles of the BSA, of which one was recorded in January, two in February, and one in mid-March, supporting overwintering, but not breeding, occurrence of burrowing owls in the vicinity. California ground squirrels do occur on site, and may provide suitable burrows for sheltering. Burrowing owls have been recorded approximately 1 mile north of the BSA in coastal dune scrub habitats (CDFW 2017b).

1.4.2.5 White-Tailed Kite

The white-tailed kite is listed by the State of California as a Fully Protected species. This medium-sized raptor is a year-round resident of coastal and valley lowlands in California, and ranges from common to uncommon throughout its range (CDFW 2017d). White-tailed kites inhabit herbaceous and open stages of most habitats, including savanna, open woodland, desert grassland, partially cleared lands, and cultivated fields, and are rarely found away from agricultural areas (Cornell 2017, CDFW 2017d). White-tailed kites were subject to egg collecting and hunting in the early 20th century, and are now threatened by development which removes suitable nesting habitat and modern farming methods that eliminate foraging habitat (Cornell 2017).

White-tailed kites primarily forage for small mammals, including voles (*Microtus* sp.) and other small, diurnal species (Cornell 2017). Foraging habitat typically consists of lightly grazed or ungrazed open grasslands, meadows, farmlands, and wet meadows. Loose nests are built in dense groves of trees, and are typically placed in the upper third of the tree, approximately 6 to 20 meters above ground level (CDFW 2017d, Cornell 2017). In southern California, white-tailed kites may also nest on the ground in saltgrass (*Distichlis spicata*) or Bermuda grass (*Cynodon dactylon*). Breeding occurs from February to October, peaking from May to August (CDFW 2017d). During the nonbreeding season, white-tailed kites may form communal roosts of as many as 100 birds (Cornell 2017, CDFW 2017d).

Based on habitat requirements of this species, white-tailed kites are not expected to breed in the BSA. Suitable nesting habitat consisting of dense groves of trees does not occur in the BSA. Suitable foraging habitat consisting of open grasslands does not occur in the BSA. No

white-tailed kites were observed during previous biological surveys. Suitable nesting and foraging habitat may occur in the vicinity of the BSA, and white-tailed kites may occur transiently, but this species is not expected to forage or breed in the BSA.

1.4.2.6 Northern Harrier

The northern harrier is listed by the State of California as an SSC (CDFW 2017d). This medium-sized raptor is a year-round resident in portions of coastal California and occurs as a winter migrant throughout coastal areas. Its range extends throughout California at elevations from sea level to 1,700 meters. Northern harriers occur in a variety of open habitats, including annual grasslands, meadows, open rangelands, desert sinks, and freshwater and saltwater emergent wetlands; this species rarely occurs in wooded areas (CDFW 2017d). Habitats with low vegetation are generally preferred (Cornell 2017).

Northern harriers feed on a variety of prey, including small mammals (especially meadow voles), reptiles, amphibians, birds, crustaceans, and rarely fish. They forage on the wing, soaring low over open habitats in search of prey (CDFW 2017d, Cornell 2017). Breeding occurs from April to September, with peak activity in June and July. Nests are built on the ground in shrubby or grassy vegetation, usually in emergent wetlands, grasslands, grain fields, or on sagebrush flats (CDFW 2017d).

Based on the habitat requirements of this species, northern harriers are not expected to breed in the BSA. The BSA occurs within the winter range for northern harriers, and suitable nesting habitat consisting of dense shrubby or grassy vegetation does not occur in the BSA. Suitable foraging habitat consisting of large tracts of herbaceous, open habitats does not occur in the BSA. No northern harriers were observed in the BSA during previous biological surveys, but this species was observed offsite in the vicinity. Suitable nesting and foraging habitat may occur in the vicinity of the BSA, and northern harriers may occur transiently, but this species is not expected to breed or forage in the BSA.

1.4.2.7 California Black Rail

California black rail (*Laterallus jamaicensis coturniculus*) is designated by the federal government as a BCC and by the State of California as a Threatened species. Formerly a resident in coastal wetland areas spanning from Santa Barbara County to San Diego County, the species currently is only observed as a rare wintering species. California black rail population decline is thought to be primarily attributed to significant loss of saltwater and freshwater wetland habitats in recent decades (CDFW 2017e).

The California black rail occurs in saline, brackish, and freshwater emergent wetlands. This species prefers tidal emergent wetlands dominated by pickleweed (*Salicornia* sp.), or freshwater wetlands vegetated with bulrush (*Scirpus* sp.), cattails (*Typha* sp.), and saltgrass. California black rails primarily take invertebrate prey by gleaning from the vegetation and muddy surfaces (CDFW 2017e).

California black rails typically nest in in dense vegetation, such as pickleweed habitats, in the higher portions of marshes. The species typically conceals deep, loose, cup nests which are generally situated close to ground level (CDFW 2017e). They require a constant water depth

of approximately 1 inch, surrounded by dense vegetation for nesting. Based on habitat requirements for this species, the California black rail has a low potential to occur in the BSA. Suitable nesting habitat is not present in the BSA. No California black rails were detected during previous biological surveys. This species is reported to occur north of the BSA between the McGrath State Beach campground and the Santa Clara River mouth, and could occur at McGrath Lake.

1.4.2.8 Salt Marsh Bird's-Beak

Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*) is a hemiparasitic annual herb that is listed by the State of California as Endangered and by the federal government as Endangered. It is ranked by the CNPS as a 1B.2 species (CDFW 2017f). It ranges from Morro Bay, California south throughout southern coastal California and into northern Baja California, Mexico.

Colonies of salt marsh bird's beak occur in low-lying areas in coastal dune habitats, coastal salt marshes and swamps, and may occur in freshwater seeps. Favorable habitat generally has well-aerated and well-drained soils that dry during the summer, in areas that have low salinity in the spring and generally low vegetative cover. Colonies may infrequently occur behind barrier dunes, and on dunes, mounds, and old oyster shell dredge spoils (USFWS 1985b). Elevation ranges from sea level to 30 meters (CNPS 2017). It blooms from May through October (Calflora 2017). Salt marsh bird's-beak is threatened by vehicular traffic, road construction, hydrological alterations, recreational activities, foot traffic, competition with nonnative plants, and loss of salt marsh habitat (CNPS 2017).

Based on the habitat requirements of this species, salt marsh bird's-beak is not expected to occur in the BSA. Focused botanical surveys did not detect this species in the BSA. The closest locations are McGrath State Beach; Ormond Beach on alkali flats northeast of the intersection of Arnold Road and Perimeter Road; and near Point Mugu (CDFW 2017g).

1.4.2.9 Orcutt's Pincushion

The Orcutt's pincushion is not State or federally listed, but is ranked by the CRPR as a 1B.1 species (CDFW 2017f). It ranges throughout southern California, and into northwestern Baja California.

Orcutt's pincushion is an annual herb that occurs in coastal dunes and coastal bluff habitats, typically on sandy soils (Calflora 2017, CNPS 2017). Elevation ranges from sea level to 100 meters, and it blooms from January to August (CNPS 2017). Orcutt's pincushion is threatened by development, foot traffic, and recreational activities.

Based on the habitat requirements for this species, Orcutt's pincushion is not expected to occur in the BSA. Focused botanical surveys did not detect this species in the BSA. The nearest occurrence was recorded along Pierpont Bay Boulevard in Ventura, California, approximately 3.3 miles north of the project (CDFW 2017g).

2 Methods

To generate a proposed survey method, biologists reviewed publicly available reports pertaining to the species identified in the Committee Order and Interveners' Motion. These sources provide information on the natural history of the species, and provide insights on previous methodologies. Details from the research are described below. This section presents the steps taken to develop the proposed survey methodology (including background data review), proposed field surveys, and potential survey time frames. It also summarizes survey limitations and how they may influence the reported results.

2.1 Method Background Review: Species Identified in Committee Order

No agency-approved protocol-level survey guidelines exist for many of the species identified in the Committee Order. Where an accepted protocol exists, it is referenced and described below. For the species where no accepted protocol is available, a proposed survey methodology was generated to determine the likelihood of the presence of these species in the BSA.

2.1.1 Ventura Marsh Milkvetch

Protocol-level rare plant surveys methods exist (California Natural Resources Agency 2009) and were used to conduct focused surveys for the Ventura marsh milkvetch in 2015 (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]). These same methods and those established by USFWS and CDFW (USFWS 1996, CDFW 2009) will be followed.

2.1.2 Globose Dune Beetle

Relatively few available sources provide background on surveys actually conducted for the globose dune beetle. Its biology is unlike other endangered arthropods in southern California, so protocol-level surveys cannot be borrowed from other federally listed species. However, the following documents provide some insights on working with the species or its relatives:

- **MacKerricher Dunes State Park Dune Rehabilitation Mitigation Monitoring and Reporting Plan (California State Parks 2012);**
- **Silver Strand Training Complex Draft Environmental Impact Statement (Commander, U.S. Navy Pacific Fleet, 2010);**
- **A Pitfall Trapping Survey of Darkling Beetles in the Desert Steppe Vegetation (Rickard and Haverfield 1965);**
- **Draft Programmatic Environmental Impact Statement for Dredged Material Disposal (U.S. Department of the Navy 1992);**
- **Natural Resources Section of the Resources Management Plan, Golden Gate National Recreation Area (GGNRA 1999); and**
- **A manual for assessing restored and natural coastal wetlands with examples from southern California (Pacific Estuarine Research Laboratory 1990).**

In the majority of the studies targeting globose dune beetles, the species was not observed, or was observed in very low numbers. However, presence can also be determined by locating

the beetle's characteristic furrows (Commander, U.S. Navy Pacific Fleet, 2010). Pitfall traps appear to have high success rates among related darkling beetles living in similar substrates in the desert. The style of pitfall trap ranged from 100 glass jars set across an entire project site to arrays of metal can traps along a grid, spaced 10 feet apart (Rickard and Haverfield 1965).

2.1.3 Two-Striped Garter Snake

Survey methods for the two-striped garter snake were based on surveys conducted for other projects, as well as surveys conducted for other species of garter snake in California. The following literature was reviewed to generate a survey methodology:

- **Status and Ecology for Sensitive Aquatic Vertebrates in Lower San Simeon and Pico Creeks, San Luis Obispo County, California (Rathburn et al. 1993);**
- **Special-Status Aquatic Species Habitat Assessment—Santa Clara River, Mission Village Project (Entrix 2006);**
- **Biological Technical Report for the Tajiguas Landfill Reconfiguration Project (AECOM 2013);**
- **Biological Species and Habitat Survey Report, Final Remedial Investigation Report for Casmalia Resources Superfund Site (Arcadis 2011); and**
- **Results of Surveys for the San Francisco Garter Snake and California Red-Legged Frog for the NCCWD Recycled Water Project in Pacifica, San Mateo County, California (Swaim Biological Consulting 2005).**

Surveys for garter snakes may involve pitfall traps, funnel traps, or visual searches walking transects along appropriate aquatic habitats. The last of these appears to be the most common method for detecting two-striped garter snake, although this is likely because its listing status does not entitle the species to focused surveys.

2.1.4 California Legless Lizard

To generate a survey method for the California legless lizard, biologists relied on a publicly available survey report and a published study that analyzed the effectiveness of survey methods.

- **Microhabitat and Population Densities of California Legless Lizards, with Comments on Effectiveness of Various Techniques for Estimating Numbers of Fossorial Reptiles (Kuhnz et al. 2005)**
- **State Route 126 Final Species Protection and Relocation Plan and Addendum (County of Los Angeles 2013)**

This species is secretive, lives primarily underground, and is difficult to detect. Proven detection methods require disturbance of habitat that is often protected for other sensitive

species. Passive detection methods, such as direct observation or coverboards, are typically not successful and can yield negative results.

The Kuhnz et al. 2005 study demonstrated the methods of detection for California legless lizards as they were removed from a development project. These methods compared low-impact time-constrained searches, moderate-impact time-constrained searches, and coverboards. The moderate-impact searches were the most reliable method for detecting the presence of the California legless lizards over a wide range of population densities and vegetation types. However, for very low densities, both of the time-constrained search methods failed to detect legless lizards. Densities, however, were confirmed in subsequent high-intensity raking and clearance activities prior to construction where the entire area was repeatedly raked (depletion raking) to remove all animals from the area. The coverboards yielded the lowest detection rates. Therefore, this method may detect this species but should not be relied on for determining the absence of this species; as Kuhnz et al. (2005) summarizes, detection rates are consistently low with coverboards and this method could fail to detect California legless lizards where there is a low population size.

The State Route 126 project (County of Los Angeles 2013) used pitfall trap arrays, coverboards, and high-impact searches to detect wildlife species and relocate them from the impact areas. The pitfall trap arrays and the coverboards yielded no California legless lizards, but were not searched down to 6 inches during each attempt. The high-impact searches involved raking and using hand tools down to 6 inches. The high-impact surveys conducted for the State Route 126 project did detect California legless lizards, but in very low numbers.

2.1.5 Blainville's Horned Lizard

A survey methodology for the Blainville's horned lizard was based on studies of its natural history. Although a survey protocol for the related flat-tailed horned lizard (*Phrynosoma mcalli*) exists, it pertains to pre-construction monitoring and is not applicable to presence/absence surveys. Previous methods used to detect the species were reviewed from the following:

- **Coast Horned Lizard Survey, Vista Canyon Ranch, Los Angeles County (Forde Biological Consultants 2006);**
- **Spatial Patterns in Abundance of the Coast Horned Lizard (Fisher et al. 2002);**
- **2004 and 2006 Reptile Survey Results, Newhall Ranch Specific Plan Area (Impact Sciences, Inc. 2006);**
- **Population Status and Habitat Affinities of the Blainville's Horned Lizard at a Site in the Northern San Joaquin Valley, California (Gerson 2011);**
- **Environmental Assessment – El Dorado County Transportation Plan (El Dorado County Transportation Commission 2014);**
- **Protocol Development Summary: Amphibians and Reptiles (SFNPS 2010);**
- **Approved Survey Methodology for the Blunt-Nosed Leopard Lizard (CDFW 2004); and**
- **Survey Protocol for the Presence of or Negative Finding for the Barefoot Banded Gecko (CDFW 2011).**

The typical way to detect the species appears to be visual surveys using walking transects during the day. Pitfall traps (Impact Sciences, Inc. 2006, Fisher et al. 2002) have been used, as

well. The presence of harvester ants would seem to be a good indicator of coast horned lizard (Suarez and Case 2002, Suarez et al. 2000, Fisher et al. 2002).

Temperature appears to be an important limitation to the species' surface activity (Hager and Brattstrom 1997). Gerson (2011) conducted surveys when temperatures are between 20 and 30 degrees Celsius (68 and 86 degrees Fahrenheit). Forde Biological Consultants (2006) conducted surveys between 14 and 32 degrees Celsius (57 and 86 degrees Fahrenheit).

2.2 Method Background Review: Species Identified in Interveners' Motion

2.2.1 General Avian Surveys

To address surveys for the western snowy plover, California least tern, least Bell's vireo, northern harrier, and white-tailed kite, and the California black rail, general nesting bird surveys would be conducted in the generally accepted bird season. For the Ventura County area, this is recognized by agencies such as CDFW and USFWS as the period of February 1 through August 31. Focused burrowing owl surveys will also be conducted.

2.2.1.1 Western Snowy Plover and California Least Tern

There are no protocol survey guidelines specific to the western snowy plover or California least tern. General avian survey techniques will be employed in the BSA due to the absence of specific USFWS or CDFW protocol guidance, in addition to the lack of suitable habitat in the BSA.

There are several approaches to conducting broad avian inventories within a specific area. One of the commonly accepted approaches is the area search technique. Area search is a habitat-specific method of survey that can be implemented in a variety of habitats. Benefits to area search include the insight that it gives into species richness in each habitat as well as general breeding bird activity in each habitat (Klamath Bird Observatory 2017).

2.2.1.2 Least Bell's Vireo

Survey guidelines for the least Bell's vireo (USFWS 2001) describe conducting repetitive surveys in suitable habitat between April 10 and July 31. The BSA does not contain suitable habitat, because there is no structurally diverse woodland along watercourses (USFWS 1998). This species is an obligate riparian breeder and as there is no riparian habitat present in the BSA, this species has a low potential to occur. Transient birds stopping on their way to breeding grounds may be present and could be detected during general avian surveys.

2.2.1.3 Burrowing Owl

Guidance for conducting burrowing owl surveys is provided by the CDFW in the *Staff Report on Burrowing Owl Mitigation*. Methodology used to inform detection of burrowing owls in the BSA will follow these standards, specifically the nonbreeding season survey guidelines outlined in Appendix D (CDFW 2012).

2.2.1.4 White-Tailed Kite

There are no protocol surveys specific to the white-tailed kite. Due to an absence of such guidelines and an absence of suitable nesting habitat in the BSA, general avian surveys will be conducted in the accepted nesting bird season.

2.2.1.5 Northern Harrier

There are no protocol surveys specific to the northern harrier. Due to an absence of such guidelines and an absence of suitable nesting habitat in the BSA, general avian surveys will be conducted in the accepted nesting bird season.

2.2.1.6 California Black Rail

Although there is no existing protocol for the California black rail, timing of general avian surveys generally coincides with the timing recommended in the USFWS protocol for California Clapper Rail (synonymous with Ridgway's rail) (USFWS 2015).

2.2.2 Rare Plant Surveys

Guidance for conducting special-status rare plant surveys is provided in General Rare Plant Survey Guidelines (ESRP 2002), Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 1996), and Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFW 2009).

2.2.2.1 Salt Marsh Bird's-Beak

Surveys for salt marsh bird's-beak will follow the directives described in ESRP 2002, USFWS 1996, and CDFW 2009, taking into account the specifics of this species' natural history, including habitat requirements and blooming period.

2.2.2.2 Orcutt's Pincushion

Surveys for Orcutt's pincushion will follow the directives described in ESRP 2002, USFWS 1996, and CDFW 2009, taking into account the specifics of this species' natural history, including habitat requirements and blooming period.

2.3 Methods: Proposed Field Surveys

This section describes the proposed field surveys recommended for each class of species. Although agency-approved survey protocols do not exist for all of the species, the proposed methodologies are designed to maximize the likelihood of detection of each species in the BSA if they are present. Details pertaining to each species' methodologies are described in Sections 2.1 and 2.2. All field surveys will be completed before May 30, 2017. Based on the species' periods of activity, the surveys are being conducted in April, and May, and June to maximize the possibility of detection. A total of 13 field days of surveys is anticipated The number of field days is described below. A proposed schedule can be found in Section 3.

In addition to the activities described in this section, the following activities pertain to all field survey methods:

- **Biologists will generate a running list of all vertebrate and plant species encountered in the survey area. This is a standard protocol to characterize the typical flora and fauna of the project site. Of particular note would be:**
  - **Potential predators of sensitive species;**
  - **Species that may be confused with sensitive species, but were positively identified as common species; and**

  - Surrogate species that may be indicators of sensitive species.

- Insects, particularly beetles, will be identified to the lowest possible taxon.

- All reptiles encountered will be identified to species.

- If one of the identified sensitive species is detected:
  - Its location will be recorded on a Trimble GeoXT GPS; ~~and~~
  - Data will be noted on CNDDB forms, with particular emphasis on describing the organism's maturity/phenology, behavior, associated species, microhabitat, and environmental conditions for the day.~~,~~ ; and
  - CNDDB forms will be submitted to CDFW.

- Environmental conditions including wind speed, cloud cover, ambient temperature, and ground temperature will be recorded.

- Equipment required for all field surveys include:
  - Trimble GeoXT GPS Unit;
  - Kestrel Handheld Weather Meter; and
  - Camera (preferably with macro capabilities to identify globose dune beetle).

Species-specific proposed survey methods are described below.

2.3.1 Terrestrial Surveys

2.3.1.1 Field Surveys for Globose Dune Beetle

The globose dune beetle is flightless, nocturnal, ground-dwelling, and active year-round. These features of its biology make it possible to pitfall trap for it at any time of the year without the danger of killing organisms in the heat of the day.

Although the globose dune beetle is found year-round (NatureServe 2015), to establish the ideal survey period, several resources were reviewed to find a pattern of the timing in the detections. Only 34 dated CNDDB records exist for this species, including observations that are more than 10 years old, have ambiguous locality information, or describe locations that are now considered to have a poor-quality habitat. To examine a larger body of data, an additional 21 records were obtained between the Essig Museum of Entomology collection (Essig Museum Online Database 2017) and research-grade photographic records from CalPhotos (2007), Flickr (2007), and iNaturalist (2007). Combined, the records showed that this species or other *Coleus* beetles were sighted between January and November, with peak records between March through June. Surveys are recommended for April, which appears to be within the height of detection. A second round of surveys will be conducted in early May.

The following surveys are recommended for the globose dune beetle:

- ~~One~~ Two early daytime surveys for visual sign, one in April and one in May;
- Two ~~One~~ nighttime surveys for visual sign and beetles, one in April and one in May; and

- Two sets of two consecutive nights of pitfall trapping, one in April and one in May, for a total of four nights.

Visual Surveys

Two visual surveys are recommended for the globose dune beetle. These surveys will take place in moderate weather, and will be rescheduled if extreme windy, warm, or cold weather is noted during the survey period. Surveyors will be versed in the identification of globose dune beetle, including its larval stage, and its differentiation from the ciliate dune beetle. ~~An~~ The initial early daylight surveys may take place on the day the pitfall traps are set, or in the morning after they have been checked. The survey will require two biologists to walk transects, no more than 10 feet apart, through the entire BSA. During surveys, biologists will pay special attention to sandy areas under native vegetation that have the ideal microhabitat requirements of the beetle. Surveys will also involve lifting cover items to inspect the arthropod fauna beneath. Surveyors will also attempt to detect the beetle's distinct furrow marks in the soil surrounding vegetation.

The nighttime surveys may be conducted the night before the pitfall traps are installed, or the night after they have been removed. ~~This~~ These surveys will be identical to the daytime survey, but will pay closer attention to surface-active insects. Nighttime surveys can begin immediately after sunset.

Pitfall Trap Surveys

Pitfall trap surveys are recommended due to the small size of the beetle (0.39 inch [1 centimeter] or less) (Doyen 1976), its potentially low densities, and its nocturnal habits that lower the effectiveness of visual surveys.

For the P3 survey, pitfall traps will be placed at 20 traps per acre. Rather than setting up the traps in an array, as done by previous studies, they will be installed in areas that meet the microhabitat requirements of the beetle. Prior to ground disturbance, the area will be surveyed for special-status plant species.

Biologists will conduct research in advance to make sure that there is no predicted precipitation during the two nights and mornings the traps will be in use. Closed traps will be installed the day before a night trapping, and reused the following night. During the day, the traps will remain closed. If precipitation occurs unexpectedly during the trapping night, the surveyors will return to the site and close the lids of the traps.

Traps will be buried so that the rim of the container is level with the surrounding soil. A piece of detritus or nearby leaves will be placed in each container to provide cover, a food source, and visual blockage from likely predators.

Traps will be opened at sunset and inspected the following morning, early enough that the last trap is emptied no later than 1 hour after sunrise. The organisms found inside will be removed, and the lids will be closed. Bycatch will be released within 3 feet of their trap site. If any dune

beetle (*Coelus*) is found in the traps, the location will be marked by GPS. The beetle will be subsequently placed in a cardboard container and set aside in shade until all the traps have been fully evacuated and closed. Surveyors will return to photograph, measure, and confirm the identity of the beetle before releasing it in the suitable habitat nearest to where it was trapped. Traps will be removed the morning after the second trapping event.

Small 16-ounce plastic deli containers are recommended as pitfall traps. The ciliate dune beetle (*Coelus ciliatus*), a species related to the globose dune beetle, cannot climb out of cylindrical 16-ounce plastic deli containers (personal observation, Ivan Parr, 2016); therefore, it seems likely that globose dune beetles would also be unable to do so. This style is also suggested because metal cans may overheat, potentially harming organisms that fall inside. Glass jars of the same size might be superior to plastic in sturdiness, but are more cumbersome. Cardboard containers, while cost-effective, may not withstand moisture in the soil and may easily dent, providing footholds that could help the beetle escape. Larger plastic buckets used in other trapping studies would maximize soil disturbance and potentially entrap lizards.

Limitations to the Proposed Survey Method

Because globose dune beetles are small (less than 0.39 inch) and are also uncommon, good conditions while surveying and trapping will be necessary to maximize detection. Nighttime and trapping surveys should be timed to avoid extremely warm or cold temperatures that may not suit the beetle. Daytime and nighttime surveys should be timed to avoid strong wind that could conceal evidence of their furrows or limit their activity on the surface. There is also a chance that predators such as raccoons (*Pyrocon lotor*), rats (*Rattus* spp.), foxes (*Urocyon* and *Vulpes*), and skunks (*Mephitis mephitis*) could take beetles trapped in the containers. If it becomes clear that predation is taking place in the traps, all sign of predators will be noted, and surveyors will place a weighted sheet (metal, brick, or plastic) across the center of each trap to cover as much as possible while still allowing for organisms to fall through the cracks.

2.3.1.2 Field Surveys for Reptiles

The proposed methodology for surveying two-striped garter snake, California legless lizard, and Blainville's horned lizard share certain activities. The general herpetological data collection has used coverboards to detect the presence of reptiles. AECOM will place ~~20~~ wooden coverboards in the BSA a minimum of 1 week prior to surveys, at a ratio of four boards per acre. Because surveys are anticipated to begin the week of April 10, 20 coverboards will be placed during the week of March 27 and ~~,~~additional coverboards will be placed the week of April 10.

Coverboards will measure approximately 2 feet by 4 feet and be located on areas with appropriate habitat characteristics, including sufficient vegetative cover (where vegetative cover is present) and a vegetative cover component consisting of native plant species (where native plant species are present). Special care will be taken to avoid placing coverboards on top of species of *Astragalus* (if present). Prior to placement, the area will be surveyed for special-status plant species. The newly introduced coverboards will be allowed to remain undisturbed for a minimum of 1 week to allow them to become naturalized. Naturalized coverboards are more likely to support a baseline invertebrate fauna and, in turn, a prey base. After this period, the coverboards will be surveyed at approximately 1-week intervals~~, every~~

~~week,~~ throughout April and into May 2017, for a total of 4 weeks. Coverboards will be checked for presence of California legless lizards, two-striped garter snake, the Blainville's horned lizard, and additional wildlife (including globose dune beetle) by lifting the boards and visually scanning the underlying sandy soils, followed by gently raking the surface to locate any individuals that are immediately beneath the surface of the substrate. All captured native wildlife species found beneath the boards shall be recorded and replaced under the coverboard.

Total surveys for all reptiles will include:

- Coverboard inspections every week (starting 1 week after placement), for a total of 4 weeks.

Additional survey methods specific to each species are described in the following sections.

2.3.1.2.1 Two-Striped Garter Snake

The two-striped garter snake can be detected diurnally and is active almost year-round (Stewart 1972). However, the citizen science-based reporting platform iNaturalist shows a pronounced increase of records in April, with more than twice as many research-grade observations (42) as the next-highest month (March, with 20) (iNaturalist 2017). CNDDB (2017) shows 156 observations of this species. A subset of 36 presumed extant records from the last 10 years also showed that April had double the number (14) of observations as the next-highest month (May, with 7). Therefore, surveys will be conducted~~mpleted~~ in April, with one additional survey in May.

Snakes passing through the BSA are most likely to be transients, because the nearest permanent water is 660 feet from the BSA. Based on this factor, trapping surveys would likely have low yield and could be detrimental to this aquatic species.

The following methods are recommended:

- ~~Two~~ Four days of daytime visual surveys, conducted ~~2~~ 1 week~~s~~ apart.

Two biologists will conduct visual surveys using meandering walking transects through the BSA to identify two-striped garter snakes. Transects would be no more than 15 feet apart and cover the entire BSA. Surveys will be conducted on warm sunny days with minimal wind (65 to 75 degrees Fahrenheit, with winds less than 10 miles per hour).

Limitations to the Proposed Survey Method

Limitations to the proposed methodology include the possibility that snakes moving away from surveyors may not be detected by transects; or the possibility that transient snakes entering the BSA may not do so during the 2 days of surveys. However, the general field surveys recommended for reptiles (Subsection 2.3.1.2) will increase the chances of finding the species under coverboards.

2.3.1.2.2 California Legless Lizard

Due to the low success of both low-impact visual surveys and coverboards for the California legless lizard (see Section 2.1.4), it is recommended that moderate-impact surveys be used to detect this species. Kuhnz et al. 2005 concluded that the most efficient method of detecting the California legless lizard was to use hand tools to assist with detection.

Surveys will be done in the spring, while soils contain some moisture and conditions are temperate. iNaturalist (2007) data indicate that the majority of sightings for *Anniella pulchra* are in March and April and the majority of sightings for *Anniella stebbinsi* are in March, based on 75 records. CNDDB reports 99 occurrences of the collective "silvery legless lizard."[3] A subset of these was refined to include only presumed extant records from the last decade. Of these 35, there was a range of records from January to November; the majority fall in February, but high records extend into April (CNDDB 2017). Based on these data, surveys are recommended to be completed prior to May. Surveys will be conducted ~~mpleted~~ in April, with one ~~an~~ additional survey in May.

The recommended survey method for California legless lizard is as follows:

- **~~Two~~ Four surveys of moderate-impact search plots, conducted 1 week apart~~separated by 2 weeks~~.**

We recommend that two biologists conduct ~~three~~ time-constrained plots across the BSA (with a ratio of two plots per acre), with the plots chosen in a grid pattern across the BSA.

Surveys will be conducted within 4 hours of sunrise, when lizards are most likely to be near the surface. Each survey will be conducted for 30 minutes and will disturb a maximum of a 15-foot by 15-foot grid. Biologists will use hand tools to remove duff layers and annual vegetation, and then dig down to a minimum depth of 6 inches. If soil conditions allow, raking will occur to a maximum depth of 22 inches. Specifically, the placement of some of the grids will target iceplant mats to ensure that this habitat type is surveyed. Perennial vegetation would be pushed aside in this method but left in place. Members of the genus *Astragalus* will be avoided (if present). Prior to ground disturbance, the area will be surveyed for special-status plant species.

If a California legless lizard is detected, it will be identified to species based on Papenfuss and Parham (2013), its locality will be recorded with a Trimble GeoXT GPS, and it will be photographed. The individual would then be released adjacent to the plot, and monitored until it has completely burrowed into the sand, to ensure its protection from predators or desiccation.

Limitations to the Proposed Survey Method

As described in Section 2.1.4, low-impact visual surveys and use of coverboards yielded low results for the species even where it was abundant. The moderate-impact surveys recommended here can be used to confirm that the California legless lizard is present, but negative results are not sufficient to assume absence of the species.

[3] **A former name of the California legless lizard used by CDFW, which would be inclusive of any species occurring in Ventura County.**

2.3.1.2.3 Blainville's Horned Lizard

Blainville's horned lizards are diurnal, tend to be found in open areas, and are relatively predictable in terms of their surface activity. Therefore, surveys can be conducted with less impact or invasion than for other reptiles.

There are more than 700 records of this species in CNDDB. A subset of these data was used to determine the best time to survey for the species. A review of presumed extant records from the last 10 years that had an "excellent" or "good" occurrence ranking showed that close to half of these 84 records were reported between April and May (CNDDB 2017). These data are corroborated by iNaturalist (2017) records, which show a dramatic increase of records from March into May, with more than 60 percent of the sightings recorded in these 3 months. Surveys are recommended to be timed for the apparent height of the lizard's activity, in April. An additional survey will be conducted in May.

The following survey methods are recommended:

- **~~Two~~ Four days of diurnal visual surveys, conducted 1 week apart~~2 weeks apart~~, including:**
  - **Meandering transects; and**
  - **Harvester ant mound surveys.**

Two biologists will conduct visual surveys on foot during temperatures representative of the lizard's surface activity, which appears to be between 57 and 86 degrees Fahrenheit (Gerson 2011, Forde Biological Consultants 2006). Each survey will span 4 hours, centered on the middle of the day if temperatures fall on the middle or lower tolerance range; or in the mornings and afternoons if they fall on the higher tolerance range of the species' diurnal activity.

Meandering Transects

Meandering transects will be spaced roughly 10 feet apart, and cover the entire BSA. During surveys, biologists will note the vegetation present and the potential food items of the lizard (particularly harvester ants). Biologists will carefully lift cover items and plant debris and search around the bases of shrubs for resting lizards. If Blainville's horned lizard is detected, the animal will not be handled.

Biologists will take special note of the presence of potential predators such as shrikes, roadrunners, opossums, raccoons, snakes, feral cats, and dogs. Additionally, biologists will note the presence of argentine ants, which displace native harvester ants.

Harvester Ant Mound Surveys

If a harvester ant mound is located, surveyors will conduct focused surveys around them, looking for Blainville's horned lizard. Surveyors will walk in spiraling transects 3 feet apart for a 40-meter radius around the ant mound, searching carefully to avoid unintended trampling of lizards or ant mounds. Harvester ant mounds that are encountered during the first survey will be marked on a Trimble GeoXT GPS and revisited during the second survey and during any subsequent visit to the site.

Limitations to the Proposed Survey Method

Surveys will need to be timed when the species is active (Hager and Brattstrom 1997). Therefore, biologists will plan ahead to ensure that surveys are conducted during a time that falls within the temperature tolerance of the Blainville's horned lizard.

2.3.2 Avian Surveys

To address surveys for the western snowy plover, California least tern, least Bell's vireo, burrowing owl, northern harrier, white-tailed kite, and the California black rail, general nesting bird surveys will be conducted in the generally referred nesting period. For the Ventura County area, this is recognized by agencies such as CDFW and USFWS as the period of February 1 through August 31.

2.3.2.1 Western Snowy Plover and California Least Tern

Surveys will be conducted in the spring to capture potential nesting activity by each of these species. General avian surveys will be conducted weekly in the BSA through April and into May, for a total of five surveys, to document all avian use of the BSA, with focus on documenting nesting activity by all species observed in the BSA. Avian surveys will be conducted ~~through~~during April and May, coinciding with the timing of ongoing biological surveys in the BSA.

A qualified biologist will complete walking meandering transects through each habitat in the BSA. The biologist will search for western snowy plover and California least tern individuals. If an individual is observed, the biologist will determine what behaviors are being displayed (nest building, nesting, foraging). If present, nest sites will be identified and recorded. The biologist will take great care to not approach any nest nor linger near a nest site, because predators have taken to using these behaviors, including footprints, as clues to nest site locations. Surveys will be conducted weekly through April and into May, for a total of five surveys. All avian species detected in each habitat will be documented. Avian surveys will be conducted within 4 hours of sunrise, to capture peak activity of activity for most avian species. Additionally, surveys should not be conducted during periods of inclement weather, when bird activity is generally lowest.

Limitations to the Proposed Survey Method

Though unlikely, given the mobility of avian species such as western snowy plover and California least tern, occurrence of a transient individual traversing the BSA is possible outside of the survey window.

The nesting bird season is generally referred to by agencies such as CDFW as the period of February 1 through August 31. Nesting activity in the BSA is therefore possible, though unlikely due to absence of suitable habitat, beyond the proposed avian survey window that concludes in April.

2.3.2.2 Least Bell's Vireo

Surveys will be conducted in April to capture potential nesting activity, because this species is generally known to migrate from wintering areas by the end of March. General avian surveys will be conducted weekly in the BSA through April and May, for a total of five surveys, to document all avian use of the BSA, and will focus on documenting nesting activity by all species observed in the BSA. Attention to auditory calls will be made where dense shrub or tree vegetation is present; however, recorded auditory calls will not be played and no additional permits for surveys will be required (USFWS 2001).

General avian surveys will be conducted in conjunction with ongoing spring biological surveys in the BSA. All avian use of the BSA will be observed and recorded.

Limitations to the Proposed Survey Method

Though unlikely to be nesting in the BSA, given the high mobility of avian species such as least Bell's vireo, occurrence of a transient individual traversing the BSA is possible outside of the survey window. The nesting bird season is generally referred to by agencies such as CDFW as the period of February 1 through August 31. Nesting activity in the BSA is therefore possible, though unlikely due to absence of suitable habitat, beyond the proposed avian survey window that concludes in April.

2.3.2.3 Burrowing Owl

As discussed, survey protocols for burrowing owl will follow the guidelines described in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). The following protocol will be used:

- **Prior to surveys, biologists will check weather conditions. Surveys will only be conducted when there is no precipitation, cloud cover is less than 75 percent, and the wind speed is less than 12 miles per hour.**
- **Surveys will consist of walking transects, spaced 20 feet apart, through the entire BSA. During surveys, biologists will note habitat quality and potential burrows; as well as indicators such as pellets, bones, whitewash, prey remains, scat, and other sign. Signs of potential predators and prey items will also be noted. Within every 300 feet, biologists will stop and scan the landscape for owls, listening for calls.**
- **If burrowing owls are detected, biologists will also attempt to determine whether any owls have leg bands, which will be reported to the Bird Banding Laboratory. All owl sightings will be recorded using a Trimble GeoXT GPS unit and described using a CNDDB rare species form.**
- **A total of four surveys will be conducted, spaced at least 1 week apart. Three surveys will be conducted in April~~/~~ and May, and one survey will be conducted after June 15.**

Limitations to the Proposed Survey Method

Though unlikely, given the fossorial nature of burrowing owls, it is possible that individuals may occur in the BSA and not be observed during surveys. However, investigations of any

potentially suitable burrows are likely to detect evidence of owls, including white wash, pellets, feathers, and prey remains, even if owls are not observed directly. Additionally, transient individuals may occur in the BSA outside of the survey window.

2.3.2.4 Northern Harrier and White-Tailed Kite

A qualified biologist will complete walking meandering transects through each habitat in the BSA. The biologist will search for northern harrier and white-tailed kite individuals. If an individual is observed, the biologist will determine what behaviors are being displayed (nest building, nesting, foraging). If present, nest sites will be identified and recorded. Surveys will be conducted weekly through April and into May, for a total of five surveys. All avian species detected will be documented. Avian surveys will be conducted within 4 hours of sunrise to capture peak activity of activity for most avian species. Additionally, surveys will not be conducted during periods of inclement weather, when bird activity is generally lowest.

Limitations to the Proposed Survey Method

Though unlikely, given the highly mobile nature of these species, individuals may occur in the BSA transiently outside the survey window. As discussed, long-term residence, including nesting and regular use of the BSA for foraging, are not anticipated due to a lack of suitable habitat for these species.

2.3.2.5 California Black Rail

General avian surveys will be conducted in the spring, on a weekly basis through April. Although there is no existing protocol for the California black rail, timing of general avian surveys generally coincides with the timing recommended in the USFWS protocol for California Clapper Rail (synonymous with Ridgway's rail) (USFWS 2015). A qualified biologist will complete walking meandering transects through each habitat in the BSA. Particular focus will be directed toward habitat features likely to be used or attract the California black rail. The biologist will visually and auditorially search for California black rail individuals. If an individual is observed, the biologist will determine what behaviors are being displayed (nest building, nesting, foraging). If present, nest sites will be identified and recorded. Surveys will be conducted weekly through April and into May, for a total of five surveys. All avian species detected will be documented. Avian surveys will be conducted within 4 hours of sunrise to capture peak activity of activity for most avian species. Additionally, surveys will not be conducted during periods of inclement weather, when bird activity is generally lowest.

Limitations to the Proposed Survey Method

Survey techniques such as call playback will not be used; therefore, detection probability could be reduced due to the lack of broadcasting California black rail vocalizations as a prompt.

The nesting bird season is generally referred to by agencies such as CDFW as the period of February 1 through August 31. Nesting activity in the BSA is therefore possible, though unlikely due to absence of suitable habitat, beyond this proposed avian survey window that concludes in April.

2.3.3 Botanical Surveys

2.3.3.1 Field Surveys for Ventura Marsh Milkvetch

Field surveys for the Ventura marsh milkvetch are based on existing protocol-level guidance provided by The California Natural Resources Agency (2009), USFWS (1996), and CDFW (2009). The recommended surveys are additional to the focused botanical surveys conducted for this species in 2015 (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]).

Surveying for this species must take into consideration the fact that Ventura marsh milkvetch numbers fluctuate dramatically from year to year (CNPS 2017, 69 FR 29081, 66 FR 54808, USFWS 2010). Milkvetch seeds are apparently able to germinate during favorable conditions, but of these, only about 25 percent may survive through the growing season (Ikeda and Meyer 2000, Wilken and Wardlaw 2001 in Jensen 2007). In a study of the North Shore at Mandalay Bay population, Wilken and Wardlaw (2001) demonstrated that among a population of 80 adult plants, fewer than 50 percent survived in a growing season and nearly half of the remainder did not flower. Snails are a major cause of die back, with reports of 75 percent of the plants at a site being killed by snails in April (Ikeda and Meyer 2000). Soza et al. (2003) also reported herbivory by snails, peaking before the end of April.

Considering the low survival rate during the year, and the potential for the plants to skip years flowering (Jensen 2007), it is recommended that surveys take place shortly after the growing season begins (March), rather than during the plants' June through October blooming period. This would maximize the ability to detect juveniles or weaker plants that could senesce or be killed before the end of spring. The Ventura marsh milkvetch is a distinctive perennial species that can be identified from vegetative characteristics (Munz 1974, Baldwin et al. 2012). With the significant rainfall during the winter and spring of 2016 to 2017, the spring of 2017 should be a good representative year for surveys.

Based on these factors, and to best augment the surveys conducted in 2016, additional ~~the proposed~~ field surveys ~~are recommended for April 2017. These would~~will include:

- **Two protocol-level rare plant surveys of the BSA in April 2017, separated by 2 weeks; ~~and~~**
- **A search for Ventura marsh milkvetch during the May 2017 BSA survey for the Orcutt's pincushion and salt marsh bird's-beak, as described in Subsections 2.3.3.2 and 2.3.3.3;**
- **One protocol-level rare plant survey of the BSA in June 2017; and**
- **Two reference population surveys to verify vegetative individuals and blooming, as feasible and subject to accessibility.**

Protocol-Level Rare Plant Surveys – Biological Survey Area

The surveys will be performed by two biologists on foot. They will take place on the entire BSA in the form of slow-paced walking transects, spaced no greater than 10 feet apart. All plant species encountered during these surveys will be identified to the lowest possible taxon, using the Jepson Manual (Baldwin et al. 2012).

During these surveys, biologists will characterize the habitat for Ventura marsh milkvetch, and use a Trimble GeoXT GPS to map any nonflowering members of the genus *Astragalus*. These individuals will be monitored for the remainder of the project.

If a Ventura marsh milkvetch is found, it will not be collected for voucher or for identification without prior notification to USFWS and CDFW. A collection will be made in accordance with the CDFW Plant Voucher Collecting Permit. No more than two plants, or 10 percent of the population (whichever is fewer) will be collected for voucher. If there are 10 or fewer plants present, only enough material to identify the plant will be collected. The voucher will be stored at the California Academy of Sciences, a herbarium that is approved by the CDFW and part of the Consortium of California Herbaria (CCH).

Protocol-Level Rare Plant Surveys – Reference Populations

Subject to accessibility, ~~R~~reference population visits will be chosen within 10 miles of the BSA. These visits will be performed within 2 days of each protocol-level survey. Reference populations will assist in determining the phenology of the species during the given survey time and also help confirm the identification of plants found in the BSA.

Limitations to the Proposed Survey Method

Ventura marsh milkvetch may remain dormant for years (Ikeda and Meyer 2000), or present in very low numbers, where it is known to occur (CNPS 2017, 69 FR 29081, 66 FR 54808, USFWS 2010). However, reference population surveys will confirm the species' physical development during the time surveys are being conducted, and will aid in identification. Although the species can be identified by vegetative characteristics, surveys will map all members of the genus *Astragalus* found in the project site to avoid uncertainty.

2.3.3.2 Salt Marsh Bird's-Beak

Field surveys for salt marsh bird's-beak are based on existing guidance provided by ESRP (2002), ~~and~~ the California Natural Resources Agency (2009), USFWS (1996), and CDFW (2009). The recommended surveys include focused botanical surveys in potentially suitable habitat for this species, taking into consideration the fact that this species can exhibit dramatic fluctuations in its population year-to-year, dependent on seed dispersal and establishment of suitable microhabitats that provide the required conditions for germination (USFWS 1985b).

Based on these factors, the proposed field surveys will be conducted in April and early May 2017, and will be conducted throughout the BSA, with a particular focus on all potentially suitable coastal dune, coastal salt marsh or swamp, and freshwater seep habitats. Surveys of reference populations will be conducted to verify blooming. Surveys will be conducted concurrently with other focused botanical surveys and related field investigations.

~~A minimum of four s~~Surveys would include:

- ~~Two~~ Three protocol-level rare plant surveys of the BSA:
  - ~~One~~ Two in April 2017 to identify vegetative individuals; and
  - One in May 2017 during the blooming period to identify individuals to species; and

- Two reference population surveys to verify vegetative individuals and blooming, as feasible and subject to accessibility.

Protocol-Level Rare Plant Surveys – Survey of the BSA

The surveys will be performed by two biologists on foot. They will take place on the entire BSA in the form of slow-paced walking transects, spaced no greater than 10 feet apart. All plant species encountered during these surveys will be identified to the lowest possible taxon, using the Jepson Manual (Baldwin et al. 2012).

During these surveys, biologists will characterize the habitat for salt marsh bird's-beak, and use a Trimble GeoXT GPS to map any nonflowering members of the genus *Cordylanthus*. These individuals will be monitored for the remainder of the project.

If an individual salt marsh bird's-beak is found, it will not be collected for voucher or for identification without prior notification to USFWS and CDFW. A collection will be made in accordance with the CDFW Plant Voucher Collecting Permit. No more than two plants or 10 percent of the population (whichever is fewer) will be collected for voucher. If there are 10 or fewer plants present, only enough material to identify the plant will be collected. The voucher will be stored at the California Academy of Sciences, a herbarium that is approved by the CDFW and part of the CCH.

Protocol-Level Rare Plant Surveys – Reference Populations

Subject to accessibility, ~~R~~reference population visits will be chosen within 10 miles of the BSA. These visits will be performed within 2 days of the BSA survey. Reference populations will assist in determining the phenology of the species during the given survey time, and will also help confirm the identification of plants found in the BSA.

Limitations to the Proposed Survey Method

Salt marsh bird's-beak exhibits dramatically fluctuating population numbers year-to-year and may be present in very low numbers (USFWS 1985b). However, reference population surveys, if feasible, will confirm the species' physical development at the time of the BSA survey, as well as aid in identification. Although this species can be identified by vegetative characteristics, surveys will map all members of the genus *Cordylanthus* found in the BSA to avoid uncertainty.

2.3.3.3 Orcutt's Pincushion

Field surveys for Orcutt's pincushion are based on existing guidance provided by ESRP (2002), ~~and~~ the California Natural Resources Agency (2009), USFWS (1996), and CDFW (2009). The recommended surveys include focused botanical surveys in potentially suitable habitat for this species.

Based on these factors, the proposed field surveys will be conducted in April and May 2017 and will be conducted throughout the BSA, with a particular focus on all potentially suitable coastal dune and coastal bluff habitats. Subject to accessibility, ~~S~~surveys of reference populations will

be conducted to verify blooming. Surveys will be conducted consecutive to other focused botanical surveys and related field investigations.

~~A minimum of four s~~Surveys would include:

- ~~Two~~ Three protocol-level rare plant surveys of the BSA:
  - ~~One~~ Two in April 2017 to identify vegetative individuals; and
  - One in May 2017 during the blooming period to identify individuals to species; and
- Two reference population surveys to verify vegetative individuals and blooming, as feasible and subject to accessibility.

Protocol-Level Rare Plant Surveys – Survey of the BSA

The surveys will be performed by two biologists on foot. They will take place on the entire BSA in the form of slow-paced walking transects, spaced no greater than 10 feet apart. All plant species encountered during these surveys will be identified to the lowest possible taxon, using the Jepson Manual (Baldwin et al. 2012).

During these surveys, biologists will characterize the habitat for Orcutt's pincushion, and use a Trimble GeoXT GPS to map any nonflowering members of the genus *Chaenactis*. These individuals will be monitored for the remainder of the project.

If an individual Orcutt's pincushion is found, it will be collected for voucher or for identification. A collection will be made in accordance with the CDFW Plant Voucher Collecting Permit. No more than two plants, or 10 percent of the population (whichever is fewer) will be collected for voucher. If there are 10 or fewer plants present, only enough material to identify the plant will be collected. The voucher will be stored at the California Academy of Sciences, a herbarium that is approved by the CDFW and part of the CCH.

Protocol-Level Rare Plant Surveys – Reference Populations

Subject to accessibility, ~~R~~reference population visits will be chosen within 10 miles of the BSA. These visits will be performed within 2 days of the BSA survey. Surveys of reference populations will verify that the phenology of the species during the given survey time and also help confirm the identification of plants found in the BSA.

Limitations to the Proposed Survey Method

Orcutt's pincushion may be difficult to identify to species outside the blooming period. However, reference population surveys will confirm the species' physical development at the time of the BSA survey, as well as aid in identification. Although this species can be identified by vegetative characteristics, surveys will map all members of the genus *Chaenactis* found in the BSA to avoid uncertainty.

3 Survey Schedule

A rough timeline of items related to the P3 Survey Methods is as follows. A schedule for the actual surveys is included in Table 1.

- **Draft Survey Methods Memorandum: due March 27**
- **Agency/Party Review of Survey Methods Memorandum: March 27 through April 7**
- **Preparation for surveys: March/early April**
- **Surveys conducted: April, ~~and~~ May, and June**
- **Survey Results Report preparation: ~~May~~June**

Table 1
Summary of the Number and Timing of Proposed Surveys

	Survey Type	Timing
Globose Dune Beetle	2 nights trapping surveys	April (prior/after to below activity)
	Daytime Survey	April
	Nighttime Survey	April
	2 nights trapping surveys	May (prior/after to below activity)
	Daytime Survey	May
	Nighttime Survey	May
Two-Striped Garter Snake/Blainville's Horned Lizard	Visual Survey	Once per week through April and into May, four total
	~~Visual Survey~~	~~April (2 weeks later)~~
	Coverboard Placement	Week of March 27, April 10
	Coverboard Surveys	Once per week through April and into May, four total
California Legless Lizard	Raking Survey	Once per week through April/May, four total~~April~~
	~~Raking Survey~~	~~April (2 weeks later)~~
	Coverboard Placement	Week of March 27, April 10
	Coverboard surveys	Once per week through April and into May, four total
Western Snowy Plover/ California Least Tern/ Least Bell's Vireo/White Tailed Kite/Northern Harrier/California Black Rail~~/Burrowing Owl~~	Avian Surveys	Once per week through April and into May, five total
Burrowing Owl	Transect Surveys	Four surveys total: three surveys in April/May, spaced 1 week apart, and one survey after June 15
Ventura Marsh Milkvetch/Salt Marsh Birds-beak/Orcutt's Pincushion	Initial survey	April
	First Reference Population Survey	Within 2 days of initial survey
	Second Survey	April (2 weeks later)
	~~Second Reference Population Survey for Ventura Marsh~~	~~Within 2 days of second survey~~

Table 1
Summary of the Number and Timing of Proposed Surveys

	Survey Type	Timing
	~~(Milkvetch)~~	
	Third Survey	Early to Mid-May
	Second Reference Population Survey for Salt Marsh Birds-beak/ Orcutt's Pincushion	Within 2 days of third survey
	Fourth Survey	Early June
	Second Reference Population Survey for Ventura Marsh Milkvetch	Within 2 days of fourth survey

4 Survey Personnel

The proposed surveys would be conducted by the following biologists. Résumés for each of these individuals are included in Appendix A.

- **Jane Donaldson, Senior Biologist, AECOM. More than 20 years of professional experience (10 with AECOM).**
  - **California legless lizard (*Anniella pulchra*): More than 75 positive contact hours in San Luis Obispo County, California.**
  - **Two-striped garter snake (*Thamnophis hammondii*): More than 20 positive contact hours in Santa Barbara County, California.**

- **Julie Love, Senior Restoration Ecologist and Biologist, AECOM. More than 15 years of professional experience (12 with AECOM).**
  - **CDFW Scientific Collecting Permit**
  - **CDFW California Endangered Species Act Voucher Collection Permit for Endangered, Threatened, and Candidate Species**

- **Julie Niceswanger Hickman, Senior Biologist, AECOM. 24 years of professional experience (more than 10 with AECOM).**
  - **CDFW Scientific Collecting Permit**

- **Ivan Parr, Senior Ecologist, AECOM. 11 years of professional consulting experience (8 with AECOM).**
  - **CDFW California Endangered Species Act Voucher Collection Permit for Endangered, Threatened, and Candidate Species**

- **Wayne Vogler. Natural Resources Group Manager, AECOM. 22 years of professional experience (more than 10 with AECOM).**
  - **12 years of coastal dune habitat experience (surveys, weed eradication, and restoration) along the California Central Coast.**

5 References

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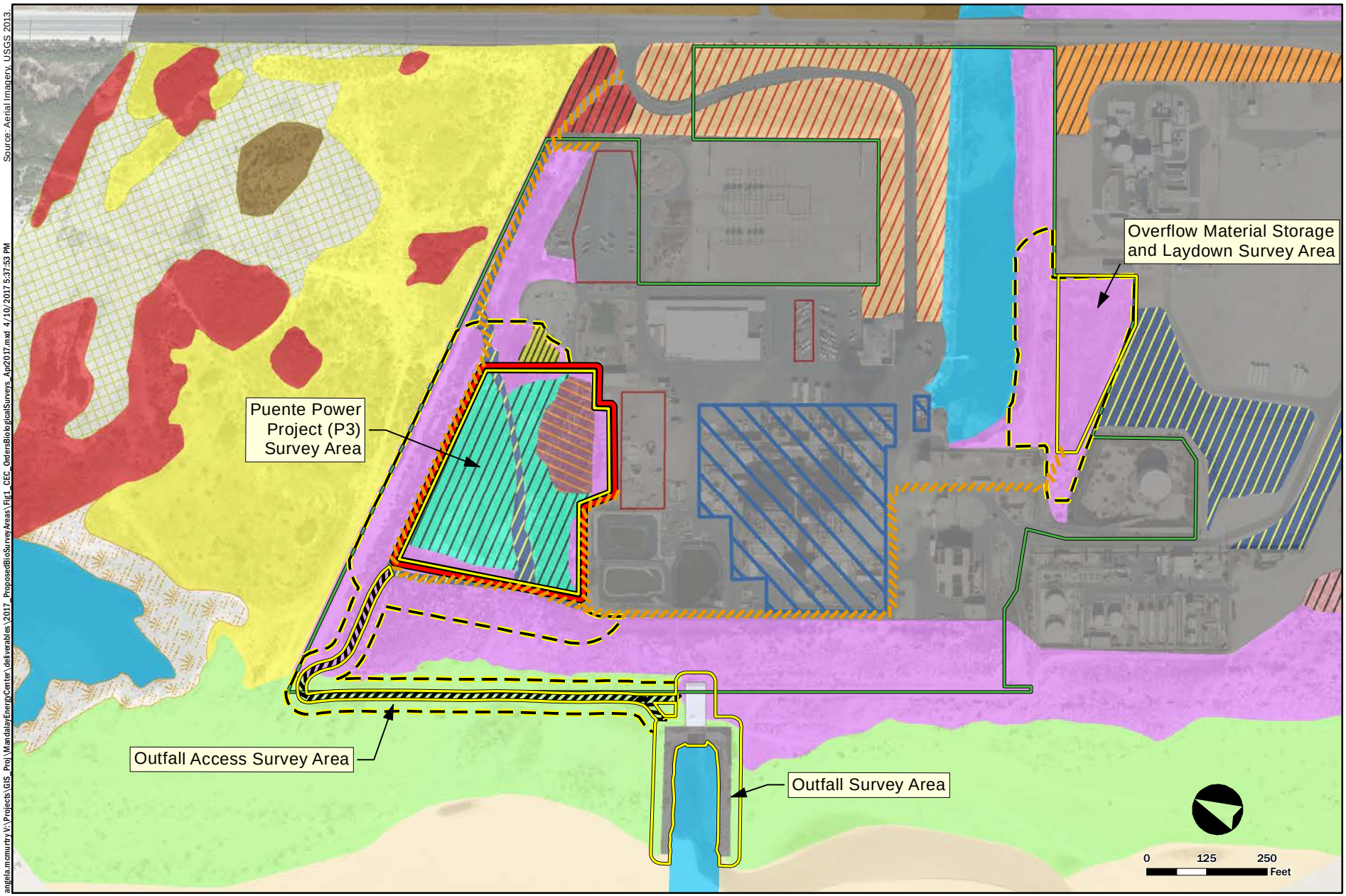
Figures



Survey Area - Footprint (5.6 ac)

Survey Area - Buffer (4.78 ac)

Project Components

Puente Power Project (P3) Site

Access to Outfall

Demolition Access on Existing Roads

Mandalay Generating Station Property

Aboveground Demolition

Construction Parking and Laydown

Vegetation Communities and Land Cover Types

Culverted water

California bulrush marsh

Arroyo willow thickets

Arroyo willow thickets/Ornamental

California sagebrush scrub (installed)

Coyote brush scrub

Developed

Dune mats

Habitat restoration in progress

Ice plant mats

Ice plant mats/European beach grass swards

Mule fat scrub (Habitat restoration in progress)

Mock heather scrub

Myoporum grove

Ornamental

Open water

Ruderal

Sandy beach

Wooly seablite scrub/ice plant mats

PROPOSED BIOLOGICAL SURVEY AREAS

NRG
Puente Power Project
April 2017 Oxnard, California

FIGURE 1

Appendix A
Résumés of Proposed Survey Personnel

AECOM

Jane Donaldson
Biologist

Education

BS, Biological Sciences, California Polytechnic State University, San Luis Obispo, 1993

Years of Experience

With AECOM (URS): 10 Years
With Other Firms: 11 Years

Training and Certifications

Biology and Conservation of the California Tiger Salamander Workshop (2013)
San Joaquin Kit Fox Workshop (2013)
Western Burrowing Owl Workshop (2013)
Desert Tortoise Field Techniques Workshop (2013)
USFWS Project Authorized to Survey, Handle, and Relocate California Red-legged Frogs
OSHA 40-hour HAZWOPER Trained
OSHA Refresher March 2014
OSHA 10 Hour Construction Program - September 2014
Adult first Aid/CPR/AED Certified - April 2014
Behavior Based Safety, 2016
California Boater Education Certification December 2014

Technical Specialties

Construction compliance monitoring sensitive, threatened and endangered birds, mammals, amphibians and plants of California
Wildlife surveys
Vegetation surveys
Habitat restoration

Professional Affiliations

Central Coast Biological Society
The Wildlife Society California Central Coast and Northern California Chapters

Ms. Donaldson is a field biologist with over 20 years of professional experience working within a variety of native habitats within California. Her field work has included conducting wildlife surveys, overseeing construction compliance and compliance monitoring for a large remediation projects such as oil field remediation and restoration, and solar power projects. She has conducted surveys for San Joaquin kit fox, Tule elk, California red-legged frogs, California tiger salamander, western snowy plover, western burrowing owl, coast horned lizards, silvery legless lizards, two striped garter snakes, desert tortoise, and point-count bird surveys. Her habitat restoration and sensitive plant conservation efforts include general habitat surveys and coastal dune wetlands restoration using genetically local native plant species.

Project Specific Experience

Field Biologist, First Solar Northstar Solar Project, Fresno County, California, June 2014–2015. Conducted biological monitoring and nesting bird surveys during construction activities associated with the installation of a 640-acre solar power plant project. Targeted species include San Joaquin kit fox, Swainson's hawk and western burrowing owl.

Field Biologist, Chevron, Kern and San Luis Obispo County, California, September 2014–Current. Conducted pre-disturbance biological surveys, breeding/nesting bird surveys, wrote habitat impact reviews, and monitored the removal and abandonment of legacy pipelines within the Kern River, Midway-Sunset, McKittrick, and Estero Bay lease fields/pipelines. Target species include: blunt-nosed leopard lizard, San Joaquin kit fox, San Joaquin antelope ground squirrel, and western burrowing owl.

Field Biologist, Vandenberg Air Force Base, Santa Barbara County, California, April 2014–August 2014. Performed biological compliance monitoring associated with repairs at various points along the Point Pederales pipeline from off-shore oil Platform Irene to the Lompoc Oil and Gas Plant facility in Santa Barbara County. Target species included: seacliff buckwheat and El Segundo blue butterfly.

Field Biologist, Antelope Valley Solar Ranch One, Los Angeles County, California, March 2012–April 2014. Conducted biological monitoring of construction activities associated with the installation of a 2,100-acre solar power plant project, and its associated linears and towers. Captured and relocated small mammals, snakes and lizards. Conducted burrowing owl surveys and breeding bird surveys. Performed compliance monitoring for targeted plant species, wetland features, and oversaw habitat restoration efforts in the planting of native plant species.

Field Biologist, Hydrogen Energy California Project, Kern County, California, June 2010–September 2010. Conducted preconstruction surveys for blunt-nosed leopard lizard, burrowing owl, Swainson's hawk, and fairy shrimp. Coordinated, scheduled, and managed blunt-nosed

leopard lizard surveys for two weeks; assessed needs and obtained surveyors from outside offices to complete job within a restricted timeframe.

Field Biologist, Chevron San Ardo Oil Field, Monterey County, California, June 2010–October 2010. Conducted pre-disturbance biological surveys and habitat impact reviews for removal of old abandoned equipment and clean-up operations on several hundred acres of an active oil field. Conducted pre-disturbance surveys for San Joaquin kit fox utilizing motion cameras and track stations to determine presence/absence of kit fox under buildings slated for demolition.

Field Biologist, Chevron Escolle Lease, Santa Barbara County, California, September 2009–October 2010. Conducted biological monitoring of construction activities involving oil line abandonment projects with an emphasis on detecting California tiger salamander presence/absence. Performed night surveys and dip netting surveys for California tiger salamander, and oversaw the installation of pit traps at surveys sites lease-wide.

Biologist, Guadalupe Restoration Project, San Luis Obispo County, California, June 2000–April 2010. Monitored endangered, threatened, and sensitive plant and animal species during excavation activities on a 2,700 acre soil remediation site. Performed eye shine, egg mass and tadpole surveys for California red-legged frogs; was site specifically approved by U.S. Fish and Wildlife Service to handle California red-legged frogs. Conducted small mammal trapping, monthly bird surveys, sensitive plant species census, wetland restoration work, wildlife and habitat assessments, and maintained species lists. Submitted yearly capture data, and contributed to a Quarterly Ecological Monitoring Report (QEMR). Endangered, threatened, or sensitive species included: La Graciosa thistle, beach spectacle pod, Blochman's leafy daisy, surf thistle, silvery legless lizard, coast horned lizard, two-striped garter snake, and California red-legged frog.

Field Biologist/Endangered Species Technician, Camp Roberts/Camp San Luis Obispo Army National Guard, San Luis Obispo and Monterey Counties, California, June 1995–May 2000. Performed point-count bird surveys for five seasons on both installations for the U.S. Army National Guard Land Condition Trend Analysis program, as well as small mammal trapping sessions, vegetation surveys, and California red-legged frog surveys. Participated in helicopter surveys for Tule elk. Wrote annual reports and worked in rugged remote areas. Set up track stations and conducted spotlight surveys, live trapping sessions, and radio telemetry for San Joaquin kit fox presence and movement.

Surveyor, California State Parks, San Luis Obispo County, California, 1993–1994. Performed western snowy plover nest surveys on the Morro Bay sand spit for two seasons. Identified and recorded nest locations, tracked nest progression and fate during the season, recorded numbers of adults and sex, and number of fledglings.

Sensitive Wildlife Species Survey Experience

Blunt-nosed leopard lizard (*Gambelia sila*) – Level 1 Surveyor: One sighting in Kern County; 2 positive contact hours at a reference site in San Luis Obispo County, California.

California legless lizard (*Anniella pulchra*): Over 75 positive contact hours in San Luis Obispo County, California.

California red-legged frog (*Rana draytonii*): Over 9 years of experience observing, surveying, and handling California red-legged frogs in diverse habitats in San Luis Obispo County, California.

California tiger salamander (*Ambystoma californiense*): Over 4 hours of observing, dip-netting and handling metamorphs while attending workshop on the biology and conservation of the California tiger salamander, Livermore, California, May 2013.

Desert tortoise (*Gopherus agassizii*): Over 35 survey hours, 3 positive contact hours at proposed relocation site near Newberry Springs, California.

El Segundo blue butterfly (*Euphilotes battoides allyni*): Approximately 3 positive contact hours in Santa Barbara County, California.

Flat-tailed horned lizard (*Phrynosoma mcallii*): Three positive contact hours in El Centro, California.

Pacific pond turtle (*Actinemys marmorata*): Over 5 positive contact hours in San Luis Obispo County, California.

San Joaquin kit fox (*Vulpes macrotis mutica*): Over 25 positive contact hours in Monterey County, California.

Swainson's hawk (*Buteo swainsoni*): Over 5 positive contact hours in Kern County, California.

Two-striped garter snake (***Thamnophis hammondii***): Over 20 positive contact hours in Santa Barbara County, California.

Western burrowing owl (*Athene cunicularia*): Over 24 survey hours in Kern, San Luis Obispo, and Santa Barbara Counties, California.

Western snowy plover (*Charadrius alexandrinus nivosus*): Over 30 positive contact hours in San Luis Obispo County, California.

Western spadefoot toad (*Spea hammondii*): Over 10 positive contact hours in San Luis Obispo County, California.

Botanical Experience

Lompoc Oil and Gas Plant, Santa Barbara County, California, September 2014. Assisted in an oak mitigation survey, and in Jurisdictional Determination surveys.

PAPCO Dig Site, Santa Barbara County, California, May 2014. Performed reconnaissance survey for the endangered Gaviota tarplant in tandem with delineating staging and project areas for an oil pipeline repair project.

Vandenberg Air Force Base, Santa Barbara County, California, March–June 2016. Performed vegetation surveys along the Point Pederales pipeline. Sensitive species of interest included seacliff buckwheat and black-flowered figwort.

Guadalupe Restoration Project, San Luis Obispo County, California, June 2000-April 2010. Approved to monitor and participated in

population censuses for sensitive and endangered plant species including Federally Endangered and State Threatened La Graciosa thistle, and State Threatened surf thistle and beach spectacle pod. Oversaw construction activity to ensure minimization of impact and avoidance of sensitive species. Assisted in the vegetation restoration and monitoring of wetland habitats.

US Army National Guard, Camp Roberts, Monterey County, March 1995-June 2000. Conducted chaparral/coastal scrub, grassland, oak woodland, and riparian vegetation surveys using point transects and belts.

AECOM

Julie Love

Senior Restoration Ecologist and Biologist

Education

MESM/Environmental Science and Management/2003/Bren School of Environmental Science and Management, University of California, Santa Barbara

BS/Marine Biology/2000/ University of California, Los Angeles

Permits

CDFW Scientific Collecting Permit

USFWS Recovery Permit for Tidewater goby

CDFW Collecting Permit for Plants

Years of Experience

With AECOM: 11 years
With Other Firms: 4 years

Training

Surface Water Ambient Monitoring Program (SWAMP), field procedures and bioassessment concepts, presented by California Waterboard, April 2016

California Rapid Assessment Method (CRAM) Estuarine Module, presented by UC Davis Extension, October 2012

California Rapid Assessment Method (CRAM) Practitioner Training and Riverine Module, presented by UC Davis Extension, March 2012

Basic Wetland Delineation Training (40-hour), presented by the Wetland Training Institute, August 2008Basic Wetland Delineation Training (40-hour), presented by the Wetland Training Institute, August 2008

Ms. Love's combined work experience and education provide a wide range of ecological training with over 15 years of experience working in the fields of habitat restoration, botany, marine biology, terrestrial and aquatic wildlife, and ecosystem inventory, assessment, and monitoring. Ms. Love's position at AECOM involves managing and coordinating habitat restoration planning and monitoring, wetland delineations and jurisdictional determinations, biological resource evaluations, botanical surveys and mapping, special-status wildlife surveys, stormwater monitoring, stream and algae monitoring, fish relocation, and database management.

Experience

Biological Resource Evaluation

Technical Lead, Puente Power Project Application for Certification, NRG Oxnard Energy Center LLC. Conducted field efforts for the biology section of the Application for Certification (CEQA-equivalent document) and prepared biological resources sections for the various exhibits prepared thereafter for the proposed 262 megawatt natural gas-fired generation facility in Oxnard, California. Responsibilities included identifying and mapping sensitive biological resources, determining the applicable laws, ordnances, regulations, and standards governing biological resources at the facility, and evaluating the potential impacts and mitigation measures to be implemented during construction and management activities**.**

Gaviota Marine Terminal, Gaviota Terminal Company, Gaviota, California, 2014-Present. Lead author for the Biological Resources Assessment Report and task leader for the associated biological surveys for the 28 acre remediation and restoration project. The BRAR provided a description of existing biological resources within the Project site and surrounding area, identified any significant impacts to these resources that may result from the proposed Project, and recommended feasible mitigation measures that would avoid or substantially lessen these impacts to biological resources, including monarch butterflies. Lead author of the Conceptual Restoration Plan to restore riparian and upland habitats after remediation is completed in phases, with specific emphasis on improving foraging habitat for the monarch butterfly.

Ekwill Street and Fowler Road Extensions Project, City of Goleta, Goleta, California, 2010 – Present. Lead author of Biological Mitigation and Monitoring Plan for a road construction and extension project crossing over Old San Jose Creek. Components of the Plan include implementation of all mitigation

measures including the conceptual restoration plan, native tree inventory and protection plan, pre-construction biological surveys, and avoidance and minimization measures to be implemented during project construction. Co-author of the Biological Resources Report, and lead author of the wetland delineation/jurisdictional determination section.

Wetland Delineations/Assessments and Jurisdictional Determinations

Hyla Crossing, Freeport-McMoRan Oil & Gas, Arroyo Grande, California, 2013 – 2015. Field crew leader and lead author for the wetland delineation/jurisdictional determination of Pismo Creek at the Hyla crossing within the Arroyo Grande Oilfield.

Arroyo Grande Oilfield Phase V, Freeport-McMoRan Oil & Gas, Arroyo Grande, California, 2013. Field crew leader and lead author for the wetland delineation/jurisdictional determination of Pismo Creek and several unnamed drainages within the Arroyo Grande Oilfield. Lead author of off-site mitigation plan. Field crew leader and lead author for the wetland delineation/jurisdictional determination of Pismo Creek and several unnamed drainages within the Arroyo Grande Oilfield. Field crew leader for focused botanical surveys within the Arroyo Grande Oilfield. Technical reviewer for associated report.

Point Pedernales Repair Site, Freeport-McMoRan Oil & Gas, Vandenberg Air Force Base, California, 2013. Field crew leader and lead author for the wetland delineation/jurisdictional determination of three <1 acre sites along three drainages intersecting a pipeline repair site.

Gaviota Road Repair Site, Freeport-McMoRan Oil & Gas, Gaviota, California, February 2013. Field crew leader and lead author for the wetland delineation/jurisdictional determination of a <1-acre site along an unnamed tributary to Gaviota Creek intersecting a pipeline repair site.

Former Hercules Gas Plant, Shell Exploration and Production Company, Gaviota, California, 2009 and 2012. Field crew leader and lead author for the wetland delineation/jurisdictional determination for a 2-acre site along Cañada de la Huerta in 2009. Field crew leader and lead author for the wetland delineation/jurisdictional determination of a <1 acre site along Cañada de la Huerta in 2012.

Mission Village, Legacy, and Entrada Projects, Newhall Land and Farming Company, Santa Clarita Valley, California, 2012-2014. Field crew leader and lead author for the wetland delineation/jurisdictional determination of several canyons in the Santa Clara River watershed within the vicinity of the 12,000 acre Newhall Ranch site in the Santa Clarita Valley, California. Assessed the condition of the canyons using California Rapid Assessment Method (CRAM) and a methodology that was based on a combination of three established methods (CRAM, Hydrogeomorphic Approach [HGM], and Special Area Management Plan Landscape Level Functional Assessment

[SAMP LLFA]). Conducted 36 riverine and 2 depresssional CRAMs.

Former Hercules Gas Plant, Shell Exploration and Production Company, Gaviota, California, July 2012. Field crew leader and lead author for the wetland delineation/jurisdictional determination of a <1 acre site along Cañada de la Huerta.

California High Speed Train Project, High Speed Rail Authority, Fresno to Bakersfield, California, September 2011. Assessed the condition of jurisdictional waters, including wetlands, along several alternative high-speed rail alignments between Fresno and Bakersfield in California's Central Valley using CRAM. The aquatic features assessed included individual vernal pools, vernal pool complexes, and depressional wetlands located on the floor of the Central Valley, as well as riverine wetlands along the Kings River and Poso Creek. A certified CRAM instructor supervised the assessment.

Resource Management and Development Plan Environmental Impact Study/ Environmental Impact Report, Newhall Land and Farming Company, Santa Clarita Valley, California, July and August 2010. Assessed the condition of reference-quality sites, as well as a number of existing compensatory mitigation sites, in the Santa Clara River watershed within the vicinity of the 12,000-acre Newhall Ranch site in the Santa Clarita Valley, California. The assessment methodology was based on a combination of three established methods (CRAM, HGM, and SAMP LLFA).

California High Speed Train Project, High Speed Rail Authority, Bakersfield to Palmdale, California, April 2011. Performed wetland delineations/jurisdictional determinations, and GIS mapping for various segments along the High Speed Rail alignments from Bakersfield to Palmdale, California.

California High Speed Train Project, High Speed Rail Authority, Fresno to Bakersfield, California, 2010. Performed wetland delineations/jurisdictional determinations, and GIS mapping for various segments along the High Speed Rail alignments from Fresno to Bakersfield.

San Jose Creek Bikeway, City of Goleta, Goleta, California, 2009. Field crew leader and lead author for the wetland delineation/jurisdictional determination for a 0.5-acre site in Goleta Slough.

Former Hercules Gas Plant, Shell Exploration and Production Company, Gaviota, California, 2009. Field crew leader and lead author for the wetland delineation/jurisdictional determination for a 2-acre site along Cañada de la Huerta for the project's Streambed Alteration Agreement and Section 404 Permit.

Resource Management and Development Plan Environmental Impact Study/ Environmental Impact Report,

Newhall Land and Farming Company, Santa Clarita Valley, California, 2008. Assisted with the wetland delineation and mapping of jurisdictional waters within the 12,000-acre Newhall Ranch site in the Santa Clarita Valley, California. Assisted with the wetland delineation report.

Botanical Surveys and Mapping

Point Arguello Pipeline Company Repair Site, Freeport-McMoRan Oil & Gas, Gaviota, California, Spring 2015. Performed focused Gaviota tarplant (Deinandra increscens ssp. villosa) surveys for the repair and reference site. Technical reviewer for associated report.

Point Pedernales Pipeline, Freeport-McMoRan Oil & Gas, Lompoc and Vandenberg Air Force Dates, California, Spring 2014. Performed focused Vandenberg monkey flower (Mimulus fremontii var. vandenbergensis) and beach layia (Layia carnosa) surveys along 10-mile pipeline and reference locations.

Special-status Wildlife Surveys

Tidewater Goby Presence/Absence Survey, Basin E/F Tidal Basin Restoration Project, City of Santa Barbara, Santa Barbara, California, October 2010 and 2011–2012. In 2010, performed presence/absence USFWS protocol surveys for tidewater goby in Tecolotito Creek, Foxtrot Drain, and an existing tidal basin adjacent to the creek prior to construction. Medium water body protocol. Installed and monitored block nets downstream of the work area. Co-author of final report. 8.5 hours. From 2011–2012, performed post-construction presence/absence USFWS protocol surveys for tidewater goby in Tecolotito Creek and a constructed tidal basin. Lead author of final report. 24 hours.

Tidewater Goby and Fish Relocation, Santa Barbara Airport Tecolotito and Carneros Creek Relocation Project, City of Santa Barbara, Santa Barbara, California, August 2006 – November 2008. Captured and relocated tidewater gobies and other fish species from Tecolotito and Carneros Creeks. Performed initial presence/absence USFWS protocol surveys for tidewater goby in all locations prior to construction. Performed presence/absence protocol surveys for tidewater goby in all locations after construction. Medium water body protocol. Managed data collection and compilation. Included as a permitted handler on USFWS Biological Opinion 1-8-06-F-42. Assisted in authoring the final report. 145 hours.

Western Snowy Plover and California Brown Pelican Construction Monitoring, Laguna Channel Tidal Gate Repair Project, City of Santa Barbara, Santa Barbara, California, October – December 2006. Performed clearance survey prior to moving sand from near the launch area at the Santa Barbara Harbor. Monitored for impacts to the birds during construction at the tidal gate.

Habitat Restoration

Santa Barbara Airport Tidal Basin Restoration Project, City of Santa Barbara, Santa Barbara, California, 2007 – Present. Project Manager. Assisted in planning and implementing restoration for the Tidal Basin consisting of 14 acres of newly created tidally influenced habitat. Organized monitoring program consisting of point-intercept transect data collection and maintenance monitoring. Managed and analyzed resulting data. Aided with benthic macroinvertebrate sampling. Created water quality monitoring program. Lead author for annual reports detailing restoration success. Co-author of Biological Assessment. Lead author of Storm Water Pollution Prevention Plan. Currently, the restoration site has met or exceeded permit issued performance criteria.

Santa Barbara Airport Airfield Safety Projects Restoration Project, City of Santa Barbara, Santa Barbara, California, 2007–2013. Project Manager. Assisted in planning and implementing restoration for 65 acres of wetland, coastal sage scrub, and riparian habitats. Organized and implemented monitoring program consisting of point-intercept transect data collection and maintenance monitoring. Managed and analyzed resulting data. Organized native seed collection. Lead author for annual and quarterly reports detailing restoration success. Three restoration sites have been completed and met or exceeded permit issued performance criteria.

Permits

California Department of Fish and Wildlife Scientific Collecting Permit for mammals, reptiles, amphibians, vernal pool/terrestrial invertebrates, freshwater and anadromous fishes, and freshwater invertebrates #SC-10045, December 2008 – Present.

U.S. Fish and Wildlife Service Recovery Permit for Tidewater Goby (*Eucyclogobius newberryi*) #TE-217402-0, February 2010 – present.

California Department of Fish and Wildlife Collecting Permit for State-Designated Endangered, Threatened, or Rare Plants #2081(a)-13-35-V, April 2010 – Present.

Specialized Training

Surface Water Ambient Monitoring Program (SWAMP), field procedures and bioassessment concepts, presented by California Waterboard, April 2016

California Rapid Assessment Method (CRAM) Estuarine Module, presented by UC Davis Extension, October 2012

California Rapid Assessment Method (CRAM) Practitioner Training and Riverine Module, presented by UC Davis Extension, March 2012

Basic Wetland Delineation Training (40-hour), presented by the Wetland Training Institute, August 2008

AECOM

Julie Niceswanger Hickman
Senior Biologist/ Project Manager

Education

MA, Psychology
BS, Biology

Permits

USFWS-California Red-legged Frog Recovery Permit #TE196188-0
CDFW-Scientific Collecting Permit #001980

Years of Experience

With AECOM: 10 Years
With other firms: 12 Years

Professional Experience

AECOM
U.S. Fish and Wildlife Service
California Dept. of Fish & Wildlife
U.S. Forest Service
U.S. Army

Training

Wetland Delineation
Conservation Partnerships
Habitat Conservation Planning
Wildlife Restraint and Handling

Technical Specialties

Federal Consultations-Section 7 & 10
CEQA Documentation
Sensitive Plant and Wildlife Surveys
Nesting Bird Surveys
Clean Water Act Section 404/401
CDFW Section 1600 Streambed Alteration Agreement Permitting
Constraints/Impacts Analyses
Comprehensive Mitigation and Monitoring Programs
Mitigation Implementation/Monitoring

Professional Affiliations

The Wildlife Society
The Surfrider Foundation
California Native Plant Society

Ms. Julie Hickman has over 20 years of natural resource management, regulatory permitting, and terrestrial ecosystem monitoring and analysis experience throughout California. Her project experience includes developing monitoring protocols and management plans for endangered species, planning and conducting biological resource investigations, working with project proponents to minimize impacts, and supervising and training project staff. She has broad knowledge of land use regulations and has worked extensively implementing the Endangered Species Act (ESA), including coordination and consultation under Sections 7 and 10.
Ms. Hickman has also prepared technical reports and permits, including California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) documents, U.S. Fish and Wildlife Service (USFWS) biological opinions, and wetland permitting.

Ms. Hickman holds an ESA section 10 (a)(1)(A) recovery permit which authorizes her to conduct presence/absence surveys for the California red-legged frog. In addition to general surveys for common and sensitive wildlife species, Ms. Hickman has experience performing focused, protocol-level, presence/absence surveys for the California red-legged frog, southwestern arroyo toad, California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and several listed plants in a variety of habitats. She has also performed avian monitoring and banding, general pitfall traps for herpetofauna, and standard small mammal grid trapping. Her botanical experience includes rare plant presence/absence surveys, vegetation classification sampling, and rare plant and vegetation monitoring.

Project Experience

Biological Services for the Malibu Creek State Park Stokes Creek Bridge Replacement, California State Parks, *Calabasas, California*. - Ms. Hickman was the lead for permitting and biological investigations for the replacement of an undersized culvert with a new bridge at Malibu Creek State Park. The project involved wetland and biological surveys to support a wetland delineation and biological resources assessment. Future assistance with federal and state permitting under sections 404/401 and 1600 (U.S. Army Corps of Engineers and Regional Water Quality Control Board and California Dept. of Fish and Wildlife) will also be required but final design of the new beidge has not been completed.

Permitting and Biological Services for the Point Dume State Beach Stair Replacement, California State Parks, *Malibu, California.* Ms. Hickman was the lead for permitting and biological investigations for the replacement of a staircase for beach access from the Point Dume Nature Preserve. The project involved biological investigations to support a Biological Technical Report and the CEQA biological resources sections, as well as the preparation of a Coastal Development Permit with the California Coastal Commission and permits with the U.S. Army Corps of Engineers and Regional Water Quality Control Board.

Compliance Studies for the Aliso Canyon Turbine Replacement Project, Southern California Gas Company, *Porter Ranch, California*. Ms. Hickman was the lead for the avian biological monitoring and nest clearance team. She organized and conducted avian nest surveys, coordinated with agencies and the Gas Company, and completed compliance documentation and weekly reporting while coordinating staff and scheduling surveys.

Permitting Services for ExxonMobile Pipeline Investigation in the Angeles National Forest, *Santa Clarita, California.* Ms. Hickman was part of the team that developed the permitting strategy for a pipeline investigation dig that crossed a regulated drainage. She developed and wrote the Biological Assessment/Biological Evaluation suitable for the U.S. Forest Service, USFWS, and the California Department of Fish and Wildlife (CDFW) and developed and wrote the Clean Water Act 401 and 404 permits as well as the CDFW Streambed Alteration Agreement.

Biological and Permitting Services for the Los Angeles County of Public Works Commerce Boulevard Interchange at State Route 126 Project, *Santa Clarita, California.* Ms. Hickman conducted inventory and clearance surveys for sensitive species for a large freeway interchange construction project which included auditory and nest clearance surveys for birds. Additionally, she conducted daily nesting bird clearance surveys and monitored construction activities for compliance with multiple permits and worked with construction operators to ensure daily activities followed mitigation requirements.

Biological Compliance Reporting for a Large-Scale Transmission Project, Southern California Edison, *California and Nevada*. Ms. Hickman was the lead reviewer for environmental documentation for a large scale power project. Responsibilities included effective coordination and communication with a large field team, ensuring consistency with the Migratory Bird Treaty Act, the ESA, the Clean Air Act, and the Clean Water Act, and development of reporting language for document submission to permitting agencies. Ms. Hickman communicated effectively with both management and field staff to complete the review process scheduling and coordinating review staff, reconciling conflicts, and developing reporting processes to streamline the submittal of several types of compliance reports to meet regulatory requirements.

Biological and Permitting Services for the Laguna Sanitation District Recycled Waterline, *Santa Maria, California*. Ms. Hickman assisted in the development of the permitting strategy for a 10-mile waterline project which bisected the Santa Maria airport and private property. The project involved both federally and state-listed species as well as special-status plants and jurisdictional waters and wetlands. Ms. Hickman assisted in writing the federal permit applications, coordinating with the agencies, and mitigation strategies. Additionally, Ms. Hickman conducted species inventory surveys conducting nesting bird surveys, and assessing potential nesting habitat, the potential for California red-legged frog, California tiger salamander, and vernal pool fairy shrimp.

CEQA Services for Multiple EIR's for a Confidential Client, *San Joaquin Valley, California.* Ms. Hickman wrote the biological sections for several EIR's on large tracks of land in the southern region of the San Joaquin Valley. Each of the EIRs involved a large list of potentially occurring species and combined several land use owners and regional

planning processes.

Biological and Permitting Services for the Santa Maria Airport Landfill, *Santa Barbara County, California*. Ms. Hickman assisted the County of Santa Barbara in developing a permitting strategy for a closed landfill within the Santa Maria Airport Property. The landfill is within occupied habitat for federally and state-listed species and requires permits from the USFWS and the California Department of Fish and Wildlife (CDFW) to complete landfill repairs on the site. She conducted site assessments which included surveys for nesting birds throughout the sites and visual surveys for listed amphibians within the existing water impoundments on the site.

Biological and Permitting Services for the Tajiguas Landfill, *Santa Barbara County, California*. As Project Manager, Ms. Hickman developed the permitting strategy for a landfill reconfiguration project involving impacts to federally listed species, and federal and state waters and wetlands. She coordinated the completion of the biological assessment, a restoration plan, and the biological analysis to support CEQA. She also coordinated the 404 permit with the U.S. Army Corps of Engineers; the 401 Certification with the Regional Water Quality Control Board; and with CDFW for a Streambed Alteration Agreement. The project included a wetland delineation and sensitive wildlife and plant surveys. She conducted surveys; wrote the California red-legged frog habitat assessments and management plans for the project site and the restoration site; and managed and implemented the plans. In addition, Ms. Hickman conducted daily nesting bird surveys and California red-legged frog surveys for the project prior to the initiation of each day's work activities over two nesting bird seasons and two wet winters.

Proponent's Environmental Assessment (PEA), Capital Project, Southern California Gas Company/Southern California Edison, *North Los Angeles County, California*. Conducted vegetation and wildlife surveys in support of the preparation of a PEA to document the effects of a major infrastructure upgrade project. Conducted a habitat assessment and mapped vegetation in the proposed project areas along over 8 miles of power lines through Santa Clarita and the Santa Susana Mountains and on a Gas Company facility.

Santa Catalina Island Conservancy, Eagles Nest Lodge investigation, *Santa Catalina Island, Los Angeles County, California*. Project manager and primary author for a biological constraints analysis looking at potential impacts of the project relative to the Los Angeles County guidelines for designated sensitive ecological areas.

Baseline Ecological Surveys for the Imperial Irrigation District's Habitat Conservation Plan, *Imperial County, California*. As Task Lead for the amphibian and small mammal surveys for this project, Ms. Hickman developed sampling protocols for three targeted amphibians and two target small mammals. This project focused on establishing the baseline conditions for a large project area using a random plot project design over multiple years of sampling to be used to prepare the Habitat Conservation Plan (HCP) and Natural Communities Conservation Plan. Additionally, Ms. Hickman conducted auditory bird surveys utilizing a point count methodology and conducted vegetation community mapping utilizing the Sawyer Keeler Wolf classification system.

Matilija Reservoir Invasive Species Removal Plan and California Red Legged Frog Study and Relocation Plan, *Ventura County, California*.

Task Lead for California red-legged frog surveys. Coordinated with the USFWS and conducted presence/absence surveys for the California red-legged frog. Ms. Hickman wrote the management plan for the California red-legged frog to aid in the development of protection measures to comply with the biological opinion requirements during project activities.

U.S. Fish & Wildlife Service Office, *Ventura, California*. Fish and Wildlife Biologist, responsible for implementation of ESA and review of actions which would affect federally listed species in Monterey, Santa Cruz, and San Benito Counties. Ms. Hickman conducted ESA Section 7 consultations, both informal and formal. Projects included a Federal Aviation Administration (FAA) project on the Monterey Airport for construction projects and dune restoration; Pacific Grove Municipal Golf Course property transfer and dune restoration; Caltrans and Federal Highways for various highway improvement projects; FAA and Marina Airport for radar tower installation; and State Parks, Hollister Hills State Vehicular Recreation Area for a park expansion project. Ms. Hickman also reviewed and conducted analysis of ESA section 10 permit requests for HCPs. She was Lead Biologist for a Section 10 HCP with California State Parks, Hollister Hills State Vehicular Recreation Area for continued operation of their off-road vehicle park.

Hill Slough West Restoration Project, California Department of Fish and Wildlife, Bay Delta Branch. Ms. Hickman was the lead biologist for the Hill Slough West Demonstration Restoration Project preparing the required CEQA, 404 ACOE, NEPA, and CDFW Endangered Species Take permits and a USFWS Biological Opinion. Prepared a proposal for USFWS section 6 funding project for endangered species protection in the Suisun Marsh.

Suisun Marsh Wildlife Investigations, California Department of Fish and Wildlife, Bay Delta Branch*, Contra Costa County, California*. Ms. Hickman conducted wildlife studies including auditory bird surveys, small mammal trapping, and vegetation studies in the Suisun Marsh. Studies targeted the endangered salt marsh harvest mouse, the California clapper rail, and black rail.

Waterfowl and Sandhill Crane Census, California Department of Fish and Wildlife, Bay Delta Branch. Conducted census of waterfowl and Sandhill cranes for several wildlife areas in the Central Valley. Surveys were conducted by boat and from stationary point count stations.

Wildlife Biologist, California Department of Fish and Wildlife, Bay Delta Branch. Ms. Hickman was part of the project team for several large water projects for the California Delta, Los Vaqueros reservoir, and the Suisun Marsh and reviewed projects submitted to the CDFW. She organized and conducted vegetation surveys to update vegetation mapping under the Sawyer/Keeler-Wolf Vegetation Classification System utilizing ArcView, GPS, and aerial photos. She also reviewed planning documents for CEQA compliance and participated in planning efforts for the Los Vaqueros Reservoir expansion project.

Wildlife Biologist for the Environmental Division, Fort Hunter Liggett Military Installation, *Monterey County, California.* Prepared Draft Conservation Agreement for endemic plants (purple amole and Santa Lucia Mint) on Fort Hunter Liggett Military Installation (FHL). Endangered Species Management Plan for endangered arroyo toad on FHL. Lead Coordinator for threatened and endangered species compliance

distribution/abundance surveys for rare plants (purple amole, Santa Lucia mint, *Calycadenia villosa*) and arroyo southwestern toad. Conducted wildlife investigations as per ESA protocols and NEPA compliance; managed database of all collected data; and graphically documented sites using ArcView. Conducted bald eagle surveys and nest monitoring, auditory bird surveys targeting the least Bell's vireo, California tiger salamander and vernal pool fairy shrimp surveys/ documentation, San Joaquin kit fox spotlighting, and wood duck nest box monitoring and banding. Prepared and presented endangered species educational compliance briefings to personnel stationed on FHL and to all new contractors. Contractor coordination and report review for threatened and endangered species surveys. Prepared annual USFWS reports for threatened and endangered species and participated in survey protocol development in coordination with the USFWS. Assisted in preparation of Biological Assessments for pre-construction/project review and informal consultations through the USFWS. Reviewed NEPA documents for new projects and participated in the conceptual and developmental phases of environmental assessment preparation including preliminary site assessments and draft review. Prepared the rare plants section of the Integrated Natural Resource Management Plan for FHL.

Land Condition and Trend Analysis, Colorado State University, Fort Hunter Liggett Military Installation, *Jolon, California*. Ms. Hickman conducted auditory bird point count surveys as part of the Land Condition and Trend Analysis study for three nesting bird seasons. Additionally, Ms. Hickman conducted vegetation surveys and mapping which included several ecological vegetation sampling methods.

U.S. Forest Service, Lake Tahoe Basin Management Unit, *South Lake Tahoe, Californa*. Ms. Hickman was part of a wildlife investigation study developing a forest service protocol to analyze riparian ecosystems. As part of the study Ms. Hickman conducted auditory bird point count surveys, small mammal trapping, and vegetation surveys for ten randomly selected study areas throughout the Lake Tahoe Basin.

AECOM

Ivan Parr
Senior Biologist

Education

BS, Environmental Science, St. Mary's College, 2007

Years of Experience

With AECOM: 8
With Other Firms: 3

Professional Affiliations

California Native Plant Society
California Academy of Sciences
Casa Avian Support Aliance
Oakland Museum of California
National Audubon Society
Wildlife Society

Certifications

Scientific Collecting Permit #SC-10483 California Department of Fish and Wildlife
Plant Voucher Collecting Permit for California Endangered Species Act Endangered, Threatened, and Candidate Species

Mr. Parr is a senior biologist with over 11 years of professional experience in performing, leading, and organizing botanical surveys, vegetation mapping efforts, wetland delineations, and wildlife surveys in northern, central, and southern California. He has a background in field biology and is experienced in plant and animal taxonomy. Mr. Parr is most familiar with California flora and plant communities (including wetlands), intertidal life, and birds. Among his specialties are chaparral, desert, and montane/alpine habitats. Mr. Parr has been involved in studies for invasive, special-status, and cultural (Native American) plant species; avian abundance; fish, amphibian, and reptile populations (including desert tortoise, yellow-legged frog, and Alameda whipsnake, giant garter snake, Mono Basin sage-grouse, and Least Bell's vireo); and macroinvertebrate diversity.

Experience

Lake Tahoe Basin Management, Sunset Stables Restoration, Lake Tahoe, California. Performed special-status plant surveys, including listed bryophyte surveys along the Truckee River of Lake Tahoe. Surveys involved mapping assessments using the rapid assessment method, a full-species inventory, mapping of noxious weeds, mapping of culturally-significant weeds, and special-status plants surveyed under protocol guidelines outlined by the California Department of Fish and Wildlife. Compiled a portfolio of botanical specimens and wrote the draft botanical section of the environmental impact report.

Golden Gate National Parks Conservancy, Redwood Creek Trail Realignment, Marin County, California. Conducted special-status plant surveys for the proposed reroute of the Redwood Creek trail alignment within Mt. Tamalpais State Park.

East Bay Regional Parks District, Road Repair - FEMA-1628-DR-CA, Various Locations, California. Performed field surveys, assisted in determining critical habitat and co-wrote the biological assessment.

San Francisco Public Utilities Commission, Tesla Portal Trenching and Geotechnical Investigation, Tracy, California. Implemented environmental awareness training for geotechnical and construction workers at the Tesla Portal facility to protect wetlands, burrowing owls, San Joaquin kit fox, and other biological resources. Conducted biological monitoring.

California Department of Transportation, Alameda Creek Bridge Replacement, Fremont, California. Assisted with biological assessment, including consultation on Alameda whipsnake habitat, rare plant species, and sensitive communities.

Kinder Morgan Energy Partners, LP, Revegetation/Monitoring, Oakland, California. Conducted annual wetland and tree monitoring, compilation of data, mitigation report, and final report.

Kinder Morgan Energy Partners, Pipeline Construction Monitoring - Concord to Sacramento, Various Locations, California. Performed rare plant surveys and monitoring along pipeline alignment.

San Francisco Public Utilities Commission, Baylands Recovery Revegetaion, Oakland, California. Aided botanical assessment and compiled plant lists, mapped plant populations for propagation, and collected and recommended seed for propagation.

Kinder Morgan Energy Partners, LP, Carquinez Strait Cover, Contra Costa County, California. Wrote the biological assessment for the National Oceanic and Atmospheric Administration (NOAA), made determinations on NOAA-regulated fish species in the strait, and assisted in writing permits.

San Francisco Public Utilities Commission, On-Call Environmental Services, San Francisco Bay Area, California. Assisted with on-call biological services in the Alameda and Peninsula watersheds. Duties included developing monitoring and methods protocols, conducting and coordinating wildlife and plant surveys, vegetation mapping, invasive weed protocol and mapping, restoration survivorship monitoring, and writing of annual reports for mitigation sites.

Confidential Utility Client, North American Electric Reliability Corporation Alert Program, California. Conducted environmental reviews, including ground and helicopter surveys, of sites and surveys for biological constraints, including wildlife habitat, wetland features, and rare plant species.

State Coastal Conservancy, Carmel River Reroute and San Clemente Dam Removal Permitting and Environmental Assessment, Monterey County, California. Assisted with botanical impacts alternatives analysis and project permit applications.

US Air Force, Munitions Response Sites - Rare Plant Surveys, Beale AFB, California. Conducted rare plant surveys and vernal pool surveys.

California Department of Transportation - District 4, Environmental On-Call Contract, San Francisco Bay Area, California. Oversaw tasks involving NEPA/ CEQA environmental

studies and documentation, monitoring, and environmental consultation for construction and landscaping. Conducted monthly and annual monitoring and reporting, weekly cost and schedule tracking, and biweekly staff meetings. Revised the mitigation management plan and filled in for Caltrans biological staff.

California High-Speed Rail Authority, California High-Speed Train - Bakersfield to Palmdale Section, Various Locations, California. Prepared chapters for biological assessment and environmental impact report/environmental impact statement. Led field effort for rare plant surveys. Provided consultation for permitting, wildlife usage, sensitive habitat management, and wetland studies.

California Department of Transportation - District 4, Road Maintenance, Various Locations, California. Conducting roadside monitoring for Swainson's hawk nests.

San Francisco Public Utilities Commission, Calaveras Dam Replacement, Sunol, California. Conducted rare plant surveys, butterfly habitat assessment, and invasive weed mapping.

Port of Oakland, Oakland International Airport - Runway Safety Area Improvement, Oakland, California. Performed rare plant, California least tern, and snowy plover surveys.

California Department of Transportation - District 4 and Bay Area Toll Authority, Dumbarton Bridge Seismic Upgrade - Environmental Permitting, Alameda and San Mateo Counties, California. Conducted biological surveys for avian nesting; conducted marine invertebrate surveys on pilings.

Rhodia, Peyton Slough Remediation, Martinez, California. Conducted and reported on vegetation studies, wildlife habitat, and restoration efforts.

BrightSource Energy, Rio Mesa Solar, San Diego, California. Performed rare plant surveys, California desert species mapping, and analyzed data.

Federal Emergency Management Agency, Humboldt Bay Techite Pipeline Retrofit - HMGP-1731-35-53, Humboldt County, California. Analyzed data and completed species information, rare plant survey, and final write-ups.

US Bureau of Reclamation, San Joaquin River Restoration, Madera and Fresno Counties, California. Performed wildlife and vegetation surveys, including for Valley Elderberry Longhorn Beetle, compiled species lists, and analyzed data.

California High-Speed Rail Authority, California High-Speed Train - Fresno to Bakersfield Section, Various Locations, California. Conducted wetland monitoring, rare plant surveys,

wildlife surveys, compilation of data, and chapters of the biological assessment and the environmental impact report/environmental impact statement.

Chevron Pipe Line Company, Holdener Park Off-Site Compensatory Mitigation, Livermore, California. Conducted vegetation monitoring, consulted on landscape and habitat restoration.

Chevron Pipe Line Company, San Antonio Reservoir Pipeline Relocation, Livermore, California. Performed wetland monitoring and assisted with the final report.

California Department of Transportation, I-580 Truck Climbing Lane Alternatives, Alameda County, California. Performed rare plant surveys, compiled species lists, mapped vegetation. Assisted with the biological assessment.

Kinder Morgan Energy Partners, LP, Oakland International Airport - LS 36/42 Maintenance Site Review, Oakland, California. Performed and wrote the site visit report, conducted surveys for burrowing owl, northern harrier, and nesting bird species.

Alameda County, Peralta Creek, Bayfair Mall, and Laguna Creek Revegetation - Flood Control Maintenance Mitigation, San Leandro, California. Oversaw maintenance of planting sites, wrote budget and scope, monitored work, and consulted client on planting procedures.

Stanford University, Searsville Dam and Reservoir Alternatives Study and Engineering and Hydrology Co, Woodside and Portola Valley, California. Conducted special-status wildlife surveys focusing on snakes (particularly San Francisco garter snake), western pond turtle, California red-legged frog, and special-status birds.

US General Services Administration, Silverspot Butterfly, Pillar Point AFS, California. Conducted inventory of invertebrate species at Pillar Point AFS, focusing on Myrtle's silverspot butterfly.

California American Water, Monterey Peninsula Water Supply Transmission Mains, Monterey and Seaside, California. Coordinated and performed natural resources surveys and wetland delineation, met with clients and other consulting firms over access, coordinated mapping and display of resources for agencies and client, and prepared botanical and wildlife sections of the technical report for the proposed desalination water pipeline in coastal Monterey County.

Southern California Edison, Big Creek No. 4 Relicensing, Sierra Nevada, California. Led field surveys to locate and identify special-status species, species of cultural importance, and noxious weeds

within the facilities. Updated both the animal and plant lists for the project and assisted with surveys for valley elderberry longhorn beetle. [Prior to AECOM]

Monterey County Water Agency, Salinas Valley Water Project Revegetation Plan, Monterey County, California. Determined loss of vegetation, conducted avian nesting surveys, and wrote instructions restoration in a mitigation Compiled a comprehensive species list for the dam site. [Prior to AECOM]

Placer County Water Agency, Licensing Application, Placer County, California. Conducted surveys for riparian and upland habitat assessment for facility betterments, including for special-status and noxious weed species. Assisted in fish population, water quality, macroinvertebrate, raptor, and herpetological field work and research. Compiled comprehensive floral lists. [Prior to AECOM]

Invenergy, LLC, Horse Lake Wind Energy, Sacramento, California. Performed avian point-count surveys, complete vegetation mapping assessments using the rapid assessment method, and botanical surveys (including a full-species inventory) using transects and protocol survey guidelines outlined by the California Department of Fish and Wildlife. These data contributed to the assessment of bird distribution, breeding, and abundance, as well as the locations of rare plant species. Also surveyed for greater sage-grouse and generated a portfolio of botanical specimens. [Prior to AECOM]

Pacific Gas and Electric Company, Donnells-Curtis Pole Replacement, Various Locations, California. Aided botanical assessment and compiled plant lists, mapped special-status species habitat and occurrences, and surveyed for valley elderberry longhorn beetle. [Prior to AECOM]

AECOM

Wayne Vogler

Principal Biologist

Education

BS, Biological Sciences, Concentration in Ecology and Environmental Science, University of California, Irvine, 1994

Years of Experience

With AECOM: 10 Years

With Other Firms: 10 Years

Training and Certifications

USFWS Project Authorized to Survey, Handle, and Relocate California Red-legged Frogs

USFWS Project Authorized to Survey, Handle, and Relocate Tidewater Goby

Endangered Species Act Section 7 Workshop

Facilitation Skills for Scientists and Resource Managers

San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques

California Tiger Salamander Upland Habitat Workshop

California Tiger Salamander Workshop

Blunt-nosed Leopard Lizard Habitat and Survey Techniques Workshop

Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop

Storm Water Pollution Prevention on Construction Sites

California Red-legged Frog Survey, Handling, and Pit Tagging

U.S. Army Corp of Engineers Wetland Delineation Certification

First Aid/CPR

Overhead Power Line Safety

Project Manager-AECOM

Behavior Based Safety

Loss Prevention Systems

Hazardous Waste Operations/ Emergency Response

Smith System Advanced Driver Training

Mr. Vogler has 20 years of experience providing solutions for oil and gas and energy production clients. This experience has primarily focused on pipeline, industrial, and remediation projects. He is adept at recognizing client's needs and suggesting fit for purpose approaches to meet client's goals. Mr. Vogler has particular experience developing strategic approaches to complex projects, and representing clients with projects involving the Endangered Species Act, California Environmental Quality Act (CEQA), Clean Water Act, and other federal and state environmental laws. Mr. Vogler is in his 10th year of program management including management of professional scientific staff, and development and management of budgets and financial plans. He has maintained compliance with Health and Safety training requirements, including specialized training, since 1996, and is fully-versed and indoctrinated in a behavior based health and safety culture.

Project Specific Experience

AECOM, Manager – Natural Resource Group, Santa Maria, California, 2010-present. Perform as an example and mentor of AECOM's safe work culture. Embody a safety culture that has resulted in no recordable incidents by staff or myself. Initiated and developed biological, cultural resources, and land use planers disciplines in Santa Maria office expanding service offerings to a sustaining and successful group. Evaluate staff performance, advise staff on technical matters, and supervise staff adherence to policies and procedures. Administer appropriate project staffing, manage staff utilization, and ensure the satisfactory completion of assigned tasks. Interact with external and internal clients to maintain current work and build new project opportunities.

Phillips 66, Pipeline Abandonment, Kern, Kings, Fresno, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, and San Diego Counties, California, 2011-present. Responsible for environmental compliance of a 550-mile pipeline abandonment project. Identify natural resource presence and evaluate potential impacts from project implementation. Developed approach and processes to avoid protected species impacts. Strategize program approach to address land use permitting, avoiding delays to project schedule. Coordinated work efforts on federal and state owned lands. Manage work efforts to locate key pipeline features, map pipeline alignments, and build Geographic Information System (GIS) database for the entire pipeline portfolio. Subsequent work assignment to maintain GIS data through the pipeline abandonment activities resulting in as-built maps of abandonment activities. Managing over $1.0 MM in project work.

Santa Maria Energy, Careaga Oil Field Expansion, Santa Barbara County, California, 2007-present. Responsible for natural resource tasks leading to the development of enhanced oil recovery at 1,100 acre oil field. Completed a constraints analysis to aid engineers in project design. Obtained incidental take authorization from federal and state resource

Approved Permit to Work Authorizer

Technical Specialties

Safe Work Culture
Project Management
Strategic Project Planning
Listed Species Permitting
Listed Species Surveys
Wetland Delineation
Mapping Services
CEQA Permitting and Environmental Analysis

Affiliations

The Wildlife Society
The Wildlife Society Western Section
The Wildlife Society, California Central Coast Chapter (President, 2013 to present)
Coastal Operators Group

agencies for 40-acre industrial facility. Identified a federal nexus to allow for federal incidental take authorization through the section 7 consultation process. Employed an innovative habitat evaluation approach for determining compensatory mitigation values resulting in a 40 percent reduction in the amount of mitigation lands to be acquired. Managing over $1.2MM in project budgets with services ranging from special status plant and animal studies to oak tree restoration, CEQA analysis, and construction monitoring.

County of Santa Barbara, Laguna Sanitation District, Phase 3 Recycled Waterline Project, Santa Barbara County, California, 2008-2014. Design and permitting for a 10.5-mile recycled waterline. Performed a siting study analysis to determine preferred pipeline alignment. Collaborated with design engineers to avoid environmental constraints. Oversight of biological and cultural resource studies. Prepared environmental analysis documents for County's use. Obtained incidental take authorization from federal and state resource agencies. Interface between County staff and resource agencies.

Chevron Environmental Management Company Escolle Lease Restoration, Santa Barbara County, California, 2011-2015. Focused surveys for California red-legged frog and California tiger salamander. Initiated and concluded consultation with U.S. Fish and Wildlife Service regarding site restoration activities. General habitat assessment and land use permitting with County of Santa Barbara including negotiations with County regarding compliance permit conditions. Senior biologist supporting the site restoration efforts.

ExxonMobil Pipeline Company, San Ardo Pipeline - Permitting Support, Monterey County, California, 2013. Biological and permitting task lead working with ExxonMobil pipeline engineers to develop strategic permitting and biological alternatives for pipeline removal across the Salinas River. Project involved consideration of federal and state water impacts, protected species avoidance (California red-legged frog, steelhead), while meeting client design parameters.

Southern California Edison, Gale-Pisgah-Lugo Transmission Corridors, San Bernardino County, California, 2011-2012. Field Manager for desert tortoise protocol surveys along two power line alignments east of Barstow, California. Responsible for rapid deployment and field survey efforts to complete the habitat assessment along 120 miles of power line alignment under an accelerated schedule to meet submission deadlines. Mentored field staff toward project completion without incident.

Chevron Environmental Management Company, McKittrick Gathering System Pipelines, Kern County, California, 2008-2010. Project Manager for the biological study and endangered species permitting (federal and state) in support of the removal of three pipelines. Services included project approach development, biological surveys, jurisdictional waters determinations, and endangered species permitting. Additional tasks included work scope development, health and safety systems, agency coordination, protocol botanical and wildlife surveys, budgeting, and client interactions. Coordinated work efforts on federal and state owned/managed lands.

Chevron Environmental Management Company, Program Biologist TDPI and Unocal Legacy Pipelines, Kern, San Luis Obispo, Santa Barbara, Ventura, Monterey Counties, California, (2007-2010). Program

Biologist for 375-mile pipeline portfolio identifying programmatic environmental needs and efforts; both conducting work efforts and directing biologists from multiple offices in work efforts. Implemented the appropriate level of oversight to maintain regulatory compliance while maintaining project implementation schedule.

SunPower, California Valley Solar Ranch, San Luis Obispo County, California, 2008-2010. Performed biological surveys over approximately 5,700-acres in support of county entitlement studies for a 250MW solar generating facility. Tasks included habitat assessment, small mammal trapping, San Joaquin kit fox and blunt-nosed leopard lizard assessment, waters/wetlands assessment, and vegetation mapping, and rare plant surveys. Technical approach review body advising the project manager in project needs and methods.

TransCanda, Bison Pipeline, Adams, Bowman, Hettinger, Slope, Stark Counties, North Dakota, 2010. Biological compliance monitor for construction of natural gas pipeline.

BP Alternative Energy, Hydrogen Energy California Application for Certification, Kern County, California, 2009. Biologist in support of an AFC for a 390MW integrated gasification combined cycle power generating facility. Team leader for blunt-nosed leopard lizard surveys and senior biologist advising survey approach, jurisdictional waters determinations, and conducting surveys.

Chevron (Unocal), Guadalupe Restoration Project, San Luis Obispo County, California, 1997-2007. (Biological Task Leader) Developed processes for project compliance with over 1,200 permit conditions regarding the remediation and restoration of a 2,700 acre site. Regular performance of focused surveys for listed plant and wildlife species. Environmental compliance monitoring during removal of 130-miles of pipelines. Primary interface between construction contractors, project management, and agency oversight contractor. Developed wetland and upland restoration plans. Responsible for writing and compiling sections of the Quarterly Ecological Monitoring Report. General habitat assessments and develop solutions for project implementation in presence of sensitive species. Oversight of monitoring efforts for western snowy plover, California red-legged frog, and protected botanical species.

General Experience

California Environmental Quality Act and Application for Certification. Conducted surveys and prepared technical reports for dozens of environmental documents supporting Initial Studies and Environmental Impact Reports (EIR) under CEQA and AFC assessments. Perform as both the sole and contributing author for environmental assessments. Make determinations regarding which environmental factors require detailed analyses, and perform the analyses, assess potential cumulative impacts, and write associated sections. Work with clients to integrate comments to documents.

At the direction of and in collaboration with the legal review team, provided technical review and comments on California Department of Oil, Gas, and Geothermal Resources Statewide EIR regarding hydrologic fracturing well development techniques.; Mr. Vogler's review and comments became the basis for a challenge to the feasibility of mitigation measure implementation prescribed in the environmental analysis.

Biological section lead for development of six draft EIRs evaluating the expansion of regional-scale oil production activities and process facilities. Managed biological efforts across multiple office locations and contributors. Responsible for document content, project schedule, and budget. Established process to obtain background information that maximized use of existing data.

Regulatory Consultations and Permitting with State Agencies. Prepare documentation supporting consultations and permit applications with the California Department of Fish and Wildlife including Streambed Alteration Agreements and Incidental Take Permits. Assess potential impacts of projects on plant and wildlife species protected under the California Endangered Species Act. Research and identify scientific and technical data in support of the impact analysis and effects determinations. Formulate mitigation in coordination with clients.

Federal Regulatory Applications and Consultation Documentation. Prepare documentation supporting formal section 7 consultations with the U.S. Fish and Wildlife Service and preparing section 10 Habitat Conservation Plans under the Endangered Species Act. Provide expert advice associated with regulatory requirements, ecology, wildlife biology and threatened and endangered species management.

Complete formal Waters of the U.S. jurisdictional determinations throughout arid Southern California. Evaluate wetland criteria to determine accurate jurisdictional boundaries, document observations, and present findings in a technical report for U.S. Army Corp of Engineers and U.S. Environmental Protection Agency concurrence.

Conduct editorial and technical review of environmental documents, scientific and technical reports, regulatory application packages, and biological assessments to ensure compliance with pertinent laws and regulations, as applicable.

Project Transaction Due Diligence Evaluations. Biological lead for due diligence evaluations for utility-scale solar energy generation facilities. Assessed permitting efforts to evaluate if appropriate and necessary authorizations or permits were in place. Identified those mitigation or compensation measures that could result in significant monetary or schedule impacts.

Siting Studies and Development Constraints Analysis. Conducted siting studies at six utility-scale solar energy-generating facilities within the San Joaquin Valley. Reviewed current and potential future land uses, land use regulations, and natural resource constraints to assess the feasibility of permitting the proposed projects. Prepared technical reports that clearly and concisely presented findings.

Completed reconnaissance surveys of 1,000s of acres to assess the potential constraints in developing oil and gas production facilities. Performed desk top research coupled with field visits to provide client a feasibility ranking for permitting the proposed facilities and provided recommendations on facility design which could avoid environmental constraints and facilitate project development.

Facilitation and Consensus Building. Through effective and efficient communication with clients and regulators, Mr. Vogler is able to find resolution even amongst competing interests of multiple regulatory agencies. While working with multiple stakeholders, sometimes with

opposing expectations, through respect and open communication Mr. Vogler is effective at distilling the core issues and garnering consensus. Mr. Vogler's project success exemplifies his ability to listen to clients and understand their expectations.

Project Management. Manage multi-disciplinary projects with annual budgets up to $1MM. Develop budget and scope to provide the appropriate level of client-desired support. Manage budget and scope, evaluate earned value, and forecast project profit revenues for senior management.

Senior member of the Phillips 66 pipeline abandonment project management team. Total program value in excess of $38MM. Develop work scope, solicit and select sub-contractors, responsible for program deliverables, interface with internal and external clients, and manage project budgets.

Solicit and select subcontractors to support project efforts. Monitor subcontractors work product, manage subcontractor costs, and ensure quality work products.

Land Use Entitlements. Review and determine permitting requirements for conducting work activities within local agency jurisdiction. Assemble permit packages for submittal to obtain requisite discretionary permits and clearances to perform work activities.

Species Expertise

- Tidewater Goby **(***Eucyclogobius newberryi*)
- Burrowing owl (*Athene cunicularia*)
- California red-legged frog (*Rana draytonii*)
- California tiger salamander (*Ambystoma californiense*)
- Blunt-nosed leopard lizard (*Gambelia sila)*
- Desert Tortoise (*Gopherus agassizii*)
- San Joaquin Kit Fox (*Vulpes macrotis mutica*)
- La Graciosa thistle (*Cirsium scariosum* var. *loncholepis*)
- Surf thistle (*Cirsium rhothopilum*)
- Beach spectacle-pod (*Dithyrea maritima*)
- Working and permitting knowledge of other California coastal, San Joaquin Valley, and California desert species.

Selected Continuing Education

- Western Section Annual Conference. The Wildlife Society. Santa Rosa, CA. January 2015.
- Western Section Annual Conference. The Wildlife Society. Reno, NV. January 2014.
- Endangered Species Act Section 7 Workshop. Western Section of The Wildlife Society, Sacramento, CA. February 2013
- Facilitation Skills for Scientists and Resource Managers. Elkhorn Slough Coastal Training Program, Prunedale, CA. November 2012.
- San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques. California Central Coast Chapter of The Wildlife Society. Carrizo Plains, CA. July 2012.
- California Tiger Salamander Upland Habitat Workshop. Elkhorn Slough Coastal Training Program. Carmel Valley, CA. June 2010.
- California Tiger Salamander Workshop. Elkhorn Slough Coastal Training Program. Monterey, CA. April 2009.

- Blunt-nosed Leopard Lizard Habitat and Survey Techniques Workshop. San Joaquin Chapter of The Wildlife Society. Bakersfield, CA. May 2007.
- Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop. Desert Tortoise Council. Ridgecrest, CA. November 2003.
- Storm Water Pollution Prevention on Construction Sites. State Water Resources Board. Sacramento, CA. April 2001.
- California Red-legged Frog Survey, Handling, and Pit Tagging. Personal instruction from Dr. Galen Rathbun while performing survey efforts under his research permit. Guadalupe, CA. 2000 – 2003.
- U.S. Army Corp of Engineers Wetland Delineation Certification Program. San Diego, CA. January 1997.

ATTACHMENT C

Application for Certification (15-AFC-01)

Puente Power Project

Oxnard, California

Final Biological Resources Survey Methodology

Prepared For:

NRG Energy Center Oxnard LLC

April 10, 2017

Table of Contents

List of Acronyms

AECOM	AECOM Technical Services, Inc.
AFC	Application for Certification
BCC	Bird of Conservation Concern
BSA	Biological Study Area
CDFW	California Department of Fish and Wildlife
CCC	California Coastal Commission
CEC	California Energy Commission
CCH	Consortium of California Herbaria
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
ESRP	Endangered Species Recovery Program
FR	Federal Register
FSA	Final Staff Assessment
GGNRA	Golden Gate National Recreation Area
MGS	Mandalay Generating Station
NRG	NRG Energy Center Oxnard LLC
P3	Puente Power Project
SSC	Species of Special Concern
SCE	Southern California Edison
SFNPS	San Francisco Bay Area National Parks Science and Learning
USFWS	United States Fish and Wildlife Service

1 Introduction

1.1 Purpose

This Final Biological Resources Survey Methodology (Survey Methodology) has been prepared by AECOM Technical Services, Inc. (AECOM), on behalf of NRG Energy Center Oxnard LLC (NRG or Applicant) in support of the Puente Power Project (P3 or project). Specifically, this Survey Methodology serves to address the directive for additional biological resource surveys in the "Committee Orders for Additional Evidence and Briefing Following Evidentiary Hearings," dated March 10, 2017 (California Energy Commission [CEC] TN # 216505 [the Committee Order]). In addition, this Survey Methodology addresses the requests for additional biological resource surveys in the Interveners' Joint Motion to Modify the CEC's Committee Orders for Additional Evidence and Briefing Following Evidentiary Hearings dated March 21, 2017 (CEC TN #216641 [the Interveners' Motion]. Finally, this Survey Methodology has been revised in response to comments received from agency staff and interveners on the initial version submitted by Applicant on March 27, 2017 (TN # 216641).

The Committee Order directed Applicant to prepare and submit results from one or more focused biological surveys, conducted before July 31, 2017, of the proposed project site to determine the likelihood for the presence of the following species: Ventura marsh milkvetch (*Astragalus pycnostachyus* var. *lanosissimus*), globose dune beetle (*Coelus globosus*), two-striped garter snake (*Thamnophis hammondii*), California legless lizard (*Anniella pulchra* [hereafter referred to as *Anniella* sp.[1]]), and Blainville's horned lizard (*Phrynosoma blainvillii*).

The Interveners' Motion requested that the Committee modify the Committee Order to require biological surveys of additional species, which according to the Interveners, will result in "a complete and legally adequate assessment of the biological resources on the Project site . . ." (Interveners' Motion, p. 2). The Interveners' Motion requested additional surveys for the following species: western snowy plover (*Charadrius nivosus nivosus*), California least tern (*Sterna antillarum browni*), least Bell's vireo (*Vireo bellii pusillus),* burrowing owl (*Athene cunicularia*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), California black rail (*Laterallus jamaicensis coturniculus*), salt marsh birds beak (*Chloropyron maritimum* ssp. *maritimum*), and Orcutt's pincushion (*Chaenactis glabruiscula orcuttiana*).

Comments on the initial version of this Survey Methodology were provided by CEC staff (TN # 216886) ("CEC Comments"), California Department of Fish and Wildlife (CDFW) staff (TN # 216901) ("CDFW Comments"), California Coastal Commission (CCC) staff (TN # 216908) ("CCC Comments"), and interveners Environmental Defense Center, Sierra Club Los Padres Chapter, Ventura County Environmental Coalition, and Center for Biological Diversity (TN # 216914) ("Intervener Comments") (collectively, "Agency/Party Comments"). Changes made to the initial version of this Survey Methodology in response to the Agency/Party Comments are reflected in a "redline" version submitted concurrently herewith.

[1] The species traditionally recognized as California legless lizard (*Anniella pulchra*) has been split into five species, following Papenfuss and Parham (2013). The Ventura County coast lies in a zone that has not been sampled; therefore, it is unknown whether legless lizards with potential to occur in the BSA would be *Anniella pulchra* or *Anniella stebbinsi*.

This Final Survey Methodology outlines the proposed methods of the surveys Applicant intends to conduct for all of the species identified in the Committee Order and the Interveners' Motion. As directed by the Committee Order, surveys will be conducted on the approximately 3-acre project site. In addition, as requested in the Interveners' Motion and the Agency/Party Comments, surveys will be conducted in the areas described in Section 1.3 below.

As explained further below, all surveys will be completed in April, May, and June, and the final survey report will be filed by June 23, 2017.

1.2 Project Background

In September 2013, Southern California Edison (SCE) issued the 2013 Local Capacity Requirements Request for Offers for the Moorpark Sub-Area (Track 1). SCE was authorized to procure between 215 and 290 megawatts of electrical capacity in the Moorpark Sub-Area of the Big Creek/Ventura local reliability area to meet long-term local capacity requirements by 2021. In November 2014, NRG was awarded a contract by SCE to develop the project and entered into a 20-year Resource Adequacy Purchase Agreement with SCE.

P3 will be developed on approximately 3 acres of previously disturbed vacant brownfield land within the existing boundaries of Mandalay Generating Station (MGS) on Assessor's Parcel Number 183-0-022-025; Township 2 North, Range 23 West, on the U.S. Geological Survey Oxnard/Oxnard OE Topographic Map Quadrangles (Latitude: 34.207115; Longitude: 119.250000).

In April 2015, NRG filed an Application for Certification (AFC) for the project with the CEC. In December 2016, the CEC Staff issued the Final Staff Assessment (FSA), which concluded that the project as proposed, with implementation of the proposed Conditions of Certification, would comply with all applicable laws, ordinances, regulations and standards, and would not result in any unmitigated significant environmental impacts. The Committee assigned to review the project conducted Evidentiary Hearings on February 7 through 10, 2017.

1.2.1 Scope of Biological Surveys and Reports Completed to Date

Several biological surveys and associated reports have been conducted and prepared throughout the AFC process. A summary of the biological surveys and associated reports is included herein to provide an understanding of what biological data have been previously collected, and how these data were used to assess the potential for special-status species and analyze potential impacts to biological resources.

Previous surveys and analysis are documented in the following reports: AFC Section 4.2, Biological Resources (CEC TN #204219-9); AFC Appendix D, Biological Resources (CEC TN #204220-4); and Puente Power Project (P3), Project Enhancement – Outfall Removal and Beach Restoration (Section 3.2) (CEC TN #213802).

A reconnaissance survey of the project site was conducted on January 12, 2015.

Focused surveys of the project site, construction parking and laydown areas, and construction material storage areas, were conducted on March 12 and 31, 2015. During the surveys, a wetland delineation/jurisdictional determination, focused botanical survey, vegetation community mapping, and a wildlife survey (including sensitive species) were conducted. In the dunes adjacent to the project site and at the edge of McGrath Lake, a focused botanical survey, vegetation community mapping, and a wildlife survey (including sensitive species) were conducted. Vegetation mapping was conducted from public roads for the offsite areas in the project vicinity.

For the beach outfall area, a portion of the area was surveyed in March 2015. During the survey, a focused botanical survey, vegetation community mapping, and a wildlife survey (including sensitive species) were conducted. A reconnaissance-level follow-up survey was conducted on October 18, 2016. At this time, the proposed wastewater discharge area was also surveyed. A botanical survey (although it was not conducted during the spring blooming period), vegetation community mapping, and a wildlife survey (including sensitive species) were conducted at that time (CEC TN #215441) (Latham & Watkins LLP 2017).

The results of the field efforts were analyzed in conjunction with the species known from the literature review to occur in the project vicinity, to determine the potential of those species to occur on the project site and beach outfall area. The project site and beach outfall area are highly disturbed, are continually used for operations, or are adjacent to site activities, and therefore do not support habitat for special-status species. Focused surveys for individual special-status species were therefore deemed not necessary and not conducted. It should be noted that pre-construction surveys and a mechanism to avoid and mitigate impacts to special-status species are outlined in the proposed Conditions of Certification (please see the CEC Staff FSA, Part 1, Section 4.3, Biological Resources [CEC TN #214712]).

1.3 Biological Study Area

For purposes of the surveys to be completed pursuant to this Survey Methodology, as directed by the Committee Order, the Biological Study Area (BSA) includes the approximately 3-acre site on which the project will be constructed (referred to herein as the project site). In addition, as requested in the Interveners' Motion and the Agency/Party Comments, the BSA includes the following areas:

- a 100-foot "buffer area" surrounding the project site, except where such a buffer area would extend outside the fence line of the MGS or into areas that are covered with impervious surfaces;

- the area potentially affected by removal of the existing outfall, including the temporary access road that will be used to reach the outfall area, and a 25-foot "buffer area" surrounding the potentially affected area; and

- temporary construction parking and laydown areas, and construction material storage areas, including a 100-foot "buffer area" surrounding such areas, except for any areas outside the fence line of the MGS or covered with impervious surfaces.

The BSA excludes areas covered by impervious surfaces, lands outside the MGS fenceline, and areas of open water. Please see Figure 1 for the extent of the BSA.

Relevant local biological resources and environmental conditions in the BSA and surrounding areas are summarized below. Additionally, Figure 1 shows vegetation communities and land cover types in the BSA and adjacent areas. Please see the AFC, Section 4.2, Biological Resources (CEC TN #204219-9) for further descriptions of these vegetation communities and land cover types.

1.3.1 Project Site

The project site is situated within the fenced boundary of the existing MGS. The project site encompasses approximately 3 acres of significantly disturbed land.

The habitats contained in the project site include iceplant mats, woolly seablite/iceplant mats, coyote brush scrub, and ruderal vegetation. The project site has been graded and subjected to various human uses. Dominant plants include many invasive weeds, including iceplant (*Carprobrotus edulis* and *Mesembryanthemum nodiflorum*), Russian thistle (*Salsola tragus*), and horticultural species such as lollypop tree (*Myoporum laetum*). Native coyote brush scrub habitat occurs in the southern portion of the project site; however, even this area is disturbed and invasive species are prevalent. Soils on the project site have been artificially compacted. With the exception of woolly seablite (*Sueda taxifolia*), a sensitive species with a California Rare Plant Rank (CRPR) of 4.2 (limited distribution), no special-status plants or wildlife were observed on the project site during all previous biological surveys.

1.3.2 Outfall Area

The habitats contained in and immediately adjacent to the outfall area include open water, sandy beach, and dune mats. Open water is found at the mouth of the outfall structure and continues as a dynamic channel to the Pacific Ocean. Sandy beach is situated between the ocean and the dunes. Dune mats are located along the dunes between the outfall structure and MGS. Dune mats are identified as a CDFW sensitive natural community.

1.3.3 Outfall Access Road

The habitats contained in and immediately adjacent to the outfall access road include iceplant mats and dune mats.

1.3.4 Construction Parking and Laydown Areas and Overflow Material Storage and Laydown Areas

Construction parking and laydown areas are within the fenced boundary of the existing MGS and currently paved for the most part. The overflow material storage and laydown area is situated within the fenced boundary of the existing MGS. The area encompasses approximately 1 acre of significantly disturbed land containing iceplant mats.

1.4 Sensitive Species Covered by Survey Methodology

1.4.1 Species Identified in Committee Order

1.4.1.1 Ventura Marsh Milkvetch

The Ventura marsh milkvetch (*Atragalus pycnostachyus* var. *lanosissimus*) is listed by the State of California as Endangered and by the federal government as Endangered. It is ranked by the California Native Plant Society (CNPS) as a 1B.1 species. Ventura marsh milkvetch is endemic to the south-central coast of California. Historically, the variety occurred in several populations in Ventura and Los Angeles counties (CCH 2017), and possibly even Orange County (Barneby 1964). Its habitat requirements are not well-known, but it appears to have been restricted to well-drained sandy-clay soils on swales, coastal meadows, and coastal marsh habitats along back dunes on the coast (Wilken and Wardlaw 2001, CCH 2017, Baldwin et al. 2012, Jensen 2007). It may have a tolerance for brackish or alkaline conditions (69 Federal Register [FR] 29081, Jensen 2007).

The species was considered extinct since the early 1900s, but was rediscovered in 1997 on the North Shore at Mandalay Bay,[2] the proposed development at Harbor Boulevard and Fifth Street that was formerly an oil-waste dump site on the Oxnard Plain in Ventura County (Impact Sciences, Inc. 1997, in 69 FR 29081). Currently, 30 to 50 adult plants (CNPS 2017) remain on these roughly 6 acres of semi-ruderal back dunes (69 FR 29081, USFWS 2010). Even with reseeding efforts and site management by the CDFW, fewer than 400 individuals (as few as 30 to 40 in some years) are known in the wild (69 FR 29081, 66 FR 54808, USFWS 2010), and offsite planting areas appear to have mixed success (Jensen 2007). Introduced localities include areas in or adjacent to Mandalay State Beach, McGrath State Beach, Ormond Beach, Carpinteria Salt Marsh, and Coal Oil Point Reserve (USFWS 2010). These require careful management, and Jensen (2007) recommends weekly monitoring from March through October, which is the growing season. In 2004, critical habitat for the species was established on roughly 420 acres of coastal dune habitat in Santa Barbara and Ventura Counties (69 FR 29081). No critical habitat occurs in the BSA.

Based on the habitat requirements of the species, the Ventura marsh milkvetch has a low potential to occur on the project site. Previously conducted focused botanical surveys (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]) did not detect this species in the project site. Two records occur within a 1-mile radius of the BSA.

1.4.1.2 Globose Dune Beetle

The globose dune beetle is a federal Species of Special Concern (SSC). The United States Fish and Wildlife Service (USFWS) has considered it for listing since 1978 (43 FR 35636), but there appears to have been too little data to conclude a designation (59 FR 58982).

The globose dune beetle is restricted to dune ecosystems along the coastline from Northern Baja California to Bodega Head. It prefers foredunes and hummocks, and is found within

[2] SunCal is developing the former North Shore at Mandalay, which is now called Beachwalk on the Mandalay Coast. The plans include 30 acres of native dune restoration (Ventura County Star 2015).

200 feet of the ocean in northern and Central California, but may extend up to roughly 1,000 feet inland in the south (Doyen 1976, NatureServe 2015).

The globose dune beetle feeds on detritus in the sand, though evidently it may climb shrubs to feed. It has a strong preference for native species. Invasive iceplant is considered one of the main threats to the beetle and its habitat (Nagano 1982). Larvae of the globose dune beetle live in sand or under vegetation and cover items (Doyen 1976). Adults that can be found year-round are mostly nocturnal. They may appear on the surface on foggy or very cool, overcast days (NatureServe 2015).

Based on the habitat requirements of the species, the globose dune beetle has a low potential to occur on the project site. No globose dune beetles were observed during previous biological surveys (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]), and no records fall within a 1-mile radius of the BSA. Three records are known from within a 10-mile radius.

1.4.1.3 Two-Striped Garter Snake

The two-striped garter snake is a California SSC and has no federal status. This snake occurs along the California coast from Monterey County to northern Baja California (Jennings and Hayes 1994). Two-striped garter snakes are found in or near permanent or intermittent fresh water, often along streams with rocky beds bordered by willows or other streamside growth (Stebbins 2003). The two-striped garter snake is highly aquatic and is considered among the most aquatic of the garter snakes (Thomson et al. 2016). This species is primarily active from spring to late fall; it is often active at dusk or night, but can be found during the day (Stebbins 2003). Two-striped garter snakes breed between March and April and live young are born from July to August. Their diet consists of tadpoles, newt larvae, small fish, and even worms (Jennings and Hayes 1994). The two-striped garter snake has a variety of predators, such as raptors, herons, raccoons, and coyotes, as well as introduced exotic species.

Based on the species requirements, the two-striped garter snake has a low potential to occur on the project site and other areas of the BSA, because there is no pooled or standing fresh water. Previous biological surveys did not detect this species on the project site (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]). There are no California Natural Diversity Database (CNDDB) records of this species within a 1-mile radius of the BSA and only one record within a 10-mile radius.

1.4.1.4 California Legless Lizard

The California legless lizard is a California SSC and has no federal status. It is endemic to California and northern Baja California, and is found from Contra Costa County south through the Coast Ranges down through northern Baja California. This species is typically found approximately 60 miles from the coast and occurs in parts of the San Joaquin Valley, the western edge of the Sierra Nevada Mountains, and the western edge of the Mohave Desert (Jennings and Hayes 1994). This species receives it listing status due to extensive loss of habitat resulting from urban and agricultural development.

The California legless lizard is typically restricted to undisturbed moist, loose, mulchy, sandy soils such as sand, loam, or humus, and frequents sparse vegetation of beaches, chaparral, pine-oak woodlands, and stream sides (Stebbins 2003). They burrow in loose sand and must live where they can reach conditions with moisture content (Kuhnz 2000, Miller 1944). They have been found at soil depths from a few to 20 inches below the surface (Kuhnz 2000). Because they are a fossorial animal (primarily burrowing underground), their feeding ecology is not well known. They are insectivores, and as a fossorial animal are generalist sit-and-wait feeders. Recorded diets consist of larval insects, adult beetles, termites, and spiders (Stebbins 2003). They forage in leaf litter by day and may emerge on the surface at dusk or night, with peak activity patterns in the morning and evening.

The California legless lizard is reported to have a high tolerance for cooler temperatures (Bury and Balgooyen 1976), and requires moisture in its environment (Miller 1944). Although the species is supposedly active all year, with little seasonal changes in movement being predicted (Morey in Zeiner et al. 1988-1990), it would seem that spring may be the best time to locate the species, when temperatures are cooler and the soils are more moist.

Based on the soil requirements of the species, it has a low to moderate potential to occur on the project site, because much of the site has densely vegetated mats of iceplant. Kuhnz et al. (2005) found California legless lizards at lower densities in disturbed soils and areas where iceplant had replaced native vegetation compared to undisturbed areas where natives were dominant. Previous biological surveys, which included raking for this species, did not observe any individuals in the project site (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]). Records in the CNDDB for this species occur approximately 0.5 mile to the north and 1.5 miles to the south of the BSA.

1.4.1.5 Blainville's Horned Lizard

The Blainville's (or California) horned lizard, formerly known as the coast horned lizard, is a California SSC and has no federal status. It is found from the northern Sacramento Valley to northwest Baja California (Brattstrom 2013). The species has decreased to fewer than 30 percent of its population in the last century, due to habitat conversion (Hollingsworth and Hammerson 2007); collection pressure (Jennings 1987); and the displacement of its native prey base, harvester ants, to nonnative Argentine ants (Stebbins 2003).

Blainville's horned lizard occurs in habitats with scrubby or open areas with sandy soils. Pristine or high-quality native communities in chaparral, coastal scrub, valley and foothill grassland, juniper desert, coastal dunes, and washes are used by the species (Brattstrom 1997, Stebbins 2003, Nafis 2017); although they may also be found on dirt roads surrounded by natural lands (Nafis 2017). Although the Blainville's horned lizard evidently eats a variety of invertebrates (Nafis 2017), the presence of its main prey base, harvester ants, is either a requirement or an important indicator for suitable habitat (Suarez and Case 2002, Suarez et al. 2000, Brattstrom 2001).

Based on the range and habitat requirements of the species, the Blainville's horned lizard has a low potential to occur in the project site. It was not detected during previous biological surveys (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]), and there are no

records within a 1-mile radius of the BSA. However, there is a record within a 5-mile radius of the BSA.

1.4.2 Species Identified in Interveners' Motion

1.4.2.1 Western Snowy Plover

The western snowy plover is listed by the federal government as Threatened, and designated as an SSC by the State of California. During fall and winter months, this species is common along estuarine shores and sandy marine areas (CDFW 2017a). Predators (crows, opossums, raccoons, and coyotes) and people and their unleashed dogs are the most significant threats to western snowy plovers at local state beaches (California State Parks 2013).

Western snowy plovers nest along estuarine shores and sandy marine areas from April to August. Nesting areas are generally shallow depressions, typically found in sandy, gravelly, or friable soils (CDFW 2017a). Nest sites are generally unobstructed from the wrack line along the seashore.

No western snowy plovers were detected during previous biological surveys. Critical habitat for the western snowy plover is designated on the beaches and dunes west, northwest, and southwest of the BSA. In addition, the beaches and sand dunes in Mandalay State Beach and McGrath State Beach in the immediate vicinity of the BSA support both wintering populations and breeding populations of this species. The nesting areas are delineated with semi-permanent or seasonal symbolic fencing (California State Parks 2013).

1.4.2.2 California Least Tern

The California least tern is listed by the federal government as Endangered and by the State of California as Endangered. This species migrates to California during the breeding season, typically arriving in southern California in late April or mid-May. Breeding habitat generally includes estuarine and marine shores. This species generally forages for fish over open water where small fish are abundant. Population declines for this species are attributed to human disturbance at areas historically used as coastal nesting (CDFW 2017b). Nest sites are usually in open expanses of light-colored sand, dirt, or dried mud, close to a lagoon or estuary with a dependable food supply (USFWS 1985a).

Based on vegetative cover in the BSA and the relatively small area available, suitable nesting habitat quality is low and potential nesting is unlikely to occur in the BSA. No California least terns were detected during previous biological surveys. Known nesting sites have been identified along the beach between the Santa Clara River Mouth and McGrath Lake; and Ormond Beach, between Ormond Beach Generating Station and Perkins Road (CDFW 2015). This species is also known to nest on the beach in the vicinity of the BSA. It may also forage over Edison Canal.

1.4.2.3 Least Bell's Vireo

The least Bell's vireo is listed by the federal government as Endangered and by the State of California as Endangered. This species is a locally rare summer resident from Santa Barbara County south to northern Baja California (Birds of North America Online 2017). The least Bell's vireo has experienced a drastic decline in numbers throughout California in recent decades,

due primarily to brood parasitism by the brown-headed cowbird (*Molothrus ater*) and habitat degradation and destruction (Birds of North America Online 2017).

The least Bell's vireo occurs in dense, valley foothill riparian habitat, particularly willow thickets, as well as cottonwood stands, coyote brush, and wild blackberry shrubland, at elevations below 600 meters (2,000 feet). They are considered an obligate riparian breeder and typically inhabit structurally diverse woodlands along watercourses (USFWS 1998). Two features appear to be the most critical for occupied habitat are summarized as 1) the presence of dense cover within 3 to 6 feet of the ground and 2) dense stratified canopy for foraging (USFWS 1998). Although nests are frequently found in willow-dominated areas, a diverse habitat structure appears to be as important as plant species composition (USFWS 1998). Least Bell's vireos primarily take insect prey, gleaning prey items from foliage and branches of dense vegetation (Birds of North America Online 2017).

Least Bell's vireos generally migrate from their wintering grounds in Mexico to arrive at their summer breeding territory by the end of March. Monogamous pairs build an open cup nest of fine grasses, pieces of bark, plant down, and animal hair approximately 0.6 to 0.9 meter (2 to 3 feet) from the ground in a willow or other small tree. Peak egg laying occurs from May into early June; an average of four eggs are laid and incubated by both parents. Incubation is generally approximately 14 days. Young are cared for by both parents and generally fledge 11 to 12 days after hatching. Least Bell's vireos usually depart the summer breeding ground by the end of August (CDFW 2017c).

Based on the absence of dense willow thickets or other densely growing shrub or tree cover, suitable nesting habitat is not present in the BSA. The least Bell's vireo has a low potential to occur in the BSA. No least Bell's vireos were detected during previous biological surveys, and no records fall within 1 mile of the BSA. Nine records are known from within a 10-mile radius.

1.4.2.4 Burrowing Owl

The burrowing owl is listed by the federal government as a Bird of Conservation Concern (BCC) and by the State of California as an SSC. Burrowing owls are year-long residents in the Central Valley and desert regions of California, with wintering migrants and smaller year-round populations occurring in coastal California. This species occurs in dry, open grassland and desert habitats, from sea level up to 1,600 meters in elevation (CDFW 2017d). Burrowing owls are primarily threatened by conversion of suitable habitat to agriculture, other forms of habitat destruction, and the reduction in ground squirrel populations due to poisoning and other eradication efforts (CDFW 2017d).

Burrowing owls forage for invertebrates and small vertebrate prey, including insects, lizards, birds, and mammals (Cornell 2017). Burrowing owls use burrows for shelter and breeding; typically, burrowing owls prefer to use burrows dug by other species, including California ground squirrels (*Otospermophilus beecheyi*), but they may dig their own burrows in suitable friable soils. Manmade structures including open pipes and culverts, debris piles, and nest boxes also may be used. Breeding typically occurs in the Central Valley; individuals may reside year-round in Central Valley habitats or migrate to coastal California or further south during the winter. Breeding occurs from March through August, with a peak in April and May.

Based on the habitat requirements for this species, burrowing owls have a low potential to occur in the BSA. The BSA occurs within the wintering range for this species. Four historical records occur within 10 miles of the BSA, of which one was recorded in January, two in February, and one in mid-March, supporting overwintering, but not breeding, occurrence of burrowing owls in the vicinity. California ground squirrels do occur on site, and may provide suitable burrows for sheltering. Burrowing owls have been recorded approximately 1 mile north of the BSA in coastal dune scrub habitats (CDFW 2017b).

1.4.2.5 White-Tailed Kite

The white-tailed kite is listed by the State of California as a Fully Protected species. This medium-sized raptor is a year-round resident of coastal and valley lowlands in California, and ranges from common to uncommon throughout its range (CDFW 2017d). White-tailed kites inhabit herbaceous and open stages of most habitats, including savanna, open woodland, desert grassland, partially cleared lands, and cultivated fields, and are rarely found away from agricultural areas (Cornell 2017, CDFW 2017d). White-tailed kites were subject to egg collecting and hunting in the early 20th century, and are now threatened by development which removes suitable nesting habitat and modern farming methods that eliminate foraging habitat (Cornell 2017).

White-tailed kites primarily forage for small mammals, including voles (*Microtus* sp.) and other small, diurnal species (Cornell 2017). Foraging habitat typically consists of lightly grazed or ungrazed open grasslands, meadows, farmlands, and wet meadows. Loose nests are built in dense groves of trees, and are typically placed in the upper third of the tree, approximately 6 to 20 meters above ground level (CDFW 2017d, Cornell 2017). In southern California, white-tailed kites may also nest on the ground in saltgrass (*Distichlis spicata*) or Bermuda grass (*Cynodon dactylon*). Breeding occurs from February to October, peaking from May to August (CDFW 2017d). During the nonbreeding season, white-tailed kites may form communal roosts of as many as 100 birds (Cornell 2017, CDFW 2017d).

Based on habitat requirements of this species, white-tailed kites are not expected to breed in the BSA. Suitable nesting habitat consisting of dense groves of trees does not occur in the BSA. Suitable foraging habitat consisting of open grasslands does not occur in the BSA. No white-tailed kites were observed during previous biological surveys. Suitable nesting and foraging habitat may occur in the vicinity of the BSA, and white-tailed kites may occur transiently, but this species is not expected to forage or breed in the BSA.

1.4.2.6 Northern Harrier

The northern harrier is listed by the State of California as an SSC (CDFW 2017d). This medium-sized raptor is a year-round resident in portions of coastal California and occurs as a winter migrant throughout coastal areas. Its range extends throughout California at elevations from sea level to 1,700 meters. Northern harriers occur in a variety of open habitats, including annual grasslands, meadows, open rangelands, desert sinks, and freshwater and saltwater emergent wetlands; this species rarely occurs in wooded areas (CDFW 2017d). Habitats with low vegetation are generally preferred (Cornell 2017).

Northern harriers feed on a variety of prey, including small mammals (especially meadow voles), reptiles, amphibians, birds, crustaceans, and rarely fish. They forage on the wing, soaring low over open habitats in search of prey (CDFW 2017d, Cornell 2017). Breeding occurs from April to September, with peak activity in June and July. Nests are built on the ground in shrubby or grassy vegetation, usually in emergent wetlands, grasslands, grain fields, or on sagebrush flats (CDFW 2017d).

Based on the habitat requirements of this species, northern harriers are not expected to breed in the BSA. The BSA occurs within the winter range for northern harriers, and suitable nesting habitat consisting of dense shrubby or grassy vegetation does not occur in the BSA. Suitable foraging habitat consisting of large tracts of herbaceous, open habitats does not occur in the BSA. No northern harriers were observed in the BSA during previous biological surveys, but this species was observed offsite in the vicinity. Suitable nesting and foraging habitat may occur in the vicinity of the BSA, and northern harriers may occur transiently, but this species is not expected to breed or forage in the BSA.

1.4.2.7 California Black Rail

California black rail (*Laterallus jamaicensis coturniculus*) is designated by the federal government as a BCC and by the State of California as a Threatened species. Formerly a resident in coastal wetland areas spanning from Santa Barbara County to San Diego County, the species currently is only observed as a rare wintering species. California black rail population decline is thought to be primarily attributed to significant loss of saltwater and freshwater wetland habitats in recent decades (CDFW 2017e).

The California black rail occurs in saline, brackish, and freshwater emergent wetlands. This species prefers tidal emergent wetlands dominated by pickleweed (*Salicornia* sp.), or freshwater wetlands vegetated with bulrush (*Scirpus* sp.), cattails (*Typha* sp.), and saltgrass. California black rails primarily take invertebrate prey by gleaning from the vegetation and muddy surfaces (CDFW 2017e).

California black rails typically nest in in dense vegetation, such as pickleweed habitats, in the higher portions of marshes. The species typically conceals deep, loose, cup nests which are generally situated close to ground level (CDFW 2017e). They require a constant water depth of approximately 1 inch, surrounded by dense vegetation for nesting. Based on habitat requirements for this species, the California black rail has a low potential to occur in the BSA. Suitable nesting habitat is not present in the BSA. No California black rails were detected during previous biological surveys. This species is reported to occur north of the BSA between the McGrath State Beach campground and the Santa Clara River mouth, and could occur at McGrath Lake.

1.4.2.8 Salt Marsh Bird's-Beak

Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*) is a hemiparasitic annual herb that is listed by the State of California as Endangered and by the federal government as Endangered. It is ranked by the CNPS as a 1B.2 species (CDFW 2017f). It ranges from Morro Bay, California south throughout southern coastal California and into northern Baja California, Mexico.

Colonies of salt marsh bird's beak occur in low-lying areas in coastal dune habitats, coastal salt marshes and swamps, and may occur in freshwater seeps. Favorable habitat generally has well-aerated and well-drained soils that dry during the summer, in areas that have low salinity in the spring and generally low vegetative cover. Colonies may infrequently occur behind barrier dunes, and on dunes, mounds, and old oyster shell dredge spoils (USFWS 1985b). Elevation ranges from sea level to 30 meters (CNPS 2017). It blooms from May through October (Calflora 2017). Salt marsh bird's-beak is threatened by vehicular traffic, road construction, hydrological alterations, recreational activities, foot traffic, competition with nonnative plants, and loss of salt marsh habitat (CNPS 2017).

Based on the habitat requirements of this species, salt marsh bird's-beak is not expected to occur in the BSA. Focused botanical surveys did not detect this species in the BSA. The closest locations are McGrath State Beach; Ormond Beach on alkali flats northeast of the intersection of Arnold Road and Perimeter Road; and near Point Mugu (CDFW 2017g).

1.4.2.9 Orcutt's Pincushion

The Orcutt's pincushion is not State or federally listed, but is ranked by the CRPR as a 1B.1 species (CDFW 2017f). It ranges throughout southern California, and into northwestern Baja California.

Orcutt's pincushion is an annual herb that occurs in coastal dunes and coastal bluff habitats, typically on sandy soils (Calflora 2017, CNPS 2017). Elevation ranges from sea level to 100 meters, and it blooms from January to August (CNPS 2017). Orcutt's pincushion is threatened by development, foot traffic, and recreational activities.

Based on the habitat requirements for this species, Orcutt's pincushion is not expected to occur in the BSA. Focused botanical surveys did not detect this species in the BSA. The nearest occurrence was recorded along Pierpont Bay Boulevard in Ventura, California, approximately 3.3 miles north of the project (CDFW 2017g).

2 Methods

To generate a proposed survey method, biologists reviewed publicly available reports pertaining to the species identified in the Committee Order and Interveners' Motion. These sources provide information on the natural history of the species, and provide insights on previous methodologies. Details from the research are described below. This section presents the steps taken to develop the proposed survey methodology (including background data review), proposed field surveys, and potential survey time frames. It also summarizes survey limitations and how they may influence the reported results.

2.1 Method Background Review: Species Identified in Committee Order

No agency-approved protocol-level survey guidelines exist for many of the species identified in the Committee Order. Where an accepted protocol exists, it is referenced and described below. For the species where no accepted protocol is available, a proposed survey methodology was generated to determine the likelihood of the presence of these species in the BSA.

2.1.1 Ventura Marsh Milkvetch

Protocol-level rare plant surveys methods exist (California Natural Resources Agency 2009) and were used to conduct focused surveys for the Ventura marsh milkvetch in 2015 (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]). These same methods and those established by USFWS and CDFW (USFWS 1996, CDFW 2009) will be followed.

2.1.2 Globose Dune Beetle

Relatively few available sources provide background on surveys actually conducted for the globose dune beetle. Its biology is unlike other endangered arthropods in southern California, so protocol-level surveys cannot be borrowed from other federally listed species. However, the following documents provide some insights on working with the species or its relatives:

- MacKerricher Dunes State Park Dune Rehabilitation Mitigation Monitoring and Reporting Plan (California State Parks 2012);
- Silver Strand Training Complex Draft Environmental Impact Statement (Commander, U.S. Navy Pacific Fleet, 2010);
- A Pitfall Trapping Survey of Darkling Beetles in the Desert Steppe Vegetation (Rickard and Haverfield 1965);
- Draft Programmatic Environmental Impact Statement for Dredged Material Disposal (U.S. Department of the Navy 1992);
- Natural Resources Section of the Resources Management Plan, Golden Gate National Recreation Area (GGNRA 1999); and
- A manual for assessing restored and natural coastal wetlands with examples from southern California (Pacific Estuarine Research Laboratory 1990).

In the majority of the studies targeting globose dune beetles, the species was not observed, or was observed in very low numbers. However, presence can also be determined by locating

the beetle's characteristic furrows (Commander, U.S. Navy Pacific Fleet, 2010). Pitfall traps appear to have high success rates among related darkling beetles living in similar substrates in the desert. The style of pitfall trap ranged from 100 glass jars set across an entire project site to arrays of metal can traps along a grid, spaced 10 feet apart (Rickard and Haverfield 1965).

2.1.3 Two-Striped Garter Snake

Survey methods for the two-striped garter snake were based on surveys conducted for other projects, as well as surveys conducted for other species of garter snake in California. The following literature was reviewed to generate a survey methodology:

- Status and Ecology for Sensitive Aquatic Vertebrates in Lower San Simeon and Pico Creeks, San Luis Obispo County, California (Rathburn et al. 1993);
- Special-Status Aquatic Species Habitat Assessment—Santa Clara River, Mission Village Project (Entrix 2006);
- Biological Technical Report for the Tajiguas Landfill Reconfiguration Project (AECOM 2013);
- Biological Species and Habitat Survey Report, Final Remedial Investigation Report for Casmalia Resources Superfund Site (Arcadis 2011); and
- Results of Surveys for the San Francisco Garter Snake and California Red-Legged Frog for the NCCWD Recycled Water Project in Pacifica, San Mateo County, California (Swaim Biological Consulting 2005).

Surveys for garter snakes may involve pitfall traps, funnel traps, or visual searches walking transects along appropriate aquatic habitats. The last of these appears to be the most common method for detecting two-striped garter snake, although this is likely because its listing status does not entitle the species to focused surveys.

2.1.4 California Legless Lizard

To generate a survey method for the California legless lizard, biologists relied on a publicly available survey report and a published study that analyzed the effectiveness of survey methods.

- Microhabitat and Population Densities of California Legless Lizards, with Comments on Effectiveness of Various Techniques for Estimating Numbers of Fossorial Reptiles (Kuhnz et al. 2005)
- State Route 126 Final Species Protection and Relocation Plan and Addendum (County of Los Angeles 2013)

This species is secretive, lives primarily underground, and is difficult to detect. Proven detection methods require disturbance of habitat that is often protected for other sensitive

species. Passive detection methods, such as direct observation or coverboards, are typically not successful and can yield negative results.

The Kuhnz et al. 2005 study demonstrated the methods of detection for California legless lizards as they were removed from a development project. These methods compared low-impact time-constrained searches, moderate-impact time-constrained searches, and coverboards. The moderate-impact searches were the most reliable method for detecting the presence of the California legless lizards over a wide range of population densities and vegetation types. However, for very low densities, both of the time-constrained search methods failed to detect legless lizards. Densities, however, were confirmed in subsequent high-intensity raking and clearance activities prior to construction where the entire area was repeatedly raked (depletion raking) to remove all animals from the area. The coverboards yielded the lowest detection rates. Therefore, this method may detect this species but should not be relied on for determining the absence of this species; as Kuhnz et al. (2005) summarizes, detection rates are consistently low with coverboards and this method could fail to detect California legless lizards where there is a low population size.

The State Route 126 project (County of Los Angeles 2013) used pitfall trap arrays, coverboards, and high-impact searches to detect wildlife species and relocate them from the impact areas. The pitfall trap arrays and the coverboards yielded no California legless lizards, but were not searched down to 6 inches during each attempt. The high-impact searches involved raking and using hand tools down to 6 inches. The high-impact surveys conducted for the State Route 126 project did detect California legless lizards, but in very low numbers.

2.1.5 Blainville's Horned Lizard

A survey methodology for the Blainville's horned lizard was based on studies of its natural history. Although a survey protocol for the related flat-tailed horned lizard (*Phrynosoma mcalli*) exists, it pertains to pre-construction monitoring and is not applicable to presence/absence surveys. Previous methods used to detect the species were reviewed from the following:

- Coast Horned Lizard Survey, Vista Canyon Ranch, Los Angeles County (Forde Biological Consultants 2006);
- Spatial Patterns in Abundance of the Coast Horned Lizard (Fisher et al. 2002);
- 2004 and 2006 Reptile Survey Results, Newhall Ranch Specific Plan Area (Impact Sciences, Inc. 2006);
- Population Status and Habitat Affinities of the Blainville's Horned Lizard at a Site in the Northern San Joaquin Valley, California (Gerson 2011);
- Environmental Assessment – El Dorado County Transportation Plan (El Dorado County Transportation Commission 2014);
- Protocol Development Summary: Amphibians and Reptiles (SFNPS 2010);
- Approved Survey Methodology for the Blunt-Nosed Leopard Lizard (CDFW 2004); and
- Survey Protocol for the Presence of or Negative Finding for the Barefoot Banded Gecko (CDFW 2011).

The typical way to detect the species appears to be visual surveys using walking transects during the day. Pitfall traps (Impact Sciences, Inc. 2006, Fisher et al. 2002) have been used, as

well. The presence of harvester ants would seem to be a good indicator of coast horned lizard (Suarez and Case 2002, Suarez et al. 2000, Fisher et al. 2002).

Temperature appears to be an important limitation to the species' surface activity (Hager and Brattstrom 1997). Gerson (2011) conducted surveys when temperatures are between 20 and 30 degrees Celsius (68 and 86 degrees Fahrenheit). Forde Biological Consultants (2006) conducted surveys between 14 and 32 degrees Celsius (57 and 86 degrees Fahrenheit).

2.2 Method Background Review: Species Identified in Interveners' Motion

2.2.1 General Avian Surveys

To address surveys for the western snowy plover, California least tern, least Bell's vireo, northern harrier, and white-tailed kite, and the California black rail, general nesting bird surveys would be conducted in the generally accepted bird season. For the Ventura County area, this is recognized by agencies such as CDFW and USFWS as the period of February 1 through August 31. Focused burrowing owl surveys will also be conducted.

2.2.1.1 Western Snowy Plover and California Least Tern

There are no protocol survey guidelines specific to the western snowy plover or California least tern. General avian survey techniques will be employed in the BSA due to the absence of specific USFWS or CDFW protocol guidance, in addition to the lack of suitable habitat in the BSA.

There are several approaches to conducting broad avian inventories within a specific area. One of the commonly accepted approaches is the area search technique. Area search is a habitat-specific method of survey that can be implemented in a variety of habitats. Benefits to area search include the insight that it gives into species richness in each habitat as well as general breeding bird activity in each habitat (Klamath Bird Observatory 2017).

2.2.1.2 Least Bell's Vireo

Survey guidelines for the least Bell's vireo (USFWS 2001) describe conducting repetitive surveys in suitable habitat between April 10 and July 31. The BSA does not contain suitable habitat, because there is no structurally diverse woodland along watercourses (USFWS 1998). This species is an obligate riparian breeder and as there is no riparian habitat present in the BSA, this species has a low potential to occur. Transient birds stopping on their way to breeding grounds may be present and could be detected during general avian surveys.

2.2.1.3 Burrowing Owl

Guidance for conducting burrowing owl surveys is provided by the CDFW in the *Staff Report on Burrowing Owl Mitigation*. Methodology used to inform detection of burrowing owls in the BSA will follow these standards, specifically the nonbreeding season survey guidelines outlined in Appendix D (CDFW 2012).

2.2.1.4 White-Tailed Kite

There are no protocol surveys specific to the white-tailed kite. Due to an absence of such guidelines and an absence of suitable nesting habitat in the BSA, general avian surveys will be conducted in the accepted nesting bird season.

2.2.1.5 Northern Harrier

There are no protocol surveys specific to the northern harrier. Due to an absence of such guidelines and an absence of suitable nesting habitat in the BSA, general avian surveys will be conducted in the accepted nesting bird season.

2.2.1.6 California Black Rail

Although there is no existing protocol for the California black rail, timing of general avian surveys generally coincides with the timing recommended in the USFWS protocol for California Clapper Rail (synonymous with Ridgway's rail) (USFWS 2015).

2.2.2 Rare Plant Surveys

Guidance for conducting special-status rare plant surveys is provided in General Rare Plant Survey Guidelines (ESRP 2002), Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 1996), and Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFW 2009).

2.2.2.1 Salt Marsh Bird's-Beak

Surveys for salt marsh bird's-beak will follow the directives described in ESRP 2002, USFWS 1996, and CDFW 2009, taking into account the specifics of this species' natural history, including habitat requirements and blooming period.

2.2.2.2 Orcutt's Pincushion

Surveys for Orcutt's pincushion will follow the directives described in ESRP 2002, USFWS 1996, and CDFW 2009, taking into account the specifics of this species' natural history, including habitat requirements and blooming period.

2.3 Methods: Proposed Field Surveys

This section describes the proposed field surveys recommended for each class of species. Although agency-approved survey protocols do not exist for all of the species, the proposed methodologies are designed to maximize the likelihood of detection of each species in the BSA if they are present. Details pertaining to each species' methodologies are described in Sections 2.1 and 2.2. All field surveys will be completed before May 30, 2017. Based on the species' periods of activity, the surveys are being conducted in April, May, and June to maximize the possibility of detection. The number of field days is described below. A proposed schedule can be found in Section 3.

In addition to the activities described in this section, the following activities pertain to all field survey methods:

- Biologists will generate a running list of all vertebrate and plant species encountered in the survey area. This is a standard protocol to characterize the typical flora and fauna of the project site. Of particular note would be:
  - Potential predators of sensitive species;
  - Species that may be confused with sensitive species, but were positively identified as common species; and

  - Surrogate species that may be indicators of sensitive species.

- Insects, particularly beetles, will be identified to the lowest possible taxon.

- All reptiles encountered will be identified to species.

- If one of the identified sensitive species is detected:
  - Its location will be recorded on a Trimble GeoXT GPS;
  - Data will be noted on CNDDB forms, with particular emphasis on describing the organism's maturity/phenology, behavior, associated species, microhabitat, and environmental conditions for the day; and
  - CNDDB forms will be submitted to CDFW.

- Environmental conditions including wind speed, cloud cover, ambient temperature, and ground temperature will be recorded.

- Equipment required for all field surveys include:
  - Trimble GeoXT GPS Unit;
  - Kestrel Handheld Weather Meter; and
  - Camera (preferably with macro capabilities to identify globose dune beetle).

Species-specific proposed survey methods are described below.

2.3.1 Terrestrial Surveys

2.3.1.1 Field Surveys for Globose Dune Beetle

The globose dune beetle is flightless, nocturnal, ground-dwelling, and active year-round. These features of its biology make it possible to pitfall trap for it at any time of the year without the danger of killing organisms in the heat of the day.

Although the globose dune beetle is found year-round (NatureServe 2015), to establish the ideal survey period, several resources were reviewed to find a pattern of the timing in the detections. Only 34 dated CNDDB records exist for this species, including observations that are more than 10 years old, have ambiguous locality information, or describe locations that are now considered to have a poor-quality habitat. To examine a larger body of data, an additional 21 records were obtained between the Essig Museum of Entomology collection (Essig Museum Online Database 2017) and research-grade photographic records from CalPhotos (2007), Flickr (2007), and iNaturalist (2007). Combined, the records showed that this species or other *Coleus* beetles were sighted between January and November, with peak records between March through June. Surveys are recommended for April, which appears to be within the height of detection. A second round of surveys will be conducted in early May.

The following surveys are recommended for the globose dune beetle:

- Two early daytime surveys for visual sign, one in April and one in May;
- Two nighttime surveys for visual sign and beetles, one in April and one in May; and

- Two sets of two consecutive nights of pitfall trapping, one in April and one in May, for a total of four nights.

Visual Surveys

Two visual surveys are recommended for the globose dune beetle. These surveys will take place in moderate weather, and will be rescheduled if extreme windy, warm, or cold weather is noted during the survey period. Surveyors will be versed in the identification of globose dune beetle, including its larval stage, and its differentiation from the ciliate dune beetle. The initial early daylight surveys may take place on the day the pitfall traps are set, or in the morning after they have been checked. The survey will require two biologists to walk transects, no more than 10 feet apart, through the entire BSA. During surveys, biologists will pay special attention to sandy areas under native vegetation that have the ideal microhabitat requirements of the beetle. Surveys will also involve lifting cover items to inspect the arthropod fauna beneath. Surveyors will also attempt to detect the beetle's distinct furrow marks in the soil surrounding vegetation.

The nighttime surveys may be conducted the night before the pitfall traps are installed, or the night after they have been removed. These surveys will be identical to the daytime survey, but will pay closer attention to surface-active insects. Nighttime surveys can begin immediately after sunset.

Pitfall Trap Surveys

Pitfall trap surveys are recommended due to the small size of the beetle (0.39 inch [1 centimeter] or less) (Doyen 1976), its potentially low densities, and its nocturnal habits that lower the effectiveness of visual surveys.

For the P3 survey, pitfall traps will be placed at 20 traps per acre. Rather than setting up the traps in an array, as done by previous studies, they will be installed in areas that meet the microhabitat requirements of the beetle. Prior to ground disturbance, the area will be surveyed for special-status plant species.

Biologists will conduct research in advance to make sure that there is no predicted precipitation during the two nights and mornings the traps will be in use. Closed traps will be installed the day before a night trapping, and reused the following night. During the day, the traps will remain closed. If precipitation occurs unexpectedly during the trapping night, the surveyors will return to the site and close the lids of the traps.

Traps will be buried so that the rim of the container is level with the surrounding soil. A piece of detritus or nearby leaves will be placed in each container to provide cover, a food source, and visual blockage from likely predators.

Traps will be opened at sunset and inspected the following morning, early enough that the last trap is emptied no later than 1 hour after sunrise. The organisms found inside will be removed, and the lids will be closed. Bycatch will be released within 3 feet of their trap site. If any dune

beetle (*Coelus*) is found in the traps, the location will be marked by GPS. The beetle will be subsequently placed in a cardboard container and set aside in shade until all the traps have been fully evacuated and closed. Surveyors will return to photograph, measure, and confirm the identity of the beetle before releasing it in the suitable habitat nearest to where it was trapped. Traps will be removed the morning after the second trapping event.

Small 16-ounce plastic deli containers are recommended as pitfall traps. The ciliate dune beetle (*Coelus ciliatus*), a species related to the globose dune beetle, cannot climb out of cylindrical 16-ounce plastic deli containers (personal observation, Ivan Parr, 2016); therefore, it seems likely that globose dune beetles would also be unable to do so. This style is also suggested because metal cans may overheat, potentially harming organisms that fall inside. Glass jars of the same size might be superior to plastic in sturdiness, but are more cumbersome. Cardboard containers, while cost-effective, may not withstand moisture in the soil and may easily dent, providing footholds that could help the beetle escape. Larger plastic buckets used in other trapping studies would maximize soil disturbance and potentially entrap lizards.

Limitations to the Proposed Survey Method

Because globose dune beetles are small (less than 0.39 inch) and are also uncommon, good conditions while surveying and trapping will be necessary to maximize detection. Nighttime and trapping surveys should be timed to avoid extremely warm or cold temperatures that may not suit the beetle. Daytime and nighttime surveys should be timed to avoid strong wind that could conceal evidence of their furrows or limit their activity on the surface. There is also a chance that predators such as raccoons (*Pyrocon lotor*), rats (*Rattus* spp.), foxes (*Urocyon* and *Vulpes*), and skunks (*Mephitis mephitis*) could take beetles trapped in the containers. If it becomes clear that predation is taking place in the traps, all sign of predators will be noted, and surveyors will place a weighted sheet (metal, brick, or plastic) across the center of each trap to cover as much as possible while still allowing for organisms to fall through the cracks.

2.3.1.2 Field Surveys for Reptiles

The proposed methodology for surveying two-striped garter snake, California legless lizard, and Blainville's horned lizard share certain activities. The general herpetological data collection has used coverboards to detect the presence of reptiles. AECOM will place wooden coverboards in the BSA a minimum of 1 week prior to surveys, at a ratio of four boards per acre. Because surveys are anticipated to begin the week of April 10, 20 coverboards will be placed during the week of March 27 and additional coverboards will be placed the week of April 10.

Coverboards will measure approximately 2 feet by 4 feet and be located on areas with appropriate habitat characteristics, including sufficient vegetative cover (where vegetative cover is present) and a vegetative cover component consisting of native plant species (where native plant species are present). Special care will be taken to avoid placing coverboards on top of species of *Astragalus* (if present). Prior to placement, the area will be surveyed for special-status plant species. The newly introduced coverboards will be allowed to remain undisturbed for a minimum of 1 week to allow them to become naturalized. Naturalized coverboards are more likely to support a baseline invertebrate fauna and, in turn, a prey base. After this period, the coverboards will be surveyed at approximately 1-week intervals

throughout April and into May 2017, for a total of 4 weeks. Coverboards will be checked for presence of California legless lizards, two-striped garter snake, the Blainville's horned lizard, and additional wildlife (including globose dune beetle) by lifting the boards and visually scanning the underlying sandy soils, followed by gently raking the surface to locate any individuals that are immediately beneath the surface of the substrate. All captured native wildlife species found beneath the boards shall be recorded and replaced under the coverboard.

Total surveys for all reptiles will include:

- Coverboard inspections every week (starting 1 week after placement), for a total of 4 weeks.

Additional survey methods specific to each species are described in the following sections.

2.3.1.2.1 Two-Striped Garter Snake

The two-striped garter snake can be detected diurnally and is active almost year-round (Stewart 1972). However, the citizen science-based reporting platform iNaturalist shows a pronounced increase of records in April, with more than twice as many research-grade observations (42) as the next-highest month (March, with 20) (iNaturalist 2017). CNDDB (2017) shows 156 observations of this species. A subset of 36 presumed extant records from the last 10 years also showed that April had double the number (14) of observations as the next-highest month (May, with 7). Therefore, surveys will be conducted in April, with one additional survey in May.

Snakes passing through the BSA are most likely to be transients, because the nearest permanent water is 660 feet from the BSA. Based on this factor, trapping surveys would likely have low yield and could be detrimental to this aquatic species.

The following methods are recommended:

- Four days of daytime visual surveys, conducted 1 week apart.

Two biologists will conduct visual surveys using meandering walking transects through the BSA to identify two-striped garter snakes. Transects would be no more than 15 feet apart and cover the entire BSA. Surveys will be conducted on warm sunny days with minimal wind (65 to 75 degrees Fahrenheit, with winds less than 10 miles per hour).

Limitations to the Proposed Survey Method

Limitations to the proposed methodology include the possibility that snakes moving away from surveyors may not be detected by transects; or the possibility that transient snakes entering the BSA may not do so during the 2 days of surveys. However, the general field surveys recommended for reptiles (Subsection 2.3.1.2) will increase the chances of finding the species under coverboards.

2.3.1.2.2 California Legless Lizard

Due to the low success of both low-impact visual surveys and coverboards for the California legless lizard (see Section 2.1.4), it is recommended that moderate-impact surveys be used to detect this species. Kuhnz et al. 2005 concluded that the most efficient method of detecting the California legless lizard was to use hand tools to assist with detection.

Surveys will be done in the spring, while soils contain some moisture and conditions are temperate. iNaturalist (2007) data indicate that the majority of sightings for *Anniella pulchra* are in March and April and the majority of sightings for *Anniella stebbinsi* are in March, based on 75 records. CNDDB reports 99 occurrences of the collective "silvery legless lizard."[3] A subset of these was refined to include only presumed extant records from the last decade. Of these 35, there was a range of records from January to November; the majority fall in February, but high records extend into April (CNDDB 2017). Based on these data, surveys are recommended to be completed prior to May. Surveys will be conducted in April, with one additional survey in May.

The recommended survey method for California legless lizard is as follows:

- Four surveys of moderate-impact search plots, conducted 1 week apart.

We recommend that two biologists conduct time-constrained plots across the BSA (with a ratio of two plots per acre), with the plots chosen in a grid pattern across the BSA.

Surveys will be conducted within 4 hours of sunrise, when lizards are most likely to be near the surface. Each survey will be conducted for 30 minutes and will disturb a maximum of a 15-foot by 15-foot grid. Biologists will use hand tools to remove duff layers and annual vegetation, and then dig down to a minimum depth of 6 inches. If soil conditions allow, raking will occur to a maximum depth of 22 inches. Specifically, the placement of some of the grids will target iceplant mats to ensure that this habitat type is surveyed. Perennial vegetation would be pushed aside in this method but left in place. Members of the genus *Astragalus* will be avoided (if present). Prior to ground disturbance, the area will be surveyed for special-status plant species.

If a California legless lizard is detected, it will be identified to species based on Papenfuss and Parham (2013), its locality will be recorded with a Trimble GeoXT GPS, and it will be photographed. The individual would then be released adjacent to the plot, and monitored until it has completely burrowed into the sand, to ensure its protection from predators or desiccation.

Limitations to the Proposed Survey Method

As described in Section 2.1.4, low-impact visual surveys and use of coverboards yielded low results for the species even where it was abundant. The moderate-impact surveys recommended here can be used to confirm that the California legless lizard is present, but negative results are not sufficient to assume absence of the species.

[3] A former name of the California legless lizard used by CDFW, which would be inclusive of any species occurring in Ventura County.

2.3.1.2.3 Blainville's Horned Lizard

Blainville's horned lizards are diurnal, tend to be found in open areas, and are relatively predictable in terms of their surface activity. Therefore, surveys can be conducted with less impact or invasion than for other reptiles.

There are more than 700 records of this species in CNDDB. A subset of these data was used to determine the best time to survey for the species. A review of presumed extant records from the last 10 years that had an "excellent" or "good" occurrence ranking showed that close to half of these 84 records were reported between April and May (CNDDB 2017). These data are corroborated by iNaturalist (2017) records, which show a dramatic increase of records from March into May, with more than 60 percent of the sightings recorded in these 3 months. Surveys are recommended to be timed for the apparent height of the lizard's activity, in April. An additional survey will be conducted in May.

The following survey methods are recommended:

- Four days of diurnal visual surveys, conducted 1 week apart, including:
  - Meandering transects; and
  - Harvester ant mound surveys.

Two biologists will conduct visual surveys on foot during temperatures representative of the lizard's surface activity, which appears to be between 57 and 86 degrees Fahrenheit (Gerson 2011, Forde Biological Consultants 2006). Each survey will span 4 hours, centered on the middle of the day if temperatures fall on the middle or lower tolerance range; or in the mornings and afternoons if they fall on the higher tolerance range of the species' diurnal activity.

Meandering Transects

Meandering transects will be spaced roughly 10 feet apart, and cover the entire BSA. During surveys, biologists will note the vegetation present and the potential food items of the lizard (particularly harvester ants). Biologists will carefully lift cover items and plant debris and search around the bases of shrubs for resting lizards. If Blainville's horned lizard is detected, the animal will not be handled.

Biologists will take special note of the presence of potential predators such as shrikes, roadrunners, opossums, raccoons, snakes, feral cats, and dogs. Additionally, biologists will note the presence of argentine ants, which displace native harvester ants.

Harvester Ant Mound Surveys

If a harvester ant mound is located, surveyors will conduct focused surveys around them, looking for Blainville's horned lizard. Surveyors will walk in spiraling transects 3 feet apart for a 40-meter radius around the ant mound, searching carefully to avoid unintended trampling of lizards or ant mounds. Harvester ant mounds that are encountered during the first survey will be marked on a Trimble GeoXT GPS and revisited during the second survey and during any subsequent visit to the site.

Limitations to the Proposed Survey Method

Surveys will need to be timed when the species is active (Hager and Brattstrom 1997). Therefore, biologists will plan ahead to ensure that surveys are conducted during a time that falls within the temperature tolerance of the Blainville's horned lizard.

2.3.2 Avian Surveys

To address surveys for the western snowy plover, California least tern, least Bell's vireo, burrowing owl, northern harrier, white-tailed kite, and the California black rail, general nesting bird surveys will be conducted in the generally referred nesting period. For the Ventura County area, this is recognized by agencies such as CDFW and USFWS as the period of February 1 through August 31.

2.3.2.1 Western Snowy Plover and California Least Tern

Surveys will be conducted in the spring to capture potential nesting activity by each of these species. General avian surveys will be conducted weekly in the BSA through April and into May, for a total of five surveys, to document all avian use of the BSA, with focus on documenting nesting activity by all species observed in the BSA. Avian surveys will be conducted during April and May, coinciding with the timing of ongoing biological surveys in the BSA.

A qualified biologist will complete walking meandering transects through each habitat in the BSA. The biologist will search for western snowy plover and California least tern individuals. If an individual is observed, the biologist will determine what behaviors are being displayed (nest building, nesting, foraging). If present, nest sites will be identified and recorded. The biologist will take great care to not approach any nest nor linger near a nest site, because predators have taken to using these behaviors, including footprints, as clues to nest site locations. Surveys will be conducted weekly through April and into May, for a total of five surveys. All avian species detected in each habitat will be documented. Avian surveys will be conducted within 4 hours of sunrise, to capture peak activity of activity for most avian species. Additionally, surveys should not be conducted during periods of inclement weather, when bird activity is generally lowest.

Limitations to the Proposed Survey Method

Though unlikely, given the mobility of avian species such as western snowy plover and California least tern, occurrence of a transient individual traversing the BSA is possible outside of the survey window.

The nesting bird season is generally referred to by agencies such as CDFW as the period of February 1 through August 31. Nesting activity in the BSA is therefore possible, though unlikely due to absence of suitable habitat, beyond the proposed avian survey window that concludes in April.

2.3.2.2 Least Bell's Vireo

Surveys will be conducted in April to capture potential nesting activity, because this species is generally known to migrate from wintering areas by the end of March. General avian surveys will be conducted weekly in the BSA through April and May, for a total of five surveys, to document all avian use of the BSA, and will focus on documenting nesting activity by all species observed in the BSA. Attention to auditory calls will be made where dense shrub or tree vegetation is present; however, recorded auditory calls will not be played and no additional permits for surveys will be required (USFWS 2001).

General avian surveys will be conducted in conjunction with ongoing spring biological surveys in the BSA. All avian use of the BSA will be observed and recorded.

Limitations to the Proposed Survey Method

Though unlikely to be nesting in the BSA, given the high mobility of avian species such as least Bell's vireo, occurrence of a transient individual traversing the BSA is possible outside of the survey window. The nesting bird season is generally referred to by agencies such as CDFW as the period of February 1 through August 31. Nesting activity in the BSA is therefore possible, though unlikely due to absence of suitable habitat, beyond the proposed avian survey window that concludes in April.

2.3.2.3 Burrowing Owl

As discussed, survey protocols for burrowing owl will follow the guidelines described in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). The following protocol will be used:

- Prior to surveys, biologists will check weather conditions. Surveys will only be conducted when there is no precipitation, cloud cover is less than 75 percent, and the wind speed is less than 12 miles per hour.

- Surveys will consist of walking transects, spaced 20 feet apart, through the entire BSA. During surveys, biologists will note habitat quality and potential burrows; as well as indicators such as pellets, bones, whitewash, prey remains, scat, and other sign. Signs of potential predators and prey items will also be noted. Within every 300 feet, biologists will stop and scan the landscape for owls, listening for calls.

- If burrowing owls are detected, biologists will also attempt to determine whether any owls have leg bands, which will be reported to the Bird Banding Laboratory. All owl sightings will be recorded using a Trimble GeoXT GPS unit and described using a CNDDB rare species form.

- A total of four surveys will be conducted, spaced at least 1 week apart. Three surveys will be conducted in April and May, and one survey will be conducted after June 15.

Limitations to the Proposed Survey Method

Though unlikely, given the fossorial nature of burrowing owls, it is possible that individuals may occur in the BSA and not be observed during surveys. However, investigations of any

potentially suitable burrows are likely to detect evidence of owls, including white wash, pellets, feathers, and prey remains, even if owls are not observed directly. Additionally, transient individuals may occur in the BSA outside of the survey window.

2.3.2.4 Northern Harrier and White-Tailed Kite

A qualified biologist will complete walking meandering transects through each habitat in the BSA. The biologist will search for northern harrier and white-tailed kite individuals. If an individual is observed, the biologist will determine what behaviors are being displayed (nest building, nesting, foraging). If present, nest sites will be identified and recorded. Surveys will be conducted weekly through April and into May, for a total of five surveys. All avian species detected will be documented. Avian surveys will be conducted within 4 hours of sunrise to capture peak activity of activity for most avian species. Additionally, surveys will not be conducted during periods of inclement weather, when bird activity is generally lowest.

Limitations to the Proposed Survey Method

Though unlikely, given the highly mobile nature of these species, individuals may occur in the BSA transiently outside the survey window. As discussed, long-term residence, including nesting and regular use of the BSA for foraging, are not anticipated due to a lack of suitable habitat for these species.

2.3.2.5 California Black Rail

General avian surveys will be conducted in the spring, on a weekly basis through April. Although there is no existing protocol for the California black rail, timing of general avian surveys generally coincides with the timing recommended in the USFWS protocol for California Clapper Rail (synonymous with Ridgway's rail) (USFWS 2015). A qualified biologist will complete walking meandering transects through each habitat in the BSA. Particular focus will be directed toward habitat features likely to be used or attract the California black rail. The biologist will visually and auditorially search for California black rail individuals. If an individual is observed, the biologist will determine what behaviors are being displayed (nest building, nesting, foraging). If present, nest sites will be identified and recorded. Surveys will be conducted weekly through April and into May, for a total of five surveys. All avian species detected will be documented. Avian surveys will be conducted within 4 hours of sunrise to capture peak activity of activity for most avian species. Additionally, surveys will not be conducted during periods of inclement weather, when bird activity is generally lowest.

Limitations to the Proposed Survey Method

Survey techniques such as call playback will not be used; therefore, detection probability could be reduced due to the lack of broadcasting California black rail vocalizations as a prompt.

The nesting bird season is generally referred to by agencies such as CDFW as the period of February 1 through August 31. Nesting activity in the BSA is therefore possible, though unlikely due to absence of suitable habitat, beyond this proposed avian survey window that concludes in April.

2.3.3 Botanical Surveys

2.3.3.1 Field Surveys for Ventura Marsh Milkvetch

Field surveys for the Ventura marsh milkvetch are based on existing protocol-level guidance provided by The California Natural Resources Agency (2009), USFWS (1996), and CDFW (2009). The recommended surveys are additional to the focused botanical surveys conducted for this species in 2015 (AFC, Section 4.2, Biological Resources [CEC TN #204219-9]).

Surveying for this species must take into consideration the fact that Ventura marsh milkvetch numbers fluctuate dramatically from year to year (CNPS 2017, 69 FR 29081, 66 FR 54808, USFWS 2010). Milkvetch seeds are apparently able to germinate during favorable conditions, but of these, only about 25 percent may survive through the growing season (Ikeda and Meyer 2000, Wilken and Wardlaw 2001 in Jensen 2007). In a study of the North Shore at Mandalay Bay population, Wilken and Wardlaw (2001) demonstrated that among a population of 80 adult plants, fewer than 50 percent survived in a growing season and nearly half of the remainder did not flower. Snails are a major cause of die back, with reports of 75 percent of the plants at a site being killed by snails in April (Ikeda and Meyer 2000). Soza et al. (2003) also reported herbivory by snails, peaking before the end of April.

Considering the low survival rate during the year, and the potential for the plants to skip years flowering (Jensen 2007), it is recommended that surveys take place shortly after the growing season begins (March), rather than during the plants' June through October blooming period. This would maximize the ability to detect juveniles or weaker plants that could senesce or be killed before the end of spring. The Ventura marsh milkvetch is a distinctive perennial species that can be identified from vegetative characteristics (Munz 1974, Baldwin et al. 2012). With the significant rainfall during the winter and spring of 2016 to 2017, the spring of 2017 should be a good representative year for surveys.

Based on these factors, and to best augment the surveys conducted in 2016, additional field surveys will include:

- Two protocol-level rare plant surveys of the BSA in April 2017, separated by 2 weeks;
- A search for Ventura marsh milkvetch during the May 2017 BSA survey for the Orcutt's pincushion and salt marsh bird's-beak, as described in Subsections 2.3.3.2 and 2.3.3.3;
- One protocol-level rare plant survey of the BSA in June 2017; and
- Two reference population surveys to verify vegetative individuals and blooming, as feasible and subject to accessibility.

Protocol-Level Rare Plant Surveys – Biological Survey Area

The surveys will be performed by two biologists on foot. They will take place on the entire BSA in the form of slow-paced walking transects, spaced no greater than 10 feet apart. All plant species encountered during these surveys will be identified to the lowest possible taxon, using the Jepson Manual (Baldwin et al. 2012).

During these surveys, biologists will characterize the habitat for Ventura marsh milkvetch, and use a Trimble GeoXT GPS to map any nonflowering members of the genus *Astragalus*. These individuals will be monitored for the remainder of the project.

If a Ventura marsh milkvetch is found, it will not be collected for voucher or for identification without prior notification to USFWS and CDFW. A collection will be made in accordance with the CDFW Plant Voucher Collecting Permit. No more than two plants, or 10 percent of the population (whichever is fewer) will be collected for voucher. If there are 10 or fewer plants present, only enough material to identify the plant will be collected. The voucher will be stored at the California Academy of Sciences, a herbarium that is approved by the CDFW and part of the Consortium of California Herbaria (CCH).

Protocol-Level Rare Plant Surveys – Reference Populations

Subject to accessibility, reference population visits will be chosen within 10 miles of the BSA. These visits will be performed within 2 days of each protocol-level survey. Reference populations will assist in determining the phenology of the species during the given survey time and also help confirm the identification of plants found in the BSA.

Limitations to the Proposed Survey Method

Ventura marsh milkvetch may remain dormant for years (Ikeda and Meyer 2000), or present in very low numbers, where it is known to occur (CNPS 2017, 69 FR 29081, 66 FR 54808, USFWS 2010). However, reference population surveys will confirm the species' physical development during the time surveys are being conducted, and will aid in identification. Although the species can be identified by vegetative characteristics, surveys will map all members of the genus *Astragalus* found in the project site to avoid uncertainty.

2.3.3.2 Salt Marsh Bird's-Beak

Field surveys for salt marsh bird's-beak are based on existing guidance provided by ESRP (2002),the California Natural Resources Agency (2009), USFWS (1996), and CDFW (2009). The recommended surveys include focused botanical surveys in potentially suitable habitat for this species, taking into consideration the fact that this species can exhibit dramatic fluctuations in its population year-to-year, dependent on seed dispersal and establishment of suitable microhabitats that provide the required conditions for germination (USFWS 1985b).

Based on these factors, the proposed field surveys will be conducted in April and early May 2017, and will be conducted throughout the BSA, with a particular focus on all potentially suitable coastal dune, coastal salt marsh or swamp, and freshwater seep habitats. Surveys of reference populations will be conducted to verify blooming. Surveys will be conducted concurrently with other focused botanical surveys and related field investigations.

Surveys would include:

- Three protocol-level rare plant surveys of the BSA:
  - Two in April 2017 to identify vegetative individuals; and
  - One in May 2017 during the blooming period to identify individuals to species; and

- Two reference population surveys to verify vegetative individuals and blooming, as feasible and subject to accessibility.

Protocol-Level Rare Plant Surveys – Survey of the BSA

The surveys will be performed by two biologists on foot. They will take place on the entire BSA in the form of slow-paced walking transects, spaced no greater than 10 feet apart. All plant species encountered during these surveys will be identified to the lowest possible taxon, using the Jepson Manual (Baldwin et al. 2012).

During these surveys, biologists will characterize the habitat for salt marsh bird's-beak, and use a Trimble GeoXT GPS to map any nonflowering members of the genus *Cordylanthus*. These individuals will be monitored for the remainder of the project.

If an individual salt marsh bird's-beak is found, it will not be collected for voucher or for identification without prior notification to USFWS and CDFW. A collection will be made in accordance with the CDFW Plant Voucher Collecting Permit. No more than two plants or 10 percent of the population (whichever is fewer) will be collected for voucher. If there are 10 or fewer plants present, only enough material to identify the plant will be collected. The voucher will be stored at the California Academy of Sciences, a herbarium that is approved by the CDFW and part of the CCH.

Protocol-Level Rare Plant Surveys – Reference Populations

Subject to accessibility, reference population visits will be chosen within 10 miles of the BSA. These visits will be performed within 2 days of the BSA survey. Reference populations will assist in determining the phenology of the species during the given survey time, and will also help confirm the identification of plants found in the BSA.

Limitations to the Proposed Survey Method

Salt marsh bird's-beak exhibits dramatically fluctuating population numbers year-to-year and may be present in very low numbers (USFWS 1985b). However, reference population surveys, if feasible, will confirm the species' physical development at the time of the BSA survey, as well as aid in identification. Although this species can be identified by vegetative characteristics, surveys will map all members of the genus *Cordylanthus* found in the BSA to avoid uncertainty.

2.3.3.3 Orcutt's Pincushion

Field surveys for Orcutt's pincushion are based on existing guidance provided by ESRP (2002), the California Natural Resources Agency (2009), USFWS (1996), and CDFW (2009). The recommended surveys include focused botanical surveys in potentially suitable habitat for this species.

Based on these factors, the proposed field surveys will be conducted in April and May 2017 and will be conducted throughout the BSA, with a particular focus on all potentially suitable coastal dune and coastal bluff habitats. Subject to accessibility, surveys of reference populations will

be conducted to verify blooming. Surveys will be conducted consecutive to other focused botanical surveys and related field investigations.

Surveys would include:

- Three protocol-level rare plant surveys of the BSA:
  - Two in April 2017 to identify vegetative individuals; and
  - One in May 2017 during the blooming period to identify individuals to species; and
- Two reference population surveys to verify vegetative individuals and blooming, as feasible and subject to accessibility.

Protocol-Level Rare Plant Surveys – Survey of the BSA

The surveys will be performed by two biologists on foot. They will take place on the entire BSA in the form of slow-paced walking transects, spaced no greater than 10 feet apart. All plant species encountered during these surveys will be identified to the lowest possible taxon, using the Jepson Manual (Baldwin et al. 2012).

During these surveys, biologists will characterize the habitat for Orcutt's pincushion, and use a Trimble GeoXT GPS to map any nonflowering members of the genus *Chaenactis*. These individuals will be monitored for the remainder of the project.

If an individual Orcutt's pincushion is found, it will be collected for voucher or for identification. A collection will be made in accordance with the CDFW Plant Voucher Collecting Permit. No more than two plants, or 10 percent of the population (whichever is fewer) will be collected for voucher. If there are 10 or fewer plants present, only enough material to identify the plant will be collected. The voucher will be stored at the California Academy of Sciences, a herbarium that is approved by the CDFW and part of the CCH.

Protocol-Level Rare Plant Surveys – Reference Populations

Subject to accessibility, reference population visits will be chosen within 10 miles of the BSA. These visits will be performed within 2 days of the BSA survey. Surveys of reference populations will verify that the phenology of the species during the given survey time and also help confirm the identification of plants found in the BSA.

Limitations to the Proposed Survey Method

Orcutt's pincushion may be difficult to identify to species outside the blooming period. However, reference population surveys will confirm the species' physical development at the time of the BSA survey, as well as aid in identification. Although this species can be identified by vegetative characteristics, surveys will map all members of the genus *Chaenactis* found in the BSA to avoid uncertainty.

3 Survey Schedule

A rough timeline of items related to the P3 Survey Methods is as follows. A schedule for the actual surveys is included in Table 1.

- Draft Survey Methods Memorandum: due March 27
- Agency/Party Review of Survey Methods Memorandum: March 27 through April 7
- Preparation for surveys: March/early April
- Surveys conducted: April, May, and June
- Survey Results Report preparation: June

Table 1
Summary of the Number and Timing of Proposed Surveys

	Survey Type	Timing
Globose Dune Beetle	2 nights trapping surveys	April (prior/after to below activity)
	Daytime Survey	April
	Nighttime Survey	April
	2 nights trapping surveys	May (prior/after to below activity)
	Daytime Survey	May
	Nighttime Survey	May
Two-Striped Garter Snake/ Blainville's Horned Lizard	Visual Survey	Once per week through April and into May, four total
	Coverboard Placement	Week of March 27, April 10
	Coverboard Surveys	Once per week through April and into May, four total
California Legless Lizard	Raking Survey	Once per week through April/May, four total
	Coverboard Placement	Week of March 27, April 10
	Coverboard surveys	Once per week through April and into May, four total
Western Snowy Plover/ California Least Tern/Least Bell's Vireo/White Tailed Kite/Northern Harrier/ California Black Rail	Avian Surveys	Once per week through April and into May, five total
Burrowing Owl	Transect Surveys	Four surveys total: three surveys in April/May, spaced 1 week apart, and one survey after June 15
Ventura Marsh Milkvetch/ Salt Marsh Birds-beak/ Orcutt's Pincushion	Initial survey	April
	First Reference Population Survey	Within 2 days of initial survey
	Second Survey	April (2 weeks later)
	Third Survey	Early to Mid-May
	Second Reference Population Survey for Salt Marsh Birds-beak/Orcutt's Pincushion	Within 2 days of third survey
	Fourth Survey	Early June
	Second Reference Population Survey for Ventura Marsh Milkvetch	Within 2 days of fourth survey

4 Survey Personnel

The proposed surveys would be conducted by the following biologists. Résumés for each of these individuals are included in Appendix A.

- **Jane Donaldson, Senior Biologist, AECOM**. More than 20 years of professional experience (10 with AECOM).
  - **California legless lizard (*Anniella pulchra*):** More than 75 positive contact hours in San Luis Obispo County, California.
  - **Two-striped garter snake** (***Thamnophis hammondii***): More than 20 positive contact hours in Santa Barbara County, California.

- **Julie Love, Senior Restoration Ecologist and Biologist**, AECOM. More than 15 years of professional experience (12 with AECOM).
  - CDFW Scientific Collecting Permit
  - CDFW California Endangered Species Act Voucher Collection Permit for Endangered, Threatened, and Candidate Species

- **Julie Niceswanger Hickman, Senior Biologist, AECOM**. 24 years of professional experience (more than 10 with AECOM).
  - CDFW Scientific Collecting Permit

- **Ivan Parr, Senior Ecologist, AECOM**. 11 years of professional consulting experience (8 with AECOM).
  - CDFW California Endangered Species Act Voucher Collection Permit for Endangered, Threatened, and Candidate Species

- **Wayne Vogler. Natural Resources Group Manager, AECOM.** 22 years of professional experience (more than 10 with AECOM).
  - 12 years of coastal dune habitat experience (surveys, weed eradication, and restoration) along the California Central Coast.

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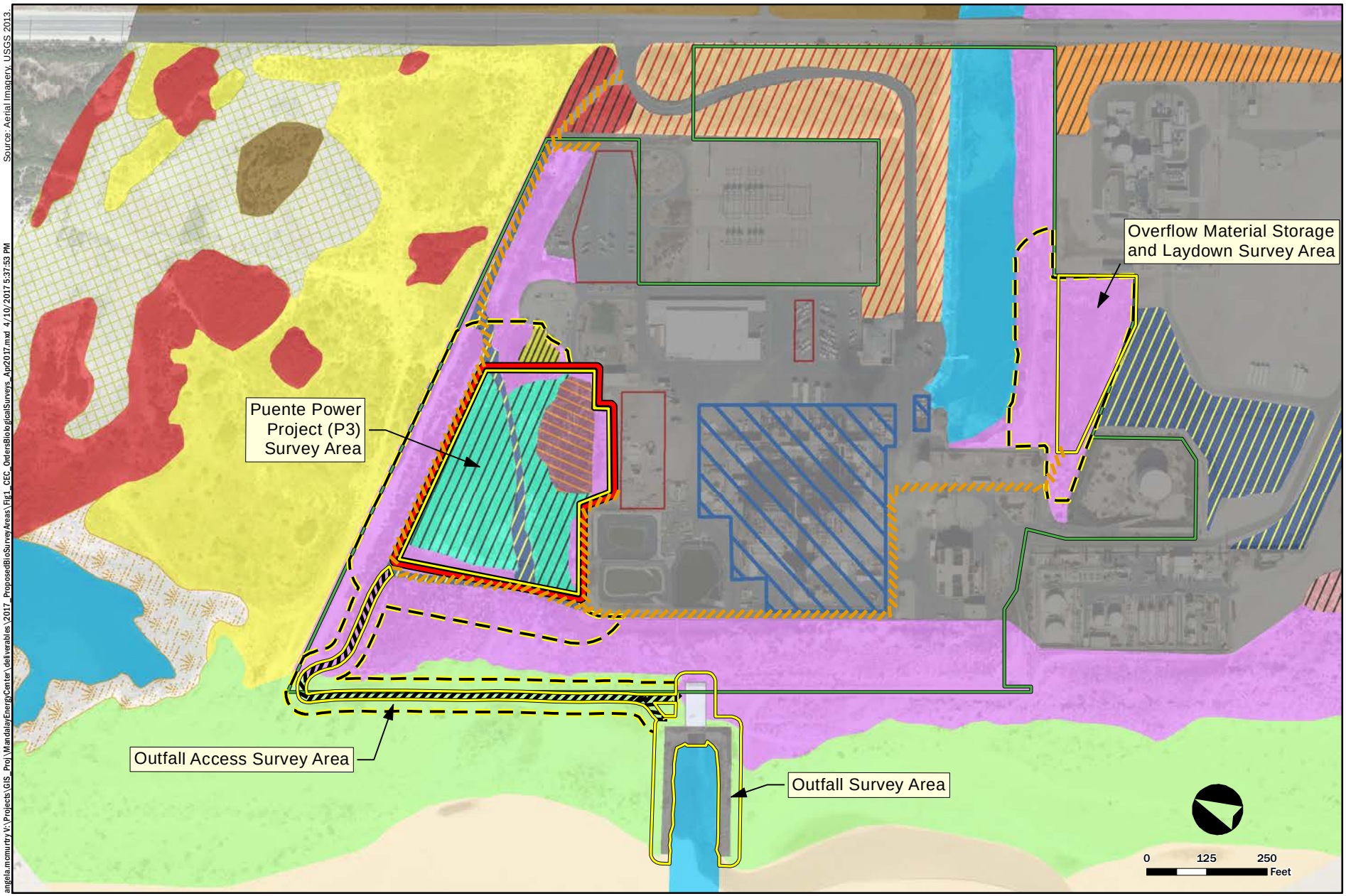

Survey Area - Footprint (5.6 ac)

Survey Area - Buffer (4.78 ac)

Project Components

Puente Power Project (P3) Site

Access to Outfall

Demolition Access on Existing Roads

Mandalay Generating Station Property

Aboveground Demolition

Construction Parking and Laydown

Vegetation Communities and Land Cover Types

Culverted water

California bulrush marsh

Arroyo willow thickets

Arroyo willow thickets/Ornamental

California sagebrush scrub (installed)

Coyote brush scrub

Developed

Dune mats

Habitat restoration in progress

Ice plant mats

Ice plant mats/European beach grass swards

Mule fat scrub (Habitat restoration in progress)

Mock heather scrub

Myoporum grove

Ornamental

Open water

Ruderal

Sandy beach

Wooly seablite scrub/ice plant mats

PROPOSED BIOLOGICAL SURVEY AREAS

NRG
Puente Power Project
April 2017 Oxnard, California

FIGURE 1

Appendix A
Résumés of Proposed Survey Personnel

AECOM

Jane Donaldson
Biologist

Education

BS, Biological Sciences, California Polytechnic State University, San Luis Obispo, 1993

Years of Experience

With AECOM (URS): 10 Years
With Other Firms: 11 Years

Training and Certifications

Biology and Conservation of the California Tiger Salamander Workshop (2013)
San Joaquin Kit Fox Workshop (2013)
Western Burrowing Owl Workshop (2013)
Desert Tortoise Field Techniques Workshop (2013)
USFWS Project Authorized to Survey, Handle, and Relocate California Red-legged Frogs
OSHA 40-hour HAZWOPER Trained
OSHA Refresher March 2014
OSHA 10 Hour Construction Program - September 2014
Adult first Aid/CPR/AED Certified - April 2014
Behavior Based Safety, 2016
California Boater Education Certification December 2014

Technical Specialties

Construction compliance monitoring sensitive, threatened and endangered birds, mammals, amphibians and plants of California
Wildlife surveys
Vegetation surveys
Habitat restoration

Professional Affiliations

Central Coast Biological Society
The Wildlife Society California Central Coast and Northern California Chapters

Ms. Donaldson is a field biologist with over 20 years of professional experience working within a variety of native habitats within California. Her field work has included conducting wildlife surveys, overseeing construction compliance and compliance monitoring for a large remediation projects such as oil field remediation and restoration, and solar power projects. She has conducted surveys for San Joaquin kit fox, Tule elk, California red-legged frogs, California tiger salamander, western snowy plover, western burrowing owl, coast horned lizards, silvery legless lizards, two striped garter snakes, desert tortoise, and point-count bird surveys. Her habitat restoration and sensitive plant conservation efforts include general habitat surveys and coastal dune wetlands restoration using genetically local native plant species.

Project Specific Experience

Field Biologist, First Solar Northstar Solar Project, Fresno County, California, June 2014–2015. Conducted biological monitoring and nesting bird surveys during construction activities associated with the installation of a 640-acre solar power plant project. Targeted species include San Joaquin kit fox, Swainson's hawk and western burrowing owl.

Field Biologist, Chevron, Kern and San Luis Obispo County, California, September 2014–Current. Conducted pre-disturbance biological surveys, breeding/nesting bird surveys, wrote habitat impact reviews, and monitored the removal and abandonment of legacy pipelines within the Kern River, Midway-Sunset, McKittrick, and Estero Bay lease fields/pipelines. Target species include: blunt-nosed leopard lizard, San Joaquin kit fox, San Joaquin antelope ground squirrel, and western burrowing owl.

Field Biologist, Vandenberg Air Force Base, Santa Barbara County, California, April 2014–August 2014. Performed biological compliance monitoring associated with repairs at various points along the Point Pederales pipeline from off-shore oil Platform Irene to the Lompoc Oil and Gas Plant facility in Santa Barbara County. Target species included: seacliff buckwheat and El Segundo blue butterfly.

Field Biologist, Antelope Valley Solar Ranch One, Los Angeles County, California, March 2012–April 2014. Conducted biological monitoring of construction activities associated with the installation of a 2,100-acre solar power plant project, and its associated linears and towers. Captured and relocated small mammals, snakes and lizards. Conducted burrowing owl surveys and breeding bird surveys. Performed compliance monitoring for targeted plant species, wetland features, and oversaw habitat restoration efforts in the planting of native plant species.

Field Biologist, Hydrogen Energy California Project, Kern County, California, June 2010–September 2010. Conducted preconstruction surveys for blunt-nosed leopard lizard, burrowing owl, Swainson's hawk, and fairy shrimp. Coordinated, scheduled, and managed blunt-nosed

leopard lizard surveys for two weeks; assessed needs and obtained surveyors from outside offices to complete job within a restricted timeframe.

Field Biologist, Chevron San Ardo Oil Field, Monterey County, California, June 2010–October 2010. Conducted pre-disturbance biological surveys and habitat impact reviews for removal of old abandoned equipment and clean-up operations on several hundred acres of an active oil field. Conducted pre-disturbance surveys for San Joaquin kit fox utilizing motion cameras and track stations to determine presence/absence of kit fox under buildings slated for demolition.

Field Biologist, Chevron Escolle Lease, Santa Barbara County, California, September 2009–October 2010. Conducted biological monitoring of construction activities involving oil line abandonment projects with an emphasis on detecting California tiger salamander presence/absence. Performed night surveys and dip netting surveys for California tiger salamander, and oversaw the installation of pit traps at surveys sites lease-wide.

Biologist, Guadalupe Restoration Project, San Luis Obispo County, California, June 2000–April 2010. Monitored endangered, threatened, and sensitive plant and animal species during excavation activities on a 2,700 acre soil remediation site. Performed eye shine, egg mass and tadpole surveys for California red-legged frogs; was site specifically approved by U.S. Fish and Wildlife Service to handle California red-legged frogs. Conducted small mammal trapping, monthly bird surveys, sensitive plant species census, wetland restoration work, wildlife and habitat assessments, and maintained species lists. Submitted yearly capture data, and contributed to a Quarterly Ecological Monitoring Report (QEMR). Endangered, threatened, or sensitive species included: La Graciosa thistle, beach spectacle pod, Blochman's leafy daisy, surf thistle, silvery legless lizard, coast horned lizard, two-striped garter snake, and California red-legged frog.

Field Biologist/Endangered Species Technician, Camp Roberts/Camp San Luis Obispo Army National Guard, San Luis Obispo and Monterey Counties, California, June 1995–May 2000. Performed point-count bird surveys for five seasons on both installations for the U.S. Army National Guard Land Condition Trend Analysis program, as well as small mammal trapping sessions, vegetation surveys, and California red-legged frog surveys. Participated in helicopter surveys for Tule elk. Wrote annual reports and worked in rugged remote areas. Set up track stations and conducted spotlight surveys, live trapping sessions, and radio telemetry for San Joaquin kit fox presence and movement.

Surveyor, California State Parks, San Luis Obispo County, California, 1993–1994. Performed western snowy plover nest surveys on the Morro Bay sand spit for two seasons. Identified and recorded nest locations, tracked nest progression and fate during the season, recorded numbers of adults and sex, and number of fledglings.

Sensitive Wildlife Species Survey Experience

Blunt-nosed leopard lizard (*Gambelia sila*) – Level 1 Surveyor: One sighting in Kern County; 2 positive contact hours at a reference site in San Luis Obispo County, California.

California legless lizard (*Anniella pulchra*): Over 75 positive contact hours in San Luis Obispo County, California.

California red-legged frog (*Rana draytonii*): Over 9 years of experience observing, surveying, and handling California red-legged frogs in diverse habitats in San Luis Obispo County, California.

California tiger salamander (*Ambystoma californiense*): Over 4 hours of observing, dip-netting and handling metamorphs while attending workshop on the biology and conservation of the California tiger salamander, Livermore, California, May 2013.

Desert tortoise (*Gopherus agassizii*): Over 35 survey hours, 3 positive contact hours at proposed relocation site near Newberry Springs, California.

El Segundo blue butterfly (*Euphilotes battoides allyni*): Approximately 3 positive contact hours in Santa Barbara County, California.

Flat-tailed horned lizard (*Phrynosoma mcallii*): Three positive contact hours in El Centro, California.

Pacific pond turtle (*Actinemys marmorata*): Over 5 positive contact hours in San Luis Obispo County, California.

San Joaquin kit fox (*Vulpes macrotis mutica*): Over 25 positive contact hours in Monterey County, California.

Swainson's hawk (*Buteo swainsoni*): Over 5 positive contact hours in Kern County, California.

Two-striped garter snake (***Thamnophis hammondii***): Over 20 positive contact hours in Santa Barbara County, California.

Western burrowing owl (*Athene cunicularia*): Over 24 survey hours in Kern, San Luis Obispo, and Santa Barbara Counties, California.

Western snowy plover (*Charadrius alexandrinus nivosus*): Over 30 positive contact hours in San Luis Obispo County, California.

Western spadefoot toad (*Spea hammondii*): Over 10 positive contact hours in San Luis Obispo County, California.

Botanical Experience

Lompoc Oil and Gas Plant, Santa Barbara County, California, September 2014. Assisted in an oak mitigation survey, and in Jurisdictional Determination surveys.

PAPCO Dig Site, Santa Barbara County, California, May 2014. Performed reconnaissance survey for the endangered Gaviota tarplant in tandem with delineating staging and project areas for an oil pipeline repair project.

Vandenberg Air Force Base, Santa Barbara County, California, March–June 2016. Performed vegetation surveys along the Point Pederales pipeline. Sensitive species of interest included seacliff buckwheat and black-flowered figwort.

Guadalupe Restoration Project, San Luis Obispo County, California, June 2000-April 2010. Approved to monitor and participated in

population censuses for sensitive and endangered plant species including Federally Endangered and State Threatened La Graciosa thistle, and State Threatened surf thistle and beach spectacle pod. Oversaw construction activity to ensure minimization of impact and avoidance of sensitive species. Assisted in the vegetation restoration and monitoring of wetland habitats.

US Army National Guard, Camp Roberts, Monterey County, March 1995-June 2000. Conducted chaparral/coastal scrub, grassland, oak woodland, and riparian vegetation surveys using point transects and belts.

AECOM

Julie Love

Senior Restoration Ecologist and Biologist

Education

MESM/Environmental Science and Management/2003/Bren School of Environmental Science and Management, University of California, Santa Barbara

BS/Marine Biology/2000/ University of California, Los Angeles

Permits

CDFW Scientific Collecting Permit

USFWS Recovery Permit for Tidewater goby

CDFW Collecting Permit for Plants

Years of Experience

With AECOM: 11 years
With Other Firms: 4 years

Training

Surface Water Ambient Monitoring Program (SWAMP), field procedures and bioassessment concepts, presented by California Waterboard, April 2016

California Rapid Assessment Method (CRAM) Estuarine Module, presented by UC Davis Extension, October 2012

California Rapid Assessment Method (CRAM) Practitioner Training and Riverine Module, presented by UC Davis Extension, March 2012

Basic Wetland Delineation Training (40-hour), presented by the Wetland Training Institute, August 2008Basic Wetland Delineation Training (40-hour), presented by the Wetland Training Institute, August 2008

Ms. Love's combined work experience and education provide a wide range of ecological training with over 15 years of experience working in the fields of habitat restoration, botany, marine biology, terrestrial and aquatic wildlife, and ecosystem inventory, assessment, and monitoring. Ms. Love's position at AECOM involves managing and coordinating habitat restoration planning and monitoring, wetland delineations and jurisdictional determinations, biological resource evaluations, botanical surveys and mapping, special-status wildlife surveys, stormwater monitoring, stream and algae monitoring, fish relocation, and database management.

Experience

Biological Resource Evaluation

Technical Lead, Puente Power Project Application for Certification, NRG Oxnard Energy Center LLC. Conducted field efforts for the biology section of the Application for Certification (CEQA-equivalent document) and prepared biological resources sections for the various exhibits prepared thereafter for the proposed 262 megawatt natural gas-fired generation facility in Oxnard, California. Responsibilities included identifying and mapping sensitive biological resources, determining the applicable laws, ordnances, regulations, and standards governing biological resources at the facility, and evaluating the potential impacts and mitigation measures to be implemented during construction and management activities**.**

Gaviota Marine Terminal, Gaviota Terminal Company, Gaviota, California, 2014-Present. Lead author for the Biological Resources Assessment Report and task leader for the associated biological surveys for the 28 acre remediation and restoration project. The BRAR provided a description of existing biological resources within the Project site and surrounding area, identified any significant impacts to these resources that may result from the proposed Project, and recommended feasible mitigation measures that would avoid or substantially lessen these impacts to biological resources, including monarch butterflies. Lead author of the Conceptual Restoration Plan to restore riparian and upland habitats after remediation is completed in phases, with specific emphasis on improving foraging habitat for the monarch butterfly.

Ekwill Street and Fowler Road Extensions Project, City of Goleta, Goleta, California, 2010 – Present. Lead author of Biological Mitigation and Monitoring Plan for a road construction and extension project crossing over Old San Jose Creek. Components of the Plan include implementation of all mitigation

measures including the conceptual restoration plan, native tree inventory and protection plan, pre-construction biological surveys, and avoidance and minimization measures to be implemented during project construction. Co-author of the Biological Resources Report, and lead author of the wetland delineation/jurisdictional determination section.

Wetland Delineations/Assessments and Jurisdictional Determinations

Hyla Crossing, Freeport-McMoRan Oil & Gas, Arroyo Grande, California, 2013 – 2015. Field crew leader and lead author for the wetland delineation/jurisdictional determination of Pismo Creek at the Hyla crossing within the Arroyo Grande Oilfield.

Arroyo Grande Oilfield Phase V, Freeport-McMoRan Oil & Gas, Arroyo Grande, California, 2013. Field crew leader and lead author for the wetland delineation/jurisdictional determination of Pismo Creek and several unnamed drainages within the Arroyo Grande Oilfield. Lead author of off-site mitigation plan. Field crew leader and lead author for the wetland delineation/jurisdictional determination of Pismo Creek and several unnamed drainages within the Arroyo Grande Oilfield. Field crew leader for focused botanical surveys within the Arroyo Grande Oilfield. Technical reviewer for associated report.

Point Pedernales Repair Site, Freeport-McMoRan Oil & Gas, Vandenberg Air Force Base, California, 2013. Field crew leader and lead author for the wetland delineation/jurisdictional determination of three <1 acre sites along three drainages intersecting a pipeline repair site.

Gaviota Road Repair Site, Freeport-McMoRan Oil & Gas, Gaviota, California, February 2013. Field crew leader and lead author for the wetland delineation/jurisdictional determination of a <1-acre site along an unnamed tributary to Gaviota Creek intersecting a pipeline repair site.

Former Hercules Gas Plant, Shell Exploration and Production Company, Gaviota, California, 2009 and 2012. Field crew leader and lead author for the wetland delineation/jurisdictional determination for a 2-acre site along Cañada de la Huerta in 2009. Field crew leader and lead author for the wetland delineation/jurisdictional determination of a <1 acre site along Cañada de la Huerta in 2012.

Mission Village, Legacy, and Entrada Projects, Newhall Land and Farming Company, Santa Clarita Valley, California, 2012-2014. Field crew leader and lead author for the wetland delineation/jurisdictional determination of several canyons in the Santa Clara River watershed within the vicinity of the 12,000 acre Newhall Ranch site in the Santa Clarita Valley, California. Assessed the condition of the canyons using California Rapid Assessment Method (CRAM) and a methodology that was based on a combination of three established methods (CRAM, Hydrogeomorphic Approach [HGM], and Special Area Management Plan Landscape Level Functional Assessment

[SAMP LLFA]). Conducted 36 riverine and 2 depresssional CRAMs.

Former Hercules Gas Plant, Shell Exploration and Production Company, Gaviota, California, July 2012. Field crew leader and lead author for the wetland delineation/jurisdictional determination of a <1 acre site along Cañada de la Huerta.

California High Speed Train Project, High Speed Rail Authority, Fresno to Bakersfield, California, September 2011. Assessed the condition of jurisdictional waters, including wetlands, along several alternative high-speed rail alignments between Fresno and Bakersfield in California's Central Valley using CRAM. The aquatic features assessed included individual vernal pools, vernal pool complexes, and depressional wetlands located on the floor of the Central Valley, as well as riverine wetlands along the Kings River and Poso Creek. A certified CRAM instructor supervised the assessment.

Resource Management and Development Plan Environmental Impact Study/ Environmental Impact Report, Newhall Land and Farming Company, Santa Clarita Valley, California, July and August 2010. Assessed the condition of reference-quality sites, as well as a number of existing compensatory mitigation sites, in the Santa Clara River watershed within the vicinity of the 12,000-acre Newhall Ranch site in the Santa Clarita Valley, California. The assessment methodology was based on a combination of three established methods (CRAM, HGM, and SAMP LLFA).

California High Speed Train Project, High Speed Rail Authority, Bakersfield to Palmdale, California, April 2011. Performed wetland delineations/jurisdictional determinations, and GIS mapping for various segments along the High Speed Rail alignments from Bakersfield to Palmdale, California.

California High Speed Train Project, High Speed Rail Authority, Fresno to Bakersfield, California, 2010. Performed wetland delineations/jurisdictional determinations, and GIS mapping for various segments along the High Speed Rail alignments from Fresno to Bakersfield.

San Jose Creek Bikeway, City of Goleta, Goleta, California, 2009. Field crew leader and lead author for the wetland delineation/jurisdictional determination for a 0.5-acre site in Goleta Slough.

Former Hercules Gas Plant, Shell Exploration and Production Company, Gaviota, California, 2009. Field crew leader and lead author for the wetland delineation/jurisdictional determination for a 2-acre site along Cañada de la Huerta for the project's Streambed Alteration Agreement and Section 404 Permit.

Resource Management and Development Plan Environmental Impact Study/ Environmental Impact Report,

Newhall Land and Farming Company, Santa Clarita Valley, California, 2008. Assisted with the wetland delineation and mapping of jurisdictional waters within the 12,000-acre Newhall Ranch site in the Santa Clarita Valley, California. Assisted with the wetland delineation report.

Botanical Surveys and Mapping

Point Arguello Pipeline Company Repair Site, Freeport-McMoRan Oil & Gas, Gaviota, California, Spring 2015. Performed focused Gaviota tarplant (Deinandra increscens ssp. villosa) surveys for the repair and reference site. Technical reviewer for associated report.

Point Pedernales Pipeline, Freeport-McMoRan Oil & Gas, Lompoc and Vandenberg Air Force Dates, California, Spring 2014. Performed focused Vandenberg monkey flower (Mimulus fremontii var. vandenbergensis) and beach layia (Layia carnosa) surveys along 10-mile pipeline and reference locations.

Special-status Wildlife Surveys

Tidewater Goby Presence/Absence Survey, Basin E/F Tidal Basin Restoration Project, City of Santa Barbara, Santa Barbara, California, October 2010 and 2011–2012. In 2010, performed presence/absence USFWS protocol surveys for tidewater goby in Tecolotito Creek, Foxtrot Drain, and an existing tidal basin adjacent to the creek prior to construction. Medium water body protocol. Installed and monitored block nets downstream of the work area. Co-author of final report. 8.5 hours. From 2011–2012, performed post-construction presence/absence USFWS protocol surveys for tidewater goby in Tecolotito Creek and a constructed tidal basin. Lead author of final report. 24 hours.

Tidewater Goby and Fish Relocation, Santa Barbara Airport Tecolotito and Carneros Creek Relocation Project, City of Santa Barbara, Santa Barbara, California, August 2006 – November 2008. Captured and relocated tidewater gobies and other fish species from Tecolotito and Carneros Creeks. Performed initial presence/absence USFWS protocol surveys for tidewater goby in all locations prior to construction. Performed presence/absence protocol surveys for tidewater goby in all locations after construction. Medium water body protocol. Managed data collection and compilation. Included as a permitted handler on USFWS Biological Opinion 1-8-06-F-42. Assisted in authoring the final report. 145 hours.

Western Snowy Plover and California Brown Pelican Construction Monitoring, Laguna Channel Tidal Gate Repair Project, City of Santa Barbara, Santa Barbara, California, October – December 2006. Performed clearance survey prior to moving sand from near the launch area at the Santa Barbara Harbor. Monitored for impacts to the birds during construction at the tidal gate.

Habitat Restoration

Santa Barbara Airport Tidal Basin Restoration Project, City of Santa Barbara, Santa Barbara, California, 2007 – Present. Project Manager. Assisted in planning and implementing restoration for the Tidal Basin consisting of 14 acres of newly created tidally influenced habitat. Organized monitoring program consisting of point-intercept transect data collection and maintenance monitoring. Managed and analyzed resulting data. Aided with benthic macroinvertebrate sampling. Created water quality monitoring program. Lead author for annual reports detailing restoration success. Co-author of Biological Assessment. Lead author of Storm Water Pollution Prevention Plan. Currently, the restoration site has met or exceeded permit issued performance criteria.

Santa Barbara Airport Airfield Safety Projects Restoration Project, City of Santa Barbara, Santa Barbara, California, 2007–2013. Project Manager. Assisted in planning and implementing restoration for 65 acres of wetland, coastal sage scrub, and riparian habitats. Organized and implemented monitoring program consisting of point-intercept transect data collection and maintenance monitoring. Managed and analyzed resulting data. Organized native seed collection. Lead author for annual and quarterly reports detailing restoration success. Three restoration sites have been completed and met or exceeded permit issued performance criteria.

Permits

California Department of Fish and Wildlife Scientific Collecting Permit for mammals, reptiles, amphibians, vernal pool/terrestrial invertebrates, freshwater and anadromous fishes, and freshwater invertebrates #SC-10045, December 2008 – Present.

U.S. Fish and Wildlife Service Recovery Permit for Tidewater Goby (*Eucyclogobius newberryi*) #TE-217402-0, February 2010 – present.

California Department of Fish and Wildlife Collecting Permit for State-Designated Endangered, Threatened, or Rare Plants #2081(a)-13-35-V, April 2010 – Present.

Specialized Training

Surface Water Ambient Monitoring Program (SWAMP), field procedures and bioassessment concepts, presented by California Waterboard, April 2016

California Rapid Assessment Method (CRAM) Estuarine Module, presented by UC Davis Extension, October 2012

California Rapid Assessment Method (CRAM) Practitioner Training and Riverine Module, presented by UC Davis Extension, March 2012

Basic Wetland Delineation Training (40-hour), presented by the Wetland Training Institute, August 2008

AECOM

Julie Niceswanger Hickman
Senior Biologist/ Project Manager

Education

MA, Psychology
BS, Biology

Permits

USFWS-California Red-legged Frog Recovery Permit #TE196188-0
CDFW-Scientific Collecting Permit #001980

Years of Experience

With AECOM: 10 Years
With other firms: 12 Years

Professional Experience

AECOM
U.S. Fish and Wildlife Service
California Dept. of Fish & Wildlife
U.S. Forest Service
U.S. Army

Training

Wetland Delineation
Conservation Partnerships
Habitat Conservation Planning
Wildlife Restraint and Handling

Technical Specialties

Federal Consultations-Section 7 & 10
CEQA Documentation
Sensitive Plant and Wildlife Surveys
Nesting Bird Surveys
Clean Water Act Section 404/401
CDFW Section 1600 Streambed Alteration Agreement Permitting
Constraints/Impacts Analyses
Comprehensive Mitigation and Monitoring Programs
Mitigation Implementation/Monitoring

Professional Affiliations

The Wildlife Society
The Surfrider Foundation
California Native Plant Society

Ms. Julie Hickman has over 20 years of natural resource management, regulatory permitting, and terrestrial ecosystem monitoring and analysis experience throughout California. Her project experience includes developing monitoring protocols and management plans for endangered species, planning and conducting biological resource investigations, working with project proponents to minimize impacts, and supervising and training project staff. She has broad knowledge of land use regulations and has worked extensively implementing the Endangered Species Act (ESA), including coordination and consultation under Sections 7 and 10.
Ms. Hickman has also prepared technical reports and permits, including California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) documents, U.S. Fish and Wildlife Service (USFWS) biological opinions, and wetland permitting.

Ms. Hickman holds an ESA section 10 (a)(1)(A) recovery permit which authorizes her to conduct presence/absence surveys for the California red-legged frog. In addition to general surveys for common and sensitive wildlife species, Ms. Hickman has experience performing focused, protocol-level, presence/absence surveys for the California red-legged frog, southwestern arroyo toad, California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and several listed plants in a variety of habitats. She has also performed avian monitoring and banding, general pitfall traps for herpetofauna, and standard small mammal grid trapping. Her botanical experience includes rare plant presence/absence surveys, vegetation classification sampling, and rare plant and vegetation monitoring.

Project Experience

Biological Services for the Malibu Creek State Park Stokes Creek Bridge Replacement, California State Parks, *Calabasas, California*. - Ms. Hickman was the lead for permitting and biological investigations for the replacement of an undersized culvert with a new bridge at Malibu Creek State Park. The project involved wetland and biological surveys to support a wetland delineation and biological resources assessment. Future assistance with federal and state permitting under sections 404/401 and 1600 (U.S. Army Corps of Engineers and Regional Water Quality Control Board and California Dept. of Fish and Wildlife) will also be required but final design of the new beidge has not been completed.

Permitting and Biological Services for the Point Dume State Beach Stair Replacement, California State Parks, *Malibu, California.* Ms. Hickman was the lead for permitting and biological investigations for the replacement of a staircase for beach access from the Point Dume Nature Preserve. The project involved biological investigations to support a Biological Technical Report and the CEQA biological resources sections, as well as the preparation of a Coastal Development Permit with the California Coastal Commission and permits with the U.S. Army Corps of Engineers and Regional Water Quality Control Board.

Compliance Studies for the Aliso Canyon Turbine Replacement Project, Southern California Gas Company, *Porter Ranch, California*. Ms. Hickman was the lead for the avian biological monitoring and nest clearance team. She organized and conducted avian nest surveys, coordinated with agencies and the Gas Company, and completed compliance documentation and weekly reporting while coordinating staff and scheduling surveys.

Permitting Services for ExxonMobile Pipeline Investigation in the Angeles National Forest, *Santa Clarita, California.* Ms. Hickman was part of the team that developed the permitting strategy for a pipeline investigation dig that crossed a regulated drainage. She developed and wrote the Biological Assessment/Biological Evaluation suitable for the U.S. Forest Service, USFWS, and the California Department of Fish and Wildlife (CDFW) and developed and wrote the Clean Water Act 401 and 404 permits as well as the CDFW Streambed Alteration Agreement.

Biological and Permitting Services for the Los Angeles County of Public Works Commerce Boulevard Interchange at State Route 126 Project, *Santa Clarita, California.* Ms. Hickman conducted inventory and clearance surveys for sensitive species for a large freeway interchange construction project which included auditory and nest clearance surveys for birds. Additionally, she conducted daily nesting bird clearance surveys and monitored construction activities for compliance with multiple permits and worked with construction operators to ensure daily activities followed mitigation requirements.

Biological Compliance Reporting for a Large-Scale Transmission Project, Southern California Edison, *California and Nevada*. Ms. Hickman was the lead reviewer for environmental documentation for a large scale power project. Responsibilities included effective coordination and communication with a large field team, ensuring consistency with the Migratory Bird Treaty Act, the ESA, the Clean Air Act, and the Clean Water Act, and development of reporting language for document submission to permitting agencies. Ms. Hickman communicated effectively with both management and field staff to complete the review process scheduling and coordinating review staff, reconciling conflicts, and developing reporting processes to streamline the submittal of several types of compliance reports to meet regulatory requirements.

Biological and Permitting Services for the Laguna Sanitation District Recycled Waterline, *Santa Maria, California*. Ms. Hickman assisted in the development of the permitting strategy for a 10-mile waterline project which bisected the Santa Maria airport and private property. The project involved both federally and state-listed species as well as special-status plants and jurisdictional waters and wetlands. Ms. Hickman assisted in writing the federal permit applications, coordinating with the agencies, and mitigation strategies. Additionally, Ms. Hickman conducted species inventory surveys conducting nesting bird surveys, and assessing potential nesting habitat, the potential for California red-legged frog, California tiger salamander, and vernal pool fairy shrimp.

CEQA Services for Multiple EIR's for a Confidential Client, *San Joaquin Valley, California.* Ms. Hickman wrote the biological sections for several EIR's on large tracks of land in the southern region of the San Joaquin Valley. Each of the EIRs involved a large list of potentially occurring species and combined several land use owners and regional

planning processes.

Biological and Permitting Services for the Santa Maria Airport Landfill, *Santa Barbara County, California*. Ms. Hickman assisted the County of Santa Barbara in developing a permitting strategy for a closed landfill within the Santa Maria Airport Property. The landfill is within occupied habitat for federally and state-listed species and requires permits from the USFWS and the California Department of Fish and Wildlife (CDFW) to complete landfill repairs on the site. She conducted site assessments which included surveys for nesting birds throughout the sites and visual surveys for listed amphibians within the existing water impoundments on the site.

Biological and Permitting Services for the Tajiguas Landfill, *Santa Barbara County, California*. As Project Manager, Ms. Hickman developed the permitting strategy for a landfill reconfiguration project involving impacts to federally listed species, and federal and state waters and wetlands. She coordinated the completion of the biological assessment, a restoration plan, and the biological analysis to support CEQA. She also coordinated the 404 permit with the U.S. Army Corps of Engineers; the 401 Certification with the Regional Water Quality Control Board; and with CDFW for a Streambed Alteration Agreement. The project included a wetland delineation and sensitive wildlife and plant surveys. She conducted surveys; wrote the California red-legged frog habitat assessments and management plans for the project site and the restoration site; and managed and implemented the plans. In addition, Ms. Hickman conducted daily nesting bird surveys and California red-legged frog surveys for the project prior to the initiation of each day's work activities over two nesting bird seasons and two wet winters.

Proponent's Environmental Assessment (PEA), Capital Project, Southern California Gas Company/Southern California Edison, *North Los Angeles County, California*. Conducted vegetation and wildlife surveys in support of the preparation of a PEA to document the effects of a major infrastructure upgrade project. Conducted a habitat assessment and mapped vegetation in the proposed project areas along over 8 miles of power lines through Santa Clarita and the Santa Susana Mountains and on a Gas Company facility.

Santa Catalina Island Conservancy, Eagles Nest Lodge investigation, *Santa Catalina Island, Los Angeles County, California*. Project manager and primary author for a biological constraints analysis looking at potential impacts of the project relative to the Los Angeles County guidelines for designated sensitive ecological areas.

Baseline Ecological Surveys for the Imperial Irrigation District's Habitat Conservation Plan, *Imperial County, California*. As Task Lead for the amphibian and small mammal surveys for this project, Ms. Hickman developed sampling protocols for three targeted amphibians and two target small mammals. This project focused on establishing the baseline conditions for a large project area using a random plot project design over multiple years of sampling to be used to prepare the Habitat Conservation Plan (HCP) and Natural Communities Conservation Plan. Additionally, Ms. Hickman conducted auditory bird surveys utilizing a point count methodology and conducted vegetation community mapping utilizing the Sawyer Keeler Wolf classification system.

Matilija Reservoir Invasive Species Removal Plan and California Red Legged Frog Study and Relocation Plan, *Ventura County, California*.

Task Lead for California red-legged frog surveys. Coordinated with the USFWS and conducted presence/absence surveys for the California red-legged frog. Ms. Hickman wrote the management plan for the California red-legged frog to aid in the development of protection measures to comply with the biological opinion requirements during project activities.

U.S. Fish & Wildlife Service Office, *Ventura, California*. Fish and Wildlife Biologist, responsible for implementation of ESA and review of actions which would affect federally listed species in Monterey, Santa Cruz, and San Benito Counties. Ms. Hickman conducted ESA Section 7 consultations, both informal and formal. Projects included a Federal Aviation Administration (FAA) project on the Monterey Airport for construction projects and dune restoration; Pacific Grove Municipal Golf Course property transfer and dune restoration; Caltrans and Federal Highways for various highway improvement projects; FAA and Marina Airport for radar tower installation; and State Parks, Hollister Hills State Vehicular Recreation Area for a park expansion project. Ms. Hickman also reviewed and conducted analysis of ESA section 10 permit requests for HCPs. She was Lead Biologist for a Section 10 HCP with California State Parks, Hollister Hills State Vehicular Recreation Area for continued operation of their off-road vehicle park.

Hill Slough West Restoration Project, California Department of Fish and Wildlife, Bay Delta Branch. Ms. Hickman was the lead biologist for the Hill Slough West Demonstration Restoration Project preparing the required CEQA, 404 ACOE, NEPA, and CDFW Endangered Species Take permits and a USFWS Biological Opinion. Prepared a proposal for USFWS section 6 funding project for endangered species protection in the Suisun Marsh.

Suisun Marsh Wildlife Investigations, California Department of Fish and Wildlife, Bay Delta Branch*, Contra Costa County, California*. Ms. Hickman conducted wildlife studies including auditory bird surveys, small mammal trapping, and vegetation studies in the Suisun Marsh. Studies targeted the endangered salt marsh harvest mouse, the California clapper rail, and black rail.

Waterfowl and Sandhill Crane Census, California Department of Fish and Wildlife, Bay Delta Branch. Conducted census of waterfowl and Sandhill cranes for several wildlife areas in the Central Valley. Surveys were conducted by boat and from stationary point count stations.

Wildlife Biologist, California Department of Fish and Wildlife, Bay Delta Branch. Ms. Hickman was part of the project team for several large water projects for the California Delta, Los Vaqueros reservoir, and the Suisun Marsh and reviewed projects submitted to the CDFW. She organized and conducted vegetation surveys to update vegetation mapping under the Sawyer/Keeler-Wolf Vegetation Classification System utilizing ArcView, GPS, and aerial photos. She also reviewed planning documents for CEQA compliance and participated in planning efforts for the Los Vaqueros Reservoir expansion project.

Wildlife Biologist for the Environmental Division, Fort Hunter Liggett Military Installation, *Monterey County, California.* Prepared Draft Conservation Agreement for endemic plants (purple amole and Santa Lucia Mint) on Fort Hunter Liggett Military Installation (FHL). Endangered Species Management Plan for endangered arroyo toad on FHL. Lead Coordinator for threatened and endangered species compliance

distribution/abundance surveys for rare plants (purple amole, Santa Lucia mint, *Calycadenia villosa*) and arroyo southwestern toad. Conducted wildlife investigations as per ESA protocols and NEPA compliance; managed database of all collected data; and graphically documented sites using ArcView. Conducted bald eagle surveys and nest monitoring, auditory bird surveys targeting the least Bell's vireo, California tiger salamander and vernal pool fairy shrimp surveys/ documentation, San Joaquin kit fox spotlighting, and wood duck nest box monitoring and banding. Prepared and presented endangered species educational compliance briefings to personnel stationed on FHL and to all new contractors. Contractor coordination and report review for threatened and endangered species surveys. Prepared annual USFWS reports for threatened and endangered species and participated in survey protocol development in coordination with the USFWS. Assisted in preparation of Biological Assessments for pre-construction/project review and informal consultations through the USFWS. Reviewed NEPA documents for new projects and participated in the conceptual and developmental phases of environmental assessment preparation including preliminary site assessments and draft review. Prepared the rare plants section of the Integrated Natural Resource Management Plan for FHL.

Land Condition and Trend Analysis, Colorado State University, Fort Hunter Liggett Military Installation, *Jolon, California*. Ms. Hickman conducted auditory bird point count surveys as part of the Land Condition and Trend Analysis study for three nesting bird seasons. Additionally, Ms. Hickman conducted vegetation surveys and mapping which included several ecological vegetation sampling methods.

U.S. Forest Service, Lake Tahoe Basin Management Unit, *South Lake Tahoe, Californa*. Ms. Hickman was part of a wildlife investigation study developing a forest service protocol to analyze riparian ecosystems. As part of the study Ms. Hickman conducted auditory bird point count surveys, small mammal trapping, and vegetation surveys for ten randomly selected study areas throughout the Lake Tahoe Basin.

AECOM

Ivan Parr
Senior Biologist

Education

BS, Environmental Science, St. Mary's College, 2007

Years of Experience

With AECOM: 8
With Other Firms: 3

Professional Affiliations

California Native Plant Society
California Academy of Sciences
Casa Avian Support Aliance
Oakland Museum of California
National Audubon Society
Wildlife Society

Certifications

Scientific Collecting Permit #SC-10483 California Department of Fish and Wildlife
Plant Voucher Collecting Permit for California Endangered Species Act Endangered, Threatened, and Candidate Species

Mr. Parr is a senior biologist with over 11 years of professional experience in performing, leading, and organizing botanical surveys, vegetation mapping efforts, wetland delineations, and wildlife surveys in northern, central, and southern California. He has a background in field biology and is experienced in plant and animal taxonomy. Mr. Parr is most familiar with California flora and plant communities (including wetlands), intertidal life, and birds. Among his specialties are chaparral, desert, and montane/alpine habitats. Mr. Parr has been involved in studies for invasive, special-status, and cultural (Native American) plant species; avian abundance; fish, amphibian, and reptile populations (including desert tortoise, yellow-legged frog, and Alameda whipsnake, giant garter snake, Mono Basin sage-grouse, and Least Bell's vireo); and macroinvertebrate diversity.

Experience

Lake Tahoe Basin Management, Sunset Stables Restoration, Lake Tahoe, California. Performed special-status plant surveys, including listed bryophyte surveys along the Truckee River of Lake Tahoe. Surveys involved mapping assessments using the rapid assessment method, a full-species inventory, mapping of noxious weeds, mapping of culturally-significant weeds, and special-status plants surveyed under protocol guidelines outlined by the California Department of Fish and Wildlife. Compiled a portfolio of botanical specimens and wrote the draft botanical section of the environmental impact report.

Golden Gate National Parks Conservancy, Redwood Creek Trail Realignment, Marin County, California. Conducted special-status plant surveys for the proposed reroute of the Redwood Creek trail alignment within Mt. Tamalpais State Park.

East Bay Regional Parks District, Road Repair - FEMA-1628-DR-CA, Various Locations, California. Performed field surveys, assisted in determining critical habitat and co-wrote the biological assessment.

San Francisco Public Utilities Commission, Tesla Portal Trenching and Geotechnical Investigation, Tracy, California. Implemented environmental awareness training for geotechnical and construction workers at the Tesla Portal facility to protect wetlands, burrowing owls, San Joaquin kit fox, and other biological resources. Conducted biological monitoring.

California Department of Transportation, Alameda Creek Bridge Replacement, Fremont, California. Assisted with biological assessment, including consultation on Alameda whipsnake habitat, rare plant species, and sensitive communities.

Kinder Morgan Energy Partners, LP, Revegetation/Monitoring, Oakland, California. Conducted annual wetland and tree monitoring, compilation of data, mitigation report, and final report.

Kinder Morgan Energy Partners, Pipeline Construction Monitoring - Concord to Sacramento, Various Locations, California. Performed rare plant surveys and monitoring along pipeline alignment.

San Francisco Public Utilities Commission, Baylands Recovery Revegetaion, Oakland, California. Aided botanical assessment and compiled plant lists, mapped plant populations for propagation, and collected and recommended seed for propagation.

Kinder Morgan Energy Partners, LP, Carquinez Strait Cover, Contra Costa County, California. Wrote the biological assessment for the National Oceanic and Atmospheric Administration (NOAA), made determinations on NOAA-regulated fish species in the strait, and assisted in writing permits.

San Francisco Public Utilities Commission, On-Call Environmental Services, San Francisco Bay Area, California. Assisted with on-call biological services in the Alameda and Peninsula watersheds. Duties included developing monitoring and methods protocols, conducting and coordinating wildlife and plant surveys, vegetation mapping, invasive weed protocol and mapping, restoration survivorship monitoring, and writing of annual reports for mitigation sites.

Confidential Utility Client, North American Electric Reliability Corporation Alert Program, California. Conducted environmental reviews, including ground and helicopter surveys, of sites and surveys for biological constraints, including wildlife habitat, wetland features, and rare plant species.

State Coastal Conservancy, Carmel River Reroute and San Clemente Dam Removal Permitting and Environmental Assessment, Monterey County, California. Assisted with botanical impacts alternatives analysis and project permit applications.

US Air Force, Munitions Response Sites - Rare Plant Surveys, Beale AFB, California. Conducted rare plant surveys and vernal pool surveys.

California Department of Transportation - District 4, Environmental On-Call Contract, San Francisco Bay Area, California. Oversaw tasks involving NEPA/ CEQA environmental

studies and documentation, monitoring, and environmental consultation for construction and landscaping. Conducted monthly and annual monitoring and reporting, weekly cost and schedule tracking, and biweekly staff meetings. Revised the mitigation management plan and filled in for Caltrans biological staff.

California High-Speed Rail Authority, California High-Speed Train - Bakersfield to Palmdale Section, Various Locations, California. Prepared chapters for biological assessment and environmental impact report/environmental impact statement. Led field effort for rare plant surveys. Provided consultation for permitting, wildlife usage, sensitive habitat management, and wetland studies.

California Department of Transportation - District 4, Road Maintenance, Various Locations, California. Conducting roadside monitoring for Swainson's hawk nests.

San Francisco Public Utilities Commission, Calaveras Dam Replacement, Sunol, California. Conducted rare plant surveys, butterfly habitat assessment, and invasive weed mapping.

Port of Oakland, Oakland International Airport - Runway Safety Area Improvement, Oakland, California. Performed rare plant, California least tern, and snowy plover surveys.

California Department of Transportation - District 4 and Bay Area Toll Authority, Dumbarton Bridge Seismic Upgrade - Environmental Permitting, Alameda and San Mateo Counties, California. Conducted biological surveys for avian nesting; conducted marine invertebrate surveys on pilings.

Rhodia, Peyton Slough Remediation, Martinez, California. Conducted and reported on vegetation studies, wildlife habitat, and restoration efforts.

BrightSource Energy, Rio Mesa Solar, San Diego, California. Performed rare plant surveys, California desert species mapping, and analyzed data.

Federal Emergency Management Agency, Humboldt Bay Techite Pipeline Retrofit - HMGP-1731-35-53, Humboldt County, California. Analyzed data and completed species information, rare plant survey, and final write-ups.

US Bureau of Reclamation, San Joaquin River Restoration, Madera and Fresno Counties, California. Performed wildlife and vegetation surveys, including for Valley Elderberry Longhorn Beetle, compiled species lists, and analyzed data.

California High-Speed Rail Authority, California High-Speed Train - Fresno to Bakersfield Section, Various Locations, California. Conducted wetland monitoring, rare plant surveys,

wildlife surveys, compilation of data, and chapters of the biological assessment and the environmental impact report/environmental impact statement.

Chevron Pipe Line Company, Holdener Park Off-Site Compensatory Mitigation, Livermore, California. Conducted vegetation monitoring, consulted on landscape and habitat restoration.

Chevron Pipe Line Company, San Antonio Reservoir Pipeline Relocation, Livermore, California. Performed wetland monitoring and assisted with the final report.

California Department of Transportation, I-580 Truck Climbing Lane Alternatives, Alameda County, California. Performed rare plant surveys, compiled species lists, mapped vegetation. Assisted with the biological assessment.

Kinder Morgan Energy Partners, LP, Oakland International Airport - LS 36/42 Maintenance Site Review, Oakland, California. Performed and wrote the site visit report, conducted surveys for burrowing owl, northern harrier, and nesting bird species.

Alameda County, Peralta Creek, Bayfair Mall, and Laguna Creek Revegetation - Flood Control Maintenance Mitigation, San Leandro, California. Oversaw maintenance of planting sites, wrote budget and scope, monitored work, and consulted client on planting procedures.

Stanford University, Searsville Dam and Reservoir Alternatives Study and Engineering and Hydrology Co, Woodside and Portola Valley, California. Conducted special-status wildlife surveys focusing on snakes (particularly San Francisco garter snake), western pond turtle, California red-legged frog, and special-status birds.

US General Services Administration, Silverspot Butterfly, Pillar Point AFS, California. Conducted inventory of invertebrate species at Pillar Point AFS, focusing on Myrtle's silverspot butterfly.

California American Water, Monterey Peninsula Water Supply Transmission Mains, Monterey and Seaside, California. Coordinated and performed natural resources surveys and wetland delineation, met with clients and other consulting firms over access, coordinated mapping and display of resources for agencies and client, and prepared botanical and wildlife sections of the technical report for the proposed desalination water pipeline in coastal Monterey County.

Southern California Edison, Big Creek No. 4 Relicensing, Sierra Nevada, California. Led field surveys to locate and identify special-status species, species of cultural importance, and noxious weeds

within the facilities. Updated both the animal and plant lists for the project and assisted with surveys for valley elderberry longhorn beetle. [Prior to AECOM]

Monterey County Water Agency, Salinas Valley Water Project Revegetation Plan, Monterey County, California. Determined loss of vegetation, conducted avian nesting surveys, and wrote instructions restoration in a mitigation Compiled a comprehensive species list for the dam site. [Prior to AECOM]

Placer County Water Agency, Licensing Application, Placer County, California. Conducted surveys for riparian and upland habitat assessment for facility betterments, including for special-status and noxious weed species. Assisted in fish population, water quality, macroinvertebrate, raptor, and herpetological field work and research. Compiled comprehensive floral lists. [Prior to AECOM]

Invenergy, LLC, Horse Lake Wind Energy, Sacramento, California. Performed avian point-count surveys, complete vegetation mapping assessments using the rapid assessment method, and botanical surveys (including a full-species inventory) using transects and protocol survey guidelines outlined by the California Department of Fish and Wildlife. These data contributed to the assessment of bird distribution, breeding, and abundance, as well as the locations of rare plant species. Also surveyed for greater sage-grouse and generated a portfolio of botanical specimens. [Prior to AECOM]

Pacific Gas and Electric Company, Donnells-Curtis Pole Replacement, Various Locations, California. Aided botanical assessment and compiled plant lists, mapped special-status species habitat and occurrences, and surveyed for valley elderberry longhorn beetle. [Prior to AECOM]

AECOM

Wayne Vogler

Principal Biologist

Education

BS, Biological Sciences, Concentration in Ecology and Environmental Science, University of California, Irvine, 1994

Years of Experience

With AECOM: 10 Years

With Other Firms: 10 Years

Training and Certifications

USFWS Project Authorized to Survey, Handle, and Relocate California Red-legged Frogs

USFWS Project Authorized to Survey, Handle, and Relocate Tidewater Goby

Endangered Species Act Section 7 Workshop

Facilitation Skills for Scientists and Resource Managers

San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques

California Tiger Salamander Upland Habitat Workshop

California Tiger Salamander Workshop

Blunt-nosed Leopard Lizard Habitat and Survey Techniques Workshop

Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop

Storm Water Pollution Prevention on Construction Sites

California Red-legged Frog Survey, Handling, and Pit Tagging

U.S. Army Corp of Engineers Wetland Delineation Certification

First Aid/CPR

Overhead Power Line Safety

Project Manager-AECOM

Behavior Based Safety

Loss Prevention Systems

Hazardous Waste Operations/ Emergency Response

Smith System Advanced Driver Training

Mr. Vogler has 20 years of experience providing solutions for oil and gas and energy production clients. This experience has primarily focused on pipeline, industrial, and remediation projects. He is adept at recognizing client's needs and suggesting fit for purpose approaches to meet client's goals. Mr. Vogler has particular experience developing strategic approaches to complex projects, and representing clients with projects involving the Endangered Species Act, California Environmental Quality Act (CEQA), Clean Water Act, and other federal and state environmental laws. Mr. Vogler is in his 10th year of program management including management of professional scientific staff, and development and management of budgets and financial plans. He has maintained compliance with Health and Safety training requirements, including specialized training, since 1996, and is fully-versed and indoctrinated in a behavior based health and safety culture.

Project Specific Experience

AECOM, Manager – Natural Resource Group, Santa Maria, California, 2010-present. Perform as an example and mentor of AECOM's safe work culture. Embody a safety culture that has resulted in no recordable incidents by staff or myself. Initiated and developed biological, cultural resources, and land use planers disciplines in Santa Maria office expanding service offerings to a sustaining and successful group. Evaluate staff performance, advise staff on technical matters, and supervise staff adherence to policies and procedures. Administer appropriate project staffing, manage staff utilization, and ensure the satisfactory completion of assigned tasks. Interact with external and internal clients to maintain current work and build new project opportunities.

Phillips 66, Pipeline Abandonment, Kern, Kings, Fresno, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, and San Diego Counties, California, 2011-present. Responsible for environmental compliance of a 550-mile pipeline abandonment project. Identify natural resource presence and evaluate potential impacts from project implementation. Developed approach and processes to avoid protected species impacts. Strategize program approach to address land use permitting, avoiding delays to project schedule. Coordinated work efforts on federal and state owned lands. Manage work efforts to locate key pipeline features, map pipeline alignments, and build Geographic Information System (GIS) database for the entire pipeline portfolio. Subsequent work assignment to maintain GIS data through the pipeline abandonment activities resulting in as-built maps of abandonment activities. Managing over $1.0 MM in project work.

Santa Maria Energy, Careaga Oil Field Expansion, Santa Barbara County, California, 2007-present. Responsible for natural resource tasks leading to the development of enhanced oil recovery at 1,100 acre oil field. Completed a constraints analysis to aid engineers in project design. Obtained incidental take authorization from federal and state resource

Approved Permit to Work Authorizer

Technical Specialties

Safe Work Culture
Project Management
Strategic Project Planning
Listed Species Permitting
Listed Species Surveys
Wetland Delineation
Mapping Services
CEQA Permitting and Environmental Analysis

Affiliations

The Wildlife Society
The Wildlife Society Western Section
The Wildlife Society, California Central Coast Chapter (President, 2013 to present)
Coastal Operators Group

agencies for 40-acre industrial facility. Identified a federal nexus to allow for federal incidental take authorization through the section 7 consultation process. Employed an innovative habitat evaluation approach for determining compensatory mitigation values resulting in a 40 percent reduction in the amount of mitigation lands to be acquired. Managing over $1.2MM in project budgets with services ranging from special status plant and animal studies to oak tree restoration, CEQA analysis, and construction monitoring.

County of Santa Barbara, Laguna Sanitation District, Phase 3 Recycled Waterline Project, Santa Barbara County, California, 2008-2014. Design and permitting for a 10.5-mile recycled waterline. Performed a siting study analysis to determine preferred pipeline alignment. Collaborated with design engineers to avoid environmental constraints. Oversight of biological and cultural resource studies. Prepared environmental analysis documents for County's use. Obtained incidental take authorization from federal and state resource agencies. Interface between County staff and resource agencies.

Chevron Environmental Management Company Escolle Lease Restoration, Santa Barbara County, California, 2011-2015. Focused surveys for California red-legged frog and California tiger salamander. Initiated and concluded consultation with U.S. Fish and Wildlife Service regarding site restoration activities. General habitat assessment and land use permitting with County of Santa Barbara including negotiations with County regarding compliance permit conditions. Senior biologist supporting the site restoration efforts.

ExxonMobil Pipeline Company, San Ardo Pipeline - Permitting Support, Monterey County, California, 2013. Biological and permitting task lead working with ExxonMobil pipeline engineers to develop strategic permitting and biological alternatives for pipeline removal across the Salinas River. Project involved consideration of federal and state water impacts, protected species avoidance (California red-legged frog, steelhead), while meeting client design parameters.

Southern California Edison, Gale-Pisgah-Lugo Transmission Corridors, San Bernardino County, California, 2011-2012. Field Manager for desert tortoise protocol surveys along two power line alignments east of Barstow, California. Responsible for rapid deployment and field survey efforts to complete the habitat assessment along 120 miles of power line alignment under an accelerated schedule to meet submission deadlines. Mentored field staff toward project completion without incident.

Chevron Environmental Management Company, McKittrick Gathering System Pipelines, Kern County, California, 2008-2010. Project Manager for the biological study and endangered species permitting (federal and state) in support of the removal of three pipelines. Services included project approach development, biological surveys, jurisdictional waters determinations, and endangered species permitting. Additional tasks included work scope development, health and safety systems, agency coordination, protocol botanical and wildlife surveys, budgeting, and client interactions. Coordinated work efforts on federal and state owned/managed lands.

Chevron Environmental Management Company, Program Biologist TDPI and Unocal Legacy Pipelines, Kern, San Luis Obispo, Santa Barbara, Ventura, Monterey Counties, California, (2007-2010). Program

Biologist for 375-mile pipeline portfolio identifying programmatic environmental needs and efforts; both conducting work efforts and directing biologists from multiple offices in work efforts. Implemented the appropriate level of oversight to maintain regulatory compliance while maintaining project implementation schedule.

SunPower, California Valley Solar Ranch, San Luis Obispo County, California, 2008-2010. Performed biological surveys over approximately 5,700-acres in support of county entitlement studies for a 250MW solar generating facility. Tasks included habitat assessment, small mammal trapping, San Joaquin kit fox and blunt-nosed leopard lizard assessment, waters/wetlands assessment, and vegetation mapping, and rare plant surveys. Technical approach review body advising the project manager in project needs and methods.

TransCanda, Bison Pipeline, Adams, Bowman, Hettinger, Slope, Stark Counties, North Dakota, 2010. Biological compliance monitor for construction of natural gas pipeline.

BP Alternative Energy, Hydrogen Energy California Application for Certification, Kern County, California, 2009. Biologist in support of an AFC for a 390MW integrated gasification combined cycle power generating facility. Team leader for blunt-nosed leopard lizard surveys and senior biologist advising survey approach, jurisdictional waters determinations, and conducting surveys.

Chevron (Unocal), Guadalupe Restoration Project, San Luis Obispo County, California, 1997-2007. (Biological Task Leader) Developed processes for project compliance with over 1,200 permit conditions regarding the remediation and restoration of a 2,700 acre site. Regular performance of focused surveys for listed plant and wildlife species. Environmental compliance monitoring during removal of 130-miles of pipelines. Primary interface between construction contractors, project management, and agency oversight contractor. Developed wetland and upland restoration plans. Responsible for writing and compiling sections of the Quarterly Ecological Monitoring Report. General habitat assessments and develop solutions for project implementation in presence of sensitive species. Oversight of monitoring efforts for western snowy plover, California red-legged frog, and protected botanical species.

General Experience

California Environmental Quality Act and Application for Certification. Conducted surveys and prepared technical reports for dozens of environmental documents supporting Initial Studies and Environmental Impact Reports (EIR) under CEQA and AFC assessments. Perform as both the sole and contributing author for environmental assessments. Make determinations regarding which environmental factors require detailed analyses, and perform the analyses, assess potential cumulative impacts, and write associated sections. Work with clients to integrate comments to documents.

At the direction of and in collaboration with the legal review team, provided technical review and comments on California Department of Oil, Gas, and Geothermal Resources Statewide EIR regarding hydrologic fracturing well development techniques.; Mr. Vogler's review and comments became the basis for a challenge to the feasibility of mitigation measure implementation prescribed in the environmental analysis.

Biological section lead for development of six draft EIRs evaluating the expansion of regional-scale oil production activities and process facilities. Managed biological efforts across multiple office locations and contributors. Responsible for document content, project schedule, and budget. Established process to obtain background information that maximized use of existing data.

Regulatory Consultations and Permitting with State Agencies. Prepare documentation supporting consultations and permit applications with the California Department of Fish and Wildlife including Streambed Alteration Agreements and Incidental Take Permits. Assess potential impacts of projects on plant and wildlife species protected under the California Endangered Species Act. Research and identify scientific and technical data in support of the impact analysis and effects determinations. Formulate mitigation in coordination with clients.

Federal Regulatory Applications and Consultation Documentation. Prepare documentation supporting formal section 7 consultations with the U.S. Fish and Wildlife Service and preparing section 10 Habitat Conservation Plans under the Endangered Species Act. Provide expert advice associated with regulatory requirements, ecology, wildlife biology and threatened and endangered species management.

Complete formal Waters of the U.S. jurisdictional determinations throughout arid Southern California. Evaluate wetland criteria to determine accurate jurisdictional boundaries, document observations, and present findings in a technical report for U.S. Army Corp of Engineers and U.S. Environmental Protection Agency concurrence.

Conduct editorial and technical review of environmental documents, scientific and technical reports, regulatory application packages, and biological assessments to ensure compliance with pertinent laws and regulations, as applicable.

Project Transaction Due Diligence Evaluations. Biological lead for due diligence evaluations for utility-scale solar energy generation facilities. Assessed permitting efforts to evaluate if appropriate and necessary authorizations or permits were in place. Identified those mitigation or compensation measures that could result in significant monetary or schedule impacts.

Siting Studies and Development Constraints Analysis. Conducted siting studies at six utility-scale solar energy-generating facilities within the San Joaquin Valley. Reviewed current and potential future land uses, land use regulations, and natural resource constraints to assess the feasibility of permitting the proposed projects. Prepared technical reports that clearly and concisely presented findings.

Completed reconnaissance surveys of 1,000s of acres to assess the potential constraints in developing oil and gas production facilities. Performed desk top research coupled with field visits to provide client a feasibility ranking for permitting the proposed facilities and provided recommendations on facility design which could avoid environmental constraints and facilitate project development.

Facilitation and Consensus Building. Through effective and efficient communication with clients and regulators, Mr. Vogler is able to find resolution even amongst competing interests of multiple regulatory agencies. While working with multiple stakeholders, sometimes with

opposing expectations, through respect and open communication Mr. Vogler is effective at distilling the core issues and garnering consensus. Mr. Vogler's project success exemplifies his ability to listen to clients and understand their expectations.

Project Management. Manage multi-disciplinary projects with annual budgets up to $1MM. Develop budget and scope to provide the appropriate level of client-desired support. Manage budget and scope, evaluate earned value, and forecast project profit revenues for senior management.

Senior member of the Phillips 66 pipeline abandonment project management team. Total program value in excess of $38MM. Develop work scope, solicit and select sub-contractors, responsible for program deliverables, interface with internal and external clients, and manage project budgets.

Solicit and select subcontractors to support project efforts. Monitor subcontractors work product, manage subcontractor costs, and ensure quality work products.

Land Use Entitlements. Review and determine permitting requirements for conducting work activities within local agency jurisdiction. Assemble permit packages for submittal to obtain requisite discretionary permits and clearances to perform work activities.

Species Expertise

- Tidewater Goby **(***Eucyclogobius newberryi*)
- Burrowing owl (*Athene cunicularia*)
- California red-legged frog (*Rana draytonii*)
- California tiger salamander (*Ambystoma californiense*)
- Blunt-nosed leopard lizard (*Gambelia sila)*
- Desert Tortoise (*Gopherus agassizii*)
- San Joaquin Kit Fox (*Vulpes macrotis mutica*)
- La Graciosa thistle (*Cirsium scariosum* var. *loncholepis*)
- Surf thistle (*Cirsium rhothopilum*)
- Beach spectacle-pod (*Dithyrea maritima*)
- Working and permitting knowledge of other California coastal, San Joaquin Valley, and California desert species.

Selected Continuing Education

- Western Section Annual Conference. The Wildlife Society. Santa Rosa, CA. January 2015.
- Western Section Annual Conference. The Wildlife Society. Reno, NV. January 2014.
- Endangered Species Act Section 7 Workshop. Western Section of The Wildlife Society, Sacramento, CA. February 2013
- Facilitation Skills for Scientists and Resource Managers. Elkhorn Slough Coastal Training Program, Prunedale, CA. November 2012.
- San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques. California Central Coast Chapter of The Wildlife Society. Carrizo Plains, CA. July 2012.
- California Tiger Salamander Upland Habitat Workshop. Elkhorn Slough Coastal Training Program. Carmel Valley, CA. June 2010.
- California Tiger Salamander Workshop. Elkhorn Slough Coastal Training Program. Monterey, CA. April 2009.

- Blunt-nosed Leopard Lizard Habitat and Survey Techniques Workshop. San Joaquin Chapter of The Wildlife Society. Bakersfield, CA. May 2007.
- Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop. Desert Tortoise Council. Ridgecrest, CA. November 2003.
- Storm Water Pollution Prevention on Construction Sites. State Water Resources Board. Sacramento, CA. April 2001.
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