B.F. Sisk Dam Raise and Reservoir Expansion Project Environmental Impact Report/ Supplemental Environmental Impact Statement

Appendix K1: B. F. Sisk Dam Safety of Dams Modification Project Biological Survey Report 2018

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B.F. SISK SAFETY OF DAMS MODIFICATION PROJECT

Biological Survey Report

Prepared for
U.S. Bureau of Reclamation
California Department of Water Resources

October 2018

Draft

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Biological Survey Report

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U.S. Bureau of Reclamation
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CHAPTER 1
Introduction

1.1 Background and Purpose

B.F. Sisk Dam is part of the San Luis Joint-Use Complex, which was designed and constructed by the federal government and is operated and maintained by the California Department of Water Resources (DWR). The complex was constructed to provide supplemental irrigation water storage for the federal Central Valley Project (CVP) and storage of municipal and industrial water for the California State Water Project (SWP).

The dam impounds San Luis Reservoir, which, with a total water storage capacity of more than 2 million acre-feet, is one of the largest off-channel storage facilities in the country and a key component of the water supply system in California. Water is lifted into the reservoir for storage by the Gianelli Pumping–Generating Plant from the California Aqueduct and is diverted from the Delta-Mendota Canal via O'Neill Forebay.

The dam and reservoir are located in an area of high potential for severe earthquake loading from active faults. A recent series of studies and analyses, including a probabilistic seismic analysis completed in 2006, determined that corrective actions were justified at B.F. Sisk Dam to reduce risk to the downstream public. The U.S. Bureau of Reclamation (Reclamation) and DWR seek to mitigate potential safety concerns identified in previous and ongoing studies by modifying water retention structures at B.F. Sisk Dam in order to reduce the seismic, static, and hydrologic risk.

The project will involve two main components: stability berms (buttresses) and a dam raise. Project construction will require a large amount (on the order of between 2 million and 20 million cubic yards) of earth material, all of which would be obtained from a number of borrow sites within the project boundary.

This report presents the findings of focused vegetation and wildlife surveys performed in September 2018 to identify the potential presence and distribution of special-status plant and wildlife species, and natural communities in the project footprint for the B.F. Sisk Safety of Dams Modification Project (project). The intent and scope of this document is to characterize sensitive biological resources in the area where the proposed project will be implemented, and those resources that may be affected by the project.

1.2 Study Area Location

The study area for the B.F. Sisk Safety of Dams Modification Project is located on the west side of California's Central Valley, near the community of Santa Nella, approximately 12 miles west of Los Banos. It is located in the San Luis Dam, California 7.5-minute U.S. Geological Survey

quadrangle. The 3,905-acre "study area" described in this report includes the immediate footprint of proposed facilities, access routes, construction staging areas, borrow areas, and other lands that may be accessed to complete the project (see Figure 1-1).[1]

1.3 Summary of Biological Survey Findings

Biological surveys performed by ESA biologists for the B.F. Sisk Safety of Dams Modification Project included a combination of walking surveys to identify and characterize vernal pool branchiopod habitat, elderberry shrubs, and small mammal burrows; day and nighttime aquatic surveys to document amphibian use; fixed point surveys to characterize site use by songbirds and raptors, including tricolored blackbird, Swainson's hawk, and burrowing owl; day and nighttime driving surveys to identify use by reptiles, raptors, and mammals; and the use of baited camera stations to study large carnivores, including American badger and San Joaquin kit fox. In addition, a single emergence and acoustic bat survey was performed. The findings of these surveys are summarized below.

Vernal Pool Branchiopods. Three pool areas comprising a total of eight pools were identified that may support the federally listed vernal pool fairy shrimp or vernal pool tadpole shrimp. One area includes an alkali pool located on grasslands near the dam face and the other areas occur north of the DWR maintenance yard. One of these features was mapped as a seasonal wetland in the 2018 wetland delineation and the other features are non-wetland areas that may support listed branchiopods. No vernal pool branchiopod habitat was identified outside of the areas immediately below B.F. Sisk Dam or near the DWR maintenance yard.

Valley Elderberry Longhorn Beetle. Forty (40) elderberry shrubs were identified in the study area with stems greater than 1-inch diameter, principally located near Basalt Quarry. No evidence of valley elderberry longhorn beetle presence, such as larval exit holes or adult beetles, was observed on any of the generally poor-to-fair health shrubs. Shrubs occurred in 5 general stands. The largest elderberry/buffaloberry stand northwest of Basalt Quarry numbered greater than 25 shrubs. Four smaller stands were found in the Basalt Quarry area comprising at least 10 shrubs. Aside from these occurrences, elderberries were not identified elsewhere in the study area. However, two elderberry shrubs occur several feet outside the study area, at the sewage holding ponds located 0.5-mile northeast of Basalt Campground.

California Tiger Salamander. Two potential aquatic breeding sites for California tiger salamander were identified in the study area and three such features were identified within 1.2 miles; generally west, south and southeast of Basalt Quarry. The California tiger salamander may be encountered in select upland and aquatic areas south of the reservoir. Aquatic habitat that may support breeding California tiger salamander does not occur west of B.F. Sisk Dam or in the Medeiros Use Area.

California Red-legged Frog. The California red-legged frog was previously not known or expected in the study area. For the current assessment, focused daytime surveys were performed at all perennial aquatic sites in the study area to assess habitat conditions, and nighttime surveys

[1] Note that figures are provided at the end of each chapter.

were performed at Willow Spring and Domengine Spring. A California red-legged frog breeding population was identified at Willow Spring, on the edge of the study area and can likely be avoided by the project. California red-legged frogs may be encountered in select areas south of the reservoir and precautions are warranted to avoid impacts to this species. Potential breeding habitat for this species was also identified at four ephemeral and perennial ponds located between 0.3 and 1.2 miles from Basalt Quarry. This species is not expected near Basalt Campground, below B.F. Sisk Dam, or at the Medeiros Use Area.

Burrowing Owl and Swainson's Hawk. Despite extensive surveys, no burrowing owls, active owl burrows, or burrowing owl sign were identified in the study area. Annual grasslands in the Medeiros Use Area and throughout the study area provide high quality foraging and breeding habitat for this species

Swainson's hawks were not identified during the survey, possibly due to the late season timing of the field review. Potential Swainson's hawk nesting habitat occurs in the Medeiros Use Area eucalyptus grove, and near Basalt Campground (both documented in the California Natural Diversity Database), and in trees below B.F. Sisk Dam. Grasslands throughout the study area provide potential foraging habitat.

American Badger and San Joaquin Kit Fox. Spotlighting surveys and camera scent stations were used to identify American badger and San Joaquin kit fox in the study area. The San Joaquin kit fox was not detected during surveys. However, kit foxes are expected to use grassland portions of the study area on an intermittent and irregular basis.

State Park rangers anecdotally report American badgers south of the reservoir, north of Basalt Quarry. The CNDDB also reports badgers in the Medeiros Use Area. During surveys, a badger was observed near the intersection of Basalt Road and Gonzaga Road and a badger skull was found in a cattail marsh area below B.F. Sisk Dam. This species is expected in annual grasslands throughout the study area.

Bat Species. A bat habitat assessment was performed throughout the study area and nighttime emergence surveys were done at a concrete tunnel structure located near the Basalt Quarry. Acoustic surveys verified the presence of three bat species. Yuma myotis and Mexican free-tailed bat roosting was verified in the concrete tunnel. A second concrete structure near Basalt Quarry also provides roosting habitat for these species. In addition, the western red bat was detected during surveys and may roost in foliage at day use areas throughout the study area.

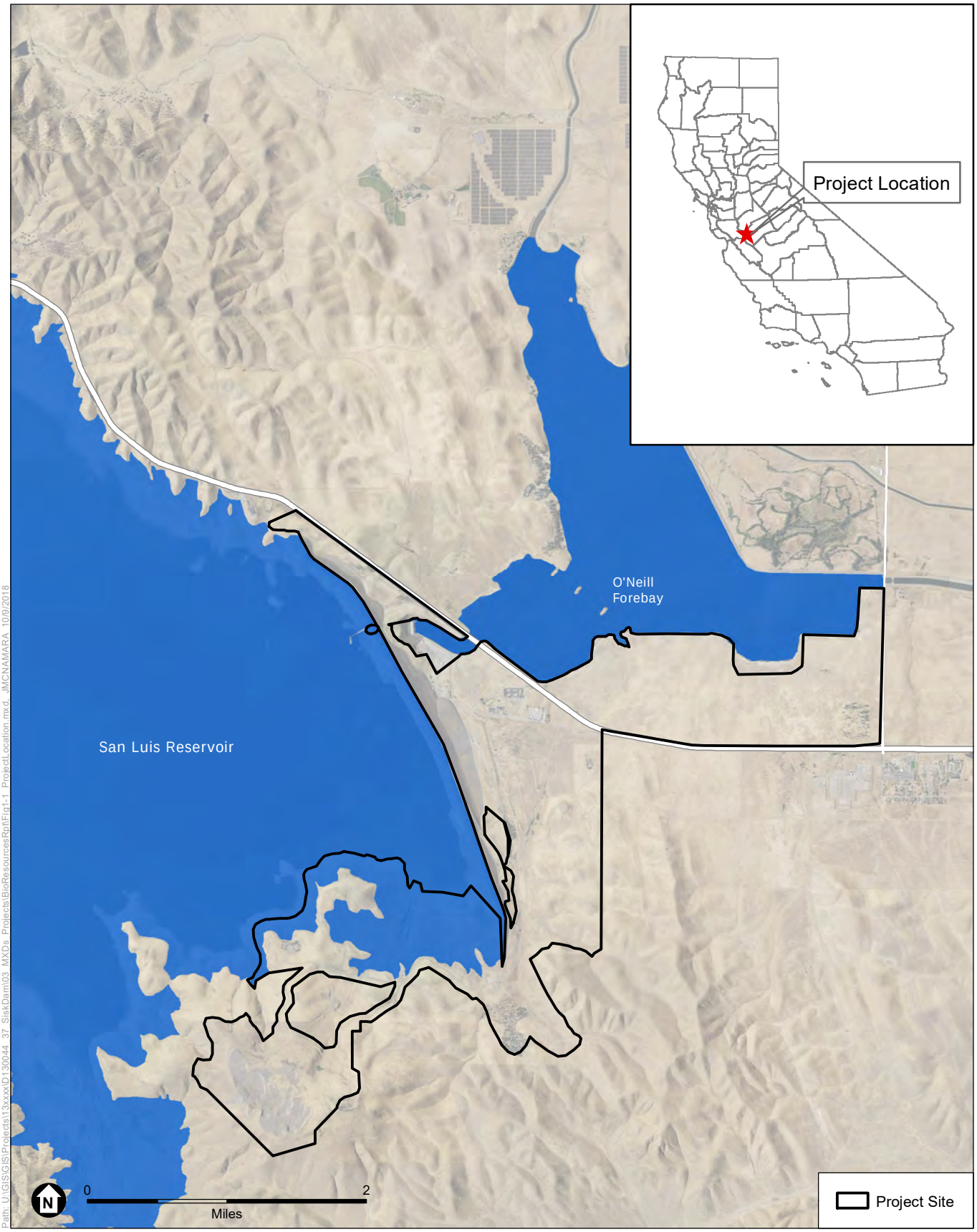
Special-Status Plants. Several areas were identified where future in-season botanical surveys are warranted to search for rare plants. These include alkali grasslands near the dam face and grasslands located north of the DWR maintenance yard (same areas described for vernal pool branchiopods). The construction area for B.F. Sisk Dam was reviewed using aerial photographs from the mid-1960s, and areas that were not subject to earth disturbance or borrow activities during construction may provide potential for the occurrence of rare plant species.

Species Not Identified. No high quality aquatic habitat was identified in the study area that would support western pond turtle. The pond at Willow Spring provides low to moderate quality habitat,

but turtles were not observed at this location during repeated surveys. This species is unlikely to be encountered.

No San Joaquin coachwhip were identified during surveys. However, habitat for this species is present throughout grasslands in the study area.

No tricolored blackbirds were identified during the survey, possibly due to the late season timing of the field review. Habitat for tricolored blackbird is present in cattail stands below the dam and at Willow Spring, though use of these areas is not known.



SOURCE: USDA, 2016; CDFW, 2018; USFS, 2017; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 1-1
Location of Project and Project Study Area

ESA

CHAPTER 2
Vernal Pool Branchiopods

2.1 Summary of Findings

This chapter presents the results of a focused site assessment that was performed for listed branchiopod[2] species that occur in the regional vicinity of the study area. These species include the federally-listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and federally-listed endangered vernal pool tadpole shrimp (*Lepidurus packardi*). An occurrence of longhorn fairy shrimp (*Branchinecta longiantenna*) is generally mapped in a 4-quadrangle, 13-mile by 17-mile area that includes the entirety of the Gustine, Stevinson, Ingomar, and San Luis Ranch USGS quadrangles. The species occurrence is in association with alkali habitat at the San Luis National Wildlife Refuge (San Luis NWR), greater than 10 miles northeast of the study area (CDFW, 2018). Similarly, the Conservancy fairy shrimp (*Branchinecta conservatio*) is documented greater than 10 miles from the study area. Neither longhorn fairy shrimp nor Conservancy fairy shrimp are expected in the study area due to their limited distribution and restricted habitat requirements (USFWS, 2007). The site assessment finds that potential aquatic habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp occurs in several areas within the project study area. These findings are summarized in **Table 2-1**.

TABLE 2-1

SUMMARY OF LISTED BRANCHIOPOD HABITAT

Area	Habitat Suitability [a]
Six Pools North of DWR Maintenance Yard (Fig. 2-2)	High quality habitat for VPFS and VPTS occurs in six seasonal alkali pools. Ostracod shells and algal mats are present, with *Eryngium* sp. and *Atriplex*. and American pillwort (*Pilularia americana*).
One Pool West of DWR Maintenance Yard (Fig. 2-2)	Single, moderate quality pool with evidence of algal mats and *Eryngium* sp.
One Pool in Grasslands Below B.F. Sisk Dam (Fig. 2-3)	Single, moderate quality pool with evidence of algal mats and saltgrass (*Distichlis spicata*).

[a] VPFS = vernal pool fairy shrimp; VPTS = vernal pool tadpole shrimp

Source: ESA

[2] The term "branchiopod" describes the taxonomic group of crustaceans that includes both fairy shrimp and tadpole shrimp.

2.2 Species Accounts

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp is endemic to the grasslands of the central valley, the Central Coast Mountain range, and South Coast Mountains, occurring in a variety of habitats. This species is described from high quality clear-water sandstone depressions and grassy swales, but also occurs in abundance in unvegetated roadside depressions and tire ruts.

The nearest vernal pool fairy shrimp record is a 1993 observation from San Luis NWR, approximately 13 miles northeast of the study area (CDFW, 2018). This species is well described from alkali sink and alkali grassland habitats, as found in the San Luis NWR. The study area is not within designated critical habitat for this species.

Typical habitat for vernal pool fairy shrimp includes vernal pools and seasonal wetlands within relatively undisturbed annual grasslands, seasonal wetlands, or wet depressions. The vernal pool fairy shrimp persists in some of the shortest-lived pools of any listed fairy shrimp species. In the warmer spring months this species can reproduce in pools that persist for as few as three to four weeks (USFWS, 1994; 2003; 2005a; 2005b; 2006).

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp is endemic to grasslands in the central valley, occurring at scattered localities in the San Joaquin Valley from San Joaquin County to Madera County (CDFW, 2018). No vernal pool tadpole shrimp occurrences are known or reported within 10 miles of the study area. The majority of populations occur in the Sacramento Valley, though an isolated population also occurs in the east San Francisco Bay Area near the City of Fremont. The nearest record is a 2003 observation 10.7 miles east of the study area (CDFW, 2018).

The vernal pool tadpole shrimp has been documented from a variety of seasonally ponding habitats, including vernal pools, alkali pools, roadside ditches, and tire ruts (Belk and Eriksen, 1999). This species tolerates a range of habitat conditions, from barren pools to well-vegetated sites. Pools range in size from small puddles measuring a few square meters to seasonal lakes that cover several acres. This species tolerates turbidity conditions ranging from relatively clear water to highly turbid pools USFWS, 1994; 2003; 2005a; 2005b; 2006)

2.3 Survey Methods

ESA senior wildlife biologist and fairy shrimp specialist Brian Pittman, CWB, was the lead biologist for large branchiopod site assessment. Mr. Pittman has held a USFWS 10a(1)(A) recovery permit for listed branchiopods since 2000 (Recovery Permit #TE-027422-5). Focused surveys of the study area were performed by B. Pittman and Kelly Bayne from September 10 to 14, 2018.

Because branchiopod habitat can vary widely between seasons and years, and it is easily overlooked during the dry season, the USFWS has not issued formal guidance in identifying

potential habitat for listed branchiopods during the dry season. In the absence of formal guidance, this assessment presents the best judgment of ESA's large branchiopod specialists B. Pittman and K. Bayne in describing the potential distribution of listed brachiopods within the study area. In addition, the USFWS generally considers that listed branchiopods within 250 feet of a proposed action may be subject to direct or indirect effects; hence, this assessment considered, the potential occurrence of habitat within 250 feet from the study area boundaries.

As part of this evaluation, the following actions were performed to identify potential habitat for listed branchiopods on or near the B.F. Sisk Safety of Dams Modification Project:

- A review of aerial photographs on Google Earth from August 1998 through March 2018 showing the extent of potential habitat, grading and site uses.
- A review of historical and recent large branchiopod distribution records from the California Natural Diversity Database (CNDDB) (CDFW, 2018) and scientific literature to create a list of special status fairy shrimp species that may occur at the site (**Figure 2-1**).
- A focused habitat assessment survey that included direct review of upland and aquatic habitat on the study site. Walking transects were performed in areas of interest to characterize aquatic features.

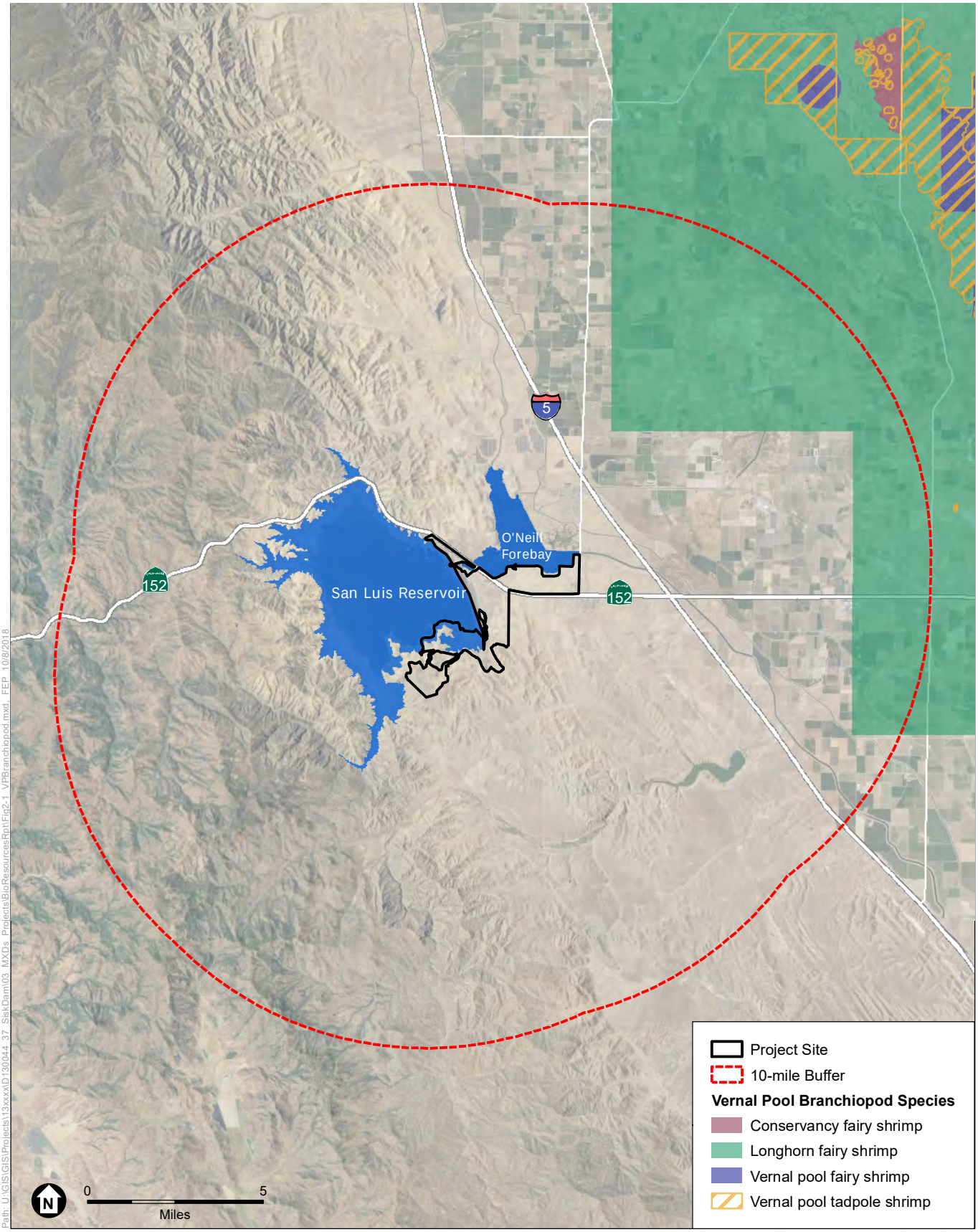
The focused site assessment survey included identification and mapping of appropriate seasonal pools in the study area.

2.4 Survey Results

Potential listed branchiopod habitat was identified in two general areas comprised of seven small pools north of the California Department of Water Resources (DWR) maintenance yard, and one area below B.F. Sisk Dam (see **Figures 2-2** and **2-3**). Each of these features is considered to provide potential habitat based on observed hydrologic indicators and ponding depth, the absence of flow-through water, alkali conditions, algal matting, the presence of aquatic invertebrates. Based on these indicators, each of the four observed features that were characterized as potential habitat during this dry season assessment are estimated to pond greater than 3 to 6 weeks out of the year, which is sufficient to support the life cycle of vernal pool fairy shrimp and vernal pool tadpole shrimp.

Neither vernal pool fairy shrimp nor vernal pool tadpole shrimp are reported within 10 miles of the study area and no other listed branchiopods occur within 10 miles of the study area. However, based on the presence of potentially suitable habitat, there is a moderate likelihood that these species occur within one or more of the aquatic depression features that were identified occur on-site. The largest of these features located north of the DWR office measures approximately 75 feet by 150 feet and may pool to an average depth of 6- to 8-inches, with a maximum depth estimated at between 14 and 16 inches (**Figure 2-4**). Ostracod shells and algal mats, both indicators of long-standing ponded water during winter, were evident in this and other observed

pools (**Figure 2-5**). These indicators show adequate ponding capacity to support vernal pool fairy shrimp maturation.



SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 2-1
Occurrences of Listed Vernal Pool Branchiopods
within 10 miles of the B.F. Sisk Dam Project Study Area

ESA

SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 2-2

Location of Potential Vernal Pool Branchiopod Habitat

ESA

SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 2-3

Location of Potential Vernal Pool Branchiopod Habitat

ESA

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 2-4

Seasonal Pools North of the DWR Maintenance Yard may Support Large Branchiopods; Algae Mats, Soil Cracking and Ostracod Shells are Present
Photo date: September 12, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 2-5

Detail of Pools North of the DWR Maintenance Yard, showing Algae Growth (Top); and Two Pools in the Vicinity (Bottom)
Photo date: September 12, 2018

CHAPTER 3
Valley Elderberry Longhorn Beetle

3.1 Summary of Findings

This chapter summarizes the findings of a focused site assessment that was performed by Environmental Science Associates biologists for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) within the study area. The purpose for the 2018 VELB survey was to identify potential VELB habitat that may be affected by proposed future actions in the study area.

The site assessment found 40 elderberry shrubs in the study area with stems greater than 1-inch diameter, principally located near the Basalt Quarry area. However, no evidence of VELB presence such as larval exit holes or adult beetles were observed on any of the generally poor-to-fair health elderberry shrubs. The VELB is considered to have a low potential to occur on inspected plants and a low to moderate potential to occur on approximately 5 to 10 inaccessible elderberry shrubs. These findings are summarized in **Table 3-1**, below.

TABLE 3-1

SUMMARY OF ELDERBERRY SHRUB FINDINGS

Stem Size	Total Number of Stems
1 to 3 inches Diameter	42
3 to 5 inches Diameter	63
> 5 inches Diameter	16
Total Stems with VELB Exit Holes	0
Shrubs Not Reviewed for Exit Holes	4 shrubs, numerous stems
Total Stems within Riparian Habitat	0

SOURCE: ESA

3.2 Species Account

Valley elderberry longhorn beetles are unique insects that spend most of their lives within the stems of elderberry (*Sambucus* spp.) trees and shrubs. Females lay their eggs within the bark, where larvae hatch and bore into the stems. Larvae remain within the stems for one to two years. In March, when the elderberries begin to flower, they pupate and emerge as adults. Mating usually occurs in June. Often, the only indicators of their presence are the distinctive small oval-shaped openings that are left after larvae pupate and emerge (U.C. Berkeley, 2005; USFWS, 2018).

Valley elderberry longhorn beetles utilize elderberry shrubs with a minimum stem diameter of at least 1 inch (at ground level) (USFWS, 2005). In the Central Valley, elderberry shrubs are fairly common in riparian forests and adjacent uplands (U.C. Berkeley, 2005). Elderberry shrubs are typically found growing in association with other riparian species, but they also occur as isolated shrubs in upland areas.

Western Merced County is within the described potential range of the VELB (USFWS, 1999), with one reported occurrence in the western portion of the county (CDFW, 2018). Critical habitat for VELB is designated along the American River in Sacramento County, more than 50 miles from the study area (USFWS, 2002). The nearest documented VELB occurrence to the study area is a 1987 collection of two adult beetles from North Fork Los Banos Creek, about 5.3 miles southeast of the Basalt Campground (CDFW, 2018). No other occurrences are reported within 20 miles of the study area.

3.3 Survey Methods

VELB habitat surveys were conducted from September 10 to 13, 2018 by ESA biologists Even Holmboe, Julie McNamara, K. Bayne, and B. Pittman. The survey focused on identifying elderberry shrubs within borrow and construction areas within the project study area shown in Figure 1-1. ESA biologists identified and inspected all elderberry shrubs and recorded the number of stems measuring at least a 1-inch in diameter at the base. Data collected for each shrub included the number of stems, diameter class, whether or not they had exit holes. No identified shrubs were located within riparian habitat, therefore, such information was not collected.

3.4 Survey Results

The survey focused on elderberry shrubs within the study area shown in Figure 1-1 and areas within 250 feet. The Basalt Quarry area contained the largest concentration of elderberry shrubs. A large mixed elderberry stand was identified northwest of Basalt Quarry, numbering greater than 25 shrubs. Shrub locations are shown in **Figures 3-1 and 3-2**. Data on stem size and the presence of valley elderberry longhorn beetle (VELB) activity (i.e., presence of exit holes) is shown in **Table 3-2**. No VELB activity was noted; however, due to the extremely dense structure within the largest identified mixed elderberry stand, perhaps five to ten shrubs could not be closely inspected to ascertain potential VELB activity.

In addition, a smaller elderberry stand was noted comprising nine shrubs (Figure 3-1a). Aside from these occurrences, elderberries are not present elsewhere in the study area. A single elderberry shrub was found several feet outside the study area, at the sewage holding ponds located 0.5-mile northeast of the Basalt Campground. The characteristics of identified shrubs are presented in Table 3-2.

TABLE 3-2

ELDERBERRY SHRUB CHARACTERISTICS

Shrub Number	Number of Stems by Size Class			Canopy Diameter in Feet	General Health	Presence of Exit Holes or other VELB Evidence
	1"-3"	3" to 5"	>5"			
1		4	2	15	Fair	None
2		2		8	Fair	None
3			3	14	Poor	None
4				12	Poor	None
5	1			4	Poor	None
6		9		14	Poor	None
7	4			10	Poor	None
8		1		5	Fair	None
9		2	2	12	Poor	None
10	4			8	Poor	None
11	5			8	Poor	None
12		2		8	Poor	None
13		1	2	10	Fair	None
14	1	1	1	10	Fair	None
15	1			6	Fair	None
16	1			6	Fair	None
17	2			6	Fair	None
18		3		5	Fair	None
19			1	5	Inaccessible	N/A
20		12 (estimated)	2	45	Inaccessible	N/A
21		10 (estimated)		20	Inaccessible	N/A
22			1	10	Inaccessible	N/A
23			1	10	Fair	N/A
24	2			8	Fair	None
25		2		8	Fair	None
26		1		5	Fair	None
27		2		6	Fair	None
28	3			7	Fair	None
29	2			10	Fair	None

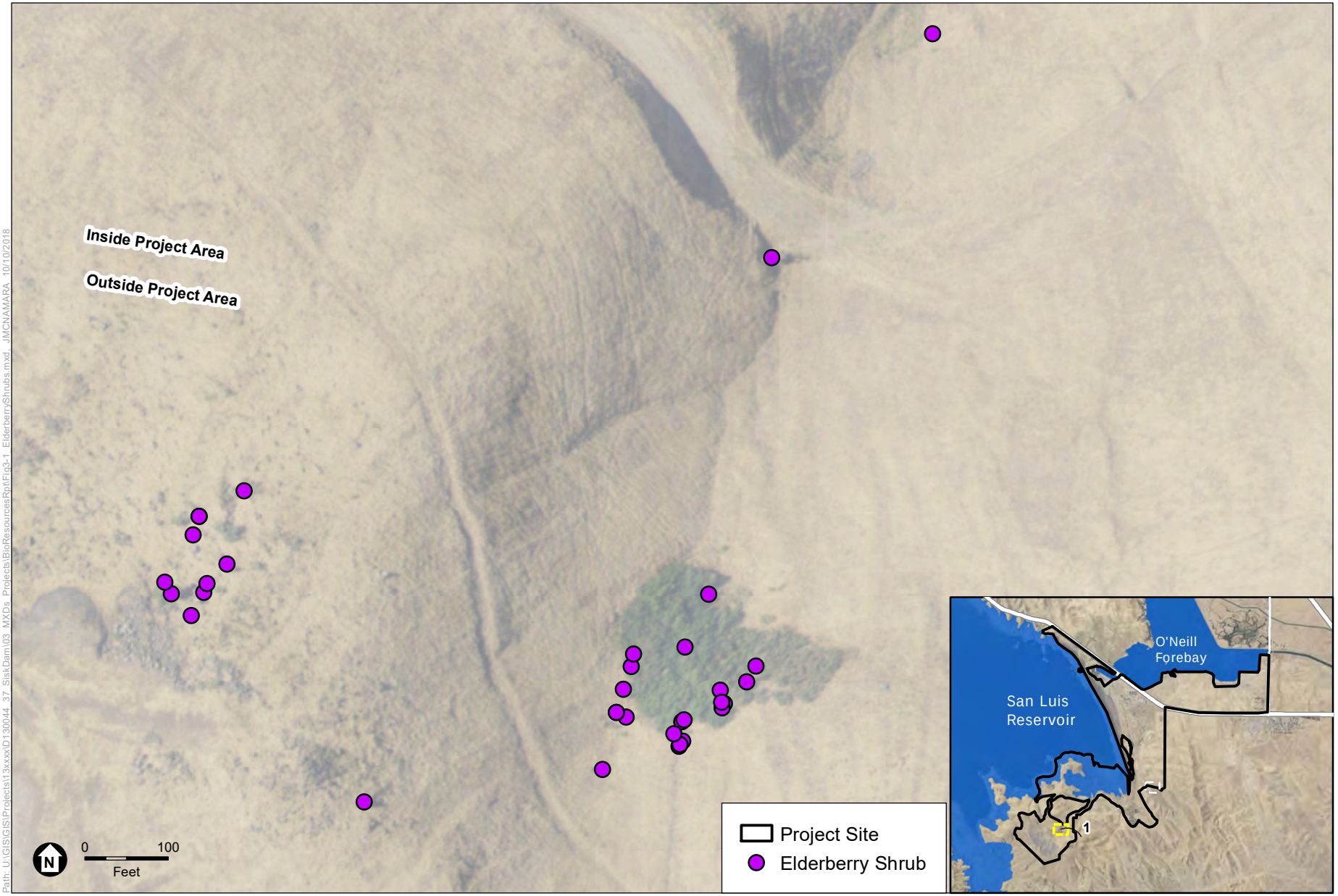
TABLE 3-2

ELDERBERRY SHRUB CHARACTERISTICS (CONTINUED)

Shrub Number	Number of Stems by Size Class			Canopy Diameter in Feet	General Health	Presence of Exit Holes or other VELB Evidence
	1"-3"	3" to 5"	>5"			
30	5	3		10	Fair	None
31	5	1		9	Fair	None
32	1			3	Poor	None
33	2			5	Poor	None
34	1	1		10	Fair	None
35		2		8	Fair	None
36	1			2	Poor	None
37			1	17	Poor	None
38			6	6	Poor	None
39	1		1	1	Poor	None

SOURCE: ESA

A single VELB occurrence is reported within 20 miles of the study area: a 1987 species collection from North Fork Los Banos Creek, about 5.3 miles southeast of the Basalt Campground (CDFW, 2018). Each of the elderberry shrubs observed during the assessment are growing on dry slopes and were considered to be in generally poor health conditions. Upon reviewing 39 elderberry plants, no VELB exit holes were observed on any of the inspected plants. An additional four shrubs were identified but could not be inspected due to access limitations. These shrubs could potentially support VELB. If VELB were present within identified elderberry shrub thickets, evidence of their presence would have been evident on the inspected plants. This species is considered to have a low potential to occur on inspected plants and a low to moderate potential to occur on inaccessible elderberry shrubs.

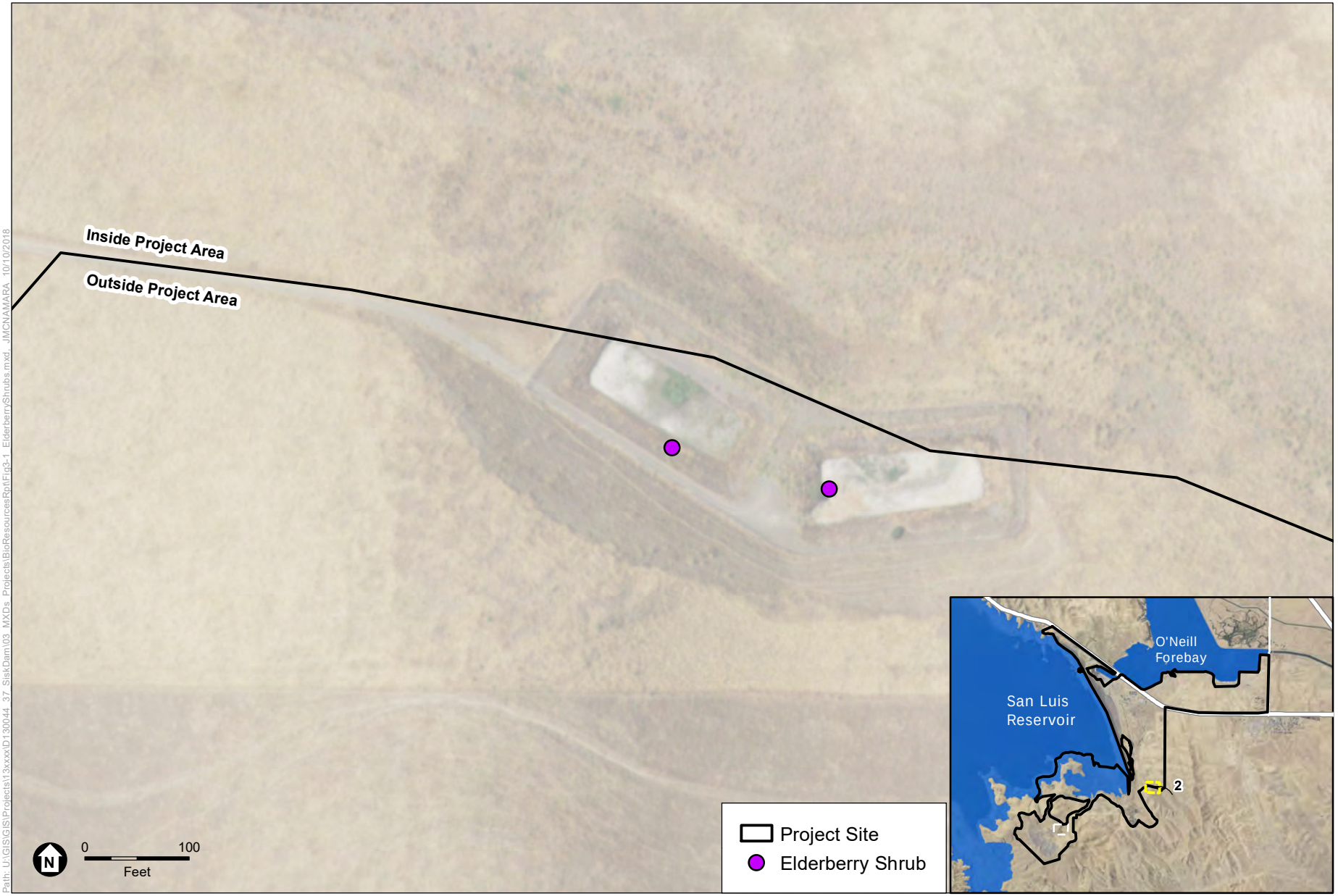


SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 3-1
Location of Elderberry Shrubs
in the B.F. Sisk Dam Project Study Area

ESA



SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 3-2
Location of Elderberry Shrubs
in the B.F. Sisk Dam Project Study Area

ESA

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 3-3

Individual and Clumped Elderberry Shrubs were Identified in Poor to Moderate Health near the Basalt Quarry Area

Photo date: September 13, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 3-4

Two Views of the Mixed Elderberry Thicket near the Basalt Quarry
Photo date: September 13, 2018

CHAPTER 4
California Tiger Salamander

4.1 Summary of Findings

A focused review was performed by ESA biologists within the study area to examine potential breeding habitat for the California tiger salamander (*Ambystoma californiense*). This review considered the sites described in a North State Resources, Inc. (NSR) (2010a) California tiger salamander site assessment, and additionally considered two off-site stock ponds in the regional vicinity. Potential California tiger salamander breeding habitat was identified in two locations in the study area, both near Basalt Quarry, and at two sites located to the south. The potential on-site breeding areas include Willow Spring stock pond located north of Basalt Quarry and a seasonal pool in the same general vicinity. Potential off-site aquatic breeding habitat was identified at three locations: a spring-fed stock pond located 0.8-mile southeast of Basalt Quarry (Off-site Pond #1); a seasonal impoundment approximately 0.6-mile south of Basalt Campground (Off-site Pond #2); and stock ponds located 0.3-mile and 1.2-miles west of Basalt Quarry (Off-site Ponds #3, and #4, respectively). The Willow Spring stock pond provides high quality breeding habitat for the California tiger salamander and is a possible source of adult tiger salamanders that have been anecdotally reported in the Basalt Use Area (U.S. Bureau of Reclamation and California Department of Parks and Recreation, 2005).

A full species account for the California tiger salamander was provided in NSR (2010a) and is not repeated in this report.

4.2 Survey Methods

California tiger salamander specialist B. Pittman, CWB, was the lead surveyor for the assessment, with assistance from species experts K. Bayne and E. Holmboe. Mr. Pittman holds a USFWS 10a(1)(A) recovery permit for California tiger salamander. Aquatic features in the study area were reviewed on by the above personnel on September 10 to 13, 2018, with assistance from wildlife biologist J. McNamara.

In advance of the survey, ESA biologists performed the following tasks:

- Review of aerial photographs on Google Earth from August 1998 through March 2018 to examine the ponding characteristics of aquatic sites and locations of perennial water.
- Examine the NSR (2010a) California tiger salamander site assessment report to locate prior survey areas, pond locations, and ascertain ponding conditions.

- A review of historical and recent California tiger salamander distribution records from the California Natural Diversity Database (CNDDB) (CDFW, 2018) and scientific literature (**Figure 4-1**).

Following this desktop review, a daytime field review was performed of select aquatic sites to examine their size, ponding characteristics, and seasonal hydrology. The day survey included direct review of aquatic sites using the methodology described in the 2003 *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or A Negative Finding of the California Tiger Salamander*, jointly issued by the USFWS and CDFW (USFWS, 2003). The habitat assessment prepared by NSR was relied upon for the descriptions of all habitat features in the study area; excepting two that that provide potential breeding habitat.

4.3 Survey Results

Two potential aquatic breeding sites for California tiger salamander were identified in the study area (**Figures 4-2 and 4-3**), and two such features were identified outside of the study area, southeast of the Basalt Quarry and Basalt Campground area (**Figure 4-4**; also see **Figure 5-4**). The first two sites are within B.F. Sisk Safety of Dams Modification Project area and the other two are within the typical movement range of the California tiger salamander. Three of the features directly reviewed, and the fourth off-site area is considered to provide potential breeding habitat based on a review of aerial photographs and review using binoculars from approximately 0.25-mile. These sites are further described in **Table 4-1**.

The California tiger salamander has not been verified within the Study Area; however, has been anecdotally described from the Basalt Use Area (U.S. Bureau of Reclamation and California Department of Parks and Recreation, 2005).

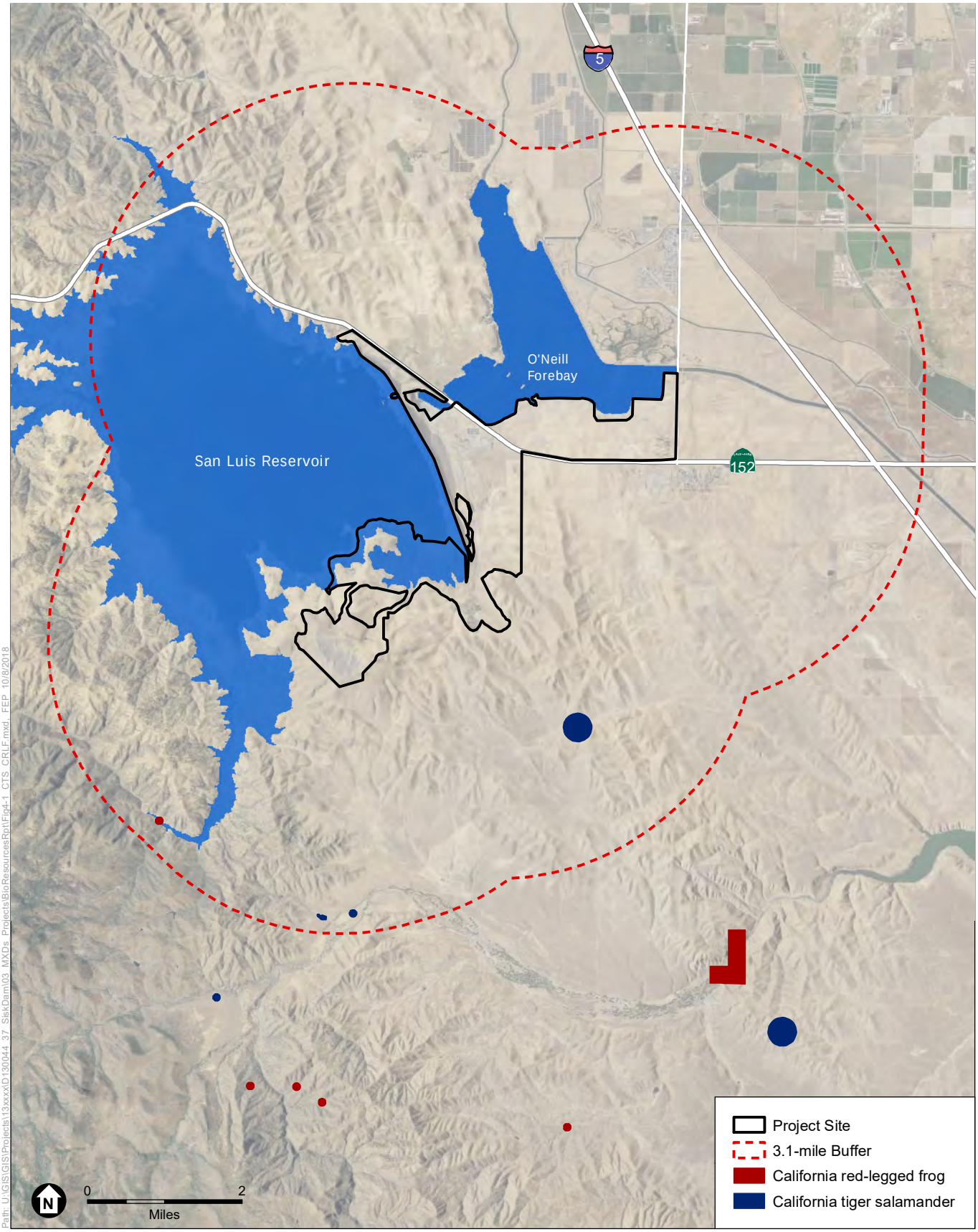
The California tiger salamander should be presumed to use Willow Spring pond, which additionally supports California red-legged frog breeding. In areas where the range of the California tiger salamander and California red-legged frog overlap, numerous accounts of sympatry are often reported from perennial and ephemeral ponds (Alvarez et al., 2013). California tiger salamanders should also be presumed to breed in each of the other three sites noted in this assessment, unless separate field surveys verify the absence of appropriate ponding conditions during a normal rainfall year. Based on resource agency guidance, this species has bene described in upland habitat up to 2 km (1.24 miles) from aquatic breeding sites under optimal movement conditions. Aside from the steep topography of the area, there are no barriers to California tiger salamander movement into or within the study area.

TABLE 4-1

POTENTIAL CALIFORNIA TIGER SALAMANDER BREEDING SITES

Pond Identification	Size	Habitat Conditions	Hydrology
Willow Spring Pond	0.17 acre	Spring-fed stock pond with dense cattails in the center surrounded by a broad ring of aquatic habitat. Duckweed seasonally provides cover within ponded areas. An extensive California ground squirrel colony is present upslope from the pond, providing hundreds of potential refuge burrows. California red-legged frog present at this site.	Perennial water; greater than 1.5 feet in numerous locations
Basalt Quarry Pond	0.04 acre	Seasonal impoundment perched on the hillside. Numerous small mammal burrows on the surrounding hillside. No emergent vegetation.	Seasonal pond that appears to have borderline hydrology to support the CTS aquatic life cycle. The upslope area is seasonally wet from natural seepage and may sustain suitable aquatic breeding conditions.
Off-site Pond #1; 0.8-mile Southeast of Basalt Quarry	0.15 acre	Seasonal impoundment perched on the hillside. Numerous ground squirrel burrows on the surrounding hillside. Feature is fed by an upslope spring that lengthens the duration of ponding. No emergent vegetation Subject to cattle grazing. Also considered potential for California red-legged frog.	Seasonal pond that retains water into summer months. An upslope seep provides shallow year-round pooled water in cattle hoof depressions.
Off-site Pond #2; 0.6-mile south of Basalt Campground	0.18 acre	Seasonal impoundment that could not be reached for surveys, but appears to provide appropriate conditions of breeding. No emergent vegetation; grazed.	Seasonal pond that retains water into summer months.
Off-site Pond #3; 0.3-mile west of Basalt Quarry	0.08 acre	Seasonal impoundment that could not be reached for surveys, but appears to provide appropriate conditions of breeding. No emergent vegetation; grazed.	Seasonal pond that retains water into summer months.
Off-site Pond #4; 1.2-miles west of Basalt Quarry	0.50 acre	Perennial impoundment that could not be reached for surveys, but appears to provide appropriate conditions of breeding. Extensive cattail growth; grazed.	Perennial water

Source: ESA

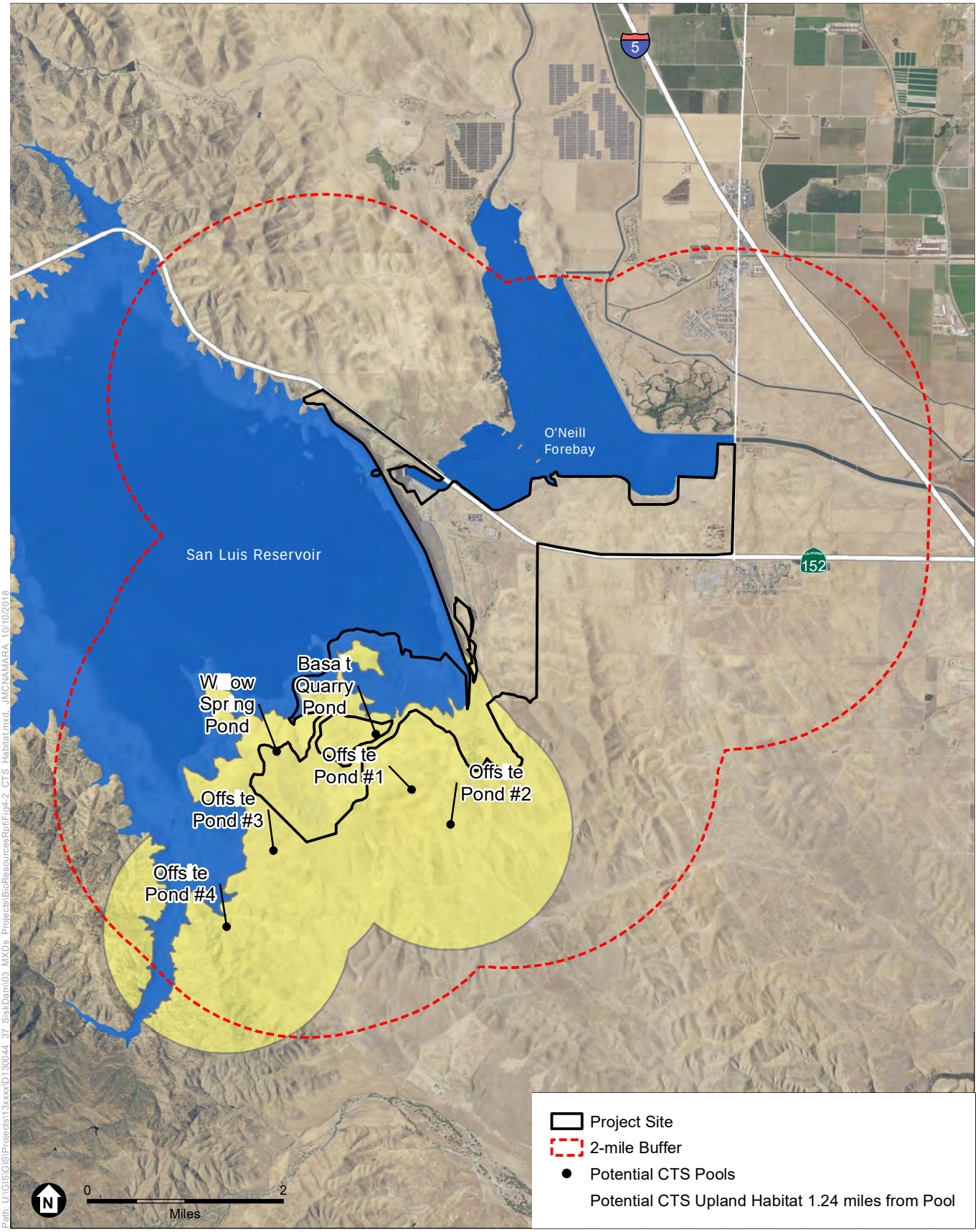


SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 4-1
Occurrences of California Tiger Salamander and California Red-legged Frog within 3.1 miles (5 km) of the B.F. Sisk Dam Project Area

ESA



SOURCE: USDA, 2016; CDFW, 2018; USFS, 2017; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 4-2
Location of Potential California Tiger Salamander Habitat
within 2 miles of the B.F. Sisk Dam Study Area

ESA

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 4-3

Potential California Tiger Salamander Breeding Habitat at Willow Spring Pond (top) and "Basalt Quarry Pond" (bottom)
Photo date: September 13, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 4-4

Potential California Tiger Salamander Breeding Pools at Off-site Pond #1, 0.8-mile Southeast of Basalt Quarry (top) and Off-site Pond #2, 0.6-mile South of Basalt Campground (bottom). Photo date: September 13, 2018

CHAPTER 5
California Red-legged Frog

5.1 Summary of Findings

A focused review was performed by ESA biologists within the study area to examine perennial aquatic sites as potential California red-legged frog (*Rana draytonii*) habitat. This review considered the sites described in a North State Resources, Inc. (NSR) (2010b) California red-legged frog habitat assessment, and additionally considered one off-site stock pond in the regional vicinity. During non-protocol day and night spotlighting surveys, a California red-legged frog population was detected in the study area at the Willow Spring pond located north of Basalt Quarry. Potential high quality aquatic breeding habitat was also identified in a spring-fed stock pond, Off-site Pond #1 located 0.63-mile northeast of the Basalt Hill summit, and Off-site Pond #3 located 0.3-mile west of Basalt Quarry. The survey confirmed NSR (2010b) findings that California red-legged frogs are unlikely to be encountered in other aquatic habitat within the study area such as below the dam or at the Medeiros Use Area. Aquatic habitat associated with Domengine Spring, near Basalt Campground, was also surveyed and is considered unlikely to support this species. A full species account for the California red-legged frog was provided in NSR (2010b) and is not repeated in this report.

5.2 Survey Methods

California red-legged frog specialists K. Bayne and B. Pittman, CWB, were the lead surveyors for the assessment. Ms. Bayne and Mr. Pittman each hold USFWS 10a(1)(A) recovery permits for California red-legged frog. Focused day and nighttime surveys of aquatic features in the study area were performed by B. Pittman, K. Bayne, J. McNamara, and E. Holmboe from September 10 to 13, 2018.

In advance of the survey, ESA biologists performed the following tasks:

- Review of aerial photographs on Google Earth from August 1998 through March 2018 to examine the ponding characteristics of aquatic sites and locations of perennial water.
- Examine the 2010 NSR habitat assessment report to locate prior survey areas, pond locations, and ascertain ponding conditions.
- A review of historical and recent California red-legged frog distribution records from the California Natural Diversity Database (CNDDB) (CDFW, 2018) and scientific literature.

Following this desktop review, day and nighttime field surveys were performed at select aquatic sites. The day survey included direct review of upland and aquatic habitat at perennial aquatic

sites to verify on-site aquatic habitat and survey for amphibian populations. Surveyors used the visual-encounter survey method, as described in the USFWS (2005) survey protocol. This method entails walking the survey area while repeatedly scanning and listening for amphibians.

Day surveys were conducted on September 10-13, 2018 between 9 am and 5 pm. Night surveys were conducted at two locations on September 13, 2018 between 2040 hours to 2200 hours. Surveys were performed under optimal visibility and weather conditions, under dry, calm and relatively warm conditions. Wind speed was generally under 2 to 3 mph and the air temperature ranged from 70 to 75 degrees Fahrenheit. All encountered amphibians were identified with 100 percent certainty. During night surveys, each surveyor used a 230-lumen Nite Lite Wizard II LED headlamp (a 6-volt, a Service-approved light for California red-legged frog surveys) and 10x42 binoculars.

5.3 Survey Results

The CNDDB reports the nearest California red-legged frog as approximately 6 miles to the east and 5 miles to the south of the study area. In addition, the NSR (2010b) habitat assessment concluded no potential for species occurrence in the study area. Perennial water seepage drains below B.F. Sisk Dam were reviewed for their potential to provide California red-legged frog habitat. Aquatic habitat is present in some features, as noted in the NSR (2010b) report; however, these perennial aquatic sites are either small, provide no cover for frogs, or are isolated and not considered accessible to red-legged frogs.

Based on the desktop review and daytime review of field sites, nighttime surveys were performed at two high quality perennial aquatic sites: Willow Spring and Domengine Spring. A California red-legged frog breeding population was identified during surveys at the Willow Spring stock pond (37.02791N, -121.10020W) (**Figures 5-1, 5-2, and 5-3**). One adult and eight subadult California red-legged frogs were identified in the pond during the night survey. Details for this occurrence are provided in the CNDDB reporting form in **Appendix A**.

In addition, potential habitat for this species was identified during daytime surveys in a spring-fed stock pond located approximately 0.63-mile northwest of the Basalt Hill summit (see Figures 5-1 and 5-3). This seasonal pond is fed by a perennial spring. It is believed that the pond may serve as a suitable California red-legged frog breeding site, drying by mid-summer. The adjacent spring provides year-round non-breeding aquatic habitat that, in combination with the pond and regionally-occurring California red-legged frog populations, could support a breeding population. This pond is located outside of the B.F. Sisk Safety of Dams Modification Project area, on grazing land owned by Reclamation.

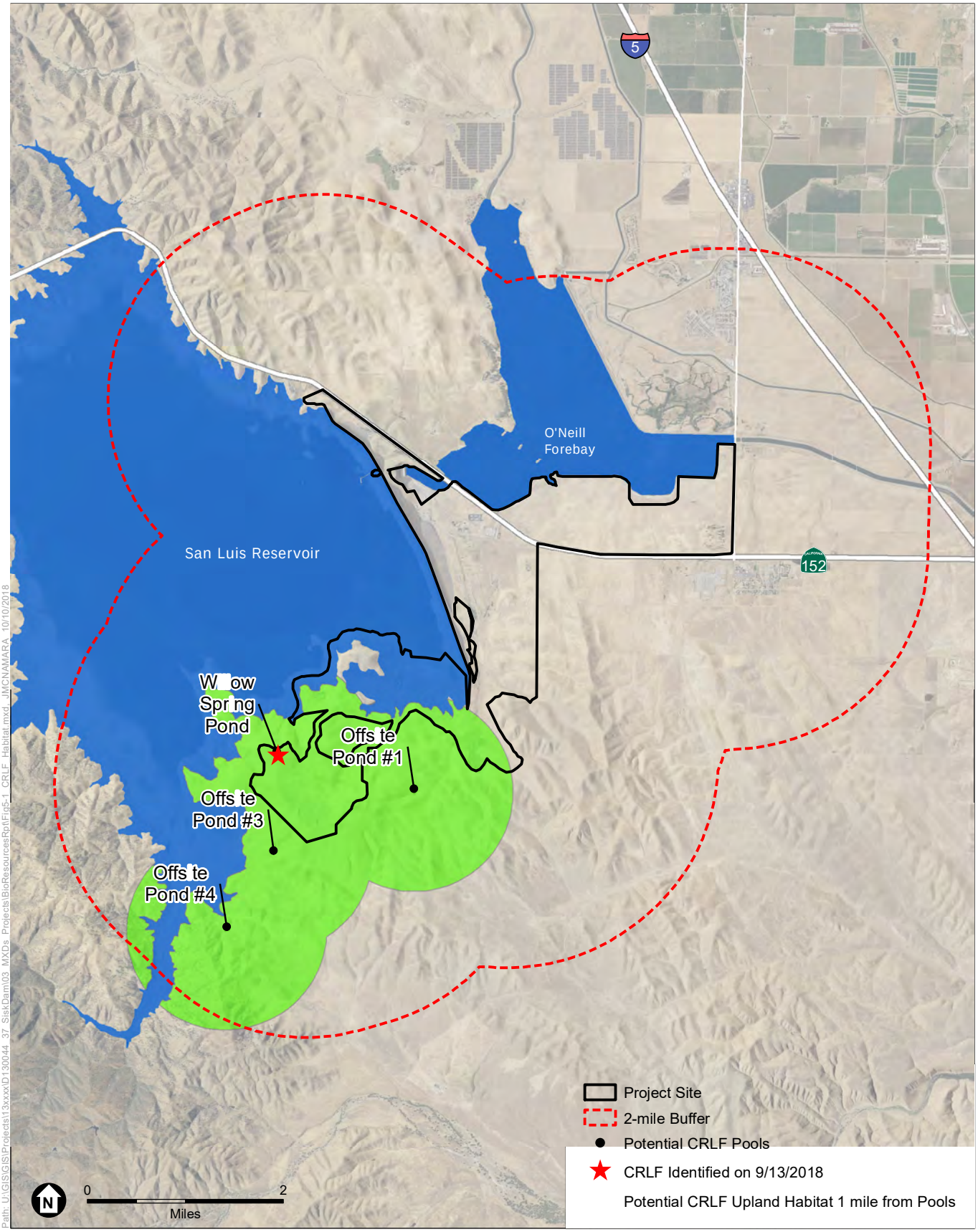
TABLE 5-1

POTENTIAL CALIFORNIA RED-LEGGED FROG BREEDING SITES

Pond Identification	Size	Habitat Conditions	Hydrology
Willow Spring Pond	0.17 acre	Spring-fed stock pond with dense cattails in the center surrounded by a broad ring of aquatic habitat. California red-legged frog present at this site.	Perennial water; greater than 1.5 feet in numerous locations
Off-site Pond #1; 0.8-mile Southeast of Basalt Quarry	0.15 acre	Seasonal impoundment perched on the hillside. Numerous ground squirrel burrows on the surrounding hillside. Feature is fed by an upslope spring that lengthens the duration of ponding. No emergent vegetation Subject to cattle grazing. Also considered potential for California tiger salamander.	Seasonal pond that retains water into summer months. An upslope seep provides shallow year-round pooled water in cattle hoof depressions.
Off-site Pond #3; 0.3-mile west of Basalt Quarry	0.08 acre	Seasonal impoundment that could not be reached for surveys, but appears to provide appropriate conditions for breeding. No emergent vegetation; grazed.	Seasonal pond that retains water into summer months.
Off-site Pond #4; 1.2-miles west of Basalt Quarry	0.50 acre	Perennial impoundment that could not be reached for surveys, but appears to provide appropriate conditions of breeding. Extensive cattail growth; grazed. High likelihood of species' presence.	Perennial water; depth unknown

Source: ESA

Based on survey findings, the California red-legged frog may be encountered in select aquatic sites and surrounding upland habitat near Basalt Quarry, south of the reservoir. This species could potentially enter active work areas both from the Willow Spring pond to the north of the work area, or from Off-site Pond #1 or Pond #3 to the south and west of the study area (if present at these locations). Hence, precautions are warranted to avoid impacts to this species.



SOURCE: USDA, 2016; CDFW, 2018; USFS, 2017; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 5-1
Location of Known and Potential California Red-legged Frog Habitat within 2 miles of the B.F. Sisk Dam Study Area

ESA

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 5-2

Surveyed Habitat in the Study Area included Two Spring-fed Drainages: Domengine Spring near Basalt Campground (top) and Willow Spring Pond (bottom). Photo date: September 12, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 5-3

A Breeding Population of California Red-legged Frogs was Detected at the Willow Spring Pond. Photos show an Adult Frog (top) and Subadult Frog (bottom). Photo date: September 13, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 5-4

Two Views of Potential CRLF Habitat in a Spring-fed Off-site Pond #1, 0.63-mile Northwest of the Basalt Hill Summit. Top Photo Shows Perennial Standing Water. Photo date: September 13, 2018

CHAPTER 6
Burrowing Owl and Swainson's Hawk

6.1 Summary of Findings

This chapter presents the results of a habitat assessment for burrowing owl (*Athene cunicularia*) and Swainson's hawk (*Buteo swainsoni*) within the study area defined in Chapter 1. The purpose of the habitat assessment is to identify active and potential burrowing owl and Swainson's hawk foraging and nesting habitat.

To summarize survey findings, no burrowing owls, active burrows, or burrowing owl sign was identified in the study area. In addition, State Parks employees do not report any recent burrowing owl sightings in the study area. Low annual grassland habitat with extensive ground squirrel burrows occurs throughout the area below the dam and provides high quality nesting and foraging habitat for this species. Annual grasslands near the Medeiros Use Area and throughout the study area provide intermittent, high quality habitat for this species.

No Swainson's hawks were observed during surveys, possibly due to the late, post-migration survey timing. The CNDDB reports recent nesting in two trees stands in the Medeiros Use Area grassland area and trees near Basalt Campground. Individual tree and tree stands in the Medeiros Use Area and similar habitat west of SR 152 provide suitable foraging habitat for Swainson's hawk.

6.2 Species Accounts

Burrowing Owl

Western burrowing owls are relatively small, semicolonial owls, and are mostly residents of open dry grasslands and desert areas. These owls use burrows excavated by ground squirrels and other small mammals during the breeding and non-breeding season. In areas where the number and availability of natural burrows is limited, owls may occupy human-made burrows such as drainage culverts, cavities under piles of rubble, discarded pipe, and other tunnel-like structures (Zeiner et al., 1990a). Burrowing owls hunt from perches and are opportunistic feeders. They consume arthropods, small mammals (e.g., meadow voles), birds, amphibians, and reptiles. Insects are often taken during the day, while small mammals are taken at night (Zeiner et al., 1990a).

The CNDDB (2018) confirms a local burrowing owl record from 2003, with two wintering owls observed about one mile southeast of the California Department of Forestry and Fire Protection (CAL FIRE) station, near the intersection of Basalt Road and Gonzaga Road. Twelve additional occurrences are reported by the CNDDB within 10 miles of the study area (**Figure 6-1**). Burrowing owl nesting has not been observed or reported in the study area.

Swainson's Hawk

This large migratory hawk nests throughout North America and winters in southern South America. Swainson's hawks begin arriving in California in late February and depart for their wintering grounds in early September (Woodbridge, 1998). Nests are typically constructed in sturdy trees within or near agricultural lands, riparian corridors, and roadside trees. Nests are composed of a platform of sticks, bark, and fresh leaves. Swainson's hawks reside in the Central Valley from March through October, with eggs typically laid in April and early May (peaking in late April).

The Swainson's hawk nesting range is restricted to portions of the Central Valley and Great Basin regions, where suitable habitat is still present. The highest density currently is in the Central Valley, between Sacramento and Modesto, and in the northern San Joaquin Valley (Woodbridge, 2004).

The CNDDB reports Swainson's hawk nesting in the study area, with three active nest sites reported in 2006 including two in Medeiros Use Area grasslands and one at Basalt Campground. Additionally, numerous Swainson's hawk nesting attempts are reported at the O'Neill Forebay Wildlife Area managed by CDFW from 2001 top 2015 (CDFW, 2018).

6.3 Survey Methods

The burrowing owl survey and habitat assessment was performed from September 10 to 13, 2018 by ESA biologists E. Holmboe, K. Bayne, and B. Pittman, with assistance from J. McNamara. The lead surveyors each have more than a 15 years of focused burrowing owl and Swainson's hawk survey experience.

In advance of the survey, ESA biologists performed the following tasks:

- A review of aerial photographs on Google Earth from August 1998 through March 2018 to examine nesting areas and review off-site nesting areas.

- An inventory of historical and recent burrowing owl and Swainson's hawk occurrence records from the California Natural Diversity Database (CNDDB) (CDFW, 2018) and scientific literature (**Figure 6-1**).

The burrowing owl assessment followed the survey guidelines described in the California Department of Fish and Wildlife (CDFW) Staff Report on Burrowing Owl Mitigation (herein referred to CDFW Staff Report) (CDFW, 2012). The description of habitat conditions in the study area includes an assessment of the presence and extent of potential burrowing owl nesting habitat (burrows) and foraging habitat (annual grasslands). The work completed and described in this report fulfills the Habitat Assessment and Reporting criteria as described in the CDFW Staff Report (CDFW, 2012).

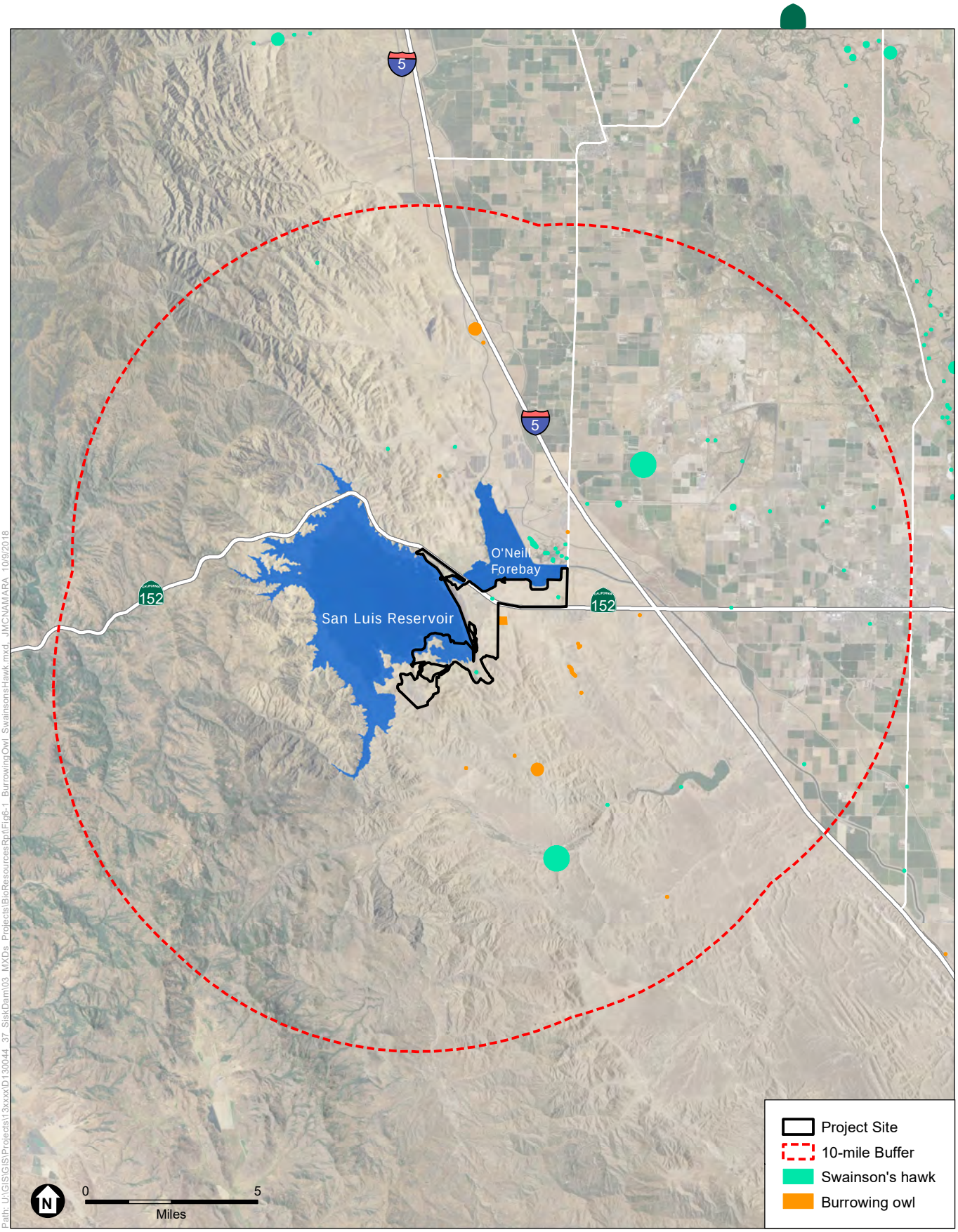
The Swainson's hawk habitat assessment was performed outside of CDFW's recommended survey period for this species, which generally runs from April 1 through July 15 (CDFW, 2010). Birds were likely Hence, a survey for individual birds could not be performed. Surveyors reviewed individual trees and tree groves for evidence of nesting and recorded

evidence of nesting great homed owls, red-tailed hawks, red-shouldered hawks and other potentially competitive species.

6.4 Survey Results

Potential burrowing owl nesting and foraging habitat was identified in grasslands throughout the study area; however, no evidence of burrowing owl presence was noted during transect surveys within the highest quality habitat areas. Based on the field review, the distribution of potential burrowing owl nesting habitat is shown in **Figure 6-2**.

While Swainson's hawk nesting was not observed in the study area, eucalyptus, cottonwoods and other trees provide potential nesting habitat. Grasslands throughout the study area provide potential foraging habitat. The distribution of potential Swainson's hawk nesting and foraging habitat is also shown in Figure 6-2.

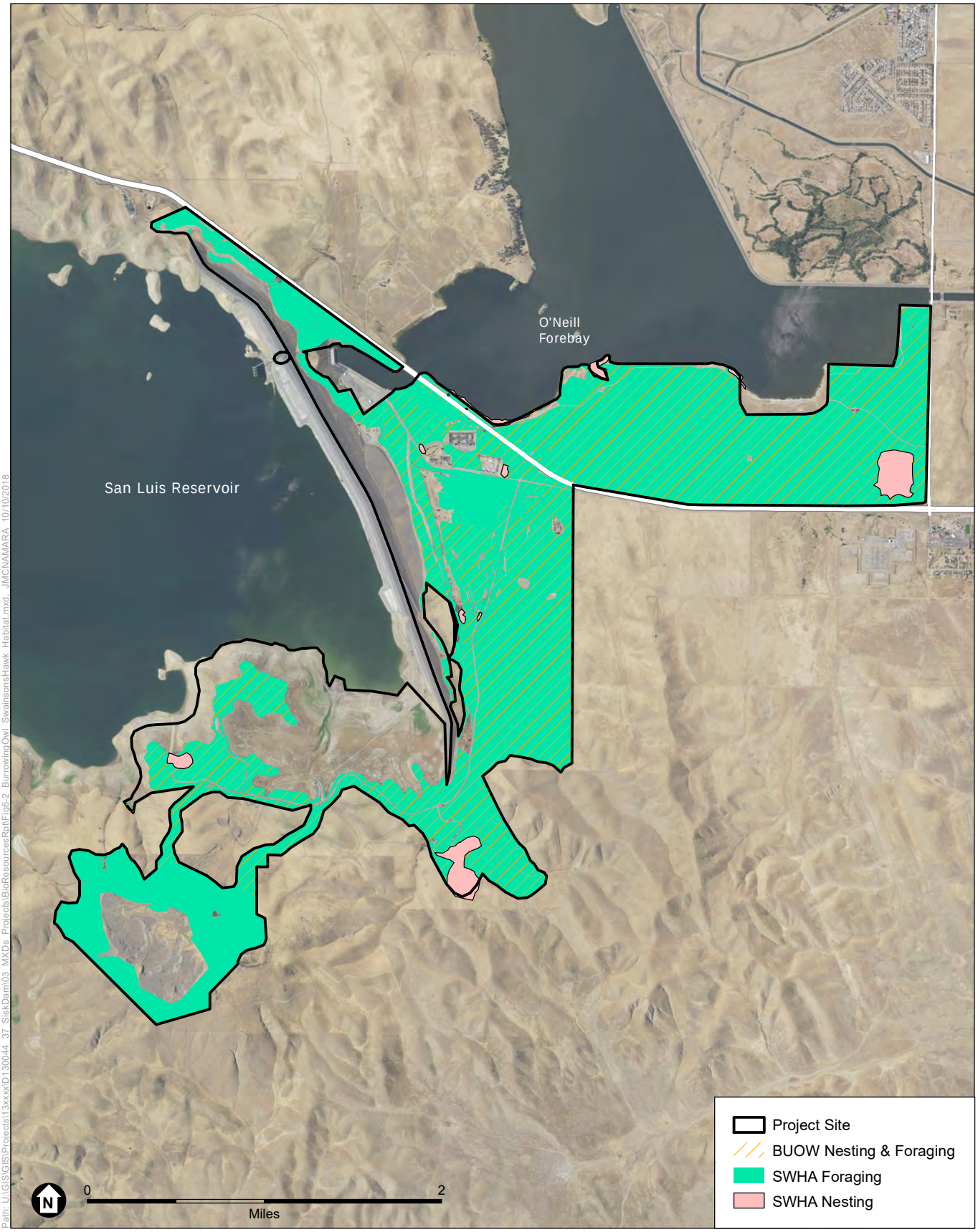


SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 6-1
Occurrences of Burrowing owl and Swainson's Hawk within 10 miles of the B.F. Sisk Dam Project Study Area

ESA



SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 6-2
Location of Potential Burrowing Owl and Swainson's Hawk Habitat in the B.F. Sisk Dam Project Study Area

ESA

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 6-3

Much of the Study Area Supports Annual Grasslands that are Suitable for Burrowing Owl Nesting; seen from atop B.F. Sisk Dam looking toward O'Neill Forebay (top) and in Greater Detail (bottom). Photo date: September 12, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 6-4

Grasslands in the Medeiros Use Area are Suitable for Burrowing Owl Nesting. The CNDDB Reports Recent Swainson's Hawk Nesting in the Eucalyptus Grove in this Area. Photo date: September 12, 2018

CHAPTER 7
American Badger and San Joaquin Kit Fox

7.1 Summary of Findings

Spotlighting surveys were conducted on four consecutive nights in September 2018, totaling 10 survey hours within the study area (2.5 hours each). Surveys resulted in the identification of 94 animals in the study area comprising 10 identified species, and one unidentified canid that was observed at a great distance. San Joaquin kit were not observed during the spotlighting survey. An American badger was detected during spotlighting surveys near the intersection of Basalt Road and Gonzaga Road.

Neither American badger nor San Joaquin kit fox were identified at 12 camera scent stations that were established throughout the study area.

7.2 Species Accounts

American Badger

American badgers are rather large, robust, short-legged mammals with broad bodies. They have a short bushy tail, small eyes and ears, shaggy grayish fur, and distinct white and black markings on the face. Badger front feet are large, with claws measuring about 1-inch long that are used for digging. Badgers prey primarily on gophers, ground squirrels, marmots, and kangaroo rats, but will also eat a variety of other animals, including mice, woodrats, reptiles, birds and their eggs, bees and other insects. In California, American badgers occupy a diversity of habitats. Grasslands, savannas, and mountain meadows near the timberline are preferred, though they can be found in deserts as well. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground.

In California, badgers range throughout the state, except for the humid coastal forests of northwestern California in Del Norte County and the northwestern portion of Humboldt County (Williams, 1986).

This species is expected to occur in moderate densities in grassland habitats throughout the study area, with individuals observed during the survey below the dam, and anecdotally reported by State Parks staff in the Basalt Day Use area, north of Basalt Quarry.

San Joaquin Kit Fox

The San Joaquin kit fox is a permanent resident of arid grasslands and open scrubland, where friable soils are present. Dens are required year-round for reproduction, shelter, temperature regulation, and protection from predators (USFWS, 1998). Historically their habitat included native alkali

marsh and saltbush scrub of the valley floor, but the availability of such habitats has diminished markedly due to agricultural conversion. Grasslands with friable soils are considered the principal habitat for denning, foraging, and dispersal, while open woodland areas and agricultural lands provide foraging and dispersal habitat. Kit foxes will use habitats that have been extensively modified by humans, including grasslands and scrublands with active oil fields, wind turbine fields, and agricultural matrices (USFWS, 1998).

San Joaquin kit fox diet characteristics vary subtly in the northern portion of their range from other portions of their range. In the Altamont region, the kit fox diet varies seasonally and by locality based on local prey availability. While kangaroo rats (*Dipodomys* spp.) are an important component of the kit fox diet in their southern range, kit foxes in the Altamont region preferentially prey upon California ground squirrel, insects, cottontails (*Sylvilagus auduboni*), black-tail jackrabbits (*Lepus californicus*), and small rodents such as voles, rats and mice (Hall, 1983; Orloff et al., 1986). Other prey that may be taken opportunistically includes ground-nesting birds, reptiles, and insects (Laughlin, 1970).

San Joaquin kit foxes occur only in and around the Central Valley, inhabiting open habitat in the San Joaquin Valley and surrounding foothills. Kit fox population densities are greatest in the southern portion of their range. Kit fox populations in the northern portion of their range are highly fragmented and sparsely distributed, where foxes occupy foothill grasslands because much of their former habitat on the valley floor has been eliminated.

At least 24 San Joaquin kit fox sightings area reported within 10 miles of the study area (CDFW, 2018), including multi-year observations of numerous individuals. Within 0.75 to 5.5 miles to the south of the study area, a single CNDDB occurrence includes sightings of 185 individuals between 1984 to 2005 (**Figure 7-1**). The next nearest sighting to the south describes 291 individuals observed from 1972 to 2003 (CDFW, 2018). Most of the recently documented kit fox sightings are pre-2005, and occur south and southeast of the study area, with scattered occurrences to the northeast (Figure 7-1).

7.3 Survey Methods

A detailed San Joaquin Kit Fox Evaluation report prepared by North State Resources (2010c) characterized the quality and distribution of potential habitat for his species in the study area, and the location of spotlighting activities in the regional area. The habitat characterization describes present-day conditions within the study area and surrounding region. The present non-protocol survey and site assessment was performed to identify the potential presence of large carnivores, including San Joaquin kit fox and American badger, through spotlighting surveys and the placement of camera scent stations.

Spotlighting Surveys. Spotlighting surveys were conducted each night between Monday, September 10 and Thursday, September 13 following the following the CDFW Region 4 Approved Survey Methodologies for Sensitive Species (1990). Surveys began each night between 1930 hours and 2000 hours and continued for 2 to 3 hours. Weather conditions during the surveys were optimal, with wind speed generally under 2 to 3 mph and air temperature ranging from 70 to

75 degrees Fahrenheit. The moon phase was new moon on September 10, and waxing crescent for other survey days.

One team of two to four biologists conducted the surveys. Survey personnel are identified in Table 7-1. Surveys were performed from paved and dirt roads within the study area, with the vehicle survey routes shown in **Figure 7-2**. A high-clearance vehicle was used to ensure unobstructed views of the surrounding areas. Surveyors used two high-output (1,000,000-candlepower) spotlight per vehicle. Survey routes were driven at speeds under 10 miles per hour.

TABLE 7-1

SPOTLIGHTING PERSONNEL

Survey Date	Lead Biologists	Assistant
September 10, 2018	Brian Pittman	Julie McNamara
September 11, 2018	Brian Pittman	Julie McNamara
September 12, 2018	Brian Pittman Even Holmboe Kelly Bayne	Julie McNamara
September 13, 2018	Brian Pittman Even Holmboe Kelly Bayne	Julie McNamara

Wildlife species that were identified during surveys were identified using 10x42 power binoculars, and their locations were generally recorded on data sheets. All wildlife observations were confirmed by multiple observers.

Camera Stations. Camera stations were established at twelve locations situated throughout the study area (Figure 7-2). The 1999 USFWS survey protocol recommends using a minimum density of 8 cameras per 640 acres. Due to the large size of the study area, cameras could not be placed at the recommended number. Hence, the survey was intended to be informational in nature and not intended as a presence-absence survey. Cameras were operated for four nights, with four cameras relocated during the survey to coincide with small mammal activity identified during spotlighting surveys.

Each camera station consisted of four Cabela's Outfitter 14MP infrared trail cameras and four Wildgame Innovations 14MP infrared trail cameras. Each camera was mounted to a wooden stake and baited with cat foot. Cameras were set up to high resolution and moderate sensitivity, with a series of three photos taken for each trigger event. The camera delay was set to 1 minute between successive trigger events. The date and time of each photograph was digitally stamped on the photograph.

7.3 Survey Results

Spotlighting Surveys. Spotlighting surveys were conducted on four consecutive nights in September 2018, totaling 10 survey hours within the study area (2.5 hours each). Surveys resulted in the identification of 94 animals in the study area comprising 10 identified species, and one unidentified canid that was observed at a great distance (**Table 7-2**). San Joaquin kit were not observed during the spotlighting survey. An American badger was detected during spotlighting surveys near the intersection of Basalt Road and Gonzaga Road. Details for this occurrence are provided in the CNDDB reporting form in **Appendix A**.

No other special-status wildlife species were observed during spotlighting surveys.

Tule elk (*Cervus canadensis nannodes*) were the most abundant mammal observed during surveys, followed by black-tailed jack rabbit (*Lepus californicus*) and Audubon's cottontail (*Sylvilagus audubonii*). Adult and juvenile coyote (*Canis latrans*) were noted during surveys south and west of SR 152; though this species was not identified in Medeiros Use Area grasslands.

One small canid was observed in the western portion of the Medeiros Use Area grasslands, but was observed from a distance (greater than 0.25-miles) and could not be confirmed to species. Due to the animal's distance from the observation point, only the eye shine and faint outline were observed. But its small size and gait were suggestive of a fox species and not a coyote.

Camera Stations. A total of 32 camera station nights were deployed during the survey effort comprised of eight cameras over the course of 4 nights. All eight cameras were set up on September 10, 2018 and operated for three days. Following the identification of an unidentified canid species during spotlighting surveys in the Medeiros Use Area, four cameras were subsequently moved to areas where small mammal activity was noted.

Cameras were set up on September 10 and taken down on September 14, 2018. During this period, camera stations detected common raven, raccoon, black-tailed jackrabbit, California ground squirrel, domestic cat, striped skunk, black-tailed deer, and small birds, as shown in **Table 7-3** and **Figures 7-3, 7-4, 7-5, and 7-6**. Neither San Joaquin kit fox nor American badger were observed during camera surveys.

TABLE 7-2

WILDLIFE OBSERVATIONS DURING SPOTLIGHTING SURVEYS

Species Name	Sept. 10	Sept. 11	Sept. 12	Sept. 13	Total # Observations
American badger *Taxidea taxus*	0	0	0	1	1
Tule elk *Cervus canadensis nannodes*	10+	10+	10+	10+	40+
Black-tailed jack rabbit *Lepus californicus*	10+	10+	1	10+	30+
Barn owl *Tyto alba*	1	1	1	1	4
Great horned owl *Bubo virginianus*	2	0	0	0	2
Coyote *Canis latrans*	4	1	0	1	6
Audubon's cottontail *Sylvilagus audubonii*	10+	0	1	1	12+
Black-tailed deer *Odocoileus hemionus*	0	2	0	4	6
Raccoon *Procyon lotor*	1	0	0	0	1
Domestic cat *Felis catus*	0	0	1	0	1
Unknown canid[a]	0	0	1	0	1

[a] The unidentified canid was observed in western portion of the Medeiros Use Area on September 12, 2018. Two trail cameras were subsequently deployed to this area, but species identification could not be confirmed.

Source: ESA

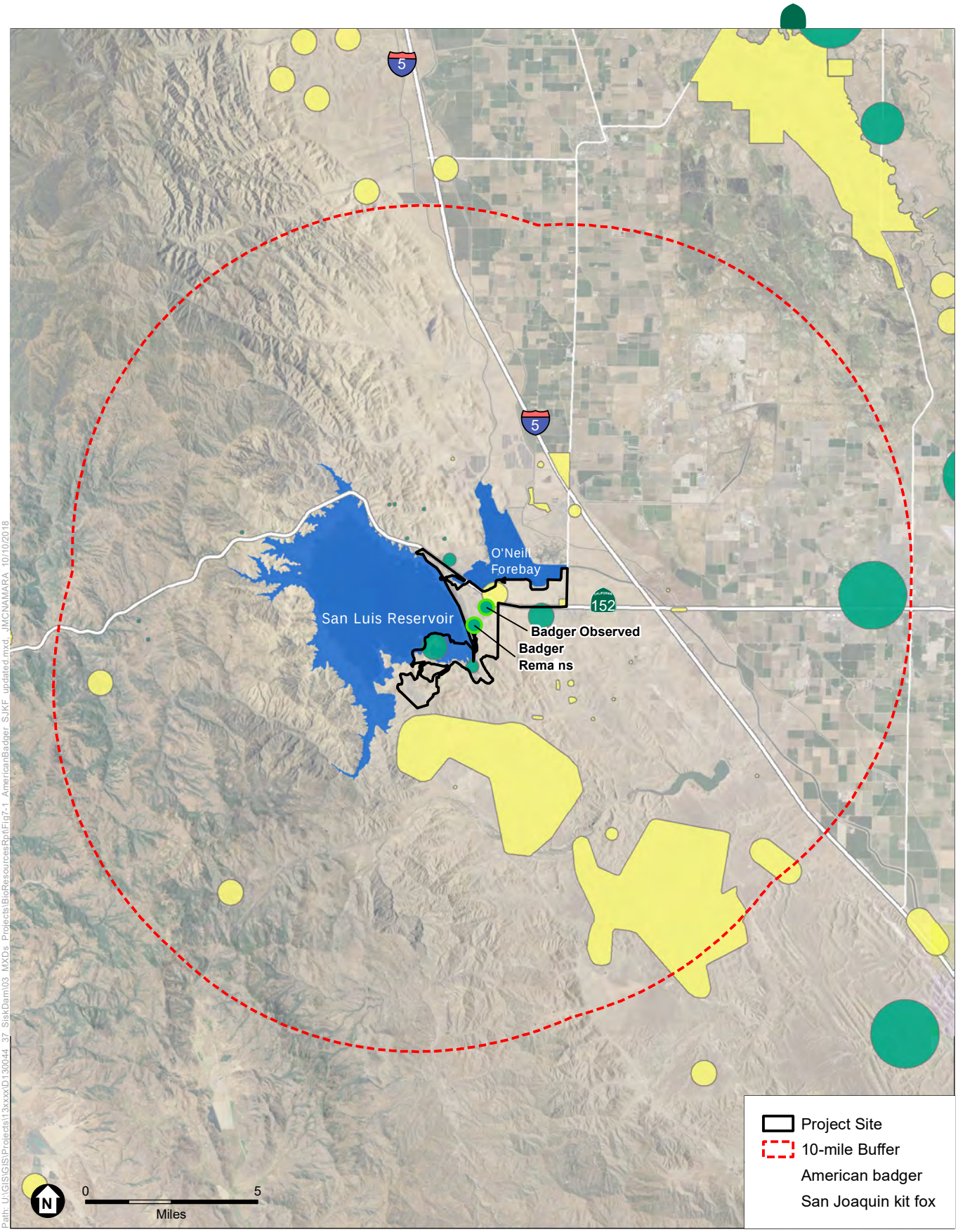
TABLE 7-3

SUMMARY OF WILDLIFE OBSERVATIONS DURING SPOTLIGHTING SURVEYS

Camera Station	Survey Dates	Number of Survey Days	Results
1	Sept. 10-14	4	Common raven, raccoon
2	Sept. 10-13	3	Black-tailed jackrabbit, red-tailed hawk, common raven, California ground squirrel, western meadowlark, small rodents
3	Sept. 10-14	4	Raccoon, striped skunk, domestic cat, coyote
4	Sept. 10-14	3	Black-tailed deer, meadowlark, violet-green swallow, loggerhead shrike
5	Sept. 10-13	3	No observations
6	Sept. 10-13	3	No observations
7	Sept. 10-14	4	No observations
8	Sept. 10-14	4	No observations
9	Sept. 13-14	1	No observations
10	Sept. 13-14	1	No observations
11	Sept. 13-14	1	No observations
12	Sept. 13-14	1	No observations

[a] The unidentified canid was observed in western portion of the O'Neill Forebay grasslands

Source: ESA



SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 7-1
Occurrences of American Badger and San Joaquin Kit Fox
within 10 miles of the B.F. Sisk Dam Project Study Area

ESA

SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 7-2
Location of Camera Stations and Spotlighting Survey Routes

ESA

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 7-3

One Station Examined Wildlife Movement across the B.F. Sisk Dam (top); as Noted in the NSR (2010c) Report, Potential Kit Fox Dens occur Throughout the Study Area.
Photo date: September 10, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 7-4

Camera Station Photos Showing a Black-tailed Jackrabbit at Station 2 and Coyote at Station 3. Photo dates: September 11 and 14, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 7-5

Camera Station Photos Showing a Striped Skunk and Domestic Cat at Station 3
Photo dates: September 12 and 13, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 7-6

Camera Station Photos Showing a Raccoon at Station 3 and Black-tailed Deer at Station 4. Photo dates: September 12, 2018

CHAPTER 8
Special-Status Bats

8.1 Summary of Findings

This chapter details the findings of a special-status bat habitat assessment that was performed in the study area from September 10 to 14, 2018, and nighttime emergence surveys and acoustic monitoring that were performed at a concrete tunnel structure located near the Basalt Quarry on September 11, 2018. The assessment found potential tree roosting habitat for the western red bat (*Lasiurus blossevillii*) in day use areas and other locations in the study area. Yuma myotis (*Myotis yumanensis*) and Mexican free-tailed bat (*Tadarida brasiliensis*) roosting was verified in a cavernous concrete structure near the Basalt Quarry, though the structure itself will not be subject to direct project impacts. Potential bat roosting was identified in a second, similar concrete structure within the study area near the quarry.

8.2 Survey Methods

Daytime roost assessment surveys were performed on September 10-13, 2018 by E. Holmboe, with assistance from B. Pittman, K. Bayne, and J. McNamara. Structures within the study area were examined, including all crevices, cavities, and entrances, and other potential roost features to identify evidence of past or present bat activity, including staining, characteristic odor, fecal pellets, and live bats. In addition, eucalyptus, cottonwood, Chinese pistache, and other trees were examined within the Basalt Day Use Area and Basalt Campground, and in the Medeiros Use Area to identify suitable bat roost habitat in the form of cavities, crevices and exfoliating bark.

Bat emergence surveys and nighttime acoustic monitoring were performed on September 12, 2018, at a single man-made cave located north of Basalt Quarry (**Figures 8-1 and 8-2**). E. Holmboe was lead biologist for the nighttime bat emergence survey, with assistance from B. Pittman and J. McNamara. This site was selected for emergence surveys because bat sign was noted and bats were observed in crevices during daytime surveys using a 230-lumen Nite Lite Wizard II LED headlamp and 10x42 binoculars.

Bat emergence survey was performed between 1930 hours and 2030 hours on September 12, 2018. Surveys were performed under optimal visibility and weather conditions, under dry, calm and relatively warm conditions. Wind speed was generally under 2 to 3 mph with an air temperature of 85 degrees Fahrenheit.

Acoustic surveys were concurrently performed using a Wildlife Acoustics EM3+ bat detector. Acoustic data was post-processed using Sonobat version 3.2.1 to identify calls to species.

8.3 Survey Results

The Wildlife Acoustics EM3+ bat detector survey was performed at a single man-made cave for a single night survey. The meter identified a total of 951 bat call files and identified three species with 99% to 100% likelihood of presence.

The assessment found potential tree roosting habitat for the western red bat (*Lasiurus blossevillii*) in day use areas and other locations in the study area, as shown in Figure 8-1. Yuma myotis (*Myotis yumanensis*) and Mexican free-tailed bat (*Tadarida brasiliensis*) roosting was verified in a cavernous concrete structure near the Basalt Quarry, though the structure itself will not be subject to direct project impacts. Potential roosting by Yuma myotis and Mexican free-tailed bat are suspected at a second, similar concrete structure within the study area near the quarry. This location of all features discussed in this chapter is shown in Figure 8-1.

SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 8-1
Location of Special-status Bat Habitat in the Study Area

ESA

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 8-2

Two Cavernous Features in the Basalt Quarry Area Support Bat Roosts. Monitoring at the Tunnel (top) Confirmed Yuma Myotis and Mexican Free-tailed Bat Roosting.
Photo date: September 12, 2018

B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 8-3

Individual Trees and Tree Stands at the Medeiros Use Area, Basalt Day Use Area, Basalt Campground, and Below B.F. Sisk Dam Provide Bat Roosting Habitat

Photo date: September 12, 2018

CHAPTER 9
Vegetation Communities and Special-Status Plants

9.1 Natural Communities

This chapter provides the environmental baseline for natural communities and special-status plant species in the study area. During the survey, natural communities and habitat types were identified within the study area, including sensitive plant communities. These communities and habitat types include lacustrine, freshwater emergent wetland, seasonal wetland, blue elderberry stands, coyote brush scrub, purple needlegrass grasslands, annual grasslands, ornamental, valley foothill riparian, and developed/disturbed habitat.

The natural community classification presented herein is based on direct field observations, prior habitat mapping for the San Luis Low Point Improvement Project and the B.F. Sisk Safety of Dams Modification Project, and the state's standard for alliance-level vegetation classification, A Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens, 2009). The distribution of vegetation communities in the Study Area is presented in **Figure 9-1** and the extent of each natural community or habitat type (for non-vegetated areas) is presented in **Table 9-1**.

TABLE 9-1

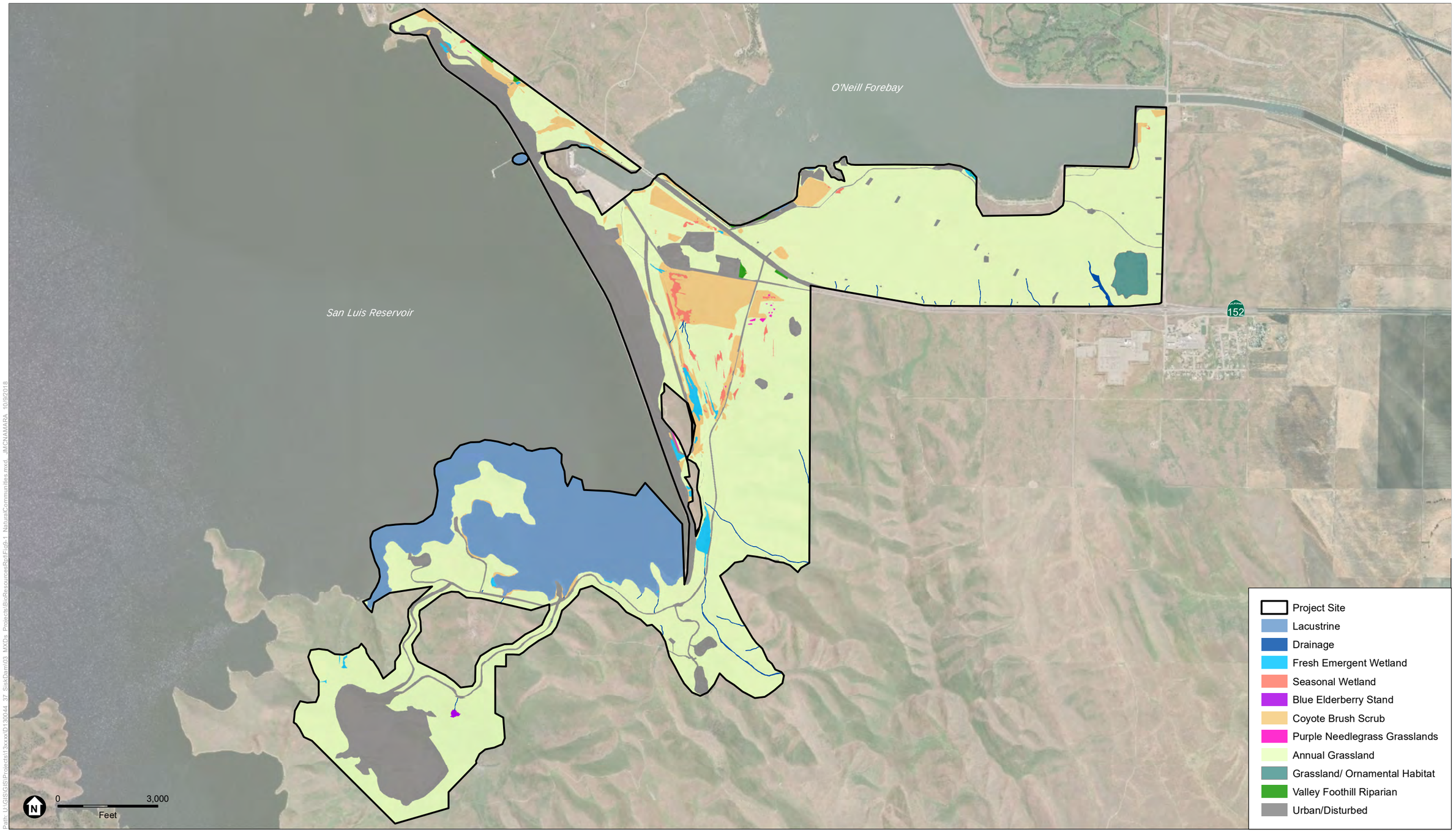
NATURAL COMMUNITY ACREAGE IN THE STUDY AREA

NATURAL COMMUNITY	AREA (ACRES)
Lacustrine	523.0
Drainage	4.6
Freshwater Emergent Wetland	24.1
Seasonal Wetland	16.8
Blue Elderberry	0.89
Coyote Brush Scrub	189.3
Purple Needlegrass Grassland	1.54
Annual Grassland	2552.9
Grassland/Ornamental Tree	28.3
Valley Foothill Riparian	3.2
Urban/Disturbed	605.4
Total Area	**3,952.3**

SOURCE: ESA

9.2 Special-status Plants

Due to the late timing of ecological surveys performed in September 2018, focused in-season surveys for special-status plants could not be performed. A key objective of the survey was the identification of areas may support special-status plants. As shown in **Figure 9-2**, much of the study area was not disturbed during the 1963 to 1968 construction of B.F. Sisk Dam. Surveyors observed small pockets of unique habitats in scattered locations throughout the study area where native grasses and forbs persist, and where special-status plants may be encountered. Plant species identified during surveys are presented in **Appendix B**. Such habitats include purple needlegrass grasslands, annual grasslands, seasonal wetlands, some of which are slightly alkaline. Based on the September 2018 field review, areas that should be evaluated during appropriately-timed botanical surveys are shown in **Figure 9-3**. Focused botanical surveys should include purple needlegrass grasslands, annual grasslands, and seasonal wetlands.

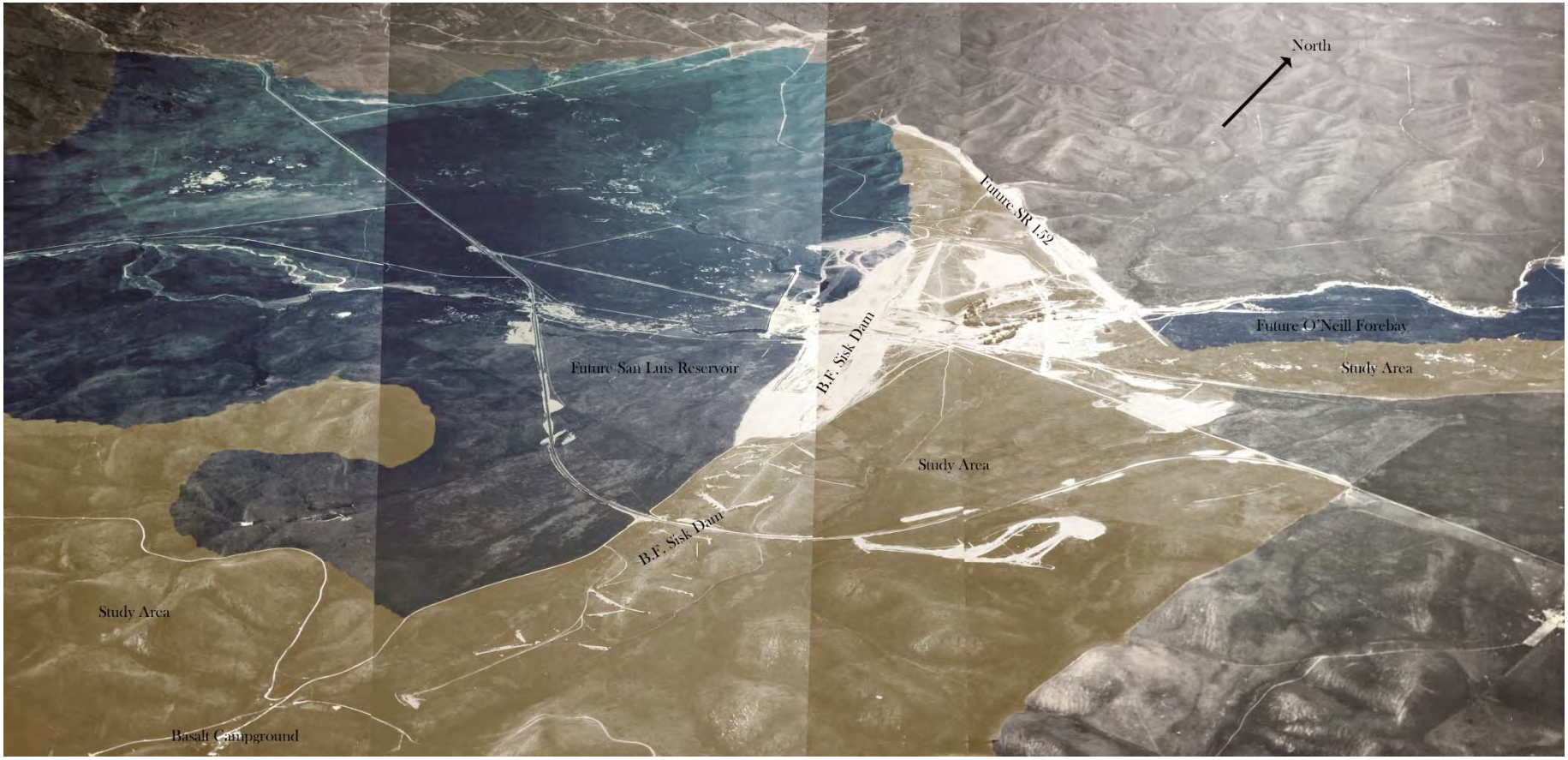


SOURCE: USDA, 2016; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 9-1
Distribution of Natural Communities
In the Study Area

ESA



B.F. Sisk Safety of Dams Modification Project. 130314.04

Source: ESA

Figure 9-2

Aerial Photo Composite of B.F. Sisk Dam Under Construction, ca. 1965.
Presently Inundated Areas Are Approximately Shown in Blue. Undisturbed Portions of the Study Area,
Shaded in Sepia, Informed the Assessment of Potential Rare Plant Distribution Shown in Figure 9-3

SOURCE: USDA, 2016; CDFW, 2018; CDM, 2018; ESA, 2018

B.F. Sisk Dam Safety of Dams Modification Project

Figure 9-3
Location of Potential Special-status Plant Habitat in the Study Area

ESA

CHAPTER 10
Other Considered Wildlife Species

10.1 Introduction

During field surveys, specific attention was given to the identification of habitat for western pond turtle (*Actinemys marmorata*), San Joaquin coachwhip (*Masticophis flagellum ruddocki*), tricolored blackbird (*Agelaius tricolor*). These species were not detected during surveys; however, potential habitat for each was identified within the study area, as described below.

10.2 Western Pond Turtle

Western pond turtles are moderate-sized aquatic turtles that feed on plants, insects, worms, amphibians, crustaceans, and carrion. Mating usually occurs in late April or early May, but may occur year-round. Hatchling turtles are thought to emerge from the nest and move to aquatic sites in the spring (Jennings and Hayes, 1994; Stebbins, 2003; Zeiner et al., 1988).

Western pond turtles are commonly found in ponds, lakes, marshes, rivers, streams, and irrigation ditches with rocky or muddy substrates surrounded by aquatic vegetation. These watercourses usually are within woodlands, grasslands, and open forests, between sea level and 6,000 feet in elevation. Turtles bask on logs or other objects when water temperatures are lower than air temperatures. Nests are located at upland sites, often up to 0.25-mile from an aquatic site (Jennings and Hayes, 1994; Stebbins, 2003; Zeiner et al., 1988).

Pond turtles are not reported within San Luis Reservoir and are not expected to regularly occur in this waterbody. Pond turtles are reported within at Los Banos Reservoir, 5.8 miles south of the study area, and in stock ponds located west of San Luis Reservoir, about 5 miles west of the study area (CDFW, 2018). Within the study area, no aquatic features or drainages are known to support western pond turtle. The perennial seep-fed pond at Willow Spring provides moderate quality habitat for this species. Pond turtles were not observed at this location during two surveys of this area, and basking habitat is limited in this pond due to extensive cattail growth. This species has a low to moderate potential to occur at the Willow Spring pond.

10.3. San Joaquin Coachwhip

San Joaquin coachwhips are energetic diurnal foragers. They become active later in the spring than other snakes, and are mostly active during warm periods of the day. They forage primarily on lizards, bird eggs and young, and small mammals, occasionally foraging on carrion. Mating is thought to occur in May, and oviposition in June or early July. Life history information on this

subspecies is poorly known and much information has been taken from similar subspecies (Jennings and Hayes, 1994).

The San Joaquin coachwhip uses open, dry areas with little or no tree cover. In the western San Joaquin Valley, they occur in valley grassland and saltbush scrub associations and are known to climb shrubs and bushes to view prey and potential predators. They use small mammal burrows for refuge and probably for egg-laying sites as well (Jennings and Hayes, 1994).

San Joaquin coachwhips range from the eastern edge of the San Joaquin Valley from Colusa County southward to Kern County and into the inner South Coast Ranges, with an isolated population in the Sutter Buttes. Western Merced County is within the documented range of the San Joaquin coachwhip, with eleven reported sightings in the western portion of the county. Seven records were reported in 1985 and 1988 near Los Banos Reservoir and Los Banos Creek, about 4 to 7 miles south of the study area. The study area and surrounding grasslands provides suitable open grassland habitat for San Joaquin coachwhips and this species can be expected at low densities in grassland habitat throughout the study area.

10.4 Tricolored Blackbird

The tricolored blackbird is a state-listed threatened species. This species is common throughout the Central Valley and coastal areas south of Sonoma County. They may occur during the breeding and nonbreeding season, sometimes within groups of red-winged blackbird (*Agelaius phoeniceus*).

Tricolored blackbirds are a colonial nesting species that construct their nests in dense vegetation in and near freshwater wetlands. When nesting, tricolored blackbirds generally require freshwater wetland areas large enough to support colonies of 50 pairs or more. They prefer freshwater emergent wetlands with tall, dense cattails or tules for nesting, but also breed in thickets of willow, blackberry, wild rose, or tall herbs. During the nonbreeding season, flocks are highly mobile and forage in grasslands, croplands, and wetlands (Zeiner et al., 1990a).

Tricolored blackbirds are often a sporadic resident species that may breed in different locations in successive years. The CNDDB describes four tricolored blackbird occurrences within the study area, with 25 nesting pairs documented in 2005 near Domengine Spring; 150 non-nesting adults reported in 1998 near the reservoir edge north of Basalt Quarry; more than 500 birds observed in 2006 and 2007 on the south shore of O'Neill Forebay; and consistent nesting reported in cattail marsh areas below B.F. Sisk Dam, consisting of 100 to 5,000 adults per year from 1998 to 2012.

Though not observed during surveys, seasonal wetlands and other aquatic habitat in the study area provide suitable nesting habitat for this species during both the breeding and nonbreeding season.

CHAPTER 11
References and Report Preparation

11.1 References

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5.2 Document Preparation

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APPENDIX A
CNDDB Reporting Forms

California Native Species Field Survey Form

Mail to:
Natural Diversity Database
California Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814

For Office Use Only
*Source Code*_____ *Quad Code*_____
Elm Code_____ Occ. No._____
EO Index No._____ Map Index No._____

Date of Field Work: ***09-13-2018***
month (mm) - date (dd) - year (yyyy)

Scientific Name: Rana draytonii

Common Name: California red-legged frog

Species Found? ☒ **Yes** ☐ **No** _____
If not, why?

Total No. of Individuals:)

Subsequent visit? ☐ **Yes** ☒ **No**

Existing NDDB occurrence:_____ ☒ **No** ☐ **Unk.**
If yes, Occ. #

Collection? ☐ **Yes** ☒ **No** If yes, # and location:

Reporter: Brian Pittman
Address: Environmental Science Associates
1425 N. McDowell Blvd., Ste. 200
Petaluma, CA 94954
Email address: bpittman@esassoc.com
Phone: 707-795-0915

Plant Information

Phenology: _____ _____ _____
% vegetative % flowering % fruiting

Animal Information

Age Structure: 1 8 _____

# adults		# juveniles		# unknown	
☒ breeding	☐ wintering	☐ burrow site	☐ rookery	☐ nesting	☐ other

Location (please also attach or draw map)

County: Merced	*Landowner / manager*: State Parks
Quad Name: San Luis Dam, CA	*Elevation*: 959 ft
T 2 S R 3 E NE ¼ of NW ¼ of Section	T R ¼ of ¼ of Section
UTM: Zone 10	*Point Accuracy*: 3 Meters
Source: Garmin ETrex/Google Earth	*Datum*: NAD 83
Site Coordinates: UTM: 4099656N, 668984E	

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope)
Habitat includes a perennial, spring-fed cattle stock pond measuring 90' by 140' within the San Luis State Recreation Area. The water source for the impoundment is formally named "Willow Spring" on the USGS San Luis Dam 7.5-minute quadrangle. The center of the pond has dense cattails surrounded by a broad, 8' to 10' wide ring of aquatic habitat. Duckweed seasonally provides cover within ponded areas. Pond water levels were at full capacity and spilling when observed in September 2018, with water depth of approximately 1.5' in numerous locations.
Other rare species?

Site Information Overall site quality: ☒ Excellent ☐ Good ☐ Fair ☐ Poor
Current / surrounding land use: Grazing land. Upslope rock quarry site to the south.
Visible Disturbances / possible threats: Construction activities from the proposed B.F. Sisk Dam Safety Project may pose a short-term hazard to moving adults and juveniles; though the spring and pond will likely be unaffected.
Comments: One adult California red-legged frog and eight subadults were identified in the pond on September 13, 2018. No other amphibians were observed during the survey.

Determination: (check one or more, and fill in blanks)
☐ **Keyed (cite reference):**
☐ **Compared with specimen housed at:**
☐ **Compared with photo / drawing in:**
☐ **By another person:**
☐ **Other: Verified by B. Pittman and Kelly Bayne**

Photographs: (check one or more) Slide Print
Plant / animal ☐ ☒
Habitat ☐ ☒
Diagnostic feature ☐ ☐

May we obtain duplicates at our expense?
☒ **yes** ☐ **no**

Attachments: Survey Report Figures 5-1, 5-2, and 5-3

California Native Species Field Survey Form

Mail to:
Natural Diversity Database
California Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814

For Office Use Only
*Source Code*_____ *Quad Code*_____
Elm Code_____ Occ. No._____
EO Index No._____ Map Index No._____

Date of Field Work: ***09-12-2018***
month (mm) - date (dd) - year (yyyy)

Scientific Name: Taxidea taxus

Common Name: American badger

Species Found? ☒ **Yes** ☐ **No** _____
If not, why?
Total No. of Individuals:)
Subsequent visit? ☐ **Yes** ☒ **No**
Existing NDDB occurrence:_____ ☒ **No** ☐ **Unk.**
If yes, Occ. #
Collection? ☐ **Yes** ☒ **No** If yes, # and location:

Plant Information
Phenology: _____ _____ _____
% vegetative % flowering % fruiting

Reporter: Brian Pittman
Address: Environmental Science Associates
1425 N. McDowell Blvd., Ste. 200
Petaluma, CA 94954
Email address: bpittman@esassoc.com
Phone: 707-795-0915

Animal Information
Age Structure: 1 _____ _____
adults # juveniles # unknown
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location (please also attach or draw map)

County: Merced	*Landowner / manager*: State Parks
Quad Name: San Luis Dam, CA	*Elevation*: 297 ft
T 2 S R 3 E NE ¼ of NW ¼ of Section	T R ¼ of ¼ of Section
UTM: Zone 10	*Point Accuracy*: 50 Meters
Source: Garmin ETrex/Google Earth	*Datum*: NAD 83
Site Coordinates: UTM: 4102943N, 673181E	

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope)
Annual grassland comprises the majority of terrestrial habitat below B.F. Sisk Dam. Grasslands below the dam are well grazed by tule elk and consist of short non-native annual grasses interspersed with coyote brush and forbs. Extensive small mammal activity is evident within the grassland, with California ground squirrel as a major species. Dominant vegetation species are wild oat (*Avena fatua*) and soft chess (*Bromus hordeaceus*).
Other rare species?

Site Information Overall site quality: ☒ Excellent ☐ Good ☐ Fair ☐ Poor
Current / surrounding land use: State Parks SRA grazed by tule elk. The badger was observed 0.8 miles east of B.F. Sisk Dam.
Visible Disturbances / possible threats: Construction activities from the proposed B.F. Sisk Dam Safety Project may pose a short-term hazard to moving badgers.
Comments: One adult badger was observed while spotlighting from Basalt Road, 50 feet east of the road and approximately 200 feet south of the intersection with Gonzaga Road. No photographs were taken of the individual.

Determination: (check one or more, and fill in blanks)
☐ **Keyed (cite reference):**
☐ **Compared with specimen housed at:**
☐ **Compared with photo / drawing in:**
☐ **By another person:**
☐ **Other: Verified by B. Pittman, Kelly Bayne, and Even Holmboe**

Photographs: (check one or more) Slide Print
Plant / animal ☐ ☐
Habitat ☐ ☒
Diagnostic feature ☐ ☐

May we obtain duplicates at our expense?
☒ **yes** ☐ **no**

Attachments: Survey Report Figure 7-1

APPENDIX B

Plant and Wildlife Species Observed During Surveys

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TABLE B-1

WILDLIFE SPECIES OBSERVED IN THE STUDY AREA, SEPTEMBER 10-14, 2018

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
California toad	*Anaxyrus boreas* ssp. *halophilus*
Sierran treefrog	*Pseudacris sierra*
California red-legged frog	*Rana draytonii*
REPTILES	
gopher snake	*Pituophis catenifer*
western fence lizard	*Sceloporus occidentalis*
BIRDS	
red-shouldered hawk	*Accipiter striatus*
spotted sandpiper	*Actitis macularius*
western grebe	*Aechmophorus occidentalis*
red-winged blackbird	*Agelaius phoeniceus*
mallard	*Anas platyrhynchos*
western scrub-jay	*Aphelocoma californica*
great blue heron	*Ardea herodias*
great horned owl	*Bubo virginianus*
cattle egret	*Bubulcus ibis*

TABLE B-1 (CONTINUED)

WILDLIFE SPECIES OBSERVED IN THE STUDY AREA; SEPTEMBER 10-14, 2018

COMMON NAME	SCIENTIFIC NAME
red-tailed hawk	*Buteo jamaicensis*
least sandpiper	*Calidris minutilla*
Anna's hummingbird	*Calypte anna*
turkey vulture	*Cathartes aura*
killdeer	*Charadrius vociferus*
northern harrier	*Circus hudsonius*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
snowy egret	*Egretta thula*
Horned lark	*Eremophila alpestris*
Brewer's blackbird	*Euphagus cyanocephalus*
prairie falcon	*Falco mexicanus*
American kestrel	*Falco sparverius*
American coot	*Fulica americana*
greater roadrunner	*Geococcyx californianus*
bald eagle	*Haliaeetus leucocephalus*
loggerhead shrike	*Lanius ludovicianus*
western gull	*Larus occidentalis*
gull sp.	*Larus sp.*

TABLE B-1 (CONTINUED)

WILDLIFE SPECIES OBSERVED IN THE STUDY AREA; SEPTEMBER 10-14, 2018

COMMON NAME	SCIENTIFIC NAME
belted kingfisher	*Megaceryle alcyon*
common merganser	*Mergus merganser*
northern mockingbird	*Mimus polyglottos*
brown-headed cowbird	*Molothrus ater*
ruddy duck	*Oxyura jamaicensis*
osprey	*Pandion haliaetus*
English sparrow	*Passer domesticus*
American white pelican	*Pelecanus erythrorhynchos*
double-crested cormorant	*Phalacrocorax auritus*
yellow-billed magpie	*Pica nuttalli*
pied-billed grebe	*Podilymbus podiceps*
black phoebe	*Sayornis nigricans*
yellow warbler	*Setophaga petechia*
Forster's tern	*Sterna forsteri*
Eurasian collared dove	*Streptopelia decaocto*
western meadowlark	*Sturnella neglecta*
tree swallow	*Tachycineta bicolor*
violet green swallow	*Tachycineta thalassina*
greater yellowlegs	*Tringa melanoleuca*

TABLE B-1 (CONTINUED)

WILDLIFE SPECIES OBSERVED IN THE STUDY AREA; SEPTEMBER 10-14, 2018

COMMON NAME	SCIENTIFIC NAME
barn owl	*Tyto alba*
mourning dove	*Zenaida macroura*
MAMMALS	
Coyote	*Canus latrans*
Tule elk	*Cervus canadensis nannodes*
black-tailed jackrabbit	*Lepus californicus*
western red bat	*Lasirurs blossevillii*
Yuma myotis bat	*Myotis yumanensis*
California ground squirrel	*Otospermophilus beecheyi*
black-tailed deer	*Odocoileus hemionus*
Audubon's cottontail	*Sylvilagus audubonii*
Mexican free-tailed bat	*Tadarida brasiliensis*
American badger	*Taxidea taxus*
Botta's pocket gopher	*Thomomys bottae*

TABLE B-2

PLANT SPECIES OBSERVED IN THE STUDY AREA, SEPTEMBER 10-14, 2018

PLANT FAMILY	COMMON NAME	*SCIENTIFIC NAME*
Adoxaceae	blue elderberry	*Sambucus nigra* ssp. *caerulea*
Amaranthaceae	prickly Russian thistle	*Salsola tragus*
Apiaceae	fennel	*Foeniculum vulgare*
Apocynaceae	narrowleaf milkweed	*Asclepias fascicularis*
Asteraceae	coyote brush	*Baccharis pilularis*
	mule fat	*Baccharis salicifolia*
	glandular big tarweed	*Blepharizonia laxa*
	Italian thistle	*Carduus pycnocephalus*
	yellow star-thistle	*Centaurea solstitialis*
	Fitch's spikeweed	*Centromadia fitchii*
	stinkwort	*Ditrichia gravendens*
	western goldenrod	*Euthamia occidentalis*
	gumplant	*Grindelia* sp.
	bristly oxtongue	*Helminthotheca ichioides*
	telegraphweed	*Heterotheca grandiflora*
	yellow tarweed	*Holocarpha virgata*
	prickly lettuce	*Lactuca serriola*
	Mediterranean milk thistle	*Silybum marianum*
	wirelettuce	*Stephanomeria* sp.

TABLE B-2 (CONTINUED)

PLANT SPECIES OBSERVED IN THE STUDY AREA, SEPTEMBER 10-14, 2018

PLANT FAMILY	COMMON NAME	*SCIENTIFIC NAME*
Asteraceae	rough cocklebur	*Xanthium strumarium*
Boraginaceae	salt heliotrope	*heliotropium curassavicum*
Brassicaceae	field mustard	*Brassica rapa*
	mustard	*Hirschfeldia* sp.
	Perennial pepperweed	*Lepidium latifolium*
	wild radish	*Raphanus sativus*
Calitrichaceae	twoheaded water-starwort	*Callitriche heterophylla*
Casuarinaceae	Australian pine	*Casuaria sp.*
Convolvulaceae	field bindweed	*Convolvulus arvensis*
Cyperaceae	purua grass	*Bolboschoenus maritimus*
	sedge	*Cyperus* sp.
Elaeagnaceae	buffaloberry	*Shepherdia argentea*
Euphorbiaceae	doveweed	*Croton setigerus*
Fabaceae	honey mesquite	*Prosopis glandulosa*
Fagaceae	coast live oak	*Quercus agrifolia*
	blue oak	*Quercus douglasii*
	valley oak	*Quercus lobata*
	interior live oak	*Quercus wislizeni*
Frankeniaceae	alkali heath	*Frankenia grandiflora*

TABLE B-2 (CONTINUED)

PLANT SPECIES OBSERVED IN THE STUDY AREA, SEPTEMBER 10-14, 2018

PLANT FAMILY	COMMON NAME	*SCIENTIFIC NAME*
Geraniaceae	broadleaf filaree	*Erodium botrys*
	dove's-foot crane's bill	*Geranium molle*
Lamiaceae	black sage	*Salvia melifera*
	vinegarweed	*Trichostemma lanceolata*
Marsileaceae	American pillwort	*Pilularia americana*
Myrtaceae	blue gum eucalyptus	*Eucalyptus globulus*
	eucalyptus	*Eucalyptus* sp.
Phytolaccaceae	pokeweed	*Phytolacca decandra*
Pinaceae	stone pine	*Pinus pinea*
Plantaginaceae	buck's-horn plantain	*Plantago coronopus*
Poaceae	common wild oat	*Avena fatua*
	stiff brome	*Brachypodium distachyon*
	ripgut brome	*Bromus diandrus*
	soft brome	*Bromus hordeaceus*
	foxtail brome	*Bromus Madritensis*
	Bermuda grass	*Cynodon dactylon*
	salt grass	*Distichlis spicata*
	Italian ryegrass	*Festuca perennis*
	hare barley	*Hordeum murinum*

TABLE B-2 (CONTINUED)

PLANT SPECIES OBSERVED IN THE STUDY AREA, SEPTEMBER 10-14, 2018

PLANT FAMILY	COMMON NAME	*SCIENTIFIC NAME*
Poaceae	sprangletop	*Leptochloa* sp.
	purple needlegrass	*Nassalla pulchra*
	dallis grass	*Paspalum dilatatum*
	bulbous bluegrass	*Poa bulbosa*
	annual beard grass	*Polypogon monspeliensis*
Polygonaceae	curly dock	*Rumex crispus*
Roseaceae	*Holly-leaved cherry*	*Prunus ilicifolia*
Salicaceae	Fremont cottonwood	*Populus fremontii*
	narrowleaf willow	*Salix exigua*
Salicaceae	willow	*Salix* sp.
Scrophulariaceae	mullein	*Verbascum* sp.
Solanaceae	sacred datura	*Datura wrighti*
	tobacco tree	*Nicotiana glauca*
Typhaceae	narrowleaf cattail	*Typha angustifolia*
	Broadleaf cattail	*Typha latifolia*

Source: ESA