United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

In reply refer to:
2024-0125050-S7-001

July 16, 2025

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Subject: Biological and Conference Opinion on the Proposed Sites Reservoir Project in Colusa and Glenn Counties, California

Dear Melissa Dekar, Hillary Regnart, and Carlos Suarez,

This document transmits the U.S. Fish and Wildlife Service's (Service) biological and conference opinion (BiOp) to the U.S. Bureau of Reclamation (Reclamation), U.S. Army Corps of Engineers (Corps), and U.S. Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS) (collectively, Action Agencies) on the effects of the Sites Reservoir Project (Project) on federally-listed and proposed species. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

Consultation was requested by Reclamation with the Service on November 16, 2023. In the consultation package submitted, the Sites Project Authority was identified as a lead applicant for planning, development, and implementation of the Sites Reservoir Project. The Sites Project Authority is a joint powers authority comprised of regional entities including local water agencies and counties. Since the initial request to consult, the Action Agencies have collaborated to develop the Proposed Action that is analyzed in this BiOp.

At issue are the proposed Project's effects on the federally listed as endangered Keck's checkermallow (*Sidalcea keckii*), Greene's tuctoria (*Tuctoria greenei),* palmate-bracted bird's-beak (*Chloropyron palmatum*), and vernal pool tadpole shrimp (*Lepidurus packardi*); the federally listed as threatened Hoover's spurge (*Chamaesyce hooveri*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp *(Branchinecta lynchi*), and giant garter snake (*Thamnophis gigas*); and the federally proposed as threatened northwestern pond turtle (*Emys marmorata*), western spadefoot (*Spea hammondii*), and monarch butterfly (*Danaus plexippus*). For proposed species, Reclamation, the Corps, and NRCS have made effect determinations and requested conference procedures. In the event that the species becomes listed (designated) before Project completion, the Action Agencies will follow procedures described in 50 CFR 402.10. Action Agency determinations are listed in the table below.

Federally Listed and Proposed Species with Potential to Be Affected by the Sites Reservoir Project.

Common Name	Scientific Name	Federal Status	Determination
Keck's checkermallow	*Sidalcea keckii*	E	May Affect, Not Likely to Adversely Affect
Greene's tuctoria	*Tuctoria greenei*	E	May Affect, Not Likely to Adversely Affect
palmate-bracted bird's-beak	*Chloropyron palmatum*	E	May Affect, Not Likely to Adversely Affect
vernal pool tadpole shrimp	*Lepidurus packardi*	E	May Affect, Likely to Adversely Affect
Hoover's spurge	*Chamaesyce hooveri*	T	May Affect, Not Likely to Adversely Affect
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	May Affect, Likely to Adversely Affect
vernal pool fairy shrimp	*Branchinecta lynchi*	T	May Affect, Likely to Adversely Affect
giant garter snake	*Thamnophis gigas*	T	May Affect, Likely to Adversely Affect
northwestern pond turtle	*Emys marmorata*	PT	May Affect, Likely to Adversely Affect
western spadefoot	*Spea hammondii*	PT	May Affect, Likely to Adversely Affect
monarch butterfly	*Danaus plexippus*	PT	May Affect, Likely to Adversely Affect

E = Endangered, T = Threatened, PT = Proposed Threatened

The Service has prepared a mixed programmatic BiOp as defined in 50 CFR 402.02, which includes a mix of standard-level and programmatic Project elements. An analysis and conclusion of whether or not the Project is likely to jeopardize each listed and proposed species is included in this BiOp.

If you have any questions regarding this biological and conference opinion, please contact Stephanie Millsap, Assistant Field Supervisor of the Watershed Planning Division, at (916) 930-2658 or stephanie_millsap@fws.gov. Please refer to Service File Number: 2024-0125050-S7-001 in any future correspondence regarding this proposed project.

Sincerely,

DONALD RATCLIFF Digitally signed by DONALD RATCLIFF Date: 2025.07.16 13:09:57 -07'00'

Donald Ratcliff, Field Supervisor

Attachment

Biological and Conference Opinion

ecc: Kristal Davis-Fadtke, California Department of Fish and Wildlife
Cathy Marcinkevage, National Marine Fisheries Service
Alicia Forsythe, Sites Project Authority
Jerry Brown, Sites Project Authority
Maya Bickner, U.S. Army Corps of Engineers
Matthew Roberts, U.S. Army Corps of Engineers
Dean Kwasny, U.S. Department of Agriculture

BIOLOGICAL AND CONFERENCE OPINION
For the Sites Reservoir Project

Service File No. 2024-0125050-S7-001

U.S. Fish and Wildlife Service
San Francisco Bay-Delta Fish and Wildlife Office
Sacramento, California

July 16, 2025

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ACRONYM LIST

Authority	Sites Project Authority
BA	Biological Assessment
BCRP	Butte Regional Conservation Plan
BiOp	biological opinion
BMPs	best management practices
CBD	Colusa Basin Drain
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLSM	controlled low strength material
CNDDB	California Natural Diversity Database
Corps	U.S. Army Corps of Engineers
CPTs	cone penetration tests
CVP	Central Valley Project
CY	cubic yards
Delta	Sacramento-San Joaquin Delta
DPS	distinct population segment
DWR	California Department of Water Resources
EIS	Environmental Impact Statement
EIR	Environmental Impact Report
ESA	Endangered Species Act
FR	Federal Register
GCID	Glenn-Colusa Irrigation District
GIS	Geographic Information System
GPS	global positioning system
HCP	Habitat Conservation Plan
HMMP	hazardous materials management plan
hp	horsepower
ITS	Incidental Take Statement
I/O	Inlet/Outlet
xI-5	Interstate 5
km	kilometer
kV	kilovolt
LIDAR	Light Detection and Ranging
LTO BiOp	Biological Opinion for the Long-Term Operations of the Central Valley Project and State Water Project
m	meter
MAF	million-acre-feet
mph	miles per hour
NAIP	National Agricultural Imagery Program
NEPA	National Environmental Policy Act
NCCP	Natural Community Conservation Plan
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service

O&M	Operations and Maintenance
PG&E	Pacific Gas and Electric Company
PGP	pumping generating plant
POI	point of interconnection
Project	Sites Reservoir Project
RBPP	Red Bluff Pumping Plant
RCIS	Regional Conservation Investment Strategy
Reclamation	U.S. Bureau of Reclamation
Service	U.S. Fish and Wildlife Service
Sites Project	Sites Reservoir Project
SPCC Plan	Spill Prevention, Containment, and Countermeasure Plan
SWP	State Water Project
SWPPP	storm water pollution prevention plan
TC Canal	Tehama-Colusa Canal
TCCA	Tehama-Colusa Canal Authority
TRR	Terminal Regulating Reservoir
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WAPA	Western Area Power Administration
WIIN Act	Water Infrastructure Improvements for the Nation Act
WMA	Wildlife Management Area
WSE	water surface elevation
WSIP	Water Storage Investment Program
YBWA	Yolo Bypass Wildlife Area

1. INTRODUCTION

The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) is proposing to serve as a funding partner in the construction of an off-stream storage reservoir known as the Sites Reservoir Project (Project/Proposed Action), located in Antelope Valley, west of the City of Maxwell, California. The Project spans portions of both Glenn and Colusa counties. Reclamation plans to enter into one or more agreements with the Sites Project Authority (Authority) to provide partial funding for construction through the Water Infrastructure Improvements for the Nation (WIIN) Act.

The Authority, previously known as the Sites Joint Powers Authority, was formed as a joint powers authority pursuant to state law on August 26, 2010, when seven regional entities, including several local water agencies and counties, executed the Joint Exercise of Powers Agreement. The Authority was formed to further the review, consideration, and development of the Project. The Authority was formed as a result of the November 2009 enactment of Senate Bill 7X 2, the Safe, Clean, and Reliable Drinking Water Supply Act of 2010. This law allows for the formation of joint powers authorities by cities, counties, irrigation districts, and other local water districts and agencies within the applicable hydrological region for the design, acquisition, and construction of water infrastructure, water supply reliability, and other types of specified water projects. The vision of the Authority is to build and operate a climate-resilient, 21st Century water storage system to responsibly manage and deliver water, improve the environment, and provide flood control and recreation benefits. The Authority would be responsible for all aspects of ownership and operations of the Project. Reclamation is the federal lead agency for the Project, for compliance with National Environmental Policy Act (NEPA), the Endangered Species Act (ESA) and other applicable federal statutes and regulations.

The U.S. Army Corps of Engineers (Corps) plays a critical regulatory role in the Sites Reservoir Project through its permitting authority under the Clean Water Act and the Rivers and Harbors Act. Specifically, the Project requires a Section 404 permit from the Corps because it involves discharges of dredged or fill material into waters of the United States, including wetlands and other aquatic resources. The Corps will evaluate potential environmental impacts of the reservoir's construction and operation, ensuring that the project complies with federal environmental standards and minimizes harm to aquatic ecosystems. As part of the permitting and consultation process, the Corps has been involved in the planning phase of this Project.

The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) is engaged in the Project due to the presence of wetland easements held by NRCS on lands where some construction activities are proposed. These easements, established in partnership with landowners through voluntary conservation programs, are designed to protect and preserve wetland functions. As the Project planning progresses, NRCS is working collaboratively with the Project proponents and affected landowners to carefully review proposed activities and ensure they are consistent with the intent and terms of the easements.

On November 8, 2024, the U.S. Fish and Wildlife Service issued a Biological Opinion for the Long-Term Operations (LTO BiOp) of the Central Valley Project (CVP) and State Water Project (SWP) (Service File No. 08FBDT00-2022-0059509). The LTO BiOp also included a framework

programmatic consultation to evaluate the potential impacts of the proposed future operations of the Sites Reservoir Project on federally listed species and designated critical habitat. As part of this framework, Reclamation committed to initiating additional consultations in the future to address both near-field and far-field effects of the Sites Reservoir operations, providing detailed information at that time for site-specific analyses. Reclamation also proposed initiating section 7 consultation for the non-operational aspects of the project, such as construction and maintenance. This current consultation by the Service focuses specifically on these non-operational components, which were previously reviewed in the 2024 LTO BiOp under the broader programmatic approach (Service 2024b).

2. SPECIES LIKELY TO BE ADVERSELY AFFECTED

In the 2024 LTO BiOp, Reclamation made may affect, likely to adversely affect determinations for 12 federally listed and proposed species and the designated critical habitat of three federally listed species for the entire LTO proposed action, which included Sites Reservoir Project as a component. Delta smelt (*Hypomesus transpacificus*), delta smelt designated critical habitat, and San Francisco Bay-Delta distinct population segment (DPS) of the Longfin Smelt (*Spirinchus thaleichthys*) were among the likely to adversely affect determinations made. Additional context about these determinations is provided in the *Consultation and Permitting Approaches* section further below. In the 2024 LTO BiOp, Reclamation also proposed initiating section 7 consultation for the non-operational construction and maintenance components of the Sites Reservoir Project as a subsequent consultation. The Proposed Action for which the Service is currently consulting on is the non-operational construction and maintenance components that had previously been analyzed in a framework approach within the 2024 LTO BiOp.

The U.S. Fish and Wildlife Service (Service) concurs with Reclamation's determinations that the Proposed Action is likely to adversely affect certain listed and proposed species. Specifically, this consultation evaluates whether the Proposed Action is likely to jeopardize the continued existence of the federally endangered vernal pool tadpole shrimp (*Lepidurus packardi*); the federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp (*Branchinecta lynchi*), and giant garter snake (*Thamnophis gigas*); and the federally proposed as threatened northwestern pond turtle (*Emys marmorata*), western spadefoot (*Spea hammondii*), and monarch butterfly (*Danaus plexippus*). The Service considered effects to delta smelt (*Hypomesus transpacificus*) and its critical habitat, and longfin smelt (*Spirinchus thaleichthys*) from the construction activities of the Proposed Action. However, they were not analyzed in this Biological Opinion because the construction activities would occur outside their known ranges and would not cause in-water disturbances or hydrologic changes that could affect these species.

3. SPECIES NOT LIKELY TO BE ADVERSELY AFFECTED

The Service concurs with Reclamation's determination that the proposed Project may affect, but is not likely to adversely affect Keck's checkermallow, Greene's tuctoria, palmate-bracted bird's-beak, and Hoover's spurge. The conservation measures identified in the *Description of the*

Proposed Action support these not likely to adversely affect species' determinations. Based on Reclamation's commitment to reinitiate consultation in the event that these species are found during protocol-level surveys, and the low likelihood of the species' presence within the Action Area, it is the Service's opinion that the proposed Project will have a discountable effect on these species.

Keck's checkermallow

The Service concurs that the proposed Project is not likely to adversely affect Keck's checkermallow. While habitat modeling suggests that suitable conditions may exist in the Action Area's grassland and oak woodland environments, the likelihood of occurrence within the Action Area is low due to the extremely limited distribution of the species, with only one confirmed extant population range-wide, located in Fresno County. A nearby occurrence approximately five miles from the Project footprints remain taxonomically unconfirmed. Any potential effects to Keck's checkermallow are considered discountable based on the rarity of the species, the uncertainty of habitat occupancy, and Reclamation's commitment under general conservation measures to conduct focused pre-construction surveys in all modeled habitat. In the unlikely event that this species is found during pre-construction surveys and cannot be avoided, the Action Agencies will reinitiate consultation with the Service.

Greene's tuctoria

The Service concurs that the proposed Project is not likely to adversely affect Greene's tuctoria. While habitat models indicate the presence of suitable conditions, the vernal pools within the Action Area are generally shallow, ephemeral, and not characteristic of the large or deep vernal pools required by this species. Based on aerial imagery and site assessments, the habitat within the Project's Action Area do not support the prolonged inundation necessary for Greene's tuctoria to persist. Any potential effects to Greene's tuctoria are considered discountable based on the rarity of the species, the uncertainty of habitat occupancy, and Reclamation's commitment under general conservation measures to conduct focused pre-construction surveys in all modeled habitat. In the unlikely event that this species is found during pre-construction surveys and cannot be avoided, the Action Agencies will reinitiate consultation with the Service.

Palmate-bracted bird's-beak

The Service concurs that the proposed Project is not likely to adversely affect palmate-bracted bird's-beak. The nearest known occurrence is at Delevan National Wildlife Refuge, located east of the Action Area. Although modeled habitat indicates possible suitable conditions, given the species' extremely limited distribution and specialized habitat requirements, its presence in the Action Area is unlikely. Any potential effects to palmate-bracted bird's-break are considered discountable based on the rarity of the species, the uncertainty of habitat occupancy, and Reclamation's commitment under general conservation measures to conduct focused pre-construction surveys in all modeled habitat. In the unlikely event that this species is found during pre-construction surveys and cannot be avoided, the Action Agencies will reinitiate consultation with the Service.

Hoover's spurge

The Service concurs that the proposed Project is not likely to adversely affect Hoover's spurge. Habitat modeling identified potentially suitable conditions, but site assessments and aerial imagery confirm that the Project footprints lack the deep vernal pools with extended inundation periods required by the species. Any potential effects to Hoover's spurge are considered discountable based on the rarity of the species, the uncertainty of habitat occupancy, and Reclamation's commitment under general conservation measures to conduct focused pre-construction surveys in all modeled habitat. In the unlikely event that this species is found during pre-construction surveys and cannot be avoided, the Action Agencies will reinitiate consultation with the Service.

4. INFORMATION PROVIDED AND AVAILABLE TO THE SERVICE

Pursuant to 50 CFR 402.12(j), Reclamation submitted a Biological Assessment (BA) for our review and requested concurrence on their determinations. The Service received the BA on November 16, 2023 and worked in an iterative manner receiving additional information as noted in the *Consultation History*. The chronological timeline of the additional requests and determination findings by Reclamation are reflected in the *Species Likely to be Adversely Affected, Species Not Likely to be Adversely Affected,* and the *Consultation History*.

In reviewing the proposed Project, the Service has relied upon: (1) Reclamation's memorandum requesting consultation, dated November 15, 2023; (2) the BA for the proposed Project, dated August 2023; (3) the final Environmental Impact Statement (EIS) for the Project, dated November 2023; (4) technical assistance from the Service to Reclamation and the Authority; (4) the BA Comment Tracker of additional information requests that occurred from April 2024 to July 2025; and (5) other information available to the Service.

5. CONSULTATION HISTORY

This consultation is the most recent in a series of coordinated efforts related to the Sites Reservoir Project. The Service issued a BiOp for geotechnical investigations on September 30, 2019 (Service File No. 08FBDT00-2019-F-0287-R002). More recently, on November 8, 2024, the Service issued a BiOp for the Long-Term Operations of the Central Valley Project (CVP) and State Water Project (SWP) (Service File No. 08FBDT00-2022-0059509), which also evaluated the proposed future operations of the Project using a framework programmatic consultation approach to assess potential effects on listed species and critical habitat. The following section outlines key milestones in the consultation history for the Project, beginning with the initial request for technical assistance and the development of the BA through the signing of this BiOp.

- November 14, 2018: The Authority and Reclamation met with National Marine Fisheries Service (NMFS) and the Service to present information on tools used to assess effects of proposed operations and begin discussions regarding the approach to

engaging with the resource agencies in informal consultation/technical assistance to aid the Authority in developing its BA for the Project.

- February 2, 2019: The Authority conducted a site visit for NMFS and the Service to view the proposed construction site of the Delevan Diversion and fish screen, the Glenn-Colusa fish screen and pumping plant, the planned Delevan Pipeline corridor, the Funks Reservoir, and the inundation area.

- May 31, 2019: Reclamation and the Authority conducted a site visit for the Service at the proposed geotechnical areas of ground disturbance. The Service was represented at the meeting by staff from the San Francisco Bay-Delta Fish and Wildlife Office (BDFWO) and Sacramento National Wildlife Refuge (Sacramento NWR Complex).

- June 28, 2019: The Service met with Reclamation and Project consultants to discuss the draft BA for the Sites Reservoir Geotechnical Investigation.

- July 25, 2019: Reclamation, the Authority, their consultants, and the Service met to discuss proposed geotechnical investigations on Delevan National Wildlife Refuge. The Service was represented at the meeting by staff from the BDFWO and Sacramento NWR Complex.

- August 21, 2019: Reclamation requested consultation via email to the Service for Sites Reservoir Geotechnical Investigation.

- September 30, 2019: The Service issued a BiOp to Reclamation for the Sites Reservoir Geotechnical Investigation, Service File No. 08FBDT00-2019-F-0287-R002.

- Between 2020 and July 2023: The Service and NMFS provided technical assistance to Reclamation prior to them initiating formal consultation on the Project. These communications included regular check-ins regarding the development of the BA.

- November 16, 2023: Reclamation requested formal consultation and conference for the terrestrial impacts associated with the construction of the Project and submitted the BA.

- Between November 2023 and April 2024: The Authority, Reclamation, and Service discussed the consultation approach, including that programmatic consultation for water conveyance and operation of the Project would need to be included within the Reinitiation of Consultation on the Coordinated Long-term Operation of the Central Valley Project and State Water Project (LTO).

- Between April 2024 and June 2025: The Authority and Reclamation met with the Service to discuss additional information requests. Supplemental BA information was provided to the Service, including analyses for western spadefoot, northwestern pond turtle, and monarch butterfly for the purpose of developing a conference opinion on these species. The BA Comment Tracker articulates these changes proposed by Reclamation and the Authority and is incorporated by reference into this BiOp.

- November 8, 2024: The Service issued a BiOp to Reclamation for the Long-Term Operations of the CVP and SWP, Service File No. 08FBDT00-2022-0059509.

- January 24, 2025: NRCS confirmed its role as a federal action agency for the Project's consultation.

- February 5, 2025: The Corps confirmed its role as a federal action agency for the Project's consultation.

6. CONSULTATION AND PERMITTING APPROACHES

Endangered Species Act regulations require that all effects of the action including "all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action" (50 CFR 402.02) are addressed in consultation. After reviewing the action as proposed by Reclamation, the Service has determined that the Proposed Action presents a mixed programmatic action, as defined in 50 CFR 402.02. This consultation includes a mix of standard and framework programmatic consultation types (for which an incidental take statement [ITS] is not required at the programmatic stage). Some Project elements and their effects may change as Reclamation and the Authority continue to develop the Proposed Action and may require reinitiation. Additionally, reinitiation of this consultation may be required when additional information becomes available for any Project elements that lack the necessary specificity at this time but do not require future federal approvals. This approach is consistent with the requirement for the Action Agency to reinitiate consultation under certain circumstances. 50 CFR 402.16 outlines the circumstances that require reinitiation of consultation, which apply to the Proposed Action. Refer to the *Reinitiation - Closing Statement* for additional specific conditions under which consultation will need to be reinitiated.

Some of the Project elements are described at a site-specific level with no future federal action required, unless reinitiation of consultation is necessary pursuant to 50 CFR 402.16 (standard). For the remainder of the Project elements, the Proposed Action describes activities in new or on-going programs, some of which are analyzed in the LTO BiOp or other existing programmatic consultations, and some program activities which will require subsequent consultations prior to implementation (framework programmatic). Activities utilizing existing programmatic consultations will require documentation and confirmation that their usage is appropriate. All activities under the framework programmatic approach will be subject to a subsequent consultation in order to proceed.

The analysis in this BiOp allows for a broad-scale examination of the potential impacts to listed and proposed species and their habitats, and examines how the parameters of the Project align with the survival and recovery needs of species occurring in the Action Area. This BiOp contains an ITS for those Project elements for which incidental take is reasonably certain to occur for an individual species that are addressed under a standard [site-specific level] consultation approach. An analysis and conclusion of whether or not the entire Proposed Action is likely to jeopardize the continued existence of listed and proposed species is included in this BiOp.

6.1 Defining the Consultation Types

The following consultation types were used for accounting how elements of the Proposed Action are binned and referred to throughout this BiOp.

6.1.1 Standard Consultation

For standard consultation activities, there is enough information available in the BA or elsewhere to address the specific effects without the need for subsequent or tiered consultations in the future. These activities do not require future federal approvals and could be implemented at any point after the federal action occurs. Quantitative modeling and analyses that support the effects analysis and an ITS are available and utilized where appropriate.

6.1.2 Framework Programmatic Consultation

For framework programmatic actions, an ITS is not required at the program (framework) level for those actions falling within the definition of framework programmatic action (50 CFR 402.02). Framework programmatic portions of the Proposed Action will require separate, project-specific section 7 consultations as part of the subsequent approval. Framework programmatic actions establish a framework for the development of future actions that are authorized, funded, or carried out at a later time, and any take of a listed species would not occur unless and until those future actions are authorized, funded or carried out and subject to further section 7 consultation. The Guiding Principles providing the framework for future proposed actions can be found within the *Description of the Proposed Action* and analyzed respectively in the *Effects of the Action*.

6.2 Consultation Type Utilized by Activity

This Proposed Action is to enlarge the water supply storage capacity of an existing flood control system networking throughout the Delta and its many tributaries to take advantage of the unappropriated flows associated with winter-storms and changing patterns in precipitation associated with climate change. There are pre-existing facilities (e.g., Red Bluff Pumping Plant [RBPP], Tehama-Colusa [TC] Canal, Funks Reservoir) that the Proposed Action will connect to which will continue to operate per existing consultations, permits, and/or other environmental regulations and any relevant amendments. Existing consultations associated with these pre-existing facilities are noted in the *Environmental Baseline* section.

Given the complexity of actions covered under existing consultations (*Environmental Baseline*) and the intersection of new activities proposed under this consultation (*Description of the Proposed Action*), the following illustration in ***Figure 1*** provides a visual breakdown of the various elements and where effects have been analyzed to species and habitat along with the consultation type. The LTO Effects Tracking Table provides additional detail regarding the 2024 LTO consultation approach and can be found in that document's Appendix 1 of the *Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project (Service File No. 2022-0059509)*. The illustration is intended to identify only those existing consultations in the *Environmental Baseline* that are related to capturing all

aspects of the Project leading up to this Proposed Action, including pre-construction, existing infrastructure, and water operations elements, and is not intended to be an exhaustive list of consultations in the *Environmental Baseline*. A full list of the O&M Plans can be found in *Section 7.2* of this BiOp.

Future operations of the Project that are addressed programmatically in the November 8, 2024 *Programmatic Biological Opinion for the Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project* (2024 LTO BiOp; Service File No. 2022-0059509), include: (1) diversions to Sites Reservoir, including resulting operating criteria and diversion criteria, (2) water releases from Sites Reservoir, (3) exchanges with Lake Oroville, (4) flood control benefits, (5) operation of facilities to meet Division of Safety of Dams criteria and requirements for emergency reservoir drawdown, and (6) the generation of energy in operations and use of energy for operations. In the 2024 LTO BiOp, Reclamation committed to initiating future consultations to address the near-field and far-field effects of operations of the Sites Reservoir Project and at that time, would provide sufficient information to support the site-specific analysis of operations. More information can also be found in the *Environmental Baseline* section of this BiOp related to existing consultations.

The 2024 LTO BiOp stated that Reclamation would initiate a subsequent section 7 consultation for the non-operational construction and maintenance components of the Sites Reservoir Project, which has ultimately prompted the need for this consultation. For additional context, the 2024 LTO BiOp also noted that construction of the Sites Reservoir would not affect delta smelt, their designated critical habitat, or longfin smelt, as the proposed location lies well north of the known range of both species.

The Proposed Action for which the Service is currently consulting on is the non-operational construction and maintenance components that had previously been analyzed in a framework approach within the 2024 LTO BiOp. Portions of the Proposed Action that have enough information available to address the specific effects and utilize standard consultation include: (1) geotechnical explorations, (2) construction, inundation, and recreation footprints, and (3) ground truthing and pre-construction surveys within the footprints, and Species Relocation Plan (***Figure 1***). Framework programmatic portions of the Proposed Action include compensatory mitigation, mitigation monitoring and adaptive management, and Operations and Maintenance [O&M] plans (***Figure 1***). These portions of the Proposed Action are not authorized to commence until these separate consultations are completed. The Service anticipates the subsequent consultations will be initiated by the appropriate Action Agency, depending on the specific project element, and will provide sufficient information as outlined in 50 CFR 402.12(f).

6.3 Habitat Conservation Planning

To reiterate, programmatic actions in this BiOp under the framework approach do not require an ITS at this time because Reclamation has identified those actions as being subject to future section 7 consultation. In the case of the O&M Plans as shown in ***Figure 1***, because Reclamation will not own, operate, or have discretionary involvement or control over the lands managed around all of the Project's facilities (e.g., the reservoir, conveyance facilities, etc.). Reclamation and the Authority signed a Memorandum of Agreement in September 2023 that identified that

the Authority would take the lead in initiating a section 10(a)(1)(b) permit (HCP) to cover the incidental take associated with those activities, as necessary. This would result in an intra-Service section 7(a)(2) consultation associated with the action of the Service issuing a permit and therefore serve as the subsequent consultation in this example. As the Project progresses, other programmatic actions in this BiOp may be identified as actions suitable to be addressed under this approach.

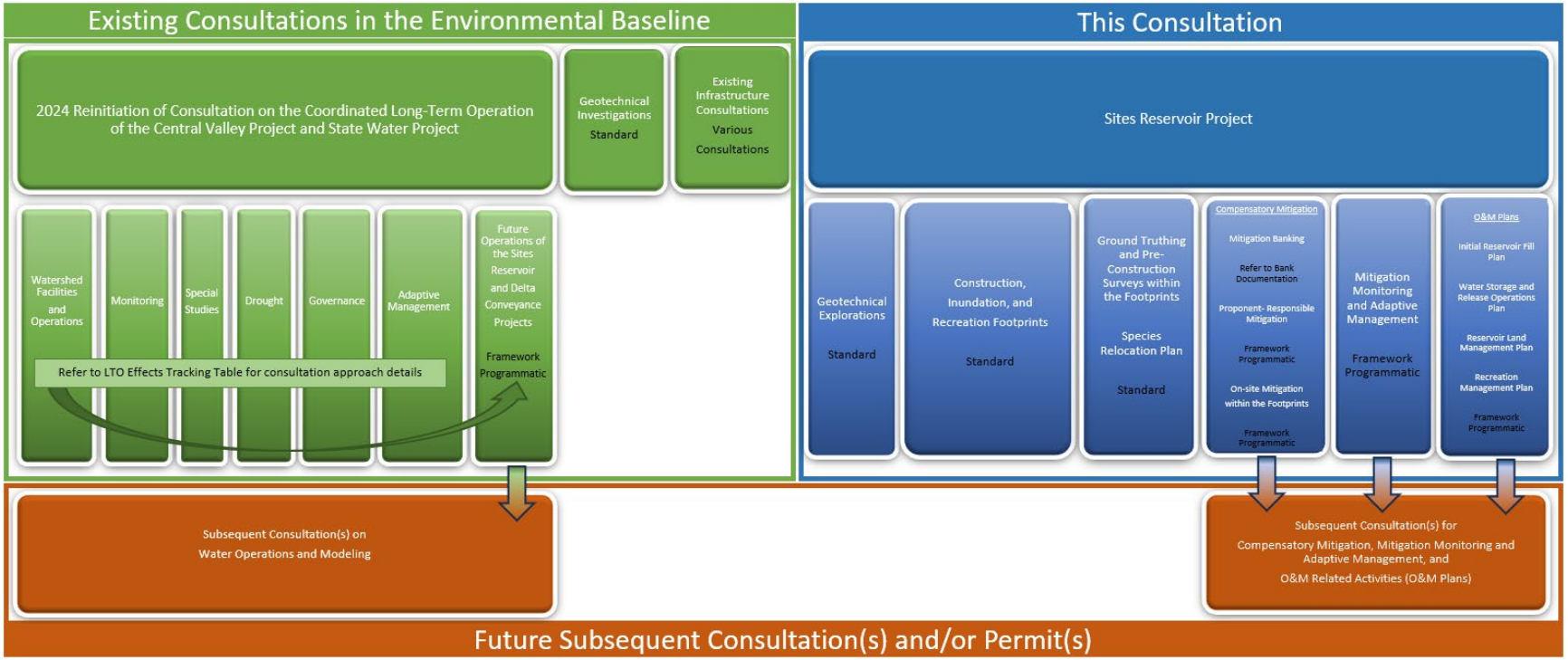

Figure 1. An illustration of relevant Sites Reservoir Project activities categorized by existing consultations, this consultation, and anticipated future subsequent consultations and/or permits. The consultation type is listed by project activity.

7. DESCRIPTION OF THE PROPOSED ACTION

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02). This federal action is authorized under the WIIN Act of 2016 (P.L. 114-322).

The fundamental role of this Project is to increase California's water supply and delivery system by increasing the operational flexibility of the CVP and SWP. The Project would use existing infrastructure to divert currently unregulated and unappropriated flow from the Sacramento River at Red Bluff and Hamilton City and convey water to a new off-stream Sites Reservoir west of the community of Maxwell. New and existing facilities would move water into and out of the reservoir. The planned reservoir would store up to 1.5-million-acre feet (MAF) of water and the geotechnical exploration, construction, inundation, and recreation area footprint encompasses approximately 22,829 acres. It will be filled opportunistically at variable rates within a maximum rate of about 4,200 cubic feet per second (cfs). Releases from Sites Reservoir would ultimately return to the Sacramento River system via existing canals and a new pipeline located near Dunnigan. Construction of the Sites Reservoir would necessitate improvements of existing roadways, building a bridge across the reservoir, and realignment of a segment of Huffmaster Road with a gravel road to residents at the south end of the reservoir. Additional components would include development of new recreational facilities at the reservoir. Figures showing the footprint of the project facilities are in ***Appendix B. Sites Reservoir Project Footprints***.

The Service has summarized this *Description of the Proposed Action* from Reclamation's BA and the full Proposed Action is incorporated by reference into this BiOp. The summary of the Proposed Action is organized into the following categories listed below in ***Table 1***.

Table 1. General Project elements.

Project Activity		Description
Construction		Construction of all Project facilities and initial filling of Sites Reservoir.
Operations		Operations, includes: • Diversions to Sites Reservoir, including resulting operating criteria and diversion criteria. • Water releases from Sites Reservoir. • Exchanges with Lake Oroville. • Flood control benefits. • Operation of facilities to meet Division of Safety of Dams criteria and requirements for emergency reservoir drawdown. • The generation of energy in operations and use of energy for

		operations. • Development of Operations and Management Plans.
Surveys and Reassessments		Occupancy and protocol-level species surveys to refine direct and indirect effects.
Conservation Measures		Measures incorporated into the Project to avoid, minimize, and mitigate effects on listed species.
Terrestrial Monitoring and Adaptive Management		The Authority will develop plans, subject to Service-approval, identifying specific locations for the compensatory mitigation for each species and the monitoring, performance criteria, and adaptive management measures that will be implemented to ensure the compensatory lands will be adequately managed and monitored for each species in perpetuity.
Compensatory Mitigation for Temporary and Permanent Impacts		Species-specific compensatory mitigation will be completed prior to construction (refer to Conservation Measure #2 [bullet 29] for mitigation phasing and 10 percent stay-ahead provisions), operations, and other activities at the ratios or acreages identified for each species.

7.1 Construction

Construction of the Sites Reservoir is comprised of numerous elements. Overall, construction is expected to take eight years for the reservoir facilities and two years for the conveyance facilities to complete and would be conducted concurrently for a total construction duration of 8 years. Several factors affect this anticipated schedule, including funding, environmental compliance, contracting methods and strategies, material and construction equipment availability, lead time for fabrication of major pipe, pumping and generating equipment, labor force constraints, weather, access road capacity limitation, property access, and land acquisition. Additional adjustments to the schedule would be addressed as required during Project development and implementation and could result in the need for reinitiation of this consultation.

Construction activities associated with the Project would be confined to designated construction disturbance areas, all of which are included within the Project footprint. Construction vehicles, equipment, and materials would also be parked or stored within these construction disturbance areas. Lath, fencing, or flags would be maintained until final cleanup or site restoration is completed, after which they would be removed. Temporarily disturbed areas would be restored

after construction is complete, consistent with the *Conservation Measures* section.

7.1.1 Construction Activities Applicable to Various Facilities

Geotechnical Explorations

To support the ongoing engineering and design of the Project, the Authority will undertake additional geologic, geotechnical**,** and geophysical investigations and testing. These investigations are in addition to geotechnical investigations that have already been consulted on (*Consultation History* and *Environmental Baseline*). The investigations would be implemented in various locations in and around the Antelope Valley and in Yolo County. Three types of studies are required: surface geologic, surface geophysical, and subsurface geotechnical investigations. The surface geologic investigations would be conducted via pedestrian surveys to map the existing geology of the Project region. Surface geophysical studies include noninvasive surveys to determine stratification properties. The subsurface geotechnical investigations consist of underground exploration utilizing several methods including pavement borings, auger borings, rotary wash borings, cone penetration tests (CPTs), seismic CPTs, piezometers, wells, test pits, fault trenches, dozer trenches, and test fill construction.

Table 2 summarizes the number of investigations proposed within each of the associated Project features. While exact locations for geotechnical investigations have not yet been identified, the Authority provided general information and estimated impact numbers during this consultation.

Table 2. Investigation type and number by Project feature planned to start in late 2025 (date subject to change).

Project Feature	Investigation Type and Approximate Number
Sites Reservoir	1. Up to 230 Rotary Wash Borings, 15 to 450 feet below grade 2. Up to 200 Auger Borings, 3 to 70 feet below grade 3. Up to 145 Test Pits, 18 feet below grade 4. Up to 6 Dozer Trenches, 15 to 20 feet below grade 5. Up to 50 Piezometers/Wells, 25 to 550 feet below grade 6. Up to 6 Test Fill Construction, 1-2 acres each 7. Up to 25 Geophysics Surveys, 50 to 7,500 feet in length and at each investigation point, noninvasive 8. Geologic Mapping in up to 20 locations, noninvasive
Funks Reservoir	1. Up to 375 Borings and CPTs, 20 to 100 feet below grade 2. Up to 10 Test Pits, 18 feet below grade 3. Up to 10 Geophysics Surveys, noninvasive 4. Geologic Mapping in up to 20 locations, noninvasive
TRR and Pipeline	1. Up to 700 Borings/CPTs, 10 to 100 feet below grade 2. Up to 10 Test Pits, 18 feet below grade 3. Up to 10 Geophysics Surveys, noninvasive 4. Geologic Mapping in up to 20 locations, noninvasive

Project Feature	Investigation Type and Approximate Number
Dunnigan Pipeline	1. Up to 70 Borings/CPTs, 18 to 80 feet below grade 2. Up to 10 Test Pits, 18 feet below grade 3. Up to 5 Geophysics Surveys, noninvasive 4. Up to 16 Piezometers/Wells, 50 to 80 feet below grade 5. Geologic Mapping along entire pipeline alignment, noninvasive

Clearing, Grubbing, and Topsoil Preservation

Clearing and grubbing would be required in the inundation area footprint and for most built facilities (i.e., dam facilities, Inlet-Outlet [I/O] Works, Funks Reservoir facilities, Terminal Regulating Reservoir [TRR] facilities, and Dunnigan Pipeline) and would entail removing and disposing of woody vegetation. This work is estimated to occur over three years. Materials cleared and grubbed would be composted, reused, placed in the reservoir inundation area to provide future fish habitat, or hauled off and recycled to the extent possible. Although the reservoir could fill within two years of initial operation should river conditions allow maximum diversions, it is estimated to take approximately 2 to 5 years for the reservoir to reach its maximum capacity.

Prior to construction, measures would be taken to preserve topsoil. In the inundation area where disturbance would occur, the topsoil material would be excavated, stockpiled separately, and used in one of several ways: for restoration of temporary work areas outside the inundation area, for support of native or naturalized plant species around a facility following construction, or for placement in agricultural areas. In the irrigated agricultural areas around the TRR and Dunnigan Pipeline, topsoil would be removed, stored, and replaced in areas of orchards, row crops, and rice fields. The topsoil would be restored so it has the same composition, except where it is located on permanent maintenance roads.

Borrow Areas and Quarries

It is anticipated that all earth and rockfill for the reservoir facilities (approximately 80 percent of materials required) would come from on-site sources (within the Sites Reservoir area or just outside Antelope Valley) and all aggregate for dam construction (approximately 20 percent of material required) would be obtained from off-site commercial sources.

Batch Plants

For dam construction, batch plants would be established in the inundation area of the Sites Reservoir or in staging areas outside the inundation area near various reservoir facilities. Concrete batch plants would be necessary for the I/O Works, Golden Gate Dam, Sites Dam, diversions, saddle dams, and the bridge crossing the reservoir. Asphalt batch plants would be used for paving activities of public access and maintenance roads.

Construction Traffic and Equipment

Approximately 1,700 Project-related construction personnel would be working at the peak of

construction. Up to 1,000 of these personnel would be involved with reservoir facilities and approximately 700 would be working on conveyance facilities. Daily construction traffic would consist of trucks hauling equipment and materials to and from the worksites and the daily arrival and departure of construction workers.

7.1.2 Sacramento River Diversion and Conveyance to Regulating Reservoirs

The Project would involve the diversion of water from the Sacramento River at the existing RBPP and Hamilton City Pump Station and includes improvements to both facilities. At the RBPP , the Project would entail the installation of two additional 250-cfs, 600 horsepower (hp) vertical axial-flow pumps into existing concrete pump bays. The Project would also require a new Glenn-Colusa Irrigation District (GCID) Main Canal headgate structure operating at 3,000 cfs about 0.25 mile downstream of Hamilton City Pump Station. Supplemental information, provided to the Service on December 17, 2024, identified in-water work would occur at the Hamilton City Pump Station and the Authority and Reclamation committed to preparing a Service-approved Dewatering Plan.

7.1.3 Regulating Reservoirs and Conveyance Complex

Multiple facilities would be required to control the conveyance of water between Sites Reservoir and the TC Canal and GCID Main Canal. These facilities would include regulating reservoirs (Funks Reservoir and the TRR), pipelines, pump generation plants (PGPs), switchyards, and administration and maintenance buildings.

Terminal Regulating Reservoir Facilities

Pumping from the GCID Main Canal to Sites Reservoir would require construction of the TRR, the TRR PGP, an electrical substation, and TRR pipelines. The TRR would be located in Colusa County near the GCID Main Canal and east of Funks Reservoir. The PGP and electrical substation would encompass approximately seven acres. Construction would include clearing and grubbing; constructing temporary access roads and staging areas; constructing a dewatering system near Funks Reservoir and potentially along Funks Creek so that installation of the pipelines can be done in the dry season; stringing pipe, excavating trenches, laying pipe, welding, backfilling trenches, restoring surfaces, utilizing native material to make controlled low strength material (CLSM) for pipe trench backfill; installing appurtenances; and testing the pipeline.

Terminal Regulating Reservoir

The TRR would encompass approximately 100 acres and have a storage capacity of approximately 600 AF. The TRR would have an earthen embankment around the perimeter and an impermeable lining consisting of a geomembrane overlying geocomposite placed over compacted earth. The TRR would be hydraulically connected to the GCID Main Canal to allow water to be conveyed to and from the Sites Reservoir. The GCID Main Canal would be the conveyance source of water for the TRR and its PGP to pump water to Sites Reservoir. The canal would also be the primary conveyance for releases of water from the TRR and its PGP

from Sites Reservoir. Maintenance activities unique to the TRR would include daily visual inspections, setting and checking water control structures, annual and 5-year dam safety inspections, quarterly vegetation and weed abatement and rodent control, annual preventative leak location surveys and evaluations of the reservoir liner, instrumentation monitoring and maintenance, and annual debris removal at the spillway outfall to Funks Creek. Replacement of the TRR liner may be needed on an infrequent basis.

TRR Pumping Generating Plant

A TRR PGP would pump water from the TRR to Sites Reservoir; the PGP would include hydroelectric turbines to generate electricity when water was released from Sites Reservoir to the TRR. The PGP would include the following three facilities in five buildings: one pump station, two turbine generator buildings, and two energy dissipation valve structures.

TRR Electrical Substation

An electrical substation would be required to provide electricity to the TRR PGP facilities. The electrical substation would connect to existing Pacific Gas and Electric Company (PG&E) or Western Area Power Administration (WAPA) lines. The substation would be constructed on approximately 1.5 acres within the TRR PGP footprint to the north of the TRR. The dimensions of the electrical substation would depend on whether it is connected with PG&E or WAPA lines.

TRR Pipeline

The TRR pipeline would convey water underground approximately 4 to 4.5 miles between the TRR PGP and Sites Reservoir. In the BA, *Figure 2-7*, *Terminal Regulating Reservoir Main Reservoir Plan* show the location and alignment route of the pipeline. The 12-foot-diameter pipe would extend from the TRR PGP, under Funks Reservoir, and terminate at the transition manifold south of Funks Creek near the Golden Gate Dam. The TRR pipeline would connect to one, 32-foot-inside diameter I/O tunnel at the transition manifold.

Funks Reservoir

The existing Funks Reservoir would be used to store and pump water from the TC Canal to and from Sites Reservoir. Excavation of existing accumulated sediment from Funks Reservoir would be required, as would the construction of three facilities: Funks PGP, an electrical substation, and Funks pipelines. These facilities would be constructed in Colusa County, west of the TC Canal, on approximately seven acres. The existing Funks Reservoir would be used as a source of water to pump to Sites Reservoir and would receive water discharged from the reservoir. The Project would not alter the footprint of Funks Reservoir; however, 740,000 cubic yards (CY) of sediment that has accumulated since it was originally constructed would be excavated from the reservoir. The excavated sediment would be deposited adjacent to Funks Reservoir and used as fill during construction of the Project. Construction of access roads and stockpile areas are necessary for dredging and excavation of sediments. The construction of temporary cofferdams and pipeline through Funks Reservoir, will also be necessary, but will be

removed after sediment removal is complete.

Funks Pumping Generating Plant

The Funks PGP would be used to pump water from Funks Reservoir to Sites Reservoir. The PGP would be constructed on the northwest side of Funks Reservoir. The PGP would include the following three facilities in five buildings: one pump station, two turbine generator buildings, and two energy dissipating structures. An electrical building (Funks electrical substation) would also be constructed behind the pumps as part of the pump station. Construction of the PGP would include construction of access roads and staging areas, foundation excavations, facility construction, reservoir testing, and testing and commissioning of pumps.

Funks Electrical Substation

The Funks PGP would require a substation to provide electricity to the Funks PGP facilities. This substation would connect to either existing WAPA or PG&E lines. The substation would be located west of Funks Reservoir in the footprint of the Funks PGP and would encompass approximately three acres. The dimensions of the electrical substation would depend on whether it is connected with PG&E or WAPA lines.

Funks Pipelines

Two underground Funks pipelines would convey water approximately one mile between the Funks PGP and Sites Reservoir. The 12-foot-diameter pipes would extend from the Funks Reservoir and Funks PGP and terminate at the transition manifold south of Funks Creek near the Golden Gate Dam. The Funks pipelines generally run parallel to the TRR pipelines. After curving around Funks Creek and hilly areas, the Funks pipelines run south, deviating from the TRR pipeline alignment to the Funks PGP. The Funks pipelines would connect to the 32-foot-inside diameter I/O tunnel at the transition manifold. After installation, the pipelines would generally be from 6 feet to 25 feet below ground surface.
Construction would include clearing and grubbing; constructing temporary access roads and staging areas; constructing a dewatering system near Funks Reservoir and potentially along Funks Creek so that installation of the pipelines can be done in the dry season; stringing pipe, excavating trench, laying pipe, welding, backfilling trenches, restoring surfaces, utilizing native material to make CLSM for pipe trench backfill; installing appurtenances, and testing the pipeline.

7.1.4 Transition Manifold

The transition manifold would be constructed south of Golden Gate Dam to connect Sites Reservoir to Funks Reservoir and the TRR. The transition manifold would be installed approximately six feet below ground and would be approximately 114 feet long by 92 feet wide. In addition to the transition manifold structure, a 12-inch-diameter underground pipeline would extend 2,800 feet north from the transition manifold to Funks Creek, where it would discharge via an energy dissipation structure/outlet before entering the creek. Construction

would include clearing and grubbing the work and staging area of the transition manifold between the reservoir tunnel and Funks pipelines, delivering pipe materials to the area, installing piping and valves and welding them together, backfilling with combination of CLSM and native material, and regrading the area to a smooth surface.

7.1.5 Electrical Transmissions Connections

New high-voltage transmission lines would be required to provide power to the Funks and TRR PGPs. Transmission lines connecting Funks and TRR substations would also be required. Interconnecting to the existing transmission system would be necessary to provide the electricity needed to operate the large pumps at the TRR and Funks Reservoir. Construction would include clearing and grubbing the easement area for the inner connection line, forming and pouring tower foundations, erecting towers, installing conductors between the inner connection point and Funks/TRR substations, and energizing and testing lines.

North-South Transmission Connections

A new north-south transmission line originating between Funks Reservoir and TRR would connect to WAPA or PG&E existing facilities. The point of interconnection (POI) to existing transmission facilities would require construction of a third substation, which is expected to be located adjacent to either the WAPA or PG&E 230-kilovolt (kV) transmission lines.

East-West Transmission Lines

There would also be an interconnection between the Funks and TRR PGPs, and it is anticipated that the transmission lines would parallel the pipelines within the same easement. Up to four 230-kV transmission lines would be required: two for the source supply to either of the PGPs and two between the Funks and TRR electrical substations.

7.1.6 Administration, Operations and Maintenance, and Storage Buildings

The Project would involve the construction of an administration and operations building and a maintenance and storage building. These buildings would be located along the existing gravel access road to the Funks PGP on approximately 0.15 acre. Construction of the proposed buildings would include clearing and grading; transporting materials and placing them at staging areas; constructing ancillary facilities (e.g., potable water source, septic system, lighting, concrete pad for refueling island, aboveground fuel tanks, perimeter fencing); and performing site restoration after construction is complete.

7.1.7 Sites Reservoir and Related Facilities

Water would be impounded by the Golden Gate Dam on Funks Creek and the Sites Dam on Stone Corral Creek; a series of saddle dams along the eastern and northern rims of the reservoir would close off topographic saddles in the surrounding ridges to form Sites Reservoir. A total of nine dams (Golden Gate Dam, Sites Dam, and seven saddle dams) would create the 1.5 MAF Sites Reservoir. Two saddle dikes would be required to close off topographic saddles in the

ridges near Saddle Dams 8A and 8B (discussed below under *Dams and Dikes*).

Inlet/Outlet Works

The I/O Works for the reservoir are generally located south of Golden Gate Dam in Sites Reservoir (*BA, Figure 2-14*, *Plan of Inlet/Outlet Works Site*). The I/O Works consists of a low-level intake, multi-level I/O tower, and one I/O tunnel.

I/O Tower

The 300-foot-tall, multi-level I/O tower would allow flows into and out of the reservoir through the use of ports around the tower's perimeter. One 32-foot-inside-diameter I/O tunnel would extend from the I/O tower through the ridge on the right abutment of Golden Gate Dam. It would daylight on the other side of the ridge and connect to the transition manifold. The tunnel would be about 3,110 feet long.

Construction of the I/O Works would disturb approximately 30 acres in the reservoir inundation area, and another 30-acre area outside of it at the downstream (eastern) tunnel portal. The construction disturbance would consist of the footprint of the two intake structures, the tunnel portals, the materials, spoils and equipment staging areas, and access roads. A portion of the footprint outside of the reservoir inundation area would overlap with the disturbance area for the conveyance system to Funks Reservoir.

Construction would include surveying and setting the work in the construction area; clearing, grubbing, and preparing materials laydown and equipment staging areas; building access roads, installing temporary infrastructure, and transporting construction materials and equipment to the site; excavating the hillside for the downstream and upstream tunnel portals 80 feet and 180 feet deep, respectively; dewatering the construction site with an on-site treatment facility that would likely include settling basins with treatment for oil/grease, settable solids, pH and turbidity; tunneling and hauling tunnel muck to a disposal area; constructing the multi-level tower of reinforced concrete; and finishing grading and site cleanup.

Dams and Dikes

The Project would include Sites Dam and Golden Gate Dam along with several saddle dams and saddle dikes of varying heights and lengths (***Table 3***). The dams and dikes would be embankment dams consisting of a combination of earth and rockfill embankment zones with a central impervious core, exterior upstream rockfill shell, and downstream earthen shell.

Table 3. Main Dam, Saddle Dam and Saddle Dike summary.

Dam/Dike	Maximum Height Above Streambed (feet)	Length (feet)	Acres
Sites Dam	267	781	18.68
Golden Gate Dam	287	2,221	38.10
Saddle Dam 1	27	318	1.76
Saddle Dam 2	57	250	1.55
Saddle Dam 3	107	3,422	32.99
Saddle Dam 5	77	1,894	17.92
Saddle Dam 6	47	362	2.37
Saddle Dam 8A	82	1,300	13.13
Saddle Dam 8B	37	475	1.17
Saddle Dike 1	12	122	0.71
Saddle Dike 2	12	198	1.04

Construction would include dewatering the construction site and an on-site water treatment facility, constructing cofferdams, trenching for the diversion pipeline at Golden Gate Dam, hillside excavation for the downstream and upstream tunnel portals for Sites Dam, excavating the tunnel and hauling tunnel muck to a disposal area for Sites Dam following tunnel portal construction, excavating for the intake structures and downstream energy dissipation structures, constructing the structures from reinforced concrete, and managing groundwater. Cofferdams would be required along Stone Corral and Funks Creeks for construction of Sites Dam and Golden Gate Dam, respectively. The cofferdams would be incorporated into the upstream toe of the embankment dams and would be constructed of material likely derived from the excavation of the dam foundations. Borrow areas and quarries will be developed in order to provide materials necessary for dam construction. Excavation of alluvium and decomposed and intensely weathered bedrock from the entire footprint of the main dam sites will occur to reach a moderately weathered bedrock surface. Materials used for construction of dam embankment would be hauled in large dump trucks from the borrow areas and quarries, spread by graders or bulldozers, moisture conditioned with water trucks, and compacted with sheepsfoot rollers and vibratory compactors.

7.1.8 Conveyance to Sacramento River

Water released from Sites Reservoir would be conveyed south of the reservoir using the existing TC Canal and a new Dunnigan Pipeline. The water would flow south about 40 miles to near the end of the TC Canal, where it would be diverted into the Dunnigan Pipeline. The flows would subsequently be conveyed to the Colusa Basin Drain (CBD) and ultimately reach the Sacramento River. Supplemental information, provided to the Service on December 17, 2024, identified in-water work would occur at the Dunnigan Pipeline at the Colusa Drain and the Authority and Reclamation committed to preparing a Service-approved Dewatering Plan. Reclamation owns the RBPP, the TC Canal, and Funks Reservoir, and GCID owns the

Hamilton City Pump Station and the GCID Main Canal. The Authority would own and operate all new facilities. The Tehama-Colusa Canal Authority (TCCA), under contract to Reclamation, would continue to operate the RBPP, TC Canal and Funks Reservoir. GCID would continue to operate the Hamilton City Pump Station and the GCID Main Canal.

Tehama-Colusa Canal Intake

A new intake would be required to move water from the TC Canal into the Dunnigan Pipeline. The TC Canal intake site would encompass approximately 0.5 acre and be accessed from the existing TC Canal access road. Construction would include clearing and grubbing the area along TC Canal for the inlet structure, placing the cofferdam in TC Canal and bypass pumping around inlet site to provide limited flow to end of canal and downstream users (less than ¼ mile from end of canal), transporting materials to the site, placing construction materials at staging areas, building the inlet structure, which would consist of excavating the ground to accommodate placement of structural concrete and rebar, and connecting the inlet structure to the Dunnigan Pipeline. The staging area would be located on the east side of the TC Canal and just north of the Dunnigan Pipeline. Access to this structure is anticipated to be from the existing TC Canal access road.

Dunnigan Pipeline

The Dunnigan Pipeline would convey water released from the TC Canal to the CBD. The Dunnigan pipeline would be about four miles long and have a minimum depth of six feet below ground surface. A CBD outlet with an energy dissipation facility would be required at the downstream end of the pipeline prior to discharging the water into the CBD. Construction of the Dunnigan Pipeline from the TC Canal to the CBD would require dewatering, trenching, and pile driving or a vibration hammer. Dewatering would be necessary for a segment of the pipeline to reduce groundwater levels to 20 or 30 feet below ground surface along its length. Trenching and pipeline installation would be completed after dewatering. Pile driving or a vibration hammer would be used to install piles for construction of the CBD outlet. Construction would include an open cut of approximately 100 feet to cross Bird Creek in the dry season.

Construction would include clearing and grading the pipeline alignment; excavating the pipeline trench and provide shoring; installing and welding up the pipeline and backfilling with a combination of CLSM and native material; installing flow meters, valving, air valves, blowoffs, and access manways; installing a cathodic protection system consisting of rectifiers attached to pipe; revegetating and restoring the pipeline route and constructing a gravel maintenance road along the pipeline route; constructing the CBD Outlet Structure; clearing and grubbing the area along the CBD for the outlet structure; transporting materials to the site; placing construction materials at staging areas; building the outlet structure, which would consist of excavating the ground to accommodate placement of structural concrete and rebar; connecting the outlet structure to the Dunnigan Pipeline; and testing the facility.

7.1.9 Recreation Areas

The Project involves the development of two primary recreation areas and a day-use boat ramp. The recreation areas would also require a network of new roads and upgrades to existing roads for maintenance and local access. The Peninsula Hills Recreation Area would be located on the northwest shore of the Sites Reservoir and would encompass up to 373 acres. The Stone Corral Creek Recreation Area would be located on the eastern shore of the Sites Reservoir and would encompass up to 235 acres. The day-use boat ramp would be located on the western side of the reservoir where the existing Sites Lodoga Road intersects with the proposed inundation area for the reservoir and would encompass up to 10 acres.

Construction of the recreation areas and facilities would consist of clearing and grubbing, excavating, backfilling, constructing roads and parking lots, installing utility connections, constructing amenities, constructing the boat ramps, and restoring temporarily disturbed areas. It is anticipated that all construction activities associated with the recreation areas would occur within the proposed footprints of the recreation areas and the temporary and permanent access road areas.

The total construction disturbance area of the recreation areas would be within the acreage of the recreation areas themselves, which is approximately 618 acres. Construction disturbance may be much less if recreational facilities are designed and constructed to minimize vegetative disturbance, including tree removal. Anticipated ground-disturbing and related activities during construction include surveying, clearing and grubbing, excavating, backfilling, constructing the road and parking lot, installing potable water and power connections, installing amenities, constructing the boat ramp, and performing site revegetation.

7.1.10 New and Existing Roadways

Approximately 46 miles of new paved and unpaved roads will be constructed to provide construction and maintenance access to the proposed facilities, as well as public access to the proposed recreation areas. Several existing roads would be improved to support the construction of Sites Reservoir facilities. The disturbance area for roads would include the footprints of the proposed roads and stream crossings, the staging areas for materials and equipment, and the area needed to construct the facilities and access roads.

Construction would include surveying; setting up staging areas within the Sites Reservoir footprint; constructing access roads involving grading; transporting materials and equipment to the site; setting up offices and batch plants; clearing and grubbing; excavating and stockpiling; constructing roadway fill prisms for the reservoir crossing; constructing bridge pier and abutment foundations, piers and abutments, and superstructures; relocating utilities, if necessary; constructing roadway embankments and cuts; widening roadways and intersections; constructing temporary and permanent fencing; constructing temporary and permanent roadway drainage conveyance systems; extending, improving, or replacing bridges and box culverts; extending or replace pipe culverts; and cleaning up the site, removing equipment, and restoring the area.

7.1.11 Construction Schedule

Project construction is expected to take approximately 8 years. Factors that could affect the schedule include funding, implementing agency environmental requirements, contracting methods and strategies, material and construction equipment availability, lead time for fabrication of major pumping and generating equipment, labor force constraints, weather, and access road capacity limitations. Adjustments to the schedule would be addressed as the Project is developed and implemented. The general construction schedule is shown in ***Table 4***.

Construction activities are generally anticipated to occur between 7:00 a.m. and 7:00 p.m. Nighttime and weekend construction may occur on an as-needed basis. If nighttime construction is necessary, construction lighting and noise would comply with applicable federal, state, and local requirements.

Table 4. General construction timing and sequencing.

Task Name	Approximate Duration	Approximate Start	Approximate Finish
Reservoir Site Development			
Site Access & Staging Development	100 days	2026	2027
Demolition & Clearing	100 days	2026	2027
Roads and Bridge			
Northern Construction Access Roads	284 days	2027	2028
Southern Construction Access Roads	274 days	2027	2028
Sites Lodoga Road Realignment and Bridge	680 days	2027	2029
Huffmaster Road Realignment	801 days	2027	2029
Process & Haul Filter Materials to Site	1,180 days	2027	2031
Dams and Dikes			
Golden Gate Dam	1,195 days	2027	2032
Sites Dam	956 days	2027	2032
Saddle Dam 3	771 days	2027	2031
Saddle Dam 5	821 days	2027	2031
Minor Saddle Dams (1, 2, 6, 8A)	711 days	2027	2031
Saddle Dam 8B - Spillway	257 days	2027	2028
Inlet Outlet Facilities	1,015 days	2027	2032
Conveyance to Sacramento River			
Dunnigan Pipeline	355 days	2028	2032
Regulating Reservoirs and Conveyance			
Funks/TRR Pipelines	965 days	2027	2030
Funks Reservoir	523 days	2027	2029
Funks Pumping Generating Plant	1,062 days	2027	2031
TRR Reservoir	780 days	2027	2030
TRR Pumping Generating Plant	1,010 days	2027	2030
Transmission Powerlines	875 days	2027	2030
Substations	755 days	2027	2030
Sacramento River Diversion and Conveyance			
Red Bluff Pumping Plant Improvements	560 days	2027	2029
GCID Improvements	680 days	2027	2029

7.2 Operations and Maintenance

The Authority will own and operate the Sites Project to take advantage of flows associated with winter-storms and changing patterns in precipitation associated with climate change. The Project is intended to provide a supplemental dry year water supply and provide an additional resource to address the environmental impacts of water development in the Sacramento River Basin. Future operations of the Project that are addressed programmatically in the 2024 LTO BiOp, include: (1) diversions to Sites Reservoir, including resulting operating criteria and diversion criteria, (2) water releases from Sites Reservoir, (3) exchanges with Lake Oroville, (4) flood control benefits, (5) operation of facilities to meet Division of Safety of Dams criteria and requirements for emergency reservoir drawdown, and (6) the generation of energy in operations and use of energy for operations. In the 2024 LTO BiOp, Reclamation committed to initiating subsequent consultations to address the near-field and far-field effects of operations of the Sites Reservoir Project and at that time, would provide sufficient information to support the site-specific analysis of operations.

The Authority is expected to develop several comprehensive O&M Plans to ensure the long-term functionality and sustainability of the system. In the 2024 LTO BiOp, these types of O&M plans were broadly included programmatically as "non-operational construction and maintenance components." The following O&M plans are referenced in the BA and the Authority has agreed to be responsible for preparing and/or implementing them. The plans identified are: Dewatering Plan; Water Storage and Release Operations Plan; Land Management Plan; Recreation Management Plan; Initial Reservoir Fill Plan; Emergency Action Plan; Worker Awareness Training; Storm Water Pollution Prevention Plan; Environmental Compliance Program (i.e., Construction Monitoring Plan); Erosion and Sediment Control Plan; Spill Prevention, Containment, and Countermeasure Plan; Hazardous Materials Management Plan; Relocation Plan for the Giant Garter Snake; Relocation Plan for Western Spadefoot; Relocation Plan for Northwestern Pond Turtle; Invasive Species Management Plan; Construction Phasing Plan; Mitigation Phasing Plan; and Site-specific Management and Monitoring Plan(s) for mitigation sites. Some of the O&M Plans may not be drafted or finalized until after a subsequent consultation for water operations has been completed. A description of what will be included in these plans are further defined in the BA and therefore incorporated by reference herein.

7.2.1 Operations and Maintenance Activities

Maintenance activities unique to the TRR would include daily visual inspections, setting and checking water control structures, annual and 5-year dam safety inspections, quarterly vegetation and weed abatement and rodent control, annual preventative leak location surveys and evaluations of the reservoir liner, instrumentation monitoring and maintenance, and annual debris removal at the spillway outfall to Funks Creek. Replacement of the TRR liner may be needed on an infrequent basis.

Maintenance activities unique to the TRR and Funks PGPs and hydroelectric turbines would involve greasing, painting, oiling, and keeping the pumps in good operating condition. These activities would also include different monthly and annual inspections of pumps, interior coating condition inspection, pump leakage inspections, temperature and pressure checks, and exterior surface cleaning. Repair and replacement of pump components would be needed on a periodic

basis. Energy dissipation structures would be visually inspected, and lubrication of bearings would be conducted on an as-needed basis.

Operations and maintenance activities unique to the electrical switchgear would include visual and mechanical inspections, moisture and corrosion inspections, general wiring checks, and insulator and barrier checks. A series of tests would be conducted at regular intervals, including but not limited to insulation electrical tests, control wiring electrical tests, circuit breakers and switch tests, system function tests, and surge arrestor tests. Electrical switchgear would be maintained, repaired, or replaced as needed to continue safe and efficient operations.

Pipelines and tunnels would be inspected at least every 5 years and remote operated vehicle inspections would be acceptable. Remote operated vehicle inspections would not require dewatering the tunnel or pipelines. If physical inspections of tunnel interiors are required, the tunnel would be completely shut down. Tunnel inspections may be completed during normally scheduled shutdowns when water is not being conveyed into or out of the reservoir. The tunnel shutdown duration could range from a few days (inspection only) to 2 weeks (if maintenance is required).

Different components of the I/O Works would need to be inspected and maintained at varying frequencies. Any port gate that was not operated in a given year based on reservoir water surface elevation would be functionally tested at least once during that year. In general, pipeline appurtenances (e.g., air/vacuum valves, blowoffs) would be inspected and functionally tested where possible annually. Most of the mechanical components in the multi-level I/O tower could be functionally tested and/or maintained without requiring a shutdown (as there would be multiple tiers from which to draw water).

Maintenance of access roads would include replacing gravel, scraping and filling ruts in gravel roads, or pavement replacement and repair for paved roads. Minor infrastructure maintenance would include repair or replacement of gates, locks, or fencing; painting gates; replacing lost or damaged signage; and lubricating gates. Maintenance of lands could include grading fire breaks/trails, maintaining vegetation (e.g., grazing, tilling, or disking), and performing limited prescribed/controlled burns.

In general, operations and maintenance activities could occur on a daily, annual, periodic (as needed), and long-term basis. It is estimated that 30 operations and maintenance workers would be needed to perform operations and maintenance activities (based on three shifts per day, 365 days a year).

7.2.2 Guiding Principles for Operations and Maintenance Activities

The following Guiding Principles are proposed by the Authority and Reclamation to establish a framework in this consultation under which future O&M Plans will be developed and support forthcoming permit and/or subsequent consultation(s) on the specific effects of implementation that have the potential to adversely affect federally listed species. In order to ensure that the future actions developed are consistent with this analysis and continue to build upon what was analyzed in this document, the Service analyzed the following Guiding Principles. The Guiding

Principles are intended to align with landscape conservation and species-level recovery planning efforts that are either currently in place or under development.

The following Guiding Principles will be considered when developing and implementing O&M Plans:

- *Habitat Conservation* - Protect and enhance habitats for listed species.
- *Sustainable Management* - Implement environmentally sustainable practices for Project operations and maintenance activities.
- *Minimization of Species Impacts* - Reduce disturbances and impacts to terrestrial and semi-aquatic species during construction, operations, and maintenance activities.
- *Adaptive Management* - Monitor and adjust management strategies based on ecological data and species and/or their habitat needs.
- *Early Coordination and Follow-Through Collaboration* - Coordinate with fish and wildlife regulatory agencies early and often to ensure compliance and that BMPs are implemented.
- *Invasive Species Control* - Prevent the spread of invasive and undesirable species that could threaten native plants and species habitats.
- *Climate Resiliency* - Consider climate change impacts on species and their habitats in operations and management strategies.
- *Drought Planning* - Develop strategies to protect species and their habitats during drought conditions, ensuring water availability and habitat integrity.

In some instances, the Guiding Principles for protecting listed species on-site within the Project footprints during implementation of operations and maintenance activities may not be fully feasible due to the constraints and limitations of the Sites Reservoir Project, such as budgetary, technical, or operational challenges. However, these principles will serve as key considerations and will guide planning and management activities wherever possible. Efforts will be made to incorporate these principles without compromising the Project's primary objective of ensuring water supply reliability and meeting the needs of water storage and release. Balancing environmental protection with the functional requirements of the Project will remain a priority as feasible solutions are explored.

Issues that arise during the implementation of the Project will be addressed through program management and technical working group coordination meetings. These groups will bring together experts and decision-makers to evaluate and tackle complex challenges that arise during implementation related to habitat protection, species conservation, and water quality. The collaborative approach will help integrate ecological considerations into every phase of the Project's development and management in a meaningful way all while balancing the Project's operational goals.

7.3 Surveys and Re-assessments

Because Reclamation and the Authority did not have access to all lands within the Project footprints at the time of writing this BiOp, modeled habitat for terrestrial species was delineated using aerial imagery without ground verification. Following land acquisition and prior to

construction, they propose to conduct ground-truthing and surveys including field reconnaissance, suitable habitat delineation, biological surveys, and preconstruction surveys.

7.3.1 Field Reconnaissance

Some investigations will be conducted through pedestrian surveys, with qualified personnel walking an area to map existing features and landcover across the Project footprints. Surface studies will involve noninvasive survey methods, such as ground-penetrating radar or seismic refraction, to assess subsurface stratification and geologic properties without disturbing the ground.

7.3.2 Suitable Habitat Delineation

When land is acquired and becomes available for surveys, and prior to Project construction commencing, qualified biologists will survey modeled habitat in areas of potential direct or indirect effects for each species within accessible parcels and identify suitable habitat based on characteristics identifiable during surveys that would not have been evident in aerial imagery. These surveys will be conducted by qualified biologists experienced with field identification of suitable habitat characteristics of the species.

Delineation of habitat for giant garter snake, Greene's tuctoria, hairy Orcutt grass, Hoover's spurge, monarch butterfly, northwestern pond turtle, slender Orcutt grass, vernal pool branchiopods, and western spadefoot will be based on the presence of suitable habitat characteristics, as determined by a qualified biologist familiar with the species.

7.3.3 Protocol-level Surveys

Protocol-level surveys will be conducted for valley elderberry longhorn beetle in accordance with the U.S. Fish and Wildlife Service's *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (2017a). For other federally listed species, including giant garter snake, northwestern pond turtle, western spadefoot, and vernal pool branchiopods, surveys will be limited to suitable habitat delineation and occupancy surveys by qualified biologists, unless the Service establishes formal protocol-level survey methods prior to implementation. The results of these efforts will be used to refine impact areas and guide avoidance and mitigation strategies.

7.3.4 Biological Surveys

Due to lack of access to the geotechnical exploration, construction, inundation, and recreation footprints, modeled habitat was delineated for each of the federally listed and proposed species based on aerial imagery but without ground-level surveys to verify locations of suitable habitat. After land access is obtained, surveys will be needed to identify locations of and assess the occupancy of suitable habitat of areas of potential temporary or permanent effects. These surveys are not anticipated to be completed until after this BiOp has been issued. As such, Reclamation and the Authority will implement the following steps prior to Project construction.

Land cover mapped using aerial imagery will be ground-truthed and surveyed in phases as land is acquired (*BA Comment Tracker; Biological Survey Schedule*). After land becomes available for surveys and prior to ground disturbance, qualified biologists will survey modeled habitat for each species and identify suitable habitat based on characteristics identifiable during surveys that would not have been evident in aerial imagery. These surveys will be conducted by qualified biologists experienced with field identification of suitable habitat characteristics of the species. The Authority will complete protocol-level surveys to determine the presence or absence of biological resources including special-status species, state and federal waters, sensitive plant communities, and other applicable resources identified as sensitive by state and/or federal agencies. Reclamation and the Authority will use this information to refine the limits of impacts to listed species habitat, identify resources that will be avoided during construction, and determine final mitigation types and acres for those areas that cannot be avoided.

7.3.5 Occupancy Surveys

Once habitat has been field delineated as described, surveys will be conducted in suitable habitat of areas of potential direct or indirect effects for the listed plants, valley elderberry longhorn beetle, and vernal pool branchiopods. Surveys will be consistent with the most current Service survey guidelines for each species. Locations of listed plant populations and occupied habitat for these species will be mapped. Occupancy will be based on the following for each species (refer to ***Figure 5*** in the *Effects of the Action* for more detail on how this project activity has been constructed by species):

Listed Plants

A qualified botanist will complete botanical surveys in areas of potential direct or indirect effects of the Project using *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (Service 2000) and *Protocols for Surveys and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (California Department of Fish and Wildlife [CDFW] 2018), or the most recent protocols. The surveys will be floristic in nature and conducted in a manner that maximizes the likelihood of locating Keck's checkermallow, palmate-bracted bird's-beak, Greene's tuctoria, and Hoover's spurge (i.e., during the species' blooming periods and at an appropriate level of ground coverage). In the event that any of these species is found, specimens observed will be recorded with global positioning system (GPS) and mapped.

Additionally, milkweed and nectar plant species will be mapped by a qualified botanist during the botanical surveys to assist with the monarch butterfly habitat assessments. Specimens observed will be recorded with GPS and mapped.

Giant Garter Snake

While delineating suitable habitat, the biologists will identify and map locations of aquatic habitat features such as slow-moving waterways, marshes, and adjacent uplands using guidance from the *Recovery Plan for the Giant Garter Snake* (Service 2017b) in areas that would be

permanently or temporarily affected by construction. Presence is assumed to be occupied in this BiOp for areas of suitable habitat within the species range.

Monarch Butterfly

While delineating suitable habitat, the botanists will identify and map locations of milkweed and nectar plants using information from the *Monarch Nectar Plants of California* (Xerces 2019) in areas that would be permanently or temporarily affected by construction.

Northwestern Pond Turtle

All areas identified as suitable habitat by a Service-approved biologist that would be permanently or temporarily affected by the Project will be assumed to be occupied by northwestern pond turtle unless presence-absence surveys provide negative survey results. Presence-absence surveys will be conducted by a Service-approved biologist. The Service-approved biologist will submit survey results to the Service with maps indicating the locations of occupied aquatic habitat. The Service will review the survey results and provide concurrence or indicate any changes in the maps indicating which aquatic areas are considered occupied by the species based on survey results. Habitat within 650 feet of occupied aquatic features will be considered occupied upland habitat.

Valley Elderberry Longhorn Beetle

While delineating suitable habitat, the qualified biologist will map all shrubs with stems at least one inch in diameter consistent with the Service's 2017 framework for this species. The location of each elderberry shrub will be recorded using GPS, mapped, and documented for submittal to the Service.

Vernal Pool Branchiopods

A qualified biologist with experience conducting sampling for listed vernal pool branchiopods will complete surveys of the suitable habitat in the construction and inundation area that would be subject to potential direct or indirect effects of the Project prior to Project construction to determine whether the species are present. These surveys will follow the most current Service-approved protocols for the vernal pool branchiopods (Service 2017c) or a modified protocol, as approved by the Service. The qualified biologist will record the locations of any aquatic features supporting listed branchiopods found using a GPS unit.

If protocol-level surveys detect any of the listed vernal pool branchiopods in a vernal pool or other habitat feature, that feature will be considered occupied, and other suitable habitat hydrologically connected to occupied habitat through surface flows will be considered occupied. If a vernal pool branchiopod habitat feature is not surveyed, that feature will be assumed to be occupied habitat.

Western Spadefoot

All areas identified as suitable habitat by a Service-approved biologist that would be permanently or temporarily affected by the Project will be assumed to be occupied by western spadefoot unless presence-absence surveys provide negative survey results.

Presence-absence surveys will be conducted by a Service-approved biologist. The Service-approved biologist will submit survey results to the Service with maps indicating the locations of occupied aquatic habitat. The Service will review the survey results and provide concurrence or indicate any changes in the maps indicating which aquatic areas are considered occupied by the species based on survey results. Habitat within 1,200 feet of occupied aquatic features will be considered occupied upland habitat.

7.3.6 Reassessment and Reporting

Prior to each development phase, the Authority will reassess anticipated impacts based on survey results and determine mitigation needs based on anticipated impacts. The Authority will provide the Service with the following information in annual reports:

- Suitable habitat mapping;
- Methods and results for species surveys;
- Refined impact assessment; and
- Description of mitigation needs based on refined impact assessment.

7.4 Conservation Measures

The following conservation measures will be implemented as part of the Proposed Action:

Conservation Measure 1: Conduct Mandatory Biological Resources Awareness Training

Prior to the start of ground-disturbing work (including vegetation clearing, grading, and equipment staging), the Service-approved biologist will conduct mandatory biological awareness training to field management and Project-related construction personnel on the importance of protecting sensitive natural resources (i.e., listed species and designated critical and/or suitable habitat for listed species). Training will be conducted during pre-construction meetings so that Project-related construction personnel are aware of their responsibilities and the importance of compliance. All trainees will be required to sign a sheet indicating their attendance and completion of environmental training. The training sheets will be provided to the Service at the end of each phase of construction.

All Project-related personnel will be educated on the types of sensitive resources located in the Project area and the measures required to avoid and minimize effects on these resources. Materials covered in the training program will include environmental rules and regulations applicable to Project activities, requirements for limiting activities to approved work areas,

timing restrictions, and avoidance of sensitive resource areas. In general, trainings will include the following components:

- The natural history, appearance (using representative photographs), and legal status of species.
- Important work windows for listed species (i.e., timing of fish migration, spawning, and rearing; and wildlife mating, nesting, and fledging).
- Specific training related to the relevant measures that will be implemented during construction for the protection of listed species and their habitat.
- The legal requirements for resource avoidance and protection, and penalties for noncompliance.
- Identification of listed species potentially affected at the worksite, which will depend upon the work to be performed and the location of the work (while workers should be familiar with species identification, the biological monitors will ultimately be responsible for identifying the species).
- Protocol for identifying the proper measures to implement for the protection of listed species based upon the nature, timing, and location of construction activities to be performed.
- Brief discussions of listed species of concern.
- Boundaries of the work area.
- Avoidance and minimization commitments.
- Exclusion and construction fencing methods.
- Roles and responsibilities.
- What to do when listed species are encountered (dead, injured, stressed, or entrapped) in work areas.

A fact sheet or other supporting materials containing this information will be prepared and will be distributed along with a list of contacts (names, numbers, and affiliations) prior to initiating Project activities.

The Authority will maintain the record of training and make it available to the Service. If new Project-related construction personnel are added to the Project, the contractor will ensure that the new Project-related personnel receive the mandatory training and sign a sheet indicating their attendance and completion of the environmental training before starting field work.

Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources

General restrictions and guidelines that will be followed by Sites Project personnel and its contractors are listed below. The Project foreman will be responsible for ensuring that crew members adhere to these guidelines and restrictions.

- Service-approved biologists and biological monitors will have the authority to temporarily stop work in any area where a listed species has been observed until that individual has passively or physically been moved outside of the work area or when any

measures or Best Management Practices (BMPs) are not functioning appropriately for the protection of listed species.

- Temporary signs, staking, or flagging will be used to identify sensitive biological resources, and Project-related personnel will be advised to avoid disturbance of these areas. These areas will be identified during pre-activity surveys. Signs, staking, and flagging will be inspected by the biological monitor daily.
- Exclusionary fencing may be placed at the edge of active construction activities and staging areas (after having been cleared by biological surveys) to restrict wildlife access from the adjacent habitats. The need for exclusionary fencing will be determined during the preconstruction surveys and the construction planning phase and may vary depending on the species and habitats present. Fence stakes will face toward the work area (on the opposite side of adjacent habitat) to prevent wildlife from using stakes to climb over the exclusionary fencing. Exclusionary fencing will be maintained such that it is intact during rain events. Fencing will be checked by the biological monitor or construction foreman periodically throughout each workday. If fencing becomes damaged, it will be immediately repaired upon detection, and the monitoring biologist will stop work in the vicinity of the fencing as needed to ensure that no sensitive wildlife species have entered. Active construction and staging areas will be delineated with high-visibility temporary fencing at least 4 feet in height, flagging, or other barrier to prevent encroachment of Project-related personnel and equipment outside the defined Project footprint. Such fencing will be inspected and maintained daily by the biological monitor or construction foreman until completion of the Project. Fencing will be removed from work areas only after all construction activities are completed and equipment is removed. No Project-related construction activities will occur outside the delineated construction areas.
- Project-related vehicles will observe a speed limit of no more than 20 miles per hour (mph) in construction areas where it is safe and feasible to do so, except on roads open to the public with posted speed limits. A vehicle speed limit of no more than 20 mph will be posted and enforced on all nonpublic access roads.
- All vehicle parking will be restricted to established areas, existing roads, or other suitable areas.
- To avoid attracting predators, all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in enclosed containers, and trash will be removed and disposed of at an appropriate facility at least once a week from the construction or work site.
- To avoid injury or death to wildlife, no firearms will be allowed on the site except for those carried by authorized security personnel or local, state, or federal law enforcement officials.
- To prevent harassment, injury, or mortality of sensitive wildlife by dogs or cats, no canine or feline pets will be permitted in the Project area.
- To prevent inadvertent entrapment of wildlife during construction, all excavated, steep-walled holes or trenches more than one-foot deep will be covered at the close of each working day with plywood boards or similar rigid material. Dirt will be shoveled around the edges of the plywood or other material to prevent animals from crawling under it. In cases where trenches or pits cannot be covered, a section of the trench or pit will be partially backfilled to create an earthen ramp with a 3:1 slope to allow wildlife to escape. All trenches and pits will be inspected by the biological monitor before they are

backfilled. If a listed species is encountered during construction, the Project Biologist will be notified, and construction activities should be diverted away from the animal until it can be relocated according to the Service-approved relocation plan.

- Any sightings and any incidental take will be reported to the Project Biologist and the Service via email within one working day of the discovery. A follow-up report will be sent to these agencies, including dates, locations, habitat description, and any corrective measures taken to protect listed species encountered. For each listed species encountered, the biologist will submit a completed California Natural Diversity Database field survey form (or equivalent) to CDFW no more than 90 days after completing the last field visit to the site. Details regarding the timing, form, and information to include when notifying the Service may be revised after coordination with the Service.
- Plastic monofilament netting or similar material will not be used for erosion control, because smaller wildlife may become entangled or trapped in it. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine, or other similar fibers or tackified hydroseeding compounds. This limitation will be communicated to the contractor through specifications or special provisions included in the construction bid solicitation package.
- Wildlife can be attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures, construction equipment, or construction debris left overnight in areas will be inspected by the biological monitor or the contractor prior to being used for construction. Such inspections will occur at the beginning of each day's activities for those materials to be used or moved that day.
- Pesticides, including rodenticides, herbicides, and insecticides, will not be used by the Authority or its contractors in areas supporting habitat for federally listed species.
- Any efforts to capture, handle, or relocate listed species will be conducted by a Service-approved biologist in accordance with the Project's Service-approved species relocation plans. Any person who captures and handles listed species will not use soaps, oils, creams, lotions, insect repellents, solvents, or other potentially harmful chemicals of any sort on their hands within two hours before handling listed species. Latex gloves will not be used either. To avoid transferring diseases or pathogens between aquatic habitats during the course of surveys or the capture and handling of listed species, all species captured and handled will be released in a safe, aquatic environment as close to the point of capture as possible and not transported and released to a different waterbody.
- The Service will be verbally notified within 24 hours of the discovery of, injury to, or mortality of a listed species that results from Project-related activities. Written notification will be provided within five days. Notification will include the date, time, and location of the incident or of the discovery of an individual listed species that is dead or injured. For a listed species that is injured, general information on the type or extent of injury will be included. The location of the incident will be clearly indicated on a U.S. Geological Survey 7.5-minute quadrangle or similar map at a scale that will allow others to find the location in the field. The Project biologist is encouraged to include any other pertinent information in the notification. Details regarding the timing, form, and information to include when notifying the Service may be revised after coordination with the Service.

- To minimize temporary disturbances, all Project-related vehicle traffic and material storage will be restricted to established and/or designated ingress/egress points, construction areas, and other designated staging/storage areas. These areas will be included in preconstruction surveys and, to the extent possible, will be established in locations disturbed by previous activities to prevent further effects. Routes will be identified in the Project plans.
- Upon completion of the Project, all areas subject to temporary ground disturbance will be recontoured to pre-Project elevations, as appropriate and necessary, and revegetated with native vegetation to promote restoration of the area to pre-Project conditions. An area subject to "temporary" disturbance is any area that is disturbed to allow for construction of the Project but is not required for operation or maintenance of any Project-related infrastructure, will not be subject to further disturbance after Project completion, and has the potential to be revegetated. Appropriate methods and native plant species used to revegetate such areas will be determined on a site-specific basis in consultation with the Service.
- A joint pre-geotechnical exploration survey will be conducted by the Project geologist, drilling foreman, and Service-approved biologist at least 1 week prior to mobilization. This team will review the site location and drilling plan and coordinate in the field the final locations of the borehole and geophysics lines and the extent of the ground surface preparations (if any) at each bore location. The team will also confirm means of access by geotechnical studies personnel and coordinate in the field the final means of transportation and route of transportation for accessing the locations.
- At least one week prior to mobilization, the Project engineer, construction foreman, and Service-approved biologist will conduct a joint pre-construction survey of areas where Project impacts will occur. This team will review the site location and construction plan and coordinate in the field the final work locations and the extent of the ground surface preparations (if any) at each Project feature. The team will also confirm means of access by construction personnel and coordinate in the field the final means of transportation and route of transportation for accessing the locations. Surveyors for aquatic amphibians will decontaminate following standard procedures before entering wetlands or streams.
- Before helicopter use, biologists and Project-related personnel will confer to determine flight plans that avoid listed species and eagles. To the extent feasible, helicopters will fly higher than 300 feet over vernal pools, elderberry shrubs, and streams and ponds potentially occupied by listed species. Helicopter crews must be knowledgeable about environmental and safety regulations and to the extent feasible; staff and loads will be loaded in staging areas; ascent will be vertical; flights will be 300 feet above ground with staff; cargo loads will be 100 feet below helicopter; cargo flights will be 200 feet above ground; suspended loads will avoid populated areas; descent will be vertical; rotor diameter will be 72 feet; landing/takeoff disturbance will be 150 feet in diameter, and rotor wash at loading will be 40 to 50 mph.
- All Project-related personnel have the authority to stop work if listed species are observed. Any worker who inadvertently injures or kills a sensitive species or finds one dead, injured, or entrapped will immediately report the incident to the Project Biologist and Project foreman, who will immediately report the incident to the Authority. The Authority will provide verbal notification to the Service's San Francisco Bay-Delta Fish and Wildlife Office within one working day of any injury or mortality of listed species.

The Authority will follow up with written notification to the Service within five working days of any injury or mortality of listed species. Details regarding the timing, form, and information to include when notifying the Service may be revised after coordination with the Service.

- The clearing of vegetation and scraping or digging of soil for the Project will be limited to the minimal area necessary to facilitate Project activities.
- The Authority will ensure the preparation and implementation of Stormwater Pollution Prevention Plans (SWPPPs) to control short-term and long-term effects associated with construction-generated stormwater runoff for each construction phase. It is anticipated that multiple SWPPPs may be prepared for different aspects of the Project, each considering site- specific conditions (e.g., proximity to surface water, drainage). The SWPPPs will include all the necessary state requirements regarding construction-generated stormwater collection, detention, treatment, and discharge that will be in place throughout the construction period.
- The Authority will ensure the preparation and implementation of erosion and sediment control plans to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities. It is anticipated that multiple erosion and sediment control plans will be prepared for the construction activities included in the Project, each considering phasing and site-specific conditions such as proximity to surface water, erosion potential, drainage, etc. The plans will include all the necessary state requirements regarding erosion control and will implement BMPs for erosion and sediment control that will be in place for the duration of construction activities.
- The Authority will require that construction contractors develop a Spill Prevention, Containment, and Countermeasure Plan (SPCC Plan) for implementation at each site where ground-disturbing activities occur. Each SPCC Plan will comply with the regulatory requirements of the Spill Prevention, Control, and Countermeasure Rule (40 CFR Part 112) under the Oil Pollution Act of 1990.
- The Authority will ensure that each contractor responsible for site work under the Project will develop and implement a Hazardous Materials Management Plan (HMMP) before beginning construction. It is anticipated that multiple HMMPs will be prepared for the various construction sites, each considering site-specific conditions such as hazardous materials present on-site and known historical site contamination. A database on historical instances of contamination and results of any field inspections regarding the presence of hazardous chemicals will be maintained. The HMMPs will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities (e.g., intake pumping plants, maintenance facilities); phone numbers of applicable city, county, state, and federal emergency response agencies; primary, secondary, and final cleanup procedures; emergency response procedures in case of a spill; and other applicable information. The HMMPs will include appropriate practices to reduce the likelihood of a spill of toxic chemicals and other hazardous materials during construction and facilities operation and maintenance. A specific protocol for the proper handling and disposal of hazardous materials will be established before construction activities begin and will be enforced by the Authority.
- Project construction will be phased consistent with a phasing plan to be developed by the Authority. Prior to each phase of development, the impacts analysis will be refined and

mitigation requirements will be determined and the Authority will ensure that mitigation stays ahead of impacts for each phase. The Authority will ensure that the ratio of cumulative mitigation lands protection and restoration/creation for each covered species remains at least ten percent greater than the cumulative impacts on each covered species' habitat until the required compensatory mitigation acreages have been achieved. In the event that anticipated impacts in a given year on each covered species' habitat are such that the ten percent stay-ahead requirement would not be met, the Authority will notify the appropriate regulatory agencies and provide a plan for permanently protecting, and restoring if required, the necessary mitigation lands before proceeding with the covered activity (activity for which take authorization has been granted) causing the impact. Additional details regarding compensatory mitigation proposal is described in ***7.6 Compensatory Mitigation for Temporary and Permanent Impacts*** of this BiOp.

- Prior to initiating ground-disturbing Project activities, the Authority will provide information to the Service on the mitigation phasing plan that aligns with the anticipated phasing of construction and a description of the methodology to implement and comply with the 10 percent stay-ahead provisions.
- Permanent protection, restoration, and funding for perpetual monitoring and management of compensatory habitat will be complete before starting Project activities for each phase, or, if financial security is provided, after initiation of Project activities but before impacts on covered species' habitat occur. Financial security may be in the form of an irrevocable letter of credit or other security provided to the appropriate agency that covers the estimated costs of mitigation lands for any mitigation lands that are not in place before proceeding with that phase.

Conservation Measure 3: Listed Plant Species

The following measures will be implemented to avoid and minimize impacts on Keck's checkermallow, Greene's tuctoria, palmate-bracted bird's-beak, and Hoover's spurge:

- Prior to the initiation of ground-disturbing activities, a qualified botanist will complete botanical surveys using *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (Service 2000) and *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018). The surveys will be floristic in nature and conducted in a manner that maximizes the likelihood of locating Keck's checkermallow, Greene's tuctoria, palmate-bracted bird's-beak, and Hoover's spurge (i.e., during the species' blooming period and at an appropriate level of ground coverage).
- A qualified botanist will record the locations of all listed plant species found using a GPS unit and will flag these locations in the field.
- The qualified botanist will work with the Project-related construction personnel to avoid populations of all listed plant species by at least 250 feet.
- If avoidance is not possible, Reclamation will reinitiate consultation with the Service to address effects on the species.

Conservation Measure 4: Giant Garter Snake

The following measures will be implemented to avoid and minimize impacts on the giant garter snake and its habitat:

- The Authority will limit construction activity within giant garter snake habitat to the period between May 1 and October 1, which corresponds with the snake's active period. Work in giant garter snake upland habitat may also occur between October 2 and November 1 or between April 1 and May 1 if ambient temperatures exceed 75 Fahrenheit (°F) during construction activities and maximum daily temperatures have exceeded 75°F for a least three consecutive days immediately preceding work. During these periods giant garter snake are more likely to be active in aquatic habitats and less likely to be found in upland habitats. When unable to limit construction activity during this time, the Authority will coordinate with the Service for alternative measures and to mitigate impacts.
- No less than 30 days prior to implementation of each phase of the Project, Reclamation, Corps, NRCS, or the Authority shall submit a request for approval of biologists to conduct monitoring of activities that will occur within and adjacent to giant garter snake habitat.
- A Service-approved biologist will survey work areas within 200 feet of giant garter snake aquatic habitat for snakes no more than 24 hours prior to the start of activities.
- Movement of heavy equipment will be confined to existing paved and dirt roads and will avoid suitable upland giant garter snake habitat.
- A Service-approved biological monitor will be present during all ground-disturbing activities and any activities involving heavy equipment within 200 feet of suitable giant garter snake aquatic habitat. Prior to daily activities, the biological monitor will inspect the area for snakes before equipment is moved. If a snake is found during Project activities, the biological monitor will be immediately notified and will have authority to stop work until appropriate corrective measures have been completed or the biological monitor determines the snake will not be harmed.
- At least 30 days prior to any ground-disturbing activities that could result in take of giant garter snake, the Authority will prepare and submit a relocation plan to be approved by the Service. Any giant garter snake individuals found within the Project footprints, and unable to volitionally move out of harm's way, will be relocated according to the Service-approved relocation plan.
- All Project activities adjacent to suitable giant garter snake aquatic habitat will be conducted within paved roads, farm roads, road shoulders, and similarly disturbed and compacted areas without small mammal burrows or other suitable refugia that could be used by giant garter snake. A Service-approved biologist will assess the locations of proposed bore holes to avoid small mammal burrows. The biologist will ensure that the work area along the geophysical line remains clear of snakes and other wildlife during testing. The Service-approved biologist will immediately stop work if a snake is seen moving into the work area. Work will resume once the snake has moved out of the work area on its own.
- A Service-approved biologist will survey all canals and aquatic areas to be dewatered for the snake, and any other stranded wildlife, immediately prior to dewatering. The biological monitor will oversee the dewatering activity until the channel is fully dewatered. Any dewatered snake habitat should remain dry for at least 15 consecutive days after April 15 and

prior to excavating or filling of the dewatered habitat. If pumps are required for dewatering, intake screens will be placed on the pump intake to prevent entrainment of snakes.

- Temporarily affected snake habitat will be restored to pre-Project conditions within one season (May 1-October 1). If not restored in this time frame the effect would be considered permanent.
- Compensation for the permanent loss of the habitat will occur at a ratio of 3:1 (3 acres of protected and restored/created habitat: 1 acre of occupied aquatic habitat lost). All upland habitat within 200 feet of the restored or created aquatic habitat will also be protected and restored/created. Compensatory mitigation sites will include a Service-approved management and monitoring plan that will consider the threats and needs of the giant garter snake. Compensatory mitigation sites will be selected in coordination with the Service to ensure equivalent or greater conservation value for the species than the impact area.

Conservation Measure 5: Monarch Butterfly

The following measures will be implemented to avoid and minimize impacts on the monarch butterfly and its habitat:

- No more than three years prior to the start of ground-disturbing activities in each Project location, Service-approved botanists will identify and map locations and species of milkweed (*Asclepias* sp.) and/or nectar plants (using guidance from *Monarch Nectar Plants of California* (https://www.xerces.org/sites/default/files/publications/19-046_02_MNPL_CA_web-print.pdf) during special-status plant surveys.
- Temporary signs, staking, or flagging will be used to identify the presence of milkweed and monarch butterfly habitat. Signs will be posted along the fencing for the duration of construction indicating the presence of milkweed or monarch butterfly habitat. The biological monitor will be responsible for ensuring the buffer area fences around milkweed or monarch butterfly habitat are maintained throughout Project activities.
- All temporary work areas and staging areas will be located at least 30 feet (ten meters) away from milkweed plants.
- Helicopter pilots will fly, when feasible, at an altitude high enough to avoid creating movement of milkweed plants during flights to and from work locations. The qualified biologist will identify the necessary locations for avoidance during the pre-mobilization surveys and ensure that the air crew is informed of this avoidance measure. The air crew will be provided with a map, and the qualified biologist will work with the air crew to plan a flight path that ensures avoidance of the milkweed and monarch butterfly habitat when feasible.
- To minimize impacts on monarch butterfly from herbicide drift, herbicide application will be limited to areas immediately adjacent to Project facilities and will be conducted using handheld equipment. As required by state and/or federal regulations, herbicides and pesticides will be applied only by applicators with current licenses and/or certifications from the California Department of Pesticide Regulation. The applicator will follow the herbicide label directions. Spray nozzles will be kept within 24 inches of target vegetation during spraying. The most current information on herbicide toxicity on wildlife will be used to inform future decisions about herbicide and pesticide use during operations.
- Where identified and delineated milkweed or monarch butterfly habitat cannot be avoided,

the Authority will compensate for permanent loss of suitable monarch butterfly habitat by planting native milkweed and nectar plants at suitable on-site and/or off-site restoration or preservation areas at a ratio of 1:1 (acres lost: acres planted). The off-site restoration areas would provide suitable habitat constituents for monarch butterfly (e.g., roosting habitat, nectar plants, native milkweed) and will be preserved through a conservation easement. The establishment of restoration areas would be completed as agreed upon by the Authority and the Service.

- The Authority will utilize monarch butterfly information from The Xerces Society to ensure that mitigation areas provide the suitable habitat constituents described above for monarch butterfly. The Authority will conduct baseline surveys of each on-site and off-site mitigation area to determine the baseline habitat conditions for monarch butterfly prior to implementing habitat improvements (i.e., planting), if applicable. Each area will be surveyed by qualified botanists to determine the extent of naturally occurring milkweed and nectar plants. After on-site restoration is completed at each mitigation area, qualified botanists will conduct surveys during three of the next five years and evaluate each site to determine if the area and condition of milkweed and nectar plants achieve the performance standards of being at or above baseline habitat conditions.
- Methods and results of surveys, and recommendations for adaptive management actions as needed, will be included in annual monitoring reports for each mitigation area (if there is more than one) and will be submitted to the Service.
- The Authority would implement a Recreation Management Plan, which would detail activities associated with long-term maintenance of the recreation facilities. This plan will detail BMPs for vegetation management and the use of pesticides around milkweed and monarch butterfly habitat. The Recreation Management Plan will identify recreation areas that can be avoided. All avoided areas identified in the recreation area will include strategic fencing and signage to protect milkweed and monarch butterfly habitat as well as other deterrents to avoid or minimize human intrusion into natural areas that may contain larval host plants or nectar plants.

Conservation Measure 6: Northwestern Pond Turtle

The following measures will be implemented to avoid and minimize impacts on the northwestern pond turtle and its habitat:

- Temporary work areas and any other activities with flexible locations will be designed to avoid occupied northwestern pond turtle habitat by 650 feet to the maximum extent feasible. Ground-disturbing activities will minimize effects on suitable northwestern upland habitat by locating work away from suitable habitat areas. A Service-approved biologist will be present during all work activities taking place within 650 feet of suitable habitat. Suitable habitat will be delineated by a Service-approved biologist.
- Recreational development will maintain a 650-foot fenced buffer around non-reservoir occupied northwestern pond turtle to discourage recreational disturbance.
- Construction will be initiated and initial ground disturbance will be conducted in suitable upland habitat within 650 feet of suitable aquatic habitat prior to the start of nesting season (August 1-February 28) and avoid northwestern pond turtle upland habitat during periods of nesting and nestling emergence (March 1-July 31).

- For activities that will occur within suitable northwestern pond turtle aquatic habitat during the northwestern pond turtle inactive season (October 1-February 28 or 29 [if leap year]), all aquatic northwestern pond turtle habitat will be dewatered prior to the start of the inactive season (October 1). Dewatering will be limited to the immediate construction area.
- If a work site is to be temporarily dewatered by pumping, intakes will be completely screened with wire mesh not larger than 3/8 of an inch to prevent juvenile northwestern pond turtle and other aquatic species from entering the pump system. The Service-approved biologist will be on-site during dewatering activities to salvage and relocate any turtles according to the Service-approved relocation plan.
- When suitable northwestern pond turtle habitat occurs within 300 feet of construction activities, exclusion fencing will be installed along the perimeter of the construction site to protect northwestern pond turtle habitat and minimize the potential for turtles to enter the construction work area. To the greatest extent possible, exclusion fencing will be installed prior to the start of nesting season (March 1). The perimeter of construction sites within 300 feet of suitable northwestern pond turtle aquatic habitat will be fenced with exclusion fencing no more than 14 days prior to the start of ground-disturbing activities. The location of exclusion fencing will be determined, in part, by the locations of suitable habitat for the species. The exclusion fencing will remain in place for the duration of construction and will be regularly inspected on a weekly basis by the Project biologist and fully maintained by the Authority's construction contractors. Repairs to the exclusion fence will be made within 24 hours of discovery of damage. If exclusionary fencing is found to be compromised, the suitable habitat inside the fencing will be surveyed in advance of any activity that may result in take of the species.
- For work sites where exclusion fencing cannot be placed around the entire perimeter, a Service-approved biological monitor will help guide access and construction work around wetlands, ponds, and other sensitive habitats capable of supporting northwestern pond turtle to minimize habitat disturbance and risk of injuring or killing northwestern pond turtles.
- Store equipment in designated staging areas at least 300 feet away from northwestern pond turtle aquatic habitat to the extent feasible.
- A Service-approved biological monitor will be present during all ground-disturbing activities and any activities involving heavy equipment within 650 feet of suitable northwestern pond turtle aquatic habitat. Prior to daily activities, the biological monitor will inspect the area for turtles before equipment is moved. If a northwestern pond turtle is found during Project activities, the biological monitor will be immediately notified and will have authority to stop work until appropriate corrective measures have been completed or the biological monitor determines the turtle will not be harmed.
- At least 30 days prior to any ground-disturbing activities that could result in take of northwestern pond turtle, the Authority will prepare and submit a relocation plan to be approved by the Service. Any northwestern pond turtle found within Project areas will be relocated according to the Service-approved relocation plan.
- Permanent unavoidable loss of northwestern pond turtle habitat will be compensated by applying a minimum of 1:1 ratio to occupied suitable and aquatic habitat (one-acre suitable aquatic habitat protected and restored/created:1 acre lost) and protection of at least 650 feet of uplands around the restored/created aquatic habitat. Compensatory mitigation will include a Service-approved management and monitoring plan that will consider the threats to and needs of the northwestern pond turtle. Compensatory mitigation sites will be selected in

coordination with the Service to ensure equivalent or greater conservation value for the species than the impact area.

Conservation Measure 7: Valley Elderberry Longhorn Beetle

The following measures will be implemented to avoid and minimize impacts on valley elderberry longhorn beetle throughout the Action Area:

- Protocol-level pre-activity surveys for elderberry shrubs will be conducted in and adjacent to potential work areas by a qualified biologist familiar with the appearance of valley elderberry longhorn beetle exit holes in elderberry shrubs. Pre-activity surveys will be conducted in accordance with the Service's 2017 *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle.* Any elderberry shrubs in the Action Area will be mapped. Those shrubs that are within 200 feet of Project activities will be identified with flagging and protected with high-visibility fencing (at the edge of the work area) and signs indicating the potential for beetle presence and excluding any Project activity within 165 feet of the plants.
- A qualified biologist will be responsible for ensuring the buffer area fences are maintained throughout Project implementation.
- Gravel roadways, staging areas, and other applicable areas will be sprayed with water as needed to minimize dust moving onto elderberry shrubs.
- If elderberry shrubs with stems equal to or greater than one-inch in diameter cannot be avoided, shrubs will be transplanted following the guidance of *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (Service 2017a).
- Compensation for the permanent loss of riparian habitat will occur at a rate of 3:1 for each acre that will be permanently impacted by the Project, consistent with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle*. Compensatory mitigation sites will be selected in coordination with the Service to ensure equivalent or greater conservation value for the species than the impact area. Compensatory mitigation sites will be managed and monitored consistent with site-specific, Service-approved management and monitoring plans that will consider the threats and needs of the valley elderberry longhorn beetle (Service 2019).

Conservation Measure 8: Vernal Pool Branchiopods

The following measures will be implemented to avoid and minimize impacts on federally listed vernal pool fairy shrimp and vernal pool tadpole shrimp (vernal pool branchiopods):

- At least two weeks prior to any ground-disturbing activities, a Service-approved biologist will ground-truth the land cover mapping within the Action Area to confirm the presence or absence of habitat suitable for vernal pool branchiopods. All suitable branchiopod habitat will be mapped in the field using a GPS with submeter accuracy and will be used to update the land cover mapping. Updated maps with exclusion buffers for listed species will be provided to all Project-related personnel.
- Vehicles and equipment will not travel in identified branchiopod habitat.
- Subsurface and surface geotechnical activities will fully avoid direct effects on vernal pool branchiopods and their suitable habitat.

- To avoid indirect impacts within 250-feet of suitable habitat the geotechnical activity must meet the following criteria:
    - Be at least 50-feet away from suitable habitat
    - Be conducted during the dry season
    - Restore the area to pre-disturbance conditions prior to the next wet season. When boring within the 250-foot avoidance buffer, soil layers will be isolated, retained, and restored in the order they occur to preserve drainage patterns and preserve plant seeds. The approved biologist will monitor and identify the soil types during the excavation. The topsoil and retention layer will be stored separately. After the geotechnical exploration is completed, the retention layer will be returned at the depth encountered, a bentonite slurry will be added to the excavation, and the topsoil returned.
    - Identify the non-disturbance areas with flagging or high- visibility fencing identifying it as off limits and protected habitat.

  If work within 250 feet of suitable habitat is conducted during the wet season, the vernal pool will be considered indirectly impacted and will be mitigated accordingly.
- Geophysical activities will not take place in suitable vernal pool branchiopod habitat. All geophysical lines will avoid going through pools that represent potential suitable habitat for these species.
- The qualified biologist will ensure that the contractor complies with these avoidance buffers.
- To avoid creating wind turbulence in close proximity to vernal pool branchiopod habitat, helicopter pilots will when feasible, fly at an altitude high enough to avoid disturbing surface soils in branchiopod habitat during flights between staging areas and bore locations. A map of vernal pool branchiopod habitat will be provided to the pilot. The qualified biologist will identify the locations for avoidance during the pre-mobilization surveys and ensure that the air crew is informed of necessary flight paths and elevation restrictions.
- The Authority will compensate for direct and indirect effects on occupied vernal pool branchiopod habitat through the purchase of mitigation credits at a Service-approved mitigation or conservation bank or through acquiring, creating, restoring, and/or protecting habitat in perpetuity at a location approved by the Service. Direct and indirect effects on occupied habitat will be mitigated by protecting occupied habitat at a 2:1 ratio (habitat protected: habitat directly or indirectly affected). In addition, direct effects on occupied habitat will be mitigated by protecting and restoring/creating occupied habitat at a 1:1 ratio (habitat protected and created/restored: habitat directly affected).
    - If vernal pools are surveyed consistent with Service protocol, survey results are negative and reviewed by the Service for adequacy to demonstrate absence, and the vernal pools cannot be avoided, compensation for permanent impacts will be consistent with requirements under Section 404 of the Clean Water Act and the Sites Final EIR/EIS. Mitigation will occur at a ratio of at least 1:1 (1 acre of protected and restored/created habitat: 1 acre of vernal pools lost).
    - Compensatory mitigation sites will be selected in coordination with the Service to ensure equivalent or greater conservation value for the species than the impact area. Compensatory mitigation sites will be managed and monitored consistent with site-specific Service-approved management and monitoring plans that will consider the threats and needs of the species.

Conservation Measure 9: Western Spadefoot

The following measures will be implemented to avoid and minimize impacts on the western spadefoot and its habitat:

- Temporary work areas and any other activities with flexible locations will be designed to avoid occupied or suitable western spadefoot habitat by 250 feet to the maximum extent feasible.
- Ground-disturbing activities within 1,200 feet of suitable and/or occupied western spadefoot aquatic breeding habitat will be avoided during the western spadefoot breeding season (October 15-May 15) to the extent feasible. If full avoidance is not feasible and if a portion of occupied western spadefoot aquatic habitat will be filled (i.e., permanent effects), the filling will be conducted when the habitat is completely dry. Suitable habitat will be delineated by a Service-approved biologist.
- All initial ground disturbance or vegetation removal (clearing) will be limited to periods of no or low rainfall (i.e., less than 0.08 inch per 24-hour period and less than 40 percent chance of rain). To the extent feasible, clearing activities in western spadefoot habitat will cease 24 hours prior to a 40% or greater forecast of rain from the closest National Weather Service weather station. Clearing may continue 24 hours after the rain ceases, if no more than 0.5 inch of precipitation is in the 72-hour forecast. If clearing must continue when rain is forecast (greater than 40 percent chance of rain), a qualified biologist will survey the work site before clearing begins each day rain is forecast. If rain exceeds 0.5 inch during a 24-hour period, clearing will cease until the National Weather Service forecasts no further rain. For a given site that has exclusion fencing in place and all surface soil disturbance completed (i.e., no burrows that could contain western spadefoot are present), these restrictions would no longer apply.
- When there is suitable and/or occupied western spadefoot aquatic habitat within 250 feet of Project activities, exclusion fencing will be installed along the perimeter of work sites to protect western spadefoot habitat and minimize the potential for western spadefoot to enter the work area. The perimeter of work site within western spadefoot habitat will be fenced with material suitable for excluding amphibians no more than 14 days prior to the start of Project activities (e.g., staging, vegetation removal, grading) in a given area. The placement of exclusion fencing will be determined, in part, by the locations of suitable habitat for the species. The amphibian exclusion fencing will remain in place for the duration of construction and will be regularly inspected and fully maintained. Repairs to the amphibian exclusion fence will be made within 24 hours of discovery of a breach. If the exclusion fence is compromised during the rainy season, a species pre-construction survey will be conducted immediately preceding ground-disturbing activity that occurs within 250 feet of suitable western spadefoot habitat, or in advance of any activity that may result in take of the species.
- The Authority will retain qualified biologists (i.e., experienced in the identification of and knowledge of the life history and habitats of western spadefoot) to conduct pre-construction surveys performed consistent with a Service-approved survey protocol (*Draft Survey Protocol for the Western Spadefoot,* Service 2024a; *Appendix C*) within 48 hours prior to the start of activities that disturb occupied or suitable western spadefoot aquatic habitat. The qualified biologists will prepare and submit reports describing the methods and results of the habitat assessments and pre-construction surveys to the Authority, Reclamation, and the

Service.

- A Service-approved biological monitor will be present during all ground-disturbing activities and any activities involving heavy equipment within 250 feet of suitable and/or occupied western spadefoot aquatic habitat. Prior to daily activities, the biological monitor will inspect the area for western spadefoot before equipment is moved. If a western spadefoot individual is found during Project activities, the biological monitor will be immediately notified and will have authority to stop work until appropriate corrective measures have been completed or the biological monitor determines the western spadefoot will not be harmed.
- At least 30 days prior to any ground-disturbing activities that could result in take of western spadefoot, the Authority will prepare and submit a relocation plan to be approved by the Service. Any western spadefoot found within Project areas will be relocated according to the Service-approved relocation plan.
- Permanent unavoidable loss of western spadefoot habitat will be compensated by applying a minimum of 1:1 ratio to occupied suitable aquatic habitat (1-acre occupied suitable aquatic protected and restored/created :1 acre lost) and protection and restoration/creation of at least 250 feet of uplands around the protected and restored/created aquatic habitat. Compensatory mitigation will include a Service-approved management and monitoring plan that will consider the threats to and needs of western spadefoot. Compensatory mitigation sites will be selected in coordination with the Service to ensure equivalent or greater conservation value for the species than the impact area.

7.5 Terrestrial Monitoring and Adaptive Management

The Authority will develop mitigation plans, subject to Service approval, identifying specific locations for the compensatory measures for each species and the monitoring, performance criteria, and adaptive management measures that will be implemented to ensure the compensatory lands will be adequately managed and monitored for each species in perpetuity. These plans will be finalized and approved by the Service, and the compensatory lands will be secured through acquisition of conservation easements or purchase of conservation bank credits prior to each phase of Project construction. Each site-specific management plan will include monitoring and adaptive management measures to ensure long-term persistence of the site's conservation values.

7.6 Compensatory Mitigation for Temporary and Permanent Impacts

Reclamation and the Authority have proposed to provide compensatory mitigation for the permanent loss of suitable habitat of federally-listed species due to construction impacts and ultimately inundation of the reservoir area ***(Table 5***). The Authority understands that they may not be able to rely solely on existing conservation banks to fulfill their mitigation obligations; therefore, the Authority has developed a strategy that will utilize various approaches such as creating new conservation banks or establishing turn-key or other proponent-responsible mitigation projects. Compensatory mitigation sites have been proposed to be located in areas that are within (a) the known ranges of each of the covered species, with prioritization of areas where the ranges of multiple species overlap to maximize potential mitigation stacking across species; (b) recovery units for the listed species with recovery plans; (c) lands within the Service's North Central Valley Wildlife Management Area (WMA) program area; and/or (d) within the

watershed of Sites Reservoir. Identification of individual compensatory mitigation sites will not be finalized until after this BiOp is written during Project implementation (refer to *Section 7.4* Conservation Measure #2 for 10 percent stay-ahead provisions).

Table 5. Summary of Proposed Compensatory Mitigation for Permanent Impacts to Federally Listed Wildlife Species.

Resource	Mitigation Ratios	Potential Location of Proposed Protection and Restoration/Creation Sites (*Figure 3*)
Giant garter snake Giant garter snake presence assumed in suitable habitat.		
Aquatic	3:1 protection and restoration/creation	Within the Service's North Central Valley WMA program area, within Colusa Basin, Butte Basin, Sutter Basin, or Yolo Basin recovery units, and within the Sites Reservoir watershed.
Upland	3:1 protection and restoration/creation	
Northwest pond turtle Northwest pond turtles are cryptic and mitigation will be based on suitable habitat that has been assessed at a site-level to confirm suitability.		
Aquatic	1:1 protection and restoration/creation	Within the Service's North Central Valley WMA program area, including locations within the geotechnical explorations, construction, inundation, and recreation footprints, and within the Sites Reservoir watershed.
Upland	Suitable upland within 650 feet of the compensatory aquatic mitigation habitat	
Western spadefoot Western spadefoot are cryptic and mitigation will be based on suitable habitat that has been assessed at a site-level to confirm suitability**.**		
Aquatic	1:1 protection and restoration/creation	Within the Service's North Central Valley WMA program area, including locations within the geotechnical explorations, construction, inundation, and recreation footprints, and within the Sites Reservoir watershed.
Upland	Suitable uplands within 1,200 feet of compensatory aquatic mitigation habitat	
Valley elderberry longhorn beetle Presence based on field evaluation.		
Riparian	3:1 protection and restoration/creation and plantings consistent with the Service's	Within the Service's North Central Valley WMA program area, including locations within the geotechnical explorations, construction, inundation, and recreation footprints, and within the Sites Reservoir watershed. Mitigation will be based on Service guidelines (Service 2017a).

Vernal pool branchiopods Species presence assumed in suitable habitat unless protocol-level surveys have negative results.		
Direct	2:1 protection and 1:1 restoration/creation if occupied or assumed to be occupied. Vernal pools with negative (protocol-level) survey results will fall under Corps CWA mitigation as described in the BA in General Conservation Measure.	Within the Northwestern Sacramento Valley, Sacramento Valley, Southeastern Sacramento Valley, or Solano-Colusa vernal pool regions within a conservation bank or location with equivalent conservation value of a conservation bank as confirmed by the Service.
Indirect	NA (would be 2:1 protection if there were indirect impacts)	
Monarch butterfly Presence assumed in suitable habitat.		
Habitat with milkweed or nectar plant species present	1:1 planting of milkweed and suitable nectar plants	No specific location: on lands serving as mitigation for other species where (1) high likelihood of planting success, and (2) will not diminish habitat value for other listed species.

7.6.1 Guiding Principles for the Framework Programmatic Consultation

The following Guiding Principles for compensatory mitigation are proposed by the Authority and Reclamation to establish a framework in this consultation under which future compensatory mitigation actions will be developed and support forthcoming permit and/or subsequent consultation(s) on the specific effects of implementation that have the potential to adversely affect federally listed species. To ensure that the future actions developed are consistent with this analysis and continue to build upon what was analyzed in this document, the Service analyzed the following Guiding Principles. The Guiding Principles are intended to align with landscape conservation and species-level recovery planning efforts that are either currently in place or under development.

The Guiding Principles are as follows for compensatory mitigation:

- Mitigation lands will be biologically suitable for the species being mitigated for, meaning it will meet the specific needs of the species in terms of food, shelter, breeding, and other environmental conditions.
- Mitigation efforts will emphasize providing connectivity between habitats to promote movement between habitat types and act as migration, dispersal, and movement corridors, when and where feasible on the landscape.
- Mitigation lands will be strategically chosen so that they contribute to broader conservation goals and/or species recovery plans.
- Management plans, subject to Service approval, will be developed for the mitigation sites and guide the sites' management actions.
- Relocating species or conducting transplantations into mitigation sites will be considered, as appropriate, to minimize effects to impacted species from the Project to the extent possible.

- Species relocations (or transplantations) will be guided by implementation of a Service-approved Relocation (or Transplanting) Plan.
- Decontamination protocols to minimize the spread of pathogens into mitigation sites will be considered during the site development and management phases.
- Decontamination protocols will be guided by implementation of a Service-approved Hazard Analysis Critical Control Point Plan, or other Service approved plan.
- The introduction and spread of nonnative, invasive plant species in mitigation sites will be minimized by encouraging the use of native plant species during revegetation and planting efforts.
- The Authority will provide financial security for the permanent protection, restoration, monitoring, and/or management of the compensatory habitat, as described in the site-specific management plan for the mitigation site.
- On-site mitigation efforts, such as those integrated into the Recreation Areas, will consider the needs of the species and their habitat requirements when developing and implementing activities described in the Recreation Management Plan.
- Effectiveness monitoring of the mitigation lands will be performed at the request of the Service to track success and adaptive management strategies that will be employed to adjust the mitigation plan as needed.

It is important to note that on-site mitigation is one potential tool for furthering conservation efforts for impacted federally listed species through the implementation of the proposed conservation measures. For the purposes of this BiOp, due to the lack of specific geographic details regarding the areas for on-site mitigation, the Service has analyzed the project features as if the geotechnical exploration, construction, recreation, and inundation footprints will have permanent and/or temporary impacts on the species. However, the Service acknowledges that within some of these areas, on-site mitigation may be incorporated into land management plans, potentially offering greater benefits to specific species than outlined here. These details will not be available until after this BiOp is completed but will be coordinated closely with the Service to help further reduce the overall impact of the project. Once the on-site mitigation details are available, the standard consultation analysis will be revisited, and reinitiation may be required (see *Reinitiation Clause*).

7.6.2 Mitigation Phasing

The Authority and Reclamation will ensure that mitigation precedes impacts to federally listed species by implementing the methodology as described in the BA (refer to the *Restoration Performance Monitoring* section in *Appendix 2A* of the BA) and supplementation documentation (BA Comment Tracker). They will implement a step-wise process to utilize when submitting a Phase Authorization Package to the Service for review and authorization prior to beginning a new phase that involves ground disturbance.

Step 1 states that Sites Authority and Reclamation will submit a Phase Authorization Package to the Service that includes the information in *Section 2.2*, *Stay-Ahead Provisions* of the BA and in the *Restoration and Protection Site Management Plan* provided during consultation. Additional information to be provided shall include:

a) Project components from the Biological Opinion project description to be included in the phase;
b) Impacts to each of the species covered in the Biological Opinion, resulting from the phase as described in *Section 2.1. Refined Habitat Mapping, Species Surveys, and Refined Impact Analyses* of the BA;
c) Maps showing locations of mitigation for each species; and
d) If mitigation is not in a Service-approved conservation bank, a long term management and monitoring plan and funding approach as described in *Section 3.3.2*, *Long-Term Management and Monitoring Approach*, and *Section 3.3.3*, *Funding* of BA, respectively.

Step 2 involves the Service determining whether all the necessary information has been provided consistent with Step 1, above and identifying how to resolve information deficiencies. Step 3 states that Reclamation and the Authority shall meet and confer with the Service as to whether re-initiation of consultation is necessary. Finally, Step 4 indicates that the Sites Authority and Reclamation will provide the Service with documentation that mitigation land has been secured as described in the BA (*Section 7.3.1.10 G-CM10: Compensatory, Mitigation Phasing, Stay-Ahead Provisions, and Financial Assurances)* and that protection mechanisms are in place consistent with the information provided in the Phase Authorization Package. Once the steps have satisfactorily been completed, the Service shall notify Sites Authority and Reclamation that the phase of ground disturbance may begin.

The Authority and Reclamation shall coordinate with the Service regarding timelines associated with when the Phase Authorization Package is submitted for review and authorized to allow for alignment with other regulatory timelines. More details regarding mitigation phasing and the stay ahead provisions was included in *Section 7.4* Conservation Measures in Conservation Measure 2.

7.6.3 Mitigation Site Management Plan

The Authority or its mitigation contractor, will prepare and implement a management plan for each listed species' habitat restoration and protection site to ensure the compensatory lands will be adequately managed and monitored for each species in perpetuity. The management plans may be for an individual parcel or for multiple parcels that share common management needs. The Authority or its mitigation contractor will conduct surveys to collect the information necessary to assess the ecological condition and function of conserved species habitats and supporting ecosystem processes, and based on the results, will identify actions necessary to achieve the desired habitat condition at each site. In instances where conservation or mitigation banks are used as compensatory mitigation and the conservation or mitigation bank has already prepared a similar type of management plan, the Authority shall not be required to prepare an additional Mitigation Site and Management Plan.

Management plans will be prepared by the Authority in collaboration with Reclamation, CDFW, NMFS, and the Service, consistent with their authority, and submitted to those agencies for approval within two years of the acquisition of each site. This schedule is designed to allow time for site inventories and identification of appropriate management techniques. During the interim period, management of the site will occur using best practices and based on successful management at the same site prior to acquisition or based on management at other similar sites.

The plans will be working documents that are updated and revised as needed to incorporate new acquisitions suitable for coverage under the same management plan and to document changes in management approach that have been agreed to by the Authority, Reclamation and the appropriate wildlife agency or agencies (CDFW, NMFS, and the Service), consistent with their authority.

Each management plan will include, but not be limited to, descriptions of the following elements:

- The species-specific objectives to be achieved with management of each site covered by the plan.
- Baseline ecological conditions (e.g., habitat maps, assessment of listed species habitat functions, occurrence of listed species and other native wildlife species, vegetation structure and composition, assessment of nonnative species abundance and effect on habitat functions, occurrence, and extent of nonnative species).
    - Vegetation management actions that benefit natural communities and listed species and reduce fuel loads, as appropriate, and that are necessary to achieve the management plan objectives.
    - If applicable, a fire management plan developed in coordination with the appropriate agencies and, to the extent feasible, consistent with achieving the management plan objectives.
    - Infrastructure, hazards, and easements.
    - Existing and adjacent land uses and management practices and their relationship to listed species habitat functions.
    - Applicable permit terms and conditions.
    - Terms and conditions of conservation easements when applicable.
    - Management actions and schedules.
    - Monitoring requirements and schedules.
    - Established data acquisition and analysis protocols.
    - Established data and report preservation, indexing, and repository protocols.
    - Adaptive management approach.
    - Any other information relevant to management of the protected parcels.

Management plans will be periodically updated to incorporate changes in maintenance, management, and monitoring requirements as they may occur. Based on the assessment of existing site conditions (e.g., soils, hydrology, vegetation, occurrence of listed species) and site constraints (e.g., location and size), and depending on biological objectives of the restoration sites, management plans will specify measures for enhancing and maintaining habitat as appropriate.

7.6.4 Monitoring and Reporting

Management plans for compensatory mitigation sites will include a description of monitoring requirements and the adaptive management approach that will be used. Methods and results of surveys, and recommendations for adaptive management actions as needed, will be included in

annual monitoring reports for each mitigation area (if there is more than one) and will be submitted to the Service.

8. DESCRIPTION OF THE ACTION AREA

The Action Area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The Action Area for this BiOp is based on the Project elements described in the *Description of the Proposed Action* (and as described in the BA), including some for which exact locations and extent of the effects are not yet known. These components are addressed programmatically and will either rely on existing consultations or be subject to subsequent consultation.

The Action Area encompasses the following areas: geotechnical exploration, construction, inundation, and recreation footprints (***Figure 2***). The geotechnical explorations are defined by the following activities with buffer distances: augers at 500 feet, dozers at 40 feet, pavement core at 20 feet, seismic refraction at five feet, test fill at 500 feet, and test pits at 50 feet. The construction area is defined as all sites where construction activities for the Project would be conducted plus a buffer zone of various distances around those sites that ensures all construction effects (e.g., noise and lighting) are identified. The inundation area is defined as the area that would be flooded by the proposed Sites Reservoir. The recreation areas are defined as the areas that would be affected during routine use of the new and expanded recreation areas. The Action Area also includes staging and storage areas, and local roads used to access these defined areas. The construction footprint for Sites Reservoir falls within Glenn and Colusa counties and includes foothill grasslands, developed surfaces *(*e.g., roadways), existing aquatic resources, and areas of agricultural production in the Sacramento Valley. Three other Project locations are included in addition to the Sites Reservoir location (***Figure 2***): (1) RBPP in Tehama County; (2) GCID Headgate in Glenn County; and (3) the location for the proposed Dunnigan Pipeline release to the CBD in Yolo County.

The conservation measures, including compensatory mitigation, are one example of where the mitigation sites may fall within the construction, inundation, and recreation areas, but also expand beyond those footprints and into species-specific recovery planning units or areas of known occurrences (***Figure 3***). Some information on the potential locations of proposed restoration and protection has been developed, but mitigation sites will not be finalized until after this BiOp is written during Project implementation. The location of compensatory mitigation areas is described in *Section 7.6* above. These potential mitigation areas are included in the Action Area and ***Figure 3*** depicts their geographical extent on the landscape.

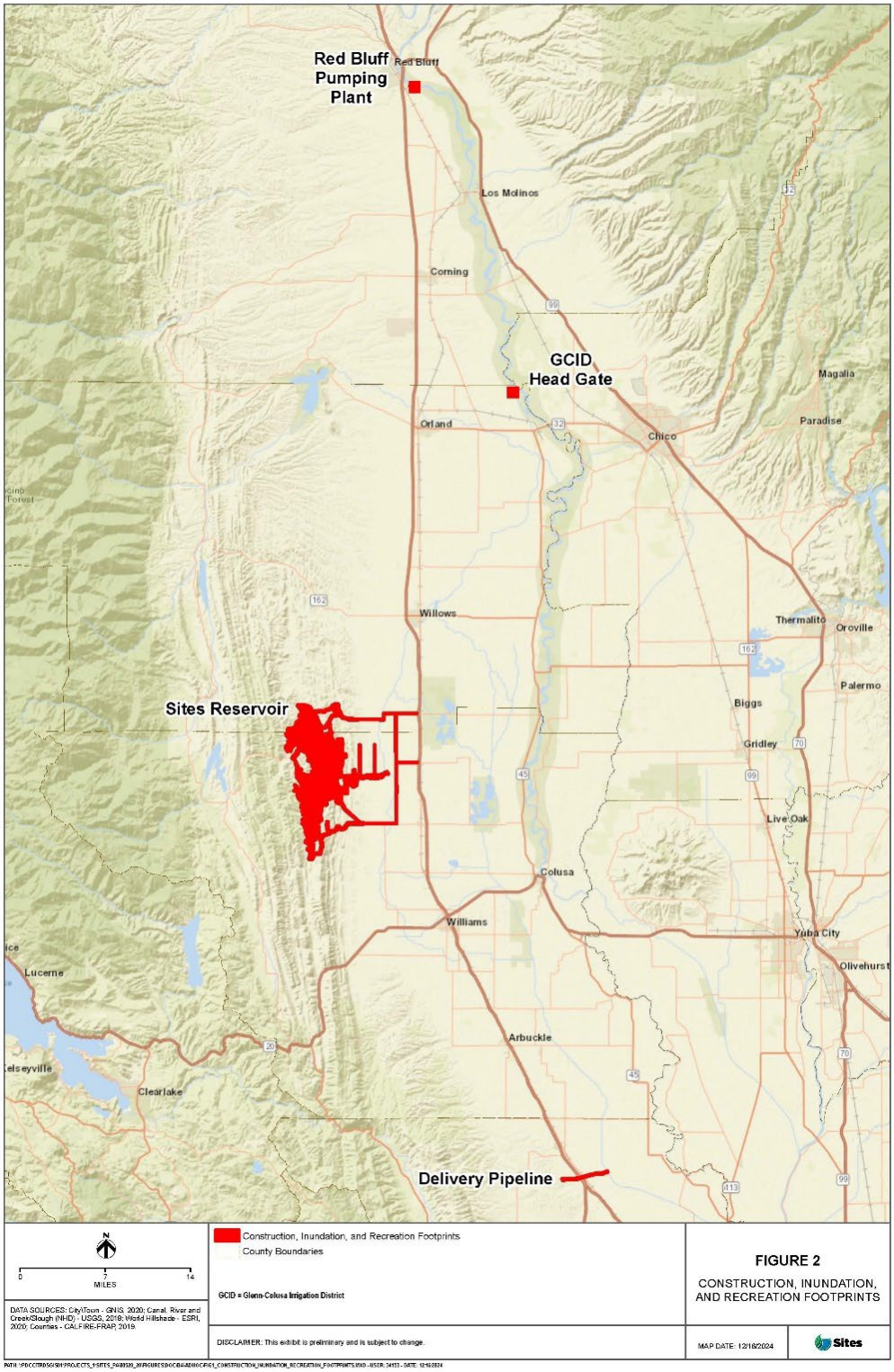

Figure 2. Geotechnical Explorations, Construction, Inundation, and Recreation Footprints in the Action Area (Reclamation 2024).

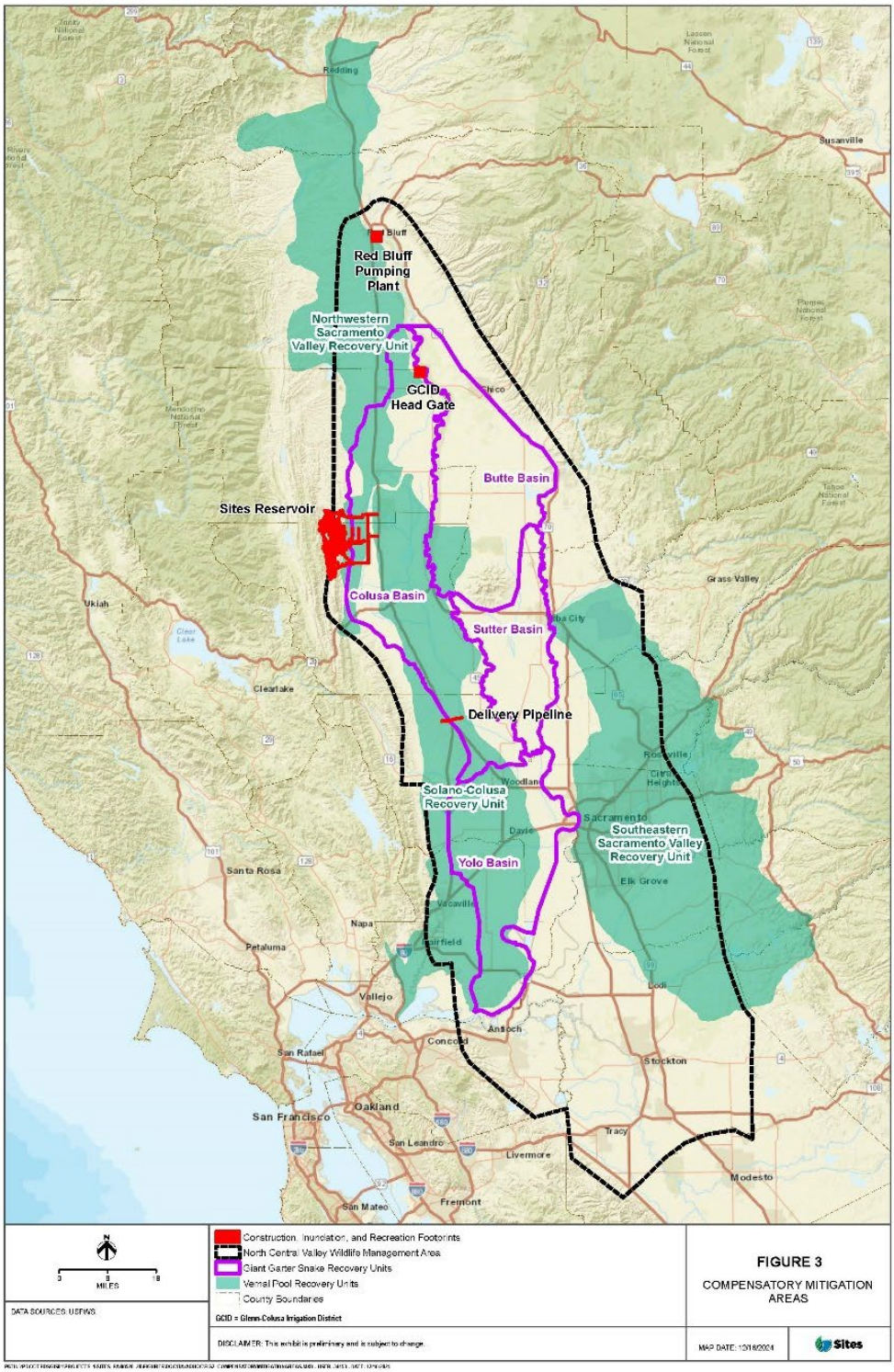

Figure 3. Areas in the Action Area Identified for Potential Compensatory Mitigation (Reclamation 2024).

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this BiOp considers the effects of the proposed federal action, and any cumulative effects, on the range-wide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the current range-wide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the current condition of the species in the Action Area without the consequences to the listed species caused by the proposed action, the factors responsible for that condition, and the relationship of the Action Area to the survival and recovery of the species; (3) the *Effects of the Action*, which includes all consequences that are caused by the proposed federal action, including the consequences of other activities that are caused by the proposed action but that are not part of the action; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the Action Area on the species. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and in light of the status of the species, the Service formulates its opinion as to whether the proposed action is likely to jeopardize the continued existence of listed species.

9. STATUS OF THE SPECIES

The Status of the Species section describes the current range-wide condition of the species, the factors responsible for that condition, and its survival and recovery needs. For each species, we have including information about the listing status, life history and habitat requirements, distribution, and threats.

9.1 Giant Garter Snake

The Service listed the giant garter snake as a threatened species on October 20, 1993 (Service 1993). No critical habitat has been designated for the giant garter snake. In 2017, the Service issued the final *Recovery Plan for the Giant Garter Snake (Thamnophis gigas)* (Service 2017b). The most recent 5-year review was completed in June 2020, where no change in status was recommended (Service 2020a). Please refer to the 2017 *Recovery Plan* for the species' general description and the 2020 5-year review for the recent comprehensive assessment of the species' range-wide status and updated life history and habitat preferences. The following paragraphs provide a summary of the relevant information in the above documents, BA, and other sources available to the Service.

9.1.1 Life History and Habitat Requirements

The giant garter snake is one of the largest garter snake species, reaching a total length of approximately 64 inches (1.6 m). Generally, the snakes have a dark dorsal background color with pale dorsal and lateral stripes, although coloration and pattern prominence are geographically and individually variable (Service 2017b). They feed on small fishes, tadpoles, and frogs. During the colder winter months, giant garter snakes spend their time in a lethargic state overwintering in locations such as mammal burrows along canal banks and marsh locations, or riprap along a railroad grade, roads, or levees (Service 2017b).

The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals, rice fields and the adjacent uplands (Service 1999). Suitable aquatic habitat consists of slow-moving or static water that is present from March through November with a mud substrate and the presence of prey (amphibians or fish) (Service 2017b). They do not occur in larger rivers and wetlands with sand, gravel, or rock substrates (Service 1999). Emergent and bankside vegetation that provides cover from predators and for thermoregulation is also required. Other components of suitable aquatic habitat are the absence of a continuous riparian canopy, basking sites with supportive vegetation (such as folded tule clumps) adjacent to escape cover, and the absence of large predatory fish (Service 2017b). Perennial wetlands provide the highest quality habitat for the giant garter snake, and ricelands, with the interconnected water conveyance structures, serve as an alternative habitat in the absence of higher-quality wetlands (Service 2017b). Giant garter snake use adjacent upland habitat for basking, cover, refugia, and for winter hibernacula (in locations where recurrent flooding occurs).

9.1.2 Distribution and Numbers

Giant garter snakes are endemic to California's Central Valley (Service 2017b). Historically, giant garter snakes inhabited the Sacramento and San Joaquin Valleys from the vicinity of Chico, in Butte County southward to Buena Vista Lake, near Bakersfield in Kern County, California. The eastern and western boundaries of the giant garter snake range from the foothills occurring along each side of the Central Valley - the Coast Range to the west and the Sierra Nevada to the east. However, they were extirpated from much of the San Joaquin Valley by the late 1980's. The prevalence of rice agriculture in the Sacramento Valley has allowed persistence of the giant garter snake after conversion of wetlands to agriculture.

Because of their secretive nature, estimating abundance of giant garter snake populations and understanding giant garter snake population ecology requires intensive field study. As such, no range-wide population estimate for giant garter snake exists. While the 2020 5-Year Review provides some annual estimates of giant garter snakes at individual management units, additional population numbers were not provided. However, the data provided indicates that many management units had decreases in giant garter snake abundance after the 2012-2015 California drought (Service 2020a).

9.1.3 Threats

The primary threat to the giant garter snake throughout California's Central Valley is the loss, degradation, and fragmentation of its wetland habitat. Today only about 5 percent of its historical wetland habitat acreage remains (Service 2017b). This dramatic decline is largely due to agricultural development, urban expansion, and extensive water infrastructure projects. In particular, the conversion of ricelands, which provide important surrogate habitat, into less suitable crops like orchards or row crops has significantly reduced the availability of seasonally flooded areas the species depends on for foraging, thermoregulation, and breeding. Additionally, water management practices that impede on water deliveries to wetlands, marshes, and rice fields further limit habitat suitability. Routine maintenance of levees, canals, and ditches, including vegetation removal and sediment dredging, can destroy habitat, displace individuals, and increase mortality risk from predation or desiccation. Habitat fragmentation caused by roads, irrigation canals, and other infrastructure isolates populations, limits genetic exchange, and increases the likelihood of local extirpation. Introduced predators, such as bullfrogs and non-native fish, also pose a threat by preying on juveniles or competing for food. These combined pressures continue to impact the species' recovery, making habitat restoration, water management improvements, and landscape connectivity essential for the long-term conservation of the giant garter snake.

9.2 Monarch Butterfly

The Service proposed to list the monarch butterfly as threatened with a 4(d) rule on December 12, 2024 and also included a proposal to designate critical habitat. The proposed listing can be found at https://www.govinfo.gov/content/pkg/FR-2024-12-12/pdf/2024-28855.pdf. At this time, a final listing determination has not been issued and a recovery plan has not yet been developed. In December 2024, the Service published a species status assessment report for the monarch butterfly (Service 2024d). Please refer to the 2024 species status assessment report and the listing proposal for a comprehensive assessment of the species' range-wide status, life history, and habitat preferences. The following paragraphs provide a summary of the relevant information in the above documents, BA, and other sources available to the Service.

9.2.1 Life History and Habitat Requirements

Monarch butterfly (*Danaus plexippus plexippus*) is a large orange and black butterfly in the brushfoot (Nymphalidae) family. Monarch butterflies exhibit long-distance migration and overwinter as adults at forested locations in Mexico and coastal California (87 FR 26152). During the breeding season, monarchs lay their eggs on their obligate milkweed host plant (primarily *Asclepias spp*.). There are multiple generations of monarchs produced during the breeding season, with most adult butterflies living approximately two to five weeks. The fall generation migrates to overwintering sites located up to 1,800 miles away and enter into reproductive diapause (suspended reproduction) and live six to nine months before mating and flying back towards their breeding grounds.

Adult monarch butterflies during breeding and migration require a diversity of blooming nectar resources, which they feed on throughout their migration routes and breeding grounds (spring

through fall). Monarchs also need milkweed (for both oviposition and larval feeding) embedded within this diverse nectaring habitat. In western North America, nectar and milkweed resources are often associated with riparian corridors, and milkweed may function as the principal nectar source for monarchs in more arid regions (Service 2024d). Their overwintering groves must be frost-free (Service 2024d) and migratory monarchs in the western population primarily overwinter in groves along the Pacific coast from Mendocino County, California to Baja California, Mexico (Service 2024d). The majority of overwintering sites are located within 2.4 km of the Pacific Ocean or San Francisco Bay (Service 2024d).

9.2.2 Distribution and Numbers

The monarch butterfly is a wide-ranging species located throughout North America, northern South America, the Iberian Peninsula, eastern and southwestern Australia, New Zealand, and the Indo-Pacific islands (Service 2020b). However, 90 percent of monarchs worldwide occur in North America. The western North American population is located west of the Rocky Mountains and overwinters along the Pacific Coast of California. Individuals in this population migrate through California and the inter-mountain west during the spring and summer, returning to wintering grounds in the fall.

Monarch butterfly populations in North America have been censused annually since the mid-late 1990's, therefore population estimates for the species has been possible. Both the eastern and western North American populations have seen extensive declines. The western North America population was estimated to be in millions of butterflies in the mid-1980s (Service 2020b). The western population of monarch butterfly, located in California, has experienced precipitous decline from about 1.2 million in 1997 to fewer than 30,000 in 2019 (Service 2020b). Analysis conducted by the Xerces Society estimated that the western population of monarch butterfly declined by 74 percent between the late 1990's and 2015 (Pelton *et al.* 2016).

9.2.3 Threats

The primary threats to the monarch butterfly include loss and degradation of habitat from conversion of grasslands to agriculture, widespread use of herbicides, logging/thinning at overwintering sites in Mexico, senescence and incompatible management of overwintering sites in California, urban development, drought, exposure to insecticides, and effects of climate change (87 FR 26152). The availability of milkweed is essential to monarch reproduction and survival and reduction in milkweed is cited as akey driver in monarch declines. Milkweed population losses are primarily associated with increased use of herbicides on agricultural lands, leading to widespread milkweed loss. Milkweed populations are also lost through the conversion of grasslands into development and new cropland (Service 2020b).

9.3 Northwestern Pond Turtle

The Service proposed to list the northwestern pond turtle as a threatened species on October 3, 2023 with a section 4(d) rule (88 FR 68370-68399). The proposed listing can be found at 2023-21685.pdf. At this time, a final listing determination has not been issued. Critical habitat has not yet been proposed and no recovery plan has been developed for the northwestern pond turtle. In

April 2023, the Service published a species status assessment report for northwestern pond turtle and southwestern pond turtle. Please refer to the 2023 species status assessment (Service 2023a) and the listing proposal for a comprehensive assessment of the species' range-wide status, life history, and habitat preferences . The following paragraphs provide a summary of the relevant information in the above documents, BA, and other sources available to the Service.

9.3.1 Life History and Habitat Requirements

Western pond turtles are drab, darkish-colored turtles with a yellowish to cream colored head. Northwestern pond turtle adults typically range in size between 160 to 180 mm long and weigh between 500 to 700 grams. Western pond turtles are semi-aquatic, having both terrestrial and aquatic life history phases. Eggs are laid in upland terrestrial habitat, and hatchings, juveniles, and adults use both terrestrial and aquatic habitat. The western pond turtle is omnivorous and considered a dietary generalist, consuming a wide variety of food items (Service 2023b).

Western pond turtles require aquatic and terrestrial habitats be within close proximity and connected to one another. They are considered habitat generalists, occurring in a broad range of permanent and ephemeral water bodies. Western pond turtles use aquatic habitat for breeding, feeding, overwintering, and sheltering. Northwestern pond turtles move to upland areas adjacent to watercourses to deposit eggs and overwinter. Preferred aquatic conditions are those with abundant basking sites, underwater shelter sites (undercut banks, submerged vegetation, mud, rocks, and logs), and standing or slow-moving water. Nesting habitat occurs in upland locations, in close proximity to aquatic habitat and is typically characterized as having sparse vegetation with short grasses and forbs and little or no canopy cover. Overwintering/aestivation habitat generally occurs in upland locations above ordinary high-water lines or beyond the riparian zone. The elevational range of the northwestern pond turtle is from sea-level to approximately 6,500 feet (88 FR 68373).

9.3.2 Distribution and Numbers

Historically, the range of western pond turtle (as a single species) extended along the Pacific Coast from British Columbia, Canada to the northern part of Baja California, Mexico, primarily west of the Sierra Nevada and Cascade Ranges (Service 2023b). Recent genetic information has led to a taxonomic split of the western pond turtle into two distinct species: southwestern pond turtle and the northwestern pond turtle (Service 2023b). The northwestern pond turtle occurs in Washington, Oregon, Nevada and throughout much of northern and central California (88 FR 68374). Current threats facing the western pond turtle include loss of suitable aquatic habitats due to rapid changes in water regimes and removal of hydrophytic vegetation.

The Central Valley in California once represented the stronghold for western pond turtles, with an estimated population size from 10 to 14 million individuals. Currently, populations rarely have densities similar to their historical counterparts, and age structures of extant populations tend to be skewed towards adults. Although there have been numerous surveys throughout the range of northwestern pond turtle, the majority of cases survey information provides presence information only. Northwestern pond turtle population growth rate and abundance are declining.

9.3.3 Threats

Habitat loss and fragmentation due to agricultural development, flood control, water diversion projects, altered hydrology (including dams), groundwater depletion, and urbanization; predation by bullfrogs; and drought were identified as the main causes for the decline for the northwestern pond turtle (Service 2023b). Extensive land conversion due to urbanization and agriculture has resulted in substantial losses to both upland and aquatic habitats across the specie's range and aquatic habitat for the northwestern pond turtle considered relatively rare and often limited. Other threats include road mortality, disease, contaminants, and impacts from climate change.

9.4 Valley Elderberry Longhorn Beetle

The Service listed the valley elderberry longhorn beetle as a threatened species on August 8, 1980 (Service 1980) and included designation of critical habitat. Critical habitat, designated at the time of listing in 1980 (Service 1980), includes two locations in Sacramento County along the American River, where the densest known populations of the beetle occur. The most recent recovery plan was published on October 4, 2019 (Service 2019) and the most recent 5-year review was published on September 26, 2023 (Service 2023c). Please refer to the 2019 recovery plan and the 2019 5-year review for the recent comprehensive assessment of the species' range-wide status and updated life history and habitat preferences. The following paragraphs provide a summary of the relevant information in the above documents, BA, and other sources available to the Service.

9.4.1 Life History and Habitat Requirements

The valley elderberry longhorn beetle is a small (0.5 - 0.8 in.) wood-boring beetle in the *Cerambycid* family. Elderberry shrubs (*Sambucus* spp.) are the obligate larval host plants for the valley elderberry longhorn beetle and their larvae go through several developmental stages within the elderberry shrub. Adult valley elderberry longhorn beetles feed on elderberry foliage and are present from March through early June, during which time the adults mate and lay eggs (Service 2006). After hatching, the larva burrows into the stem where it develops for one to two years and feeds on the pith in the center of the stem. Before pupation, the larva creates an exit hole, plugs the hole with wood shavings, and returns to the gallery to pupate. After transforming into an adult, the valley elderberry longhorn beetle emerges through the previously created exit hole (Service 2017a). Exit holes are 0.3 to 0.4-inch wide (Service 2017a).

The valley elderberry longhorn beetle is found only in association with its host plant, elderberry, which is commonly present in riparian forests and adjacent grasslands in the Central Valley of California (Barr 1991). Elderberry shrubs can also be present in non-riparian valley oak (*Quercus lobata*) and blue oak (*Quercus douglasii*) woodland habitats (Service 2017a). Environmental and habitat conditions that favor a robust elderberry community also benefit the beetle. Elderberry is an important component of riparian ecosystems in California.

9.4.2 Distribution and Numbers

The valley elderberry longhorn beetle is endemic to California's Central Valley, from approximately Shasta County in the north to Fresno County in the south including the valley floor and lower foothills predominantly found at elevations of 500 feet or less. Distribution is typically based on the occurrence of elderberry shrubs, which are known to occur along riparian corridors, along smaller natural and channelized drainages, as well as in upland habitats.

Estimates of occupancy, as measured by recent exit hole observations per elderberry groups, have a wide range. The most recent, comprehensive range-wide survey by observers known to be qualified to detect occupancy of the species was conducted in 1997 (Service 2014) and estimated an occupancy rate of approximately 20 percent. In 2014, the Service concluded that there are extant occurrences of the valley elderberry longhorn beetle at 36 geographical locations in the Central Valley (Service 2014).

9.4.3 Threats

The primary threat facing the valley elderberry longhorn beetle has been identified as habitat loss and degradation. There has been a significant loss and degradation of riparian and other natural habitats in the presumed historical range of the valley elderberry longhorn beetle driven by agricultural and urban development, and flood control activities throughout the Central Valley. Present day losses of Valley elderberry longhorn beetle habitat are often associated with urban development of agricultural areas and the maintenance of levees and other flood control structures. Additional threats identified include increased temperatures due to climate change, increased competition for the host plant from invasive plant species, predation of valley elderberry longhorn beetle larvae by invasive Argentine ants (*Linepithema humile*), and reduced survivorship of the host plant due to pesticides, and the increasing frequency and severity of wildfires and drought throughout the entirety of the species' range (Service 2023c).

9.5 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

The Service listed the vernal pool fairy shrimp as a threatened species and the vernal pool tadpole shrimp as an endangered species on September 19, 1994. Critical habitat for both species was designated on August 6, 2003. In 2005, the Service issued the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005) which included both species. This Recovery Plan was for multiple plant and animal species, using an ecosystem-level approach because many of the listed species and species of concern co-occur in the same natural ecosystem and share the same threats. The most recent 5-year review for both species was completed in 2024 in a single document. Please refer to the 2005 Recovery Plan and the 2024 5-year review for a comprehensive assessment of the both species' general descriptions, life history, range-wide status, and habitat preferences. The following paragraphs provide a summary of the relevant information in the above documents, BA, and other sources available to the Service.

9.5.1 Life History and Habitat Requirements

The vernal pool fairy shrimp and vernal pool tadpole shrimp are small freshwater crustaceans that occur in the vernal pool ecosystems of California and Southern Oregon. Vernal pool fairy shrimp vary in size, ranging from 11 to 25 millimeters (0.4 to 1.0 inch) in length. Vernal pool tadpole shrimp range in size from 15 to 86 millimeters (0.6 to 3.3 inches) in length. Vernal pool tadpole shrimp are predators of vernal pool fairy shrimp, whereas vernal pool fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus. Vernal pools are ephemeral wetland features that form in depressions above an impervious substrate layer, typically within a larger matrix of annual grasslands. The shrimp species have life histories that are highly adapted to the environmental conditions of these ephemeral habitats. During the summer dry season when there is no water in the vernal pools, shrimp cysts (eggs) lie dormant in the soil. After winter rains fill the pools, cysts hatch and the shrimps progress through their entire lifecycle over several weeks or months, depositing more cysts at the bottom of the pools and then dying off as pools dry. Both flooding and the movement of wildlife and livestock within and between vernal pool complexes allow the shrimp species to passively disperse between individual pools. The majority of known occurrences for these species are within the Central Valley of California.

9.5.2 Distribution and Numbers

It is likely the historical distribution of this species coincides with the historical distribution of vernal pools in California's Central Valley and southern Oregon and an estimated 1,618,700 hectares (4,000,000 acres) of vernal pool habitat existed in the Central Valley prior to the widespread agricultural development that began in the mid-1800s (Service 2005). As of 2018, 737,337 acres of vernal pool grassland remained in the Central Valley (Service 2024c). Although the current and historical distribution of vernal pools is similar, vernal pools are now far more fragmented and isolated from each other than during historical times. The current distribution of both shrimp species in the Central Valley may be similar to its historical distribution in extent, but remaining populations are now considerably more fragmented and isolated than in pre-agricultural times.

Surveys (and monitoring) of both shrimp species generally only record presence/absence in pools and do not provide information on shrimp abundance in pools. The Service is not aware of information documenting population trends for either of the shrimp species (Service 2024c). Increased surveys of vernal pools throughout California have resulted in additional occurrences of both species being documented. Vernal pool fairy shrimp is known to occur in a wide range of vernal pool habitats and has 1,038 confirmed occurrences in 13 vernal pool regions (Service 2024c). There have been 329 confirmed occurrences of vernal pool tadpole shrimp in 8 vernal pool regions (Service 2024c).

9.5.3 Threats

Habitat destruction, degradation, and fragmentation continue to be the primary threats to both shrimp species. Habitat loss is mostly due to agricultural conversion as well as urban development, construction of infrastructure, and other activities. Although some occurrences have been protected throughout both species' ranges, habitat loss continues to threaten the

unprotected occurrences. Approximately 76,023 acres of vernal pool grasslands were lost between 2005 and 2018 and the majority of losses were due to conversion to agricultural uses, most of which failed to acquire necessary permits under the Clean Water Act (Service 2024c). Other significant threats include drought and climate change, incompatible management and grazing practices on protected lands and other vernal pool habitat, and invasive plant species (Service 2024c).

9.6 Western Spadefoot, Northern DPS

On December 4, 2023, the Service proposed to list two distinct population segments (DPSs) of the western spadefoot as threatened, the northern DPS and the southern DPS segment (88 FR 84252). At this time, a final listing determination has not been issued. Critical habitat has not yet been proposed. A species status assessment report for the western spadefoot was published in May 2023 (Service 2023d). In 2005, the Service issued the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005) which included western spadefoot as a species of concern. This Recovery Plan was for multiple plant and animal species, using an ecosystem-level approach because many of the listed species and species of concern co-occur in the same natural ecosystem and share the same threats. The following paragraphs provide a summary of the relevant information in the above documents, BA, and other sources available to the Service.

9.6.1 Life History and Habitat Requirements

The western spadefoot is small (approximately 1.5 to 2.5 inches) and dusky green to gray. Western spadefoots are almost entirely nocturnal, with most aboveground movement and breeding occurring during rainy nights. Typically, western spadefoots are not found above the surface, instead they are found in underground burrows for eight to ten months of the year. Spadefoots emerge from their burrows to forage and breed in ephemeral pools following seasonal rains in winter and spring (Service 2023d). Depending on temperature and annual rains, western spadefoot breeding and oviposition generally occurs from October to May (Service 2023d). Adult western spadefoot toads will forage on a variety of insects, worms, and other invertebrates (Service 2005).

Western spadefoot may be found in coastal sage scrub, chaparral, and grasslands habitats, but it is most common in grasslands or mixed grassland/coastal sage scrub with vernal pools and areas of open vegetation and short grasses where the soil is sandy or gravelly (Service 2005). Western spadefoots require both aquatic and terrestrial habitat components in close proximity. Spadefoots are primarily terrestrial, requiring upland habitats for feeding and for constructing burrows for long dry-season dormancy. Aquatic habitat is used for breeding and developing larvae. Although vernal pools are considered the primary aquatic breeding habitat, eggs and larvae of western spadefoot have been observed in a variety of permanent and temporary wetlands, both natural and altered, including non-flowing rivers, creeks, artificial ponds, livestock ponds, sedimentation and flood control ponds, irrigation and roadside ditches, roadside puddles, tire ruts, and borrow pits (Shedd 2016). Pools must lack predators such as fish, bullfrogs, and crayfish for western spadefoots to successfully reproduce and metamorphose (Service 2023d).

9.6.2 Distribution and Numbers

The western spadefoot toad is nearly endemic to California, and historically ranged from the vicinity of Redding in Shasta County southward to Mesa de San Carlos in northwestern Baja California, Mexico (Service 2005). The species is patchily distributed throughout its historical range within suitable habitat (88 FR 84256). The northern DPS of western spadefoot occurs entirely in California, north of Santa Barbara and encompasses the Sacramento and San Joaquin Valleys from Shasta to Kern Counties, including the lower elevation foothill areas of the Sierra Nevada and low elevation and valley areas in northern Coast Range from Tehama County south to Santa Clara County. In the southwest portion of the northern DPS's range, the occupied area extends from southern Santa Cruz County to southern Santa Barbara County of the Coast Range and is contiguous with the Central Valley portion of the DPS's range (88 FR 84258). Western spadefoot can be found at elevations over 4,000 feet but most individuals are found below 3,000 feet (Service 2023d).

Population abundance estimates do not exist for the western spadefoot throughout its range (88 FR 84260). This is partly because consistent range-wide population surveying has not been completed. Additionally, life history characteristics and dry-season dormancy makes it difficult to survey for the species except when breeding ponds are available and the species is active and above ground or by surveying for egg masses in aquatic habitat. Currently, the species is patchily distributed throughout its historical range. However, the western spadefoot is thought to be extirpated throughout most of the lowlands of southern California and from many historical locations within the Central Valley (Service 2023d).

9.6.3 Threats

Habitat destruction, degradation, and fragmentation are primary threats to the western spadefoot (Service 2023d). Habitat loss is mostly due to agricultural conversion as well as urban development, construction of infrastructure, and other activities. Roads represent an additional threat associated with development to the western spadefoot as mortality of western spadefoot from motor vehicle strikes has been observed by multiple researchers throughout the range of both the northern and southern clade. Other threats to the western spadefoot include overabundance of vegetation in grassland landscapes, nonnative predators, drought, contaminants, and noise disturbance (Service 2023d).

10. ENVIRONMENTAL BASELINE

Environmental baseline refers to the condition of the listed species or its designated critical habitat in the Action Area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, State, or private actions and other human activities in the Action Area, the anticipated impacts of all proposed federal projects in the Action Area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The impacts to listed species or designated critical habitat from ongoing federal agency activities or existing federal agency

facilities that are not within the agency's discretion to modify are part of the *Environmental Baseline*.

To assess the status of federally listed species and their habitat within the Action Area, the Service utilized species habitat models developed using the best available scientific information on habitat preferences, elevation, soil types, and land cover associations for each species. Due to the infeasibility of conducting comprehensive ground-based surveys or mapping the entirety of the Action Area, particularly on private lands, the Service relied on remote sensing data, aerial imagery, existing ecological datasets, and historical occurrence records to characterize baseline environmental conditions. These species models served as the primary tool to identify areas of potentially suitable habitat, allowing the Service to make informed inferences about the presence and distribution of listed species within the Project footprint in the absence of complete field verification. Narratives on how the species models were constructed can be found in *Section 11.1.2 Species Models*.

10.1 Status of the Giant Garter Snake in the Action Area

The overall Action Area overlaps with a large portion of the giant garter snake's range, which spans the Central Valley of California. The giant garter snake is known to occur in the vicinity of the Project footprints. At least 18 California Natural Diversity Database (CNDDB) occurrences of giant garter snake have been reported within 5 miles of the geotechnical exploration, construction, inundation, and recreation footprints, and three of them overlap with the footprints (CNDDB Occurrences #251, 253, 344; CDFW 2024). Within the Project footprints, suitable aquatic habitat is present in ditches, canals, freshwater emergent wetlands, and rice fields within and adjacent to the agricultural lands (Sites Project Authority and Bureau of Reclamation 2023). Suitable giant garter snake upland habitat is present in annual grassland, ruderal areas, and canal banks within 200 feet of suitable aquatic habitat. Modeled suitable habitat falls within the geotechnical exploration and construction footprints of the Project.

Four populations described in the *Recovery Plan* occur in the Action Area where Project activities and giant garter snake mitigation are proposed:

10.1.1 Colusa Basin Population

The Project footprints overlap with the Colusa Basin Population and Recovery Unit as defined in the *Recovery Plan for Giant Garter Snake* (Service 2017b). The Colusa Basin Recovery Unit is comprised of mostly agricultural lands predominantly in rice production, and also includes the Sacramento NWR, the Delevan NWR, GCID Main Canal, Colusa Trough, Colusa Drain, and several wetland habitats between the towns of Chico and Woodland from north to south and between the western edge of the Sacramento Valley to the Sacramento River from west to east.

There are 81 records in the CNDDB (CDFW 2024) of giant garter snake in the Colusa Basin Recovery Unit. The USGS has conducted trapping surveys of giant garter snake at the Sacramento NWR Complex (Service 2020a). Wylie, in conjunction with Refuge staff, observed giant garter snakes at each of the federal wildlife refuges (Colusa, Delevan, and Sacramento) that comprise the Sacramento NWR complex. Wylie *et al*. (2016, 2017) located 51 and 32 giant

garter snakes, respectively, in the years 2016 and 2017 within the Colusa NWR. It is also documented that giant garter snakes occur outside of NWR lands in the adjacent rice production areas. The Colusa NWR represents a stable, relatively protected sub-population of snakes within the Colusa Basin and continues to reflect a healthy population of giant garter snakes with successful recruitment of young (Wylie *et al.* 2003, 2004, 2005). Stony, Logan, Hunters, and Lurline Creeks, as well as the Colusa Drain, and GCID Main, TC, and CBD Canals and their associated wetlands, are important as snake habitat and movement corridors for giant garter snake. These waterways and associated wetlands provide vital permanent aquatic and upland habitat for snakes in areas with otherwise limited habitat (Wylie *et al.* 2005).

10.1.2 Yolo Bypass Population

The Yolo Bypass is a leveed, 59,300-acre floodplain located about 5 miles west of Sacramento. It is California's largest contiguous floodplain and provides valuable habitat for a wide variety of aquatic and terrestrial species (Sommer *et al.* 2001). When flooded, the Yolo Bypass provides up to about 59,300 acres of shallow floodplain habitat, with a typical mean depth of 6.5 feet or less.

There are 47 records in CNDDB (CDFW 2024) of giant garter snake in the Yolo Bypass, with the majority of sightings located at the upper portion of the Yolo Bypass between Interstate 5 and Interstate 80 in a location known as Conaway Ranch. There are eight recent sightings reported in CNDDB from 2018 to 2022 in the Southern portion of the Bypass of the Cache Slough complex along Lookout Slough and Shag Slough near Liberty Island.

10.1.3 Butte Basin Population

The Butte Basin Recovery Unit encompasses the entire Butte Basin, extending from Red Bluff in the north to the Sutter Buttes in the south. The Butte Basin consists of 479,118 acres, including portions of Tehama, Butte, Sutter, and Colusa counties (Service 2017b). Three management units have been defined for the Butte Basin Recovery Unit: Llano Seco, Upper Butte Basin, and Gray Lodge/Butte Sink. Most occurrences are located in the Upper Butte Basin Wildlife Area and the Gray Lodge Wildlife Area and are associated with rice fields. In addition, within the Butte Basin Recovery Unit, there are two important snake populations that occur within this unit (portions of Little Butte Creek, Butte Creek). Refer to the 2020 5-year review for occurrence and trapping data.

10.1.4 Sutter Basin Population

The Sutter Basin extends south from the Sutter Buttes to the confluence of the Feather and Sacramento rivers. The Sutter Basin consists of 239,810 acres, including portions of Butte and Sutter counties. Three management units have been defined for the Sutter Basin Recovery Unit: Sutter, Gilsizer Slough, and Robbins. Two important snake populations (portions of Willow Slough and Bypass, Sutter Bypass Toe Drain) are located within the Sutter Basin Recovery Unit. Refer to the 2020 5-year review for occurrence and trapping data.

10.2 Status of the Monarch Butterfly in the Action Area

The Action Area supports various native species of milkweed, which are potential spring and summer breeding locations for monarch. Modeled suitable habitat for monarch butterfly is present throughout the Project footprints. Comprehensive surveys have not been conducted for this species in the Action Area where Project activities and monarch butterfly mitigation are proposed. The Action Area is approximately 75 miles from the Pacific Ocean and is subject to frosts and therefore not suitable to support overwintering sites.

Conservation efforts are addressing some of the threats from loss of milkweed and nectar resources across eastern and western North America and management at overwintering sites in California; however, these efforts and the existing regulatory mechanisms are not sufficient to protect the species from all threats (87 FR 26152). Within the Action Area, there are a number of programs in place to encourage landowners to voluntarily plant native milkweed and native wildlflowers on their properties. Many restoration projects within the Action Area also utilize seed mixes that incorporate multiple species of native milkweed and native wildflowers that are nectar sources for the monarch butterfly.

10.3 Status of the Northwestern Pond Turtle in the Action Area

Northwestern pond turtle are aquatic turtles that potentially occur in suitable habitat throughout the Action Area, including the Project footprints, primarily in ditches, canals, perennial streams, intermittent streams, forested wetlands, freshwater marshes, managed wetlands, ponds, reservoirs, rice fields, scrub-shrub wetlands, and seasonal wetland land cover types. Potentially suitable upland habitat for the northwestern pond turtle consists of annual grassland, blue oak woodland, chamise chaparral, foothill pine, mixed chaparral, oak savanna, ruderal, and upland riparian that is within 1,640 feet of suitable aquatic habitat. Modeled suitable habitat for northwestern pond turtle is present throughout the Project footprints.

To date, no CNDDB occurrences of northwestern pond turtles have been detected in the geotechnical exploration, construction, inundation, and recreation footprints of the proposed Project. However, detections have been recorded nearby in the broader Action Area with the closest occurrence from 2017 being 2.8 miles east of the footprint in the Sacramento National Wildlife Refuge (CNDDB Occurrence #1376) and another recorded occurrence from 2016 approximately 4 miles northeast of RBPP (CNDDB Occurrence #1312; CDFW 2024).

The Project footprints overlap with the North Central Valley and Bay Delta and Nevada Analysis Units identified in the 2023 Species Status Assessment. The overall Action Area where mitigation may occur overlaps the Service-designated analysis units that fall within California: Northern California, North Central Valley, Bay Delta and Nevada, Yosemite, and San Joaquin Valley. (Service 2023b). Each of these basins includes an extant population of northwestern pond turtle. Based on literature review, Manzo *et al.* (2021) estimates most populations contained between 1 and 50 individuals, with the highest population estimates in Trinity, Fresno, and Kern counties (Service 2023b).

10.4 Status of the Valley Elderberry Longhorn Beetle in the Action Area

A survey for valley elderberry longhorn beetle and its habitat was conducted in 1998 and 1999 within a portion of the Action Area that overlapped with the geotechnical exploration, construction, inundation, and recreation footprints of the project proposed in the Sites area at the time, which constituted roughly 75 to 80 percent of the locations within the current footprints with potential habitat for this species. Surveys focused on identifying potential habitat for valley elderberry longhorn beetle, the number of elderberry stems found measuring more than one inch, and the presence of exit holes. The survey revealed 672 stems counted within the survey area, and exit holes were found on 18 individual stems. Based on Geographic Information System (GIS) mapping from this survey, none of the elderberry plants with exit holes are within the current geotechnical exploration, construction, inundation, and recreation footprints. Due to the age of the survey information, the Service has not relied on the 1998 and 1999 survey information and future surveys will be necessary for the Project. There are numerous records for occurrences of valley elderberry longhorn beetle along the Sacramento River within the Action Area (CDFW 2025). Previous studies conducted in 2000 within portions of the Action Area documented several elderberry shrubs, some with exit holes; however, more recent surveys have not been conducted (DWR 2000). Modeled suitable habitat for valley elderberry longhorn beetle is present throughout the Project footprints.

For the valley elderberry longhorn beetle, three management units have been identified based on watersheds. The management units are: the Sacramento River Management Unit; the San Joaquin River Management Unit; and the Putah Creek Management Unit.

The Action Area where Project and mitigation activities will take place overlaps all 3 management units. The Service's recovery goal is to preserve resilient populations of valley elderberry longhorn beetle across the historical range of the species by maintaining occupancy of at least 80 percent within each management unit (Service 2019). Data suggests that the valley elderberry beetle continues to persist throughout its historic range despite significant habitat alteration and losses of populations in certain drainages (CNDDB 2025; Service 2019).

10.5 Status of the Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp in the Action Area

The overall Action Area falls within the Great Valley, the massive geological 'structural basin' surrounded by mountains where vernal pools and the species that inhabit them occur. Within the Great Valley, the proposed Project footprint is located in Glenn and Colusa Counties within the Solano-Colusa Vernal Pool Region (Vollmar *et al.* 2023). According to the best current known scientific data, the portion of the Action Area that falls outside of the Sacramento Valley floor and within the Coast Range foothills does not support any known federally or State-listed vernal pool species (Vollmar *et al.* 2023). The areas generally east of Funks Reservoir consist of cultivated lands and rural developments (e.g., the towns of Delevan and Maxwell). These areas are not considered suitable habitat for vernal pool branchiopods because when natural land is cultivated or developed, the physical characteristics required for vernal pool formation are

altered. Alteration of vernal pools is generally irreversible. Land use conversion often disrupts the physical and biological processes conducive to a functional vernal pool ecosystem because the associated ground-disturbing activities can alter the hydrology, soil formation, seed bank, and topography of the landscape (Service 2005).

The habitat model for the Project is limited primarily by the accuracy of aerial imagery interpretation and the inability to ground-truth the land cover mapping (e.g., determine if seasonal wetlands and ponds have sufficient depth and ponding duration to support one or more vernal pool branchiopod species). Aquatic habitat must be inundated sufficiently by rainfall at the appropriate time of year to allow vernal pool branchiopods to reach maturity and reproduce; if the availability of aerial imagery is limited or the resolution is poor, it may not be possible to accurately determine the sufficiency of ponding. Additionally, very small seasonal wetlands that could provide suitable habitat may not be visible on aerial imagery. Other parameters that affect the habitat suitability for vernal pool branchiopods that are not measurable using aerial imagery review include water quality, ponding depth, and water temperature (Service 2005).
Surveys of potential shrimp habitat at the potential reservoir sites were performed in 1998 and 1999 in portions of the Project footprints. The majority of the areas identified as potential habitat were identified as degraded by cattle activity, erosion, and debris from cattle feeding areas. Focused surveys for the shrimp near the Funks Reservoir were conducted in 2003. The vernal pool fairy shrimp and vernal pool tadpole shrimp were not found during these surveys, and no more recent surveys have been conducted. Due to the age of the survey information and lack of survey detail available, the Service has not relied on the 1998, 1999, and 2003 survey information and future surveys will be necessary for the Project to determine occupancy.

There are no recorded occurrences of vernal pool fairy shrimp and vernal pool tadpole shrimp in the geotechnical exploration, construction, inundation, and recreation footprints (CDFW 2025). There are several records for vernal pool fairy shrimp occurrences at the Sacramento National Wildlife Refuge Complex, approximately 2.75 to 3.75 miles from the footprints. There are also records of occurrences near the RBPP, the closest being approximately 1.2 miles northwest of the pumping plant (CDFW 2025). Modeled suitable habitat for vernal pool branchiopods is present within the geotechnical exploration and construction footprints of the Project.

Vernal pools and seasonal wetlands within the Action Area are presumed to be suitable habitat for and occupied by vernal pool fairy shrimp and vernal pool tadpole shrimp. No surveys have been conducted for the species within the proposed geotechnical exploration, construction, inundation, and recreation footprints for this Project, but known occurrences exist within and nearby where Project activities are proposed to occur.

Four Vernal Pool Regions described in the *Recovery Plan* occur in the Action Area where Project activities and vernal pool fairy shrimp and vernal pool tadpole shrimp mitigation are proposed:

Solano-Colusa Vernal Pool Region

Project activities will partially occur within the Solano-Colusa Vernal Pool Region. When comparing vernal pool grassland habitat in 2005 compared to 2018, 96 percent of the acreage was still extant and almost 40 percent of those acres have been protected (Service 2024c).

Northeastern Sacramento Valley Vernal Pool Region

In the Northeastern Sacramento Valley Vernal Pool Region, when comparing vernal pool grassland habitat in 2005 compared to 2018, 97 percent of the acreage was still extant and almost 33 percent of those acres have been protected (Service 2024c).

Northwestern Sacramento Valley Vernal Pool Region

Project activities will partially occur within the Northwestern Sacramento Valley Vernal Pool Region. In the Northwestern Sacramento Valley Vernal Pool Region, when comparing vernal pool grassland habitat in 2005 compared to 2018, 84 percent of the acreage was still extant and 8 percent of those acres have been protected (Service 2024c). This vernal pool region has exhibited the largest percentage of total vernal pool losses and the largest percentage of losses to agricultural conservation with the Central Valley, although other areas do have a greater amount of loss (Witham 2021). The vast majority of vernal pool losses within this region have been to agricultural conversions (Service 2024c). This region also had the second highest amount and percentage of vernal pool grassland lost to urban development, after the Southeastern Sacramento Valley Vernal Pool Region (Witham 2021).

Southeastern Sacramento Valley Vernal Pool Region

In the Southeastern Sacramento Valley Vernal Pool Region, when comparing vernal pool grassland habitat in 2005 compared to 2018, 88 percent of the acreage was still extant and almost 31 percent of those acres have been protected (Service 2024c).

10.6 Status of the Western Spadefoot, Northern DPS in the Action Area

There are no western spadefoot CNDDB occurrences in the geotechnical exploration, construction, inundation, and recreation footprints; however, recorded occurrences do exist more broadly in the Action Area, with the closest occurrence from 2019 at 3.3 miles northwest of Dunnigan. There are five known CNDDB occurrences of western spadefoot within three to five miles of the Dunnigan Pipeline, but no suitable aquatic or upland habitat is present in the Dunnigan Pipeline portion of the Action Area.

Potentially suitable aquatic habitat consists of intermittent stream and seasonal wetland land cover types that inundate during the late fall to early spring depending on when precipitation events occur and hold water for a minimum of three consecutive weeks. Potentially suitable upland habitat is composed of annual grassland, blue oak woodland, chamise chaparral, foothill pine woodland, mixed chaparral, and oak savanna land cover types within 1,200 feet of

intermittent streams and seasonal wetlands. Modeled suitable habitat for western spadefoot is present throughout the Project footprints.

Western spadefoot is a species addressed in the *Draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (69 FR 67601) and the *2005 Recovery Plan for Vernal Pool Species* (Service 2005). To assess the current condition of the western spadefoot in more detail, the species' range was divided into multiple regions, which were chosen to align with the recovery units identified in the Service's *Recovery Plan for Vernal Pool Ecosystems of California and Oregon* (Service 2005). In total, 10 northern western spadefoot regions were identified, 7 of which overlap the Action Area where western spadefoot mitigation activities are proposed: Northwestern Sacramento Valley, Northeastern Sacramento Valley, Solano-Colusa, Southeastern Sacramento Valley, Livermore, Southern Sierra Foothills, and San Joaquin Valley.

Northwestern Sacramento Valley

The Northwestern Sacramento Valley vernal pool region extends from the Redding area of Shasta County south to the Williams area of Colusa County, also including parts of Glenn and Tehama counties. The overall condition of the Northwestern Sacramento Valley region is estimated to be low, meaning it has less than 65 percent of local populations as decided by experts. Out of five pools that were surveyed in the Northwestern Sacramento Valley region in 2019, only one had western spadefoot present (Service 2023d).

Northeastern Sacramento Valley

The Northeastern Sacramento Valley vernal pool region extends from the Millville Plains to the Sutter Buttes, including parts of Butte, Shasta, Sutter, Tehama, and Yuba counties. The overall condition of the Northeastern Sacramento Valley region is estimated to be low. Out of eight pools that were surveyed in the Northeastern Sacramento Valley region in 2019, only one had western spadefoot present (Service 2023d).

Solano-Colusa

The Solano-Colusa vernal pool region includes substantial areas of Solano, Colusa, and Yolo counties, as well as small parts of Glenn, Butte, Sutter, and Contra Costa counties. The overall condition of the Solano-Colusa region is estimated to be low. Out of six pools that were surveyed in the Solano-Colusa region in 2019, none had western spadefoot present (Service 2023d).

Southeastern Sacramento Valley

The Southeastern Sacramento Valley vernal pool region extends from southern Yolo County south to San Joaquin and Calaveras counties, incorporating most of Sacramento county and smaller areas of Amador, El Dorado, Nevada, Placer, and Sutter counties. The overall condition of the Southeastern Sacramento Valley region is estimated to be low-moderate, meaning the region has between less than and at least 65 percent of local populations as decided by experts. Out of 14 pools that were surveyed in the Southeastern Sacramento Valley region in 2019, three had western spadefoot present (Service 2023d).

Livermore

The Livermore vernal pool region straddles Alameda, Contra Costa, and Santa Clara counties. The overall condition of the Livermore region is estimated to be low (Service 2023d).

Southern Sierra Foothills

The Southern Sierra Foothills vernal pool region occupies high and low terrace landforms ranging from the junction of San Joaquin, Stanislaus, and Calaveras counties south to Tulare County. Portions of Fresno, Madera, Mariposa, Merced, and Tuolumne counties also are included in the region. The overall condition of the Southern Sierra Foothills region is estimated to be low-moderate. Out of 29 pools that were surveyed in the Southern Sierra Foothills region in 2019, five had western spadefoot present (Service 2023d).

San Joaquin Valley

The San Joaquin Valley vernal pool region occupies the long, narrow area that runs southward from San Joaquin County to Kern County, including parts of Fresno, Kings, Madera, Merced, Stanislaus, and Tulare counties. The overall condition of the San Joaquin Valley region is estimated to be low. Out of 53 pools that were surveyed in the San Joaquin Valley region in 2019, 11 had western spadefoot present (Service 2023d).

10.7 Surrounding Land Uses and Existing Conditions

The Action Area spans a broad geographic region in California encompassing portions of 17 counties, extending roughly from Red Bluff in the north to Modesto in the south, and the valley floor from the Coast Ranges in the west to the Sierra Nevada Mountains in the east (see ***Figure 2*** and ***Figure 3***). Counties within the Action Area include Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Glenn, Nevada, Placer, Sacramento, San Joaquin, Shasta, Solano, Sutter, Tehama, Yolo and Yuba. While this expansive Action Area encompasses all potential compensatory mitigation lands associated with the proposed Project, the primary physical Project components, including the geotechnical exploration, construction, inundation, and recreational footprints, are largely concentrated within Glenn, Colusa, and Yolo counties. The surrounding land uses in these four counties reflect a mix of rural agricultural landscapes, transportation corridors, small urban centers, and associated infrastructure, as described in further detail below.

Glenn County

In Glenn County, the Project footprint intersects with areas surrounding the Glenn-Colusa Irrigation District (GCID) Main Canal. This region is characterized by a combination of agricultural and transportation infrastructure. Key existing infrastructure includes Interstate 5 (I-5), which runs north to south and serves as a major transportation artery in the region; State Route (SR) 162, which provides east to west access through the county; and the City of Willows, the county seat and primary urban center. The surrounding landscape is predominantly rural, with irrigated croplands, orchards, and canal infrastructure forming the dominant land uses (Sites Project Authority and Bureau of Reclamation 2023).

Colusa County

The Colusa County portion of the Action Area encompasses several key Project components, including areas of potential inundation, segments of the GCID Main Canal, the TC Canal, Replacement Reach (TRR) East and West, and Funks Reservoir. Existing infrastructure in this area includes I-5, SR 45, a network of rural county roads, and an extensive system of levees and irrigation canals that support local water conveyance. The towns and communities in this portion of the Action Area are generally small and dispersed, often situated along major transportation routes (Sites Project Authority and Bureau of Reclamation 2023).

Land use in Colusa County is heavily dominated by agriculture. Common agricultural uses include intensively managed cropland, particularly rice fields, as well as permanent orchards such as almond and walnut groves. Pastureland for livestock grazing is also prevalent in less intensively irrigated areas. The presence of canals, levees, and reservoirs is integral to the region's water supply and land management systems (Sites Project Authority and Bureau of Reclamation 2023).

Tehama County

The Tehama County portion of the Action Area lies at the northern extent of the Project footprint, generally around the Red Bluff area and adjacent rural lands. Land use in Tehama County is primarily agricultural and rangeland, with extensive areas of orchards, irrigated croplands, and open pasture used for livestock grazing (Vestra 2006). The landscape also includes low-density residential development and rural infrastructure. Key transportation routes include I-5, which bisects the county from north to south, and SR 36, which provides east to west access across northern California. In addition to agricultural activity, Tehama County includes important riparian corridors and groundwater recharge areas that contribute to the ecological health of the Sacramento River watershed.

Yolo County

In Yolo County, the Action Area encompasses the terminal end of the TC Canal, the CBD, and associated lands extending to the Sacramento River. Existing infrastructure in this area includes Interstate 5, County Road 99W, local levee systems, and commercial operations such as the Ritchie Bros. Auction Yard, a large open-air facility situated between I-5 and Road 99W. This facility occupies a prominent footprint but is surrounded by primarily agricultural lands (Sites Project Authority and Bureau of Reclamation 2023).

Similar to Colusa County, the predominant land use in Yolo County within the Action Area is agriculture, with rice cultivation being the primary crop. The flat, low-lying terrain and extensive irrigation infrastructure make the area particularly suitable for rice farming. Water conveyance structures, such as canals and levees, are key features of the landscape and play a critical role in supporting agricultural operations and managing seasonal water flows from the Sacramento River and associated tributaries (Sites Project Authority and Bureau of Reclamation 2023).

And Other Surrounding Counties

Beyond the counties directly supporting the main Project infrastructure, the broader Action Area extends across several additional counties, Butte, Contra Costa, Placer, Sacramento, San Joaquin, Solano, Shasta, Sutter, and Yuba. These counties encompass areas identified for potential compensatory mitigation activities or areas that contribute to the broader ecological context in which the Sites Reservoir Project occurs.

The Action Area, situated on the floor of California's Central Valley, is framed by the Coast Ranges to the west and the Sierra Nevada foothills and mountains to the east. This geographic setting creates a natural basin that supports one of the most productive agricultural regions in the country. Land use across these additional counties is highly variable but predominantly agricultural in rural areas, with urban and suburban development increasingly present near metropolitan centers such as Sacramento and Stockton.

Forested areas, particularly along the foothills of the Sierra Nevada and Coast Ranges, border the valley floor and provide critical wildlife habitat and ecosystem services such as carbon sequestration, water filtration, and slope stabilization. These forested and upland areas also influence watershed hydrology and support downstream flow regimes that are essential for sustaining aquatic habitat in the valley floor and Delta regions.

While direct impacts from the Project are concentrated in the western Sacramento Valley, these surrounding counties are ecologically and hydrologically interconnected with the Action Area and may play a role in regional mitigation strategies or conservation planning associated with the Sites Reservoir Project.

10.7.1 Vegetation or Land Cover Types within the Action Area

The Action Area includes a wide variety of vegetation communities that reflect differences in climate, elevation, hydrology, soil types, and land use history. Despite the broad geographic extent of the Action Area, vegetation within the geotechnical exploration and construction footprints located on the valley floor are generally dominated by agricultural land cover types, managed wetland habitats, and disturbed or developed lands. Land cover types within the inundation and recreation footprints are located in primarily undisturbed foothill habitat dominated by annual grassland and blue oak woodland. The broader Action Area, however, supports a more diverse array of vegetation communities that include the following land cover types.

Agricultural and Ruderal Vegetation

Within the Project footprint and surrounding lowland valleys, the landscape is dominated by intensively managed agricultural fields, including rice fields, orchards (almonds, walnuts), row crops, and pasturelands. These areas are frequently disturbed, highly modified, and maintained through irrigation and tillage. Ruderal vegetation, composed of non-native grasses and weedy forbs such as *Bromus spp.*, *Avena fatua*, *Brassica spp.*, and *Convolvulus arvensis*, often dominates roadsides, canal banks, levees, and field margins.

Valley Grassland and Vernal Pool Complexes

In less developed portions of the Action Area, patches of valley grassland and vernal pool complexes persist. These areas are typically found on claypan soils with poor drainage and support native and non-native annual grasses such as *Nassella pulchra*, *Elymus glaucus*, and *Festuca spp.*, intermixed with vernal pool endemics like *Lasthenia spp.* (goldfields), *Downingia spp.*, and *Plagiobothrys spp.* during seasonal inundation. These habitats are of high conservation value due to their limited distribution and the number of endemic species they support.

Riparian, Open Water, and Wetland Vegetation

Riparian corridors along waterways such as the Sacramento River, CBD, and various irrigation canals support riparian forest and scrub vegetation. Common riparian species include Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), box elder (*Acer negundo*), and a variety of herbaceous understory species. These areas also provide important ecological functions such as bank stabilization, water filtration, and habitat connectivity for wildlife. Freshwater emergent wetlands and irrigation reservoirs (e.g., Funks Reservoir) may support bulrush (*Schoenoplectus spp.*), cattail (*Typha spp.*), and other hydrophytic vegetation.

In addition to riparian vegetation, the Sites Reservoir Project footprint includes open water features such as irrigation canals, agricultural ponds, and reservoirs (e.g., Funks Reservoir), which contribute to the region's aquatic habitat diversity. Open water habitats within the Action Area vary in size and permanence, supporting aquatic species and providing foraging and resting areas for waterfowl and other wildlife. Freshwater emergent wetlands and seasonally inundated areas may support dense stands of bulrush (*Schoenoplectus* spp.), cattail (*Typha* spp.), and other hydrophytic vegetation, especially around the margins of open water bodies. These habitats play a critical role in nutrient cycling, sediment retention, and biodiversity support within the broader landscape.

Oak Woodland and Chaparral

In the higher elevation and more upland areas, particularly along the western and eastern fringes of the Action Area, oak woodland and chaparral communities are present. These areas are typically composed of blue oak (*Quercus douglasii*), interior live oak (*Quercus wislizeni*), manzanita (*Arctostaphylos spp.*), and chamise (*Adenostoma fasciculatum*), often occurring on hillsides and well-drained soils. These upland habitats contribute to the biological diversity of the Action Area and may serve as important refugia for native flora and fauna.

Developed

Portions of the Action Area consist of a combination of developed land cover types, including urban infrastructure, transportation corridors, agricultural support facilities, levees, and areas of bare ground. Developed lands are primarily concentrated along major roadways such as I-5, SR 45 and 162, and within or near small urban centers and rural communities like Maxwell, Willows, and Dunnigan. These areas include residential neighborhoods, commercial facilities,

industrial sites, utility infrastructure, and public services such as schools and government buildings.

Agricultural support infrastructure is also a prominent feature of developed lands in the region. This includes grain silos, processing facilities, farm equipment yards, storage buildings, and water conveyance structures such as pump stations and canal maintenance facilities. Many of these developments are interspersed with or adjacent to active farmland, forming a patchwork landscape of mixed agricultural and developed use.

Levees, canal embankments, and access roads form a network of linear infrastructure throughout the Action Area. These features, while largely unpaved or minimally developed, are classified as developed or disturbed due to their altered condition, ongoing maintenance, and restricted vegetative growth. Bare ground is also present in staging areas, construction zones, utility corridors, and areas subject to frequent vehicle access or soil disturbance.

While developed lands generally offer no to low habitat value for most sensitive species, they can provide marginal or opportunistic habitat for certain wildlife adapted to human-modified environments, such as raptors, burrowing owls, and small mammals. Some disturbed areas may also support ruderal vegetation or serve as corridors between more natural habitats. Overall, developed lands in the Action Area reflect the region's mix of rural infrastructure and small urban centers, supporting both agricultural operations and local communities.

10.8 Previous Consultations in the Action Area

Section 7 consultations under the ESA have occurred throughout the Action Area in connection with infrastructure, water operations, habitat management, and conservation initiatives. These consultations have addressed various federally listed species, including the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and/or western spadefoot. The following subsections summarize relevant past consultations by project type or activity.

10.8.1 Existing Water Structures and Facilities

Within the Project footprint, the Service has consulted with Reclamation on construction at water structures and facilities: GCID Hamilton City Pumping Plant and the RBPP. Both facilities are expected to be utilized as part of the Proposed Action.

Construction of GCID's Hamilton City Pumping Plant predates the ESA. In 1997, the Service consulted with Reclamation regarding proposed improvements to fish screens at GCID's Hamilton City Pumping Plant (Service File No. 81420-1997-F-0115**)**. The consultation evaluated impacts on the giant garter snake, Sacramento splittail (*Pogonichthys macrolepidotus*), and valley elderberry longhorn beetle. Protective measures included installation of improved screens, pre-construction surveys, and seasonal timing to avoid sensitive life stages of aquatic species.

In 2007, the Service consulted with Reclamation regarding construction of the RBPP **(**Service File No. 1-1-07-F-0101). This consultation addressed potential adverse effects to the federally-

threatened valley elderberry longhorn beetle. The project involved the removal and transplant of up to nine elderberry shrubs within the RBPP project area. Conservation commitments included transplanting shrubs to offsite nurseries, planting 67 elderberry seedlings plus 93 native understory species, establishing protective buffers, conducting biological monitoring, and implementing a long-term habitat management plan, actions designed to offset the loss of beetle habitat.

10.8.2 Water Operations

Within the Project footprints and the broader Action Area, the Service has consulted with Reclamation and the California Department of Water Resources regarding water operations. The proposed Project will utilize the Red Bluff Diversion Dam, RBPP, TC Canal, and Funks Reservoir which are owned by Reclamation and are components of the Sacramento Canals Unit of the CVP. The Project will also utilize the GCID Main Canal and the Hamilton City Pump Station which are owned by the GCID (a member of the Sacramento River Settlement Contractors) and are an operating component of the CVP. Most recently, the Service has consulted on the operations of these facilities in the November 8, 2024, LTO BiOp of CVP and SWP (Service File No. 08FBDT00-2022-0059509). The BiOp primarily evaluated the effects of long-term CVP and SWP operations on listed fish species and their critical habitats, focusing on flow regimes, water temperature management, and operational timing to minimize adverse effects and ensure compliance with the ESA.

In 2024, the Service consulted with Reclamation to establish a Sacramento River Settlement Contractor's Water Reduction Program (reduce water deliveries) and implement drought resiliency actions (Service File: 2024-0093832). The BiOp primarily evaluated the impacts fallowed rice acreage would have on the giant garter snake. The Service anticipated that an annual maximum amount of rice acreage to be fallowed will be 83,333 acres in 2025-2035 and 16,667 acres in 2035-2045.

10.8.3 Geotechnical Investigations and Major Construction Efforts

Within the Project footprint, the Service consulted with Reclamation for geotechnical investigations to inform engineering designs for the Proposed Sites Reservoir (Service File No. 08FBDT00-2019-F-0287-R001). While many species were consulted on, a biological opinion was issued only for the giant garter snake. The Service anticipated up to 10 individual giant garter snakes may be subject to incidental take from moving snakes to prevent injury and up to two snakes may be subject to incidental take from collisions with truck or equipment. To date, no incidental take of the giant garter snake as a result of these actions have occurred.

Within the broader Action Area, the Service consulted with the USACE on the construction of the Colusa Generating Station by Pacific Gas and Electric in 2008. The natural gas power plant is located less than one mile from the project footprint, approximately 6 miles north of the community of Maxwell (Service file number 81420-2008-F-0836). PG&E purchased conservation credits equivalent to 3.552 acres of giant garter snake habitat to offset habitat impacts to the giant garter snake.

10.8.4 Levees, Dredging, and Waterway Management

The Service has consulted with the USACE on a variety of projects associated with levees, dredging, and waterway management within the broader Action Area. Many of these projects are relatively small, involving repairs of levees, canals, and associated infrastructure repair and maintenance. Giant garter snake and valley elderberry longhorn beetle are the species most frequently consulted on for these types of projects. A consultation located less than five miles from the Project footprint include the Lurline Check and Siphon Replacement Project (Service File No. 2024-0043207). The check, siphon, and bridge structures associated with GCID's Main Canal at intersection with Lurline Creek are aging and the reinforced concrete had degraded and replacement of these structures was necessary to avoid future structural failure. The project resulted in impacts to habitat for the giant garter snake. To offset these impacts, GCID committed to creation of snake berms adjacent to the project area to provide upland refugia, hydroseeding of upland habitats, and purchase of conservation credits equivalent to 0.187 acres of giant garter snake habitat. The Service has consulted with the USACE to conduct emergency levee repairs by the utilizing Public Law 84-99 (Service File Nos. 2023-0105296 and 2024-0149585), which only repairs levees to pre-damage condition and does not provide substantive improvement to the levee.

Within the broader Action Area, the Service has also consulted with the USACE on several large levee improvement projects to provide flood protection to surrounding communities. These projects generally involve the construction of multiple miles of levees around existing waterways. Giant garter snake and valley elderberry longhorn beetle are the species most frequently consulted on for these types of projects. The Hamilton City Flood Damage Reduction and Ecosystem Restoration Project (Service File No. 81420-2009-F-0209) is located adjacent to the Sacramento River by Hamilton City and less than five miles downstream from the Hamilton City Pumping Plant. This consultation addressed impacts to the valley elderberry longhorn beetle. The USACE project constructed 6.8 miles of levee for improved flood protection and restored approximately 1,400 acres of native floodplain riparian habitat. It was estimated that approximately 107 elderberry shrubs might be impacted during construction and planting of approximately 2,747 or more elderberry shrubs was included within the restoration plan. The restoration is expected to benefit the recovery and stability of numerous federal and state-listed species and provide a more natural river function, contributing significantly to aquatic ecosystem restoration along this reach of the Sacramento River. Restoration work was completed in July 2024 and maintenance and monitoring of the site is anticipated to be ongoing through 2027.

10.8.5 Roadways and Public Access

The Service has consulted with the California Department of Transportation and the Federal Highway Administration on a variety of projects associated with roadways within the Action Area. Consultations located less than five miles away from the Project footprint include the Lenahan Road at Funks Creek Bridge Replacement Project (Service File No 81420-2009-F-1136) and the Danley Road Bridge Replacement Project at the Glenn-Colusa Main Canal (08ESMF00-2012-F-0521). BiOps for both projects evaluated habitat impacts to the giant garter snake. For the Lenahan Road at Funks Creek Bridge Replacement Project, the City of Colusa purchased conservation credits equivalent to 0.315 acres of giant garter snake habitat to offset

habitat impacts to the giant garter snake. For the Danley Road Bridge Replacement Project, less than one acre of giant garter snake habitat was anticipated to be permanently affected, and Colusa County designed the project to restore giant garter snake habitat immediately upstream and downstream and downstream. Within the broader Action Area, the Service has consulted with the California Department of Transportation and the Federal Highway Administration on a variety of other bridge replacements, evaluating impacts primarily to giant garter snake and the valley elderberry longhorn beetle. These projects have been small in scope with relatively small impacts estimated to federally listed species.

Within the broader Action Area, the Service has consulted with the California Department of Transportation and the Federal Highway Administration on larger projects. The Programmatic BiOp for the proposal to carry out or authorize construction of the statewide Middle-Mile Broadband Network evaluated impacts to numerous federally listed species and involves the construction of a statewide, middle-mile fiber optic broadband internet network within or adjacent to rights-of-way along approximately 10,000 miles of California's State Highway System (Service File No. 2022-0076259). For all listed species whose habitat is expected to be impacted, California Department of Transportation will offset temporary and permanent impacts to habitat through compensatory mitigation that meets the Service's policy of no net loss.

The Service has consulted with the Federal Highway Administration on the proposed Route 65 Lincoln Bypass project in Placer County, California (Service File No. 2022-0041301). The 1,755-acre project footprint includes both the proposed 12.8-mile alignment right-of-way footprint and a 250-foot "indirect effects" zone on either side of the alignment. Proposed impacts included: two elderberry shrubs and approximately 40.50-wetted acres of vernal pool crustacean habitat. Compensatory mitigation included transplanting elderberry shrubs and planting elderberry seedlings and vernal pool crustacean habitat preservation and creation which will be accomplished through the acquisition of specified properties and the purchase of vernal pool crustacean habitat credits.

10.8.6 Conservation Efforts

Habitat for federally listed species has also been preserved, created, or restored in the Action Area on properties owned and managed by a variety of conservation agencies. The National Wildlife Refuges that comprise the Sacramento National Wildlife Refuge Complex were initially intended to protect and manage waterfowl habitat; however, they also support habitat for other federally-listed species such as the giant garter snake and vernal pool species. Giant garter snake habitat is also present in the Gray Lodge State Wildlife Area and the Yolo Bypass State Wildlife Area. Other properties with vernal pool habitat include the 6,000-acre combined The Nature Conservancy Valensin Ranch conservation easement/CDFW Cosumnes River Ecological Reserve and the 3,900-acre Stone Lakes NWR.

Habitat for federally listed species has also been preserved, created, or restored in the Action Area as a result of the establishment of conservation and mitigation banks. There are multiple established giant garter snake conservation banks and preserves in the Action Area. They include the Colusa Basin Mitigation Bank (163 acres), the Ridge Cut Giant Garter Snake Conservation Bank (185.9 acres), the Sutter Basin Conservation Bank (407.55 acres), Gilsizer Slough South

Conservation Bank (379.4 acres), Gilsizer Slough North Giant Garter Snake Preserve (145 acres), the Prichard Lake Preserve (42.7 acres), Willey Wetlands Preserve (217 acres), and the Pope Ranch Conservation Bank (391 acres). There have been multiple conservation and mitigation banks established to conserve vernal pool fairy shrimp and vernal pool tadpole shrimp within the Action Area. They include the Dove Ridge Conservation Bank (2,400 acres), Blackburn Vernal Pool Conservation Bank (631 acres), Stillwater Plains Mitigation Bank (125 acres), Fitzgerald Conservation Bank (808 acres), and the Sacramento Municipal Utility District (SMUD) Conservation Bank (1,275 acres),

Habitat loss due land conversion due to urbanization has been identified as a primary threat to multiple species. The Service has been working with communities to develop and approve regional HCPs to provide long-term conservation and management of natural communities and sensitive species, while accommodating other land uses such as residential, commercial, public facility, and industrial construction. The HCPs identify types of covered activities, conservation measures that will be taken by species, identifies suitable habitat that could be impacted, and identifies conservation and habitat enhancement actions that can be used to provide compensatory mitigation. Within the Action Area, examples of Service approved HCPs include South Sacramento Habitat Conservation Plan (Service File No. 2022-0038281), Western Placer County Habitat Conservation Plan/Natural Community Conservation Plan (81420-2009-F-0520), and the Yolo Habitat Conservation Plan and Natural Community Conservation Plan (Service File No. 2022-0032217).

11. EFFECTS OF THE PROPOSED ACTION

Effects of the action are all consequences to listed species or critical habitat that are caused by the Proposed Action, including the consequences of other activities that are caused by the Proposed Action but that are not part of the action. A consequence is caused by the Proposed Action if it would not occur but for the Proposed Action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action.

This BiOp includes a mixture of project- and program-level analyses for the different Sites Reservoir Project components as described in the *Description of the Proposed Action* and *Consultation and Permitting Approaches*. Geotechnical explorations, construction, inundation, and recreation-related activities have been analyzed and described in the BA and supplementation documentation (BA Comment Tracker) at the site-specific level for near-term implementation with no future federal action required, including biological surveying and species relocations required prior to start of construction. Subsequent federal approvals will occur for the programmatic-level actions, such as implementation of the compensatory mitigation (including monitoring and adaptive management) and O&M plans.

Chapter 5 Effects Analysis of the BA prepared for the Service discusses the effects of the Proposed Action on federally listed and proposed species that are reasonably certain to occur in the Action Area. The Service requested additional information that provided further clarification to the BA that can be found within the BA Comment Tracker.

This *Effects of the Proposed Action* is organized by Standard and Framework Programmatic consultation approaches and furthermore by Project activity. The following concepts are covered prior to or within each activity header: deconstruction of the Proposed Action, methodology to assessing effects on federally listed species, and effects by species and their habitat.

11.1 Methods to Assessing Effects on Federally Listed Species

Access to the proposed geotechnical exploration, construction, inundation, and recreation footprints of the Project was not available for conducting site assessments and listed species surveys at the time this BiOp was written. Therefore, the Service relied on aerial imagery and other available data, such as soil maps, used in the developed species habitat models in the BA to predict where each listed species and its habitat have potential to occur. When identifying the abundance of listed species within Project footprints, the Service utilized existing information within recovery plans, from other previous consultations within the Action Area, and knowledge about each species. For instance, observations of elderberry shrub extent and abundance made during ongoing geotechnical investigations for Site Reservoir Project (BiOp Service File No. 08FBDT00-2019-F-0287-R002) helped inform the estimation of elderberry shrubs and beetles throughout the Project footprints where surveys have not yet occurred but had similar modeled habitat.

11.1.1 Land Cover Mapping

The Service relied on mapped land cover in and adjacent to the geotechnical exploration, construction, inundation, and recreation footprints. Land cover was digitized using Esri's ArcGIS 10.5.1 software with National Agricultural Imagery Program (NAIP) imagery (2016) as a base map to establish the limits of each land cover type, including potential aquatic resources. Historical aerial imagery was used to acquire images from winter and spring months to identify areas of ponding and vegetation signatures indicative of a transition between upland and wetland vegetation. In particular, the NAIP imagery from 2020 and Google Earth aerial images from multiple years, but especially March 2016, May 2017, and August 2018, were inspected for signatures that could be indicative of soil saturation, flooding or ponding, or relative wetness and shifts in vegetation type and cover. Topographic data available for the Action Area was also used to assess topographic depressions and areas where wetlands are likely to occur (e.g., low spots and valleys). The topographic data used at this time was a combination of Light Detection and Ranging (LIDAR) data and digital elevation models, where LIDAR data was not available. The land cover terminology used was not based on any specific source, but rather was kept general due to a lack of specific on-the-ground information to further classify the land cover types by dominant vegetation.

The reservoir impact footprint is based on the 498-foot elevation, which is the maximum level of inundation possible after the dams have been built (see BA Comment Tracker). All land within this maximum footprint is considered permanently impacted by the Project.

11.1.2 Species Models

The Service relied on the BA's developed species models for each of the listed species based on the best available information on known habitat preferences and distribution, land cover mapping described above, and other available data such as elevation and soils. Most of the Action Area is not currently available for ground-level surveys, and the limited number of surveys conducted to date are outdated and incomplete. *Appendix 5A* of the BA and *Supplemental Appendix 5A*, *Species Habitat Models and Methods*, provides a detailed explanation of the parameters used for each species model, the assumptions applied to develop each model, and references to the published scientific literature and other information on which the biologists based these assumptions.

These models are limited primarily by the accuracy of aerial imagery interpretation and the inability to ground truth the land cover mapping (e.g., identifying area with suitable soil type and presence of grassy openings). The models likely overestimate the amount of suitable habitat for each species due to the inability to conduct ground-level surveys for specific habitat elements that are not visible using aerial imagery (e.g., presence of elderberry shrubs in modeled habitat for valley elderberry longhorn beetle). Future surveys will allow Project biologists to refine the habitat mapping and assess the habitat for potential occupancy by each listed species.

Giant Garter Snake

Modeled habitat is limited to giant garter snake's range along the valley floor (Service 2017b). Modeled aquatic and upland habitats for giant garter snake in the Project footprints are the GCID Main Canal and areas east; within 200 feet of the west bank of the GCID Main Canal north of Stone Corral Creek; and east and west of the GCID Main Canal south of Stone Corral Creek. The modeled aquatic habitat for giant garter snake consists of canal, ditch, freshwater marsh, managed wetland, pond, and rice land cover types. Modeled upland habitat for giant garter snake consists of annual grassland, disturbed, and ruderal land cover types immediately adjacent to and within 200 feet of the modeled aquatic habitat types.

Greene's Tuctoria

The modeled habitat for Greene's tuctoria includes seasonal wetlands with specific areas of seasonal wetland removed from the model if they did not occur on Cibo-Ayar-Altamont (s626) or Sehorn-Millsholm-Lodo (s625) soil associations, which include clay soils (NRCS 2016).

Hoover's Spurge

The modeled habitat for Hoover's spurge includes seasonal wetlands with the seasonal wetlands being removed from the model if they did not occur on Riz or Willows soil map units or inclusions in map units based on USDA soil data (NRCS 2020) and at elevations below 500 feet.

Keck's Checkermallow

The modeled habitat for Keck's checkermallow consists of annual grassland, oak savanna, and blue oak woodland land cover types, with specific areas of annual grassland and blue oak woodland being removed from the habitat model if the mapped area did not occur within the Cibo-Ayar-Altamont (s626) or Sehorn-Millsholm-Lodo (s625) soil associations (NRCS 2016). Elevation was not included in the species model because the construction and inundation footprints fall within the elevation range of known occurrences.

Monarch Butterfly

The parameters of modeled habitat for the monarch butterfly consist of riparian land cover types (blue oak woodland, forested wetland, scrub-shrub wetland, upland riparian), fringes of wetlands and waterways (ditch, ephemeral stream, freshwater marsh, intermittent stream, managed wetland, perennial stream, pond, reservoir, seasonal wetland) agricultural areas (hayfield, ruderal), grasslands and savannas (annual grassland, foothill pine, oak savanna), and other upland areas which could provide habitat for annual milkweeds (chamise, mixed chaparral, ornamental woodland).

Northwestern Pond Turtle

The modeled northwestern pond turtle aquatic habitat consists of four habitat quality types: lower quality aquatic habitat, lower quality upland habitat, higher quality aquatic habitat, and higher quality upland habitat. Modeled northwestern pond turtle lower quality aquatic habitat is defined as intermittent stream, seasonal wetland, and scrub-shrub wetland land cover types. Higher quality aquatic habitat is defined as ditch, canal, perennial stream, forested wetland, freshwater marsh, managed wetland, pond, reservoir, and rice land cover types. Modeled northwestern pond turtle lower quality upland habitat is defined as annual grassland, blue oak woodland, chamise chaparral, disturbed, foothill pine, mixed chaparral, oak savanna, ruderal, and upland riparian land cover types within 650 feet from lower quality aquatic habitat. Higher quality upland habitat is defined as annual grassland, blue oak woodland, chamise chaparral, disturbed, foothill pine, mixed chaparral, oak savanna, ruderal, and upland riparian land cover types within 650 feet from higher quality aquatic habitat.

Palmate-Bracted Bird's-Beak

The modeled habitat for palmate-bracted bird's-beak includes intermittent streams and seasonal wetland, with specific areas of seasonal wetland and intermittent stream removed from the model if they did not occur on Capay soils, which indicate potentially alkaline conditions (NRCS 2020).

Valley Elderberry Longhorn Beetle

The parameters of modeled habitat for the valley elderberry longhorn beetle consist of riparian land cover types (upland riparian, scrub-shrub wetland, and forested wetland), as well as other land cover types that provide suitable habitat (blue oak woodland, oak savanna, annual grassland, and ruderal). The modeled habitat was also restricted to areas at elevations below 500 feet.

Vernal Pool Branchiopods

The parameters of modeled habitat for vernal pool branchiopods consist of seasonal wetland and semi-permanent pond land cover types that were identified utilizing data from the Project's Aquatic Resources Delineation Report (Sites Authority and Reclamation 2022). Potentially suitable habitat for vernal pool branchiopods is primarily located to the north of the community of Sites and northwest of Funks Reservoir. Modeled habitat is limited to the species' ranges along the valley floor (Vollmar *et al.* 2023).

Modeled habitat was additionally refined by cross walking potential suitable seasonal wetlands and semi-permanent ponds with soil types that contain major and minor inclusions of soils associated with vernal pools and/or federally listed large branchiopod habitat (Keeler-Wolf *et al.* 1998 and Helm 1998) and terrace landforms (Helm 1998 and Service 2007).

Western Spadefoot

The modeled western spadefoot aquatic habitat consists of intermittent stream and seasonal wetland land cover types. The model western spadefoot upland habitat includes annual grassland, blue oak woodland, chamise chaparral, foothill pine, mixed chaparral, and oak savanna land cover types within 1,200 feet of suitable aquatic habitat.

11.1.3 Permanent Habitat Loss

Loss of modeled habitat was assessed quantitatively by overlaying the geotechnical investigation, construction, inundation, and recreation footprints with the species habitat models in GIS. The analysis assumes the modeled habitat is occupied by the species due to lack of ability to conduct surveys. Once access has been granted or obtained, surveys of the geotechnical investigation, construction, inundation, and recreation footprints will be performed prior to ground disturbance, see BA Comment Tracker; *Biological Survey Schedule.* These surveys will result in refined habitat mapping, a better understanding of species occupancy and suitable habitat, and, ultimately, revised habitat loss acreages. Habitat estimates are intended to provide upper impact limits and actual impacts are expected to go down with future surveys and refinement.

11.1.4 Temporary Habitat Loss

Temporary habitat loss is that in which the habitat can be restored to pre-Project conditions within one year of disturbance. Temporary activities include geotechnical explorations, work areas, staging areas, and access roads. Temporary habitat loss is quantified by overlapping the temporary work areas with the modeled habitat in GIS. As it is with permanent habitat loss, temporary habitat loss is likely to be overestimated as a result of conservative habitat modeling and Project footprint design. Temporary work areas have more flexibility as to where they need to be located so avoidance of occupied habitat is possible. Temporary work areas that cannot avoid occupied plant habitat, or occupied host plant habitat (as is the case with valley elderberry longhorn beetle), will result in permanent habitat loss. Temporary work areas that cannot avoid

vernal pools will also result in permanent habitat loss for the vernal pool branchiopods because vernal pools typically cannot be restored to pre-Project conditions after disturbance.

11.2 Standard

11.2.1 Geotechnical Explorations

Deconstruction of the Action

Reclamation and the Authority have described geotechnical explorations as including the following types of work activities: surface geologic investigations; subsurface geophysical investigations; subsurface geotechnical investigations; borehole drilling; cone penetration tests; test pits; fault studies; quarry studies; test fill construction; piezometers, wells, and aquifer testing; and site accessing ***(Figure 4***). These activities are anticipated to occur in the Sites Reservoir, Funks Reservoir, TRR, Dunnigan Pipeline, and GCID Headworks footprints (*Appendix B*, ***Figure B-1. Geotechnical Explorations Footprint for the Sites Reservoir Project.***). Vehicle driving and construction equipment operating during geotechnical exploration activities are anticipated to be of short duration, ranging from a few days to conduct surface investigations to up to 21 days to conduct subsurface investigations but last for up to eight years, as needed, to refine the engineering design plans for the various Project components in and around the Antelope Valley. The geotechnical activities may overlap with other Project components, such as construction, and will follow the implementation schedule developed by Reclamation and the Authority. Ground-disturbing activities associated with geotechnical explorations may adversely affect the **giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot** and their modeled suitable habitat (***Appendix A. Sites Reservoir Project Effects Tracking Table)***. ***Table 6*** provides a summary of the total acreages of modeled habitat anticipated to be temporarily and permanently affected from geotechnical exploration activities and ***Table 7*** identifies the proposed compensatory mitigation to offset permanent Project effects to habitat. If the ability to locate a geotechnical exploration site further than 250 feet of an occupied vernal pool is not available, indirect effects may occur. The Authority has committed to restore temporarily disturbed habitat (e.g., cleared land) to pre-Project conditions, so the habitat may be used by listed species between geotechnical exploration and construction activities. For example, seeding may occur in annual grasslands to encourage rapid growth of grasses in the disturbed areas. Additional avoidance and minimization measures, including compensatory mitigation, have been identified by Reclamation and the Authority to minimize and mitigate Project effects that are described throughout this section, where appropriate.

Reclamation and the Authority have proposed avoidance measures for the following listed species for geotechnical explorations that were taken into consideration during the development of the BA and this BiOp: Keck's checkermallow, palmate-bracted bird's-beak, Greene's tuctoria, Hoover's spurge, and vernal pool branchiopods. If any of these species are detected during biological surveys, the Authority will avoid all plants and vernal pool branchiopods (e.g., seasonal wetlands) by 250 feet.

Where avoidance of the 250-foot buffer around suitable vernal pool habitat is not feasible, geotechnical activities will adhere to *Conservation Measure 8: Vernal Pool Branchiopods*, which requires a minimum 50-foot buffer from the suitable habitat and full restoration of the area to pre-Project conditions using Service-approved criteria. In the event that geotechnical activities cannot avoid indirect effects to vernal pools, Reclamation and the Authority will reinitiate consultation to address effects on the species from implementation of geotechnical explorations and mitigate for indirect effects at a 2:1 ratio.

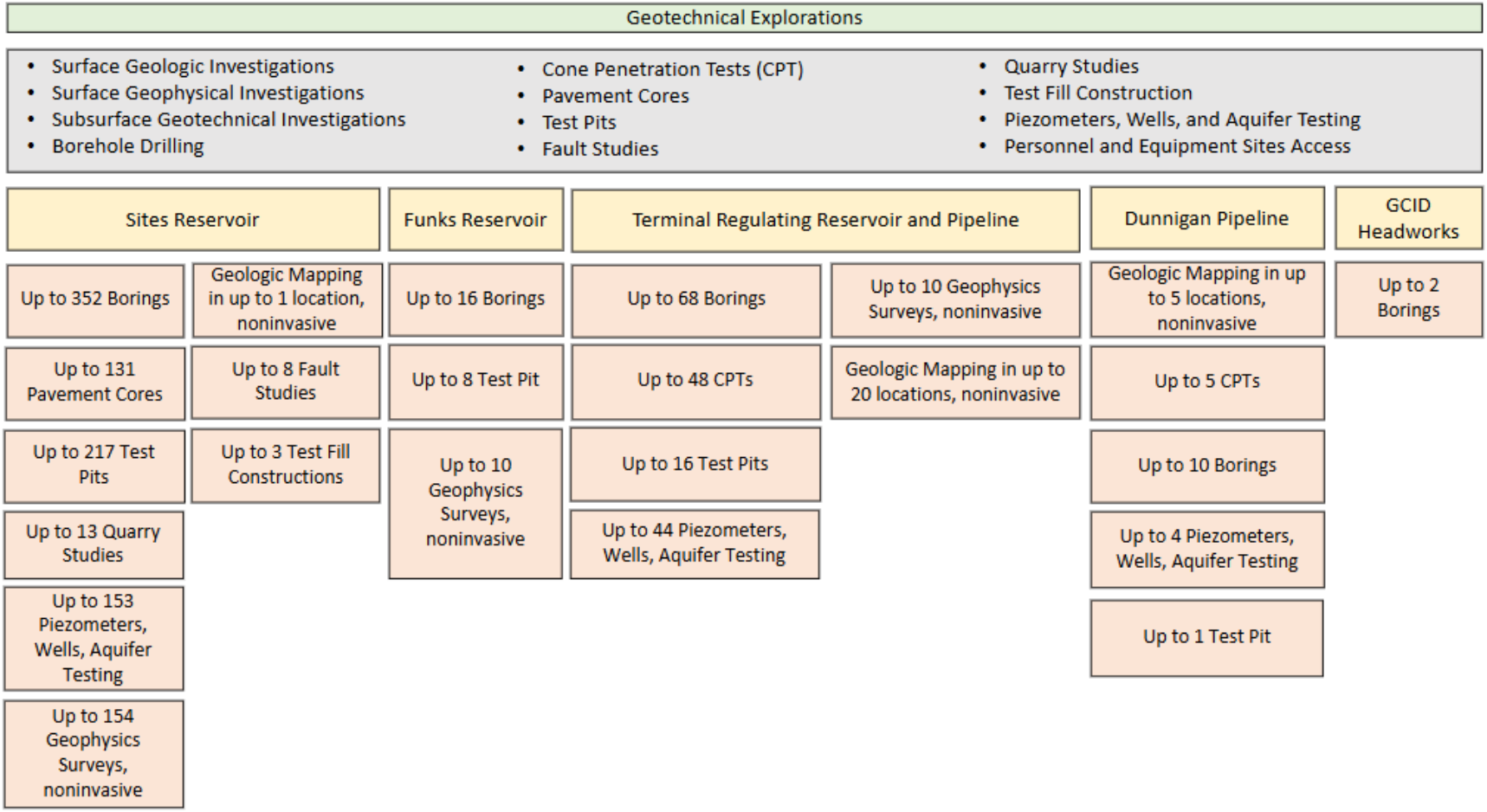

Figure 4. Deconstruction of the geotechnical exploration activities for the Sites Reservoir Project.

Table 6. Summary table of the anticipated temporary and permanent loss of giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot modeled habitat from geotechnical explorations.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle				Valley Elderberry Longhorn Beetle		Western Spadefoot	
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat, High Value (acres)	Modeled Upland Habitat, High Value (acres)	Modeled Aquatic Habitat, Low Value (acres)	Modeled Upland Habitat, Low Value (acres)	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)
Sites Reservoir											
Temporary Habitat Loss	34.24	26.12	3,790.87	50.88	855.11	193.24	2,090.58	14.14	2,738.68	191.77	3,354.89
Permanent Habitat Loss	0	0	54.1	0	20.44	0.31	17.2	0	31.33	0.31	53.64
Funks Reservoir											
Temporary Habitat Loss	0	0	84.01	61.61	20.05	2.35	0	1.19	18.91	2.3	18.91
Permanent Habitat Loss	0	0	0	0	0	0	0	0	0	0	0
TRR West											
Temporary Habitat Loss	1.01	6.69	301.13	11.86	90.38	1	21.08	0.11	295.05	1	111.26
Permanent Habitat Loss	0	0	0.0116	0	0	0.00348	0	0	0.0116	0	0.00232
Dunnigan Pipeline											
Temporary Habitat Loss	10.78	6.12	55.76	12.06	25.72	1.94	9.33	3.68	41.54	1.94	0
Permanent Habitat Loss	0	0.00014	0.00022	0	0.00014	0	0.00014	0	0.00022	0	0
GCID Headworks											
Temporary Habitat Loss	0	0	5.57	1.68	6.26	0	0	3.47	0.01	0	0
Permanent Habitat Loss	0	0	0	0	0	0	0	0	0	0	0
Total											
Temporary Habitat Loss	46.03	38.93	4,237.34	138.09	997.52	198.53	2,120.99	22.59	3,094.19	197.01	3,485.06
Permanent Habitat Loss	0	0.00014	54.11	0	20.44	0.31	17.20	0	31.34	0.31	53.64

Table 7. Summary table of the proposed compensatory mitigation (in habitat acres protected and restored/created) for the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot to offset permanent habitat loss effects from geotechnical exploration activities.

	Giant Garter Snake		**Monarch Butterfly**	**Northwestern Pond Turtle**	**Valley Elderberry Longhorn Beetle**		**Western Spadefoot**
	Aquatic Habitat (acres)	Upland Habitat (acres)	Habitat (acres)	Aquatic Habitat and Upland Habitat within 650 ft (acres)	Riparian Habitat (acres)	Non-Riparian Habitat (e.g., Upland; acres)	Aquatic Habitat and Upland Habitat within 1,200 ft (acres)
Compensatory Mitigation to Offset Effects Resulting in Permanent Habitat Loss							
Habitat Protection and Restoration/Creation	0	0.00042	54.11	0.31	0	31.34	0.31

Effects to Giant Garter Snake

Ground disturbing activities associated with geotechnical explorations with the Project have the potential to result in the injury or mortality to a low number of giant garter snakes if these activities are conducted in occupied habitat. The Service has come to this assessment based on the following reasons: geotechnical activities are expected to occur within known areas of occurrence during the active season; individual snakes are cryptically colored, secretive, and notoriously sensitive to human activities often making them difficult to detect unless they are observed, undisturbed, at a distance which may put them at greater risk of not being seen during work activities; and ground disturbing activities have been cited in other comparable projects as mortality sources to snakes. Conservation measures have been proposed to minimize effects, but even monitoring, encouraging movement out of work areas, handling, and relocating of snakes during the Project phases could result in adverse effects to the species. Giant garter snakes exhibit fidelity to overwintering sites and may have local patterns of movement within a familiar area. Relocating a giant garter snake to an area with unfamiliar retreats, cover, and foraging habitat may increase a snake's risk of predations. Giant garter snakes may also be exposed to greater risk of predation and potentially to vehicular mortality when attempting to return to their capture site.

Activities proposed in the geotechnical exploration footprint include movement and operation of heavy equipment, the movement of vehicles on nearby developed access roads, and ground disturbance activities associated with geological and geophysical surface and subsurface investigations and explorations. Giant garter snakes could be struck by vehicles and equipment traveling along access roads. These activities are anticipated to occur primarily on County Road 68, Delevan Road, McDermott Road, Maxwell Sites Road, Dunnigan Pipeline, and at the terminus of the pipeline near the CBD where upland and aquatic habitat are modeled to be present. To avoid injury or mortality to snakes on access roads, vehicles will observe a 20 mph speed limit on unpaved roads within GGS habitat, as described in *Conservation Measure 4: Giant Garter Snake*.

Fuel or oil spills from equipment into occupied habitat could also cause the injury or mortality of giant garter snakes directly or through adverse effects to their prey base. Reclamation and the Authority have proposed a conservation measure that will minimize the potential for fuel or oil spills into occupied or prey base aquatic habitat and therefore reduce the likelihood of a spill occurring. Best management practices will be followed and implemented by Reclamation, the Authority, and their contractors.

Clearing, grubbing, excavation, and other activities during geotechnical explorations could result in destruction of burrows that are used as refugia habitat for the snake. The risk of injury or mortality from burrow crushing is highest from late fall through early spring, when the snakes are dormant (generally October 1 through May 1). Reclamation and the Authority have proposed to limit activities within giant garter snake habitat to the period between October 2 and November 1 or between April 1 and May 1 if ambient temperatures have exceeded 75°F during geotechnical exploration activities and maximum daily temperatures have exceeded 75°F for a least 3 consecutive days immediately preceding work. To minimize crushing snakes during clearing and grubbing, *Conservation Measure 4: Giant Garter Snake* requires the biologist to

verify no giant garter snakes are present in the work area prior to vegetation removal, ground disturbance, and the placement of equipment. To avoid crushing snakes taking refuge in burrows during the summer, *Conservation Measure 4: Giant Garter Snake* requires all aquatic habitat be dewatered for 15 days prior to ground disturbance to allow underground snakes to emerge and move out of the area.

Activities are occurring during the snake's active season, when snakes could become trapped in open trenches and deep holes. Proposed BMPs and monitoring state that trenches and pits will be covered or ramps installed that will allow for species to exit. Exclusionary fencing will be placed at the edge of the active geotechnical exploration areas to restrict wildlife access where feasible when considering worker safety, and 24 hours prior to work activities, geotechnical and construction areas within 200 feet of occupied aquatic habitat will be surveyed for snakes by a biologist.

Giant garter snakes also have the potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the CPT, boring machines, trenching, and seismic refraction testing, which could reduce foraging efficiency. This could result in decreased fitness or increased dispersal time away from cover and make individuals more vulnerable to predators. Noise generated from equipment would likely range between 85 to 90 dBA at a distance of 50 feet. This level of noise is a common occurrence in the Action Area where active agricultural practices occur; therefore, effects from noise are expected to be low.

Effects to giant garter snakes would be avoided and minimized with the implementation of *Conservation Measure 4: Giant Garter Snake*, which would require coordination between the Project geologist, drilling foreman, and the Service-approved biologist to review each work area for sensitive resources. *Conservation Measure 4: Giant Garter Snake* would require the Service-approved biologist to conduct pre-activity surveys and monitor work at specific locations. The Service-approved biologist would clear all CPT, boring, and pin locations to ensure that probes, bores, and pins are not situated over small mammal burrows or other subsurface retreats where snakes or their prey may occur. Also, implementation of *Conservation Measure 4: Giant Garter Snake* would ensure that the Proposed Action would not unnecessarily deepen the effects to snakes by making workers aware of the species habitat requirements, the need to avoid the species habitat, and ensure proper implementation of the proposed conservation measures.

Relocation of giant garter snakes from active work areas will expose individuals to capture and handling. Relocations could expose snakes to increased risk of predation. Individual snakes could be harmed or injured during capture attempts and increased stress to the snake could reduce overall fitness. Removing snakes from areas where they could contact equipment or other hazardous equipment will reduce the potential for adverse effects. The use of a Service-approved biologist will reduce the potential for harm, injury, or death as a result of relocation.

Although measures would be applied to minimize the risk of harming, injuring, or killing giant garter snake during geotechnical explorations and construction, some potential would remain for individuals to be injured or killed, particularly if individuals are underground in crevices, burrows, or other hidden areas and go undetected.

The BA has analyzed the temporary loss of up to 46.03 acres of modeled aquatic habitat, up to 38.93 acres of modeled upland habitat, and the permanent loss of up to 0.00014 acres of modeled upland habitat. The Service utilized these figures for our analysis in this BiOp. Temporary loss of habitat will be mitigated by restoring the affected snake habitat to pre-Project conditions within one calendar year. If the habitat is not restored, it is considered a permanent loss of habitat. Based on this effects analysis (***Table 6***), 0.00042 acres of mitigation is anticipated to occur prior to the habitat being impacted to compensate for unavoidable loss of habitat (***Table 7***).

Effects to Monarch Butterfly

The presence and movement of heavy equipment within the expansive geotechnical exploration footprint is likely to result in harassment, injury, or death of an unknown number of individual butterflies and result in the temporary and permanent loss of habitat quality in the Action Area. Conservation Measures to minimize the risk of injuring or killing monarch butterflies include *Conservation Measure 5: Monarch Butterfly*. Although these measures would be applied to minimize the risk of injuring or killing monarchs during geotechnical explorations, some potential remains for monarch butterflies or host plants to be injured or killed. Adult monarch butterflies could be struck by the increased number of vehicles traveling along access roads during driving to and from exploration sites if monarchs are foraging or flying through the area. Geotechnical exploration activities could also disrupt roosting or foraging activities and there is a possibility that butterflies may be inadvertently killed or injured by heavy equipment operations.

One of the BMPs to address road kills is to reduce vehicle speed. Reclamation and the Authority have proposed that vehicles observe a 20 mph speed limit on access roads and unpaved roads, as described in *Conservation Measure 5: Monarch Butterfly*. Additionally, this conservation measure includes the ability for the Service-approved biologists to temporarily stop work in any areas where listed species are observed or measures are not properly protecting listed species, which includes the authority to limit work in 'hotspot' areas (or direct work around) when butterflies may have an increased presence and be at risk of greater mortality.

Geotechnical explorations will reduce the suitability of an area for roosting, foraging, and breeding activities of the monarch butterflies by temporarily up to 4,237.34 acres of modeled habitat and permanently removing up to 54.11182 acres of modeled habitat (***Table 6***). Use of heavy equipment could disturb soils and habitat of the monarch butterfly's host and nectar plants, subsequently affecting the health and fitness of adults and larvae. Vehicles and heavy equipment used at the geotechnical exploration sites have the potential to increase airborne dust during Project activities, which can adversely affect plants. Effects to nectar a host plants being damaged or killed as a result of exposure to contaminants such as spilled fuels associated with geotechnical exploration activities will be minimized through the adoption of best management practices.

Geotechnical explorations have the potential to introduce or spread invasive plant species resulting in the reduction of suitable habitat or by causing competition with native plants, milkweed, and monarch butterfly habitat. Measures to minimize the risk of introducing invasive species are identified in the general *Conservation Measures* and *Conservation Measure 5: Monarch Butterfly*.

Reclamation and the Authority have proposed to mitigate 54.1118 acres for the permanent loss of suitable monarch habitat from geotechnical explorations (***Table 7***) and will follow the measures as they have been identified in *Conservation Measure 5: Monarch Butterfly*. There is uncertainty on the success and ability to remove and transplant milkweeds from the impacted footprints to a new protected location. Therefore, a diverse strategy of planting, seeding, and/or transplanting will be used to determine which techniques will result in the best outcome at the mitigation sites. Details related to how the conservation measure will be implemented are provided in *Conservation Measure 5: Monarch Butterfly*. Ultimately, the final landscape design for the mitigation sites will be Service-approved, and accompanied with site-specific restoration plans to provide assurances that the mitigation will provide the habitat characteristics to successfully offset Project impacts as described in this BiOp.

Effects to Northwestern Pond Turtle

Use of vehicles and heavy equipment within suitable habitat could result in harm, injury, or mortality of northwestern pond turtle if the habitat is occupied. To minimize the impacts from vehicle strikes within the exploration area, *Conservation Measure 6: Northwestern Pond Turtle*, requires a 20 mph speed limit on unpaved roads within suitable habitat. Implementation of *Conservation Measure 6: Northwestern Pond Turtle*, will minimize the potential for vehicle and equipment crushing by requiring inspections under vehicles, under equipment, and in excavated holes or ditches without exit etc. prior to and during geotechnical explorations within 300 feet of occupied northwestern pond turtle suitable aquatic habitat. Equipment, such as drill rigs, have proven to be difficult and unsafe to remove from the work areas at the end of the work day based on Reclamation and the Authority's previous experience from performing geotechnical explorations under consultation File No. 08FBDT00-2019-F-0287. Therefore, in those instances, the drill rigs will be lifted on hydraulic jacks to eliminate listed species getting crushed. This flexibility is built into the conservation measures, to allow for the contractors to utilize exclusion fencing or other measures like lifting equipment to minimize effects to turtles and other species considered in this BiOp.

Best management practices and monitoring requires trenches and pits to be covered or ramps installed that will allow turtles to exit them. Per *Conservation Measure 6: Northwestern Pond Turtle*, biological surveys will be conducted prior to geotechnical explorations where suitable northwestern pond turtle habitat overlaps with the Action Area. Where the habitat is determined to be occupied, exclusionary fencing will be placed at the edge of the active geotechnical areas to restrict wildlife access where feasible when considering worker safety. However, this may not be feasible in all cases for the contractors to implement exclusion fencing for various reasons, such as safety, and in those cases fencing will not be implemented based on advance coordination with the Service. Where geotechnical activities are within 650 feet of occupied suitable habitat, a qualified biologist will inspect under vehicles and in holes, trenches, and mud cracks prior to beginning daily activities; remain onsite through the day to identify any turtles that have entered the work area; and facilitate avoidance and minimization of adverse effects to individuals.

Although these measures will be applied to minimize the risk of injuring or killing northwestern pond turtle during geotechnical explorations, some potential remains for individuals to be injured or killed, particularly if individuals or eggs are in buried nests or adults are in hidden areas and

go undetected. Geotechnical explorations activities could also disrupt typical northwestern pond turtle foraging or reproductive behaviors and normal movement from construction noise, vibration, human presence, or light. Behavior disruptions could increase the risk of predation and impair typical feeding or breeding behavior.

Geotechnical explorations will result in the temporary loss of up to 336.62 acres of modeled high and low quality aquatic habitat and 3,118.51 acres of modeled high and low quality upland habitat (***Table 6***). Additionally, geotechnical explorations will result in the permanent loss of up to 0.31 acres of modeled high and low quality aquatic habitat and up to 37.64 acres of modeled high and low quality upland habitat. Reclamation and the Authority propose to mitigate by protecting and restoring/creating 0.31 acres of suitable aquatic habitat and protecting and restoring/creating at least 650 feet of uplands around the protected and restored/created aquatic habitat (***Table 7***).

Effects to Valley Elderberry Longhorn Beetle

Geotechnical explorations will result in adverse effects to the valley elderberry longhorn beetle but are overall expected to be low for geotechnical exploration activities. Based on previous work conducted under consultation File No. 08FBDT00-2019-F-0287 and other information available to the Service in the *Environmental Baseline*, low numbers of elderberry shrubs have been visually observed within the footprint. The Service has assumed that the valley elderberry longhorn beetle habitat in the Action Area is restricted to certain areas and vegetative types that were utilized in the habitat suitability model. The model identifies habitat for the valley elderberry longhorn beetle as locations where the Service would expect to find the elderberry shrub and designates additional habitat as annual grasslands, blue oak woodland, oak savanna, and ruderal lands. The Service anticipates no more than 6 elderberry shrubs to be detected within the footprint and be affected by geotechnical explorations in riparian and non-riparian habitats (***Table 8***). The number of elderberry shrubs estimated to be detected and number/size of stems estimated to be present is based on the amount of modeled suitable habitat in conjunction with observations of elderberry shrub extent and abundance made during ongoing geotechnical investigations for Site Reservoir Project (BiOp Service File No. 08FBDT00-2019-F-0287-R002). Ground-truthing efforts when the land becomes accessible will be provided to the Service from Reclamation and the Authority during Project implementation to verify the information presented in ***Table 8*** and this effects analysis.

The Service currently uses habitat in the form of appropriately sized elderberry shrub stems (greater than 1 inch diameter) as a surrogate to quantify impacts to valley elderberry longhorn beetles. Valley elderberry longhorn beetles are small in size, and their life cycle and patchy habitats make detection difficult and the quantification of impacts to individual beetles infeasible.

Table 8. Compensatory mitigation for adverse effects to valley elderberry longhorn beetle from geotechnical investigations.

Location of Affected Plants[d]	Stems (maximum diameter at ground level) of Affected Plants	Exit Holes on Affected Shrub (Yes/No)[a]	Estimated Number of Stems Affected	Elderberry Seedling per stem[b]	Associated Native Plants per stem[c]	Elderberry Seedling Requirement	Associated Native Plant Requirement
Non-riparian (3 shrubs; 20 stems per shrub)	Greater than or equal to 1 inch, less than 3 inches	No	18	1	1	18	18
		Yes	15	2	2	30	30
	Greater than or equal to 3 inches, less than 5 inches	No	7	2	1	14	7
		Yes	7	4	2	28	14
	Greater than or equal to 5 inches	No	7	3	1	21	7
		Yes	6	6	2	36	12
Riparian (3 shrubs; 21 stems per shrub)	Greater than or equal to 1 inch, less than 3 inches	No	21	2	1	42	21
		Yes	22	4	2	88	44
	Greater than or equal to 3 inches, less than 5 inches	No	5	3	1	15	5
		Yes	5	6	2	30	10
	Greater than or equal to 5 inches	No	5	4	1	20	5
		Yes	5	8	2	40	10
Total						**382**	**183**

[a] Presence or absence of exit holes indicating presence of valley elderberry longhorn beetle. All stems measuring 1 inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[b] Ratios in this column correspond to the number of cuttings or seedlings to be planted per elderberry stem (1 inch or greater in diameter at ground level) affected by a covered activity.

[c] Ratios in this column correspond to the number of associated native species to be planted per elderberry seedling or cutting planted.

[d] Shrub is considered affected if it is within 165 feet of impact area, unless the Service provides confirmation in writing that sufficient avoidance measures have been implemented to avoid impact to the shrub within 165 feet.

The life cycle of the valley elderberry longhorn beetle is such that it may be impossible to know whether an elderberry plant is occupied by larvae or not. Without visual verification of adult valley elderberry longhorn beetles being present, the only other indication of occupation is the presence of exit holes in the stems of elderberry shrubs. The presence of exit holes in elderberry shrub stems does translate to a higher likelihood that the shrubs in the general area are occupied, but the lack of exit holes does not indicate a lack of presence of the valley elderberry longhorn beetle. For that reason, the Service assumes that any elderberry plant within the range of the valley elderberry longhorn beetle might be occupied by larvae.

Elderberry shrubs within riparian and grassland habitats within the Action Area have the potential to provide habitat for valley elderberry longhorn beetles and all suitable habitat is presumed occupied. It was not possible to do field surveys of the entire Action Area for the valley elderberry longhorn beetle because many of the properties are in private ownership. Therefore, suitable modeled habitat was used to identify areas of potential effect. The model used vegetation types and associations from various data sets to map the distribution of suitable valley elderberry longhorn beetle habitat in the Action Area (Sites Project Authority and Bureau of Reclamation 2023).

Conservation Measures to minimize the risk of injuring or killing the valley elderberry longhorn beetle include those stated in *Conservation Measure 7: Valley Elderberry Longhorn Beetle*. Although measures would be applied to minimize the risk of injuring or killing valley elderberry longhorn beetle during Project implementation, some potential remains for individuals or shrubs to be injured or killed, particularly if shrubs cannot be avoided. When elderberry shrubs occur within the area where geotechnical exploration activities are planned to occur, removal or trimming of elderberry shrubs could result in injury or mortality of the beetle and their larvae. The Service views the killing of or damage of elderberry shrubs as a cause of mortality to the beetle and any ground disturbance within 20 ft of the dripline of an elderberry plant as also having the potential to adversely affect that plant and may cause mortality. *Conservation Measure 7: Valley Elderberry Longhorn Beetle* is also intended to minimize indirect effects that may occur outside the 20 ft buffer around an elderberry plant. Elderberry shrubs may be indirectly affected by actions occurring within 100 ft of the elderberry plant's dripline. These may include dust accumulating on plants, soil compaction, and fuel spills. Elderberry shrubs could be damaged or killed as a result of exposure to contaminants such as spilled fuels associated with geotechnical explorations activities; however, this is expected to be minimized through implementing BMPs. Proposed measures in the *Conservation Measure* section requires the application of water to minimize dust and equipment maintenance to prevent leaks and spills of hazardous materials.

Use of heavy equipment could disturb soils adjacent to shrubs and affect the roots and health of elderberry shrubs (Service 2017a), subsequently affecting the health and fitness of adult beetles and larvae within the shrub. Vehicles and equipment could also strike the beetle when traveling through the Action Area during the adult emergence and mating period (generally March through July). Vehicles and heavy equipment used at the geotechnical sites have the potential to increase airborne dust during Project activities, which can negatively affect local plants, including elderberries (Farmer 1993).

Geotechnical explorations have the potential to introduce or spread invasive species. The European earwig (*Forficula auricularia*) and Argentine ant (*Linepithema humile*) may prey upon the early phases of the beetle (Service 2006). Huxel (2000) considered the Argentine ant a potential threat to the elderberry beetle as an aggressive competitor and predator on native fauna that is spreading throughout the riparian habitats in California. Huxel observed a negative association between the presence of the ant and valley elderberry longhorn beetle exit holes. As described in *Conservation Measure 7: Valley Elderberry Longhorn Beetle*, geotechnical personnel would decontaminate equipment, tools, and vehicles before entering the Action Area to minimize these impacts.

Geotechnical explorations that reduce the suitability of an area for elderberry shrubs or elderberry recruitment could affect mating, foraging, and dispersal of the beetle. Geotechnical explorations will result in less available modeled habitat that supports elderberry shrubs with the temporary loss of up to 22.59 acres of modeled riparian habitat and 3,094.19 acres of modeled upland habitat, and permanent loss of 31.34 acres of modeled upland habitat (***Table 6***). Reclamation and the Authority propose to mitigate 31.34182 acres of suitable non-riparian habitat to for the permanent loss of valley elderberry longhorn beetle non-riparian habitat from geotechnical exploration activities (***Table 7***).

Effects to Western Spadefoot

Use of vehicles and heavy equipment within seasonal wetlands could result in injury or mortality of western spadefoot during the rainy season if suitable aquatic habitat is occupied. Implementation of *Conservation Measure 9: Western Spadefoot*, would minimize impacts to occupied habitat by requiring suitable habitat be mapped, preconstruction surveys be performed within suitable habitat, and, if occupied, temporary work areas and other activities with flexible locations be moved if possible, to provide a 250-foot non-disturbance buffer around the occupied aquatic habitat. If full avoidance is not feasible and if a portion of occupied western spadefoot habitat will be modified or disturbed (i.e., permanent effects), the impacted areas will be conducted when the habitat is completely dry. Injury or mortality would therefore result primarily from geotechnical exploration in permanent impact areas (i.e., permanent habitat loss). With the implementation of these conservation measures, the Service anticipates effects to individuals in the form of injury or mortality to be low and that effects will be minimized to the western spadefoot during its sensitive life history phases (e.g., breeding season). Operation of heavy equipment could result in localized increases in noise and vibration. Increased noise and vibration could temporarily impair essential behaviors, including breeding, foraging, and sheltering, if individuals utilize suboptimal habitats to avoid noisy areas. Other potentially adverse effects to the western spadefoot include changes in air quality, introduction of hazardous materials, introduction of invasive plants, changes in hydrology, disturbance to areas of refugia, and vehicle strikes. These effects will be minimized through the implementation of BMPs. Geotechnical explorations will result in the temporary loss of up to 197.01 acres of modeled aquatic habitat and 3,485.06 acres of modeled upland habitat (***Table 6***). Additionally, geotechnical explorations will result in the permanent loss of up to 0.31 acres of modeled aquatic habitat and up to 53.64232 acres of modeled upland habitat (***Table 6***). Habitat loss will be offset through riparian and upland habitat restoration or protection of 0.31 acres along with suitable uplands within 1,200 feet of the riparian mitigation habitat (***Table 7***).

11.2.2 Ground Truthing, Surveys, and Species Relocations

Deconstruction of the Action

Given Reclamation and the Authority did not have access to all lands within the footprints at the time of writing this BiOp, modeled habitat was delineated for the terrestrial species based on aerial imagery but without ground-level surveys to verify locations of suitable habitat. They have proposed to conduct the following ground truthing and surveys after land acquisition but before construction activities commence: field reconnaissance, suitable habitat delineation, biological surveys, and preconstruction surveys which will be followed up with reassessments, reporting, and species relocations (***Figure 5***). Additionally, during construction, monitoring efforts will occur with the potential for species relocations. All these activities are anticipated to occur in the geotechnical exploration, construction, recreation, and inundation footprints where Project-related activities are planned (***Appendix B. Sites Reservoir Project Footprints****, Figures 1 through 4*).

These surveys will occur throughout the entire pre-construction and construction phases of the Project and while some low level of injury or mortality could occur during these activities, it is crucial to implement them for the overall protection of listed species. Suitable habitat delineations may occur throughout the geotechnical exploration, construction, inundation, and recreation footprints (i.e., roughly an expanse of 22,829 acres). However, these field reconnaissance and suitable habitat delineations are not expected to result in adverse effects to federally listed species given they are typically performed through pedestrian surveys or noninvasive surveying techniques. Similarly, with the reassessment and reporting, as these are generally computer-based activities that can be performed via an office setting. The activities that may result in adverse effects are the occupancy surveys, preconstruction surveys, construction monitoring, and species relocations (including transplantings), especially if a species is found within the work area. Resurveying the same parcel of land(s) may be necessary in some instances and captured within the *Description of the Proposed Action* for this BiOp. Reinitiation triggers will be evaluated over the course of implementation to ensure adverse effects resulting from resurveys are within those analyzed in this BiOp, and consultation will be reinitiated as needed. Reclamation and the Authority have committed to having only Project-related personnel with appropriate qualifications capturing, handling, relocating, and releasing listed species as identified in *Section 2.7.1.2 Construction Best Management Practices and Monitoring* of the BA. Implementation of these BMPs by Service-approved biologists may adversely affect the **giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot** (***Appendix A. Sites Reservoir Project Effects Tracking Table***). The effects of implementing these efforts are analyzed in this BiOp.

Qualified biologists will use the most current Service survey guidance for conducting all surveys if guidance is available. Otherwise, survey protocols and a species relocation plan will be submitted to the Service prior to implementation to ensure the BMPs are executed in a manner that is most protective for the species. ***Table 9*** provides a summary of the acreages of modeled habitat anticipated to be ground-truthed for the Project that reside within the geotechnical exploration, construction, recreation, and inundation footprints.

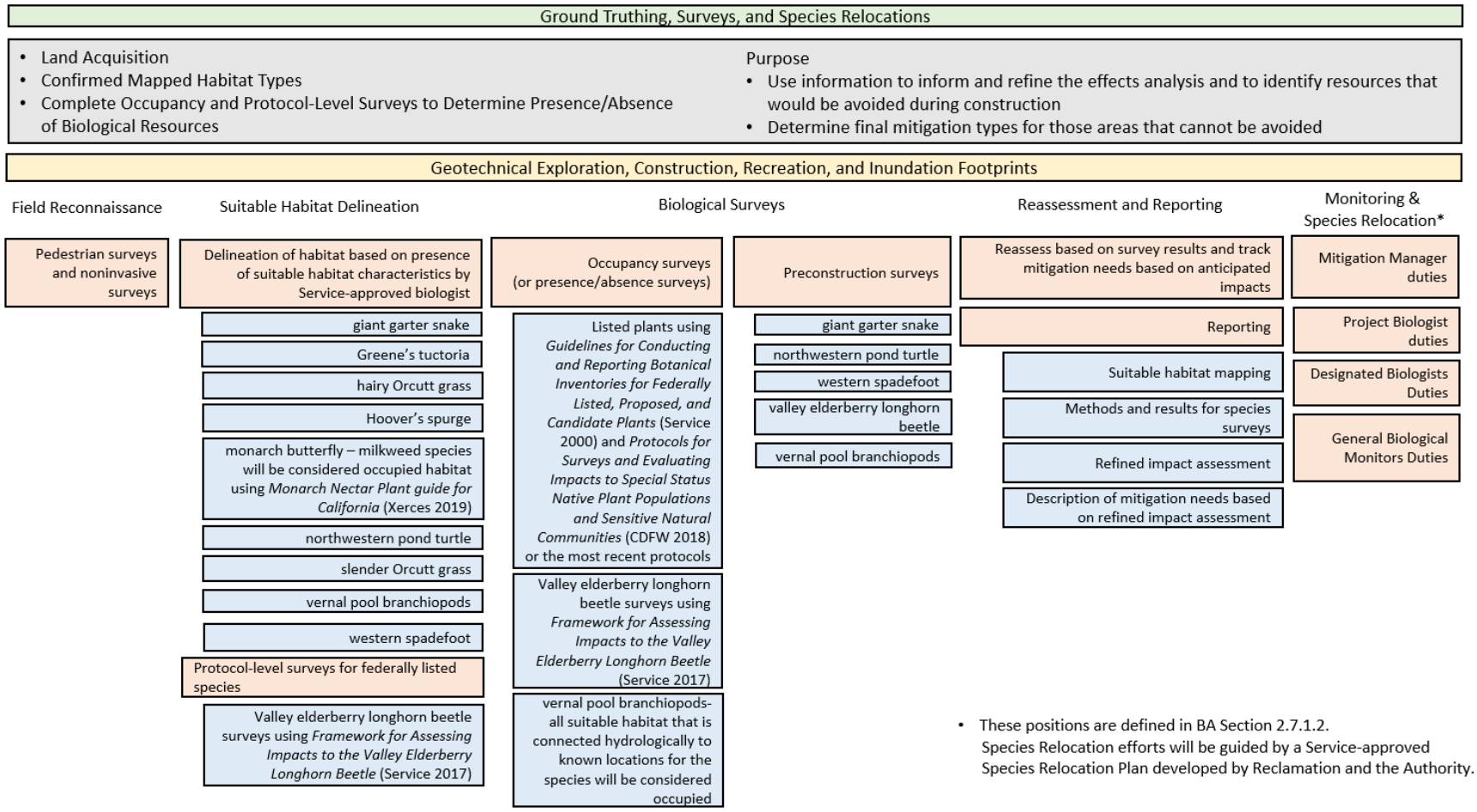

Figure 5. Deconstruction of the ground truthing, surveys, and species relocations for the Sites Reservoir Project.

Table 9. Summary table of the anticipated Project acreages that will be verified through ground truthing and biological surveying (e.g., occupancy surveys, etc.) for the following species: giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot. For reference, the geotechnical exploration, construction, inundation, and recreation footprints sum up to 22,829 acres.

	Giant Garter Snake		**Monarch Butterfly**	**Northwestern Pond Turtle**		**Valley Elderberry Longhorn Beetle**		**Vernal Pool Branchiopods**	**Western Spadefoot**	
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Breeding Habitat (acres)	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Riparian Habitat Supporting Elderberry Shrubs (acres)	Modeled Upland Habitat Supporting Elderberry Shrubs (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)
Modeled Habitat (up to) for Conducting Occupancy Surveys										
Potentially Occupied Habitat Disturbed	1	20	16,887	622	11,875	63	13,251	13.43	525	13,515

Effects to Giant Garter Snake

No occupancy surveys were proposed for the giant garter snake. Rather, presence is assumed if suitable habitat exists (as defined by the species' model). Delineations will be conducted to assess whether suitable habitat exists through ground truthing. Adverse effects may occur while Service-approved biologists are in the field conducting these delineations if they happen to encounter a giant garter snake. These effects are anticipated to be minimal during these walking activities.

Giant garter snakes will be encouraged to freely move out of work areas on their own volition. The Service-approved biologist will have the discretion to relocate the snake to the nearest suitable habitat, if necessary, to reduce exposure to Project activities that may result in further adverse effects to the species. Proper handling procedures will be implemented to reduce the potential for harm or injury to occur to the snake when relocating snakes out of the work area. Given the handlers will be qualified individuals, instances of mortality during handling and relocation efforts is expected to be rare. Overall, handling and relocating procedures are anticipated to have minimal adverse effects to the snake and result in an overall reduction in risk of harm, injury, and mortality through the implementation of the proposed conservation measures.

Effects to Monarch Butterfly

Service occupancy survey guidance has not yet been developed for this species. Monarchs can be difficult to detect through occupancy surveys because of their ability to move long distances throughout their home range during periods of foraging and migration. Since monarch butterflies rely on nectar-rich forbs for forage in all life stages, and milkweed species for successful reproduction, the survey protocols for this species will target using a habitat assessment that includes milkweed and forb components as the basis for assuming presence. Delineating suitable habitat will entail mapping locations of milkweed and nectar plants using information from the *Monarch Nectar Plants of California* (Xerces 2019) throughout the geotechnical exploration, construction, recreation, and inundation footprints. There is a potential for foraging butterflies to be harassed during vegetation sampling, resulting in those individuals to find alternative areas to forage. Walking disturbances will be minimized by biologists as they conduct sampling activities to lessen any potential impacts to foraging butterflies. Because these surveys can be conducted by walking and through noninvasive surveys, the Service anticipates that the effects will be minimal.

Milkweed found within the impacted footprints may be transplanted into suitable areas on- or off-site, or a combination thereof. The success of these transplantations is dependent on numerous factors (e.g., environmental conditions, plant health, etc.) and will be assessed on a case-by-case basis for transplanting suitability during implementation. If transplantation is unsuccessful or results in damage to the milkweed, adverse effects could occur to the butterfly. Qualified biologists will inspect all milkweed prior to transplanting to minimize harmful effects to individual butterflies.

Effects to Northwestern Pond Turtle

Delineations will be conducted for the northwestern pond turtle to determine if suitable habitat is present. These are not anticipated to have adverse effects to the turtle. Areas mapped as suitable aquatic habitat are presumed to be occupied, along with upland habitat within 650 feet of the aquatic features. Presence-absence surveys will be conducted within the geotechnical exploration, construction, recreation, and inundation footprints where presence is not assumed and may result in adverse effects if a turtle is encountered. The risk of injury or mortality would be very low from walking activities occurring from the Service-approved biologist(s). Turtles may be salvaged and relocated during dewatering activities that would result in the potential for elevated stress, harm, injury, or mortality during relocation activities. Reclamation and the Authority have committed to preparing a Service-approved species relocation plan to document the methods used for handling and relocating activities and ensure proper methods are utilized by the qualified biologists.

Effects to Valley Elderberry Longhorn Beetle

The Service's guidelines for assessing presence of suitable habitat for the valley elderberry longhorn beetle has been well documented since 2017. A qualified Service-approved biologist will identify and map all elderberry shrubs with stems at least one inch in diameter consistent with the Service's 2017 *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle*. The location of each elderberry shrub will be recorded using GPS and documented for reporting purposes to the Service. Suitable habitat delineations are not anticipated to result in injury or mortality of beetles. They are intended to assist in refining measures to avoid, minimize, and compensate for adverse effects of the Project to valley elderberry longhorn beetle or its habitat (***Table 11***). Once it has been determined whether the valley elderberry longhorn beetle's host plant (elderberry shrub) is present, occupancy surveys will be conducted to determine the likelihood of a particular shrub being occupied by valley elderberry longhorn beetle. There are anticipated to be minimal to no effects to valley elderberry longhorn beetle from biologists conducting these protocol-level surveys. Elderberry shrubs with stems greater than one inch in diameter will be transplanted if they cannot be directly avoided or if indirect effects will result in death of stems or the entire shrub by the Project. The Service estimates up to 112 shrubs may be transplanted over the course of implementing the geotechnical exploration, construction, recreation, and inundation activities. Transplanting and trimming procedures for this species are well-established and have a history of success in other consultations. Adverse effects to transplanted occupied shrubs may occur, resulting in death of eggs, larva, or adults depending on the timing of the transplant and the overall health of the shrub when removed from the ground. For all unavoidable adverse impacts to valley elderberry longhorn beetle or its habitat, Reclamation and the Authority have proposed appropriate compensatory mitigation (***Table 11***).

Effects to Vernal Pool Branchiopods

The Service's survey guidelines for vernal pool branchiopods were revised in 2017. Branchiopod surveys and wetland delineations are not expected to result in injury or mortality; however, persons conducting these activities should minimize any potential impact on listed vernal pool

branchiopods that may be present by reducing the amount of walking through the potential habitat to the lowest extent practical. Qualified Service-approved biologists conducting these activities should also minimize walking through potential vernal pool branchiopod habitat since walking through wet pool sediments and substrate can damage branchiopod eggs, vernal pool plants, and their seeds.

Once habitat has been deemed suitable through habitat delineations, occupancy surveys will be conducted to assess whether vernal pool branchiopods are present. Activities associated with the occupancy surveys could result in harassment, injury, or mortality to vernal pool branchiopods. Any variations to survey guidelines outlined by the Service will require prior approval to proceed with the proposed recurring surveys and to determine if reinitiation is required. Occupancy surveys once started will consist of one wet season and one dry season survey conducted and completed within a three-year period. Surveys will be conducted to maximize the probability of a detection of all listed branchiopod species at the site. The established wet season survey guidelines relies on the use of dip nets, seines, or aquarium nets that capture and trap branchiopods. Some species may be retained and preserved as voucher specimens resulting in mortality for those individuals. Other branchiopods incidentally captured or observed that will not be collected as voucher specimens will be returned in good condition to the site where they were found as quickly as possible to minimize the potential for harm to occur to the individual.

During the dry season, soil samples will be collected when it is dry to avoid damaging or destroying branchiopod eggs (also known as cysts or resting eggs). The sample volumes to be collected are outlined in detail within the Service's 2017 *Survey Guidelines for the Listed Large Branchiopods* and incorporated by reference herein. This involves processing, isolating, and identifying branchiopod eggs, where methods that have found to be most successful in isolating whole, intact (undamaged) branchiopod eggs will be favored. A representative of the eggs may be taken as voucher specimens or DNA analysis resulting in mortality of those individuals, while others may be handled to ensure proper identification and determine egg abundance.

If the habitat is occupied, the Service anticipates that most individuals captured and handled during the dry and wet season protocols will survive to be released back to the site, while an unknown number of vernal pool branchiopods will experience mortality during this process, especially those that are captured and preserved to be retained as specimen vouchers.

Effects to Western Spadefoot

Adverse effects to the western spadefoot will be similar to those described above to the northwestern pond turtle with the additional difference in how suitable habitat is defined and the ease of capturing an individual. A northwestern pond turtle may be easier to detect and relocate than the western spadefoot, which should be quicker to respond to human disturbances. Areas mapped as suitable aquatic habitat are presumed to be occupied, along with upland habitat within 1,200 feet of the aquatic features. The western spadefoot may be subject to harm, injury, or mortality from capture, transport, and release/relocation activities that will be subject to review through a Service-approved species relocation plan prior to implementation. These effects are anticipated to be very low.

11.2.3 Construction

Deconstruction of the Action

Reclamation and the Authority have described construction as including the following types of work activities: dewatering; clearing and grubbing; grading; excavating; stockpiling; equipment staging and transportation; constructing temporary and permanent fencing; setting up offices and batch plants; and construction, installation, or improvement of facilities and infrastructure. These activities are anticipated to occur in the construction footprint, which includes the Sacramento River Diversions and Conveyance to Regulating Reservoirs; Administration, Operations and Maintenance, and Storage Buildings; Sites Reservoir; and the New and Existing Roadways (***Figure 6***).

Construction of the Sites Reservoir is expected to take approximately 8 years for the reservoir facilities and 2 years for the conveyance facilities to complete. Construction of the reservoir facilities and the conveyance facilities would be conducted concurrently. Several factors affect this anticipated schedule, including funding, environmental compliance, contracting methods and strategies, material and construction equipment availability, lead time for fabrication of major pipe, pumping and generating equipment, labor force constraints, weather, access road capacity limitation, property access, and land acquisition.

Construction activities associated with the Project would be confined to designated construction disturbance areas, all of which are included within the Project footprint. Construction vehicles, equipment, and materials would also be parked or stored within these construction disturbance areas. Lath, fencing, or flags would be maintained until final cleanup or site restoration is completed, after which they would be removed. Temporarily disturbed areas would be restored after construction is complete, consistent with the Conservation Measures.

Construction activities may adversely affect **giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot** and their modeled suitable habitat (***Appendix A. Sites Reservoir Project Effects Tracking Table***). ***Table 10*** provides a summary of the total acreages of modeled habitat anticipated to be temporarily or permanently affected by construction activities.

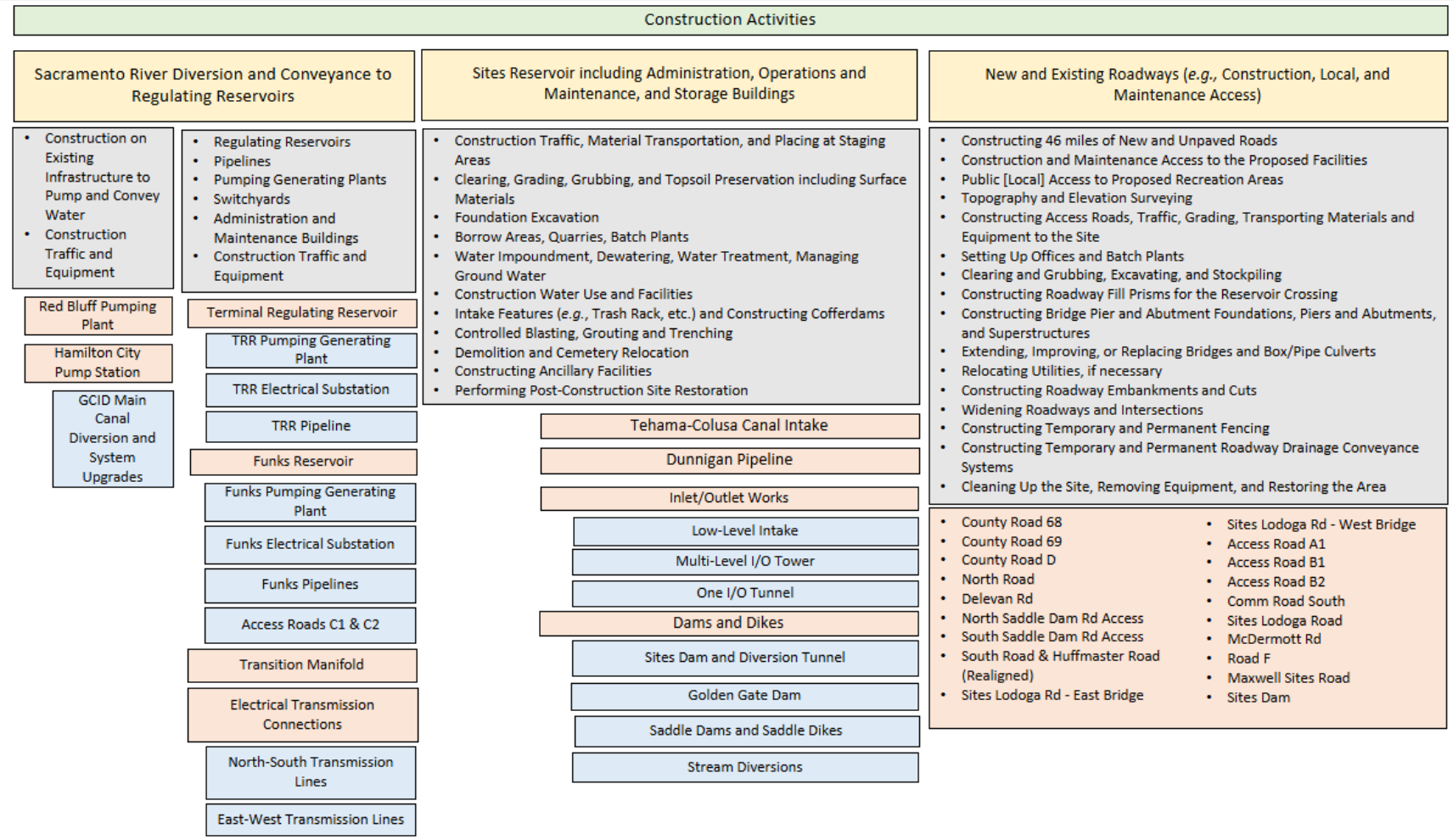

Figure 6. Deconstruction of the construction activities for the Sites Reservoir Project.

Table 10. Summary table of the anticipated temporary and permanent loss of giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot modeled habitat from construction activities.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle				Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods		Western Spadefoot	
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat, High Value (acres)	Modeled Upland Habitat, High Value (acres)	Modeled Aquatic Habitat, Low Value (acres)	Modeled Upland Habitat, Low Value (acres)	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct Effect on Aquatic Habitat (acres)	Indirect Effect on Aquatic Habitat (acres) [b]	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)
Sites Reservoir													
Temporary Habitat Loss	0	0	772.63	7.05	218.57	68.61	371.13	8.06	561.53	0 [a]	0.05 [b]	66.91	652.06
Permanent Habitat Loss	0.36	17.46	2,737.18	22.77	571.19	138.27	1561.54	7.81	1,980.39	10.15 [a]	1.34	137.37	2,423.56
Funks Reservoir													
Temporary Habitat Loss	0	0	666.01	234.46	235.84	18.67	113.26	1.27	417.15	0	0	18.38	369.24
Permanent Habitat Loss	0	0	51.39	2.98	27.68	2.65	11.98	0.01	46.44	0	0	2.65	41.64
Terminal Regulating Reservoir West													
Temporary Habitat Loss	0	0	87.12	0.64	31.85	1.37	12.02	0	85.19	0	0	1.37	61.97
Permanent Habitat Loss	0.47	1.55	208.12	7.41	91.59	1.44	19.40	0.56	201.92	1.26 [a]	0	1.44	99.56
Dunnigan Pipeline													
Temporary Habitat Loss	6.06	11.27	44.67	6.19	20.59	2.98	13.64	1.70	33.86	0	0	2.98	0
Permanent Habitat Loss	0	0.25	0.58	0	0.58	0	0	0.10	0.48	0	0	0	0
GCID Headworks													
Temporary Habitat Loss	0	0	0.05	0	1.41	0	0	0.02	0	0	0	0	0
Permanent Habitat Loss	0	0	0	0.06	0.03	0	0	0	0	0	0	0	0

[a.] All direct impacts to vernal pools, whether permanent or temporary, are calculated as permanent impacts because any direct disturbance to vernal pools could have lasting effects. If only a portion of the pool overlaps with the direct effect footprint, the entire vernal pool is considered directly impacted.

[b.] If temporary activities within 250 feet of vernal pools occur only during the dry season and are returned to pre-project conditions prior to the following wet season, this will not be counted as an indirect impact.

Table 11. Summary table of the proposed compensatory mitigation (in habitat acres) for the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot to offset effects from construction activities.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle	Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods [c]		Western Spadefoot
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat (acres) [a]	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct (acres)	Indirect (acres)	Modeled Aquatic Habitat (acres)[b]
Compensatory Mitigation to Offset Effects Resulting in Permanent Habitat Loss									
Habitat Protection and Restoration/Creation	2.50	57.76	2,997.27	175.59	25.45	2,229.23	22.82 protected[d] 11.41 restored/ created[d]	2.68 [e]	141.46

[a.] All uplands within 650 ft of the compensatory mitigation aquatic habitat will also be protected and restored/created. The acreage given only includes aquatic habitat and not upland habitat.

[b.] All uplands within 1,200 ft of the compensatory mitigation aquatic habitat will also be protected and restored/created. The acreage given only includes aquatic habitat and not upland habitat.

[c.] When a portion of a vernal pool is impacted, the entire pool must be mitigated for.

[d.] Direct effects on vernal pools will be mitigated at a 2:1 ratio for protection and 1:1 ratio for restoration/creation. This is for both permanent and temporary effects.

[e.] Indirect effects on vernal pools will be mitigated at a 2:1 ratio for protection, with no restoration/creation. See footnote b of ***Table 10*** regarding temporary indirect effects.

Effects to Giant Garter Snake

Ground-disturbing activities associated with construction activities within the Sites Reservoir, TRR, and Dunnigan Pipeline work areas (as depicted in ***Appendix A. Sites Reservoir Project Effects Tracking Table***) have the potential to result in the injury or mortality of an unknown number of giant garter snakes if these activities are conducted in occupied upland habitat. Clearing, grubbing, excavation, and other ground-disturbing activities could result in destruction of burrows that are used as refugial habitat for the snake. The risk of injury or mortality from burrow-crushing is highest from late fall through early spring, when the snakes are dormant (generally October 1 through May 1). Snakes could become trapped in open trenches and deep holes. To minimize crushing snakes during clearing and grubbing, *Conservation Measure 4: Giant Garter Snake* requires all heavy equipment to avoid suitable upland giant garter snake habitat. When unavoidable, the affected area will be treated as a temporary impact area and will be mitigated. To avoid crushing snakes overwintering in burrows, the conservation measure requires Reclamation and the Authority to limit construction activity within giant garter snake habitat between May 1 and October 1 (unless certain conditions are met, as described more thoroughly in the measure). To avoid crushing snakes taking refuge in burrows during the summer, *Conservation Measure 4: Giant Garter Snake* requires all aquatic habitat be dewatered for 15 days prior to ground disturbance to allow underground snakes to emerge and move out of the area. Proposed construction BMPs and monitoring state that trenches and pits will be covered or ramps installed that will allow for species to exit. Where monitoring identifies occupied giant garter snake habitat, exclusionary fencing will be placed at the edge of the active construction areas to restrict wildlife access, and 24 hours prior to work activities, construction areas within 200 feet of occupied aquatic habitat will be surveyed for giant garter snakes.

Operation of heavy equipment could result in localized increases in noise and vibration. Increased noise and vibration could temporarily impair essential behaviors, including breeding, foraging, and sheltering, if individuals utilize sub-optimal habitats to avoid noisy areas. This could result in decreased fitness or increased dispersal time away from cover and make individuals more vulnerable to predators. Noise generated from equipment would likely range between 85 to 90 dBA at a distance of 50 feet. This level of noise is a common occurrence in the Action Area where active agricultural practices occur; therefore, effects from noise are expected to be similar or slightly above baseline conditions.

Fuel or oil spills from equipment into occupied habitat could also cause the injury or mortality of giant garter snakes directly or through adverse effects to their prey base. Direct exposure to hazardous materials could result in injury or death to individuals through acute toxicity. Reclamation and the Authority have proposed a conservation measure that will minimize the potential for fuel or oil spills into occupied or prey base aquatic habitat and therefore reduce the likelihood of a spill occurring (*Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*). The BMPs described in Conservation Measure 2 will be followed and implemented by Reclamation, the Authority, and their contractors.

Giant garter snakes could be struck by vehicles and equipment traveling along access roads. These activities are anticipated to occur primarily on County Road 68, Delevan Road,

McDermott Road, and Maxwell Sites Road in Glenn County, and Road 4, Road 5, Road 88 and adjacent areas in Yolo County where upland and aquatic habitat are modeled to be present. To avoid injury and mortality to snakes on access roads, vehicles will observe a 20 mph speed limit on unpaved roads within the construction area and on all nonpublic access roads, as described in *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources.*

Implementation of relocation efforts during construction activities would result in the capture and handling of individual giant garter snakes that would otherwise be subject to more severe adverse effects that may result in injury or mortality. Implementation of a Service-approved species relocation plan will minimize the adverse effects to giant garter snakes resulting from physical capture, collection, or handling.

The Project would avoid and minimize effects to giant garter snake by adhering to Conservation Measure 6, which requires a Service-approved biological monitor to be present during all ground-disturbing activities and any activities involving heavy equipment within 200 feet of suitable giant garter snake aquatic habitat. Prior to daily activities, the biological monitor will inspect the area for snakes before equipment is moved. If a snake is found during Project activities, the biological monitor will be immediately notified and will have authority to stop work until appropriate corrective measures have been completed or the biological monitor determines the snake will not be harmed. Also, implementation of conservation measures would ensure that the Proposed Action would not unnecessarily worsen the effects to snakes by making workers aware of the species habitat requirements, the need to avoid the species habitat, and ensure proper implementation of the proposed conservation measures (*Conservation Measure 1: Conduct Mandatory Biological Resources Awareness Training*).

Relocation of giant garter snakes from active work areas will result in capture and handling. Relocations could expose snakes to increased risk of predation. Individual snakes could be harmed or injured during capture attempts resulting in increased stress to the snake that could reduce overall fitness, while removing snakes from areas where they could contact equipment or other hazardous equipment will reduce the potential for injury or death. The use of a Service-approved biologist will reduce the potential for harm, injury, or death as a result of relocation.

Although measures would be applied to minimize the risk of injuring or killing giant garter snake individuals during construction activities, some potential would remain for individuals to be injured or killed, particularly if individuals are underground in crevices, burrows, or other hidden areas and go undetected.

Based on information presented in the BA, this BiOp analyzes the temporary loss of up to 6.06 acres of modeled aquatic habitat and up to 11.27 acres of modeled upland habitat, and the permanent loss of up to 0.83 acres of modeled aquatic habitat and up to 19.25 acres of modeled upland habitat. Temporary loss of habitat will be mitigated by restoring the affected snake habitat to pre-Project conditions within one season (May 1 to October 1). If the habitat is not restored, it is considered a permanent loss of habitat.

Effects to Monarch Butterfly

Project activities could result in disturbance or removal of vegetation, including host plants that monarch butterfly depend upon for survival, leading to injury or mortality. For example, Project activities could crush, cover, or remove host plants and individuals of covered insects that are slow moving (e.g., caterpillars) or immobile (e.g., eggs) may be impacted because they would not be able to escape. These effects would be minimized through implementation of the conservation measures, including establishing avoidance buffers around suitable habitats for covered insects, as well as implementing BMPs such as pre-construction surveys and transplanting of milkweeds, as feasible (*Conservation Measure 5: Monarch Butterfly*).

Adult monarch butterflies could be struck by the increased number of vehicles traveling along access roads during driving to and from exploration sites if monarchs are foraging or flying through the area. Construction activities could also disrupt roosting or foraging activities and there is a possibility that butterflies may be inadvertently killed or injured by heavy equipment operations. The presence of heavy equipment within the expansive construction footprint is likely to result in harassment, injury, or death of individual butterflies and/or temporary and permanent loss of habitat quality in the Project Action Area. *Conservation Measure 9: Monarch Butterfly* contains multiple measures to minimize the risk of injuring or killing monarch butterflies. Although these measures would be applied to minimize the risk of injuring or killing monarchs during construction activities, some potential remains for monarch butterflies or host plants to be injured or killed. One of the BMPs to address road kills is to reduce vehicle speed, especially in 'hotspot' areas. Reclamation and the Authority have proposed that vehicles observe a 20 mph speed limit on all nonpublic access roads and unpaved roads, as described in *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*. Additionally, this conservation measure includes the ability for the Service-approved biologists and biological monitors to temporarily stop work in any areas where listed species are observed or measures are not properly protecting listed species, which includes the authority to limit work in 'hotspot' areas (or direct work around) when butterflies may have an increased presence and be at risk of greater mortality.

Construction activities have the potential to introduce or spread invasive plant species resulting in the reduction of suitable habitat or by causing competition with native plants, milkweed, and monarch butterfly habitat. Measures to minimize the risk of introducing invasive species are included in *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*. Use of heavy equipment could disturb soils and habitat of the monarch butterfly's host and nectar plants, subsequently affecting the health and fitness of adults and larvae. Vehicles and heavy equipment used at the construction activity sites have the potential to increase airborne dust during Project activities, which can adversely affect plants. Nectar and host plants could be damaged or killed as a result of exposure to contaminants such as spilled fuels associated with construction activities.

Operation of heavy equipment and the associated refueling and maintenance needs would require the use of potential contaminants that, if released into the environment could result in adverse effects to covered insects and the host plants they depend upon. Exposure to contaminants could cause both acute and longer-term food-web based responses within the Action Area. Direct

exposure to hazardous materials could also result in injury or death to individuals through acute toxicity. Reclamation and the Authority have proposed a conservation measure that will minimize the potential for fuel or oil spills into occupied or prey base aquatic habitat and therefore reduce the likelihood of a spill occurring (*Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*). Best management practices will be followed and implemented by Reclamation, the Authority, and their contractors.

Construction activities will reduce the suitability of an area for roosting, foraging, and breeding activities of the monarch butterflies by temporarily impacting up to 1,570.49 acres of modeled habitat and permanently impacting up to 2,997.27 acres of modeled habitat (***Table 10***).

Effects to Northwestern Pond Turtle

Ground-disturbing activities associated with construction activities for the Project have the potential to result in the injury or mortality of an unknown number of pond turtles if these activities are conducted in occupied upland habitat.

Clearing, grubbing, excavation, and other ground-disturbing activities could result in destruction of refugia for the turtle or injury or mortality of pond turtle individuals. Per *Conservation Measure 7: Northwestern Pond Turtle*, temporary work areas and other activities with flexible locations will avoid northwestern pond turtle occupied aquatic habitat by 650 feet to the maximum extent feasible. Initial ground disturbance will be conducted in suitable upland habitat within 650 feet of suitable aquatic habitat prior to the start of nesting season (August 1-February 28) and will avoid northwestern pond turtle upland habitat during periods of nesting and nestling emergence (between March 1-July 31). For activities that will occur within suitable northwestern pond turtle aquatic habitat during the northwestern pond turtle inactive season (October 1-February 28), all aquatic northwestern pond turtle habitat will be dewatered prior to the start of the inactive season. When suitable northwestern pond turtle habitat occurs within 300 feet of construction activities, exclusion fencing will be installed along the perimeter of the construction site to protect northwestern pond turtle habitat and minimize the potential for turtles to enter the construction work area.

Biological surveys will be conducted prior to construction activities where suitable northwestern pond turtle habitat overlaps with the Action Area. The qualified biologist will inspect under vehicles and in holes, trenches, and mud cracks prior to beginning daily activities; remain on-site through the day to identify any turtles that have entered the work area; and facilitate avoidance. Implementation of relocation efforts during construction activities would result in the capture and handling of pond turtle individuals that would otherwise be subject to more severe adverse effects that may result in injury or mortality. Implementation of a Service-approved species relocation plan will minimize the adverse effects to pond turtle resulting from physical capture, collection, or handling.

Operation of heavy equipment could result in localized increases in noise and vibration. Increased noise and vibration could temporarily impair essential behaviors, including breeding, foraging, and sheltering, if individuals utilize sub-optimal habitats to avoid noisy areas. This could result in decreased fitness or increased dispersal time away from cover and make

individuals more vulnerable to predators. Noise generated from equipment would likely range between 85 to 90 dBA at a distance of 50 feet. This level of noise is a common occurrence in the Action Area where active agricultural practices occur; therefore, effects from noise are expected to similar or slightly above baseline conditions.

Fuel or oil spills from equipment into occupied habitat could also cause the injury or mortality of turtles directly or through adverse effects to their prey base. Direct exposure to hazardous materials could also result in injury or death to individuals through acute toxicity. Reclamation and the Authority have proposed a conservation measure that will minimize the potential for fuel or oil spills into occupied or prey base aquatic habitat and therefore reduce the likelihood of a spill occurring (*Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*). Best management practices will be followed and implemented by Reclamation, the Authority, and their contractors.

Vehicles or construction equipment could contact or crush pond turtles, leading to injury or death. Species that are slow moving or immobile are more susceptible to these impacts as they may not be able to escape or perceive the vehicle in time. Vehicle strikes will be minimized by implementing conservation measures that avoid suitable habitat and known populations, as well as implement BMPs such as pre-construction surveys, daily clearance surveys, and vehicle speed limits. To minimize the impacts from vehicle strike within the exploration area, *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*, requires a 20 mph-speed limit on unpaved roads within federally listed species habitat. Implementation of *Conservation Measure 6: Northwestern Pond Turtle* will minimize the potential for vehicle and equipment crushing by requiring inspections under vehicles, under equipment, and in excavated holes or ditches without exit etc. prior to and during construction activities within 300 feet of occupied northwestern pond turtle suitable aquatic habitat.

Although these measures will be applied to minimize the risk of injuring or killing northwestern pond turtle during construction activities, some potential remains for individuals to be injured or killed, particularly if individuals or eggs are in buried nests or adults are in hidden areas and go undetected. Construction activities could also disrupt typical northwestern pond turtles foraging or reproductive behaviors and normal movement from construction noise, vibration, human presence, or light. Behavior disruptions could increase the risk of predation and impair typical feeding or breeding behavior.

Construction activities will result in the temporary loss of up to 339.97 acres of modeled high- and low-quality aquatic habitat and 1,018.31 acres of modeled high- and low-quality upland habitat (***Table 10***). Additionally, construction activities will result in the permanent loss of up to 175.58 acres of modeled high- and low-quality aquatic habitat and up to 2,283.99 acres of modeled high- and low-quality upland habitat (***Table 10***).

Effects to Valley Elderberry Longhorn Beetle

Removal or trimming of elderberry shrubs associated with construction activities could result in injury or mortality of the beetle. Vehicles and equipment could also strike the beetle when traveling through the Action Area during the adult emergence and mating period (generally

March through July). *Conservation Measure 4: Valley Elderberry Longhorn Beetle* aims to minimize the risk of injuring or killing valley elderberry longhorn beetle by including measures that will flag shrubs for avoidance and install high-visibility fencing. Although measures would be applied to minimize the risk of injuring or killing valley elderberry longhorn beetle during Project implementation, some potential remains for individuals or shrubs to be injured or killed, particularly if shrubs cannot be avoided.

Use of heavy equipment could disturb soils adjacent to shrubs and affect the roots and health of elderberry shrubs (Service 2017a), subsequently affecting the health and fitness of adult beetles and larvae within the shrub. Vehicles and heavy equipment used for the Project have the potential to increase airborne dust during construction activities, which can negatively affect local plants, including elderberries (Farmer 1993). Elderberry shrubs could be damaged or killed because of exposure to contaminants such as spilled fuels associated with construction activities. *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources,* describes how the potential for fuel or oil spills into occupied or prey base aquatic habitat will be minimized, therefore reduce the likelihood of a spill occurring. Best management practices will be followed and implemented by Reclamation, the Authority, and their contractors.

Construction activities that reduce the suitability of an area for elderberry shrubs or elderberry recruitment could affect mating, foraging, and dispersal of the beetle. Implementation of *Conservation Measure 7: Valley Elderberry Longhorn Beetle* will minimize or avoid impacts in temporary construction areas and requires the application of water to minimize dust. A Hazardous Materials Management Plan will be enforced by the Authority to prevent leaks and spills of hazardous materials.

Construction activities have the potential to introduce or spread invasive species. As described in *Conservation Measure 7: Valley Elderberry Longhorn Beetle*, construction personnel would decontaminate equipment, tools, and vehicles before entering the Action Area to minimize these impacts.

The Service anticipates no more than 17 elderberry shrubs to be detected within the footprint and be affected by construction activities in riparian and non-riparian areas (***Table 12***). The number of elderberry shrubs estimated to be detected and number/size of stems estimated to be present is based on the amount of modeled suitable habitat in conjunction with observations of elderberry shrub extent and abundance made during ongoing geotechnical investigations for Site Reservoir Project (BiOp Service File No. 08FBDT00-2019-F-0287-R002). Ground-truthing efforts when the land becomes accessible will be provided to the Service from Reclamation and the Authority during Project implementation to verify the information presented in ***Table 12*** and this effects analysis.

Table 12. Compensatory mitigation for adverse effects to valley elderberry longhorn beetle from construction activities.

Location of Affected Plants	Stems (maximum diameter at ground level) of Affected Plants	Exit Holes on Affected Shrub (Yes/No)[a]	Estimated Number of Stems Affected	Elderberry Seedling per stem[b]	Associated Native Plants per stem[c]	Elderberry Seedling Requirement	Associated Native Plant Requirement
Non-riparian (8 shrubs; 20 stems per shrub)	Greater than or equal to 1 inch, less than 3 inches	No	48	1	1	48	48
		Yes	42	2	2	84	84
	Greater than or equal to 3 inches, less than 5 inches	No	20	2	1	40	20
		Yes	17	4	2	68	34
	Greater than or equal to 5 inches	No	18	3	1	54	18
		Yes	15	6	2	90	30
Riparian (9 shrubs; 21 stems per shrub)	Greater than or equal to 1 inch, less than 3 inches	No	62	2	1	124	62
		Yes	64	4	2	256	128
	Greater than or equal to 3 inches, less than 5 inches	No	15	3	1	45	15
		Yes	18	6	2	108	36
	Greater than or equal to 5 inches	No	15	4	1	60	15
		Yes	15	8	2	120	30
Total						**1,097**	**520**

[a.] Presence or absence of exit holes indicating presence of valley elderberry longhorn beetle. All stems measuring 1 inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[b.] Ratios in the column correspondence to the number of cuttings or seedlings to be planted per elderberry stem (1 inch or greater in diameter at ground level).

[c.] Rations in this column correspond to the number of associated native species to be planted per elderberry seedling or cutting planted.

The Service currently uses habitat in the form of appropriately sized elderberry shrub stems (greater than one inch diameter) as a surrogate to quantify impacts to valley elderberry longhorn beetles. Valley elderberry longhorn beetles are small in size, and their life cycle and patchy habitats make detection difficult and the quantification of impacts to individual beetles infeasible.

Construction activities will result in less available modeled habitat that supports elderberry shrubs with the temporary loss of up to 22.59 acres of modeled riparian habitat and 3,094.19 acres of modeled upland habitat, and the permanent loss of 31.34 acres of modeled upland habitat.

Effects to Vernal Pool Branchiopods

If present, vernal pool fairy shrimp and tadpole shrimp cysts are likely to be crushed by construction equipment and vehicles driving through the aquatic features in which they live, and/or be killed by ground-disturbing activities involving the grading, excavating, and filling of pools. Cysts also could be transported in the wheels of construction vehicles and equipment to areas without suitable aquatic habitat where they would be unable to hatch. Per *Conservation Measure 8: Vernal Pool Branchiopods,* vehicles and equipment will not travel in identified branchiopod habitat and construction activities will avoid occupied vernal pools by 250 feet where feasible, which should minimize the number of cysts subject to these effects.

Operation of heavy equipment and the associated refueling and maintenance needs would require the use of potential contaminants that, if released into the environment could result in adverse effects to vernal branchiopods. Exposure to contaminants could cause both acute and longer-term food-web based responses within the project footprint and may in some instances extend beyond the footprint. Direct exposure to hazardous materials could also result in injury or death to individuals through acute toxicity. These consequences would be limited to the construction phase and will be minimized with conservation measures to minimize the risk of introducing hazardous materials during Project activities. *Conservation Measure 8: Vernal Pool Branchiopods* will require construction activities to avoid temporary work in vernal pools when they are inundated and prohibit work within a 250-foot buffer around vernal pools. Implementing these measures will reduce the potential for adverse effects on covered branchiopods due to the introduction of hazardous materials.

Project activities may introduce non-native plant species that alter the composition of suitable species habitats. For example, seeds of invasive plants may become lodged in construction vehicle tires from within or outside the Action Area, then be deposited into the Action Area during construction. In addition, ground disturbing activities, including those that remove vegetation or alter the substrate, may lead to increased colonization by invasive species. Reclamation and the Authority will implement conservation measures to avoid or minimize the risk of introducing or spreading invasive plants.

Project activities that involve excavation could cause changes in the hydrology of nearby aquatic habitats. Excavation may occur in adjacent uplands, resulting in minor, localized changes in hydrology. Changes in hydrology could adversely affect vernal branchiopods by modifying

suitable aquatic habitats, for example by altering inundation duration, or causing minor changes in flows where they may expose individuals to increased predation or stress, and impair essential behaviors such as breeding, foraging, or sheltering. These effects will be minimized by implementing conservation measures to avoid suitable habitat where feasible, restore and recontour topography to original grade, and establish avoidance buffers around suitable habitat. Construction activities ultimately will result in the fragmentation of, and reduction in the amount and/or suitability of, habitat available to the species in the area; will lead to the death of cysts if present; and may reduce both the species' dispersal ability and the genetic diversity in, and exchange between, populations.

Construction activities will result in the permanent habitat loss of 1.34 acres from indirect effects to modeled aquatic habitat (***Table 10***). Additionally, construction activities will result in the permanent loss of up to 11.41 acres of modeled aquatic habitat (***Table 10***). Reclamation and the Authority propose to mitigate for these indirect effects by protecting 2.68 acres and mitigating for direct effects by protecting 22.82 acres and protection and restoring/creating 11.41 acres of suitable habitat (***Table 11***).

Effects to Western Spadefoot

The use of vehicles and heavy equipment within seasonal wetlands could result in injury of western spadefoot during the rainy season if suitable aquatic habitat is occupied. Implementation of *Conservation Measure 9: Western Spadefoot* would minimize impacts to occupied habitat by requiring suitable habitat be mapped, occupancy surveys be performed within suitable habitat, and temporary work areas and other activities with flexible locations be moved, if possible, to provide a 250-foot non-disturbance buffer around the occupied aquatic habitat.

If full avoidance is not feasible and if a portion of occupied western spadefoot habitat will be filled (i.e., permanent effects), the filling will be conducted when the habitat is completely dry. Additionally, this conservation measure would restrict initial ground-disturbing activities to periods of no or low rainfall. Injury or mortality would result primarily from construction activities in permanent impact areas, such as through permanent habitat loss and injury or mortality of aestivating individuals in upland habitat.

Implementation of relocation efforts during construction activities would result in the capture and handling of western spadefoot individuals that would otherwise be subject to more severe adverse effects that may result in injury or mortality. Implementation of a Service-approved species relocation plan will minimize the adverse effects to western spadefoot resulting from physical capture, collection, or handling.

With the implementation of these conservation measures, the Service anticipates effects to individuals in the form of injury or mortality to be low and that effects will be minimized to the western spadefoot during its sensitive life history phases (e.g., breeding season). Operation of heavy equipment could result in localized increases in noise and vibration. Increased noise and vibration could temporarily impair essential behaviors, including breeding, foraging, and sheltering, if individuals utilize suboptimal habitats to avoid noisy areas. Other potentially adverse effects to the western spadefoot include changes in air quality, introduction of hazardous

materials, introduction of invasive plants, changes in hydrology, disturbance to areas of refugia, and vehicle strikes. These effects will be minimized through the implementation of BMPs.

Reclamation and the Authority have proposed a conservation measure that will minimize the potential for fuel or oil spills into occupied or prey base aquatic habitat and therefore reduce the likelihood of a spill occurring (*Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*). Best management practices will be followed and implemented by Reclamation, the Authority, and their contractors.

Construction activities will result in the temporary loss of up to 89.65 acres of modeled aquatic habitat and 1,083.28 acres of modeled upland habitat (***Table 10***). Additionally, construction activities will result in the permanent loss of up to 141.46 acres of modeled aquatic habitat and up to 2,564.76 acres of modeled upland habitat (***Table 10***).

11.2.4 Inundation

Deconstruction of the Action

Reclamation and the Authority have described the inundation area as including all areas that would be flooded by the proposed Sites Reservoir (***Figure B-4. Inundation Footprint for the Sites Reservoir Project.***; *Appendix B*). Site preparation activities for Project inundation will involve demolition of areas as necessary and removal of vegetation, (i.e., clearing and grubbing) (***Figure 7***). The initial filling of Sites Reservoir will be guided by an Initial Reservoir Fill Plan that will be prepared as a part of the Department of Water Resources, Division of Safety of Dams approval process and would be finalized at least one year prior to initial inundation of Sites Reservoir. Although the reservoir could fill within two years of initial operation should river conditions allow maximum diversions, it is estimated to take approximately 2 to 5 years for the reservoir to reach its maximum capacity. The reservoir inundation footprint is based on the 498-foot elevation, which is the maximum level of inundation possible after the dams have been constructed. All areas within the inundation footprint are considered permanently impacted by the Project. At maximum inundation, the depth of the footprint is estimated to be 498 feet above mean sea level and the minimum normal operating water elevation is estimated to be 340 feet above mean sea level. Water levels of the reservoir will be variable within that footprint depending on the operations schedule identified in the O&M Plan. For purposes of analyzing effects to listed species and their habitats, the Service has analyzed the effects of filling the reservoir to the maximum footprint of inundation. Inundation areas associated with the filling of Sites Reservoir may adversely affect the **monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot** and their modeled suitable habitat (***Appendix A. Sites Reservoir Project Effects Tracking Table***). The reservoir inundation footprint does not overlap with modeled suitable habitat for giant garter snake or for vernal pool branchiopods. ***Table 13*** provides a summary of the total acreages of modeled habitat anticipated to be permanently affected from reservoir inundation activities. ***Table 14*** identifies the proposed compensatory mitigation to offset those permanent Project effects.

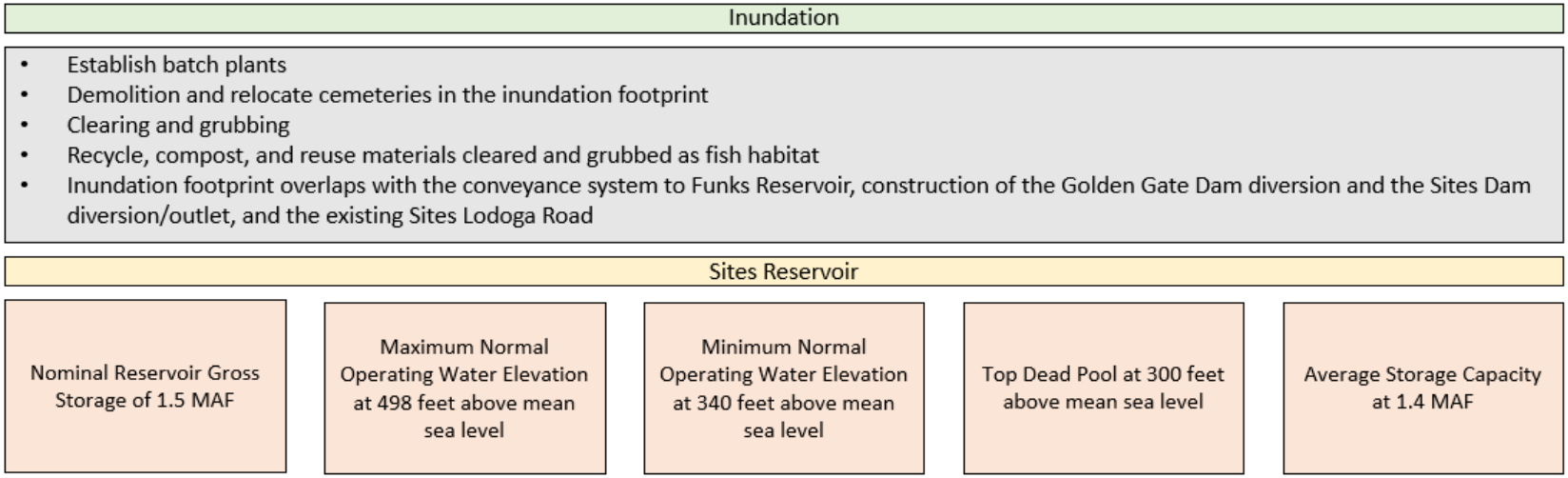

Figure 7. Deconstruction of the inundation area for the Sites Reservoir Project.

Table 13. Summary table of the anticipated permanent loss of monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot modeled habitat from inundation activities.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle				Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods		Western Spadefoot	
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat, High Value (acres)	Modeled Upland Habitat, High Value (acres)	Modeled Aquatic Habitat, Low Value (acres)	Modeled Upland Habitat, Low Value (acres)	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct (acres)	Indirect (acres)	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)
Inundation Area													
Permanent Habitat Loss	0	0	12,995.92	76.58	2,430.15	482.46	7,722.95	54.17	11,565.52	0	0	476.88	11,474.05

Table 14. Summary table of the proposed compensatory mitigation (in habitat acres protected and restored/created) for the monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot to offset permanent habitat loss effects from inundation activities.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle	Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods		Western Spadefoot
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat (acres) [a]	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct (acres)	Indirect (acres)	Modeled Aquatic Habitat (acres) [b]
Habitat Protection and Restoration/Creation	0	0	12,995.92	559.04	162.50	11,565.52	0	0	476.88

[a.] All uplands within 650 ft of the compensatory mitigation aquatic habitat will also be protected and restored/created. The acreage given only includes aquatic habitat and not upland habitat.

[b.] All uplands within 1,200 ft of the compensatory mitigation aquatic habitat will also be protected and restored/created. The acreage given only includes aquatic habitat and not upland habitat.

Effects to Monarch Butterfly

Anticipated changes in the topography and compaction of soils that may influence the hydrology of the area, including those areas within the inundation footprint, may negatively impact monarchs. Site preparation and inundation will eliminate modeled monarch habitat within the inundation footprint.

The clearing, grubbing, and preparation of the inundation footprint for reservoir filling will result in the removal of vegetation. Up to 12,995.92 acres of modeled monarch butterfly habitat will be permanently impacted by these activities. Following site preparation and the initial fill-up of the reservoir, the inundated area will provide a long-term water source to newly established riparian vegetation along the waterline and reservoir borders. The extent to which plants will be present will be dependent on the future Service-approved management plans and potential for on-site mitigation to occur within the Project footprints.

In the area surrounding the inundation footprint, hydrological impacts that change vegetation dynamics could increase or decrease both milkweed and nectar plant availability, density, and vigor in adjacent areas, which, depending on the nature of the change, would impact monarch at all stages. Insufficient or excessive water availability can result in wilting, stunted growth, or mortality of milkweed. Such changes may also affect the quality and quantity of nectar resources available to monarchs (Brower *et al.* 2015, Couture *et al.* 2015, Service 2020b). A decrease in milkweed availability may limit food resources for monarchs, impairing egg-laying and larval survival, and potentially reducing recruitment into the population.

Due to the expansive range of monarch breeding grounds, the hydrological impacts of the inundation footprint are unlikely to affect a sufficient area to elicit a population-level response or pose a significant risk to the western North American breeding population. Most milkweed species are deciduous perennials adapted to seasonal dry conditions (Borders *et al.* 2013, Service 2020b). However, milkweed plants that experience limited water availability may produce a more viscous latex, which has been shown to negatively impact larval development (Bell 1998, Service 2020b).

Milkweed availability is crucial for monarch reproduction and survival within the Action Area. A reduction in milkweed resources is widely recognized as a key factor contributing to monarch population declines (Brower *et al.* 2012, Pleasants and Oberhauser 2013, Inamine *et al.* 2016, Thogmartin *et al.* 2017, Waterbury and Potter 2019, Sauders *et al.* 2019, Service 2020b), and as such, translocating or replacing milkweed is an essential component of the mitigation strategy for this Project. The Authority has proposed to mitigate the permanent loss of modeled suitable habitat by planting native milkweed and nectar plants in suitable on-site and/or off-site restoration/creation areas at a 1:1 ratio (acres lost: acres planted) for up to 12,995.92 acres of modeled habitat (***Table 13*** and ***Table 14***).

Effects to Northwestern Pond Turtle

The Service expects that adverse effects to the northwestern pond turtle would occur from changes in the topography and alteration of hydrology in the area, especially in the initial fill-up

stage of the Project. Hydrologic impacts may lead to increased erosion and sedimentation throughout the inundation footprint as water levels fluctuate. These changes will be influenced by the operations of the Sites Reservoir. Inundation that occurs during the breeding season could cause the flooding of nesting sites or the displacement of adult individuals from nesting sites, resulting in reproductive failure and decreased survival rates for the offspring. Turtles utilizing surface and subsurface refugia or hibernacula may be disturbed, displaced, or harassed out of areas during flooding events. Inundation of nests located in areas that become submerged will likely result in mortality to unhatched eggs. While some mortality to juveniles and adults could occur during inundation, it is anticipated to be low due to the nature of the described Initial Reservoir Fill Plan and water operations.

Preparation of the inundation footprint will involve vegetation removal, clearing, grubbing, and soil disturbance, leading to the degradation of suitable habitat. This process could potentially expose individuals seeking refuge or hibernating, subjecting them to heightened predation risks, increased stress, and disruption of essential sheltering behaviors.

Following site preparation and the initial fill-up of the reservoir, the inundated area will provide a long-term water source to newly established riparian vegetation along the waterline and reservoir borders. Northwestern pond turtles require both aquatic and upland habitats that are within proximity and connected to one another. Following the initial fill-up, displaced turtles may colonize the reservoir, utilizing slack water areas for overwintering by burying themselves in the substrate, such as mud. The varying water depths may offer suitable habitat for overwintering and the growth of hatchlings. In the long term, northwestern pond turtles are likely to use the inundated area for breeding, foraging, overwintering, and sheltering. These turtles may occupy basking sites, underwater shelters *(*e.g.*,* undercut banks, submerged vegetation, mud, rocks, and logs), as well as standing or slow-moving water areas. The extent to which suitable habitat for northwestern pond turtle will be present will be dependent on the future Service-approved management plans and potential for on-site mitigation to occur within the Project footprints. This may result in increased suitable habitat available for northwestern pond turtle.

Inundation activities will permanently affect up to 559.04 acres of modeled northwestern pond turtle aquatic habitat and up to 10,153.10 acres of modeled upland habitat (***Table 13***). The Authority will compensate for permanent loss of occupied aquatic habitat at a 1:1 ratio (1 acre occupied aquatic habitat protected and restored/created:1 acre lost) and all uplands within 650 ft of the compensatory mitigation aquatic habitat will also be protected and restored/created (***Table 14***).

Effects to Valley Elderberry Longhorn Beetle

The Service expects there to be adverse effects to valley elderberry longhorn beetle through direct disturbance and physical collection, or relocation of individuals within the inundation footprint. Elderberry shrubs, the host plant of the valley elderberry longhorn beetle, within the inundation footprint would be cleared or flooded as a result of inundating the reservoir, if not for the conservation measure being implemented to relocate host plants following the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (2017). It is possible that not all elderberry shrubs will be successfully transplanted and may succumb to mortality. Site

preparation activities for Project inundation will involve removal of vegetation, (i.e., clearing and grubbing), that could result in increased temperatures in the microhabitats that valley elderberry longhorn beetle depend upon for survival. This could cause adverse effects such as degradation of suitable habitat through a reduction in soil moisture, and result in changes in plant physiology including changes in evapotranspiration which leads to wilting.

Operation of heavy equipment could result in localized increases in noise and vibration and impair essential behaviors, including breeding, foraging, and sheltering, if individuals utilize sub-optimal habitats to avoid noisy areas. These areas would be limited to areas being operated with heavy equipment. Agricultural practices are part of the environmental baseline conditions for this area, where tractors, trucks, and other similar types of equipment are commonly used.

The Service anticipates no more than 84 elderberry shrubs to be detected within the footprint and be affected by inundation in riparian and non-riparian areas (***Table 15***). The number of elderberry shrubs estimated to be detected and number/size of stems estimated to be present is based on the amount of modeled suitable habitat in conjunction with observations of elderberry shrub extent and abundance made during ongoing geotechnical investigations for Site Reservoir Project (BiOp Service File No. 08FBDT00-2019-F-0287-R002). Ground-truthing results when the land becomes accessible will be provided to the Service from Reclamation and the Authority during Project implementation to verify the information presented in ***Table 15*** and this effects analysis.

The Service currently uses habitat in the form of appropriately sized elderberry shrub stems (greater than 1 inch diameter) as a surrogate to quantify impacts to valley elderberry longhorn beetles. Valley elderberry longhorn beetles are small in size, and their life cycle and patchy habitats make detection difficult and the quantification of impacts to individual beetles infeasible.

Inundation and relocation activities may affect all life stages (eggs, larva, or adults) occupying host plants. Up to 54.17 acres of modeled valley elderberry longhorn beetle riparian habitat may be permanently affected from reservoir inundation (***Table 13***). After the reservoir has been inundated, the area will no longer serve as habitat for this species, affecting the valley elderberry longhorn beetle's reproductive cycle. Reclamation and the Authority have proposed compensation measures that would promote reproduction through the protection and restoration/creation of suitable habitat. Compensation for the permanent loss of riparian habitat will occur at a rate of 3:1 for each acre that will be permanently impacted by inundation, up to 162.50 acres of modeled valley elderberry longhorn beetle riparian habitat (***Table 14***).

Table 15. Compensatory mitigation for adverse effects to valley elderberry longhorn beetle from inundation.

Location of Affected Plants[d]	Stems (maximum diameter at ground level) of Affected Plants	Exit Holes on Affected Shrub (Yes/No)[a]	Number of Stems Affected	Elderberry Seedling per stem[b]	Associated Native Plants per stem[c]	Elderberry Seedling Requirement	Associated Native Plant Requirement
Non-riparian (40 shrubs; 800 stems)	Greater than or equal to 1 inch, less than 3 inches	No	242	1	1	242	242
		Yes	206	2	2	412	412
	Greater than or equal to 3 inches, less than 5 inches	No	99	2	1	198	99
		Yes	85	4	2	340	170
	Greater than or equal to 5 inches	No	91	3	1	273	91
		Yes	77	6	2	462	154
Riparian (44 shrubs; 1,008 stems)	Greater than or equal to 1 inch, less than 3 inches	No	331	2	1	662	331
		Yes	344	4	2	1,376	688
	Greater than or equal to 3 inches, less than 5 inches	No	82	3	1	246	82
		Yes	89	6	2	534	178
	Greater than or equal to 5 inches	No	80	4	1	320	80
		Yes	82	8	2	656	164
Total						**5,721**	**2,691**

[a.] Presence or absence of exit holes indicating presence of valley elderberry longhorn beetle. All stems measuring 1 inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[b.] Ratios in this column correspond to the number of cuttings or seedlings to be planted per elderberry stem (1 inch or greater in diameter at ground level) affected by a covered activity.

[c.] Ratios in this column correspond to the number of associated native species to be planted per elderberry seedling or cutting planted.

[d.] Shrub is considered affects if it is within 165 feet of impact area, unless the Service provides confirmation in writing that sufficient avoidance measures have been implemented to avoid impact to the shrub within 165 feet.

Effects to Western Spadefoot

Inundation will result in the alteration of hydrological conditions in the area, which are critical for the breeding and survival of the western spadefoot. In particular, the proposed inundation footprint may include existing or suitable habitat for the species, such as ephemeral ponds or vernal pools that support breeding populations of western spadefoot and upland aestivation habitat. Adverse effects for western spadefoot include impacts on habitat availability and breeding success, and the overall alteration of hydrological and environmental conditions due to the reservoir's inundation. Western spadefoot are highly sensitive to hydrological conditions, particularly the timing, duration, and seasonal variation of water availability in breeding sites. The breeding cycle of western spadefoot is tightly linked to the seasonal availability of water. They rely on ephemeral ponds and vernal pools that form during winter and spring rains. If the reservoir inundation coincides with or disrupts the seasonal timing of these water sources, it could delay or prevent the establishment of suitable breeding sites. If inundation occurs earlier or later than typical seasonal patterns, it may create unsuitable conditions for reproduction.

Preparation of the inundation footprint will involve vegetation removal, clearing, grubbing, and soil disturbance. This process could potentially expose, disturb, or injure spadefoot individuals that may be aestivating underground, subjecting them to heightened predation risks, increased stress, disruption of essential sheltering behaviors, and mortality.

Inundation will convert ephemeral habitats into permanent waterbodies, which favor fish and other predators that could prey on spadefoot larvae. Permanent water bodies are generally unsuitable for the species, which requires temporary pools for breeding.

Direct inundation of ephemeral ponds or vernal pools will lead to the loss of breeding habitat for the western spadefoot within in the inundation footprint. Inundation will prevent egg development, disrupt larval stages, or result in predation by introduced or non-native species. Inundation that occurs during the breeding season could cause the flooding of egg masses or the displacement of adult individuals from suitable breeding sites, resulting in reproductive failure and decreased survival rates for the offspring.

Western spadefoot use upland areas adjacent to breeding sites for aestivation. Reservoir activities may disturb these upland habitats and potentially force the toads into less favorable areas, reducing their survival chances and reproductive success. Additionally, inundation will remove available aestivation habitat within the inundation footprint via flooding.

Up to 476.88 acres of modeled western spadefoot aquatic habitat and 11,474.05 acres of modeled upland habitat may be permanently affected from reservoir inundation (***Table 13***). Reclamation and the Authority have proposed to mitigate for these permanent affects at a 1:1 ratio to occupied suitable aquatic habitat (1 acre occupied suitable aquatic habitat protected and restored/created:1 acre lost), and the protection and restoration/creation of at least 1,200 feet of uplands around the protected and restored/created aquatic habitat (***Table 14***). Compensatory mitigation will include a Service-approved management and monitoring plan that will consider the threats to and needs of western spadefoot.

11.2.5 Recreation Areas

Deconstruction of the Action

Reclamation and the Authority have described the development of recreation areas at the Sites Reservoir. The proposed recreation construction activities include the following types of work necessary to develop the recreation areas and associated facilities: constructing roads and parking lots, clearing and grubbing, performing excavation, dewatering, and backfilling, accommodating construction traffic and equipment, installing utility connections, constructing recreational amenities and boat ramps, and restoring temporarily disturbed areas (***Figure 8***). These activities are anticipated to occur in the recreation footprint, which includes the Peninsula Hills Recreation Area, the Stone Corral Creek Recreation Area, and the Day-Use Boat Ramp and Parking Areas (*Appendix B*, ***Figure B-3. Recreation Footprint for the Sites Reservoir Project***.).

The Peninsula Hills Recreation Area would be located on the northwest shore of the Sites Reservoir and will encompass up to 552 acres. Its facilities are anticipated to include a kiosk, access to electricity and potable water, picnic sites, campsites, vault toilets, and hiking trails. The Stone Corral Creek Recreation Area would be located on the eastern shore of the Sites Reservoir and will encompass up to 175 acres. Its facilities are anticipated to include a kiosk, access to electricity and potable water, picnic sites, campsites, vault toilets, and hiking trails. The day-use boat ramp would be located on the western side of the reservoir and is expected to encompass up to 58 acres and include a kiosk, access to potable water, and a vault toilet.

The total disturbance area associated with development of the recreation areas would be approximately 785 acres and includes the recreation areas and new roads necessary for maintenance and access. Disturbance may be less if recreational facilities are designed and constructed to minimize vegetative disturbance, including tree removal. Anticipated ground-disturbing and related activities during recreational area development include surveying, clearing and grubbing, excavating, backfilling, constructing the road and parking lot, installing potable water and power connections, installing amenities, constructing the boat ramp, and performing site revegetation.

Recreational development activities associated with the Project would be limited to designated recreational areas, all of which are included within the Project footprint, and have been analyzed as areas likely to experience disturbance from frequent public use. Construction vehicles, equipment, and materials would also be parked or stored within these recreational areas. Lath, fencing, or flags would be maintained until final cleanup or site restoration is completed, after which they would be removed. Temporarily disturbed areas would be restored after construction of the recreational areas are complete, consistent with the conservation measures.

Recreational area construction activities may adversely affect **monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot** and their modeled suitable habitat (***Appendix A. Sites Reservoir Project Effects Tracking Table***). ***Table 16*** provides a summary of the total acreages of modeled habitat anticipated to be temporarily and permanently lost from recreational development activities. and ***Table 17*** identifies the proposed compensatory mitigation to offset those permanent Project effects.

The operation and maintenance of the recreational areas is one of the comprehensive O&M Plans that will be developed and is included as a *Framework Programmatic* action in this BiOp.

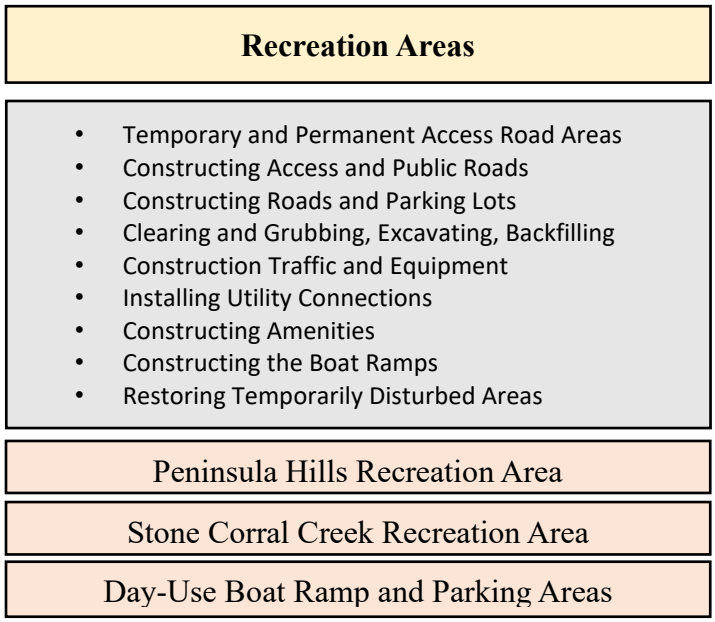

Figure 8. Deconstruction of the Recreation Areas activities for the Sites Reservoir Project.

Table 16. Summary table of the anticipated temporary and permanent loss of giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods and western spadefoot modeled habitat from recreation activities.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle				Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods		Western Spadefoot	
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat, High Value (acres)	Modeled Upland Habitat, High Value (acres)	Modeled Aquatic Habitat, Low Value (acres)	Modeled Upland Habitat, Low Value (acres)	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct (acres)	Indirect (acres)	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)
Peninsula Hills Recreation Area													
Temporary Habitat Loss	0	0	26.94	0	0	0.04	16.85	0.69	26.19	0	0	0.04	23.46
Permanent Habitat Loss	0	0	551.72	0.27	49.09	1.20	354.49	3.07	546.16	0	0	1.20	543.48
Stone Corral Creek Recreation Area													
Temporary Habitat Loss	0	0	0	0	0	0	0	0	0	0	0	0	0
Permanent Habitat Loss	0	0	175.35	0	4.55	0.26	71.88	0.03	7.11	0	0	0.18	148.25
Day-Use Boat Ramp and Parking Areas													
Temporary Habitat Loss	0	0	13.38	0	2.00	0.45	10.93	0.66	12.28	0	0	0.45	12.28
Permanent Habitat Loss	0	0	57.62	0	1.37	0.57	43.05	1.10	55.94	0	0	0.57	55.81

Table 17. Summary table of the proposed compensatory mitigation (in habitat acres protected and restored/created) for the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot to offset permanent habitat loss effects from recreation activities.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle	Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods		Western Spadefoot
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat (acres) [a]	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct (acres)	Indirect (acres)	Modeled Aquatic Habitat (acres) [b]
Habitat Protection and Restoration/Creation	0	0	784.70	2.30	12.59	609.2		0	1.95

[a.] All uplands within 650 ft of the compensatory mitigation aquatic habitat will also be protected and restored/created. The acreage given only includes aquatic habitat and not upland habitat.

[b.] All uplands within 1,200 ft of the compensatory mitigation aquatic habitat will also be protected and restored/created. The acreage given only includes aquatic habitat and not upland habitat.

Table 18. Compensatory mitigation for adverse effects to valley elderberry longhorn beetle from recreational area development activities.

Location of Affected Plants	Stems (maximum diameter at ground level) of Affected Plants	Exit Holes on Affected Shrub (Yes/No)[a]	Number of Stems Affected	Elderberry Seedling per stem[b]	Associated Native Plants per stem[c]	Elderberry Seedling Requirement	Associated Native Plant Requirement
Non-riparian (2 shrubs; 20 stems per shrub)	Greater than or equal to 1 inch, less than 3 inches	No	12	1	1	12	12
		Yes	10	2	2	20	20
	Greater than or equal to 3 inches, less than 5 inches	No	5	2	1	10	5
		Yes	4	4	2	16	8
	Greater than or equal to 5 inches	No	5	3	1	15	5
		Yes	4	6	2	24	8
Riparian (3 shrubs; 21 stems per shrub)	Greater than or equal to 1 inch, less than 3 inches	No	21	2	1	42	21
		Yes	21	4	2	84	42
	Greater than or equal to 3 inches, less than 5 inches	No	5	3	1	15	5
		Yes	6	6	2	36	12
	Greater than or equal to 5 inches	No	5	4	2	20	10
		Yes	5	8	1	40	5
Total						**334**	**153**

[a.] Presence or absence of exit holes indicating presence of valley elderberry longhorn beetle. All stems measuring 1 inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[b.] Ratios in the column correspondence to the number of cuttings or seedlings to be planted per elderberry stem (1 inch or greater in diameter at ground level).

[c.] Ratios in this column correspond to the number of associated native species to be planted per elderberry seedling or cutting planted.

Effects to Monarch Butterfly

Ground-disturbing activities along with the presence and movement of heavy equipment within the recreational area footprint is likely to result in harassment, injury, or death of an unknown number of individual butterflies. Ground-disturbing activities could result in disturbance or removal of vegetation, including host plants that monarch butterfly depend upon for survival, leading to injury or mortality. For example, Project activities could crush, cover, or remove host plants and individuals that are slow moving (e.g., caterpillars) or immobile (e.g., eggs) because they would not be able to escape. These effects would be minimized through implementation of the conservation measures, including establishing avoidance buffers around suitable habitats for covered insects, as well as implementing BMPs such as pre-construction surveys and transplanting of milkweeds, as feasible (*Conservation Measure 5: Monarch Butterfly*).

Adult monarch butterflies could be struck by the increased number of vehicles traveling along access roads while driving to and from recreational area sites if monarchs are foraging or flying through the area. Project activities associated with recreational area development could also disrupt roosting or foraging activities and there is a possibility that butterflies may be inadvertently killed or injured by heavy equipment operations.

Conservation Measure 5: Monarch Butterfly contains multiple measures to minimize the risk of injuring or killing monarch butterflies. Although these measures would be applied to minimize the risk of injuring or killing monarchs during recreational area development activities, some potential remains for monarch butterflies or host plants to be injured or killed. One of the BMPs to address road kills is to reduce vehicle speed. Reclamation and the Authority have proposed that vehicles observe a 20 mph speed limit on all non-public access roads and unpaved roads, as described in *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*. Additionally, this conservation measure includes the ability for the Service-approved biologists and biological monitors to temporarily stop work in any areas where listed species are first observed or measures are not properly protecting listed species, which includes the authority to limit work in 'hotspot' areas (or direct work around) when butterflies may have an increased presence and be at greater risk of mortality.

Recreational area development will also reduce the suitability of areas for roosting, foraging, and breeding activities of monarch butterflies by temporarily removing up to 40.32 acres of modeled habitat and permanently removing up to 784.70 acres of modeled habitat (***Table 15***). Use of heavy equipment could disturb soils and habitat of the monarch butterfly's host and nectar plants, subsequently affecting the health and fitness of adults and larvae. Vehicles and heavy equipment used during recreational area development activities have the potential to increase airborne dust during Project activities, which can adversely affect plants. Effects to nectar and host plants being damaged or killed as a result of exposure to contaminants such as spilled fuels associated with recreational area development activities will be minimized through implementation of BMPs included within *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*. Activities associated with recreational area development also have the potential to introduce or spread invasive plant species resulting in the reduction of suitable habitat or by causing competition with native plants, milkweed, and

monarch butterfly habitat. Conservation measures to minimize the risk of introducing or spreading invasive plant species will be implemented by the Authority.

Reclamation and the Authority have proposed to mitigate 784.70 acres for the permanent loss of suitable monarch habitat from recreational area development activities (***Table 16***) and will follow the measures as they have been identified in *Conservation Measure 5: Monarch Butterfly* and other pertinent conservation measures. There is uncertainty on the success and ability to remove and transplant milkweeds from the impacted footprints to a new protected location. Therefore, a diverse strategy of planting, seeding, and/or transplanting will be used to determine which techniques will result in the best outcome at the mitigation sites. Ultimately, the final landscape design for the mitigation sites will be Service-approved, and accompanied with site-specific restoration plans to provide assurances that the mitigation will provide the habitat characteristics to successfully offset Project impacts as described in this BiOp.

Effects to Northwestern Pond Turtle

Ground-disturbing activities associated with recreational area development activities for the Project have the potential to result in the injury or mortality of an unknown number of pond turtles if these activities are conducted in occupied upland habitat.

Clearing, grubbing, excavation, and other ground-disturbing activities could result in destruction of refugia for the turtle or injury or mortality of pond turtle individuals. Per *Conservation Measure 6: Northwestern Pond Turtle*, temporary work areas and other activities with flexible locations will avoid northwestern pond turtle occupied aquatic habitat by 650 feet to the maximum extent feasible. Initial ground disturbance will be conducted in suitable upland habitat within 650 feet of suitable aquatic habitat prior to the start of nesting season (August 1-February 28) and will avoid northwestern pond turtle upland habitat during periods of nesting and nestling emergence (between March 1-July 31). For activities that will occur within suitable northwestern pond turtle aquatic habitat during the northwestern pond turtle inactive season (October 1 through February 28), all aquatic northwestern pond turtle habitat will be dewatered prior to the start of the inactive season. When suitable northwestern pond turtle habitat occurs within 300 feet of recreational area development activities, exclusion fencing will be installed along the perimeter of the construction site to protect northwestern pond turtle habitat and minimize the potential for turtles to enter the construction work area.

Biological surveys will be conducted prior to recreational area development activities where suitable northwestern pond turtle habitat overlaps with the Action Area. The qualified biologist will inspect under vehicles and in holes, trenches, and mud cracks prior to beginning daily activities; remain onsite through the day to identify any turtles that have entered the work area; and facilitate avoidance.

Implementation of relocation efforts during recreational area development activities would result in the capture and handling of pond turtle individuals that would otherwise be subject to more severe adverse effects that may result in injury or mortality. Implementation of a Service-approved species relocation plan will minimize the adverse effects to pond turtle resulting from physical capture, collection, handling, and relocation.

Operation of heavy equipment could result in localized increases in noise and vibration. Increased noise and vibration could temporarily impair essential behaviors, including breeding, foraging, and sheltering, if individuals utilize sub-optimal habitats to avoid noisy areas. This could result in decreased fitness or increased dispersal time away from cover and make individuals more vulnerable to predators. Noise generated from equipment would likely range between 85 to 90 dBA at a distance of 50 feet. This level of noise is a common occurrence in the Action Area where active agricultural practices occur; therefore, effects from noise are expected to similar or slightly above baseline conditions.

Fuel or oil spills from equipment into occupied habitat could also cause the injury or mortality of turtles directly or through adverse effects to their prey base. Direct exposure to hazardous materials could also result in injury or death to individuals through acute toxicity. Reclamation and the Authority have proposed a conservation measure that will minimize the potential for fuel or oil spills into occupied or prey base aquatic habitat and therefore reduce the likelihood of a spill occurring (*Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*). Best management practices will be followed and implemented by Reclamation, the Authority, and their contractors.

Vehicles or construction equipment could contact or crush pond turtles, leading to injury or death. Species that are slow moving or immobile are more susceptible to these impacts as they may not be able to escape or perceive the vehicle in time. Vehicle strikes will be minimized by implementing conservation measures that avoid suitable habitat and known populations, as well as implement BMPs such as pre-construction surveys, daily clearance surveys, and vehicle speed limits. To minimize the impacts from vehicle strike within the exploration area, *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*, requires a 20 mph-speed limit on unpaved roads within federally listed species habitat. Implementation of *Conservation Measure 6: Northwestern Pond Turtle* will minimize the potential for vehicle and equipment crushing by requiring inspections under vehicles, under equipment, and in excavated holes or ditches without exit etc. prior to and during construction activities within 300 feet of occupied northwestern pond turtle suitable aquatic habitat.

Although these measures will be applied to minimize the risk of injuring or killing northwestern pond turtle during recreational area development activities, some potential remains for individuals to be injured or killed, particularly if individuals or eggs are in buried nests or adults are in hidden areas and go undetected. Recreational area development activities could also disrupt typical northwestern pond turtles foraging or reproductive behaviors and normal movement from construction noise, vibration, human presence, or light. Behavior disruptions could increase the risk of predation and impair typical feeding or breeding behavior.

Recreational area development activities will result in the temporary loss of up to 0.49 acres of modeled high- and low-quality aquatic habitat and 29.78 acres of modeled high- and low-quality upland habitat (***Table 15***). Additionally, recreational area development activities will result in the permanent loss of up to 2.31 acres of modeled high- and low-quality aquatic habitat and 524.43 acres of modeled high- and low-quality upland habitat (***Table 16***). Reclamation and the Authority propose to mitigate by conserving 2.30 acres of suitable aquatic habitat and protecting at least 650 feet of uplands around the protected and restored/created aquatic habitat (***Table 17***).

Mitigation will include a Service-approved management and monitoring plan that will consider the threats to and needs of the species.

Effects to Valley Elderberry Longhorn Beetle

Removal or trimming of elderberry shrubs associated with recreational area development activities could result in injury or mortality of the beetle. Vehicles and equipment could also strike the beetle when traveling through the Action Area during the adult emergence and mating period (generally March through July). *Conservation Measure 7: Valley Elderberry Longhorn Beetle* aims to minimize the risk of injuring or killing valley elderberry longhorn beetles by including measures that will flag shrubs for avoidance and install high-visibility fencing. Although measures would be applied to minimize the risk of injuring or killing valley elderberry longhorn beetles during Project implementation, some potential remains for individuals or shrubs to be injured or killed, particularly if shrubs cannot be avoided.

Use of heavy equipment could disturb soils adjacent to shrubs and affect the roots and health of elderberry shrubs (Service 2017a), subsequently affecting the health and fitness of adult beetles and larvae within the shrub. Vehicles and heavy equipment used for the Project have the potential to increase airborne dust during construction activities, which can negatively affect local plants, including elderberries (Farmer 1993). Elderberry shrubs could be damaged or killed because of exposure to contaminants such as spilled fuels associated with construction activities. *Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources,* describes how the potential for fuel or oil spills into occupied or prey base aquatic habitat will be minimized, therefore reduce the likelihood of a spill occurring). Best management practices will be followed and implemented by Reclamation, the Authority, and their contractors.

Recreation area development activities that reduce the suitability of an area for elderberry shrubs or elderberry recruitment could affect mating, foraging, and dispersal of the beetle. Implementation of *Conservation Measure 7: Valley Elderberry Longhorn Beetle* will minimize or avoid impacts in temporary construction areas and requires the application of water to minimize dust. A Hazardous Materials Management Plan will be enforced by the Authority to prevent leaks and spills of hazardous materials, in accordance with the BA conservation measure, *Hazardous Materials Management*.

Recreational area development activities have the potential to introduce or spread invasive species. As described in *Conservation Measure 7: Valley Elderberry Longhorn Beetle*, Project-related construction personnel would decontaminate equipment, tools, and vehicles before entering the Action Area to minimize these impacts.

The Service anticipates no more than 5 elderberry shrubs to be detected within the footprint and be affected by recreational area development activities in riparian and non-riparian habitats (***Table 18***). The number of elderberry shrubs estimated to be detected and number/size of stems estimated to be present is based on the amount of modeled suitable habitat in conjunction with observations of elderberry shrub extent and abundance made during ongoing geotechnical investigations for Site Reservoir Project (BiOp Service File No. 08FBDT00-2019-F-0287-R002).

Ground-truthing efforts when the land becomes accessible will be provided to the Service from Reclamation and the Authority during Project implementation to verify the information presented in ***Table 18*** and this effects analysis.

Recreational area development activities that reduce the suitability of an area for elderberry shrubs or elderberry recruitment could affect mating, foraging, and dispersal of the beetle. Recreational area development activities will result in less available modeled habitat that supports elderberry shrubs with the temporary loss of up to 1.34 acres of modeled riparian habitat and 38.46 acres of modeled upland habitat, and the permanent loss of 4.20 acres of modeled riparian habitat and 609.22 acres of modeled upland habitat (***Table 16***). Reclamation and the Authority propose to mitigate this loss by conserving 12.59 acres of riparian habitat and 609.22 acres of upland habitat (***Table 17***). Mitigation will include a Service-approved management and monitoring plan that will consider the threats to and needs of the species.

Effects to Western Spadefoot

The use of vehicles and heavy equipment within seasonal wetlands could result in injury of western spadefoot during the rainy season if suitable aquatic habitat is occupied. Implementation of *Conservation Measure 9: Western Spadefoot* would minimize impacts to occupied habitat by requiring suitable habitat to be mapped, occupancy surveys be performed within suitable habitat, and temporary work areas and other activities with flexible locations be moved, if possible, to provide a 250-foot non-disturbance buffer around the occupied aquatic habitat.
If full avoidance is not feasible and if a portion of occupied western spadefoot habitat will be filled (i.e., permanent effects), the filling will be conducted when the habitat is completely dry. Additionally, this conservation measure would restrict initial ground-disturbing activities to periods of no or low rainfall. Injury or mortality would result primarily from recreational area development activities in permanent impact areas, such as permanent habitat loss and injury or mortality of aestivating individuals in upland habitat.

Implementation of relocation efforts during recreational area development activities would result in the capture and handling of western spadefoot individuals that would otherwise be subject to more severe adverse effects that may result in injury or mortality. Implementation of a Service-approved species relocation plan will minimize the adverse effects to western spadefoot resulting from physical capture, collection, handling, and relocation.

With the implementation of these conservation measures, the Service anticipates effects to individuals in the form of injury or mortality to be low and that effects will be minimized to the western spadefoot during its sensitive life history phases (e.g., breeding season). Operation of heavy equipment could result in localized increases in noise and vibration. Increased noise and vibration could temporarily impair essential behaviors, including breeding, foraging, and sheltering, if individuals utilize suboptimal habitats to avoid noisy areas. Other potentially adverse effects to the western spadefoot include changes in air quality, introduction of hazardous materials, introduction of invasive plants, changes in hydrology, disturbance to areas of refugia, and vehicle strikes. These effects will be minimized through the implementation of conservation measures and utilizing BMPs by the Authority. For example, Reclamation and the Authority have proposed a conservation measure that will minimize the potential for fuel or oil spills into

occupied or prey base aquatic habitat and therefore reduce the likelihood of a spill occurring (*Conservation Measure 2: General Measures to Avoid and Minimize Effects on Sensitive Biological Resources*).

Recreational area development activities will result in the temporary loss of up to 0.49 acres of modeled aquatic habitat and 35.74 acres of modeled upland habitat (***Table 16***). Additionally, recreational area development will result in the permanent loss of up to 1.95 acres of modeled aquatic habitat and up to 747.54 acres of modeled upland habitat (***Table 16***). Reclamation and the Authority propose to mitigate this loss by conserving 1.95 acres of aquatic habitat and protecting at least 1,200 feet of uplands around the protected and restored/created aquatic habitat (***Table 17***). Mitigation will include a Service-approved management and monitoring plan that will consider the threats to and needs of the species.

11.3 Framework Programmatic

11.3.1 Compensatory Mitigation

Deconstruction of the Action

Reclamation and the Authority have proposed to mitigate for Project impacts to federally listed species. ***Table 19*** summarizes the maximum permanent impacts, the proposed compensation, and potential location on the landscape where the protection and restoration are planned to occur. The table focuses on mitigation needs for permanent impacts (more than one year of impact), as temporarily impacted areas will be restored to pre-Project conditions. Reclamation and the Authority may opt to meet their compensatory mitigation commitments in various ways, including purchasing banking credits, proponent-responsible mitigation, and other types of contracted mitigation development and/or management practices. The timing in which the mitigation will be implemented will vary greatly across the mitigation types. For example, some mitigation may be acquired relatively quickly through purchasing conservation bank credits, whereas proponent-responsible mitigation projects may take years to acquire land, design, construct, and maintain the site until performance standards are met.

In most cases, to fulfil the majority of the compensatory mitigation for the Project, the Authority intends to contract with a firm specializing in mitigation development and management. The Authority, or its mitigation contractor, will prepare and implement a management plan for each federally listed species' habitat protection and restoration site. Surveys will be conducted to collect information necessary to assess the ecological condition and function of conserved species habitats and supporting ecosystem processes, and based on those results, will identify actions necessary to achieve the desired habitat condition at each site.

Management plans will be prepared by the Authority in collaboration with Reclamation, CDFW, NMFS, and the Service, consistent with their authority, and submitted to those agencies for approval within two years of the acquisition of each site. This schedule is designed to allow time for site inventories and identification of appropriate management techniques. During the interim period, management of the site will occur using best practices and based on successful management at the same site prior to acquisition or based on management at other similar sites.

The plans will be working documents that are updated and revised as needed to incorporate new acquisitions suitable for coverage under the same management plan and to document changes in management approach that have been agreed to by the Authority, Reclamation and the appropriate wildlife agency or agencies (CDFW, NMFS, and the Service), consistent with their authority. Information on what the management plan will include can be found within the BA.

Implementing the proposed compensatory mitigation may adversely affect the **giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot** and their modeled suitable habitat (***Appendix A. Sites Reservoir Project Effects Tracking Table***).

A framework programmatic approach was proposed to address the effects of the compensatory mitigation for the Project. The process for these types of consultations is described in the *Consultation and Permitting Approach* section of this BiOp. The site-specific effects to federally listed species from implementation will be addressed in separate, subsequent consultations. Additionally, the area in which these activities may occur are depicted in ***Figure 2*** and ***Figure 3*** of the *Action Area* section.

Table 19. Deconstruction of the compensatory mitigation for the Sites Reservoir Project. This table represents a summary of the maximum permanent impact, proposed compensation, and potential location of protection and restoration for federally listed species.

Resource	Total Maximum Permanent Impacts[a]	Future Refinement of Impact Acres	Mitigation Ratios	Total proposed Compensation if All Impacts Occur	Potential Location of Proposed Protection and Restoration (*Figure 3*)
Giant garter snake Presence assumed in suitable habitat					
Aquatic	1 acre	Field evaluation by qualified biologist to confirm locations of suitable aquatic habitat and suitable uplands 200 feet from aquatic habitat	3:1 protection and restoration/creation	Up to 3 acres protected and restored/created	Within the Service's North Central Valley WMA program area, within Colusa Basin, Butte Basin, Sutter Basin, or Yolo Basin recovery units, and within the Sites Reservoir watershed.
Upland	20 acres		3:1 protection and restoration/creation	Up to 60 acres protected and restored/created	
Northwestern pond turtle Presence assumed in suitable habitat.[b]					
Aquatic	Up to 622 total (91 acres of higher value, 531 acres of lower value)	Field evaluation by qualified biologist to confirm locations of suitable aquatic habitat and suitable uplands 650 feet from aquatic habitat.	1:1 protection and restoration/creation	Up to 622 acres protected and restored/created	Within the Service's North Central Valley WMA program area, including locations within the geotechnical explorations, construction, inundation, and recreation footprints, and within the Sites Reservoir watershed.
Upland	Up to 11,875 total (2,915 higher value, 8,960 lower value)		Suitable upland within 650 feet of the aquatic mitigation habitat	Depends on configuration of aquatic habitat	
Western spadefoot Presence assumed in suitable habitat.[b]					
Aquatic	Up to 525 acres	Field evaluation by qualified biologist to confirm locations of suitable aquatic habitat and suitable uplands 1,200 feet from aquatic habitat	1:1 protection and restoration/creation	Up to 525 acres protected and restored/created	Within the Service's North Central Valley WMA program area, including locations within the geotechnical explorations, construction, inundation, and recreation footprints, and within the Sites Reservoir watershed.
Upland	Up to 13,515 acres		Suitable uplands within 1,200 feet of aquatic mitigation habitat	Depends on configuration of aquatic habitat	

Valley elderberry longhorn beetle Presence based on field evaluation					
Riparian	Up to 63 acres and 112 elderberry shrubs	Field evaluation consistent with the Services' valley elderberry longhorn beetle guidelines (e.g., elderberry shrubs, exit holes)	3:1 protection and restoration/creation and plantings consistent with the Services' 2017 framework)	Up to 189 acres protected and restored/created	Within the Service's North Central Valley WMA program area, including locations within the geotechnical explorations, construction, inundation, and recreation footprints, and within the Sites Reservoir watershed Mitigation will be based on Service guidelines.
Upland	Up to 13,251 acres and 112 elderberry shrubs	Field evaluation consistent with the Services' valley elderberry longhorn beetle guidelines (e.g., elderberry shrubs, exit holes)	1:1 protection and restoration/creation and plantings consistent with the Services' 2017 framework)	Up to 13,251 acres protected and restored/created	Within the Service's North Central Valley WMA program area, including locations within the geotechnical explorations, construction, inundation, and recreation footprints, and within the Sites Reservoir watershed Mitigation will be based on Service guidelines.
Vernal pool branchiopods Presence assumed in suitable habitat unless protocol-level surveys result in negative results					
Direct	13 acres	Field evaluation by qualified biologist to confirm locations of vernal pools. Assumed species presence unless protocol-level surveys have negative results.	2:1 protection and 1:1 restoration/creation if occupied or assumed to be occupied. Vernal pools with negative (protocol-level) survey results will fall under Corps CWA mitigation as described in the BA in General Conservation Measure.	Up to 26 acres protected Up to 13 acres restored/created	Within the Northwestern Sacramento Valley, Sacramento Valley, Southeastern Sacramento Valley, or Solano-Colusa vernal pool regions within a conservation bank or location with equivalent conservation value of a conservation bank as confirmed by the Service.
Indirect	0 acres		N/A (would be 2:1 protection if there were indirect impacts identified during reinitiation)	0 acres	

Monarch butterfly Presence assumed in suitable habitat					
Habitat with milkweed present	Up to 15,276 acres	Qualified biologist will map in the field milkweed and nectar plant locations. [c]	1:1 planting of milkweed and suitable nectar plants	Up to 15,276 acres	No specific location: on lands serving as mitigation for other species where (1) high likelihood of planting success, and (2) will not diminish habitat value for other listed species.

[a.] This table addresses compensatory mitigation for permanent impacts only. Temporarily impacted areas (less than a year of impact) will be restored to pre-project conditions.

[b.] These two species are cryptic and as such mitigation is based on suitable habitat not on presence absence surveys.

[c.] Per species model, *Appendix 5A*, *Section 5A.10*, monarch butterflies utilize a wide variety of short-corolla wildflowers for nectaring.

Effects to Giant Garter Snake, Monarch Butterfly, Northwestern Pond Turtle, Valley Elderberry Longhorn Beetle, Vernal Pool Branchiopods, and Western Spadefoot

The implementation of proposed compensatory mitigation will offset adverse effects from the proposed Project and provide a net benefit to the ecosystem, specifically to the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot by establishing, protecting, restoring, creating, and/or conserving lands that meet the habitat requirements of these federally listed species. The Service anticipates the mitigation efforts to have direct and indirect positive effects at the population and individual levels over the long-term, supporting population abundance and resiliency. The mitigation outlined in ***Table 19*** will provide higher quality, quantity, and diversity of habitats to the species population with the opportunity to adapt when threats occur, such as climate change or nonnative invasions. The benefits from these efforts will vary depending on the specific mitigation site and are anticipated to improve conditions that support essential life history stages such as feeding, breeding, and rearing. These improvements will be implemented prior to Project impacts, offsetting species impacts and ultimately benefitting the species and contributing to their recovery.

The extent and degree of the benefits will depend on several factors, including the type and goals of the mitigation activity, the scale and complexity of the work, the timing of the activity, and how well it supports the life history needs of the species present at the mitigation site. However, despite the significant benefits, there is also the possibility that the mitigation actions may have adverse effects on these species, depending on the nature, scope, location, and timing of the activities associated with individual projects.

Construction activities associated with compensatory mitigation implementation, in particular, may result in harassment or behavioral disturbance to these species, such as the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot, especially if individuals are present in or near the area. These disruptions may elevate the risk of adverse effects as animals alter their normal behaviors in response to disturbances, leading to injury or mortality in low numbers.

Restoration and/or habitat creation activities associated with compensatory mitigation implementation, which may involve large equipment like excavators, backhoes, bulldozers, dump trucks, and water trucks, could also cause temporary disturbances to individuals and their habitat through noise, dust, and vibrations. It is expected that more mobile species, such as the snake, turtle, and adult forms of the butterfly and beetle, would move away from the disturbed areas to nearby habitats for refuge. However, less mobile species like the spadefoot, vernal pool branchiopods, and earlier life stages for all species, may be more susceptible to adverse effects during construction-related activities. Nonetheless, the application of BMPs is expected to reduce the likelihood of significant disturbance to these individuals.

Although the BMPs will be identified during the planning phase of each mitigation project to minimize harm and harassment, there is still a risk that adverse effects could occur, albeit they would be expected to be low effects for all species analyzed herein. The nature and severity of

these effects will be evaluated on a case-by-case basis in subsequent consultations under this framework, but the adoption of these practices will help to minimize and mitigate adverse impacts to these species, while maximizing the overall benefit of the mitigation efforts.

The beneficial outcomes of the proposed compensatory mitigation identified in ***Table 19*** is reasonably certain to occur, as they are supported by a developed phasing process, required agency approvals, secured funding commitments, and integration into the overall project schedule. The Sites Authority and Reclamation have committed to a mitigation sequencing process that ensures that mitigation measures will be implemented prior to impacts, as documented in the BA and BA Comment Tracker.

As part of this BiOp, no phase of project construction may begin without written approval from the Service, as approvals are contingent on the submittal of refined habitat and species assessments, a full accounting of anticipated impacts, and complete documentation of avoidance, minimization, and compensatory mitigation measures. It also includes site-specific mapping and funding assurances, as well as management and monitoring plans where mitigation is not within a Service-approved conservation bank. The Service will review these materials and confirm that all necessary mitigation is in place prior to construction proceeding in compliance with 10-percent stay-ahead provisions as prescribed in *Conservation Measure 2*. Additionally, Reclamation and the Authority must evaluate whether reinitiation of consultation is needed and complete that process, if applicable, before receiving authorization to continue.

To implement the majority of the proposed compensatory mitigation, the Authority intends to contract with a qualified mitigation development and land management contractors. These contractors, under the oversight of the Sites Authority, will prepare and implement species-specific Restoration and Protection Site Management Plans for each mitigation site, or set of sites with shared management objectives. These plans will be developed in coordination with the Service, CDFW, and Action Agencies, as appropriate, once the lands have been acquired. Interim site management will be informed by best available practices drawn from prior site management experience or from analogous sites, and ongoing collaboration with the agencies.

Each management plan will contain detailed habitat objectives, baseline ecological conditions assessments, vegetation and fire management strategies, monitoring protocols, adaptive management components, and conservation easement terms, where applicable. Plans will be considered living working documents, updated over time to reflect new acquisitions, improved ecological understanding, or refined management techniques.

Furthermore, the identification of potential mitigation sites has been informed by the known ranges and recovery plans if available, with an emphasis on areas of overlapping habitat value to maximize ecological benefit across the multiple listed species addressed in this BiOp. Together, the phased approach, regulatory coordination, financial assurances, detailed site management planning, and use of experienced mitigation contractors provide strong evidence that compensatory mitigation is not speculative. These measures are already integrated into the Project's implementation strategy and reflect a logical and necessary component to the Proposed Action.

11.3.2 Operations and Maintenance Plans

Deconstruction of the Action

The Sites Reservoir Project will be operated by the Authority. The Authority, a local government entity, will handle the Project's development and operations with a focus on regional water needs. The Project is designed to take advantage of flows from winter storms and changing precipitation patterns due to climate change, with the goal of supplementing water supplies during dry years. It will also provide an additional resource to address the environmental impacts of water development in the Sacramento River Basin. By securing off-stream water storage, the Project will enhance the state's water supply reliability. The planned reservoir will have a capacity of 1.5 million acre-feet, capturing water from high-flow periods in the Sacramento River and releasing it during drier times to meet agricultural, urban, and environmental needs. This Project aims to increase Northern California's water storage capacity, offering improved operational flexibility and flood protection.

The Authority is expected to develop several comprehensive Operations and Maintenance (O&M) Plans to ensure the long-term functionality and sustainability of the system. The Service anticipates that specific details may evolve as the Project gets implemented. The general plans envisioned for the Project may include the following: Reservoir Land Management Plan, Recreation Management Plan, Initial Reservoir Fill Plan, Dewatering Plan, and Water Storage and Release Operations Plan (described below). Additional planning documents may be developed to address the evolving needs and circumstances of the Project.

Reservoir Management Plan - The Reservoir Management Plan will guide the operation of the Sites Reservoir, focusing on efficient operations of water storage, releases, and quality management. The plan will outline key management actions such as regulating water storage and releases based on seasonal flow patterns, balancing water allocation for agricultural, urban, and environmental needs, and monitoring water quality. Regular testing and monitoring of the water quality in the reservoir will be incorporated into the plan, including temperature, turbidity, and contamination levels, to meet regulatory standards and ensure safe use for various needs.

Recreation Management Plan - The Recreation Management Plan will outline strategies for providing and managing recreational activities at the reservoir and its adjoining structural features, such as boating, fishing, trail use, and other activities. It will include guidelines for ensuring safety, protecting natural resources that remain within the Project footprint, and minimizing environmental impacts through the inclusion of conservation measures. The plan will address entrance and exit points to the various Project features, facility locations, and visitor services.

Initial Reservoir Fill Plan - The Initial Reservoir Fill Plan will outline the process for filling the reservoir following construction. It will include the management of incoming water into the reservoir, monitoring of reservoir levels, testing structural components, surveillance and monitoring features that can be used for inspections, potential for planning outages, equipment changes or improvements, and transmission line and safety inspections. Other activities under this plan may be developed as additional information is acquired.

Dewatering Plan - Dewatering may occur throughout various areas of the Project footprints, including the reservoirs, dams, and pipelines. Dewatering may occur for a variety of reasons such as inspection, failed equipment, equipment changes, or improvements. Dewatering is expected to occur during construction and over the life of the Projects operations and maintenance. The plan will outline appropriate measures to treat and dispose of construction site dewatering from excavations, pipeline testing discharges, and dewatering of dams that may be kept on-site and used within the reservoir. Water proposed to be discharged to surface water will be disclosed within the plan for review by the respective regulatory agencies.

Management plans will be prepared by the Authority in collaboration with Reclamation, CDFW, NMFS, and the Service, consistent with their authority, and submitted to those agencies for approval prior to implementation. More information on what the management plan will include can be found within the BA.

Implementing these O&M plans may adversely affect the **giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot** and their modeled suitable habitat (***Appendix A. Sites Reservoir Project Effects Tracking Table***). A framework programmatic approach was proposed to address the effects of the O&M Plans for the Project. The process for this type of consultation is described in the *Consultation and Permitting Approach* section of this BiOp. The site-specific effects to federally listed species from implementation will be addressed in separate consultations. Activities related to implementing the O&M plans may occur throughout the Action Area as depicted in ***Figure 2*** and ***Figure 3*** of the *Action Area* section.

Effects to Giant Garter Snake, Monarch Butterfly, Northwestern Pond Turtle, Valley Elderberry Longhorn Beetle, Western Spadefoot

The implementation of the Project's operations and maintenance activities could have a range of effects on the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot. These species could utilize habitats near the reservoir and recreation sites, and disturbances in these areas could affect their movement, foraging, breeding, and overall survival.

For the giant garter snake, recurring ground disturbance from mowing, grading, or trail maintenance near wetland edges may degrade aquatic and upland habitats essential for foraging and cover. Human foot traffic and recreational use near habitat corridors may also disrupt the snake's movement between wetland and upland areas, particularly during its active season. Additionally, unauthorized off-trail access or expansion of recreation zones into sensitive habitat areas could result in direct mortality or increased predation risk.

The monarch butterfly could be impacted by the clearing of vegetation for trail visibility, recreation maintenance, or fire hazard management that inadvertently remove milkweed or nectar plants in riparian and upland areas. The loss or alteration of floral resources near recreational areas may reduce available breeding and foraging habitat, particularly during migration periods.

Northwestern pond turtles, which utilize both aquatic and adjacent terrestrial areas for basking and nesting, may be disturbed by recreational use near the shoreline of the reservoir and recreation sites. Human activity such as boating, shoreline access, or maintenance of facilities near turtle nesting sites could result in trampling of nests, disruption during critical basking periods, or displacement from preferred areas. Maintenance-related activities, including debris removal or erosion control, could also alter nesting substrates or impede turtle movement.

For the valley elderberry longhorn beetle, routine maintenance of trails, roads, or recreation infrastructure in riparian corridors may lead to trimming, removal, or unintentional damage to elderberry shrubs, which are the beetle's host plant. Compaction of soil near elderberry root zones, especially by heavy equipment or sustained foot traffic, could further degrade habitat conditions. Avoidance and protection measures will be necessary to ensure elderberry shrubs are protected during any ground-disturbing or vegetation-clearing activities.

The western spadefoot, which breeds in temporary, shallow depressions, may be affected by grading, trail maintenance, or off-road vehicle use that disturbs vernal pool or seasonal wetland habitats. Maintenance work during or after rainfall events may fill in or alter natural depressions used for breeding, reducing habitat suitability and reproductive success. Increased human presence during the species' breeding season could also lead to inadvertent injury or mortality of individuals or egg masses.

Overall, recreational operations and maintenance may introduce disturbances that affect habitat quality and species viability if not properly managed. The Project will implement avoidance, minimization, and mitigation measures to reduce impacts on listed species and habitats within and adjacent to recreational areas. These measures may include seasonal work windows, protective buffers, signage, habitat restoration, and employee/contractor training. Implementation of the Guiding Principles will support the adoption of sustainable management practices designed to reduce adverse effects on listed species during the operation and maintenance of recreational sites.

To address species-specific needs, the Project will adopt an adaptive management approach, with monitoring protocols and site-specific evaluations integrated into the management plans described herein. Coordination between the Service, NMFS, and CDFW will ensure that operations are conducted in compliance with applicable regulations and conservation goals. The Guiding Principles established for the Project emphasize proactive stewardship of biological resources and aim to minimize long-term impacts to listed and sensitive species through responsible recreation and reservoir planning and implementation.

12. EFFECTS OF THE PROPOSED ACTION ON RECOVERY

12.1 Giant Garter Snake

The giant garter snake is endemic to the Central Valley of California, and in Glenn and Colusa counties, conservation efforts are focused within the Colusa Basin Recovery Unit, which spans portions of both counties. These efforts aim to protect and restore habitat, enhance connectivity

between populations, and mitigate threats to the species. Key to these recovery actions are conservation banks in the region, such as the Colusa Basin Mitigation Bank in Colusa County and the Ridge Cut Giant Garter Snake Conservation Bank in Yolo County. These conservation banks play a significant role by providing essential wetland and upland habitats, serving as refuges that support breeding and foraging activities vital to the snake's survival. In addition, these banks offer compensatory mitigation for habitat losses resulting from agricultural and developmental activities, ensuring that the giant garter snake's habitat is protected and restored. Without these efforts, the ongoing loss of habitat due to urbanization and agricultural expansion would pose severe risks to the species' survival and recovery.

While new development projects, such as the Project, present potential challenges to the recovery of the giant garter snake, the Project is designed to incorporate several conservation measures to mitigate adverse effects. The construction of infrastructure such as reservoirs, roads, and other landscape features could disrupt habitats and fragment existing populations. However, Reclamation and the Authority have committed to implementing compensatory mitigation strategies that offset these impacts. These strategies include the restoration and enhancement of habitat connectivity, protection of critical wetlands, and measures to prevent further isolation of snake populations. By integrating these mitigation efforts into the Project design, the Project will minimize its potential impact on the species.

Furthermore, the mitigation actions proposed as part of the Project will help meet the giant garter snake's recovery needs, particularly by securing lands in perpetuity that will be maintained and managed to support the snake. These lands will be obtained in advance of Project impacts as described in *Conservation Measure 2*, and will contribute to the overall goal of habitat protection and restoration in the region. In this context, the Project's mitigation measures will not only offset any adverse impacts but may also contribute to the long-term recovery of the species by ensuring the protection of vital habitats. The Service concludes that the proposed action will not diminish the recovery potential of the giant garter snake. Project activities would not preclude the Service's ability to implement recovery actions, and may, in fact, support recovery efforts.

12.2 Monarch Butterfly

The monarch butterfly is a species reliant on specific habitats for breeding, migration, and overwintering. In California, conservation efforts have focused on the preservation and restoration of these habitats, with an emphasis on enhancing milkweed populations (the primary host plant for monarch larvae) and nectar plants that are essential for adult feeding.
The monarch butterfly currently does not have a federally-approved recovery plan, though several important documents guide conservation efforts and outline the species' recovery goals. The Western *Monarch Butterfly Conservation Plan* (Western Association of Fish and Wildlife Agencies 2019), proposed rule to list the monarch butterfly as a threatened species, and the *Monarch Butterfly (Danaus plexippus) Species Status Assessment Report* (Service 2024d) provide key frameworks for monitoring the species and identifying critical actions needed for recovery. These documents emphasize goals such as stabilizing and increasing monarch populations, protecting and restoring key habitats (particularly milkweed and nectar plants), and addressing threats like habitat loss and climate change. While these are not formal recovery plans, they serve as essential guides for ongoing conservation efforts to support the monarch's

long-term survival. Achieving these conservation goals requires a concerted effort to restore and protect milkweed habitats, reduce fragmentation of populations, and ensure the availability of nectar sources along migration corridors.

While large-scale development projects like the Project may pose potential risks to monarch butterfly recovery by disrupting habitat continuity and fragmenting important migration corridors, the Project has incorporated several conservation measures to minimize and mitigate these effects. The construction features of the Project could disrupt breeding and foraging habitats for monarchs, particularly milkweed patches and nectar sources. However, Reclamation and the Authority have committed to implementing compensatory mitigation measures, including habitat protection and restoration/creation, to offset these potential impacts. These mitigation measures focus on protecting and restoring/creating monarch habitats, enhancing connectivity between breeding areas, and ensuring the availability of nectar-rich plants along migration routes.

Additionally, the Project will contribute to the overall conservation of the monarch butterfly by securing lands for habitat restoration in perpetuity. These lands will be managed specifically to support monarch populations, meeting conservation goals for the species. The implementation of these conservation measures will help reduce the fragmentation of monarch habitats, support breeding success, and provide critical resources during migration. With these mitigation strategies, the Sites Reservoir Project will minimize adverse impacts to the monarch butterfly and may, in fact, contribute positively to the species' recovery by enhancing habitat availability and connectivity. The Service concludes that the proposed action will not diminish the recovery potential of the monarch butterfly. Project activities would not preclude the Service's ability to implement recovery actions, and may, in fact, support recovery efforts.

12.3 Northwestern Pond Turtle

Within the Action Area, which spans the northern Central Valley of California, the northwestern pond turtle inhabits a variety of aquatic habitats including slow-moving streams, ponds, wetlands, and stock ponds, as well as adjacent upland habitats used for nesting and overwintering. Conservation and recovery efforts for the northwestern pond turtle in this region focus on maintaining hydrologically suitable aquatic habitats, preserving upland nesting areas, and reducing threats such as habitat fragmentation, invasive species (e.g., bullfrogs and non-native turtles), and road mortality.

Recovery priorities identified in recent conservation assessments include the protection and enhancement of habitat connectivity, especially between breeding and overwintering sites, as well as the preservation of natural hydrological regimes. While conservation banks specifically for the northwestern pond turtle are limited in the region, broader wetland and riparian habitat conservation initiatives—such as those occurring in the Colusa Basin and Sacramento Valley—provide indirect benefits to the species. These conservation lands serve as refugia and corridors for turtle movement and may support long-term population stability through managed grazing, invasive species control, and hydrological restoration efforts.

The Project, while providing long-term water storage and supply benefits, may result in habitat loss, altered hydrology, and temporary or permanent displacement of northwestern pond turtles during construction and operational phases. These potential impacts could hinder localized recovery efforts if not properly addressed. However, Reclamation and the Authority have developed a suite of mitigation measures to at avoid, minimize, and compensate for adverse effects to pond turtle habitat. These include seasonal timing restrictions on construction to avoid sensitive periods such as nesting and overwintering, habitat restoration in nearby suitable areas, and the protection and restoration/creation of aquatic and upland habitats that support all life stages of the turtle.

Moreover, the Project's proposed compensatory mitigation includes securing and managing lands in perpetuity that contain high-quality aquatic and upland habitat, improving connectivity between isolated populations, and conducting long-term monitoring to evaluate the effectiveness of mitigation efforts. These measures align with regional recovery goals for the northwestern pond turtle by addressing key threats such as habitat loss, hydrological disruption, and population isolation. The Service concludes that the proposed action will not diminish the recovery potential of the northwestern pond turtle. Project activities would not preclude the Service's ability to implement recovery actions, and may, in fact, support recovery efforts.

12.4 Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle is a federally listed threatened species endemic to California's Central Valley. It is highly specialized, with its life cycle dependent on mature elderberry shrubs, which provide both larval and adult habitat. In Colusa and Glenn counties, the species primarily occurs in riparian and upland riparian transition zones associated with the Sacramento River and its tributaries, where elderberry shrubs occur within remnant or restored riparian vegetation. Recovery efforts for this species emphasize the protection and enhancement of elderberry populations, the restoration of riparian corridors, and the prevention of habitat fragmentation and degradation.

The Service's recovery plan for the beetle identifies key recovery actions including the protection of existing elderberry shrubs and associated riparian vegetation, the planting and maintenance of new elderberry stands in suitable habitat, and the long-term protection and management of occupied and potential habitat areas. Numerous habitat mitigation and restoration projects along the Sacramento River corridor and its tributaries—such as within the Colusa Subbasin—provide benefits to the species through elderberry plantings and riparian habitat restoration.

The Project may affect the recovery of the valley elderberry longhorn beetle primarily through the potential removal or disturbance of elderberry shrubs during construction or infrastructure development, as well as through indirect effects such as altered hydrology or habitat fragmentation. However, Reclamation and the Authority have committed to implementing species-specific avoidance and minimization measures consistent with the Service's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*. These include pre-construction surveys to identify and avoid elderberry shrubs with stems greater than 1 inch in diameter at ground level, establishing protective buffers around occupied shrubs, and

transplanting shrubs as appropriate where avoidance is not feasible under Service-approved protocols.

In addition, the Project includes compensatory mitigation measures that will contribute to the beetle's recovery. These include the planting of elderberry seedlings with associated native understory species in suitable riparian settings, long-term management and protection of mitigation sites, and monitoring to ensure shrub survival and habitat quality. These mitigation sites will be protected in perpetuity and managed to maintain the habitat structure and connectivity required by the beetle, contributing to recovery goals by increasing the extent and quality of riparian elderberry habitat in the Action Area.

Given the scale of proposed mitigation and the commitment to compliance with species-specific conservation measures, the Project is not expected to hinder the recovery of the valley elderberry longhorn beetle. Instead, through the implementation of these protective and restorative actions, the Project may contribute positively to the species' long-term conservation by increasing habitat availability and connectivity in the northern Sacramento Valley. The Service concludes that the proposed action will not diminish the recovery potential of the valley elderberry longhorn beetle. Project activities would not preclude the Service's ability to implement recovery actions, and may, in fact, support recovery efforts.

12.5 Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp is endemic to vernal pool habitats in the Central Valley and surrounding foothills of California. In Glenn and Colusa counties, conservation efforts for this species are concentrated within the Northwestern Sacramento Valley Vernal Pool Region, a critical area identified in the Service's *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005). Recovery efforts focus on preserving large, contiguous complexes of vernal pools and their associated upland watersheds, promoting hydrological integrity, and minimizing fragmentation. Key to these recovery actions are conservation banks and preserves that protect intact vernal pool landscapes, such as the Stillwater Plains Mitigation Bank and various private conservation easements. These protected areas maintain the ecological conditions necessary for the shrimp's short, seasonal life cycle, which is highly sensitive to changes in hydrology, soil disturbance, and water quality.

The construction and operation of the Sites Reservoir Project may present challenges to the recovery of the vernal pool fairy shrimp due to potential impacts on vernal pool hydrology, habitat loss, and indirect effects from infrastructure development. However, the Project includes comprehensive mitigation measures to avoid, minimize, and compensate for these impacts. These measures include preserving and restoring vernal pool complexes within the species' recovery region, implementing hydrological protection measures, and securing off-site mitigation lands that support functioning vernal pool ecosystems. These compensatory actions are designed to ensure no net loss of vernal pool habitat function and to contribute meaningfully to long-term habitat conservation goals outlined in the Recovery Plan.

Moreover, lands protected and managed in perpetuity under the mitigation strategy for the Project will support the vernal pool fairy shrimp's recovery by maintaining vernal pool

ecosystems with appropriate soil and hydrological characteristics. These lands will be managed to sustain ecological processes critical to the shrimp's reproductive cycle and will support broader conservation goals for associated vernal pool species. In this way, the Project's proposed mitigation measures are expected not only to offset adverse impacts but also to contribute to regional recovery objectives. The Service concludes that the proposed action will not diminish the recovery potential of the vernal pool fairy shrimp. Project activities would not preclude the Service's ability to implement recovery actions, and may, in fact, support recovery efforts.

12.6 Vernal Pool Tadpole Shrimp

Similar to the vernal pool fairy shrimp, the vernal pool tadpole shrimp depends on intact vernal pool complexes with natural hydrology, appropriate soil conditions, and undisturbed upland watersheds to complete its life cycle. While both species share similar habitats, the tadpole shrimp has a longer developmental period, making it especially vulnerable to alterations in hydroperiod and pool longevity. As a result, conservation measures that protect and restore functioning vernal pool ecosystems are equally vital to the recovery of this species. The Service concludes that the proposed action will not diminish the recovery potential of the vernal pool tadpole shrimp. Project activities would not preclude the Service's ability to implement recovery actions, and may, in fact, support recovery efforts.

12.7 Western Spadefoot

The western spadefoot is adapted to the Mediterranean climate of California's grasslands, open woodlands, and vernal pool landscapes to meet its habitat needs. In Colusa and Glenn counties, the species relies on ephemeral aquatic habitats such as vernal pools, seasonal wetlands, and ephemeral stock ponds for breeding, and adjacent upland areas with loose, soft soils for burrowing and estivation during the dry season. Conservation efforts in the region aim to protect and manage the hydrologic and ecological integrity of vernal pool and ephemeral wetland complexes, preserve connectivity among breeding sites, and reduce threats such as habitat fragmentation, road mortality, and the loss of native grassland ecosystems.
Recovery priorities for the western spadefoot emphasize the maintenance of intact breeding habitats with appropriate hydrology and vegetation, protection of upland refugia from ground-disturbing activities, and long-term land stewardship. While there are currently no conservation banks specifically dedicated to western spadefoot in the Action Area, multiple vernal pool preservation and restoration efforts are underway or established in the Sacramento Valley and surrounding foothills that benefit the species indirectly. These efforts, including conservation easements and habitat restoration projects, help secure the wetland-upland mosaics that are critical for spadefoot reproduction and survival.

The Project presents potential challenges to western spadefoot recovery due to anticipated changes in land use, potential loss of ephemeral breeding sites, and disturbances to upland soils used for estivation. However, Reclamation and the Authority have incorporated a range of conservation measures to avoid or offset these potential effects. These include conducting pre-construction surveys to identify and avoid known breeding habitats, implementing exclusion and relocation protocols as appropriate where avoidance is not feasible, and restoring or creating seasonal wetland habitats that mimic the hydroperiods and conditions needed by the species.

In addition, the Project includes compensatory mitigation actions that involve protecting large contiguous areas of grassland and seasonal wetland habitat, maintaining appropriate soil conditions for burrowing, and enhancing landscape connectivity between breeding and upland refugia. These measures will be implemented on lands that will be protected and managed in perpetuity, supporting the long-term conservation of spadefoot populations in the region. Monitoring and adaptive management will ensure that these mitigation areas continue to function ecologically and contribute to species recovery.

Therefore, while the Project may result in some localized impacts to western spadefoot habitat, the proposed mitigation measures are expected to effectively offset these effects. By protecting and restoring/creating essential habitat functions for the species and supporting regional conservation goals, the Project may contribute to the long-term recovery of the western spadefoot in the northern Central Valley. The Service concludes that the proposed action will not diminish the recovery potential of the western spadefoot. Project activities would not preclude the Service's ability to implement recovery actions, and may, in fact, support recovery efforts.

13. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the Action Area considered in this BiOp. Future federal actions that are unrelated to the proposed Project are not considered in this section; they require separate consultation pursuant to Section 7 of the Act.

Major human interactions and uses of the landscape within the Action Area include agricultural use, urbanization, and recreational use.

13.1 Agriculture

Farming occurs throughout the Sacramento Valley. Conversion of existing suitable habitat to agriculture results in habitat destruction, degradation, and fragmentation. Habitat loss through agricultural conversion has been identified as a primary threat to giant garter snake (Service 2017b), monarch butterfly (Service 2024d), northwestern pond turtle (Service 2023b) vernal pool branchiopods (Service 2024c), and western spadefoot (Service 2023d). Agricultural practices are a major cause of the current loss of biodiversity. Agricultural practices can lead to habitat degradation and other impacts by introducing nitrogen, ammonium, and other nutrients into the watershed. Agricultural irrigation discharges often contain numerous pesticides and herbicides that may negatively affect native wildlife (Fritsch *et al.* 2025). These contaminants may adversely affect the reproductive success, survival rates, and food supply of each of the species.

The giant garter snake can occasionally benefit from agricultural rice cultivation, as flooded rice paddies can provide suitable alternative habitat for the species in the absence of natural perennial wetlands. Agricultural conversion of rice lands due to long-term fallowing or permanent conversion to another crop type also represents a significant threat to the giant garter snake (Service 2017b) by reducing the amount of suitable aquatic habitat available. Agricultural conversion does not require consultation with the Service.

13.2 Recreational Uses

Existing recreational use of covered species habitat within the Action Area may affect covered species. Vernal pool species are adversely affected by off-road vehicle use, hiking, and bicycling by impairing hydrological functions, burial of cysts so they have decreased viability, and facilitating the spread of invasive plants (Service 2005). Covered species may also be crushed and killed as a result of careless site users (Service 2023b).

13.3 Urbanization

Urbanization contributes to the loss and fragmentation of habitat throughout the Central Valley. Urbanization is predicted to increase substantially in the Central Valley through 2051 (Radeloff *et al.* 2012). Increases in urbanization and housing development can impact habitat by altering watershed characteristics, and changing both water use and stormwater runoff patterns. Increased growth will place additional burdens on resource allocations, including natural gas, electricity, and water, as well as on infrastructure such as wastewater sanitation plants, roads and highways, and public utilities. Although the Service will consult on a number of these actions, including via HCPs, some of these actions will not require consultation with the Service.

13.4 Summary of Cumulative Effects to Giant Garter Snake, Monarch Butterfly, Northwestern Pond Turtle, Valley Elderberry Longhorn Beetle, Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp, and Western Spadefoot

Cumulative effects from future non-federal actions within the Action Area, including ongoing agricultural conversion, increased recreational use, and accelerating urbanization, are expected to negatively affect the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot by contributing to continued habitat loss, degradation, and fragmentation. These impacts are likely to intensify over time as land-use changes and human population growth place additional pressure on natural ecosystems.

Agricultural practices, while providing some temporary benefits to certain species (e.g., flooded rice fields for the giant garter snake), continue to be a major driver of biodiversity loss through habitat conversion, pesticide and herbicide use, and nutrient runoff. These pollutants can alter water quality and affect sensitive aquatic and semi-aquatic species, including vernal pool crustaceans, amphibians, reptiles, and invertebrates by adversely affecting the reproductive success, survival rates, and food supply of each of the species.

Urbanization poses a widespread threat by reducing the extent and connectivity of natural habitats, modifying hydrologic regimes, and increasing impervious surfaces and stormwater runoff. These changes impair watershed function and reduce the quality and availability of breeding, foraging, and sheltering habitat across species groups. As urban development expands, remaining habitat patches become increasingly isolated, leading to population fragmentation and heightened vulnerability to local extirpation.

Recreational activities, including off-road vehicle use, hiking, and bicycling, can directly disturb or destroy sensitive habitats, especially vernal pools and riparian corridors, and may result in the mortality of plants and animals through trampling or inadvertent destruction.

Together, these cumulative effects are expected to reduce the viability, connectivity, and long-term persistence of covered species populations within the Action Area. The Service is not aware of any information that can be used to quantitatively predict what the cumulative effect of such changes would be. Qualitatively, species dependent on ephemeral wetlands (e.g., vernal pool branchiopods and western spadefoot), riparian corridors (e.g., valley elderberry longhorn beetle), aquatic habitats (e.g., northwestern pond turtle and giant garter snake), and pollinator habitat (e.g., monarch butterfly) are especially vulnerable. Without coordinated conservation measures, these cumulative effects may limit recovery potential and increase the likelihood of further declines for the giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot.

14. EFFECTS OF THE AGGREGATE STATUS OF THE SPECIES, ENVIRONMENTAL BASELINE, AND PROPOSED ACTION FOR SPECIES

This section summarizes the aggregate status, baseline, and effects of the Proposed Action. As previously noted, there are aspects of the Proposed Action that have been analyzed and will be ground truthed or developed between now and when the Project goes online operationally (for example, future Service-approved O&M plans). Reclamation and the Authority have committed to a transparent, collaborative process with the Service to implement these future actions consistent with the Guiding Principles, as stated in the Compensatory Mitigation for Permanent Impacts section of the *Description of the Proposed Action*. Those actions identified under the Framework Programmatic approach will be subject to subsequent consultation.

To further inform whether the Project is reasonably expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, and distribution of that species, this section includes summary tables that quantify the anticipated impacts of the Project on modeled habitat for the species based on the Project components addressed under the standard consultation approach in this BiOp (***Table 20***). ***Table 21*** presents the extent of temporary and permanent habitat loss, as well as the associated mitigation amounts proposed for each species. The overall expanse of the footprints (i.e., geotechnical explorations, construction, recreation, and inundation) covers roughly 22,829 acres. The summary tables help to clearly illustrate the scale and nature of impacts from individual and collective Project components, supporting the Service's conclusion of whether the Project is likely to result in jeopardy to the species' continued existence.

Table 20. Summary table of the anticipated impacts on giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot modeled habitat from each Project component addressed as a standard consultation approach in the BiOp.

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle				Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods		Western Spadefoot	
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat, High Value (acres)	Modeled Upland Habitat, High Value (acres)	Modeled Aquatic Habitat, Low Value (acres)	Modeled Upland Habitat, Low Value (acres)	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct Aquatic Habitat (acres)	Indirect Aquatic Habitat (acres)	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)
Geotechnical Explorations													
Temporary Habitat Loss	46.03	38.93	4,237.34	138.09	997.52	198.53	2,120.99	22.59	3,094.19	0	33.22	197.01	3,485.06
Permanent Habitat Loss	0	0.00014	54.11	0	20.44	0.31	17.20	0	31.34	0	0	0.31	53.64
Surveys and Relocation: Modeled Habitat (up to) for Conducting Occupancy Surveys													
Potentially occupied habitat disturbed	1.00	20.00	16,887.00	91.00	2,915.00	531.00	8,960.00	0	13,251.00	13.43	0	525.00	13,515.00
Construction													
Temporary Habitat Loss	6.06	11.27	1,570.49	248.34	508.27	91.64	510.04	11.05	1,097.73	0	0.05	89.65	1,083.28
Permanent Habitat Loss	0.83	19.25	2,997.27	33.22	691.07	142.36	1,592.92	8.48	2,229.23	11.41	1.34	141.46	2,564.76
Recreation													
Temporary Habitat Loss	0	0	40.32	0	2.00	0.49	27.78	1.34	38.46	0	0	0.49	35.74
Permanent Habitat Loss	0	0	784.70	0.27	55.01	2.04	469.42	4.20	609.22	0	0	1.95	747.54
Inundation													
Temporary Habitat Loss	0	0	0	0	0	0	0	0	0	0	0	0	0
Permanent Habitat Loss	0	0	12,995.92	76.58	2,430.15	482.46	7,722.95	54.17	11,565.52	0	0	476.88	11,474.05

Table 21. Total anticipated permanent habitat loss of giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool branchiopods, and western spadefoot modeled habitat from all Project components addressed at the standard level under this BiOp, and total mitigation [a, b]

	Giant Garter Snake		Monarch Butterfly	Northwestern Pond Turtle				Valley Elderberry Longhorn Beetle		Vernal Pool Branchiopods		Western Spadefoot	
	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)	Modeled Habitat (acres)	Modeled Aquatic Habitat, High Value (acres)	Modeled Upland Habitat, High Value (acres)	Modeled Aquatic Habitat, Low Value (acres)	Modeled Upland Habitat, Low Value (acres)	Modeled Riparian Habitat (acres)	Modeled Upland Habitat (acres)	Direct Aquatic Habitat (acres)	Indirect Aquatic Habitat (acres)	Modeled Aquatic Habitat (acres)	Modeled Upland Habitat (acres)
TOTAL IMPACTS													
Permanent Habitat Loss	1	20	15,276	91.00	2,915	531	8,960	63	13,251	13	0	525	13,515
MITIGATION													
Total Mitigation Acres	3	60	15,276	91.00	Depends on config-uration of aquatic habitat	531	Depends on config-uration of aquatic habitat	189	13,251	26 protected 13 restored/ created	0	525	Depends on config-uration of aquatic habitat

[a.] The geotechnical exploration, construction, inundation, and recreation area footprint total encompasses approximately 22,829 acres.
[b.] Impacts from Project components addressed as framework programmatic are not included because incidental take exemptions will occur with future consultations, as appropriate.

14.1 Giant Garter Snake

14.1.1 Summary of Status of Giant Garter Snake

The giant garter snake was listed as a threatened species under the Act on October 20, 1993. The most recent comprehensive Recovery Plan, finalized in 2017, outlines the species' life history, habitat preferences, and ongoing threats, with habitat loss being the primary concern. Despite some conservation efforts, the giant garter snake continues to face significant threats from habitat destruction, particularly due to agricultural development and urbanization. The 2020 5-Year Review did not recommend any changes to the species' listing status. Although no critical habitat has been designated for the species, there are several conservation efforts in place across its range. These efforts aim to protect and restore wetland and aquatic habitats essential for the snake's survival. The Recovery Plan highlights four populations of giant garter snake located within the Action Area, with habitat restoration and protection efforts ongoing, especially in areas like the Colusa Basin, Yolo Bypass, Butte Basin, and Sutter Basin.

14.1.2 Summary of Environmental Baseline and Existing Conditions

The giant garter snake has established populations in multiple locations within the Action Area, notably the Colusa Basin, Yolo Bypass, Butte Basin, and Sutter Basin. Each of these areas includes both protected and unprotected habitats critical to the snake's survival. For instance, the Colusa Basin Population consists largely of agricultural lands, primarily rice fields, interspersed with protected areas like the Sacramento National Wildlife Refuge, where the species is monitored regularly. While the Colusa National Wildlife Refuge represents a stable, healthy sub-population, areas outside these protected lands are still vulnerable to habitat degradation from development and agricultural practices. In the Yolo Bypass, the snake thrives in the flooded floodplains that provide ample aquatic habitat, though its presence remains mostly in protected wetland areas like the Yolo Bypass Wildlife Area. Similarly, populations in the Butte Basin and Sutter Basin are also closely linked to rice fields and managed wetlands, providing important seasonal and permanent aquatic habitats. To assist in recovery, several conservation banks and preserves have been established within these units, including the Colusa Basin Mitigation Bank, Ridge Cut Giant Garter Snake Conservation Bank, and Sutter Basin Conservation Bank, among others. These areas restore and protect important habitats for the giant garter snake. Despite the ongoing restoration efforts, habitat fragmentation remains a major challenge, particularly as large-scale infrastructure projects, such as flood protection and levee improvement initiatives, sometimes interfere with suitable giant garter snake habitat. Conservation efforts continue to work toward habitat restoration and connectivity, which are key to the species' long-term viability.

14.1.3 Summary of Effects of the Proposed Action on the Reproduction, Numbers, and Distribution of the Giant Garter Snake

Reproduction

Project activities are expected to cause both temporary and permanent disturbances to aquatic and upland habitats used by the giant garter snake. When Project activities occur during the breeding season for the species, these local changes will temporarily result in decreased breeding

success by individuals that are exposed to the changes if they alter their breeding behavior in response to project activities. However, the Service does not anticipate that this Project, as proposed, will meaningfully affect the reproductive capacity of the giant garter snake range-wide, because effects are low, primarily temporary, and of a short duration (i.e., most Project activities will not occur in a local area for longer than one breeding season). The decreased breeding success of the limited number of giant garter snakes exposed to Project activities would be undetectable at the scale of the species given the natural variation in the species' numbers and its life history as described in the *Status of the Species*. The Service expects that the Proposed Action would not measurably reduce the giant garter snake's reproductive capacity locally or range wide.

Numbers

Some injury or mortality of giant garter snakes could occur if individuals are present and undetected within work areas during construction, particularly during grading, excavation, or vegetation clearing. The Service expects such injury and mortality to be low due to the nature of the Project activities and the implementation of avoidance and minimization measures, such as biological monitoring and relocation plans. If any individuals are encountered, the number affected is anticipated to be small and within the natural demographic variability of nearby populations. The Service does not expect the Proposed Action to cause a measurable decline in the giant garter snake's population, either locally, or across its range.

Distribution

Project activities are expected to result in temporary and permanent loss of modeled suitable aquatic and upland habitat for giant garter snake across multiple areas within the species' known range in Glenn and Colusa counties (***Table 21***). This includes habitat within the Sites Reservoir, TRR, Dunnigan Pipeline, and associated access routes, particularly in areas adjacent to irrigation canals, wetlands, and other aquatic features used by the species. Ground-disturbing activities, including excavation and vegetation removal, as well as vehicle and equipment use, will reduce the availability and quality of suitable habitat across these locations and will lead to local shifts or contraction in distribution within the Action Area.

While the Project will implement conservation measures to minimize adverse effects and restore habitat conditions post-disturbance, the disruption and fragmentation of habitat—particularly during sensitive activity periods such as overwintering or dispersal—could alter snake movement patterns and habitat use at localized scales. The temporary nature of most habitat loss and the implementation of habitat restoration and mitigation measures are expected to minimize long-term reductions in habitat distribution; however, the potential for short-term displacement or avoidance of areas during active construction and exploration remains.

Modeled habitat in the Project footprints represent a portion of the species' occupied range in the Sacramento Valley. The loss or degradation of these areas, particularly if snakes are present but undetected, will reduce the functional distribution of the species within Glenn and Colusa counties until habitat conditions are restored or suitable habitat is re-established elsewhere. Due to the small amount of habitat impacts and Reclamation and the Authority's commitment to

compensate for those impacts, the Service does not anticipate that the Proposed Action will reduce the range wide distribution of the giant garter snake.

14.1.4 Summary of the Effects of the Proposed Action on the Recovery of Giant Garter Snake

The giant garter snake, found only in California's Central Valley, faces threats from habitat loss due to urbanization and agricultural practices. Conservation efforts for the snake in the Action Area have focused on preserving and restoring wetlands and uplands vital to the snake's survival. The Project poses potential risk to the species, but includes compensatory mitigation such as habitat restoration/creation, protection, and connectivity enhancements, to offset adverse effects. These measures are expected to support the snake's recovery, and the Project is not anticipated to hinder, and will even aid, long-term conservation goals. The Proposed Action would not increase the regional threats currently affecting the giant garter snake, nor preclude the Service's ability to implement recovery actions.

14.2 Monarch Butterfly

14.2.1 Summary of Status of Monarch Butterfly

The monarch butterfly was proposed for listing as a threatened species in December 2024, though a final determination is still pending. The butterfly is known for its long-distance migration and overwintering in coastal California and Mexico. The species primarily uses milkweed as a host plant for larvae and a variety of wildflowers for nectaring. The western population of monarchs has seen a dramatic decline, with numbers dropping from approximately 1.2 million in 1997 to fewer than 30,000 by 2019. The primary threats to the monarch butterfly include habitat loss, particularly due to the conversion of grasslands for agriculture, herbicide use, logging at overwintering sites, and the impacts of climate change.

14.2.2 Summary of Environmental Baseline and Existing Conditions

The Action Area provides potential spring and summer breeding habitats for the monarch butterfly, with native species of milkweed present across several locations, including the GCID Main Canal and Funks Reservoir. However, comprehensive surveys for the species have not been conducted in the impacted footprint areas. While the Action Area contains suitable breeding habitat, it is approximately 75 miles from the Pacific Ocean and is subject to frosts, making it unsuitable for overwintering sites. Conservation efforts aimed at mitigating milkweed and nectar resource loss are ongoing, but current efforts are insufficient to fully address the threats facing the species. The regulatory mechanisms in place are also not enough to protect the monarch butterfly from ongoing habitat degradation and other significant threats.

14.2.3 Summary of Effects of the Proposed Action on the Reproduction, Numbers, and Distribution of the Monarch Butterfly

Reproduction

Project activities will temporarily alter local conditions in areas where monarch butterflies breed, including through the removal or disturbance of milkweed plants used for egg-laying and larval development. If Project activities occur during the monarch breeding season, these changes will reduce breeding success in affected areas by decreasing the availability of host plants or disturbing adults engaged in mating or oviposition. However, the Service does not anticipate that the Project, as proposed, will meaningfully affect the reproductive capacity of the monarch butterfly at the regional or population level, as impacts are expected to be limited in scope, largely temporary, and occur in a staggered manner across the Project footprints.

Given the monarch's wide migratory range, large population fluctuations due to other environmental drivers, and the anticipated effectiveness of conservation measures (e.g., habitat buffers, milkweed transplanting, speed limits, and pre-construction surveys), any temporary reductions in breeding success within the Action Area are expected to be minimal. The Service expects that the Proposed Action would not measurably reduce the monarch butterfly's reproductive capacity locally or range wide.

Numbers

Some injury or mortality of monarch butterflies could occur during Project activities, particularly from vehicle strikes, equipment operation, vegetation clearing, or incidental harm to immobile life stages such as eggs or larvae. However, the Service expects this mortality to be low due to the mobile nature of adult butterflies and the conservation measures. Reclamation and the Authority will implement to avoid, minimize, and mitigate these effects, including habitat buffers, speed restrictions, pre-construction surveys, and compensatory mitigation.

While some individuals will be lost, this level of mortality is anticipated to fall within the natural variability of the species' population, particularly considering the monarch's high reproductive output and broad migratory range. The Service does not expect the Proposed Action to cause a measurable decline in the monarch butterfly's population either locally or across its range.

Distribution

Project activities are expected to result in both temporary and permanent loss of modeled monarch butterfly habitat across the Action Area, leading to localized reductions in habitat suitability and potential shifts in species distribution. Temporary and permanent impacts are anticipated to occur from vegetation clearing, soil disturbance, and other construction-related activities. These activities will result in direct mortality or harassment of monarchs, particularly during sensitive life stages such as eggs, larvae, or roosting adults, and will reduce the availability of milkweed and nectar sources critical to reproduction and foraging.
Although conservation measures including pre-construction surveys, establishment of avoidance buffers, milkweed transplanting (as feasible), and vehicle speed reductions are expected to

reduce the overall magnitude of impacts, the fragmentation and degradation of habitat will lead to temporary or long-term avoidance of affected areas. This could result in a contraction or redistribution of monarch activity within the Action Area, especially in locations where disturbance overlaps with areas of higher milkweed density or established use.
The wide geographic footprint of Project activities, combined with the loss of host and nectar plants, increases the likelihood that monarchs will shift to surrounding less-disturbed areas if available. The degree to which distribution is altered will depend on the timing of Project activities, the effectiveness of mitigation, and the availability of alternative habitat within the species' migratory corridor in the Sacramento Valley. Reclamation and the Authority will offset temporary and permanent impacts to habitat through the Project's proposed compensatory mitigation. Due to this commitment and the expansiveness of the species' range, the Service does not anticipate that the Proposed Action will reduce the range-wide distribution of monarch butterflies.

14.2.4 Summary of the Effects of the Proposed Action on the Recovery of Monarch Butterfly

The Service does not anticipate that the Project will diminish the recovery potential of monarch butterfly. Project activities will pose risks by disrupting monarch habitats, but will also mitigate those adverse effects through conservation measures that include habitat restoration, protection, and connectivity improvements. These actions are expected to minimize harm and will contribute to the butterfly's recovery by supporting essential breeding and migration habitats. The Proposed Action would not increase the regional threats currently affecting the monarch butterfly, nor preclude the Service's ability to implement recovery actions.

14.3 Northwestern Pond Turtle

14.3.1 Summary of Status of Northwestern Pond Turtle

The northwestern pond turtle was proposed for listing as a threatened species in October 2023, though a final determination is still pending. This species, found primarily in northern and central California, Oregon, Washington, and parts of Nevada, faces significant threats from habitat loss and fragmentation, water management practices, predation, competition from nonnative species, disease, and climate change. Suitable aquatic habitats for the turtle include slow-moving streams, ponds, and wetlands, while nesting sites can be located up to 1,640 feet from water. Recent genetic studies have separated the western pond turtle into two distinct species, with the northwestern pond turtle's range extending from the San Joaquin Valley northward.

14.3.2 Summary of Environmental Baseline and Existing Conditions

The Action Area overlaps with regions containing suitable northwestern pond turtle habitats, such as ditches, canals, ponds, and wetlands, particularly in the Bay Delta and Nevada Analysis Units identified in the 2023 Species Status Assessment (Service 2023b). While no direct occurrences of the species have been recorded within the proposed Project's footprints, nearby detections have been made, including occurrences 2.8 miles east and 4 miles northeast of the

area in 2017 and 2016, respectively. Habitat loss in the area is driven by agricultural development, water diversion, urbanization, and altered hydrology, such as from the Central Valley Project and State Water Project. These activities contribute to the turtle's habitat fragmentation and population decline. Conservation measures in California, including research, population monitoring, and conservation coordination, aim to mitigate these impacts and support the species' survival.

14.3.3 Summary of Effects of the Proposed Action on the Reproduction, Numbers, and Distribution of the Northwestern Pond Turtle

Reproduction

Project activities are expected to cause both temporary and permanent disturbances to aquatic and upland habitats used by the northwestern pond turtle, particularly during critical reproductive periods. These impacts may occur if construction overlaps with the nesting season (typically late spring to early summer) or hatchling emergence (late summer to early fall). Disturbances such as vegetation clearing or increased human activity could disrupt nesting behavior or cause nearby nests to be abandoned. However, due to the limited scope of the Project and the relatively few confirmed turtle occurrences within the direct impact area, these activities are not expected to result in a measurable decrease in reproductive success at either the population or range-wide level. Additionally, conservation measures, including pre-construction surveys and the avoidance of potential nesting areas during sensitive periods, are expected to further reduce potential impacts. The Service expects that the Proposed Action would not measurably reduce the northwestern pond turtle's reproductive capacity locally or range wide.

Numbers

Some mortality or injury of northwestern pond turtles could occur if individuals are present and undetected within work areas during construction, particularly during grading, excavation, or vegetation clearing. However, such risks are expected to be low due to the species' absence from the immediate Project footprint and the implementation of avoidance and minimization measures, such as biological monitoring and relocation plans. If any individuals are encountered, the number affected is anticipated to be small and within the natural demographic variability of nearby populations. The Service does not expect the Proposed Action to cause a measurable decline in the northwestern pond turtle's population either locally or across its range.

Distribution

The Project will result in the temporary and permanent alteration of small areas of potentially suitable habitat within the Action Area. These impacts will include degradation of aquatic features such as ditches and canals, or loss of adjacent upland habitat used for nesting or overwintering. While such changes could lead to localized shifts in turtle distribution—particularly through displacement or habitat avoidance during construction—the affected habitats represent a small fraction of the total available habitat within the Bay Delta and Nevada Analysis Units. Conservation measures, including habitat restoration and post-project monitoring, are expected to support habitat recovery and minimize long-term fragmentation. The Service does

not anticipate that the Proposed Action will reduce the range wide distribution of the northwestern pond turtle.

14.3.4 Summary of the Effects of the Proposed Action on the Recovery of Northwestern Pond Turtle

The northwestern pond turtle inhabits aquatic and adjacent upland habitats in Colusa and Glenn counties, relying on connected, hydrologically suitable environments for breeding, nesting, and overwintering. The proposed Project will result in temporary and permanent impacts to these habitats through ground-disturbing activities and changes in water management, but such effects are expected to be limited in scope and duration. Mitigation measures, including habitat restoration, biological monitoring, and construction timing restrictions, are expected to reduce adverse effects and maintain functional habitat connectivity. With implementation of conservation measures, the Project is unlikely to hinder the northwestern pond turtle's recovery and will support long-term conservation goals by improving habitat management within the region. The Proposed Action would not increase the regional threats currently affecting the northwestern pond turtle, nor preclude the Service's ability to implement recovery actions.

14.4 Valley Elderberry Longhorn Beetle

14.4.1 Summary of Status of Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle was listed as a threatened species under the Act in 1980. The species is strongly associated with its host plant, the elderberry, found in riparian habitats in California's Central Valley. While the valley elderberry longhorn beetle was once considered for delisting, a 2014 decision to withdraw that proposal highlighted the continued challenges the species faces, including habitat fragmentation and loss. The most recent comprehensive review in 2023, along with the 2019 Revised Recovery Plan, reiterates the ongoing conservation concerns, such as the low local population numbers, fragmented habitats, and limited dispersal ability. The species is considered rare, with a highly localized distribution, and an estimated 90 percent loss of its riparian habitat in the Central Valley. Although the valley elderberry longhorn beetle continues to face threats from habitat destruction, it remains a key species for riparian ecosystem health, and its recovery is contingent upon protecting and restoring elderberry habitat.

14.4.2 Summary of Environmental Baseline and Existing Conditions

The environmental baseline for the valley elderberry longhorn beetle within the Action Area is based on limited, older survey data. A survey conducted in 1998-1999 identified elderberry shrubs and valley elderberry longhorn beetle exit holes in portions of the Action Area, but these areas were not found within the current proposed geotechnical exploration, construction, inundation, and recreation footprints. However, elderberry shrubs and valley elderberry longhorn beetle occurrences have been recorded along the Sacramento River and within the Action Area. While no new, comprehensive surveys for valley elderberry longhorn beetle have been conducted recently, it is presumed that suitable habitat for the species exists in areas such as the GCID Main Canal diversion, Funks Reservoir, and surrounding infrastructure. The lack of up-to-date surveys means the exact population size and the distribution of the valley elderberry

longhorn beetle within the Action Area remain unknown. Future surveys are essential for determining habitat suitability and presence. The species' known occurrences along riparian corridors, particularly those along the Sacramento River, will help guide mitigation measures and provide context for understanding potential impacts from the Project.

14.4.3 Summary of Effects of the Proposed Action on the Reproduction, Numbers, and Distribution of the Valley Elderberry Longhorn Beetle

Reproduction

Project activities that involve ground disturbance, vegetation removal, or alterations to riparian zones may negatively affect the valley elderberry longhorn beetle's reproductive success if elderberry shrubs containing larvae or eggs are disturbed or removed. The beetle lays eggs on elderberry shrubs, and larvae remain within stems for one to two years before emerging. If occupied shrubs are impacted during this period, it could interrupt the species' life cycle. However, pre-construction surveys, implementation of avoidance buffers, and compliance with the Service's *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (2017a) are expected to minimize these risks. Mitigation measures such as transplanting shrubs and establishing new elderberry plantings in restoration sites will help compensate for the loss of any reproductive individuals or habitat. The Service expects that the Proposed Action would not measurably reduce the valley elderberry longhorn beetle's reproductive capacity locally or range wide.

Numbers

The number of individual beetles directly affected by the Project is expected to be low, particularly given the absence of confirmed recent occurrences within the construction footprint and the application of standard protective measures. If beetles are present in elderberry shrubs that are inadvertently removed or disturbed, mortality could occur. However, implementation of avoidance and minimization strategies, including fencing, timing restrictions, and habitat compensation, is expected to significantly reduce the likelihood and severity of such effects. Additionally, the mitigation planting of elderberry shrubs will help support the long-term stability of local populations. The Service does not expect the Proposed Action to cause a measurable decline in the valley elderberry longhorn beetle's population either locally or across its range.

Distribution

Project-related habitat impacts are expected to be limited in geographic scope and primarily concentrated near known infrastructure sites such as canals, reservoirs, and access roads. These areas may include or be adjacent to suitable elderberry habitat, though updated surveys are needed to confirm occupancy. Removal or disturbance of elderberry shrubs in these areas may result in localized shifts in beetle distribution, particularly if shrubs are permanently lost or degraded. However, the proposed compensatory plantings and habitat restoration within the Action Area are expected to offset these effects over time and contribute to broader habitat connectivity. Because the species already has a fragmented distribution, habitat mitigation and

protection measures will be key in maintaining or enhancing its range. The Service does not anticipate that the Proposed Action will reduce the range wide distribution of the valley elderberry longhorn beetle.

14.4.4 Summary of the Effects of the Proposed Action on the Recovery of Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle depends entirely on mature elderberry shrubs found in riparian and upland transition zones. Conservation for this species focuses on protecting elderberry habitat, restoring riparian corridors, and preventing fragmentation. While the Project will disturb, remove, or destroy elderberry shrubs and their habitat, it also includes specific mitigation measures such as pre-construction surveys, protective buffers, shrub transplants, and compensatory plantings. These actions are designed to avoid, minimize, and mitigate Project impacts and are aligned with the recovery plan. As a result, the Project is not expected to hinder and will help advance the beetle's long-term recovery and habitat expansion. The Proposed Action would not increase the regional threats currently affecting the valley elderberry longhorn beetle, nor preclude the Service's ability to implement recovery actions.

14.5 Vernal Pool Fairy Shrimp

14.5.1 Summary of Status of Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp is a federally listed endangered species that inhabits ephemeral vernal pools throughout the Central Valley of California and parts of southern Oregon. The species is highly adapted to the seasonal nature of vernal pools, where it completes its lifecycle within a short timeframe, depending on specific hydrological conditions. The most recent status assessment, found in the Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) 5-Year Review: Summary and Evaluation (Service 2024c), confirms the ongoing threats of habitat destruction, fragmentation, and degradation. Historical estimates suggest that nearly 90 percent of vernal pool habitats have been lost to agricultural and urban development. While conservation efforts such as habitat restoration, the creation of conservation banks, and establishment of protected areas have helped to slow declines, the fairy shrimp continues to face threats from climate change, invasive species, and hydrological changes in their environment. The vernal pool fairy shrimp remains a species of significant concern for conservation due to these persistent threats.

14.5.2 Summary of Environmental Baseline and Existing Conditions

In the Action Area for the Project, vernal pool fairy shrimp habitat is presumed to exist in the Solano-Colusa Vernal Pool Region. This region has been significantly impacted by agricultural expansion and urban development, reducing the availability of suitable vernal pool habitats. While no recent surveys for vernal pool fairy shrimp have been conducted in the Project's geotechnical exploration, construction, inundation, or recreation footprints, known occurrences of the species exist within several miles of the Action Area, particularly around the Sacramento National Wildlife Refuge Complex. The majority of the habitat in the Action Area has been disturbed by activities such as grazing, erosion, and debris accumulation. Conservation efforts, including areas protected under the Solano Land Trust and other conservation entities, provide

valuable mitigation opportunities. However, habitat quality remains limited, and further surveys will be needed to confirm the suitability of the land for supporting this species in the context of the Project.

14.5.3 Summary of Effects of the Proposed Action on the Reproduction, Numbers, and Distribution of the Vernal Pool Fairy Shrimp

Reproduction

Vernal pool fairy shrimp reproduction is highly sensitive to changes in hydrology and soil disturbance, as their eggs (cysts) lie dormant in the dry pool bed and hatch only under specific inundation conditions. Project activities that disturb vernal pool topography or alter surface water flow, such as grading, compaction, or road construction, could disrupt these conditions and prevent successful hatching or development. While there are no documented populations within the immediate Project footprint, the proximity of known occurrences suggests the potential for indirect effects if nearby hydrology is altered. Mitigation measures, including hydrological modeling, buffer establishment, and avoidance of vernal pool microtopography, will help reduce potential impacts to reproduction. The Service expects that the Proposed Action would not measurably reduce the vernal pool fairy shrimp's reproductive capacity locally or range wide.

Numbers

Project activities that result in the loss or degradation of vernal pool habitats could lead to the mortality of dormant cysts or active individuals if pools are inadvertently impacted during construction. However, with no confirmed presence within the Project footprint and the implementation of protective measures, such as habitat avoidance and pre-construction surveys, the likelihood of direct mortality is low. The anticipated loss of individuals, if any, would be minimal relative to regional population sizes, particularly given the species' broad distribution across multiple vernal pool regions. The Service does not expect the Proposed Action to cause a measurable decline in the vernal pool fairy shrimp's population either locally or across its range.

Distribution

The Project may result in temporary and permanent impacts to potentially suitable vernal pool habitats in the Solano-Colusa Vernal Pool Region, contributing to localized habitat loss or fragmentation. Changes to surface water flow, soil structure, or pool isolation may reduce the functional distribution of the species within the Action Area. However, these impacts are expected to be limited in geographic scope and offset through the Project's proposed compensatory mitigation, including the protection and restoration/creation of vernal pool complexes off-site. These efforts will maintain or enhance habitat connectivity and function in the region. As such, while minor shifts in local distribution may occur due to project-related disturbance, no significant reduction in the species' overall distribution is anticipated.

14.5.4 Summary of the Effects of the Proposed Action on the Recovery of Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp depends on intact vernal pool ecosystems with specific hydrological conditions. Conservation focuses on preserving large, connected vernal pool complexes and minimizing habitat fragmentation. While the Project could impact these habitats, it includes mitigation measures such as protecting and restoring/creating vernal pool landscapes, protecting hydrology, and securing off-site conservation lands. These actions are designed to maintain habitat function and support the species' reproductive needs. As a result, the Project is not expected to hinder recovery and will contribute positively to long-term conservation goals. The Service does not anticipate that the Proposed Action will reduce the range wide distribution of the vernal pool fairy shrimp.

14.6 Vernal Pool Tadpole Shrimp

14.6.1 Summary of Status of Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp is another federally listed endangered species that shares similar habitat requirements with the vernal pool fairy shrimp. Found primarily in California's Central Valley and the Central Coast, the tadpole shrimp also depends on vernal pool ecosystems to complete its lifecycle. Recent evaluations, including the *Vernal Pool Tadpole Shrimp (Lepidurus packardi) 5-Year Review* (Service 2024c), highlight the ongoing threat of habitat loss and degradation, with a significant portion of suitable habitat being lost to agricultural and urban development. Like the vernal pool fairy shrimp, the tadpole shrimp is also highly susceptible to the impacts of climate change, drought, and altered hydrological conditions. Although there have been efforts to conserve and restore vernal pool habitats, such as through mitigation banks and conservation easements, the species continues to face significant challenges to its recovery. Its fragmented and diminished populations are a concern for long-term conservation efforts.

14.6.2 Summary of Environmental Baseline and Existing Conditions

The environmental baseline for the vernal pool tadpole shrimp within the Action Area is similar to that of the vernal pool fairy shrimp, as both species rely on the same vernal pool ecosystems in the Solano-Colusa Vernal Pool Region. Habitat for the tadpole shrimp in this region has been heavily impacted by land use changes, particularly agricultural development and urbanization. No recent surveys have been conducted within the Project's construction footprints, although habitat modeling indicates the potential presence of suitable conditions. The lack of recent surveys means that future assessments will be necessary to confirm habitat suitability and the potential presence of the species in the Action Area.

14.6.3 Summary of Effects of the Proposed Action on the Reproduction, Numbers, and Distribution of the Vernal Pool Tadpole Shrimp

Reproduction

The vernal pool tadpole shrimp's reproductive cycle is closely tied to the hydrology of vernal pools, with successful reproduction dependent on pools retaining water long enough to allow for growth and egg-laying, which typically occurs within 20 to 60 days of inundation. Project activities that disturb vernal pool topography, alter drainage patterns, or reduce pool duration may negatively impact reproductive success, particularly for a species that requires longer hydroperiods than other vernal pool crustaceans. Although the presence of the species within the Project footprint has not been confirmed, the potential for suitable habitat and undocumented cysts exists. Mitigation measures, such as avoidance of known or potential vernal pools, hydrological modeling, and off-site habitat conservation, are expected to minimize these risks. The Service expects that the Proposed Action would not measurably reduce the vernal pool tadpole shrimp's reproductive capacity locally or range wide.

Numbers

Direct mortality of vernal pool tadpole shrimp will occur if construction activities inadvertently impact occupied pools or disturb sediment layers containing dormant cysts. However, due to the absence of confirmed occurrences in the Project footprints and the implementation of pre-construction surveys, avoidance measures, and the Project's proposed compensatory mitigation, such impacts are expected to be minimal. The small number of individuals that may be affected would not significantly influence broader population trends, especially considering the species' presence in other conserved areas within the region. The Service does not expect the Proposed Action to cause a measurable decline in the vernal pool tadpole shrimp's population either locally or across its range.

Distribution

Project-related impacts to vernal pool habitat may result in minor, localized reductions in suitable habitat within the Solano-Colusa Vernal Pool Region. This may temporarily shift the local distribution of vernal pool tadpole shrimp if hydrological conditions are altered or pools are degraded or eliminated. However, these effects are expected to be offset by habitat protection and restoration commitments included in the Project's mitigation strategy. Off-site conservation efforts and hydrologically compatible restoration will help maintain overall habitat connectivity and ecological function. The Service does not anticipate that the Proposed Action will reduce the range wide distribution of the vernal pool tadpole shrimp.

14.6.4 Summary of the Effects of the Proposed Action on the Recovery of Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp, like the fairy shrimp, relies on intact vernal pool ecosystems with stable hydrology and undisturbed uplands. Due to its longer development period, it is particularly sensitive to changes in water duration and pool conditions. Conservation efforts

focus on preserving and restoring these delicate habitats. The Project includes mitigation measures to protect vernal pool function and support species recovery. With these in place, the Project is not expected to hinder and will help advance the recovery of the vernal pool tadpole shrimp in the region. The Proposed Action would not increase the regional threats currently affecting the vernal pool tadpole shrimp, nor preclude the Service's ability to implement recovery actions.

14.7 Western Spadefoot

14.7.1 Summary of Status of Western Spadefoot

The Service proposed to list two distinct population segments (DPSs) of the western spadefoot, including the northern DPS, as a threatened species on December 4, 2023. The northern DPS spans California's Sacramento and San Joaquin valleys, from Shasta to Kern counties, and extends into the coastal ranges. The species primarily inhabits vernal pools and other temporary aquatic habitats, relying on water temperatures between 48°F and 86°F for reproduction. Threats to the western spadefoot include habitat loss due to urbanization and land use changes, nonnative predators, disease, climate change, and pollution. Although not currently listed, the species is addressed in several recovery plans, including the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005). Conservation efforts, including habitat restoration and land acquisition through habitat conservation plans (HCPs) and natural community conservation plans (NCCPs), have provided some protections for the species.

14.7.2 Summary of Environmental Baseline and Existing Conditions

The northern DPS of the western spadefoot potentially occurs in the Action Area, with recorded occurrences in the broader region, including a detection 3.3 miles northwest of Dunnigan in 2019. However, no CNDDB occurrences have been recorded in the geotechnical exploration, construction, inundation, or recreation footprints of the proposed Project. Suitable habitat within the Action Area includes intermittent streams and seasonal wetlands that inundate during the fall and winter and hold water for at least three weeks, as well as upland habitats such as grasslands and oak woodlands within 1,200 feet of these aquatic features. Current threats in the Action Area include habitat degradation from urbanization, land conversion, and climate change, as well as potential disruptions from nonnative predators and disease. Conservation measures for the species, such as land acquisition, habitat restoration, and the implementation of BMPs, like work windows and exclusion fencing, have been employed in surrounding areas to support recovery efforts.

14.7.3 Summary of Effects of the Proposed Action on the Reproduction, Numbers, and Distribution of the Western Spadefoot

Reproduction

Project activities are anticipated to permanently and temporarily disturb aquatic and upland habitats used by the western spadefoot. These disturbances, such as the fill of suitable vernal pools, will permanently remove breeding habitat. Given the limited number of western spadefoot

occurrences in the vicinity of the Project footprint, the Service does not anticipate that the proposed activities will result in a measurable reduction in reproductive output at the population or range-wide scale. Conservation measures, including pre-construction surveys and avoidance of potential habitat during rainy weather, are expected to further minimize potential impacts. The Service expects that the Proposed Action would not measurably reduce the western spadefoot's reproductive capacity locally or range wide.

Numbers

Some mortality or injury of western spadefoot could occur if individuals are present and undetected within work areas during construction and inundation activities, particularly during grading, excavation, or vegetation clearing. However, such risks are expected to be low due to the limited number of western spadefoot occurrences in the vicinity of the Project footprint and the implementation of avoidance and minimization measures, such as biological monitoring and relocation protocols. If any individuals are encountered, the number affected is anticipated to be small and within the natural demographic variability of nearby populations. The Service does not expect the Proposed Action to cause a measurable decline in the western spadefoot's population either locally or across its range.

Distribution

The Project will result in the temporary and permanent alteration of potentially suitable habitat within the Action Area. These impacts will include degradation or fill of suitable breeding pools and loss of adjacent upland habitat used for aestivation. Conservation measures including mitigation via habitat restoration, vernal pool creation, and post-Project monitoring, are expected to support habitat recovery and minimize long-term fragmentation of this species' habitat. the Service does not anticipate that the Proposed Action will reduce the range wide distribution of the western spadefoot.

14.7.4 Summary of the Effects of the Proposed Action on the Recovery of Western Spadefoot

The western spadefoot relies on ephemeral wetlands for breeding and nearby uplands for burrowing in California's grasslands and vernal pool ecosystems. In the Action Area, conservation efforts have focused on protecting wetlands in addition to upland habitat mosaics and reducing threats like habitat loss and fragmentation. Although the Project will impact these habitats, proposed mitigation measures including habitat avoidance, restoration, and long-term protection are expected to offset potential adverse effects. These efforts align with regional recovery goals and will support the species' long-term conservation in the northern Central Valley. The Proposed Action would not increase the regional threats currently affecting the western spadefoot, nor preclude the Service's ability to implement recovery actions.

15. CONCLUSION

After reviewing the current *Status of Species* for the vernal pool branchiopods, valley elderberry longhorn beetle, giant garter snake, western pond turtle, western spadefoot, and monarch butterfly, the *Environmental Baseline* for the Action Area, the *Effects of the Proposed Action*, and the *Cumulative Effects*, it is the Service's biological and conference opinion that the Sites Reservoir Project, as proposed, is not likely to jeopardize the continued existence of these species. The Service reached this conclusion because the Project-related effects to the species, when added to the environmental baseline and analyzed in consideration of the cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following:

1) The construction-related components of the Proposed Action are extensive in scale and scope and, if unmitigated, would reasonably be likely to have considerable effects on landscape-scale population dynamics. However, the Proposed Action includes extensive conservation measures to avoid, minimize, and mitigate the adverse effects to the species. Measures such as training construction personnel, implementing pre-construction surveys for species, installing exclusion fencing, filling aquatic habitat during the dry season, and restricting work during rain events will serve to avoid and minimize the specific loss of, injury to, and impairment of individuals of each species. Additionally, proposed off-site compensatory mitigation measures will offset the loss of, disturbance to, and indirect effects to on-site habitats for all of the species.
2) Because the range of each species extends variably across other parts of the State and are not restricted only to this particular Project location, the resulting adverse effects of the Proposed Action (reduced by the aforementioned conservation measures) are not expected to appreciably diminish the likelihood of both the survival and recovery of the listed species in the wild by reducing their reproduction, numbers, or distribution.
3) Reclamation, Corps, and NRCS have committed to implement, or require the Authority to implement, all general and species-specific conservation measures, as applicable.
4) The Proposed Action will not appreciably reduce the reproductive capacity, number of individuals, or distribution of covered species.
5) The Proposed Action would not cause any effects that would prelude our ability to recover the covered species.

16. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of "take" in the Act means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Harass in the definition of "take" in the Act means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns

which include, but are not limited to, breeding, feeding or sheltering (50 CFR 17.3). Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the proposed protective measures and the terms and conditions of an incidental take statement and occurs as a result of the action as proposed.

The measures described below are non-discretionary and must be undertaken by Reclamation, Corps, and NRCS so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. Reclamation, Corps, and NRCS have a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation, Corps, or NRCS (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Reclamation, Corps, NRCS or the Authority must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(4)].

The prohibitions against taking found in section 9 of the Act do not apply to the monarch butterfly, northwestern pond turtle, and western spadefoot until the species are listed. However, the Service advises Reclamation, Corps, and NRCS to consider implementing the following Reasonable and Prudent Measures for these species. If this conference opinion is adopted as a biological opinion following a listing, the Reasonable and Prudent Measures, with their implementing Terms and Conditions, will be non-discretionary.

16.1 Amount or Extent of Take

Due to the implementation of the standard consultation components of the Proposed Action, the Service anticipates the following levels of incidental take. Upon implementation of the Reasonable and Prudent Measures and Terms and Conditions, incidental take associated with the Project will become exempt from the prohibitions described under section 9 of the Act.

16.1.1 Giant Garter Snake

The Service expects the incidental take of giant garter snake to be in the form of: (1) harm, through the loss of suitable habitat (i.e., cover, food, prey), (2) harass, through disturbance during geotechnical exploration, surveys and species relocations, and construction activities, and (3) injury or mortality through the contact of equipment, vehicles, or increased susceptibility to predation. The Service expects the loss of suitable habitat is reasonably certain to significantly impair normal foraging, sheltering, and reproduction behaviors of all giant garter snakes that use habitat within the Project footprint.

Within the species' habitat, it is not practical to express the amount or extent of incidental take of the giant garter snake, or to monitor such take, in terms of individuals due to its cryptic and fossorial nature. Giant garter snakes are highly sensitive to human activity and are extremely difficult to detect unless observed undisturbed at a distance. In instances in which the total

number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate.

The amount of habitat disturbance is an appropriate way to measure the anticipated extent of incidental take because this habitat is likely to contain features that giant garter snakes use for breeding, feeding, and sheltering (such as small fossorial mammal burrows or natural crevices around man-made features) and the anticipated take is caused by such disturbance activities. Therefore, given this causal link and the difficulty in quantifying or monitoring the number of giant garter snakes that will be taken within their habitat in the form of harm, harass, injury, or mortality, the Service is using modeled suitable habitat as a surrogate to quantify incidental take of the species, except on roadways within modeled suitable habitat.

The Service anticipates that all giant garter snakes inhabiting or utilizing modeled aquatic habitat and modeled upland habitat identified in the BA to be permanently or temporarily lost by the standard consultation elements will be subject to incidental take in the form of harm, harass, injury, or mortality. The Service will consider the amount or extent of incidental take of giant garter snake to be exceeded if modeled suitable habitat loss is beyond the total amount of habitat identified by activity as described below and summarized in ***Table 20***.

Injury or mortality of giant garter snake as a result of contact with project equipment and/or vehicles on the roadways within the modeled suitable habitat can be quantified and monitored. The Service will consider the amount or extent of incidental take of giant garter snake to be exceeded if the total number of individual giant garter snakes killed or injured by project equipment or vehicles on roadways is beyond what has been identified by activity as described below.

Geotechnical Explorations

The Service expects that no more than 15 giant garter snakes will be killed or injured from contact with geotechnical exploration equipment and/or vehicles on roadways over the duration of this BiOp in which geotechnical exploration activities are estimated to occur. The Service anticipates all giant garter snakes inhabiting or utilizing the 46.03 acres of modeled aquatic habitat and 38.93 acres of modeled upland habitat identified in the BA to be temporarily lost by geotechnical exploration activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

A single geotechnical exploration investigation may range from a few days to three years to conduct depending on the level of investigations (surface or subsurface). These activities will occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of giant garter snake to be exceeded if a total of 16 or more giant garter snakes are killed or injured on roadways during geotechnical exploration activities. The Service will consider the amount or extent of incidental take of giant garter snake to be exceeded if modeled suitable habitat loss is beyond the 46.03 acres of modeled aquatic habitat or the 38.93 acres of modeled upland habitat identified.

Ground Truthing, Surveys, and Species Relocations

The Service anticipates up to 30 individual giant garter snakes in the Action Area may be subject to incidental take in the form of harassment by survey, capture, handle, and release efforts associated with implementation of the conservation measures by moving snakes to prevent injury or mortality from implementation of Project-related activities. Garter snakes may be subject to incidental take in the form of harassment by survey during occupancy surveys, preconstruction surveys, and construction monitoring which are only anticipated to occur within the geotechnical exploration footprint and the construction footprint. These activities will occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of giant garter snake to be exceeded if a total of 31 or more giant garter snakes are disturbed, captured, or handled during Ground Truthing, Surveys, and Species Relocations activities.

Construction

The Service expects that no more than 15 giant garter snakes will be killed or injured from contact with construction equipment and/or vehicles on the roadways during construction activities. The Service anticipates that all giant garter snakes inhabiting or utilizing the 6.06 acres of modeled aquatic habitat and 11.27 acres of modeled upland habitat identified in the BA to be temporarily lost by construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality. The Service anticipates that all giant garter snakes inhabiting or utilizing the 0.83 acres of modeled aquatic habitat and 19.25 acres of modeled upland habitat identified in the BA to be permanently lost by construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

Construction activities are estimated to occur over a time period of eight years, delays could occur, and construction activities may occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of giant garter snake to be exceeded if a total of 16 or more giant garter snakes are killed or injured on roadways during construction activities. The Service will consider the amount or extent of incidental take of giant garter snake to be exceeded if modeled suitable habitat loss is beyond the 6.06 acres of modeled aquatic habitat or the 11.27 acres of modeled upland habitat identified to be temporarily lost or the 0.83 acres of modeled aquatic habitat or the 19.25 acres of modeled upland habitat identified to be permanently lost.

16.1.2 Monarch Butterfly

The Service expects the incidental take of monarch butterfly to be in the form of: (1) harm, through the loss of suitable habitat, (2) harass, through disturbance during geotechnical explorations, ground truthing, surveys and species relocations, construction, recreation, and inundation activities, and (3) injury or mortality through the removal of milkweed or other native forbs.

It is not practical to express the amount or extent of incidental take of the monarch butterfly, or to monitor such take, in terms of individuals due to their small size and the lack of a suitable

survey protocol. In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate.

The amount of habitat disturbance is an appropriate way to measure the anticipated extent of incidental take because this habitat is likely to contain features that butterflies use for reproduction (e.g., where the females lay their eggs on milkweed plants) and feeding (e.g., milkweed flowers provide nectar) and the anticipated take is caused by such disturbance activities. Therefore, given this causal link and the difficulty in quantifying or monitoring the number of monarch butterflies that will be taken in the form of harm, harass, injury, or mortality, the Service is using modeled suitable habitat as a surrogate to quantify incidental take of the species.

The Service anticipates that all butterflies inhabiting or utilizing the modeled suitable habitat identified in the BA to be permanently or temporarily lost by the standard consultation elements will be subject to incidental take in the form of harm, harass, injury, or mortality. The Service will consider the amount or extent of incidental take of monarch butterflies to be exceeded if modeled suitable habitat loss is beyond the total amount of habitat identified by activity as described below and summarized in ***Table 20***.

Geotechnical Explorations

Geotechnical investigations may vary in duration, from several days to multiple years, and will occur intermittently throughout the Project footprint. The Service anticipates that all monarch butterflies inhabiting or utilizing the 4,237.34 acres of modeled suitable habitat identified in the BA to be temporarily lost and the 54.11 acres of modeled suitable habitat identified in the BA to be permanently lost by geotechnical exploration activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service will consider the extent of incidental take to be exceeded if more than 4,237.34 acres of suitable monarch butterfly habitat are temporarily lost or more than 54.11 acres of suitable monarch butterfly habitat is permanently lost by geotechnical investigation activities (***Table 20***).

Ground Truthing, Surveys, and Species Relocations

Delineating suitable habitat will entail mapping locations of milkweed and nectar plants using information from the *Monarch Nectar Plants of California* (Xerces 2019) throughout the geotechnical exploration, construction, recreation, and inundation footprints. There is a potential for foraging butterflies to be harassed during vegetation sampling, resulting in those individuals needing to find alternative areas to forage. The Service anticipates monarch butterflies in the geotechnical exploration, construction, inundation, and recreation footprints (i.e., roughly an expanse of 22,829 acres) may be subject to incidental take in the form of harassment by survey. The Service anticipates that all monarch butterflies inhabiting or utilizing the 16,887 acres of modeled suitable habitat identified in the BA where occupancy surveys are expected to occur will be subject to incidental take in the form of harm, harass, injury, or mortality during capture, handle, and relocation efforts associated with implementation of the conservation measures, including transplantation of milkweed, to prevent injury or mortality from implementation of Project-related activities. These activities will occur throughout the entire Project duration. The

Service will consider the extent of incidental take to be exceeded if more than 16,887.00 acres of suitable monarch butterfly habitat are disturbed by occupancy surveys and species relocation activities.

Construction

Construction activities are estimated to occur over a time period of eight years, delays could occur, and construction activities may occur throughout the entire Project duration. The Service anticipates that all monarch butterflies inhabiting or utilizing the 1,570.49 acres of modeled habitat identified in the BA to be temporarily lost and the 2,997.27 acres of modeled habitat identified in the BA to be permanently lost by construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).The Service will consider the extent of incidental take to be exceeded if more than 1,570.49 acres of modeled habitat are temporarily lost or more than 2,997.27 acres of modeled habitat are permanently lost by construction activities.

Recreation

The Service anticipates that all monarch butterflies inhabiting or utilizing the 40.32 acres of modeled habitat identified in the BA to be temporarily lost and the 784.70 acres of modeled habitat identified in the BA to be permanently lost by recreational area development activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service will consider the extent of incidental take to be exceeded if more than 40.32 acres of modeled habitat are temporarily lost or more than 784.70 acres of modeled habitat is permanently lost by recreational area development activities.

Inundation

In addition to the time necessary for site preparation activities that will occur prior to inundation, it is estimated to take approximately 2-5 years for the reservoir to reach its maximum capacity. The Service anticipates that all monarch butterflies inhabiting or utilizing the 12,995.92 acres of modeled habitat identified in the BA to be permanently lost by inundation activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service will consider the extent of incidental take to be exceeded if more than 12,995.92 acres of modeled monarch butterfly habitat are permanently lost from inundation activities.

16.1.3 Northwestern Pond Turtle

The Service expects the incidental take of northwestern pond turtle to be in the form of: (1) harm, through the loss of suitable habitat (i.e., cover, food, prey), (2) harass, through disturbance during geotechnical exploration, construction, and recreation activities, and (3) injury or mortality through the contact of equipment, vehicles, or increased susceptibility to predation. The Service expects the loss of suitable habitat is reasonably certain to significantly impair normal foraging, sheltering, and reproduction behaviors of all northwestern pond turtles that use habitat within the Project footprints.

Within the species' habitat, it is not practical to express the amount or extent of incidental take of the northwestern pond turtle, or to monitor such take, in terms of individuals due to their cryptic nature and their sheltering behaviors, which involve aestivation and brumation for significant time periods throughout the year. Ground-disturbing activities associated with Project activities have the potential to result in the injury or mortality of an unknown number of pond turtles if these activities are conducted in occupied upland habitat. In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate.

The amount of habitat disturbance is an appropriate way to measure the anticipated extent of incidental take because this habitat is likely to contain features that northwestern pond turtles use for breeding, feeding, and sheltering and the anticipated take is caused by such disturbance activities. Therefore, given this causal link and the difficulty in quantifying or monitoring the number of northwestern pond turtles that will be taken within their habitat in the form of harm, harass, injury, or mortality, the Service is using modeled habitat as a surrogate to quantify incidental take of the species, except on roadways within modeled suitable habitat.

The Service anticipates that all northwestern pond turtles inhabiting or utilizing modeled aquatic habitat and modeled upland habitat identified in the BA to be permanently or temporarily lost by the standard consultation elements will be subject to incidental take in the form of harm, harass injury, or mortality. The Service will consider the amount or extent of incidental take of northwestern pond turtles to be exceeded if modeled suitable habitat loss is beyond the total amount of habitat identified by activity and is described below and summarized in (***Table 20***).

Injury or mortality of northwestern pond turtle as a result of contact with project equipment and/or vehicles on the roadways within the modeled suitable habitat can be quantified and monitored. The Service will consider the amount or extent of incidental take of northwestern pond turtles to be exceeded if the total number of individual northwestern pond turtles are killed or injured by project equipment or vehicles on roadways is beyond what has been identified by activity as described below.

Geotechnical Explorations

The Service expects that no more than 10 northwestern pond turtles will be killed or injured from contact with geotechnical exploration equipment and/or vehicles on roadways over the duration of this BiOp in which geotechnical exploration activities are estimated to occur. The Service anticipates all northwestern pond turtles inhabiting or utilizing the 138.09 acres of modeled high value aquatic habitat, 198.53 acres of modeled low-value aquatic habitat, 997.52 acres of modeled high-value upland habitat, and 2,120.99 acres of modeled low-value upland habitat identified in the BA to be temporarily lost by geotechnical exploration activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service anticipates all northwestern pond turtles inhabiting or utilizing the 0.31 acres of modeled low-value aquatic habitat, 20.44 acres of modeled high-value upland habitat, and 17.2 acres of modeled low-value upland habitat identified in the BA to be permanently lost by geotechnical exploration activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

A single geotechnical exploration investigation may range from a few days to three years to conduct depending on the level of investigations (surface or subsurface). These activities will occur throughout the entire Project duration and entire project footprint. The Service will consider the amount or extent of incidental take of northwestern pond turtle to be exceeded if a total of 11 or more northwestern pond turtles are killed or injured on roadways during geotechnical exploration activities. The Service will consider the amount or extent of incidental take of northwestern pond turtle from geotechnical exploration activities to be exceeded if the temporary modeled habitat loss is beyond the 138.09 acres of modeled high value aquatic habitat, 198.53 acres of modeled low-value aquatic habitat, 997.52 acres of modeled high-value upland habitat, or 2,120.99 acres of modeled low-value upland habitat identified. The Service will consider the amount or extent of incidental take of northwestern pond turtle from geotechnical exploration activities to be exceeded if permanent modeled habitat loss is beyond the 0.31 acres of modeled low-value aquatic habitat, 20.44 acres of modeled high-value upland habitat, or 17.2 acres of modeled low-value upland habitat identified.

Ground Truthing, Surveys, and Species Relocations

The Service anticipates up to 40 individual northwestern pond turtles in the Action Area may be subject to incidental take in the form of harassment by survey, capture, handle, and release efforts associated with implementation of the conservation measures by moving northwestern pond turtles to prevent injury or mortality from implementation of Project-related activities. The Service anticipates that all northwestern pond turtles inhabiting or utilizing the geotechnical exploration, construction, recreation, and inundation footprints (i.e., roughly an expanse of 22,829 acres) may be subject to incidental take in the form of harassment during ground truthing and surveys. These activities will occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of northwestern pond turtle to be exceeded if a total of 41 or more northwestern pond turtles are captured or handled during the course of Project activities.

Construction

The Service expects that no more than 20 northwestern pond turtles will be killed or injured from contact with construction equipment and/or vehicles on roadways during construction activities over the duration of this BiOp in which construction activities are estimated to occur. The Service anticipates all northwestern pond turtles inhabiting or utilizing the 248.34 acres of modeled high value aquatic habitat, 91.64 acres of modeled low-value aquatic habitat, 508.27 acres of modeled high-value upland habitat, and 510.04 acres of modeled low-value upland habitat identified in the BA to be temporarily lost by construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service anticipates all northwestern pond turtles inhabiting or utilizing the 33.22 acres of modeled high value aquatic habitat, 142.36 acres of modeled low-value aquatic habitat, 691.07 acres of modeled high-value upland habitat, and 1,592.92 acres of modeled low-value upland habitat identified in the BA to be permanently lost by construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

Construction activities are estimated to occur over a time period of eight years, delays could occur, and construction activities may occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of northwestern pond turtles to be exceeded if a total of 21 or more northwestern pond turtles are killed or injured on roadways during construction activities. The Service will consider the amount or extent of incidental take of northwestern pond turtle from construction activities to be exceeded if temporary modeled habitat loss is beyond the 248.34 acres of modeled high value aquatic habitat, 91.64 acres of modeled low-value aquatic habitat, 508.27 acres of modeled high-value upland habitat, or the 510.04 acres of modeled low-value upland habitat identified. The Service will consider the amount or extent of incidental take of northwestern pond turtle from construction activities to be exceeded if permanent modeled habitat loss is beyond the 33.22 acres of modeled high value aquatic habitat, 142.36 acres of modeled low-value aquatic habitat, 691.07 acres of modeled high-value upland habitat, or 1,592.92 acres of modeled low-value upland habitat identified.

Recreation

The Service expects that no more than 10 northwestern pond turtles will be killed or injured from contact with equipment and vehicles on roadways associated with conducting recreational area development activities. The Service anticipates all northwestern pond turtles inhabiting or utilizing the 0.49 acres of modeled low-value aquatic habitat, 2.0 acres of modeled high-value upland habitat, and 27.78 acres of modeled low-value upland habitat identified in the BA to be temporarily lost from recreational area development activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service anticipates all northwestern pond turtles inhabiting or utilizing the 0.27 acres of modeled high value aquatic habitat, 2.04 acres of modeled low-value aquatic habitat, 55.01 acres of modeled high-value upland habitat, and 469.42 acres of modeled low-value upland habitat identified in the BA to be permanently lost from recreational area development will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

The Service will consider the amount or extent of incidental take of northwestern pond turtles to be exceeded if a total of 11 or more northwestern pond turtles are killed or injured by equipment or vehicles on roadways during Project activities associated with recreation. The Service will consider the amount or extent of incidental take of northwestern pond turtle from recreational area development activities to be exceeded if temporary modeled habitat loss is beyond the 0.49 acres of modeled low-value aquatic habitat, 2.0 acres of modeled high-value upland habitat, or 27.78 acres of modeled low-value upland habitat identified. The Service will consider the amount or extent of incidental take of northwestern pond turtle from recreational area development activities to be exceeded if permanent modeled habitat loss is beyond the 0.27 acres of modeled high value aquatic habitat, 2.04 acres of modeled low-value aquatic habitat, 55.01 acres of modeled high-value upland habitat, or and 469.42 acres of modeled low-value upland habitat identified.

Inundation

The Service expects that no more than 15 northwestern pond turtles will be killed or injured from contact with inundation equipment and/or vehicles on roadways over the duration of this BiOp in

which inundation activities are estimated to occur. The Service anticipates all northwestern pond turtles inhabiting or utilizing the 76.58 acres of modeled high value aquatic habitat, 482.46 acres of modeled low-value aquatic habitat, 2.430.15 acres of modeled high-value upland habitat, and 7,722.95 acres of modeled low-value upland habitat identified in the BA to be permanently lost from inundation activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

Preparation of the inundation footprint will involve vegetation removal, clearing, grubbing, and soil disturbance. After preparation, it is estimated to take approximately two to five years for the reservoir to reach its maximum capacity. The Service will consider the amount or extent of incidental take of northwestern pond turtles to be exceeded if a total of 16 or more northwestern pond turtles are killed or injured from contact with equipment and/or vehicles on roadways during inundation activities. The Service will consider the amount or extent of incidental take of northwestern pond turtle from recreational area development activities to be exceeded if permanent modeled habitat loss is beyond the 76.58 acres of modeled high value aquatic habitat, 482.46 acres of modeled low-value aquatic habitat, 2.430.15 acres of modeled high-value upland habitat, or 7,722.95 acres of modeled low-value upland habitat identified.

16.1.4 Valley Elderberry Longhorn Beetle

The Service expects the incidental take of valley elderberry longhorn beetle to be in the form of: (1) harm, through the loss of suitable habitat (i.e., cover, food, prey), (2) harass, through disturbance during geotechnical explorations, ground truthing, surveys and species relocations, construction, recreation, and inundation activities, and (3) injury or mortality predominately through the trimming and transplanting of elderberry shrubs. The Service expects the loss of suitable habitat is reasonably certain to significantly impair normal foraging, sheltering, and reproduction behaviors of all valley elderberry longhorn beetles that use habitat within the Project footprint. Surveys will be conducted throughout the Project footprints to identify the location of elderberry shrubs and conservation measures to avoid elderberry shrubs will be implemented. Elderberry shrubs with stems greater than 1 inch in diameter will be transplanted if they cannot be directly avoided, or if indirect effects will result in death of stems or the entire shrub.

It is not practical to express the amount or extent of incidental take of valley elderberry longhorn beetle, or to monitor such take, in terms of individuals because of its small size, the relative inability to detect live larvae in elderberry stems, and the fact that their life cycle and patchy habitats make detection difficult. In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate.

The amount of habitat disturbance and number of elderberry shrubs transplanted are appropriate ways to measure the anticipated extent of incidental take because the valley elderberry longhorn beetle is found only in association with its host plant, elderberry, and the anticipated take is caused by disturbing the host plant. Therefore, given this causal link and the difficulty in quantifying or monitoring the number of valley elderberry longhorn beetles that will be taken in the form of harm, harass, injury, or mortality, the Service is using modeled suitable habitat in the

form of appropriately sized elderberry shrub stems (greater than 1 inch in diameter) and number of elderberry shrubs transplanted as a surrogate to quantify incidental take of the species.

The Service anticipates that all valley elderberry longhorn beetles inhabiting or utilizing modeled riparian habitat and modeled upland habitat identified in the BA to be permanently or temporarily lost by the standard consultation elements will be subject to incidental take in the form of harm, harass, injury, or mortality. The Service will consider the amount or extent of incidental take of valley elderberry longhorn beetle to be exceeded if modeled habitat is impacted beyond the total amount of habitat identified by activity as described below and summarized in ***Table 20***. The Service will consider the amount or extent of incidental take of valley elderberry longhorn beetle to be exceeded if the total number of shrubs transplanted is beyond what has been identified by activity as described below.

Geotechnical Explorations

The Service expects all valley elderberry longhorn beetles inhabiting or utilizing the 22.59 acres of temporarily lost modeled riparian habitat, 3,094.19 acres of temporarily lost modeled upland habitat, and 31.34 acres of permanently lost modeled upland habitat identified in the BA to be lost from geotechnical exploration activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service anticipates no more than six elderberry shrubs to be detected within the footprint and be lost from geotechnical explorations in riparian and non-riparian areas (***Table 8***).

A single geotechnical exploration investigation may range from a few days to three years to conduct depending on the level of investigations (surface or subsurface). These activities will occur throughout the entire Project duration and entire project footprint. The Service will consider the amount or extent of incidental take to be exceeded if more than 22.59 acres of modeled riparian habitat is temporarily lost, 3,094.19 acres modeled upland habitat is temporarily lost, 31.34 acres of modeled upland habitat is permanently lost, or if seven or more elderberry shrubs are detected within the footprint.

Ground Truthing, Surveys, and Species Relocations

Delineating suitable habitat and mapping individual elderberry shrubs will occur throughout the geotechnical exploration, construction, recreation, and inundation footprints. There is a potential for foraging and dispersing valley elderberry longhorn beetles to be harassed during surveys. The Service anticipates valley elderberry longhorn beetles in the geotechnical exploration, construction, inundation, and recreation footprints (i.e., roughly an expanse of 22,829 acres) may be subject to incidental take in the form of harassment by survey. The Service expects that no more than 112 shrubs may be transplanted over the course of implementing the geotechnical exploration, construction, recreation, and inundation activities. Elderberry shrubs with stems greater than 1 inch in diameter will be transplanted if they cannot be directly avoided or if indirect effects will result in death of stems or the entire shrub. The Service will consider the extent of incidental take to be exceeded if 113 or more elderberry shrubs are transplanted during the course of Project activities.

Construction

The Service anticipates all valley elderberry longhorn beetles inhabiting or utilizing the 22.59 acres of temporary modeled riparian habitat, 3,094.19 acres of temporary modeled upland habitat, and 31.34 acres of permanent modeled upland habitat identified in the BA to be lost by construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service expects no more than 17 elderberry shrubs to be detected within the footprint and taken by construction activities in riparian and non-riparian areas (Table 12).

Construction activities are estimated to occur over a time period of eight years, delays could occur, and construction activities may occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take to be exceeded if more than 22.59 acres of temporary modeled riparian habitat, 3,094.19 acres of temporary modeled upland habitat, or 31.34 acres of permanent modeled upland habitat are lost, or if 18 or more elderberry shrubs are detected within the construction footprint.

Recreation Areas

The Service anticipates all valley elderberry longhorn beetles inhabiting or utilizing 1.34 acres of temporary modeled riparian habitat, 38.46 acres of temporary modeled upland habitat, 4.20 acres of permanent modeled riparian habitat, and 609.22 acres of permanent modeled upland habitat identified in the BA to be lost from recreational area development activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service expects no more than 5 elderberry shrubs to be detected within the footprint and be taken by recreational area development activities in riparian and non-riparian habitats (***Table 18***).

The Service will consider the amount or extent of incidental take to be exceeded if more than 4.20 acres of modeled riparian habitat are permanently lost from recreation activities, or if 6 or more elderberry shrubs are detected within the recreation footprint.

Inundation

Up to 54.17 acres of modeled valley elderberry longhorn beetle riparian habitat may be permanently lost from reservoir inundation and will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service expects no more than 84 elderberry shrubs to be detected within the footprint and be taken by inundation in riparian and non-riparian areas (***Table 15***)

Preparation of the inundation footprint will involve vegetation removal, clearing, grubbing, and soil disturbance. After preparation, it is estimated to take approximately two to five years for the reservoir to reach its maximum capacity. The Service will consider the extent of incidental take to be exceeded if more than 54.17 acres of riparian habitat are permanently lost by activities associated with inundation, or if 85 or more elderberry shrubs are detected within the inundation footprint.

16.1.5 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

The Service expects the incidental take of both vernal pool fairy shrimp and vernal pool tadpole shrimp (vernal pool branchiopods) to be in the form of: (1) harm, through the loss of suitable habitat (i.e., hydrology, cover, food, prey), (2) harassment, through disturbance during geotechnical exploration and construction activities, and (3) injury or mortality through the contact of equipment and by ground-disturbing activities involving the grading, excavating, and filling of pools. Most activities that would result in incidental take in the form of harm, injury, or mortality will likely occur when the vernal pool is dry. Therefore, the life stage most affected will be the eggs, which are embedded in the soil

It is not practical to express the amount or extent of incidental take of the vernal pool brachiopods, or to monitor such take, in terms of individuals because vernal pool branchiopods are small in size and the eggs, which would be the life stage most affected by Project activities, are embedded in the soil and are difficult to detect without a detailed microscopic analysis. In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate.

The amount of modeled suitable aquatic habitat disturbed is an appropriate way to measure the anticipated extent of incidental take because vernal pool branchiopods are dependent on this habitat for all life stages and the anticipated take is caused by the habitat disturbance. Therefore, given this causal link and the difficulty in quantifying or monitoring the number of vernal pool brachiopods that will be taken in the form of harm, harass, injury, or mortality, the Service is using modeled suitable aquatic habitat to quantify incidental take of the species.

The Service anticipates that all vernal pool branchiopods inhabiting modeled aquatic habitat identified in the BA to be directly and indirectly affected by the standard consultation elements will be subject to incidental take in the form of harm, harass, injury, or mortality. The Service will consider the amount or extent of incidental take of vernal pool branchiopods to be exceeded if modeled aquatic habitat is impacted beyond the total amount of habitat identified by activity and is described below and summarized in (***Table 20***).

Ground Truthing, Surveys, and Species Relocations

Once habitat has been deemed suitable through habitat delineations, occupancy surveys will be conducted to assess whether vernal pool branchiopods are present. Activities associated with the ground truthing and occupancy surveys could result in harassment, injury, or mortality to vernal pool branchiopods. The Service anticipates that that all vernal pool branchiopods inhabiting the 13.43 acres of modeled aquatic habitat identified in the BA to be directly lost from ground truthing, surveys, and species relocations activities will be subject to incidental take in the form of harm, harass, injury, or mortality ***(Table 20***).

If the habitat is occupied, the Service expects that most individuals captured and handled during the dry and wet season protocols will survive to be released back to the site, while an unknown number of vernal pool branchiopods will experience mortality during this process, especially those that are captured and preserved to be retained as specimen vouchers. These activities will

occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take to be exceeded if more than 13.43 acres of modeled aquatic habitat of vernal pool branchiopods are directly lost from occupancy surveys and species relocation activities.

Construction

The Service anticipates that all vernal pool branchiopods inhabiting the 0.05 acres of modeled habitat identified in the BA to be indirectly lost temporarily, 11.41 acres of modeled habitat identified to be directly lost permanently, and 1.34 acres of modeled habitat identified to be indirectly lost permanently by construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). Construction activities are estimated to occur over a time period of eight years, delays could occur, and construction activities may occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take to be exceeded if more than 0.05 acres of modeled habitat are indirectly lost temporarily, 11.41 acres of modeled habitat are directly lost permanently, or 1.34 acres of modeled habitat are indirectly lost permanently from construction activities.

16.1.6 Western Spadefoot

The Service expects the incidental take of western spadefoot to be in the form of: (1) harm, through the loss of suitable habitat (i.e., cover, food, prey), (2) harassment, through disturbance during geotechnical exploration, construction, inundation, and recreation activities, and (3) injury or mortality through the contact of equipment, vehicles, or increased susceptibility to predation. The Service expects the loss of suitable habitat is reasonably certain to significantly impair normal foraging, sheltering, and reproduction behaviors of all western spadefoot that use habitat within the Project footprints.

Within the species' habitat, it is not practical to express the amount or extent of incidental take of the western spadefoot, or to monitor such take, in terms of individuals due to their cryptic nature and sheltering behaviors, which involve aestivating in underground burrows for most of its lifetime. Ground-disturbing activities associated with Project activities have the potential to result in the injury or mortality of an unknown number of western spadefoot if these activities are conducted in occupied upland habitat. In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate.

The amount of modeled suitable habitat disturbed is an appropriate way to measure the anticipated extent of incidental take because this habitat is likely to contain features that western spadefoot uses for breeding, feeding, and sheltering (such as suitable grasslands and wetlands) and the anticipated take is caused by such disturbance activities. Therefore, given this causal link and the difficulty in quantifying or monitoring the number of western spadefoot that will be taken in the form of harm, harass, injury, or mortality, the Service is using modeled suitable habitat as a surrogate to quantify incidental take of the species, except on roadways within the modeled habitat. The Service anticipates that all western spadefoot inhabiting or utilizing modeled aquatic habitat and modeled upland habitat permanently or temporarily affected by the standard consultation elements will be subject to incidental take in the form of harm, harass

injury, or mortality. The Service will consider the amount or extent of incidental take of western spadefoot to be exceeded if modeled suitable habitat is impacted beyond the total amount of habitat identified by activity as described below and summarized in (***Table 20***).

Injury or mortality of western spadefoot as a result of contact with project equipment and/or vehicles on the roadways within the modeled suitable habitat can be quantified and monitored. The Service will consider the amount or extent of incidental take of western spadefoot to be exceeded if the total number of individual western spadefoot are killed or injured by project equipment or vehicles on roadways is beyond what has been identified by activity as described below.

Geotechnical Explorations

The Service expects that no more than 15 western spadefoot will be killed or injured from contact with geotechnical exploration equipment and/or vehicles on roadways over the duration of this BiOp in which geotechnical exploration activities are estimated to occur. The Service anticipates all western spadefoot inhabiting or utilizing the 197.01 acres of modeled aquatic habitat and 3,485.05 acres of modeled upland habitat identified in the BA to be temporarily lost from geotechnical exploration activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service anticipates all western spadefoot inhabiting or utilizing the 0.31 acres of modeled aquatic habitat and 53.64 acres of modeled upland habitat identified in the BA to be permanently lost from geotechnical exploration activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

A single geotechnical exploration investigation may range from a few days to three years to conduct depending on the level of investigations (surface or subsurface). These activities will occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of western spadefoot to be exceeded if a total of 16 or more western spadefoot are injured or killed by contact with equipment and vehicles on roadways during geotechnical exploration activities. The Service will consider the amount or extent of incidental take of western spadefoot from geotechnical exploration activities to be exceeded if temporary modeled habitat loss is beyond the 197.01 acres of modeled aquatic habitat or the 3,485.06 acres of modeled upland habitat identified. The Service will consider the amount or extent of incidental take of western spadefoot from geotechnical exploration activities to be exceeded if permanent modeled suitable habitat loss is beyond the 0.31 acres of modeled aquatic habitat or the 53.64 acres of modeled upland habitat identified.

Ground Truthing, Surveys, and Species Relocations

The Service anticipates up to 20 individual western spadefoot in the Action Area may be subject to incidental take in the form of harassment by survey, capture, handle, and release efforts associated with implementation of the conservation measures by moving western spadefoot to prevent injury or mortality from implementation of Project-related activities. Western spadefoot may be subject to incidental take in the form of harassment during surveys. The Service anticipates that all western spadefoot inhabiting or utilizing the geotechnical exploration, construction, recreation, and inundation footprints (i.e., roughly an expanse of 22,829 acres) may

be subject to incidental take in the form of harassment during ground truthing and surveys. These activities will occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of western spadefoot to be exceeded if a total of 21 or more western spadefoot are captured or handled during the course of Project activities.

Construction

The Service expects that no more than 30 western spadefoot individuals will be killed or injured from contact with construction equipment and/or vehicles on roadways over the duration of this BiOp in which construction activities are estimated to occur. The Service anticipates all western spadefoot inhabiting or utilizing the 89.65 acres of modeled aquatic habitat and 1,083.28 acres of modeled upland habitat identified in the BA to be temporarily lost from construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service anticipates all western spadefoot inhabiting or utilizing the 141.46 acres of modeled aquatic habitat and 2,564.76 acres of modeled upland habitat identified in the BA to be permanently lost from construction activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

Construction activities are estimated to occur over a time period of eight years, delays could occur, and construction activities may occur throughout the entire Project duration. The Service will consider the amount or extent of incidental take of western spadefoot to be exceeded if 31 or more western spadefoot are injured or killed by contact with equipment and vehicles on roadways during construction activities. The Service will consider the amount or extent of incidental take of western spadefoot from construction activities to be exceeded if temporary modeled habitat loss is beyond the 89.65 acres of modeled aquatic habitat or the 1,083.28 acres of modeled upland habitat identified. The Service will consider the amount or extent of incidental take of western spadefoot from construction activities to be exceeded if permanent modeled habitat loss is beyond the 141.46 acres of modeled aquatic habitat or the 2,564.76 acres of modeled upland habitat identified.

Recreation

The Service expects that no more than 15 western spadefoot will be killed or injured from contact with recreational area development equipment and/or vehicles on roadways over the duration of this BiOp in which recreational area development activities are estimated to occur. The Service anticipates all western spadefoot inhabiting or utilizing the 0.49 acres of modeled aquatic habitat and 35.74 acres of modeled upland habitat identified in the BA to be temporarily lost from recreational area development activities will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***). The Service anticipates all western spadefoot inhabiting or utilizing the 1.95 acres of modeled aquatic habitat and 747.54 acres of modeled upland habitat identified in the BA to be permanently lost from recreational area development activities will be subject to incidental take in the form of harm, harass, injury, or mortality (Table 20).

The Service will consider the amount or extent of incidental take of western spadefoot to be exceeded if 16 or more western spadefoot are injured or killed by contact with equipment and

vehicles on roadways during recreational area development activities. The Service will consider the amount or extent of incidental take of western spadefoot from recreational area development activities to be exceeded if temporary modeled habitat loss is beyond the 0.49 acres of modeled aquatic habitat or the 35.74 acres of modeled upland habitat identified. The Service will consider the amount or extent of incidental take of western spadefoot from recreational area development activities to be exceeded if permanent modeled habitat loss is beyond the 1.95 acres of modeled aquatic habitat or the 747.54 acres of modeled upland habitat identified.

Inundation

The Service expects that no more than 20 western spadefoot will be killed or injured from contact with inundation equipment and/or vehicles on roadways over the duration of this BiOp in which inundation activities are estimated to occur. The Service anticipates all western spadefoot inhabiting or utilizing the 476.88 acres of modeled aquatic habitat and 11,474.05 acres of modeled upland habitat identified in the BA to be permanently lost from inundation will be subject to incidental take in the form of harm, harass, injury, or mortality (***Table 20***).

Preparation of the inundation footprint will involve vegetation removal, clearing, grubbing, and soil disturbance. After preparation, it is estimated to take approximately two to five years for the reservoir to reach its maximum capacity. The Service will consider the amount or extent of incidental take of western spadefoot to be exceeded if 21 or more western spadefoot are injured or killed by contact with equipment and vehicles on roadways during inundation activities. The Service will consider the amount or extent of incidental take of western spadefoot from inundation activities to be exceeded if permanent modeled habitat loss is beyond the 476.88 acres of modeled aquatic habitat or the 11,474.05 acres of modeled upland habitat identified.

17. EFFECT OF THE TAKE

In the accompanying BiOp, the Service determined that this level of anticipated take is not likely to result in jeopardy to the giant garter snake, monarch butterfly, northwestern pond turtle, western spadefoot, valley elderberry longhorn beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

18. REASONABLE AND PRUDENT MEASURES

All necessary and appropriate measures to avoid or minimize effects on the giant garter snake, monarch butterfly, northwestern pond turtle, western spadefoot, valley elderberry longhorn beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp resulting from implementation of this Project have been incorporated into the Project's proposed conservation measures. Therefore, the Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of the giant garter snake, monarch butterfly, northwestern pond turtle, western spadefoot, valley elderberry longhorn beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp:

1) All conservation measures, as described in the BA, BA Comment Tracker, and the supplemental information and restated here in the *Description of the Proposed Action* section of this BiOp, shall be fully implemented and adhered to.
2) Minimize impacts from the geotechnical explorations, construction, recreation, and inundation footprints to giant garter snake, monarch butterfly, northwestern pond turtle, western spadefoot, valley elderberry longhorn beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp and their habitat in the Action Area.
3) Best management practices and procedures adopted under this Project shall be administered in accordance with the efforts negotiated between Reclamation, Corps, NRCS, Authority, and the Service.
4) Reclamation, Corps, NRCS, and the Authority shall allow Service personnel to access work sites to ensure the impacts of the incidental takes are being minimized.
5) Minimize impacts to the giant garter snake, monarch butterfly, northwestern pond turtle, western spadefoot, valley elderberry longhorn beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp by incorporating measures throughout the processes of ground truthing, finalizing designs, executing contracts and agreements, and developing construction procedures for both new and existing infrastructure. When appropriate, a representative from the Service will participate. Technical design teams shall be convened prior to the start of geotechnical exploration, construction, recreation, or inundation activities and shall continue to meet periodically until Reclamation, Corps, NRCS, and/or the Authority complete all final design modifications.

18.1 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Reclamation, Corps, NRCS, and the Authority must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1) The following Terms and Conditions implement Reasonable and Prudent Measure 1:
    a) Reclamation, Corps, NRCS, and the Authority shall include full implementation and adherence to the conservation measures as a condition of any permit or contract issued for the Project.
    b) Reclamation, Corps, NRCS, and/or the Authority shall provide the Service's San Francisco Bay-Delta Fish and Wildlife Office Field Supervisor with a copy of the completed bill of sale and payment receipt upon the purchase of all credits purchased at Service-approved conservation/mitigation banks.
    c) Prior to each phase of development, the impact analysis shall be refined, coordinated with the Service, and mitigation requirements shall be based on the compensatory mitigation tables shown in ***Table 19***.
    d) Reclamation and the Authority shall ensure that mitigation precedes impacts associated with the Project by implementing the Mitigation Phasing Plan. The Authority shall not begin any phase of the Project until they have obtained written authorization from the Service following the Service's receipt of each Phase Authorization Package.

e) The following plans that are applicable to the standard consultation portion of the Project are referenced in the BA and the Authority has agreed to be responsible for preparing and/or implementing them. The plans identified are: Dewatering Plan; Water Storage and Release Operations Plan; Land Management Plan; Recreation Management Plan; Initial Reservoir Fill Plan; Emergency Action Plan; Worker Awareness Training; Storm Water Pollution Prevention Plan; Construction Monitoring Plan; Erosion and Sediment Control Plan; Spill Prevention, Containment, and Countermeasure Plan; Hazardous Materials Management Plan; Relocation Plan for the Giant Garter Snake; Relocation Plan for Western Spadefoot; Relocation Plan for Northwestern Pond Turtle; Species Management Plan; Construction Phasing Plan; Mitigation Phasing Plan; and Site-specific Management and Monitoring Plan(s) for mitigation sites. The plans shall be developed in coordination with the Service and a final copy shall be provided to the Service electronically, and upon request information related to the implementation of these plans shall be provided to the Service.

2) The following Terms and Conditions implement Reasonable and Prudent Measure 2:
   a) Reclamation and/or the Authority shall submit Project compliance reporting prepared by the on-site biological monitor to the San Francisco Bay-Delta Fish and Wildlife Office on a quarterly basis every year unless stated otherwise in writing by the Service. This report shall detail: (1) dates that work occurred, (2) pertinent information concerning the success of the project in meeting the avoidance and minimization measures, (3) an explanation of failure to meet such measures, if any, (4) known project effects to listed species or their habitats, if any, (5) occurrences of incidental take of listed species, if any, (6) documentation of employee environmental education, and (7) other pertinent information.
   b) For each discrete activity (e.g., geotechnical exploration, construction, recreation, and inundation), after designs are completed but before commencement of ground disturbance, Reclamation and/or the Authority shall submit to the Service a pre-activity accounting of the actual amount of listed species habitat which will be temporarily and permanently affected by that phase of the Project (e.g., an exercise of providing the Service with post ground truthed information). This includes but is not limited to acreages of species habitats (upland and/or aquatic) and numbers of individuals or host plant counts.
   c) Within one year of the issuance of this BiOp, Reclamation and the Authority shall develop a tracking mechanism in coordination with the Service to track impacts to giant garter snake, monarch butterfly, northwestern pond turtle, western spadefoot, valley elderberry longhorn beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp. This Service-approved tracker shall be used to track compliance with the ITS.
   d) For each discrete activity (e.g., geotechnical exploration, construction, recreation, survey, and inundation), as an activity nears reaching 80 percent completion of its authorized take, Reclamation and the Authority shall meet with the Service to identify if reinitiation of consultation is warranted.
3) The following Terms and Conditions implement Reasonable and Prudent Measure 3:
   a) Detailed survey protocols for implementing activities described herein shall be developed and shared with the Service upon request.

b) If a listed species is suspected of being injured by Project activities or by handling, the Project Biologist shall contact the Assistant Field Supervisor of the San Francisco Bay-Delta Fish and Wildlife Office at (916) 930-2658 within one business day. The Authority shall coordinate with animal care centers and report back to the Service as to which care centers will be utilized for species injured from implementing the Project. Injured animals shall be transported to a Service-approved center for treatment by a licensed veterinarian as soon as possible. Confirmation from a Service biologist is not necessary before transporting the animal for treatment. Reclamation, Corps, NRCS, and/or the Authority shall coordinate with the Service on procedures for releasing a recovered animal, if release is deemed appropriate by the attending veterinarian.

4) The following Terms and Conditions implement Reasonable and Prudent Measure 4:
   a) Service personnel shall be allowed to access work sites in order to ensure the Project, including the conservation measures, are being implemented as described in this BiOp.
5) The following Terms and Conditions implement Reasonable and Prudent Measure 5:
   a) In order to monitor whether the amount or extent of incidental take anticipated from implementation of the proposed Project is approached or exceeded, the Reclamation, Corps, and/or NRCS shall adhere to the following reporting requirements: Should the extent of incidental take exceed 80 percent, Reclamation, Corps, NRCS, or the Authority shall meet with Service to discuss if reinitiation may be warranted. Should the anticipated amount or extent of take be exceeded, Reclamation, Corps, or NRCS must immediately reinitiate formal consultation, as per 50 CFR §402.16.
   b) The Authority shall convene technical teams with the Service and Reclamation at least twice per year to review progress on Project planning and implementation activities. These meetings shall address topics such as mitigation measure performance, quarterly reporting, facility design, and other elements related to compliance with this BiOp. The Service reserves the right to adjust the timing and frequency of compliance inspections based on information gathered from technical team meetings and quarterly compliance reports. For example, if issues arise with the implementation of conservation measures, the Service may determine that more frequent meetings are needed for a certain period to ensure those measures are achieving the intended performance outcomes.
   c) The Authority shall submit the final designs for the facilities being constructed under this BiOp to the Service at the 30 percent, 60 percent, and 90 percent design stages.
   d) Following the issuance of this BiOp, the Authority, Reclamation, and the Service shall meet to develop a reporting template that will guide the quarterly and annual reports that include incidental take. This template will ensure that the relevant information the Service requires is included. To improve reporting efficiency, the reports may align with other reporting requirements, and, with prior written approval, the due dates for these reports may be adjusted to coincide with those other efforts.

18.2 Reporting Requirements

Pursuant to 50 CFR 402.14(i)(3), Reclamation, Corps, NRCS, or the Authority must report the progress of the action and its impact on the species to the Service as specified in this incidental take statement. The Authority shall estimate incidental take and habitat impacts for each project phase when reviewing projects for consistency with this BiOp, and shall communicate those estimates to the Service using a Service-approved reporting template. The Authority shall use an internal tracking mechanism to ensure incidental take is not exceeded. Reclamation shall monitor the progress of the action by reviewing the annual report and Reclamation and/or the Authority shall submit an annual report to the Service that contains an updated accounting of the take that is estimated to occur in upcoming projects, and that have occurred following the completion of projects (post-construction reports). Quarterly reporting identified in the *Terms and Conditions* above will assist in gathering information to complete the annual report.

Reclamation and/or the Authority must submit the annual report to the Service's San Francisco Bay-Delta Fish and Wildlife Office via electronic mail by a date annually as agreed up by Reclamation, the Authority, and the Service. An annual submittal date will be determined in coordination between Reclamation, the Authority, and the Service that aligns with the other regulatory reporting requirements being undertaken by the Authority to comply with other regulations. Reports must be sent to the Assistant Field Supervisor of the Watershed Planning Division and must describe all activities that were conducted under this BiOp, including activities and conservation measures that were described in the Proposed Action and required under the *Terms and Conditions*, and discuss any problems that were encountered in implementing conservation measures or *Terms and Conditions* and any other pertinent information. Reports must also include the Service's file number for this BiOp (2024-0125050-S7-001).

18.3 Salvage and Disposition of Individuals

Injured giant garter snake, pond turtle, or western spadefoot individuals must be cared for by a licensed veterinarian or other qualified person(s), such as a Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact persons are the Assistant Field Supervisor of the Watershed Planning Division at (916) 930-2658.

19. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a Proposed Action on listed species or critical habitat, to

help implement recovery plans, or to develop information. The Service recommends the following actions:

1) The Service recommends that Reclamation, Corps, NRCS, and the Authority fill out and submit CNDDB field survey forms for all rare or sensitive species observed during this Project. For instructions on how to submit data, refer to https://wildlife.ca.gov/Data/CNDDB/Submitting-Data.

2) The Service recommends that Reclamation, the Corps, and NRCS participate in recovery planning and implementation of conservation actions consistent with active recovery planning documents and recovery planning under development.

3) Periodically evaluate mitigation outcomes across projects to refine best practices and information future decision-making.

4) Evaluate mitigation sites for long-term viability under projected climate change scenarios to ensure sustainable conservation outcomes.

5) Define measurable performance standards (e.g., habitat function, species presence) for all compensatory mitigation projects to assess ecological success effectively.

6) Involve local communities and tribes early in planning to incorporate traditional knowledge and enhance local stewardship.

7) Foster partnerships with other agencies and entities to align mitigation efforts and reduce duplication or conflict.

8) The Service recommends that Reclamation, the Corps, and NRCS evaluate and enhance existing protocols to reduce impacts on vernal pool complexes and associated branchiopods during relocation efforts. Similarly, the Service encourages advancement of methods for transplanting milkweeds and nectar plants, or identifying suitable alternatives, to minimize effects on monarch butterfly host plants.

9) To benefit the vernal pool fairy shrimp and vernal pool tadpole shrimp, Reclamation and the Authority should consider avoiding further fragmentation of vernal pool landscapes, restoring natural hydrology where feasible, and managing sites for native vernal pool vegetation.

10) In support of monarch butterfly conservation, the agencies are encouraged to plant native milkweed and regionally appropriate nectar sources in non-operational or mitigation lands and along rights-of-way. Use of herbicides and insecticides should be avoided and minimized in these areas to reduce harm to pollinators.

11) To improve conservation outcomes, the agencies are encouraged to collaborate with the Service and local conservation partners on species and habitat monitoring efforts, data sharing, and adaptive management approaches that respond to observed trends.

12) In areas managed or influenced by the agencies, implement control programs for invasive species (e.g., bullfrogs, non-native fish, invasive plants) that degrade habitat quality for listed species.

13) Educational signs can be a helpful tool for informing the public about recreation's impacts on the northwestern pond turtle and how to minimize those impacts. Signs can be included to minimize noise and disturbance from recreation activities such as hiking, boating, and cycling, etc. and to make the public aware of northwestern pond turtle at recreation sites to avoid disturbance of northwestern pond turtle. Please work with your local Service field office to determine if signage is advisable, and to develop appropriate signage for northwestern pond turtle in your area.

14) To reduce the risk of northwestern pond turtle getting killed on roads, install wildlife safe passage features (e.g., culverts, overcrossings, directional fencing) under a Service-approved plan.

15) Design and construct the transmission line in compliance with the Avian Power Line Interaction Committee (APLIC) guidance to reduce impacts on avian species.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

20. REINITIATION — CLOSING STATEMENT

This concludes formal consultation and conference on the Sites Reservoir Project. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the monarch butterfly, northwestern pond turtle, or western spadefoot is listed. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the proposed project and no further section 7 consultation will be necessary. As provided in 50 CFR §402.16,

(a) Reinitiation of consultation is required and shall be requested by the federal agency, where discretionary federal involvement or control over the action has been retained or is authorized by law and:

(1) If the amount or extent of taking specified in the incidental take statement is exceeded;

(2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the BiOp or written concurrence; or

(4) If a new species is listed or critical habitat designated that may be affected by the identified action.

(b) An agency shall not be required to reinitiate consultation after the approval of a land management plan prepared pursuant to 43 U.S.C. 1712 or 16 U.S.C. 1604 upon listing of a new species or designation of new critical habitat if the land management plan has been adopted by the agency as of the date of listing or designation, provided that any authorized actions that may affect the newly listed species or designated critical habitat will be addressed through a separate action-specific consultation. This exception to reinitiation of consultation shall not apply to those land management plans prepared pursuant to 16 U.S.C. 1604 if:

(1) Fifteen years have passed since the date the agency adopted the land management plan prepared pursuant to 16 U.S.C. 1604; and

(2) Five years have passed since the enactment of Public Law 115-141 [March 23, 2018] or the date of the listing of a species or the designation of critical habitat, whichever is later.

The incidental take statement provided in this conference opinion for monarch butterfly, northwestern pond turtle, and western spadefoot does not become effective until the monarch butterfly, northwestern pond turtle, or western spadefoot is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the monarch butterfly, northwestern pond turtle, or western spadefoot has occurred or will occur. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the monarch butterfly, northwestern pond turtle, or western spadefoot may occur between the listing of species and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

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Appendix A. Sites Reservoir Project Effects Tracking Table

This lists all of the Proposed Action elements, the consultation type utilized for each element, and the species under our jurisdiction that may be affected by each element. If no species or critical habitat may be affected by a Proposed Action element, then "Not applicable" is used.

Proposed Action Element	Consultation Approach Type	Service Species and Critical Habitat That May Be Affected
Geotechnical Explorations		
Sites Reservoir	Standard	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
Funks Reservoir	Standard	monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
TRR and Pipeline	Standard	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
Ground Truthing, Biological Surveys, and Species Relocations (including Transplantings)		
Geotechnical Exploration, Construction, Recreation, and Inundation Footprints	Standard	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot
Construction		
Sites Reservoir	Standard	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot
Funks Reservoir	Standard	monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
Terminal Regulating Reservoir West	Standard	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot
Dunnigan Pipeline	Standard	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
GCID Headworks and RBPP	Standard	monarch butterfly, northwestern pond turtle, and valley elderberry longhorn beetle
Recreation		
Peninsula Hills Recreation Area	Standard	monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
Stone Corral Creek Recreation Area	Standard	monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
Day-Use Ramp and Parking Areas	Standard	monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot

Proposed Action Element	Consultation Approach Type	Service Species and Critical Habitat That May Be Affected
Inundation		
Sites Reservoir	Standard	monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot
Compensatory Mitigation (including Monitoring and Adaptive Management)		
On-Site Mitigation, Proponent-Responsible Mitigation, and Mitigation Banking	Framework Programmatic	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot
Operations and Maintenance Plans		
All Sites Reservoir Project Facilities/Structures	Framework Programmatic	giant garter snake, monarch butterfly, northwestern pond turtle, valley elderberry longhorn beetle, and western spadefoot

Appendix B. Sites Reservoir Project Footprints

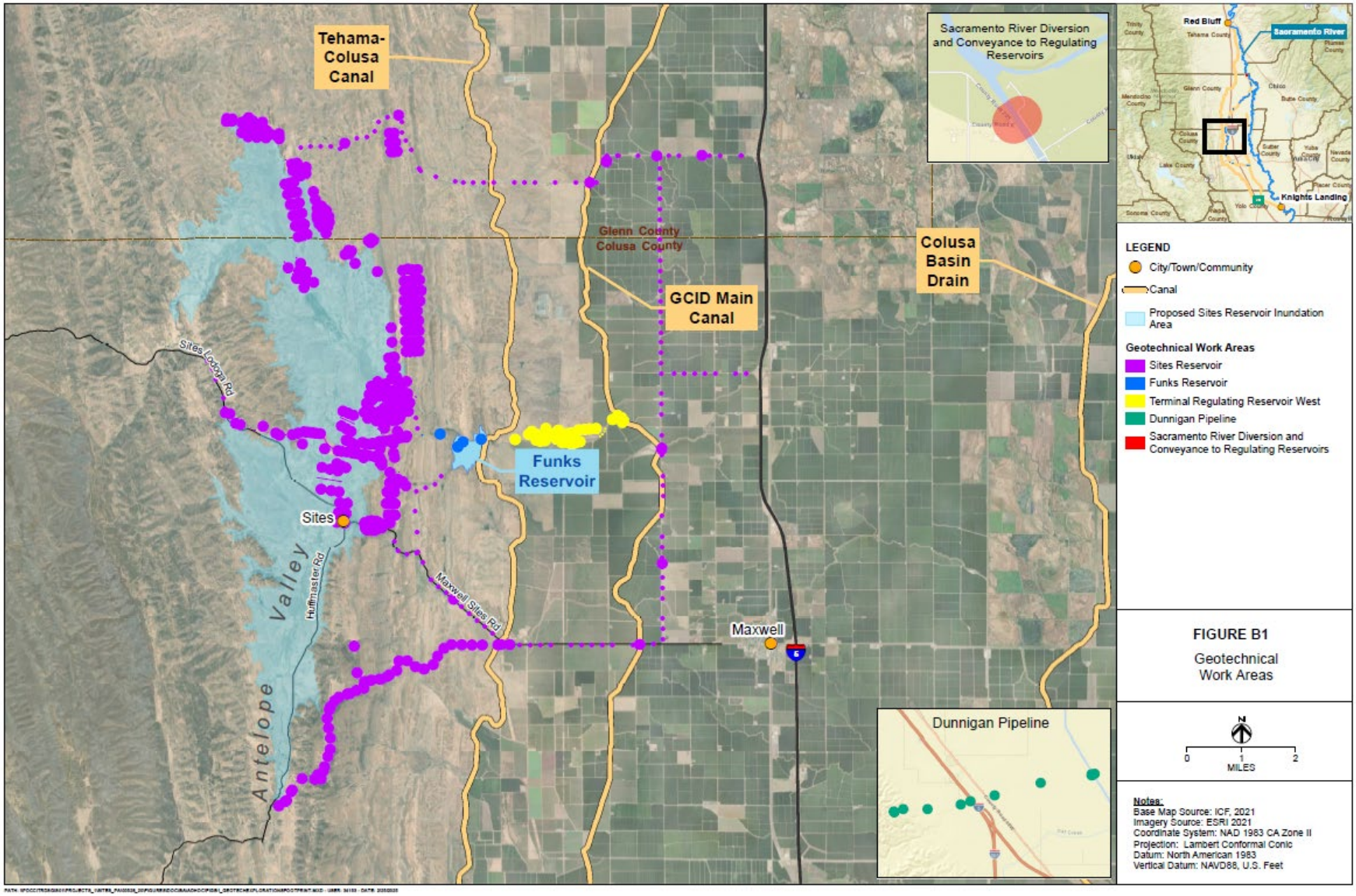

Figure B-1. Geotechnical Explorations Footprint for the Sites Reservoir Project.

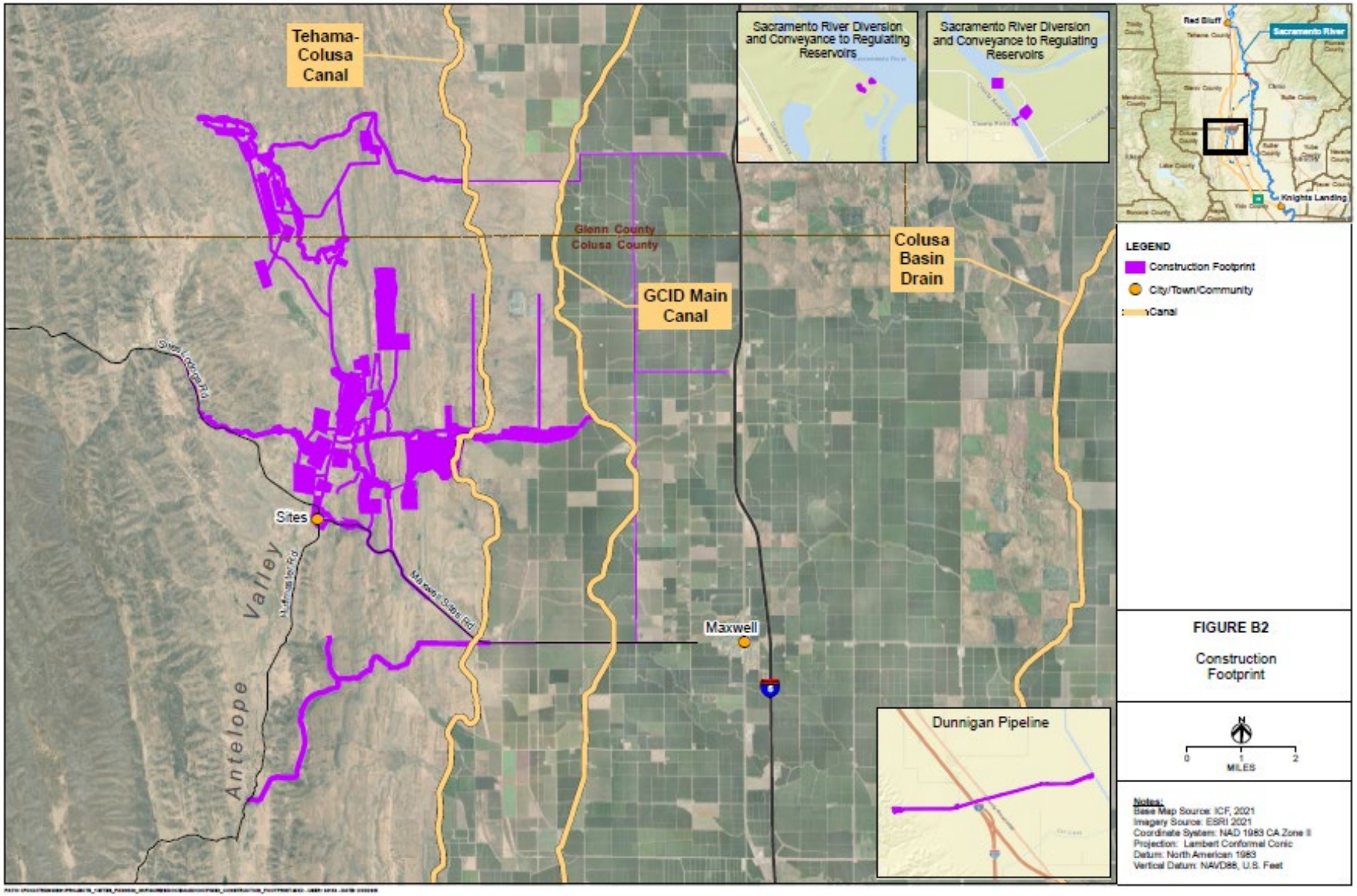

Figure B-2. Construction Footprint for the Sites Reservoir Project.

Figure B-3. Recreation Footprint for the Sites Reservoir Project.

Figure B-4. Inundation Footprint for the Sites Reservoir Project.