Chapter 10 Wildlife Resources

10.1 Introduction

This chapter describes the environmental setting, methods of analysis, and impact analysis for wildlife resources that would potentially be affected by the construction and operation of the Project. Wildlife resources addressed in this chapter are defined as special-status wildlife species (excluding fish) and the habitats on which they depend, nesting migratory birds, colonies of non-special-status roosting bats, and wildlife corridors.

The study area for wildlife resources consists of all areas where ground disturbance is planned under all Project alternatives plus a 300-foot-wide buffer area (Figure 9B-1 in Appendix 9B, *Vegetation and Wetland Methods and Information*). The 300-foot buffer was assessed for potential temporary direct impacts on wildlife resources. For some special-status and migratory birds, direct and indirect effects may exceed the 300-foot buffer. In these instances, survey areas and no-disturbance buffers identified in mitigation measures are extended to address a larger potential impact area based on the species biology or established guidance from wildlife agencies (i.e., California Department of Fish and Wildlife [CDFW] and U.S. Fish and Wildlife Service [USFWS]). For operational impacts only, the study area for wildlife resources also includes the Sacramento River between the RBPP and the Delta, Sutter Bypass, and Yolo Bypass. This area is referred to as the operations study area.

Tables 10-1a and 10-1b summarize the CEQA determinations and NEPA conclusions for construction and operation impacts, respectively, between alternatives that are described in the impact analysis.

Table 10-1a. Summary of Construction Impacts and Mitigation Measures for Wildlife Resources

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact WILD-1: Substantial adverse effect (i.e., loss or removal), either directly or through habitat modifications, on wildlife species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	**Mitigation Measure WILD-1.1**: Assess Habitat Suitability and Survey Suitable Habitat for Vernal Pool Branchiopods **Mitigation Measure WILD-1.2**: Avoid and Minimize Potential Effects on Vernal	SU/SA (golden eagle) LTSM/NE (other species)

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Pool Branchiopods and Western Spadefoot **Mitigation Measure WILD-1.3**: Compensate for Impacts on Occupied Vernal Pool Branchiopod Habitat **Mitigation Measure WILD-1.6**: Conduct Surveys for Suitable Valley Elderberry Longhorn Beetle Habitat **Mitigation Measure WILD-1.7**: Fence Elderberry Shrubs to be Protected **Mitigation Measure WILD-1.8**: Transplant Permanently Affected Elderberry Shrubs and Compensate for Loss of Valley Elderberry Longhorn Beetle and its Habitat **Mitigation Measure WILD-1.10**: Assess Habitat Suitability and Survey for Presence of Monarch Butterfly Nectar and Larval Host Plants **Mitigation Measure WILD-1.11**: Compensate for Loss of Monarch Butterfly Nectar and Larval Host Plants **Mitigation Measure WILD-1.12**: Assess Habitat Suitability and Survey for Presence of Crotch Bumble Bee and Western Bumble Bee Food Plants **Mitigation Measure WILD-1.13**: Compensate for Loss of Crotch Bumble Bee and Western Bumble Bee Habitat **Mitigation Measure WILD-1.14**: Assess Habitat Suitability and Survey Suitable Habitat for Western Spadefoot, California Red-legged Frog, and Western Pond Turtle **Mitigation Measure VEG-2.2**: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities **Mitigation Measure VEG-3.2**: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands **Mitigation Measure WILD-1.17**: Implement California Red-legged Frog Protective Measures	

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Mitigation Measure WILD-1.18: Compensate for Permanent and Temporary Losses of Occupied California Red-legged Frog Aquatic and Upland Habitats **Mitigation Measure WILD-1.19**: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Initial In-Water Work **Mitigation Measure VEG-3.1**: Avoid and Minimize Disturbance of Wetlands and Non-Wetland Waters During Construction Activities **Mitigation Measure VEG-3.3**: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Non-Wetland Waters **Mitigation Measure WILD-1.20**: Implement Protective Measures for Giant Gartersnake **Mitigation Measure WILD-1.21**: Compensate for Permanent and Temporary Losses of Giant Gartersnake Aquatic and Upland Habitats **Mitigation Measure WILD-1.22**: Conduct Vegetation Removal During the Non-Breeding Season of Nesting Migratory Birds **Mitigation Measure WILD-1.23**: Conduct Preconstruction Surveys for Non-Raptor Nesting Migratory Birds and Implement Protective Measures if Found **Mitigation Measure WILD-1.24**: Conduct Surveys for Western Burrowing Owl Prior to Construction and Implement Avoidance and Minimization Measures if Found **Mitigation Measure WILD-1.25**: Restore Temporarily Disturbed Habitat and Compensate for the Permanent Loss of Occupied Burrowing Owl Habitat **Mitigation Measure WILD-1.28**: Conduct Focused Surveys for Golden Eagle and Bald Eagle and Implement Protective Measures if Found	

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Mitigation Measure WILD-1.29: Compensate for the Loss of Eagle Nest Trees **Mitigation Measure VEG-4.1**: Avoid and Minimize Potential Adverse Effects on Oak Woodlands During Construction **Mitigation Measure VEG-4.2**: Compensate for Adverse Effects on Oak Woodlands **Mitigation Measure WILD-1.30**: Conduct Focused Surveys for Nesting Swainson's Hawk, White-tailed Kite, and Other Raptors Prior to Construction and Implement Protective Measures During Construction **Mitigation Measure WILD-1.31**: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk **Mitigation Measure AG-1.1**: Purchase Agricultural Conservation Easements to Preserve Regional Important Farmland **Mitigation Measure WILD-1.32**: Conduct Surveys and Implement Protection Measures for Special-Status Bat Species Prior to Building/Structure Demolition **Mitigation Measure WILD-1.33**: Conduct Surveys and Implement Protection Measures for Special-Status Bat Species Prior to Tree Trimming and Removal **Mitigation Measure WILD-1.34**: Compensate for Permanent Impacts on Occupied Roosting Habitat **Mitigation Measure WILD-1.35**: Implement Protective Measures to Avoid and Minimize Potential Impacts on American Badger	

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Alternative 2	S/SA	Same as Alternative 1, plus: **Mitigation Measure WILD-1.4**: Evaluate and Survey Potential Habitat for Antioch Dunes Anthicid and Sacramento Anthicid Beetles and Implement Protective Measures **Mitigation Measure WILD-1.5**: Compensate for the Loss of Occupied Antioch Dunes Anthicid and Sacramento Anthicid Beetle Habitat	SU/SA (golden eagle), LTSM/NE (other species)
Alternative 3	S/SA	Same as Alternative 1	SU/SA (golden eagle), LTSM/NE (other species)
Impact WILD-2: Substantial interference with the movement of a native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impediment of the use of native wildlife nursery sites			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	Same as for Impact WILD-1	SU/SA
Alternative 2	S/SA	Same as for Impact WILD-1	SU/SA
Alternative 3	S/SA	Same as Alternative 1	SU/SA
Impact WILD-3: Conflict with any local policies or ordinances protecting wildlife resources			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	Same as for Impacts WILD-1 and WILD-2	LTSM/NE
Alternative 2	S/SA	Same as for Impacts WILD-1 and WILD-2	LTSM/NE
Alternative 3	S/SA	Same as Alternative 1	LTSM/NE
Impact WILD-4: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	Same as for Impact WILD-1	LTSM/NE
Alternative 2	S/SA	Same as for Impact WILD-1	LTSM/NE
Alternative 3	S/SA	Same as Alternative 1	LTSM/NE

Notes:
NI = CEQA no impact
LTSM = CEQA less than significant with mitigation
S= CEQA significant impact
SU = CEQA significant and unavoidable
NE = NEPA no effect or no adverse effect
SA = NEPA substantial adverse effect

Table 10-1b. Summary of Operation Impacts and Mitigation Measures for Wildlife Resources

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact WILD-1: Substantial adverse effect (i.e., loss or removal), either directly or through habitat modifications, on wildlife species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	**Mitigation Measure WILD-1.9**: Protect Special-Status Invertebrates and Their Host and Food Plants from Herbicide and Pesticide Use **Mitigation Measure WILD-1.15**: Design and Construct Wildlife Crossings for New Roadways at Suitable Locations **Mitigation Measure WILD-1.16**: Monitor and Maintain Wildlife Crossings **Mitigation Measure WILD-1.26**: Protect Special-Status Wildlife from Rodenticide Use **Mitigation Measure WILD-1.27**: Construct Overhead Power Lines and Associated Equipment Following Suggested Practices to Reduce Bird Collisions with Power Lines	LTSM/NE
Alternative 2	S/SA	Same as Alternative 1	LTSM/NE
Alternative 3	S/SA	Same as Alternative 1	LTSM/NE
Impact WILD-2: Substantial interference with the movement of a native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impediment of the use of native wildlife nursery sites			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	Same as for Impact WILD-1	SU/SA
Alternative 2	S/SA	Same as Alternative 1	SU/SA
Alternative 3	S/SA	Same as Alternative 1	SU/SA
Impact WILD-3: Conflict with any local policies or ordinances protecting wildlife resources			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	Same as for Impacts WILD-1 and WILD-2	LTSM/NE
Alternative 2	S/SA	Same as Alternative 1	LTSM/NE
Alternative 3	S/SA	Same as Alternative 1	LTSM/NE
Impact WILD-4: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan			
No Project	NI/NE	-	NI/NE
Alternative 1	S/SA	Same as for Impact WILD-1	LTSM/NE
Alternative 2	S/SA	Same as Alternative 1	LTSM/NE

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Alternative 3	S/SA	Same as Alternative 1	LTSM/NE

Notes:
NI = CEQA no impact
LTSM = CEQA less than significant with mitigation
S= CEQA significant impact
SU = CEQA significant and unavoidable
NE = NEPA no effect or no adverse effect
SA = NEPA substantial adverse effect

10.2 Environmental Setting

This section presents the methods for assessing wildlife resources in the study area, describes the habitats and wildlife commonly associated with each land cover type in the study area, and discusses the federally and state listed special-status wildlife species identified as potentially present in the study area. Table 10A-1 in Appendix 10A, *Wildlife Species Lists, Special-Status Wildlife Table, and Non-Listed Wildlife Species Accounts*, includes the status, habitat requirements description, and likelihood of occurrence for the special-status species. Appendix 10A also provides species accounts for non-special-status wildlife species with moderate to high potential to occur in the study area. Appendix 10B, *Wildlife Habitat Models and Methods*, contains special-status species model descriptions.

10.2.1. Methods for Assessing Wildlife Resources in the Study Area

Potential wildlife resources in the study area were evaluated by reviewing existing information and identifying potentially suitable habitat with geographic information system (GIS) modeling. Limited access was obtained for geotechnical boring investigations for the Project, and focused bird surveys prior to geotechnical work were conducted in these specific locations in 2020 and 2021. Information from the January 2021 focused bird surveys conducted prior to geotechnical boring is reported in Appendix 10A. Property access restrictions precluded field surveys of wildlife resources in the remainder of the study area since the preparation of the 2017 Draft EIR/EIS (Chapter 3, *Environmental Analysis*). Previous surveys to characterize habitat and wildlife communities and for focused surveys for groups of wildlife species (i.e., amphibians and reptiles, birds, and mammals) were conducted from 1998 to 2004 and in 2010 to 2011 within study areas that vary from the Project study area. Because these survey data are 10 to 23 years old, other sources of data and habitat modeling were used to determine the potential presence of wildlife resources in the study area. The following information was reviewed.

- California Natural Diversity Database (CNDDB) search results for occurrences of special-status wildlife species (defined in Section 10.2.3, *Special-Status Wildlife Species*) within 5 miles of the study area (Appendix 9A, *Special-Status Plant Species*) (California Department of Fish and Wildlife 2021a), which encompasses a distance that reasonably includes special-status wildlife that may occur in the Project area.

- An unofficial endangered and threatened species list for the study area, obtained from the Information, Planning, and Consultation (IpaC) website (Appendix 9A) (U.S. Fish and Wildlife Service 2021).
- Historical and recent (i.e., 2020) aerial imagery of the study area in Google Earth Pro.
- Species distribution, habitat association, and habitat requirement information from numerous sources cited in this chapter and Appendices 10A and 10B.
- California Essential Habitat Connectivity Project (Spencer et al. 2010) and GIS habitat connectivity layers from 2019 in the online map viewer.
- Locations of special-status birds in eBird (Cornell Lab of Ornithology 2021).

Potentially suitable habitat for special-status wildlife species in the study area was determined based on scientific literature and GIS modeling. Available literature was reviewed to identify known habitat associations and habitat requirements for each species. Habitat requirements were then compared with the existing land cover types mapped in the study area, and a series of assumptions were made regarding which land cover types could provide potentially suitable habitat for each species based on its habitat requirements. The land cover types associations, model assumptions, and rationales are in the species model descriptions (Appendix 10B). Using the assumptions and rationales from the model descriptions, a list of potentially suitable land cover types was created for each species. The potentially suitable land cover types were then modeled using GIS software to identify areas of potential habitat for most species in the study area. Modeling using GIS software was not used to identify habitat for Antioch Dunes anthicid beetle (*Anthicus antiochensis*) and Sacramento anthicid beetle (*Anthicus sacramento*) because suitable habitat for these species is limited to areas along the Sacramento River and was assumed to be present in the limited Project footprint along the river. Because the models were limited in part by the accuracy of aerial imagery interpretation and the inability to field verify the land cover mapping, they generally overestimate the amount of potential habitat in the study area for one or more species (see species models description in Appendix 10B for more information). Special-status wildlife species with moderate to high potential to occur in the study area are assumed to be present in the Project area and may be affected by the Project.

10.2.2. Land Cover Types and Associated Common Wildlife Species

The study area and vicinity are predominantly vegetated by natural and agricultural vegetation. Aerial imagery interpretation was primarily used to map the land cover types in the study area. The land cover types identified in the study area are shown in Figure 9B-1 in Appendix 9B, *Vegetation and Wetland Methods and Information*, and are listed in Table 9B-1, which also provides acreage estimates for each type. All land cover type acreages are preliminary and subject to revision based on pedestrian surveys once access has been granted to the study area. The habitats and common wildlife associated with each land cover type are described below. Land cover types that special-status wildlife are associated with are discussed in Section 10.2.3, *Special-Status Wildlife Species*, and in Appendix 10A.

10.2.2.1. Annual Grassland

Annual grassland is the dominant land cover type in the study area. Annual grasslands are used by many wildlife species for foraging. Some of these species also inhabit annual grassland if

special features such as cliffs, caves, ponds, or woody plants are available for breeding or resting habitat, or as escape cover. Reptiles that occur in annual grassland habitats include western fence lizard (*Sceloporus occidentalis*), common gartersnake (*Thamnophis sirtalis*), and Northern Pacific rattlesnake (*Crotalus oreganus oreganus*). Grasslands provide foraging habitat for wide-ranging species such as red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), and American kestrel (*Falco sparverius*). Mammals typically found in this habitat include California vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), California ground squirrel (*Otospermophilus beecheyi*), black-tailed hare (*Lepus californicus*), and coyote (*Canis latrans*), (California Department of Fish and Wildlife 2021b). In addition, many species that nest or roost in open woodlands may forage in associated grasslands, including western bluebird (*Sialia mexicana*), western kingbird (*Tyrannus verticalis*), and some species of bats (Zeiner et al. 1990a:428, 510; 1990b).

10.2.2.2. Barren

The barren land cover type is characterized by areas where vegetation cannot grow. Barren was mapped in one location in the study area in a landslide on a hillslope where vegetation was not present. Because of the lack of vegetation, barren ground has a limited use by wildlife. However, some species, such as California horned lark (*Eremophila alpestris actia*), prefer areas with limited or very low-growing vegetation.

10.2.2.3. Blue Oak Woodland

The blue oak woodland vegetation community, dominated by blue oak (*Quercus douglasii*), is the most common land cover type in the low foothills of the western portion of the study area. Oak woodlands are important habitats because of their high value to wildlife in the form of nesting sites, cover, and food (California Department of Fish and Wildlife 2021b). Birds associated with oak woodlands include acorn woodpecker (*Melanerpes formicivorus*), California scrub jay (*Aphelocoma californica*), yellow-billed magpie (*Pica nuttalli*), and many warblers and flycatchers (Zeiner et al. 1990a:376, 452, 460). Cavities in oak trees are important nesting sites for acorn woodpecker, oak titmouse (*Baeolophus inornatus*), Bewick's wren (*Thryomanes bewickii*), and western bluebird (California Partners in Flight 2002:24). Oak woodlands provide nesting sites and/or foraging habitat for raptors, such as red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), and great-horned owl (*Bubo virginianus*) (Zeiner et al. 1990a:132, 136, 326; California Partners in Flight 2002:24). Mammals associated with oak woodlands include western gray squirrel (*Sciurus griseus*), bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), and gray fox (*Urocyon cinereoargenteus*) (Zeiner et al. 1990b:70, 146, 324, 352). Acorns are an important food source for species such as California quail (*Callipepla californica*), wild turkey (*Meleagris gallopavo*), western gray squirrel, and mule deer (California Department of Fish and Wildlife 2021b).

10.2.2.4. Canal

Canals occur throughout the lower elevation portions of the study area in agricultural areas. Canals, including the TC Canal, GCID Main Canal, and CBD, were defined as constructed channels used for irrigation that may be earth- or concrete-lined. Most canals are subject to ongoing maintenance, including vegetation removal. Wildlife use of canals depends on several factors, including the extent of vegetation in and along the canal, whether the canal is concrete lined, the period of time that water remains in the canal, and the velocity of flow. Concrete-lined

canals, or those with high flow velocities, typically have low value for wildlife, although large canals with slower flows can be used by waterfowl.

10.2.2.5. Chamise Chaparral

The chamise chaparral community is uncommon in the study area and is concentrated along South Road in the western portion where it is the dominant vegetation. Chaparral provides habitat for a variety of birds and mammals. Numerous rodents, deer, and other herbivores are common in chaparral communities. Rabbits and hares will eat twigs, evergreen leaves, and bark from chaparral in fall and winter when there is not an abundance of grasses. Shrubby vegetation provides mammals with cover and shade during hot weather and protection from wind in the winter. Chaparral provides seeds, fruits, insects, protection from predators and the weather, in addition to singing, roosting, and nesting sites for many species of birds (California Department of Fish and Wildlife 2021b). California quail, Bewick's wren, wrentit (*Chamaea fasciata*), California thrasher (*Toxostoma redivivum*), black-tailed hare, brush mouse (*Peromyscus boylii*), dusky-footed woodrat (*Neotoma fuscipes*), and black-tailed deer (*Odocoileus hemionus columbianus*) are common in chaparral habitats (Zeiner et al. 1990a:168, 492, 524, 532; 1990b:94, 230, 246, 352).

10.2.2.6. Developed

Developed areas are generally paved or covered with an impermeable substrate (i.e., asphalt, concrete). Structures in developed areas such as buildings, bridges, and culverts may provide suitable roosting habitat for bats or nesting habitat for birds. Roadways and other paved surfaces do not provide habitat for wildlife.

10.2.2.7. Disturbed

Disturbed areas are regularly compacted but still have a permeable surface (e.g., graveled roads). Because these areas are typically subject to disturbance from human activity on a regular basis, they provide low-quality habitat for wildlife. Wildlife species commonly found in urban areas are also found in disturbed areas. Such species may include Brewer's blackbird (*Euphagus cyanocephalus*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), yellow-billed magpie, mourning dove (*Zenaida macroura*), Virginia opossum (*Didelphus virginiana*), and striped skunk (*Mephitis mephitis*) (Zeiner et al. 1990a:310, 460, 646, 668, 682; Zeiner et al. 1990b:2, 316). American kestrel and red-tailed hawk frequently forage in this habitat (Zeiner et al. 1990a:136, 144). Killdeer (*Charadrius vociferus*) and lesser nighthawk (*Chordeiles acutipennis*) may nest in graveled areas (Zeiner et al. 1990a:192, 344).

10.2.2.8. Ditch

Ditches are defined as earth-lined, constructed channels used for irrigation or drainage, including roadside drainages, and are present throughout the study area in the lower elevation agricultural areas. Most ditches are subject to ongoing maintenance, including vegetation removal. Wildlife use of ditches is dependent on several factors including the extent of vegetation in and along the ditch, the period of time that water remains in the ditch, and the velocity of flow. Ditches with high flow velocities typically have low value for wildlife. Ditches with vegetation in the channel and along the banks and an adequate inundation period can provide food, water, cover, and dispersal corridors for various wildlife species such as Sierran treefrog (*Pseudacris sierra*), California newt (*Taricha torosa*), great egret (*Ardea alba*), raccoon (*Procyon lotor*), and striped

skunk. The banks of ditches could be used by California ground squirrel and western fence lizard.

10.2.2.9. Ephemeral Stream

Ephemeral streams occur throughout the Antelope Valley and surrounding hills. These unnamed features convey flows only during and immediately after rainfall events. Ephemeral streams provide temporary sources of water for several common wildlife species but do not provide breeding habitat for amphibians. The banks of the channels may be used by California ground squirrel, western fence lizard, and gopher snake (*Pituophis catenifer*).

10.2.2.10. Foothill Pine

Foothill pine occurs only in the western part of the study area along the South Road alignment. A large variety of wildlife species breed in foothill pine habitat, although no species is completely dependent on it for breeding, feeding, or cover. Most species utilizing this habitat breed during late winter and early spring (California Department of Fish and Wildlife 2021b). Blue oak-foothill pine woodland habitat provides forage opportunities for a variety of bird species that feed on acorns, bark, and foliage insects. Primary cavity-nesting birds (e.g., woodpeckers) excavate nest holes in living and dead trees, which are subsequently used by other cavity-nesting species such as American kestrel, white-breasted nuthatch (*Sitta carolinensis*), and western bluebird. Other species that may occur in this habitat include wild turkey, oak titmouse, and western gray squirrel (Zeiner et al. 1990a:144, 164, 472, 510; 1990b:146).

10.2.2.11. Forested Wetland

Forested wetlands (i.e., riparian forest) occur in one segment of Willow Creek (northeast of the city of Willows) and in segments of Antelope Creek, Stone Corral Creek, Grapevine Creek, Funks Creek, and unnamed intermittent streams that are tributary to these creeks, as well as at the edge of a pond southwest of Funks Reservoir. When the vegetation is diverse and well developed, riparian forest provides high value habitat for wildlife, including several special-status species. Riparian forest habitat provides food, water, and migration and dispersal corridors, as well as escape, nesting, and thermal cover for many wildlife species (California Department of Fish and Wildlife 2021b). Invertebrates, amphibians, and aquatic reptiles live in aquatic and adjacent upland habitats. Raptors, herons, egrets, and other birds nest in the upper canopy. A variety of songbirds use the shrub canopy, and cavity-nesting birds, such as Nuttall's woodpecker (*Picoides nuttallii*) and oak titmouse, occupy dying trees and snags (Zeiner et al. 1990a:388, 472). Several mammals including raccoon, Virginia opossum, and striped skunk are common in riparian forest habitats (Zeiner et al. 1990b:2, 298, 316).

10.2.2.12. Freshwater Marsh

Freshwater marsh occurs at the saturated edges of riparian vegetation, ponds (including Salt Lake), seasonal wetlands, Funks Reservoir, Stone Corral Creek, GCID Main Canal near the Sacramento River at the GCID head gate, and unnamed intermittent streams. Most irrigation ditches and agricultural field edges are regularly maintained, and freshwater marsh is infrequently in ditches. Freshwater marsh provides food, cover, and water for a variety of amphibians, reptiles, birds, and mammals (California Department of Fish and Wildlife 2021b). Wildlife species that use freshwater marsh habitat include Sierran treefrog (Zeiner et al. 1988:78), valley gartersnake (*Thamnophis sirtalis fitchi*) (Stebbins 2003:375), great blue heron

(*Ardea herodias*), great egret, Virginia rail (*Rallus limicola*), and red-winged blackbird (*Agelaius phoeniceus*) (Zeiner et al. 1990a:32, 34, 176, 638).

10.2.2.13. Hayfield

The largest areas of hayfields in the study area are located on the Antelope Valley floor. Alfalfa fields are included with this land cover type. Hayfield provides high-quality seasonal habitat for reptiles (e.g., gopher snake, California kingsnake [*Lampropeltis californiae*]), birds (e.g., blackbirds, doves, egrets, hawks, owls, waterfowl), and mammals (gophers, voles, deer, elk [*Cervus canadensis*], fox [*Vulpia* spp.]). However, when hayfields are harvested repeatedly, reproduction values for ground-nesting birds are reduced to zero. If rotational cropland is adjacent to hayfields, the hayfields can provide cover during seasonal disking and planting of the rotated fields (California Department of Fish and Wildlife 2021b). Alfalfa is also high-quality wildlife habitat because it provides nesting cover, abundant insects, and feeding opportunities throughout the year due to its perennial growth pattern. Many types of insects and vertebrate herbivores, such as gophers and rabbits, feed in alfalfa fields. The insect and vertebrate herbivores are then prey for songbirds, raptors, foxes, snakes, and lizards. Deer, pronghorn, and elk commonly feed in alfalfa fields, especially in times of drought, and raptors can be found hunting in alfalfa fields (Agronomy Research and Information Center 2021).

10.2.2.14. Intermittent Stream

There are numerous intermittent streams in the study area, including Willow Creek, Stone Corral Creek, Lurline Creek, Grapevine Creek, Wilson Creek, tributaries to these creeks, and many unnamed streams. Segments of Hunters Creek, Funks Creek, and Antelope Creek also have intermittent flows. Intermittent streams have the most water flow during the wet season and may contain pools that remain inundated into late summer. Intermittent streams have a more limited use by wildlife species than perennial streams because of their restricted flows. When flowing or when pools are present, these streams may provide sources of drinking water for birds and mammals and may provide movement corridors for some species of amphibians.

10.2.2.15. Managed Wetland

Managed wetlands in the study area include human-made wetlands in a mitigation area on the west side of the CBD. Wildlife species and habitat use for managed wetland are similar to those described for freshwater marsh.

10.2.2.16. Mixed Chaparral

Mixed chaparral is generally found in the western and southern portions of the study area at elevations ranging from 800–1,800 feet. Wildlife species and habitat use for mixed chaparral are similar to those described for chamise chaparral.

10.2.2.17. Oak Savanna

Oak savanna in the study area can be found on gently sloping hills and occasionally on terraces and valley floors. Wildlife species and habitat use for oak savanna are similar to those described for annual grassland and blue oak woodland.

10.2.2.18. Orchard

Orchards in the study area are located east of Funks Reservoir on the Central Valley floor. Orchards are typically planted on deep fertile soils that supported diverse and productive natural habitats in the past. Orchards can provide shade or water, if irrigated, for wildlife. Deer may browse on orchard trees. Orchards may provide cover and nesting sites for various species of birds including mourning dove and California quail. California ground squirrels may also feed on nuts in orchards. Birds that commonly feed on almonds and walnuts are northern flicker (*Colaptes auratus*), California scrub jay, American crow, oak titmouse, Brewer's blackbird, and house finch. Birds that frequently feed on orchard fruit include yellow-billed magpie, western bluebird, American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), cedar waxwing (*Bombycilla cedrorum*), and Bullock's oriole (*Icterus bullockii*) (California Department of Fish and Wildlife 2021b).

10.2.2.19. Ornamental Woodland

Ornamental woodlands in the study area are stands of nonnative trees that have been planted around buildings or agricultural lands. Ornamental woodland provides a location where animals can escape, nest, and obtain thermal cover. Common and special-status birds may perch or nest in stands of nonnative woodland. Common mammals such as raccoon, Virginia opossum, and striped skunk may take cover in nonnative woodland. Foliage-roosting bat species may roost in the foliage of nonnative woodland trees.

10.2.2.20. Perennial Stream

The Sacramento River is a perennial stream. Portions of several streams in the study area carry water year-round in some years, including a realigned segment Hunters Creek and Stone Corral Creek downstream of the confluence with Antelope Creek. Perennial streams with adjacent riparian or emergent wetland vegetation provide food, water, and migration and dispersal corridors, as well as escape, nesting, and thermal cover for a variety of wildlife and fish species. The open water areas of large rivers and creeks provide resting and escape cover for many species of waterfowl and other waterbirds. Insectivorous birds, such as swallows, swifts, and flycatchers catch insects over open water areas. The river shore and shallow water areas provide foraging opportunities for waterfowl, herons, and shorebirds (California Department of Fish and Wildlife 2021b). Other wildlife species that may use the riverine habitat and/or associated riparian habitat include western pond turtle (*Actinemys marmorata*) (Zeiner et al. 1988:100), river otter (*Lontra canadensis*), raccoon, and striped skunk (Zeiner et al. 1990b:298, 316, 318).

10.2.2.21. Pond

There are numerous ponds in the Antelope Valley and surrounding hills, as well as one detention basin in the Dunnigan Pipeline alignment. Ponds provide habitat for several species of amphibians including Sierran treefrog, California newt, and California toad (*Anaxyrus boreas halophilus*), as well as aquatic reptiles such as valley gartersnake. Freshwater marsh vegetation is commonly associated with ponds and provides cover habitat for these species, and may provide cover, resting, or breeding habitat for various bird species. Bats and insectivorous birds may drink from and forage over ponds, and other mammal species may use ponds as a source of water.

10.2.2.22. Reservoir

Funks Reservoir is the only reservoir in the study area. Reservoirs provide habitat for a variety of amphibians, reptiles, birds, and mammals for reproduction, food, water, or cover (California Department of Fish and Wildlife 2021b). Various species of ducks and geese inhabit reservoirs, and other birds such as herons and belted kingfishers (*Megaceryle alcyon*) forage along the water's edge. Many species of insectivorous birds, including barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), and black phoebe (*Sayornis nigricans*), catch their prey over open water (Zeiner et al. 1990a:416, 442, 444).

10.2.2.23. Rice

Rice is the most dominant agricultural type in the easternmost portion of the study area. Flooded rice fields provide freshwater wetlands for a variety of wetland-associated wildlife, including shorebirds, wading birds, and gulls (California Department of Fish and Wildlife 2021b). Wildlife species associated with flooded rice fields include great egret, white-faced ibis (*Plegadis chihi*), snow goose (*Chen caerulescens*), northern pintail (*Anas acuta*), black-necked stilt (*Himantopus mexicanus*), and greater yellowlegs (*Tringa melanoleuca*) (Zeiner et al. 1990a:34, 44, 52, 66, 198, 203).

10.2.2.24. Row Crops

Row crops are mostly scattered in the eastern portion of the study area on the valley floor. Agricultural lands (including row crops) are established on fertile soils that historically supported abundant wildlife. The quality of habitat for wildlife is greatly diminished when the land is converted to agricultural uses and is intensively managed. Many species of rodents and birds have adapted to agricultural lands, but they are often controlled by fencing, trapping, and poisoning to prevent excessive crop losses (California Department of Fish and Wildlife 2021b). Wildlife species that may be associated with row crops include mourning dove, American crow (*Corvus brachyrhynchos*), Brewer's blackbird, raptors, egrets, and rodents.

10.2.2.25. Ruderal

Ruderal areas are mostly scattered in the eastern portion of the study area on the valley floor. Ruderal refers to weedy or disturbed conditions including areas surrounding residences, out-buildings, and stockyards. Depending on the size and location of ruderal areas, wildlife use of ruderal areas is similar to those described above for annual grassland (larger ruderal areas or near other natural land cover types) or disturbed (smaller ruderal areas or near developed areas).

10.2.2.26. Scrub-Shrub Wetland

Scrub-shrub wetland is present along Willow Creek and Grapevine Creek (intermittent streams); perennial streams, including Sacramento River and portions of Stone Corral Creek and Funks Creek; Funks Reservoir; edges of ponds; and irrigation and drainage ditches with enough water supply to support woody vegetation. Scrub-shrub wetland provides cover, a place to escape, and nesting substrate for a variety of animals. Songbirds perch and nest in the woody vegetation and other birds such as red-winged blackbird and Virginia rail may use the emergent vegetation for cover and nesting (Zeiner et al. 1990a:176, 638). Because the vegetation in scrub-shrub wetlands is dependent on long-term sources of water, open water associated with scrub-shrub wetland provides habitat for amphibians and aquatic reptiles.

10.2.2.27. Seasonal Wetland

Seasonal wetlands occur throughout the study area in isolated depressions in annual grassland, as well as in association with other wetlands and non-wetland waters, such as freshwater marsh, ponds, and streams. Some of the seasonal wetlands in the study area would be considered vernal pools, because they have higher species diversity and support native or obligate-wetland species (California Department of Water Resources 2000). Several seasonal wetlands northwest of Funks Reservoir are alkali wetlands. Seasonal wetlands and vernal pools provide unique habitat for a variety of aquatic invertebrates that are food for other wildlife species, including great blue heron, killdeer, American avocet (*Recurvirostra americana*), black-necked stilt, and greater yellowlegs (Zeiner et al. 1990a:32, 192, 198, 200, 202). In addition, amphibians such as Sierran treefrog, and California toad use vernal pools and seasonal swales for breeding and feeding (Zeiner et al. 1988:56, 78).

10.2.2.28. Upland Riparian

Riparian vegetation in the study area is associated with intermittent and perennial stream corridors and floodplain terraces, although most of the riparian areas are narrow and degraded by cattle use. Well-developed, native riparian vegetation occurs in small remnant patches along foothill portions of the larger creeks in the study area. The largest concentration of riparian habitat is in the southern portion of the inundation area along Antelope Creek. One large stand of upland riparian also occurs along the Sacramento River at the end of the Dunnigan Pipeline alignment. Wildlife species and habitat use for upland riparian are similar to those described for forested wetland.

10.2.2.29. Vineyard

Small portions of two individual vineyards are located in the northern portion of the study area on the outer edges of the city of Willows and in the southern portion of the study area along the Dunnigan Pipeline alignment. Wildlife species and habitat use for vineyard are similar to those described for orchard and row crops.

10.2.3. Special-Status Wildlife Species

For the purpose of this chapter, special-status wildlife are animals that are legally protected under the Endangered Species Act (ESA), the California Endangered Species Act (CESA), or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing.

Special-status wildlife are those animals in any of the following categories:

- Species listed or proposed for listing as threatened or endangered under ESA (50 Code of Federal Regulations [CFR] 17.11 [listed animals] and various notices in the Federal Register [FR] [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (85 FR 73164 [November 16, 2020]).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations 670.5).

- Animal species of special concern identified on the Special Animals List by CDFW (California Department of Fish and Wildlife 2021c).
- Animals fully protected in California (California Fish and Game Code Section 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).
- Animals that are considered biologically rare, very restricted in distribution, or declining throughout their range, as determined by the scientific community (such as the Western Bat Working Group) and/or identified on the CDFW Special Animals List (California Department of Fish and Wildlife 2021c).

While migratory birds are not considered special status, their occupied nests and eggs are protected by the California Fish and Game Code Sections 3503 and 3503.5 and the Migratory Bird Treaty Act. Migratory birds have the potential to nest throughout the study area and potential impacts on nesting migratory birds are addressed in Section 10.4, *Impact Analysis and Mitigation Measures*.

As described in Appendix 10A, wildlife biologists used the CNDDB to search for records in the Project area and the area within 5 miles of the Project (California Department of Fish and Wildlife 2021a) and the IpaC species list (U.S. Fish and Wildlife Service 2021) to determine which special-status wildlife species should be considered for analysis. The species evaluated included those that would be considered rare under CEQA based on being biologically rare, very restricted in distribution, or declining throughout their range, as determined by the scientific community (such as the Western Bat Working Group) and/or identified on the CDFW Special Animals List (California Department of Fish and Wildlife 2021c). Special-status wildlife recommended for consideration by CDFW staff were also considered. A total of 42 special-status wildlife species were evaluated for their potential to occur in the study area (Table 10A-1 in Appendix 10A).

Based on a review of species distribution, habitat requirements, and land cover types in the study area (Figure 9B-1 in Appendix 9B), nine of the 42 species are not expected to occur in the study area because it lacks suitable habitat for the species or is outside the species' known range. Table 10A-1 provides an explanation for the absence of each of these species from the study area. These nine species are not addressed further. Federally listed, state-listed, and fully protected species (13 species) that have potential to occur in the study area are discussed below. Non-listed and non-fully-protected species (20 species) are discussed in Appendix 10A.

10.2.3.1. Conservancy Fairy Shrimp

Status and Distribution

Conservancy fairy shrimp (*Branchinecta conservatio*) is federally listed as endangered (59 FR 48136–48153). Historically, Conservancy fairy shrimp was probably found in suitable vernal pool habitats throughout much of the Central Valley and southern coastal regions of California (U.S. Fish and Wildlife Service 2005a:II-181). Except for one population along the Central Coast in Ventura County, all current locations of Conservancy fairy shrimp are in the Central Valley (U.S. Fish and Wildlife Service 2012:3).

Habitat Requirements and Biology

Conservancy fairy shrimp primarily occurs in large turbid vernal pools (playa pools) that stay inundated for much longer than typical vernal pools, often into summer (Eriksen and Belk 1999:88, U.S. Fish and Wildlife Service 2012:3). Conservancy fairy shrimp has been found in vernal pools on a variety of landforms, geologic formations, and soil types (U.S. Fish and Wildlife Service 2005a:II-183) and within a wide elevation range (16 to 5,577 feet) (Eriksen and Belk 1999:88).

Similar to other vernal pool branchiopods, Conservancy fairy shrimp is adapted to the environmental conditions of its ephemeral vernal pool habitats. These adaptations include the ability of fairy shrimp cysts (eggs) to remain dormant in the soil when vernal pool habitats are dry. Fairy shrimp are also able to complete their lifecycle (from cyst hatching to reproducing) within the relatively short time period when vernal pools are inundated with water (U.S. Fish and Wildlife Service 2005a:II-195). Differences in the rate of maturation and reproduction of vernal pool branchiopods are thought to be the result of variations in water temperature (Helm 1998:134).

Occurrence in and Near the Study Area

There are no recorded occurrences of Conservancy fairy shrimp in the study area (California Department of Fish and Wildlife 2021a). There is one known occurrence of Conservancy fairy shrimp at the Sacramento National Wildlife Refuge, approximately 1.5 miles from the study area (California Department of Fish and Wildlife 2021a). Potentially suitable habitat for this species in the study area consists of the seasonal wetland and ditch land cover types when adjacent to or surrounded by annual grassland.

10.2.3.2. Vernal Pool Fairy Shrimp

Status and Distribution

Vernal pool fairy shrimp (*Branchinecta lynchi*) is federally listed as threatened (59 FR 48136–48153). Vernal pool fairy shrimp is known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California (U.S. Fish and Wildlife Service 2005a:II-192). The species is currently found in fragmented habitats across the Central Valley of California from Shasta County to Tulare and Kings Counties, in the central and southern Coast Ranges from Napa County to Los Angeles County, and inland in western Riverside County, California (U.S. Fish and Wildlife Service 2005a:II-193; 2007a:17).

Habitat Requirements and Biology

Vernal pool fairy shrimp commonly inhabit vernal pools or vernal pool-like habitats, typically in grassland landscapes. Most frequently, vernal pool fairy shrimp are found in vernal pools or vernal swales, in unplowed grasslands (Eng et al. 1990:257). Vernal pool fairy shrimp sometimes occur in other wetlands that provide habitat characteristics similar to those of vernal pools; these other wetlands include alkaline rain pools, rock outcrop pools, and some disturbed and constructed sites, including tire ruts, ditches, and puddles (59 FR 48136–48153; Eriksen and Belk 1999:93; Helm 1998:129–130; U.S. Fish and Wildlife Service 2007a:24, 58). Occupied habitats range in size from 6-square-foot puddles to pools exceeding 24 acres (Eriksen and Belk 1999:93). Vernal pool fairy shrimp is not found in riverine, marine, or other permanent waters

(U.S. Fish and Wildlife Service 2007a:4). Suitable pools must stay inundated long enough for the shrimp to complete their life cycle.

Vernal pool fairy shrimp mature very quickly and can have multiple clutches of eggs per lifespan (Eriksen and Belk 1999:93). In a study using large plastic pools to simulate natural vernal pools, Helm (1998:133) found that vernal pool fairy shrimp reached maturity in an average of 18 days following hatching and reproduced an average of 40 days after hatching. Differences in the rate of maturation and reproduction of vernal pool branchiopods are thought to be the result of variations in water temperature (Helm 1998:134).

Occurrence in and Near the Study Area

There are no recorded occurrences of vernal pool fairy shrimp in the study area (California Department of Fish and Wildlife 2021a). There are several records for vernal pool fairy shrimp occurrences at the Sacramento National Wildlife Refuge, approximately 2.75–3.75 miles from the study area. There are also records for occurrences near the RBPP, the closest being approximately 1.2 miles northwest of the pumping plant (California Department of Fish and Wildlife 2021a). Potentially suitable habitat for this species in the study area consists of the seasonal wetland and ditch land cover types when adjacent to or surrounded by annual grassland.

10.2.3.3. Vernal Pool Tadpole Shrimp

Status and Distribution

Vernal pool tadpole shrimp (*Lepidurus packardi*) is federally listed as endangered (59 FR 48136–48153). The historical range of vernal pool tadpole shrimp likely consisted of the Central Valley and Central Coast regions of California (U.S. Fish and Wildlife Service 2005a:II-204). Vernal pool tadpole shrimp presently occurs sporadically in the Central Valley from Shasta County to northwestern Tulare County and the San Francisco Bay area (U.S. Fish and Wildlife Service 2005a:II-204-205; 2007b:4).

Habitat Requirements and Biology

Vernal pool tadpole shrimp occurs in a variety of seasonal habitats, including vernal pools and other seasonal pools, ponded clay flats, roadside ditches, and stock ponds (Helm 1998:132; Rogers 2001:1002). Habitats where vernal pool tadpole shrimp have been observed range in size from small (less than 25 square feet), clear, vegetated vernal pools to large (more than 80 acres) winter lakes (Helm 1998:133). Vernal pool tadpole shrimp produce cysts (eggs) that lie in the soil until the next winter rains trigger the eggs to hatch (U.S. Fish and Wildlife Service 2007b:3).

In the laboratory, vernal pool tadpole shrimp eggs collected from dry pond sediments at the end of summer hatched in 17 days (Ahl 1991:137). In a study using large plastic pools to simulate natural vernal pools, Helm (1998:133) found that vernal pool tadpole shrimp reached maturity in an average of 38 days following hatching and reproduced an average of 54 days after hatching (Helm 1998:133). Differences in water temperature, which strongly effects the growth rates of aquatic invertebrates, may cause variation in rates of growth and maturation (U.S. Fish and Wildlife Service 2005a:II-206). Vernal pool tadpole shrimp can produce additional eggs during the wet season that hatch without going through a dormant period (Ahl 1991:137).

While vernal pool tadpole shrimp is adapted to seasonal habitats, it has a relatively long lifespan compared to other large branchiopods (U.S. Fish and Wildlife Service 2005a:II-206). In Helm's study (1998:133), vernal pool tadpole shrimp lived an average of 143 days. The long lifespan of vernal pool tadpole shrimp is attributed to its ability to tolerate drying pool conditions and warm water (Helm 1998:135).

Occurrence in and Near the Study Area

There are no recorded occurrences of vernal pool tadpole shrimp in the study area (California Department of Fish and Wildlife 2021a). There are several known occurrences of vernal pool tadpole shrimp at the Sacramento National Wildlife Refuge, approximately 1.25–3 miles from the study area (California Department of Fish and Wildlife 2021a). Potentially suitable habitat for this species in the study area consists of the seasonal wetland and ditch land cover types when adjacent to or surrounded by annual grassland.

10.2.3.4. Valley Elderberry Longhorn Beetle

Status and Distribution

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is federally listed as threatened. The current range of valley elderberry longhorn beetle consists of the Central Valley from approximately Shasta County south to to Fresno County. It includes the valley floor and lower foothills, with most beetle observations recorded at elevations below 500 feet (U.S. Fish and Wildlife Service 2017a).

Habitat Requirements and Biology

Valley elderberry longhorn beetle is found only in association with its host plant, elderberry (*Sambucus* spp.), which is commonly present in riparian forests and adjacent grasslands in the Central Valley (Barr 1991:4–5). Elderberry shrubs can also be present in non-riparian valley oak (*Quercus lobata*) and blue oak woodland habitats (U.S. Fish and Wildlife Service 2017a:5). 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 (U.S. Fish and Wildlife Service 2006a:5). Females lay their eggs in bark crevices or at the junction of stem and trunk or leaf petiole and stem (Barr 1991:4). After hatching, the larva burrows into the stem where it develops for 1–2 years and feeds on the pith in the center of the stem (Talley et al. 2007:1480). Before pupation, the larva creates an exit hole, plugs the hole with wood shavings, and returns to the pith to pupate.

After transforming into an adult, valley elderberry longhorn beetle emerges through the previously created exit hole (U.S. Fish and Wildlife Service 2017a:4). Exit holes are 0.3–0.4 inch wide (Barr 1991:5). Adult emergence, mating, and egg laying takes place in the spring and summer (March to July) (U.S. Fish and Wildlife Service 2017a:4). Adults feed on elderberry leaves and flowers (Talley et al. 2007:1480). Valley elderberry longhorn beetle abundance is associated with higher levels of nitrogen available in the pith of stressed elderberries (Talley et al. 2007:1480).

Occurrence in and Near the Study Area

There are numerous records for occurrences of valley elderberry longhorn beetle along the Sacramento River in the operations study area (California Department of Fish and Wildlife 2021a). Potentially suitable habitat for this species in the study area consists of upland riparian, scrub-shrub wetland, forested wetland, blue oak woodland, oak savanna, annual grassland, and ruderal land cover types.

10.2.3.5. California Red-legged Frog

Status and Distribution

California red-legged frog (*Rana draytonii*) is federally listed as threatened. The historical range of California red-legged frog extended along the coast from the vicinity of Mendocino in Mendocino County, California, and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Storer 1925:235–236; Jennings and Hayes 1985:95). The species is known from isolated locations in the Sierra Nevada and the North Coast and northern Transverse Ranges. It is locally abundant in portions of the San Francisco Bay area and along the Central Coast and is still present in Baja California, Mexico (69 FR 19622). California red-legged frog is believed to be extirpated from the floor of the Central Valley (U.S. Fish and Wildlife Service 2002:5). California red-legged frogs have been found at elevations that range from sea level to about 5,000 feet. Nearly all sightings have occurred below 3,500 feet (U.S. Fish and Wildlife Service 2002:1).

Habitat Requirements and Biology

California red-legged frog uses a variety of habitat types that include various aquatic systems, as well as riparian and upland habitats (U.S. Fish and Wildlife Service 2002:12). However, the frogs may complete their entire life cycle in a pond or other aquatic site that is suitable for all life stages (66 FR 14626). California red-legged frogs inhabit marshes, streams, lakes, ponds, and other, usually permanent, sources of water that have dense riparian vegetation (Stebbins 2003:225). Habitat generally consists of still or slow-moving water that is at least 2.5 feet deep and adjacent to shrubby riparian vegetation (willows [*Salix* spp.]) or tules [*Scirpus* sp.] and cattails [*Typha* sp.]) (Jennings and Hayes 1994:64). Although California red-legged frog can inhabit either intermittent or permanent streams or ponds, populations probably cannot be maintained in streams in which all surface water disappears (Jennings and Hayes 1994:64–65).

California red-legged frogs are highly aquatic and spend most of their lives in the riparian zone (Brode and Bury 1984:32). Adults may take refuge during dry periods in rodent holes or leaf litter in riparian habitats (U.S. Fish and Wildlife Service 2002:14). Adult California red-legged frogs have been observed using large cracks in the bottoms of dried ponds as refugia (Alvarez 2004:162). Although California red-legged frogs typically remain near streams or ponds, marked and radio-tagged frogs have been observed to move more than 2 miles through upland habitat. These movements are frequently made during wet weather and at night (U.S. Fish and Wildlife Service 2002:12–13.)

Aestivation habitat consists of riparian vegetation and landscape features within 300 feet of riparian vegetation that provide cover and moisture during the dry season including boulders,

rocks, organic debris (e.g., downed trees or logs), industrial debris, and agricultural features (e.g., drains, watering troughs, spring boxes, abandoned sheds, haystacks) (61 FR 25814).

California red-legged frogs breed from November through April and typically lay their eggs in clusters around aquatic vegetation (U.S. Fish and Wildlife Service 2002:16). Larvae typically undergo metamorphosis from July to September, 3.5 to 7 months after hatching (66 FR 14626), but larvae have been observed to take more than a year to complete metamorphosis in four counties on the Central Coast of California (Fellers et al. 2001:156).

Occurrence in and Near the Study Area

There are no recorded California red-legged frog occurrences within 5 miles of the study area (California Department of Fish and Wildlife 2021a). The closest reported occurrence is approximately 34 miles from the study area in Butte County (California Department of Fish and Wildlife 2021d). California red-legged frog was not found in the Sites Reservoir portion of the survey area during focused surveys for the species in 1997–1998 (Brown and Yip 2000:20). California red-legged frog is considered extirpated from the floor of the Central Valley (U.S. Fish and Wildlife Service 2002:5), which constitutes the portion of the study area generally east of Funks Reservoir (excluding the reservoir). Potentially suitable aquatic habitat for this species in the study area consists of freshwater marsh, perennial stream, intermittent stream, pond, and reservoir land cover types. Potentially suitable upland habitat in the study area consists of annual grassland, blue oak woodland, foothill pine, oak savanna, ruderal, forested wetland, ephemeral stream, scrub-shrub wetland, seasonal wetland, and upland riparian land cover types within 300 feet of aquatic habitat. Potentially suitable upland habitat land cover types within 1 mile of potentially suitable aquatic habitat land cover types in the study area are considered dispersal habitat for California red-legged frog.

10.2.3.6. Giant Gartersnake

Status and Distribution

Giant gartersnake (*Thamnophis gigas*) is federally listed as threatened and state listed as threatened. Giant gartersnake is endemic to the Sacramento and San Joaquin Valleys, where it is found in lowland areas (U.S. Fish and Wildlife Service 2015a:I-8). Historically, this species was found throughout the Central Valley from Butte County in the north to Kern County in the south. Giant gartersnake is presently known to occur only in nine discrete populations in Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Kings, Madera, Merced, Placer, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, Tulare, Yolo, and Yuba Counties (U.S. Fish and Wildlife Service 2015a:9, 11–12).

Habitat Requirements and Biology

Giant gartersnake inhabits marshes, ponds, sloughs, small lakes, low-gradient streams and other waterways, and agricultural wetlands, including irrigation and drainage canals, rice fields, and the adjacent uplands (U.S. Fish and Wildlife Service 2006b:3).

Suitable giant gartersnake 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) (U.S. Fish and Wildlife Service 2017b:I-3). Emergent and bankside vegetation that provides cover from predators and for thermoregulation are also required. Other components of suitable

aquatic habitat are basking sites with supportive vegetation (such as folded tule [*Schoenoplectus* spp.] clumps) adjacent to escape cover, upland refugia in locations that are not subject to recurrent flooding, and the absence of a continuous riparian canopy and large predatory fish (U.S. Fish and Wildlife Service 2017b:I-3).

Characteristics of suitable upland habitat are available bankside vegetation, such as cattail or tule; shelter that is more permanent in nature, such as bankside cracks and crevices, holes, or small mammal burrows; and banksides that are not subjected to overgrazing (U.S. Fish and Wildlife Service 2017b:I-3). Riparian woodland is generally considered unsuitable habitat because of the lack of basking sites, presence of excessive shade, and lack of prey (U.S. Fish and Wildlife Service 1999:22).

Small mammal burrows and other areas of cover above the flooding zone, such as riprap, are used for overwintering (generally October 1 through April 1). Overwintering snakes have been documented in burrows as far as 656 to 820 feet from the edge of summer aquatic habitat (U.S. Fish and Wildlife Service 2017b:I-3, I-5, I-6). Results of a U.S. Geological Survey (USGS) study indicate that giant gartersnakes utilize burrows in upland areas during their active period more than previously assumed (Halstead et al. 2015). The USGS study found that at least one-half of giant gartersnake activity during the active season occurs in terrestrial environments, although primarily within 33 feet of wetlands (Halstead et al. 2015). Nearly all (i.e., 90%) of the snakes were females that were in burrows within 66 feet of water during the active season (Halstead et al. 2015).

The breeding season extends from March through May. Females give birth to live young from summer to early fall. Giant gartersnake feeds primarily on small fish and amphibians (U.S. Fish and Wildlife Service 2017b:I-5, I-6).

Occurrence in and Near the Study Area

There are four records for occurrences of giant gartersnake in the study area and numerous occurrences of giant gartersnake recorded within 5 miles of the study area, including at the Sacramento National Wildlife Refuge, in other areas east of the inundation area, and at the east end of the Dunnigan Pipeline (California Department of Fish and Wildlife 2021a). Potentially suitable aquatic habitat for giant gartersnake in the study area consists of canal, ditch, freshwater marsh, managed wetland, pond, and rice land cover types. Suitable giant gartersnake upland habitat in the study area consists of annual grassland, disturbed, and ruderal land cover types within 200 feet of suitable aquatic habitat. Aquatic and upland habitats for giant gartersnake in the study area are east of the GCID Main Canal except for upland habitat within 200 feet west of GCID Main Canal; and east and west of the GCID Main Canal south of Stone Corral Creek.

10.2.3.7. Golden Eagle

Status and Distribution

Golden eagle (*Aquila chrysaetos*) is fully protected under the California Fish and Game Code and protected by the Bald and Golden Eagle Protection Act (BGEPA). Golden eagle is a year-round resident throughout much of California. The species does not breed in the center of the Central Valley but breeds in much of the rest of the state (Zeiner et al. 1990a:142, 143).

Habitat Requirements and Biology

Golden eagle inhabits nearly all terrestrial habitats of the western United States, except densely forested, densely populated, and agricultural areas (Katzner et al. 2020). Secluded, protected cliffs with overhanging ledges are usually preferred for nesting but large trees are also used for nesting and cover (Driscoll 2010:1, Hunt et al. 1999:4). Preferred territory sites include those that have a favorable nest site, a dependable food supply (medium to large mammals and birds), and broad expanses of open country for foraging. Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats (Johnsgard 1990:262). In the interior central Coast Ranges of California, golden eagles favor open grasslands and oak savanna, with lesser numbers in oak woodland and open shrublands. In the Diablo Range of California, all except a few pairs nest in trees in oak woodland and oak savanna habitats due to a lack of suitable rock outcrops or cliffs. Nest trees include several oak species (*Quercus* spp.), foothill pine (*Pinus sabiniana*), Coulter pine (*Pinus coulteri*), California bay laurel (*Umbellularia californica*), eucalyptus (*Eucalyptus* spp.), and western sycamore (*Platanus racemose*). Eagles will also nest on electrical transmission towers traversing grasslands (Hunt et al. 1999:13).

Grasslands, deserts, savannas, and early successional stages of forest and shrub habitats provide open foraging terrain for golden eagles (Zeiner et al. 1990a:142). Golden eagle preys on a variety of animal species, with mammals making up 80%–90% of its diet (Driscoll 2010:2). The golden eagle nesting season is generally late March through the end of August. In the Diablo Range of California, courtship behaviors have been observed in December and January (Katzner et al. 2020).

Occurrence in and Near the Study Area

Although there are no recorded occurrences of golden eagle in the study area or within 5 miles of the study area (California Department of Fish and Wildlife 2021a), there are numerous observations of individuals in the study area that are recorded in eBird (Cornell Lab of Ornithology 2021). Potentially suitable golden eagle nesting habitat in the study area consists of blue oak woodland, foothill pine, and oak savanna land cover types. Potentially suitable foraging habitat for golden eagle in the study area consists of annual grassland, oak savanna, mixed chaparral, ornamental woodland, and ruderal land cover types.

10.2.3.8. Bald Eagle

Status and Distribution

Bald eagle (*Haliaeetus leucocephalus*) is state listed as endangered, is fully protected under the California Fish and Game Code, and is protected under the BGEPA. Bald eagle is a permanent resident and uncommon winter migrant in California (California Department of Fish and Game 1999a).

Habitat Requirements and Biology

Bald eagle breeds at coastal areas, rivers, lakes, and reservoirs with forested shorelines or cliffs in northern California. Wintering bald eagles are associated with aquatic areas containing some open water for foraging. Bald eagle nests in trees in mature and old growth forests that have some habitat edge and are somewhat close (within 1.25 miles) to water with suitable foraging

opportunities. The average distance of bald eagle nests to human developments is 0.3 mile for most populations, which indicates a preference for nesting away from those areas. (Buehler 2020). Bald eagle will occasionally nest in riparian habitats, where nests are often in black cottonwoods (*Populus trichocarpa*) (Anthony et al. 1982:333). In California, ponderosa pine (*Pinus ponderosa*) and sugar pine (*Pinus lambertiana*) are the most frequently used tree species for nesting (Lehman 1979:13, Anthony et al. 1982:333). Where no large conifers are present, bald eagle will nest in deciduous trees such as oaks and cottonwoods (*Populus* spp.). Bald eagles build their nests in the upper canopy, generally selecting the largest trees in the area (Buehler 2020). The breeding season is February through July (Zeiner et al. 1990a:122).

Roost sites, like nest sites, are associated with aquatic foraging areas, but roost sites are farther from water than nest sites (Buehler 2020). Bald eagle is an opportunistic forager that takes live prey and scavenges carrion. Bald eagles hunt for live fish in shallow water but more frequently scavenge dead or dying fish. Bald eagle also eats other aquatic and terrestrial animals including waterfowl, muskrats (*Ondatra zibethicus*), raccoons, and small mammals (Buehler 2020; Jackman et al. 1999:87, 90–92; California Department of Fish and Game 1999a).

Occurrence in and Near the Study Area

Although there are no recorded occurrences of bald eagle in the study area (California Department of Fish and Wildlife 2021a), there is one known bald eagle occurrence at Sacramento National Wildlife Refuge, approximately 1.5 miles from the study area (California Department of Fish and Wildlife 2021a). Several bald eagles were observed by an ICF biologist at Funks Reservoir in January 2021 during focused bird surveys for geotechnical boring investigation locations. Potentially suitable habitat for this species in the study area consists of blue oak woodland, foothill pine, forested wetland, perennial stream, reservoir, and upland riparian land cover types.

10.2.3.9. Swainson's Hawk

Status and Distribution

Swainson's hawk (*Buteo swainsoni*) is state listed as threatened. The breeding range for Swainson's hawk in California consists of the extreme northeast portion of the state, the Sacramento and San Joaquin Valleys, valleys of the Sierra Nevada Range in Inyo and Mono Counties, and occasionally elsewhere in the state (Bechard et al. 2020). Swainson's hawks primarily winter in South America but some individuals winter in the Delta (Bechard et al. 2020).

Habitat Requirements and Biology

Swainson's hawks arrive in the Central Valley in March or April to establish nesting territories and breed (California Department of Fish and Wildlife 2016:5). They usually nest in large, mature trees. Most nest sites (87%) in the Central Valley are found in riparian habitats (Estep 1989:35), primarily because trees are more available there. Swainson's hawk also nests in mature roadside trees and in isolated trees in agricultural fields or pastures. The breeding season is from March through August (Estep 1989:12, 35). Nest sites are generally adjacent to, or within flying distance of, suitable foraging habitat and near large tracts of agricultural lands (California Department of Fish and Wildlife 2016:8).

Swainson's hawk forages in grasslands, grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Vineyards, orchards, rice, and cotton crops are generally unsuitable for foraging because of the density of the vegetation (California Department of Fish and Game 1992:41). Important land cover types for foraging are alfalfa and other irrigated hay crops, grain and row crops, fallow fields, dryland pasture, grassy ruderal lots, and annual grasslands (Swolgaard et al. 2008:192, 194; California Department of Fish and Wildlife 2016:7). In California, voles make up a large portion of Swainson's hawk's diet, but it will also eat ground squirrels, pocket gophers, and deer mice (*Peromyscus* spp.) (Bechard et al. 2020).

Occurrence in and Near the Study Area

There are numerous records for Swainson's hawk nest sites along the Sacramento River and other locations in the study area. Potentially suitable nesting habitat in the study area consists of blue oak woodland, forested wetland, oak savanna, ornamental woodland, and upland riparian land cover types. Isolated tree stands and solitary trees in agricultural fields or field borders or semi-developed areas were mapped as oak savanna or ornamental woodland and were included as potential nesting habitat in the habitat model, to the extent that they were mapped. Foraging habitat for Swainson's hawk in the study area consists of annual grassland, hayfield, managed wetland, oak savanna, row crops, ruderal, and seasonal wetland land cover types.

10.2.3.10. White-tailed Kite

Status and Distribution

White-tailed kite (*Elanus leucurus*) is fully protected under the California Fish and Game Code. In California, white-tailed kite occurs in coastal and valley lowlands (California Department of Fish and Game 2005).

Habitat Requirements and Biology

White-tailed kite nests in trees or shrubs in open grassland, agricultural, wetland, oak woodland, and savanna habitats (Dunk 2020). Habitat elements that influence nest site selection and nesting distribution include habitat structure (usually trees with a dense canopy) and prey abundance and availability (primarily the association with California vole), while the association with specific vegetation types (e.g., riparian, oak woodland, etc.) appears less important (Erichsen et al. 1996:165, 173; Dunk 2020). White-tailed kite nests have been documented in a variety of tree species, including oak, Fremont's cottonwood (*Populus fremontii*), willow, eucalyptus, box elder (*Acer negundo*), coast redwood (*Sequoia sempervirens*), ornamental trees including olive (*Olea* sp.) and pine (*Pinus* sp.), and in shrubs less than 10 feet tall (e.g., *Atriplex* sp. and *Baccharis* sp.) (Dixon et al. 1957:159; Erichsen et al. 1996:172; Dunk 2020). Nest trees appear to be selected based on structure and security, and thus typically have a dense canopy or are in a dense group of trees or large stands (more than 250 acres). White-tailed kites also nest in single isolated trees and, in the non-breeding season, communally roost in small stands of trees (Dunk 2020). The breeding season lasts from February through October and peaks between May and August (California Department of Fish and Game 2005).

White-tailed kites prefer grasslands, low shrubs, open woodlands, and cultivated areas for foraging (Dunk 2020). The foraging success of white-tailed kite is directly proportional to the abundance and composition of prey species (Erichsen et al. 1996:173), with rodents being the

main prey type (Dunk 2020; Mendelsohn and Jaksic 1989:8). Preferred foraging habitats are ungrazed grasslands, open woodlands, low shrubs, wetlands dominated by grasses, and fence rows and irrigation ditches with residual vegetation adjacent to grazed lands (Mendelsohn and Jaksic 1989:2, 8; Dunk 2020). In cultivated areas, alfalfa and sugar beet fields are preferred, as well as rice stubble fields in the spring (Erichsen et al. 1994:46; Erichsen et al. 1996:170).

Occurrence in and Near the Study Area

There are no recorded occurrences of white-tailed kite in the study area (California Department of Fish and Wildlife 2021a). There is one record for a white-tailed kite nest site approximately 2.5 miles south of the RBPP and one record for a nest site approximately 3 miles east of the southern portion of the inundation area (California Department of Fish and Wildlife 2021a). Potentially suitable nesting habitat in the study area consists of blue oak woodland, forested wetland, oak savanna, ornamental woodland, and upland riparian land cover types. Foraging habitat for white-tailed kite in the study area consists of annual grassland, hayfield, managed wetland, oak savanna, row crops, ruderal, and seasonal wetland land cover types.

10.2.3.11. Western Yellow-billed Cuckoo

Status and Distribution

The western distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is federally listed as threatened (79 FR 59992) and state listed as endangered (California Department of Fish and Wildlife 2021b). The breeding range of western yellow-billed cuckoo in California consists of isolated locations along the South Fork Kern River, lower Colorado River, and Sacramento River (Hughes 2015).

Habitat Requirements and Biology

Breeding western yellow-billed cuckoos are riparian obligates and nest almost exclusively in riparian woodland with native broadleaf trees and shrubs (Halterman et al. 2015:3). Suitable habitat has a tree or large-shrub component with a variable overstory canopy and an understory component (U.S. Fish and Wildlife Service 2019a:5, 6). The overstory of the riparian habitat typically includes cottonwood and willow trees (U.S. Fish and Wildlife Service 2019a:6). Nest sites are often in dense foliage, and nests are primarily in willow, Fremont's cottonwood, and mesquite (*Prosopis* sp.). Along the Sacramento River, nests have rarely been found in prune (*Prunus* sp.), English walnut (*Juglans regia*), and almond (*Prunus dulcis*) orchards (Laymon 1998:4). Cottonwoods are used extensively for foraging and are an important component of foraging habitat (78 FR 61634).

Western yellow-billed cuckoo requires large blocks of riparian habitat for breeding (78 FR 61633). Patch size was found to be the most important habitat variable to predict presence of western yellow-billed cuckoo on the Sacramento River (Girvetz and Greco 2009). Large patch sizes (50 to 100 acres, with a minimum width of 328 feet) are typically required for cuckoo occupancy (Riparian Habitat Joint Venture 2004).

Western populations of yellow-billed cuckoos form pairs in mid-June or later and breed from June to August, with a peak in mid-July to early August (Hughes 2015). Breeding is restricted to the middle of summer, presumably because of a seasonal peak in large insect abundance (Rosenberg et al. 1982). To accommodate this, development of young is very rapid with a

breeding cycle of 17 days from egg-laying to fledging of young (Hughes 2015). Western populations continue nesting through August, and up to three broods can be raised in a season if the prey base is sufficient. The birds begin their southbound migration in mid-August, and most have left the breeding grounds by mid-September (78 FR 61632).

Little is known about western yellow-billed cuckoo migratory habitat. Yellow-billed cuckoos may be found in a variety of vegetation types during migration, which suggests that the habitat needs of the cuckoo during migration are not as restricted as their habitat needs during the breeding season. Yellow-billed cuckoo may also be found in smaller riparian patches during migration than those in which it typically nests (78 FR 61634).

Occurrence in and Near the Study Area

There are numerous records for occurrences of western yellow-billed cuckoo along the Sacramento River in the operations study area (California Department of Fish and Wildlife 2021a). Potentially suitable western yellow-billed cuckoo habitat in the operations study area consists of forested wetland, scrub-shrub wetland, and upland riparian land cover types that are a minimum of 37 acres in size and have a minimum patch width of 328 feet and a maximum canopy gap width of 328 feet.

10.2.3.12. Bank Swallow

Status and Distribution

Bank swallow (*Riparia riparia*) is state listed as a threatened (California Department of Fish and Wildlife 2021b). The geographic range for bank swallow in California includes breeding in portions of the northern and central regions of the state where appropriate habitat exists. There are scattered colonies throughout northern California, but an estimated 70%–90% of the breeding population is along the Sacramento River and its tributaries. This species spends winters in Central and South America (Bank Swallow Technical Advisory Committee 2013:9–10) and breeds in California between approximately March and September (California Department of Fish and Game 1999b).

Habitat Requirements and Biology

Riparian, lake, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils provide suitable habitat for bank swallow (California Department of Fish and Game 1999b). Bank swallows typically establish colonies along eroded, vertical banks in river systems with friable alluvial soils. Nesting colonies are infrequently found in artificial sites, including sand quarries and road cuts (Bank Swallow Technical Advisory Committee 2013:12–13). Nesting sites are almost always near water (California Department of Fish and Game 1999b). In addition, riparian overbank vegetation appears to be an important habitat feature for bank swallow nesting, foraging, or both on the Sacramento River; a 10-year survey indicated that colonies were more strongly associated with native herbaceous/scrub and riparian forest habitat types, than with orchards (Garcia 2009:53, 55; Bank Swallow Technical Advisory Committee 2013:13). Nesting site selection is also based on attributes such as soil moisture, soil texture, orientation of the bank face, verticality of the bank face, and proximity to foraging areas (California Department of Fish and Game 1995:11).

Foraging habitat for bank swallow includes wetlands, open water, grasslands, riparian woodland, orchards, agricultural fields, shrub lands, and upland woodlands (Bank Swallow Technical Advisory Committee 2013:14, California Department of Fish and Game 1999b). This species typically forages within approximately 650 feet of nest sites but may forage up to 6 miles away (Garrison 1998:4). Bank swallows typically forage in flight on a wide variety of aerial and terrestrial soft-bodied insects including flies, bees, and beetles (Bank Swallow Technical Advisory Committee 2013:14, California Department of Fish and Game 1999b).

Bank swallow nests in colonies ranging in size from three to over 3,000. Females typically lay three to five eggs, and are thought to have one brood per season, but may have two. Peak egg-laying is between mid-April and mid-May, and most juveniles fledge by mid-July (Bank Swallow Technical Advisory Committee 2013:11–12).

Occurrence in and Near the Study Area

There are numerous CNDDB records for occurrences of bank swallow along the Sacramento River in the operations study area. The occurrences that are closest to construction areas are 0.2 mile from the RBPP and 0.4 mile from the GCID head gate structure, both along the Sacramento River (California Department of Fish and Wildlife 2021a). Potentially suitable bank swallow nesting habitat in the study area consists of portions of the Sacramento River with eroded, vertical banks. Potentially suitable bank swallow foraging habitat in the study area consists of annual grassland, blue oak woodland, barren, chamise chaparral, ephemeral stream, forested wetland, foothill pine, freshwater marsh, intermittent stream, mixed chaparral, oak savanna, perennial stream, pond, reservoir, scrub-shrub wetland, seasonal wetland, upland riparian, canal, disturbed, ditch, hayfield, managed wetland, orchard, ornamental woodland, reservoir, rice, row crops, ruderal, and vineyard land cover types.

10.2.3.13. Tricolored Blackbird

Status and Distribution

Tricolored blackbird (*Agelaius tricolor*) is state listed as threatened. Tricolored blackbird is a highly colonial species that is largely endemic to California. The historical tricolored blackbird breeding range in California included the Sacramento and San Joaquin Valleys, the foothills of the Sierra Nevada south to Kern County, the coastal slope from Sonoma County south to the Mexican border, and, sporadically, the Modoc Plateau. However, historical surveys did not include large areas of the species' currently known breeding range (Shuford and Gardali 2008:438). The species' overall range has not changed much since the mid-1930s (Beedy et al. 2020), though more recent surveys have documented additional local populations at the periphery of the range (e.g., as far north along the Pacific Coast as Humboldt County, and in the western Mojave desert), and new colony sites within the overall historical range (Shuford and Gardali 2008:439).

Habitat Requirements and Biology

Suitable tricolored blackbird breeding colony sites have open, accessible water; a protected nesting substrate, including either flooded, thorny, or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony. Tricolored blackbird breeding colonies occur in freshwater marshes dominated by tules and cattails, in

Himalayan blackberry (*Rubus armeniacus*), and in silage and grain fields (Beedy and Hamilton 1997:3–4). The breeding season is from early March to early August (Beedy et al. 2020).

Tricolored blackbird foraging habitats in all seasons include annual grasslands, dry seasonal pools, agricultural fields (such as large tracts of alfalfa with continuous mowing schedules, and recently tilled fields), cattle feedlots, and dairies. Tricolored blackbirds also forage occasionally in riparian scrub habitats and along marsh borders. Weed-free row crops and intensively managed vineyards and orchards do not serve as regular foraging sites. Most tricolored blackbirds forage within 3 miles of their colony sites but commute distances of up to 8 miles have been reported (Beedy and Hamilton 1997:5).

Occurrence in and Near the Study Area

There are two records for presumably extant tricolored blackbird colonies that overlap the study area; one is east of the inundation area and the other is east of the GCID system improvements area. There are more than 20 records for occurrences of tricolored blackbird colonies within 5 miles of the study area (California Department of Fish and Wildlife 2021a). Potentially suitable tricolored blackbird nesting habitat in the study area consists of freshwater marsh and managed wetland land cover types. Potentially suitable foraging habitat for tricolored blackbird in the study area consists of annual grassland, rice, row crops, and seasonal wetland land cover types within 3 miles of suitable nesting habitat. Ruderal areas are also considered suitable foraging habitat when adjacent to other suitable foraging habitat land cover types.

10.2.4. Wildlife Corridors

Suitable habitat is required for wildlife species to provide food, water, cover, and other elements for survival. Depending on the species, a variety of habitats may be used throughout the life cycle, including reproduction and dispersal. Local movement, migration, and dispersal patterns vary for different species, and may be an important part of individual and species survival. In California, development, including agriculture, urbanization, and transportation, has resulted in substantial habitat reduction and fragmentation that presents barriers to local movements and migration for many wildlife species. Development has also resulted in additional risk to wildlife when moving through these areas, including risk of vehicle strikes on roadways.

CDFW and the California Department of Transportation have identified existing habitat blocks and linkages within the state, as well as missing linkages, and developed strategies for preserving and enhancing wildlife linkages through the California Essential Habitat Connectivity Project (Spencer et al. 2010). Mapped natural landscape blocks are large areas of mostly intact and well-conserved natural areas, and essential connectivity areas are connections between these blocks that have been identified as high priority for maintaining and enhancing ecological connectivity. In the Central Valley region, the essential connectivity areas often connect existing reserves across lands with more roads, agriculture, and urbanization, which can constrain wildlife movements. According to California Essential Habitat Connectivity Project mapping, there are multiple natural landscape blocks, small natural areas, low priority linkages, and essential connectivity areas in and near the study area (Figure 10-1). In addition, CDFW's Areas of Conservation Emphasis viewer shows that portions of the study area are identified as "irreplaceable and essential corridors", "conservation planning linkages", and "connections with implementation flexibility" (Figure 10-2) (California Department of Fish and Wildlife 2018).

Figure 10-1. Wildlife Movement Corridors [FIGURE UNDER REVIEW – TO BE INCLUDED IN THE FINAL EIR/EIS]

Figure 10-2. Areas of Conservation Emphasis: Terrestrial Connectivity [FIGURE UNDER REVIEW – TO BE INCLUDED IN THE FINAL EIR/EIS]

Much of the study area is comprised of natural and agricultural land covers, and there is very little existing urban development to impede wildlife movement except for roadways and irrigation infrastructure (i.e., the TC Canal and GCID Canal). As described above and in Appendix 10A, *Wildlife Species Lists, Special-Status Wildlife Table, and Non-Listed Wildlife Species Accounts*, there is potential habitat for multiple special-status species in the study area that could be used for migration and dispersal. Non-listed wildlife such as deer, tule elk, bobcats, foxes, raccoons, skunks, squirrels, and various species of amphibians and reptiles could also use the study area for dispersal and migration.

10.3 Methods of Impact Analysis

The methods for analysis of impacts on wildlife resources are based on professional standards and information cited throughout this section. The key impacts were identified and evaluated based on the environmental characteristics of the study area and the expected magnitude, intensity, and duration of activities related to the construction and operation of the Project.

Direct impacts are those effects that would be caused by the Project and would occur at the same time and place. Filling of the reservoir is considered a direct impact, even though it would take time for the reservoir to be filled completely. Indirect impacts are those effects that are caused by the Project but would occur later in time (e.g., impacts from operations) or be farther from the Project but are reasonably foreseeable (e.g., impacts downstream of the Project). Direct and indirect impacts may be either permanent or temporary. Short-term temporary impacts on wildlife resources would occur when temporarily affected areas would be restored to preconstruction conditions within 1 year. Long-term temporary impacts would occur when impacts on wildlife resources would be temporary but would last between 1 and 5 years. Short-term temporary impacts are calculated as temporary impacts and long-term temporary impacts were calculated as permanent impacts in the impact analysis. The study area for wildlife resources includes a 300-foot-wide area beyond the permanent and temporary impact areas. For vernal pool branchiopods, the amount of modeled habitat within 250 feet of impact boundaries was estimated for potential impacts such as changes in hydrology that would indirectly but permanently affect modeled habitat. The additional 300-foot area was assessed for potential temporary direct impacts on wildlife resources. For some special-status birds and migratory birds, direct and indirect effects may exceed the 300-foot assessment buffer. In these instances, survey areas and no-disturbance buffers identified in mitigation measures are extended to address a larger potential impact area based on the species' biology or established guidance from wildlife agencies (i.e., CDFW and USFWS). For operational impacts only, the study area for wildlife resources also includes the Sacramento River between the RBPP and the Delta, the Sutter Bypass, and the Yolo Bypass (i.e., operations study area).

In general, permanent and temporary impacts on potential habitat for special-status species are overestimated because surveys to assess habitat suitability of land cover types could not be conducted in the study area due to access limitations. Consequently, the entirety of the land cover is considered affected even when specific habitat requirements may be absent (e.g., elderberry shrubs, which are host plants for valley elderberry longhorn beetle, in riparian land cover types).

Climate change is likely to alter temperature and hydrologic patterns in the Sacramento Valley. Heat waves are expected to become longer and affect larger areas, with higher daytime and nighttime temperatures and fewer cooling days. The Sacramento Valley will likely see increased precipitation during winter storms, more extreme floods, and greater floodplain vulnerability. On the dry extreme, the region will experience increased dryness and more extreme droughts. Changes in temperature and precipitation patterns and extremes could modify habitats and wildlife species compositions as some wildlife species become unable to survive in the new climate conditions. Climate change considerations and wildlife are discussed in Chapter 28, *Climate Change.*

10.3.1. Construction

As a result of the inability to access most of the study area because it is privately owned, direct permanent impacts on special-status wildlife and their habitats were assessed using the estimated amounts of modeled habitat (as described in Section 10.2.1, *Methods for Assessing Wildlife Resources in the Study Area*) that would be converted by Project construction. Construction impacts include both construction of facilities and filling of Sites Reservoir. Short-term (less than 1 year of disturbance) and long-term temporary (1 to 5 years of disturbance) impacts on habitat for wildlife species were calculated using the estimated acreages of land cover types that would be temporarily disturbed during Project construction based on the amount of time the land cover would be disturbed. One of the assumptions of the impact analysis was that the conditions on parcels of land surrounding the reservoir would be maintained similar to baseline conditions (e.g., as grazing lands).

Impacts on special-status wildlife habitats were calculated using GIS software. GIS data of the Project footprint and associated temporary impact areas were overlaid on the modeled species habitat (and in a few cases, land cover mapping data) to quantify the permanent and temporary impacts associated with the construction of the Project facilities. Impacts on individuals of special-status wildlife species were assumed if modeled habitat was affected. This approach is conservative and overestimates the potential effects. Once property access is obtained, surveys would be conducted to determine if suitable habitat and/or special-status wildlife are present in the study area. Special-status wildlife species identified as having moderate to high potential to occur in the study area (Table 10A-2 in Appendix 10A) were included in the impact analysis. The special-status wildlife species with low or no potential to occur in the study area were not included in the impact analysis because they are not expected to occur in the study area or be affected by the Project.

The following assumptions and alternative details regarding specific Project components were applied to the impact analysis for Alternatives 1, 2, and 3 unless otherwise stated:

- Installation of the two additional TC Canal diversion pumps at the RBPP would not affect any modeled habitat for special-status wildlife because construction would occur in the existing facility footprint. In addition, work would be short term. These activities would likely be conducted during winter because dewatering would be required and because it would be outside of the nesting bird season. No impacts are anticipated and this area is not considered further in this analysis.

- Staging areas for all Project components would be temporarily affected, unless a part of the Project footprint overlaps the staging area, where impacts would be considered permanent.
- Impacts from the north-south transmission line and the east-west transmission line would be primarily long-term temporary for installation of new high-voltage electrical transmission lines to power the regulating reservoirs. Only one of the two alignments described in Chapter 2, *Project Description and Alternatives*, would be constructed and the specific locations of the transmission lines are unknowns. Permanent impacts would result from new transmission line towers and an access road, which are assumed to be within annual grassland. Construction would include installation of up to 16 towers that are assumed to each have vegetation clearing within a 10-foot radius of the base, and an unpaved 15-foot-wide access road. Based on these specifications, approximately 5 acres of annual grassland would be permanently removed. The impact on the remaining area within the transmission line alignments would be considered long-term temporary and is overestimated because only one transmission line would be constructed.
- Quarries located outside the inundation area would be regraded and allowed to revegetate at the bottoms but would not return to pre-Project conditions and would be considered permanently affected.
- Offsite borrow areas or aggregate areas would be in existing active commercial facilities and are not part of the impact analysis for wildlife resources due to the ongoing activities at these locations.
- The reservoir would replace existing land cover types with open water and Alternative 1 or 3 would permanently flood a larger area (1.5 MAF) than Alternative 2 (1.3 MAF).
- The footprints for the Peninsula Hills, Stone Corral Creek, and day-use boat ramp/parking recreation areas represent the total area that could be used for recreation activities, but only a portion of each footprint would be permanently affected as a result of construction of campsites, parking areas, picnic areas, hiking trails, potable water sources, utility connections, kiosks (at Peninsula Hills and Stone Corral Creek Recreation Areas), and toilets. Therefore, permanent impacts from these facilities are overestimated in the impact analysis for wildlife resources.
- New road construction would result in the permanent loss of existing land cover types in the entire construction disturbance area, and improvements to existing roads would affect only the area to the edges of the rights-of-way. The exact locations of the realigned Huffmaster Road, new Comm Road South, and new South Road are not yet finalized. Corridors were used to identify the areas in which potential direct and indirect impacts would occur. For example, for South Road, a 400-foot-wide conceptual road alignment plus a 300-foot-wide buffer was identified to allow for design flexibility. Because the final realigned South Road location is unknown, the entire 700-foot-wide corridor was assumed to be permanently affected for the purpose of the impact analysis. Within the corridors, the actual permanent impact area would be only the footprint of roads and shoulders with additional temporarily affected areas for construction staging and equipment movement. Therefore, permanent impacts from these facilities are overestimated.

The Authority will implement the following BMPs, which are described in Appendix 2D, *Best Management Practices, Management Plans, and Technical Studies*, for all alternatives unless otherwise noted, and as such are incorporated into the analysis of potential construction impacts on wildlife resources.

- BMP-12, Development and Implementation of Stormwater Pollution Prevention Plan(s) (SWPPP) and Obtainment of Coverage under Stormwater Construction General Permit (Stormwater and Non-stormwater) (Water Quality Order No. 2022-0057-DWQ/NPDES No. CAS000002 and any amendments thereto), requires development and use of erosion control measures, sediment control measures, construction materials management measures, waste management measures, non-stormwater control measures, and postconstruction stormwater management measures to prevent the movement of sediment and contaminants into aquatic habitats.
- BMP-17, Implementation of Visual/Aesthetic Design, Construction, and Operation Practices, requires all construction lighting to be directional to minimize glare impacts to wildlife; requires permanent outdoor lighting to be limited to safety and security requirements, to be shielded to minimize offsite light spill and glare, and to be screened and directed away from adjacent uses to the highest degree possible to minimize lighting impacts on wildlife, such as exposure to predation and altering movement to avoid the light.
- BMP-13, Development and Implementation of Spill Prevention and Hazardous Materials Management/Accidental Spill Prevention, Containment, and Countermeasure Plans (SPCCPs) and Response Measures, requires site-specific plans with measures to minimize effects from spills of hazardous or petroleum substances during construction and operation/maintenance to prevent contamination of aquatic habitats.
- BMP-15, Performance of Site-Specific Drainage Evaluations, Design, and Implementation, requires professional hydrologists and civil engineers to evaluate and design water conveyance systems (e.g., ditches, curb and gutters, culverts) that are within 250 feet of seasonal wetlands to maintain the existing hydrology of the seasonal wetlands and ensure that contaminants from impervious surfaces are not channeled into seasonal wetlands.
- BMP-33, Implementation of a Worker Environmental Awareness Program (WEAP), requires training of all construction crews and contractors on protection and avoidance of biological, cultural, archaeological, paleontological, and other sensitive resources to make personnel aware of these resources and avoid impacts on sensitive biological resources.
- BMP-35, Development and Implementation of Construction Best Management Practices and Monitoring for Fish, Wildlife, and Plant Species Habitats, and Natural Communities, requires a construction monitoring plan for sensitive biological resources and in-water construction activities, construction monitoring by qualified biologists, use of exclusion fencing around sensitive biological resources to protect them from disturbance, limiting vehicle speeds to 15–20 miles per hour on unpaved roads to reduce the potential for vehicle strikes, and the following measures for construction personnel to protect wildlife.

  - Requiring trash to be removed from work sites daily to avoid attracting wildlife to the construction area.
  - Prohibiting firearms and pets in construction areas to prevent injury or mortality of wildlife.
  - Covering all trenches and holes at the end of each day and inspecting them prior to the start of work each day to prevent wildlife entrapment.
  - Prohibiting the use of netting for erosion control to prevent special-status wildlife from being entangled in the netting.
- BMP-37, Shading of Work Lighting for Nighttime Work (Alternative 2 Discharge Location on Sacramento River), requires work lights to be shaded to minimize illumination of water in order to minimize disturbance of wildlife species.

These BMPs would be implemented for Alternatives 1, 2, and 3 and would reduce direct and indirect impacts on special-status wildlife.

10.3.2. Operation

Operation of the Project would not involve additional earth-moving or substantial disturbance of new areas beyond those that would be disturbed during construction. Therefore, impact acreages from operation were not calculated for purpose of analysis of impacts on wildlife resources. The operation phase would include primarily changes in water diversions to Sites Reservoir, routine tasks to maintain the facilities after construction according to operations and maintenance plans that would be developed, scientific studies such as fish monitoring in the Sacramento River, and energy generation and use. Energy generation and use is not anticipated to affect wildlife resources.

Based on hydrologic modeling results and practical application of the North Delta Flow action, only minimal effects from operational water diversions would occur in most parts of the study area with respect to wildlife. Impacts in the Yolo Bypass were assessed qualitatively, based on the best available information. Details of hydrologic modeling results are described in Chapter 5 (*Surface Water Resources*), Chapter 7 (*Fluvial Geomorphology*), Chapter 11 (*Aquatic Biological Resources*), and Appendix 11M (*Yolo and Sutter Bypass Flow and Weir Spill Analysis*).

Maintenance would include vegetation control and grazing around all facilities, recreation areas, and a 100-foot buffer around the facilities. These activities would affect undeveloped land where special-status wildlife or their habitats could occur. Because public use of recreation areas could affect areas that support special-status wildlife or their habitats, impacts that could result during operation of recreation areas were considered.

The completion and implementation of a Land Management Plan (LMP), which is described in Section 2D.7, *Land Management Plan*, are incorporated into the analysis of potential operation impacts on wildlife resources. This plan would address management and maintenance activities on all non-recreation land resources held in fee or easement (including the Project buffer) by the Authority, including vegetation maintenance, invasive aquatic and plant control, and rodent control. The LMP would include general measures and practices when working in or near habitat

for special-status wildlife and specify when pre-activity surveys or monitoring would be required prior to or during maintenance activities.

Impacts that could result during operation of recreation areas were also considered because public use of recreation areas could affect special-status wildlife or their habitats. The development and implementation of a Recreation Management Plan, which is described in Section 2D.8, *Recreation Management Plan*, are incorporated into the impact analyses for wildlife resources. This plan would address management activities and specify where signs, fencing areas, or other deterrents to avoid or minimize human intrusion into habitat would be required on all Project recreation lands and areas.

10.3.3. Thresholds of Significance

An impact on wildlife resources would be considered significant if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any wildlife species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.
- Interfere substantially with the movement of a native resident or migratory wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting wildlife resources.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

10.4 Impact Analysis and Mitigation Measures

Impact WILD-1: Substantial adverse effect (i.e., loss or removal), either directly or through habitat modifications, on wildlife species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (*the following impact analysis is subdivided into lettered components, and special-status species are grouped together when they utilize the same land cover types or impacts are similar*)

Summary tables showing permanent and temporary impacts on modeled habitat for special-status species by alternative are included for each group of special-status wildlife discussed below. Appendix 10C, *Special-Status Wildlife Impacts Tables,* has detailed tables showing permanent and temporary impacts on modeled habitat for special-status species by Project component.

No Project

Under the No Project Alternative, no new Project facilities would be constructed or operated. As described in Section 10.2, *Environmental Setting*, special-status wildlife species and their habitats are known or have the potential to occur in the Project area. Because there would be no construction or operation of new Project facilities under the No Project Alternative, there would

be no temporary or permanent impacts on special-status wildlife or their habitats. In addition, under the No Project Alternative, the operation of existing facilities, such as TC Canal, RBPP, and GCID Main Canal, would continue. The owner/operators of these facilities would operate within the conditions and requirements of existing permits and agreements meant to protect special-status wildlife species. Finally, activities that currently occur within the study area such as grazing or other rural agricultural activities would continue and may result in effects on special-status wildlife species but would do so in the context of existing regulations, requirements, and activities.

Significance Determination

The No Project Alternative would not result in a substantial adverse effect, either directly or through habitat modifications, on special-status wildlife species. There would be no impact/no effect.

Alternatives 1, 2, and 3

The analyses of Project construction and operation impacts for special-status wildlife species are presented for individual species or groups of species if they utilize the same land cover types or impacts are similar. The analyses incorporate the BMPs in Section 10.3, *Methods of Impact Analysis*, the LMP, and the Recreation Management Plan that the Authority will implement to avoid and/or reduce potential impacts on special-status wildlife species. For example, construction workers would be trained on the importance of avoiding special-status wildlife and plant species (BMP-33), and fencing would be required around sensitive habitats that feasibly can be avoided during construction (BMP-35). BMP-35 would also restrict off-road driving in construction areas to prevent disturbance in, and damage to, habitats that would be avoided during construction (e.g., those adjacent to work areas or in activity exclusion zones). While these BMPs would avoid and/or reduce impacts during construction, they would not prevent the permanent loss of habitat or degradation of habitat, described further below by species, as a result of the construction of Alternative 1, 2, or 3. All land cover type acreages are preliminary and subject to revision based on pedestrian surveys once access has been granted to the study area.

Aquatic Invertebrates

Impact WILD-1a: Vernal Pool Branchiopods

The largest continuing threats to vernal pool branchiopods are habitat loss and modification of habitat from urban development and agricultural conversion (U.S. Fish and Wildlife Service 2007a:16, U.S. Fish and Wildlife Service 2007b:27).

Direct permanent and temporary impacts and indirect impacts on modeled habitat for Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp (i.e., vernal pool branchiopods) from Alternatives 1, 2, and 3 are shown in Table 10-2a.

Table 10-2a. Acreages of Permanent and Temporary Impacts on Modeled Special-Status Vernal Pool Branchiopod Habitat in the Study Area

	Alternatives 1 and 3 Permanent Impacts	Alternatives 1 and 3 Temporary Impacts	Alternatives 1 and 3 Indirect Impacts	Alternative 2 Permanent Impacts	Alternative 2 Temporary Impacts	Alternative 2 Indirect Impacts
Conservancy Shrimp, Vernal Pool Fairy Shrimp, and Vernal Pool Tadpole Shrimp	366	0	120	358	0	123

Alternatives 1 and 3

Modeled habitat for vernal pool branchiopods is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, and recreation areas.

Construction

Construction of Alternative 1 or 3 would result in permanent loss of modeled habitat for vernal pool branchiopods (Table 10-2a). Modeled habitat would also be lost when the reservoir is inundated. Clearing and grubbing, excavation, and other construction activities could result in individuals or cysts being crushed or buried by equipment. Spills or leaks of gasoline, oil, or other contaminants during construction could contaminate suitable habitat and cause illness or mortality of individuals.

Operation

Indirect effects on vernal pool branchiopods could occur during operation as a result of changes in topography, compaction of soils, and increases in surface runoff from the additional impervious surfaces associated with the new facilities. These changed conditions could modify the existing hydrologic regime of modeled vernal pool branchiopod habitat in or within 250 feet of affected areas (Table 10-2a). Changes in topography could result in additional water entering habitat or could interfere with existing hydrology of or water flow into occupied habitats, thereby increasing or reducing the amount of water entering habitat. Alterations in the length of the inundation period of habitat could affect vernal pool branchiopod reproduction. Changes in topography could also result in new or increased contaminants such as gasoline, oil, and herbicides entering vernal pool branchiopod habitat from adjacent new or widened roads, or new facilities, which could cause illness or mortality of individuals. The Authority would implement BMP-15, which will require professional hydrologists and civil engineers to evaluate and design water conveyance systems (e.g., ditches, curb and gutters, culverts) that are within 250 feet of seasonal wetlands to maintain the existing hydrology of the seasonal wetlands and ensure that contaminants from impervious surfaces are not channeled into seasonal wetlands.

Implementation of this BMP would avoid potential indirect effects on vernal pool branchiopod habitat from changes in hydrology and new or increased amounts of contaminants.

Impacts on vernal pool branchiopods from maintenance activities are not expected to occur because maintenance activities would be conducted mostly in previously disturbed areas using existing roadways. Any occupied vernal pools in or near maintenance areas would be protected from disturbance through implementation of measures and practices in the LMP.

Based on the habitat modeling, there is suitable vernal pool branchiopod habitat at the recreation areas, which would be used by visitors on a regular basis. There is potential for visitors to access undeveloped areas and disturb existing habitat (e.g., walk through habitat, increase trash). If vernal pool branchiopods were present in the modeled habitat, they could be crushed by visitors. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into vernal pool branchiopod habitat.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on vernal pool branchiopods from removal of suitable habitat and loss of individuals. Operational effects on vernal pool branchiopods would be avoided or minimized through implementation of BMP-15, the LMP, and the Recreation Management Plan, and would be less than significant. Construction impacts would be significant because implementation of Alternative 1 or 3 could reduce the local populations of federally listed vernal pool branchiopods through direct mortality and habitat loss.

Implementation of Mitigation Measures WILD-1.1, WILD-1.2, and WILD-1.3 would reduce the level of impact from construction and operation to less than significant because surveys would be conducted to determine occupancy, habitat disturbance would be avoided during the rainy season, the topsoil of vernal pools in permanent impact areas would be removed for use in habitat creation or restoration (if requested by USFWS), and compensation would be provided for impacts on occupied habitat. All modeled habitat would be evaluated, and suitable habitat would be surveyed for the presence of vernal pool branchiopods prior to construction. Direct and indirect impacts on occupied habitat would be mitigated through acquiring and protecting habitat in perpetuity or purchasing mitigation credits in accordance with mitigation ratios and requirements developed during ESA Section 7 consultation with USFWS.

Mitigation Measure WILD-1.1: Assess Habitat Suitability and Survey Suitable Habitat for Vernal Pool Branchiopods

Once property access is granted and prior to the start of construction, the Authority will retain qualified biologists to assess habitat suitability and conduct surveys for vernal pool branchiopods in the Project area and where modeled habitat is within 250 feet of the Project area and indirect effects may occur. Qualified biologists are defined as those who have a recovery permit from USFWS to conduct surveys for listed vernal pool branchiopods. The surveys will be conducted in accordance with the *Survey Guidelines for the Listed Large Branchiopods*, which recommend surveys at 14-day intervals after initial inundation of habitat until the habitat dries or it has been inundated for a minimum

of 90 consecutive days (U.S. Fish and Wildlife Service 2015b). Surveys in accordance with the guidelines take a minimum of 1 year to complete and will be initiated early enough to allow completion before the start of construction. The biologists will submit the results of the surveys in a report to USFWS, per the requirements of the biologists' recovery permits.

Mitigation Measure WILD-1.2: Avoid and Minimize Potential Effects on Vernal Pool Branchiopods and Western Spadefoot

The following steps will be taken to avoid or minimize potential effects on vernal pool branchiopods and western spadefoot.

- Ground disturbance within 250 feet of occupied habitat or suitable habitat that hasn't been surveyed that would not be directly affected will be avoided during the rainy season (approximately October 15 through May 15). Compensation will be provided for habitat occupied by listed vernal pool branchiopods that cannot be avoided during the rainy season (Mitigation Measure WILD-1.3).
- If a portion of occupied vernal pool branchiopod or western spadefoot habitat will be filled (i.e., permanent impacts), the filling will be conducted when the habitat is completely dry.
- If requested by USFWS, the top 3 to 4 inches of soil of pools occupied by listed or unlisted vernal pool branchiopods that would be destroyed or completely filled will be removed and stored in the Project area until ready for placement in created or restored habitat outside of the Project footprint. The topsoil will be covered with tarps or other appropriate material and orange construction barrier fencing or stakes and flagging will be installed around the covered topsoil. A qualified biologist will be on site to monitor the removal and covering of the topsoil during periodic monitoring visits to the Project area. The stored topsoil will be spread over the bottom of created or restored pools prior to the start of the winter rainy season.

Mitigation Measure WILD-1.3: Compensate for Impacts on Occupied Vernal Pool Branchiopod Habitat

The Authority will compensate for direct and indirect effects on occupied vernal pool branchiopod habitat through the purchase of mitigation credits at a USFWS-approved mitigation or conservation bank or through acquiring, creating, restoring and/or protecting habitat in perpetuity at a location approved by USFWS. Direct and indirect effects on occupied habitat will be mitigated by preserving occupied habitat at a 2:1 ratio (habitat preserved : habitat directly or indirectly affected) or by an equivalent or greater amount as determined during ESA Section 7 consultation with USFWS. In addition, direct effects on occupied habitat will be mitigated by creating or preserving occupied habitat at a 1:1 ratio (habitat created : habitat directly affected) or by an equivalent or greater amount as determined during ESA Section 7 consultation with USFWS. The purchase of mitigation credits or the establishment of onsite or offsite mitigation areas (or a combination of these options) would be completed as agreed upon by the Authority, Reclamation, and USFWS.

USFWS-approved conservation banks have long-term adaptive management plans with performance standards. Therefore, if mitigation is through a USFWS-approved conservation bank, the bank's performance standards and success criteria will be applied.

If credits are not purchased at a USFWS-approved conservation bank, the Authority will implement standards for long-term management and protection of conservation areas. The Authority will work closely with USFWS during the planning and development of conservation areas. Once established, conservation areas will be surveyed by a USFWS-approved biologist a minimum of two times per year during the wet season (generally November through April). The biologist will survey for the presence of listed vernal pool branchiopods, evaluate the adequacy of site protection (e.g., fencing, signage) and weed control, assess potential threats to vernal pool branchiopods, and take photographs of the site. The biologist will also survey a set of reference pools to compare to the preserved and created/restored pools. The reference pools should be located in proximity to the conservation area and exhibit characteristics similar to the preserved and created/restored pools.

For non-mitigation bank compensation, the performance standard for occupancy of the created/restored pools by listed vernal pool branchiopods is a minimum of 5% of the total number of created/restored pools supporting listed vernal pool branchiopods over a 10-year monitoring period. A pool must be occupied at least once during the 10-year monitoring period to be considered occupied. If the performance standard cannot be achieved, the Authority and Reclamation will consult with USFWS to determine if the standard is not realistic based on data from other vernal pool surveys in the Project region and/or implement an alternative compensatory mitigation approach.

Working closely with USFWS during planning and development of the conservation area, monitoring the conservation area to ensure performance standards are achieved, and applying adaptive management actions when the performance standard is not achieved will ensure that the compensatory mitigation is effective and compensates for the loss of occupied habitat resulting from the Project.

NEPA Conclusion

Construction and operation effects on vernal pool branchiopods would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on vernal pool branchiopods as compared to the No Project Alternative as a result of removal of suitable habitat and loss of individuals. Operational effects on vernal pool branchiopods would be avoided or minimized through implementation of BMP-15, the LMP, and the Recreation Management Plan. With implementation of Mitigation Measures WILD-1.1, WILD-1.2, and WILD-1.3, the construction and operation effects would be reduced to no adverse effect on vernal pool branchiopods.

Alternative 2

Modeled habitat for vernal pool branchiopods may be present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR West, TRR/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, and recreation areas.

Construction

Construction of Alternative 2 would result in the permanent loss of modeled habitat for vernal pool branchiopods (Table 10-2a). Clearing and grubbing, excavation, and other construction activities could result in the destruction of vernal pools or other suitable habitats, and individuals or cysts could be crushed or buried by equipment. Impacts would be the same as described for Alternatives 1 and 3 except that construction of South Road and TRR West would result in additional loss of modeled habitat and the smaller inundation area would result in reduced loss of modeled habitat. Overall, permanent impacts on modeled vernal pool branchiopod habitat would be less under Alternative 2 because of the smaller inundation area and reduced permanent impacts from construction of dams and dikes (Appendix 10C, Table 10C-1).

Operation

Potential changes in the hydrologic regime of vernal pool branchiopod habitat that could result from changes in topography, soil compaction, and increased amounts of impervious surfaces and potential illness or mortality of vernal pool branchiopods from new or increased contaminants would be similar under Alternative 2 as described for Alternatives 1 and 3. Impacts would be the same as described for Alternatives 1 and 3 except that the larger amount of impervious surface from South Road under operation of Alternative 2 would result in potential indirect effects on additional modeled vernal pool branchiopod habitat. Impacts from maintenance activities and disturbance at recreation areas would be the same under Alternative 2 as described for Alternatives 1 and 3. Effects from operation would be avoided or minimized through implementation of BMP-15, the LMP, and the Recreation Management Plan.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that permanent loss of modeled habitat would be less under Alternative 2 because of the smaller inundation area and fewer permanent impacts on habitat from dams and dikes (Appendix 10C, Table 10C-1). Operation of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that the additional impermeable surface from South Road could result in potential indirect effects on additional modeled vernal pool branchiopod habitat. Operational effects on vernal pool branchiopods would be avoided or minimized through implementation of BMP-15, the LMP, and the Recreation Management Plan, and would be less than significant. Construction impacts would be significant because the implementation of Alternative 2 could reduce the local populations of federally listed vernal pool branchiopods through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.1, WILD-1.2, and WILD-1.3 would reduce the level of impact to less than significant for reasons discussed above.

NEPA Conclusion

Construction and operation effects on vernal pool branchiopods would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on vernal pool branchiopods as compared to the No Project Alternative. Construction of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that permanent loss of modeled habitat would be less under Alternative 2 because of the smaller inundation area and fewer permanent impacts on habitat from dams and dikes (Appendix 10C, Table 10C-1). Operation of Alternative 2 would result in similar impacts to Alternatives 1 and 3

except that the additional impermeable surface from South Road could result in potential indirect effects on additional modeled vernal pool branchiopod habitat. Operational effects on vernal pool branchiopods would be avoided or minimized through implementation of BMP-15, the LMP, and the Recreation Management Plan With implementation of Mitigation Measures WILD-1.1, WILD-1.2, and WILD-1.3, the construction and operation effects would be reduced to no adverse effect.

Terrestrial Invertebrates

Permanent and temporary impacts on modeled habitat for other special-status invertebrates from Alternatives 1, 2, and 3 are shown in Table 10-2b.

Table 10-2b. Acreages of Permanent and Temporary Impacts on Modeled Special-Status Terrestrial Invertebrate Habitat in the Study Area

	Alternatives 1 and 3 Permanent Impacts	Alternatives 1 and 3 Temporary Impacts	Alternative 2 Permanent Impacts	Alternative 2 Temporary Impacts
Antioch Dunes Anthicid Beetle and Sacramento Anthicid Beetle	0	0	<1	<1
Valley Elderberry Longhorn Beetle	13,548	973	12,709	947
Monarch Butterfly	15,542	1,305	15,158	1,281
Crotch Bumble Bee and Western Bumble Bee	14,117	979	13,649	927

Impact WILD-1b: Antioch Dunes Anthicid Beetle and Sacramento Anthicid Beetle

Antioch Dunes anthicid beetle has been extirpated from Antioch Dunes and both anthicid beetle species have limited distributions (California Department of Fish and Wildlife 2021e, 2021f). However, the current distributions of these beetles are limited to adjacent to the Sacramento River (California Department of Fish and Wildlife 2021e, 2021f).

Alternatives 1 and 3

Potentially suitable habitat for Antioch Dunes anthicid beetle and Sacramento anthicid beetle is present along the Sacramento River in the operations study area.

Construction

Construction of Alternatives 1 and 3 would not result in direct impacts on Antioch Dunes anthicid beetle or Sacramento anthicid beetle because construction activities would not be conducted in or near potentially suitable habitat.

Operation

Operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Diversions from the Sacramento River to

the reservoir would occur only under higher Sacramento River flow regimes. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water available in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. Minimal changes to the natural river geomorphic processes and existing geomorphic characteristics of the Sacramento River would not affect potentially suitable habitat for Antioch Dunes anthicid beetle or Sacramento anthicid beetle (i.e., sandy banks and sand bars).

Impacts on Antioch Dunes anthicid beetle and Sacramento anthicid beetle from maintenance activities are not expected to occur because maintenance activities would be conducted mostly in previously disturbed areas using existing roadways.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would not result in direct impacts on Antioch Dunes anthicid beetle or Sacramento anthicid beetle because there would be no work in potentially suitable habitat for these species. Operation of Alternative 1 or 3 would not result in indirect impacts on these anthicid beetles because changes in natural river geomorphic processes and existing geomorphic characteristics would be minor and would not affect existing potential habitat. There would be no impact.

NEPA Conclusion

Construction and operation effects on Antioch Dunes anthicid beetle or Sacramento anthicid beetle would be the same as described above for CEQA. Construction of Alternative 1 or 3 would not result in direct effects on Antioch Dunes anthicid beetle or Sacramento anthicid beetle as compared to the No Project Alternative because there would be no work in potentially suitable habitat for these species. Operation of Alternative 1 or 3 would not result in indirect effects on these anthicid beetles as compared to the No Project Alternative because changes in natural river geomorphic processes and existing geomorphic characteristics would be minor and would not affect existing potential habitat. Construction and operation of Alternative 1 or 3 would result in no effect on Antioch Dunes anthicid beetle and Sacramento anthicid beetle.

Alternative 2

Potentially suitable habitat for Antioch Dunes anthicid beetle and Sacramento anthicid beetle is present along the Sacramento River in the operations study area and at the location of the Sacramento River discharge.

Construction

Construction of Alternative 2 would result in the permanent loss and temporary disturbance of potentially suitable habitat for Antioch Dunes anthicid beetle and Sacramento anthicid beetle (Table 10-2b). There is potentially suitable habitat for these species at the Sacramento River discharge location.

Installation of rock slope protection would result in the permanent and temporary losses of potentially suitable habitat for Antioch Dunes anthicid beetle and Sacramento anthicid beetle. Individuals could also be crushed or buried by equipment or rock.

Operation

Operation effects on Antioch Dunes anthicid beetle and Sacramento anthicid beetle under Alternative 2 would be the same as for Alternatives 1 and 3.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in the permanent loss and temporary disturbance of potentially suitable habitat for Antioch Dunes anthicid beetle and Sacramento anthicid beetle and could cause mortality of individuals. These impacts would be significant because the construction of Alternative 2 could reduce the local populations of these rare beetles through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.4 and WILD-1.5 would reduce the level of impact from construction to less than significant because potentially suitable habitat would be assessed and surveyed by a qualified entomologist prior to removal or disturbance and suitable habitat that would not be affected would be fenced and avoided during construction. If occupied habitat is removed, an equivalent amount of habitat would be restored or preserved in the vicinity of the affected area. There would be no impact on Antioch Dunes anthicid beetle and Sacramento anthicid beetle from operations under Alternative 2.

Mitigation Measure WILD-1.4: Evaluate and Survey Potential Habitat for Antioch Dunes Anthicid and Sacramento Anthicid Beetles and Implement Protective Measures

The Authority will retain a qualified entomologist (experienced with anthicid beetle identification and habitat suitability) to assess and survey the area of potentially suitable habitat for Antioch Dunes anthicid and Sacramento anthicid beetles prior to the start of construction of the Sacramento River discharge. If suitable habitat is not present or no Antioch Dunes anthicid and Sacramento anthicid beetles are observed and the entomologist concurs that no further surveys are needed, no further actions are required. If either beetle species is observed, the entomologist will relocate the beetles to suitable habitat outside of the impact area. The entomologist will report observations of either

beetle species to CDFW and submit occurrence data to the CNDDB. The Authority will protect any suitable habitat in the vicinity of the work area that will not be affected with fencing or stakes and flagging. No construction related foot or vehicle traffic will be allowed in the fenced or flagged area. The Authority will remove fencing when construction of the Sacramento River discharge is complete.

Mitigation Measure WILD-1.5: Compensate for the Loss of Occupied Antioch Dunes Anthicid and Sacramento Anthicid Beetle Habitat

The Authority will compensate for the permanent loss of occupied Antioch Dunes anthicid beetle and/or Sacramento anthicid beetle habitat by restoring disturbed habitat or preserving occupied habitat along the Sacramento River, preferably in the vicinity of the affected area, at a 1:1 ratio (acres restored or preserved : acres of permanent impact). The Authority will retain a qualified entomologist to assess habitat to be restored or preserved and provide guidance on habitat restoration. The Authority will retain a qualified entomologist to monitor the restored or preserved habitat annually for a minimum of 5 years. Monitoring will be conducted at the preserved area to ensure that habitat conditions are maintained at baseline conditions or better, that the habitat has not been degraded, and that it continues to be occupied by the beetle(s). If habitat is restored, the entomologist will conduct monitoring to ensure the restored habitat conditions are maintained, survey for beetle occupancy, and make adaptive management recommendations for habitat improvements. The Authority will submit monitoring reports that include habitat conditions, beetle occupancy information, and photographs to the CDFW annually. If either beetle is observed during habitat monitoring, the entomologist will submit occurrence information to the CNDDB.

NEPA Conclusion

Construction and operation effects on Antioch Dunes anthicid beetle or Sacramento anthicid beetle would be the same as described above for CEQA. Construction of Alternative 2 would result in the permanent loss and temporary disturbance of potentially suitable habitat for Antioch Dunes anthicid beetle and Sacramento anthicid beetle and could cause mortality of individuals as compared to the No Project Alternative if occupied habitat is removed or beetles are killed. With implementation of Mitigation Measures WILD-1.4 and WILD-1.5, effects would be reduced to no adverse effect. There would be no effect on Antioch Dunes anthicid beetle and Sacramento anthicid beetle from operations under Alternative 2.

Impact WILD-1c: Valley Elderberry Longhorn Beetle

The greatest historical threat to valley elderberry longhorn beetle has been the elimination, loss, or modification of its habitat by urban, agricultural, or industrial development, and other activities that reduce or eliminate its host plants (Talley et al. 2006:21, 22).

Alternatives 1 and 3

Modeled habitat for valley elderberry longhorn beetle is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal

intake, and Dunnigan Pipeline. Potential habitat is also present along the Sacramento River in the operations study area.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled habitat for valley elderberry longhorn beetle (Table 10-2b). Removal of elderberry shrubs would result in the permanent and temporary losses of suitable valley elderberry longhorn beetle habitat. Elderberry shrubs could also die after filling of the Sites Reservoir if they are present in the inundation area. Removal or trimming of elderberry shrubs could result in injury or mortality of valley elderberry longhorn beetle if the species is present. Ground disturbance within 20 feet of an elderberry shrub's dripline could damage its roots and result in stress or reduced vigor of the shrub (U.S. Fish and Wildlife Service 2017a:11).

Operation

Potential indirect effects on valley elderberry longhorn beetle that were considered were altered hydrology for elderberry shrubs, loss of connectivity to adjacent habitat, and disturbance from maintenance activities. Reduction of water to elderberry shrubs as a result of altered hydrology from changes in topography or compaction of soils could result in reduced shrub vigor/vitality and an associated decrease in shoot, leaf, and flower production that could ultimately reduce the suitability of the shrubs to provide habitat for valley elderberry longhorn beetle. Loss of connectivity between elderberry shrubs may result when elderberry or associated vegetation is removed. Removal of such vegetation could result in gaps in vegetation that are too wide for valley elderberry longhorn beetle to travel across due to their fairly limited movement distances (Talley et al. 2006), resulting in separation of individuals or a reduction in the possibility of colonization of adjacent areas.

Maintenance activities required for operation of Project facilities could result in impacts on valley elderberry longhorn beetle. Impacts are generally expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas that likely have few elderberry shrubs present. Maintenance activities involving herbicide and pesticide use could cause mortality of elderberry shrubs or illness or mortality of valley elderberry longhorn beetle, respectively. Elderberry shrubs could also be inadvertently removed or trimmed during maintenance activities. The LMP will include specifications on herbicide and pesticide use in operations and maintenance areas to minimize or prevent potential effects on elderberry shrubs and valley elderberry longhorn beetle. The LMP will also specify measures to protect valley elderberry longhorn beetle habitat from accidental trimming and other maintenance activities that could harm elderberry shrubs.

Stone Corral and Funks Creeks would receive bypass flows from the reservoir from outlets on Sites Dam and Golden Gate Dam, respectively. Bypass flows would range from 0 to 100 cubic feet per second (cfs), with larger pulse flows to emulate natural flood conditions, and lower flows in the drier months (e.g., summer). The increase of flow in each drainage would support the existing geomorphic functions and characteristics of each channel. A Flow Characterization and Geomorphic Study (Section 2D.4, *Stone Corral Creek and Funks Creek Aquatic Study Plan and Adaptive Management*) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. While increased flows from bypass

releases may result in minor erosion and changes in sediment deposition, the changes are expected to be minimal when compared to the existing flashy hydrology of both creeks and no impacts on elderberry shrubs or valley elderberry longhorn beetle are anticipated.

Potential impacts associated with flow releases at RBPP and GCID Main Canal at Hamilton City on the Sacramento River, Yolo Bypass, and Delta as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. Operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. The banks of the Sacramento River provide suitable habitat for elderberry shrubs. Diversions from the Sacramento River to the reservoir would occur only under higher Sacramento River flow regimes. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. Minimal changes to the natural river geomorphic processes and existing geomorphic characteristics for the Sacramento River would not affect elderberry shrubs and valley elderberry longhorn beetle.

Based on observations during North Delta Flow Actions (Davis pers. comm.), the comparable August–October habitat flows from Sites Reservoir through the Yolo Bypass may cause limited inundation of low-elevation parcels in the upper Yolo Bypass (north of the Interstate 80 [I-80] causeway). The intent of the releases from Sites Reservoir to the Yolo Bypass during this period is to temporally and spatially distribute food resources for fish species. If the water inundates floodplain areas (i.e., areas outside existing channels) the food would be deposited and would fail to move into the Delta. As such, Sites Reservoir would be operated to maintain flows within the existing Toe Drain, Tule Canal, and other channels, and adjustments in operations would be coordinated between the Authority and parcel owners using the existing Yolo Bypass monitoring network. As a result, impacts on potential valley elderberry longhorn beetle habitat in the Yolo Bypass are not anticipated.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 could result in significant impacts on valley elderberry longhorn beetle from removal of suitable habitat and loss of individuals, when compared to baseline conditions. Operation could result in significant impacts on valley elderberry longhorn beetle from altered hydrology, loss of connectivity to adjacent habitat, and disturbance from maintenance activities. These impacts would be significant because the implementation of

Alternative 1 or 3 could reduce the local population of this federally listed species through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.6, WILD-1.7, WILD-1.8, and WILD-1.9 would reduce the level of impact from construction and operation to less than significant because surveys would be conducted to determine presence, elderberry shrubs to be protected would be fenced, compensation would be provided for permanent loss of habitat, and a measure would be implemented to avoid and minimize potential effects of herbicide and pesticide use on valley elderberry longhorn beetle and its habitat.

Mitigation Measure WILD-1.6: Conduct Surveys for Suitable Valley Elderberry Longhorn Beetle Habitat

The Authority will retain qualified biologists or botanists (i.e., with elderberry/valley elderberry longhorn beetle experience) to conduct surveys to identify and map locations of elderberry shrubs in work areas and within 165 feet of the work areas. For shrubs located in non-riparian areas, elderberry stems will be examined for the presence of valley elderberry beetle exit holes. This information will be used to determine the amount of compensation required for the loss of elderberry shrubs in accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (U.S. Fish and Wildlife Service 2017a). The biologist will mark elderberry shrubs in or within 165 feet of work areas with flagging for future removal or protection.

Mitigation Measure WILD-1.7: Fence Elderberry Shrubs to be Protected

Elderberry shrubs in or within 165 feet of work areas that will not be removed will be protected during construction. If not already marked, a qualified biologist will flag the elderberry shrubs that will be protected during construction. The Authority's contractor will install orange construction barrier fencing or stakes and flagging at the edge of the buffer areas established for each shrub and signs indicating the potential for beetle presence and excluding any Project activity within the buffer areas will be posted prior to the start of work. The buffer area distances will be proposed by the biologist and approved by USFWS. No construction activities will be permitted in the buffer area other than those activities necessary to erect the fencing or stakes and flagging without written permission from USFWS.

If orange construction barrier fencing is used, it will be placed such that there is at least a 1-foot gap between the ground and the bottom of the orange construction fencing to minimize the potential for snakes and other ground-dwelling animals to become caught in the fencing. Buffer areas around elderberry shrubs will be inspected periodically by a qualified biologist until Project construction is complete or until the fences or staking/flagging are removed, as approved by the biological monitor and the resident engineer. The Authority's contractor will be responsible for maintaining the buffer area fences around elderberry shrubs throughout construction and removing the fencing or staking and flagging when construction is complete. The biologist's fencing inspection reports will be provided to the Authority.

Mitigation Measure WILD-1.8: Transplant Permanently Affected Elderberry Shrubs and Compensate for Loss of Valley Elderberry Longhorn Beetle and its Habitat

Before construction begins, the Authority will retain a qualified contractor to transplant elderberry shrubs that cannot be avoided to a USFWS-approved mitigation or conservation bank or other approved area in accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (U.S. Fish and Wildlife Service 2017a). Elderberry shrubs that cannot be avoided will be transplanted during the plant's dormant phase (November through the first 2 weeks of February). A qualified biological monitor will remain on site while the shrubs are being transplanted. Additionally, the Authority will compensate for permanent impacts on occupied riparian habitat by creating or preserving habitat at a 3:1 (acres of created or preserved habitat : acres of permanent impact) or by an equivalent or greater amount as determined in consultation with USFWS. The Authority will compensate for permanent impacts on occupied non-riparian habitat by creating or preserving habitat at a ratio of 1:1 for all acres that are permanently affected, or by transplanting affected elderberry shrubs containing valley elderberry longhorn beetle exit holes and providing compensation at a 1:1 ratio for the area of the affected shrubs. The purchase of mitigation credits or the establishment of onsite or offsite mitigation areas (or a combination of these options) would be completed as agreed upon by the Authority, Reclamation, and USFWS.

USFWS-approved conservation banks have long-term adaptive management plans with performance standards. If credits are not purchased at a USFWS-approved conservation bank, the Authority will implement standards for long-term management and protection of conservation areas. The Authority will work closely with USFWS during the planning and development of preservation areas. Once established, preservation areas will be surveyed by a USFWS-approved biologist a minimum of two times per year between February 14 and June 30. The biologist will search for valley elderberry longhorn beetle exit holes, evaluate the adequacy of site protection (e.g., fencing, signage) and weed control, assess potential threats to the beetle, take photographs of the site, and evaluate the performance standards below.

1. A minimum of 60% of the initial elderberry and native associate plantings must survive over the first 5 years after the site is established. As much as feasible, elderberry shrubs should be well distributed throughout the site; however, in some instances underlying geologic or hydrologic issues might preclude elderberry establishment over some portion of the site. If significant die-back occurs within the first 3 years, replanting may be used to achieve the 60% performance standard. However, replanting efforts should be concentrated in areas containing surviving elderberry plants. In some instances, overplanting may be used to offset the selection of a less suitable site.

2. After 5 years, the site must show signs of recruitment. A successful site should have evidence of new growth on existing plantings, as well as natural recruitment of elderberry. New growth is characterized as stems 1.2 inches in diameter. If no signs of

recruitment are observed, the Authority and Reclamation will discuss possible remedies with the USFWS.

Following USFWS's interim standards for the long-term management and protection of mitigation sites, working closely with USFWS during planning and development of the preservation area, monitoring the preservation area to ensure performance standards are achieved, and replanting elderberries when the performance standards are not achieved will ensure that the compensatory mitigation is effective and compensates for the losses resulting from the Project.

Mitigation Measure WILD-1.9: Protect Special-Status Invertebrates and Their Host and Food Plants from Herbicide and Pesticide Use

To minimize impacts on valley elderberry longhorn beetle, monarch butterfly, Crotch bumble bee, and western bumble bee from herbicide drift, herbicide application will be limited to areas immediately adjacent to Project facilities and will be conducted using handheld equipment. 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.

NEPA Conclusion

Construction and operation effects on valley elderberry longhorn beetle would be the same as described above for CEQA. Construction of Alternative 1 or 3 could result in effects on valley elderberry longhorn beetle as compared to the No Project Alternative from removal of suitable habitat and loss of individuals. Operation of Alternative 1 or 3 could result in effects on valley elderberry longhorn beetle as compared to the No Project Alternative from altered hydrology, loss of connectivity to adjacent habitat, and disturbance from maintenance activities. With implementation of Mitigation Measures WILD-1.6, WILD-1.7, WILD-1.8, and WILD-1.9, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for valley elderberry longhorn beetle is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR West, TRR/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline, and the Sacramento River discharge. Potential habitat is also present along the Sacramento River in the operations study area.

Construction

Construction of Alternative 2 could result in permanent and temporary losses of modeled habitat for valley elderberry longhorn beetle (Table 10-2b). Removal of elderberry shrubs would result in the permanent and temporary losses of valley elderberry longhorn beetle habitat, and potential injury or mortality of individuals. Ground disturbance within 20 feet of an elderberry shrub's

dripline could result in disturbance of roots, which could cause stress or reduced vigor of elderberry shrubs. Impacts would be the same as described for Alternatives 1 and 3 except that construction of TRR West and the Sacramento River discharge would result in additional loss of modeled habitat and the smaller inundation area would result in reduced loss of modeled habitat under Alternative 2. Construction of the new South Road would not result in impacts on valley elderberry longhorn beetle habitat because the roadway would be located above 500 feet elevation (the level above which suitable habitat is present). Overall, the amount of permanent habitat loss would be less under Alternative 2 because of the smaller inundation area and reduced impacts from construction of dams and dikes, and roads (Table 10C-3). Overall, the amount of temporary habitat loss would be less under Alternative 2 because of less modeled habitat being affected by the regulating reservoirs and conveyance complex, inlet/outlet works, and dams and dikes (Table 10C-3).

Operation

Potential indirect effects on valley elderberry longhorn beetle from altered hydrology, loss of connectivity to adjacent habitat, and disturbance from maintenance activities would be the same under Alternative 2 as described for Alternatives 1 and 3. Impacts on valley elderberry beetle from operation would be the same as described for Alternatives 1 and 3.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that permanent habitat loss would be less under Alternative 2 because of the smaller inundation area and reduced impacts from construction of dams and dikes and roads. Temporary habitat loss would be less for construction of Alternative 2 because of less modeled habitat being affected by the regulating reservoirs and conveyance complex, I/O Works, dams, and dikes. Operation of Alternative 2 would result in the same impacts as Alternatives 1 and 3. These impacts would be significant because the implementation of Alternative 2 could reduce the local valley elderberry longhorn beetle population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.6, WILD-1.7, WILD-1.8, and WILD-1.9 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on valley elderberry longhorn beetle would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on valley elderberry longhorn beetle as compared to the No Project Alternative. Construction of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that permanent habitat loss would be less under Alternative 2 because of the smaller inundation area and reduced effects from construction of dams and dikes, and roads. Temporary habitat loss would be less for construction of Alternative 2 than for Alternative 1 or 3 because of less modeled habitat being affected by the regulating reservoirs and conveyance complex, I/O Works, dams, and dikes. Operation of Alternative 2 would result in the same impacts as Alternatives 1 and 3 as compared to the No Project Alternative from effects on valley elderberry longhorn beetle from altered hydrology, loss of connectivity to adjacent habitat, and disturbance from maintenance activities. With implementation of Mitigation Measures WILD-1.6, WILD-1.7, WILD-1.8, and WILD-1.9, effects would be reduced to no adverse effect.

Impact WILD-1d: Monarch Butterfly

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 (U.S. Fish and Wildlife Service 2020a) as a result of habitat loss at breeding and overwintering sites, disease, pesticides, and climate change (U.S. Fish and Wildlife Service 2019b).

Alternatives 1 and 3

Modeled habitat for monarch butterfly is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and Sacramento River in the operations study area.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled habitat for monarch butterfly (Table 10-2b). Construction of Alternatives 1 and 3 facilities could result in the permanent and temporary losses of suitable roosting, foraging, and breeding habitats for monarch butterfly. Potentially suitable habitat would be lost when the Sites Reservoir was inundated. Clearing and grubbing, excavation, and other construction activities could result in mortality of adults or larvae from being crushed or buried by equipment. Adult monarch butterflies could be struck by vehicles and construction equipment traveling along access roads during construction if foraging or flying through the area. Construction could also disrupt roosting or foraging activities.

Operation

Maintenance activities required for operation of Alternative 1 or 3 could result in impacts on monarch butterfly. Impacts are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. However, maintenance activities involving herbicide and pesticide use have the potential to affect monarch butterfly and its larval host plants (native milkweeds) and nectar plants and cause the loss of habitat or individuals. Monarch butterflies could also be struck by vehicles and equipment traveling along access roads during operation. The LMP will include specifications on herbicide and pesticide use in operations and maintenance areas to minimize or prevent potential effects on monarch butterfly larval host plants and nectar plants.

The recreation areas and reservoir would be used on a regular basis, which would result in an increased human presence in these areas. There is potential for visitors to access undeveloped areas and disturb existing habitat (e.g., walk through habitat, remove nectar plants). Larval butterflies could be crushed by visitors walking through habitat and suitable nectar plants could be removed or stepped on by visitors. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into natural areas that may contain larval host plants or nectar plants.

New roadways, once completed, could increase the potential mortality of monarch butterfly from being struck by vehicles of workers traveling to operations facilities or those of visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on monarch butterfly from removal of suitable habitat and loss of individuals. Operation of Alternative 1 or 3 could result in mortality of adult butterflies from vehicle strikes, illness or injury of adults or larvae from pesticide use, or death of nectar plants from herbicide use. Construction and operation impacts would be significant because the implementation of Alternative 1 or 3 could reduce the local monarch butterfly population. Implementation of Mitigation Measures WILD-1.9, WILD-1.10, and WILD-1.11 would reduce the level of impact from construction and operation to less than significant because surveys would be conducted to identify patches of native milkweeds and nectar plants, temporarily disturbed habitat would be restored, permanent loss of habitat containing native milkweeds and/or nectar plants would be compensated for through either onsite or offsite habitat restoration or preservation, and a measure would be implemented to avoid and minimize potential effects of herbicide and pesticide use on monarch butterfly and its larval host plants and nectar plants.

Mitigation Measure WILD-1.9: Protect Special-Status Invertebrates and Their Host and Food Plants from Herbicide and Pesticide Use

This measure is the same as that described above for valley elderberry longhorn beetle.

Mitigation Measure WILD-1.10: Assess Habitat Suitability and Survey for Presence of Monarch Butterfly Nectar and Larval Host Plants

No more than 3 years prior to the start of ground-disturbing activities botanists will identify and map locations and species of milkweed and/or nectar plants (using information from https://xerces.org/sites/default/files/publications/19-046_01_MonarchNectarPlants_California_web-3pg.pdf or the most updated information) during special-status plant surveys (Mitigation Measure VEG-1.1) in areas that would be permanently or temporarily affected by construction.

Mitigation Measure WILD-1.11: Compensate for Loss of Monarch Butterfly Nectar and Larval Host Plants

The Authority will compensate for permanent loss of suitable monarch butterfly habitat (as identified through implementation of Mitigation Measure WILD-1.10) by including native milkweed and nectar plants for monarch butterfly in onsite and/or offsite mitigation plans for sensitive natural communities (Mitigation Measure VEG-2.2). The Authority will compensate for permanent loss of suitable monarch butterfly habitat by planting native milkweed and nectar plants at suitable onsite and/or offsite restoration or preservation areas at a ratio of 1:1 (acres lost : acres planted. The offsite 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, USFWS, and CDFW.

The Authority will compensate for temporary loss of suitable monarch butterfly habitat by including native milkweed and nectar plants in planting palettes for onsite restoration of sensitive natural communities (Mitigation Measure VEG-2.2) or temporarily disturbed grassland, and/or at offsite mitigation areas.

The Authority will utilize monarch butterfly information[1] 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 onsite and offsite 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 onsite restoration is completed at each mitigation area, qualified botanists will conduct surveys during 3 of the next 5 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 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 USFWS and CDFW.

Using the latest information from The Xerces Society during planning and development of the mitigation areas, monitoring the mitigation areas to ensure performance standards are achieved and implementing adaptive management options when the performance standards are not achieved will ensure that the compensatory mitigation is effective and compensates for the losses resulting from the Project.

NEPA Conclusion

Construction and operation effects on the monarch butterfly would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on monarch butterfly as compared to the No Project Alternative due to removal of suitable habitat and loss of individuals, including potential mortality of adult butterflies or illness or injury of adults or larvae. With implementation of Mitigation Measures WILD-1.9, WILD-1.10, and WILD-1.11, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for monarch butterfly is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR West, TRR/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, Sacramento River discharge, and Sacramento River in the operations study area.

[1] https://xerces.org/monarchs/western-monarch-conservation/habitat

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for monarch butterfly (Table 10-2b). Impacts would be the same as described for Alternatives 1 and 3 except that construction of South Road and TRR West under Alternative 2 would result in additional loss of modeled habitat, permanent impacts on modeled habitat would be less because the inundation area would be smaller, and construction of the Sacramento River discharge would result in permanent loss of additional modeled habitat. Overall, permanent and temporary impacts on modeled monarch butterfly habitat would be less under Alternative 2 than under Alternatives 1 and 3 because of the smaller inundation area and reduced impacts from construction of dams, and dikes (Appendix 10C, Table 10C-4).

Operation

Potential effects on monarch butterfly as a result of operation of Alternative 1 or 3 would be similar to those for Alternative 2. There could be a greater potential for monarch butterflies to be struck by vehicles of workers traveling to operations facilities or those of visitors traveling to recreation areas on the new South Road.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that permanent and temporary impacts on modeled monarch butterfly habitat would be less under Alternative 2 because of the smaller inundation area and reduced impacts from construction of dams and dikes. Operation of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that the increased amount of roadway could result in greater potential for monarch butterflies to be struck by vehicles. These impacts would be significant because the implementation of Alternative 2 could reduce the local population of monarch butterfly through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.9, WILD-1.10, and WILD-1.11 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on monarch butterfly would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on monarch butterfly as compared to the No Project Alternative. Construction of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that permanent and temporary effects on modeled monarch butterfly habitat would be less under Alternative 2 because of the smaller inundation area and reduced effects from construction of dams and dikes. Operation of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that the increased amount of roadway could result in greater potential for monarch butterflies to be struck by vehicles. With implementation of Mitigation Measures WILD-1.9, WILD-1.10, and WILD-1.11, effects would be reduced to no adverse effect.

Impact WILD-1e: Crotch Bumble Bee and Western Bumble Bee

Although not federally or state listed, The Xerces Society considers Crotch bumble bee and western bumble bee endangered with extinction throughout their ranges. Recent studies have

shown that these species have experienced significant reductions in both their range and relative abundance and are far less common than they were historically in areas where the species persist (The Xerces Society for Invertebrate Conservation 2018:5).

Alternatives 1 and 3

Modeled habitat for Crotch bumble bee and western bumble bee is present at the GCID Main Canal improvements, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled Crotch bumble bee and western bumble bee habitat (Table 10-2b). Potentially suitable habitat would also be lost when the reservoir was inundated. Clearing and grubbing, excavation, and other activities could result in the destruction of nests or mortality of bees from being crushed or buried by equipment. Crotch and western bumble bees could also be struck by vehicles and equipment traveling along access roads during construction.

Operation

Maintenance activities required for operation of Alternatives 1 and 3 facilities could result in impacts on Crotch bumble bee and western bumble bee. Impacts are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas using existing roadways. However, maintenance activities involving herbicide and pesticide use have the potential to affect Crotch and western bumble bees and their food plants and cause the loss of habitat or illness or mortality of individuals. Crotch and western bumble bees could also be struck by vehicles and equipment traveling along access roads during operation. The LMP will include specifications on herbicide and pesticide use in operations and maintenance areas to minimize or prevent potential effects on Crotch bumble bee and western bumble bee food plants.

The recreation areas and reservoir would be used on a regular basis, which would result in an increased human presence in these areas, as well as additional roadway traffic, which could result in increased vehicle strikes. There is potential for visitors to access undeveloped areas and disturb existing habitat (e.g., walk through habitat, removal of nectar plants). Individual bees could be stepped on or their nests could be buried or collapsed. Suitable food plants could also be removed or stepped on by visitors walking through habitat. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into natural areas that may contain bumble bee food plants.

New roadways, once completed, could increase the potential mortality of Crotch and western bumble bees from being struck by workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction and operation of Alternative 1 or 3 would result in significant impacts on Crotch bumble bee and western bumble bee from removal of potential habitat and loss of individuals.

These impacts would be significant because Alternative 1 or 3 could reduce the local populations of these rare bumble bees through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.9, WILD-1.12, and WILD-1.13 would reduce the level of impact from construction and operation to less than significant because surveys would be conducted to identify patches of native food plants, temporarily disturbed habitat would be restored, permanent loss of habitat containing suitable native food plants would be compensated for through offsite habitat restoration or preservation, and a measure would be implemented to avoid and minimize potential effects of herbicide and pesticide use on Crotch bumble bee, western bumble bee, and their food plants.

Mitigation Measure WILD-1.9: Protect Special-Status Invertebrates and Their Host and Food Plants from Herbicide and Pesticide Use

This measure is described above for valley elderberry longhorn beetle.

Mitigation Measure WILD-1.12: Assess Habitat Suitability and Survey for Presence of Crotch Bumble Bee and Western Bumble Bee Food Plants

No more than 3 years prior to the start of ground-disturbing activities, botanists will identify and map locations of patches of native plants in the taxa most commonly associated with Crotch bumble bee and western bumble bee that would be permanently or temporarily affected by construction during special-status plant surveys (Mitigation Measure VEG-1.1). Native plants of the following genera are appropriate for Crotch bumble bee: *Antirrhinum*, *Asclepias*, *Phacelia*, *Chaenactis*, *Clarkia*, *Dendromecon*, *Eriogonum*, *Eschscholzia*, *Lupinus*, *Medicago*, and *Salvia*. Native plants of the following taxa are appropriate for western bumble bee: *Asteraceae*, *Ceanothus*, *Centaurea*, *Chrysothamnus*, *Cirsium*, *Eriogonum*, *Geranium*, *Grindelia*, *Lupinus*, *Melilotus*, *Monardella*, *Rubus*, *Penstemon*, *Solidago*, and *Trifolium*.

Mitigation Measure WILD-1.13: Compensate for Loss of Crotch Bumble Bee and Western Bumble Bee Habitat

The Authority will compensate for permanent loss of suitable bumble bee foraging habitat (as identified through implementation of Mitigation Measure WILD-1.12) by including suitable native nectar- and pollen-producing plants commonly used as food sources by Crotch and western bumble bees in onsite and/or offsite mitigation plans for sensitive natural communities (Mitigation Measure VEG-2.2). The Authority will compensate for permanent loss of suitable Crotch and western bumble bee habitat by planting native suitable native nectar- and pollen-producing plants at suitable onsite and/or offsite restoration or preservation areas at a ratio of 1:1 (acres lost : acres planted The Authority will compensate for temporary loss of suitable Crotch and western bumble bee habitat by including native bumble bee food plants in planting palettes for onsite restoration of sensitive natural communities (Mitigation Measure VEG-2.2) or temporarily disturbed grassland and/or at offsite mitigation areas.

Native plants of the following genera are appropriate for Crotch bumble bee: *Antirrhinum*, *Asclepias*, *Phacelia*, *Chaenactis*, *Clarkia*, *Dendromecon*, *Eriogonum*,

Eschscholzia, *Lupinus*, *Medicago*, and *Salvia*. Native plants of the following taxa are appropriate for western bumble bee: *Asteraceae*, *Ceanothus*, *Centaurea*, *Chrysothamnus*, *Cirsium*, *Eriogonum*, *Geranium*, *Grindelia*, *Lupinus*, *Melilotus*, *Monardella*, *Rubus*, *Penstemon*, *Solidago*, and *Trifolium*. In mitigation areas where these plant genera are present, habitat will be preserved. In mitigation areas where these plant genera are absent, these plant genera will be seeded or planted, as appropriate based on site conditions. Mitigation areas will be placed under a conservation easement.

The Authority will utilize bumble bee conservation information[2] from The Xerces Society to ensure that mitigation areas provide the suitable native nectar- and pollen-producing plants described above for Crotch bumble bee and western bumble bee. The Authority will conduct baseline surveys of each onsite and offsite mitigation area to determine the baseline habitat conditions for Crotch bumble bee and western bumble bee 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 native nectar- and pollen-producing plants. After onsite restoration is completed at each mitigation area, qualified botanists will conduct surveys during 3 of the next 5 years and evaluate each site to determine if the area and condition of native nectar- and pollen-producing plants achieve the performance standards of being at or above baseline 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 USFWS and CDFW.

Using the latest information from The Xerces Society during planning and development of the mitigation area, monitoring the mitigation area to ensure performance standards are achieved, and implementing adaptive management options when the performance standards are not achieved will ensure that the compensatory mitigation is effective and compensates for the losses resulting from the Project.

NEPA Conclusion

Construction and operation effects on Crotch bumble bee and western bumble bee would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on Crotch bumble bee and western bumble bee as compared to the No Project Alternative from removal of potential habitat and loss of individuals. With implementation of Mitigation Measures WILD-1.9, WILD-1.12, and WILD-1.13, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for Crotch bumble bee and western bumble bee is present at the GCID Main Canal improvements, Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works,

[2] https://www.xerces.org/sites/default/files/publications/12-020_01_BumbleBeeConservation_web.pdf

dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and the Sacramento River discharge.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for Crotch bumble bee and western bumble bee (Table 10-2b). Impacts would be the same as described for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge under Alternative 2 would result in additional loss of modeled habitat and permanent impacts on modeled habitat would be less under Alternative 2 because the inundation area would be smaller. Overall, permanent and temporary impacts on modeled Crotch bumble bee and western bumble bee habitat would be less under Alternative 2 than under Alternatives 1 and 3 because of the smaller inundation area and reduced impacts from construction of dams and dikes (Appendix 10C, Table 10C-5).

Operation

Potential effects on Crotch bumble bee and western bumble bee as a result of operation of Alternative 1 or 3 would be similar to Alternative 2. There could be greater potential for Crotch bumble bee and western bumble bee to be struck by vehicles of workers traveling to operations facilities or those of visitors traveling to recreation areas on the new South Road.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that permanent and temporary impacts on modeled Crotch bumble bee and western bumble bee habitat would be less under Alternative 2 than under Alternatives 1 and 3 because of the smaller inundation area and reduced impacts from construction of dams and dikes. Operation of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that the increased amount of roadway could result in greater potential for Crotch bumble bee and western bumble bee to be struck by vehicles. These impacts would be significant because the implementation of Alternative 2 could reduce the local populations of Crotch bumble bee and western bumble bee through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.9, WILD-1.12, and WILD-1.13 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on Crotch bumble bee and western bumble bee would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on Crotch bumble bee and western bumble bee as compared to the No Project Alternative. Construction of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that permanent and temporary effects on modeled Crotch bumble bee and western bumble bee habitat would be less under Alternative 2 than under Alternatives 1 and 3 due to less area disturbed. Operation of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that the increased amount of roadway could result in greater potential for Crotch bumble bee and western bumble bee to be struck by vehicles. With implementation of Mitigation Measures WILD-1.9, WILD-1.12, and WILD-1.13, effects would be reduced to no adverse effect.

Amphibians and Reptiles

Permanent and temporary impacts on modeled habitat for special-status amphibians and reptiles from Alternatives 1, 2, and 3 are shown in Table 10-2c.

Table 10-2c. Acreages of Permanent and Temporary Impacts on Modeled Special-Status Amphibian and Reptile Habitats in the Study Area

	Alternatives 1 and 3 Permanent Impacts	**Alternatives 1 and 3 Permanent Impacts**	**Alternatives 1 and 3 Temporary Impacts**	**Alternatives 1 and 3 Temporary Impacts**	**Alternative 2 Permanent Impacts**	**Alternative 2 Permanent Impacts**	**Alternative 2 Temporary Impacts**	**Alternative 2 Temporary Impacts**
	Aquatic Habitat	Upland Habitat	Aquatic Habitat	Upland Habitat	Aquatic Habitat	Upland Habitat	Aquatic Habitat	Upland Habitat
Western Spadefoot	532	13,739	50	838	532	13,331	48	813
California Red-legged Frog	287	6,765	17	365	280	6,383	16	366
Western Pond Turtle	636	14,213	330	1,005	642	13,827	429	985
Giant Gartersnake	2	26	28	17	2	20	137	49

Impact WILD-1f: Western Spadefoot

Western spadefoot has been eliminated from a portion of its range as a result of urban and agricultural development and additional habitat losses are expected (Morey 2005:516, 517).

Alternatives 1 and 3

Modeled habitat for western spadefoot is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, and Dunnigan Pipeline.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled western spadefoot habitat (Table 10-2c). Modeled habitat would also be lost when the reservoir was inundated. Clearing and grubbing, excavation, and other construction activities could result in destruction of burrows and mortality or injury of individuals from being crushed or buried by equipment. Western spadefoot could also be struck by vehicles and equipment traveling along access roads during construction. In addition, work in or adjacent to suitable aquatic habitats during the breeding season could destroy developing eggs and/or larvae. Construction activities and lighting could result in the disruption of foraging activities or dispersal. Spills or leaks of gasoline, oil, or other contaminants during construction could contaminate suitable habitat and cause illness or mortality of individuals. Construction of the reservoir could cause fragmentation or isolation of western spadefoot populations and create a barrier for movement between areas of suitable habitat.

Operation

Western spadefoot aquatic habitat could be indirectly affected as a result of changes in topography, compaction of soils, and increases in surface runoff from the additional impervious surfaces associated with the new facilities. These changed conditions could modify the existing hydrologic regime of modeled potential habitat in or near the affected areas. Changes in topography could result in additional water entering habitat or could interfere with existing water flow into habitats, thereby increasing or reducing the amount of water entering habitat. Changes to the length of the inundation period of habitat could affect western spadefoot reproduction. Changes in topography could also result in new or increased amounts of contaminants such as gasoline, oil, and herbicides entering suitable western spadefoot aquatic habitat from adjacent new or widened roads, or new facilities, could cause illness or mortality of individuals. The Authority would implement BMP-15, which will require professional hydrologists and civil engineers to evaluate and design water conveyance systems (e.g., ditches, curb and gutters, culverts) that are within 250 feet of seasonal wetlands to maintain the existing hydrology of the seasonal wetlands and ensure that contaminants from impervious surfaces are not channeled into seasonal wetlands. Implementation of this BMP would avoid potential indirect effects on western spadefoot aquatic habitat from changes in hydrology and new or increased amounts of contaminants.

Impacts from maintenance activities required for operation under Alternatives 1 and 3 are expected to be minimal because maintenance activities would be conducted mostly in previously

disturbed areas during daytime hours and using existing roadways. Western spadefoot could be struck by vehicles and equipment traveling along access roads during operation, but this is unlikely to occur because western spadefoot movement primarily occurs at night. The LMP will include measures and practices to avoid or minimize operations and maintenance impacts on western spadefoot, where suitable or occupied habitat is present.

Modeled habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. There is potential for visitors to access undeveloped areas and disturb existing habitat (e.g., walk through habitat, increase trash). If western spadefoot was present, individuals could be crushed by visitors walking through habitat. In addition, increased human activity at the recreation areas and near the reservoir could cause western spadefoot to avoid habitat in these areas. There is also potential for the introduction of exotic invasive species (e.g., bullfrogs [*Lithobates catesbeianus*], red-eared sliders [*Trachemys scripta elegans*]) from visitors releasing these animals at recreation areas or into the reservoir, which could compete with or prey on western spadefoot. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into western spadefoot aquatic habitat.

New roadways, once completed, could impede movement and increase the potential mortality of western spadefoot from being struck by the vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. The presence of the reservoir could cause fragmentation or isolation of western spadefoot populations and create a barrier for movement between areas of suitable habitat.

Safety lighting would be installed at the dams, bridge, and recreation areas. Lighting could cause western spadefoot to avoid using areas illuminated by these new sources of light or modify its movement pathways to avoid the lighted areas. Lighting could also make western spadefoot more vulnerable to predation. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on western spadefoot.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on western spadefoot from removal of potential habitat and loss of individuals. Operation of Alternative 1 or 3 would result in significant impacts on western spadefoot because exotic invasive species that prey on or compete with western spadefoot could be introduced at recreation areas and individuals could be killed by being struck by the vehicles of personnel or recreationists. These impacts would be significant because implementation of Alternatives 1 and 3 could reduce the local western spadefoot population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.2, WILD-1.3, WILD-1.14, WILD-1.15, WILD-1.16, VEG-2.2, and VEG-3.2 would reduce the level of impact from construction and operation to less than significant because surveys would be conducted to determine presence, disturbance of seasonal wetlands would be avoided during the rainy season, compensation would be provided for the permanent and temporary losses of occupied vernal pool branchiopod habitat (which would also benefit western

spadefoot), and if found to be necessary through a wildlife corridor study, suitable crossings would be installed at appropriate locations to facilitate safe crossings.

Mitigation Measure WILD-1.2: Avoid and Minimize Potential Effects on Vernal Pool Branchiopods and Western Spadefoot

This measure is described above for vernal pool branchiopods.

Mitigation Measure WILD-1.3: Compensate for Impacts on Vernal Pool Branchiopod Habitat

This measure is described above for vernal pool branchiopods.

Mitigation Measure WILD-1.14: Assess Habitat Suitability and Survey Suitable Habitat for Western Spadefoot, California Red-legged Frog, and Western Pond Turtle

Once property access is granted and prior to the start of construction, the Authority will retain qualified biologists to assess habitat suitability and conduct surveys for western spadefoot, California red-legged frog, and western pond turtle in the Project area and where potentially suitable habitat is within 300 feet of the Project area where impacts from operation may occur. Qualified biologists are defined as those who have experience evaluating habitat and conducting focused surveys for western spadefoot, California red-legged frog, and western pond turtle. The surveys will be conducted in accordance with the following conditions.

- Western spadefoot habitat assessments and surveys of seasonal wetland habitat will be conducted during vernal pool branchiopod habitat assessments and surveys (Mitigation Measure WILD-1.1).
- Habitat assessment and surveys for California red-legged frog will be conducted in accordance with the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog*, which provides direction for site assessments and recommend up to eight surveys that are conducted over a period of 9–12 months (U.S. Fish and Wildlife Service 2005b). Habitat assessment and surveys for western pond turtle and western spadefoot (intermittent streams) will be conducted concurrently with the California red-legged frog surveys.

The qualified biologists will prepare and submit reports describing the methods and results of the habitat assessments and surveys to the Authority, CDFW, and USFWS.

Mitigation Measure WILD-1.15: Design and Construct Wildlife Crossings for New Roadways at Suitable Locations

The Authority will retain a qualified wildlife biologist with expertise in wildlife crossing use and design to conduct a wildlife connectivity and crossing assessment and to determine where suitable wildlife crossing structures would be most effective along North Road, Sites Lodoga Road, South Road, and other roads as determined by the

Authority and the wildlife biologist, in coordination with CDFW. Wildlife crossing structures will be designed and constructed at suitable locations to provide habitat connectivity and safe movement for an array of wildlife likely to use the Project area. To ensure that the assessment is inclusive of a variety of species, a wildlife crossing species guild (WCG) approach will be used as detailed in Kintsch et al. (2015). This WCG approach will include ecological and behavioral needs of a variety of species inhabiting the Project area/region. The Authority will also use information from other documents (e.g., Clevenger and Huijser 2011; Langton and Clevenger 2020; Ontario Ministry of Natural Resources and Forestry 2016) when planning and designing corridors for amphibians and reptiles. Wildlife crossing locations and design will be determined based on WCG species inhabiting the Project area/region, habitat features, topography, existing land ownership and use, and the future state of the study area (as shown or described in planning documents) through a wildlife connectivity and crossing assessment. Where possible, wildlife crossings will be located where there is compatible land ownership and use and opportunities for habitat preservation on either side of the wildlife crossing.

Prior to final roadway design for the Project, a wildlife connectivity assessment will be conducted to assess existing and expected wildlife movement and habitat connectivity conditions, evaluate Project-related impacts on connectivity and species movement, and identify appropriate wildlife crossing locations and designs. Other connectivity enhancement strategies such as land acquisition, retrofit of existing structures, habitat enhancement, and traffic control will be considered as part of the connectivity assessment to maintain and enhance connectivity in the area surrounding the reservoir. The assessment will include a landscape-scale and local (Project)-scale assessments. The assessment may use database research, field surveys, photo monitoring, GIS modeling, or a combination thereof to identify existing wildlife species in the Project area, determine how connectivity and species movement may be affected by the Project, and determine the appropriate locations and designs of wildlife crossings.

Wildlife crossings will be located at appropriate frequencies within contiguous suitable habitat and in other locations where crossing structures are warranted (e.g., riparian/riverine crossings) to accommodate a range of species expected to move through the area. For example, for small-bodied animals like amphibians, reptiles, and small mammals, where species habitat and movement needs are present, wildlife crossings may be located no more than 1,000 feet apart or as determined appropriate for specific target species. For medium- and large-bodied animals, such as bobcats, coyotes, tule elk, and deer, wildlife crossings may be located no more than 1 mile apart.

Wildlife crossings will be located where there is suitable habitat on both sides of the roadway. If feasible and depending on the size and ecological and behavioral needs of target species, vegetative cover will be provided near entrances to give animals security and reduce negative effects such as lights and noise associated with the road. Suitable habitat and/or cover will also be provided in the crossing structure wherever feasible. This may be achieved by designing culverts or culvert-like structures to be high enough to allow light for plants to grow, installing rubble piles, stumps, or branches to provide

cover for smaller animals in the crossings, and leaving earthen bottoms in crossing structures.

When possible, wildlife crossings will be located away from areas used or dominated by humans, including recreation areas, trails, and lighted areas to avoid reduced wildlife crossing movement function and to prevent human-wildlife conflict.

Wildlife crossings will be designed to optimally facilitate movement for multiple WCG species. When possible, proposed culverts will be constructed to function as multi-use culverts, which are designed to ensure that they facilitate wildlife movement. Multi-use culvert crossings will be designed to be optimally accessible to wildlife movement and will also be designed to require minimal maintenance.

Wildlife fencing will be installed to direct wildlife toward crossings and prevent species' access to roadways and other areas they must be excluded from. Escape opportunities such as jump-out ramps may be provided as appropriate in conjunction with fencing to allow animals to escape from the roadway.

Mitigation Measure WILD-1.16: Monitor and Maintain Wildlife Crossings

Because many wildlife species will avoid or be obstructed by structures with a substantial amount of debris or blockages, the Authority will require a qualified wildlife biologist to regularly monitor crossings and culverts and clear them or oversee the clearing of debris and other blockages. Cameras, roadkill surveys, or other methods will be used to monitor wildlife crossing use. Vegetative cover will be maintained near crossing entrances to provide cover and reduce negative effects such as artificial lighting and noise associated with the road. A monitoring and maintenance plan for wildlife crossings will be developed during design of wildlife crossings (Mitigation Measure WILD-1.15) that will specify the methods for documenting postconstruction conditions, the approach for and frequency of monitoring and maintenance, performance standards, reporting requirements, and adaptive management actions to ensure long-term success of crossing structure function.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, *Vegetation and Wetland Resources*, Section 9.5, *Impact Analysis and Mitigation Measures*.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction and operation effects on western spadefoot would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse

effect on western spadefoot as compared to the No Project Alternative. Construction of Alternative 1 or 3 would result in effects on western spadefoot from removal of potential habitat and loss of individuals. Operation of Alternative 1 or 3 would result in effects on western spadefoot because exotic invasive species that prey on or compete with western spadefoot could be introduced at recreation areas and individuals could be killed by being struck by the vehicles of personnel or recreationists. With implementation of Mitigation Measures WILD-1.2, WILD-1.3, WILD-1.14, WILD-1.15, WILD-1.16, VEG-2.2, and VEG-3.2, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for western spadefoot is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR West, TRR/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, and Dunnigan Pipeline.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for western spadefoot (Table 10-2c). Impacts would be similar to those under Alternatives 1 and 3 except that construction of South Road and TRR West result in additional loss of modeled habitat and the smaller inundation area would result in reduced loss of modeled habitat. Overall, permanent impacts on modeled western spadefoot aquatic habitat would be slightly more under Alternative 2, and permanent impacts on western spadefoot upland habitat would be less under Alternative 2 than under Alternatives 1 and 3 because of the smaller inundation area and reduced permanent impacts from construction of dams and dikes (Appendix 10C, Table 10C-6). Overall, temporary impacts on modeled aquatic and upland habitat would be less under Alternative 2 because of reduced temporary impacts from dams and dikes and Sites Reservoir related facilities (Appendix 10C, Table 10C-6).

Operation

Potential effects on western spadefoot from operation would be similar under Alternative 2 to Alternatives 1 and 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway could impede western spadefoot movement over a larger area and increase the potential for individual spadefoot toads to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that construction of South Road and TRR West would result in additional permanent loss of potential habitat and the smaller reservoir footprint would reduce the amount of permanent habitat loss under Alternative 2. Overall, permanent and temporary impacts on modeled western spadefoot habitat would be less under Alternative 2 than under Alternatives 1 and 3, except for permanent impacts on modeled aquatic habitat, because of the smaller inundation area and reduced impacts from construction of dams and dikes (Appendix 10C, Table 10C-6). Operation of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that the increased amount of

roadway could impede movement over a larger area and result in additional mortality from vehicle strikes. These impacts would be significant because the implementation of Alternative 2 could reduce the local western spadefoot population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.2, WILD-1.3, WILD-1.14, WILD-1.15, WILD-1.16, VEG-2.2, and VEG-3.2 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on western spadefoot would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on western spadefoot as compared to the No Project Alternative. Overall, permanent and temporary impacts on modeled western spadefoot habitat would be less under Alternative 2 than under Alternatives 1 and 3, except for permanent impacts on modeled aquatic habitat, because of the smaller inundation area and reduced impacts from construction of dams and dikes (Appendix 10C, Table 10C-6). Operation of Alternative 2 would result in similar effects to Alternatives 1 and 3, except that the increased amount of roadway could impede movement over a larger area and result in additional mortality from vehicle strikes. With implementation of Mitigation Measures WILD-1.2, WILD-1.3, WILD-1.14, WILD-1.15, WILD-1.16, and VEG-2.2, effects would be reduced to no adverse effect.

Impact WILD-1g: California Red-legged Frog

California red-legged frog has been extirpated from approximately 70% of its historical range, with severe declines occurring primarily in the Central Valley and southern California (U.S. Fish and Wildlife Service 2002:1, 4, 5).

Alternatives 1 and 3

Modeled habitat for California red-legged frog is present west of Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, and recreation areas.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled habitat for California red-legged frog (Table 10-2c). Clearing and grubbing, excavation, and other construction activities could result in destruction of burrows, and mortality or injury of individuals from being crushed or buried by equipment. California red-legged frog could be struck by vehicles and equipment traveling along access roads during construction. In addition, work in or adjacent to suitable aquatic habitats during the breeding season could destroy developing eggs and/or larvae. Construction activities and lighting could also result in disruption of foraging activities or dispersal. Spills or leaks of gasoline, oil, or other contaminants during construction could contaminate suitable habitat and cause illness or mortality of individuals.

Operation

New or increased amounts of contaminants such as gasoline, oil, and herbicides could enter suitable California red-legged frog aquatic habitat from adjacent new or widened roads, or new facilities, which could cause illness or mortality of eggs or individuals.

Impacts from maintenance activities required for operation under Alternatives 1 and 3 are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. If present, California red-legged frog could be struck by vehicles and equipment traveling along access roads during operation, but this is unlikely to occur because California red-legged frog movement mostly occurs at night. The LMP will include measures and practices to avoid or minimize operations and maintenance impacts on California red-legged frog, where suitable or occupied habitat is present.

Modeled habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. There is potential for visitors to access undeveloped areas and disturb existing habitat (e.g., walk through habitat, increase trash). If California red-legged frog was present, individuals could be crushed by visitors walking through habitat. In addition, increased human activity at the recreation areas and near the reservoir could cause California red-legged frog to avoid habitat in these areas. There is also potential for the introduction of exotic invasive species (e.g., bullfrogs, red-eared sliders) from visitors releasing these animals at recreation areas or into the reservoir, which could compete with or prey on California red-legged frog. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into California red-legged frog aquatic habitat.

New roadways could impede movement and increase the potential for mortality of California red-legged frog from being struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. The presence of Sites Reservoir under Alternatives 1 and 3 would be an ongoing impediment to movement of California red-legged frog. If California red-legged frogs are present in the aquatic features directly east of the reservoir, presence of the reservoir could cause fragmentation of the California red-legged frog population and create a barrier for California red-legged frog movement between these aquatic features and suitable habitat directly west of the reservoir.

Safety nighttime lighting would be installed at the dams, Funks Reservoir, bridge, and recreation areas, where modeled habitat is present. Lighting could cause California red-legged frog to avoid using areas illuminated by these new sources of light or modify its movement pathways to avoid the lighted areas. Lighting could also make California red-legged frog vulnerable to predation. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on California red-legged frog.

Stone Corral and Funks Creeks would receive bypass flows from the reservoir through outlets on Sites Dam and Golden Gate Dam, respectively. Bypass flows would range from 0 to 100 cfs, with larger pulse flows to emulate natural flood conditions, and lower flows in the drier months (e.g., summer). The increase of flow in each drainage would support the existing geomorphic functions (i.e., flow regime, sediment transport, and bank erosion) and characteristics (i.e., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian

vegetation) of each channel. A Flow Characterization and Geomorphic Study (Appendix 2D) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. Because the bypass flows would emulate natural conditions and would not exceed 100 cfs, they would not substantially change the length of time that there is flow in the creeks or the length of ponding in the creeks. The addition of impervious surfaces would not substantially alter the existing drainage patterns of a site or area because of the limited area of impervious surfaces and the ability of the surrounding open area to allow infiltration of precipitation. While increased flows from bypass releases may result in minor increases in erosion and changes in sediment deposition, the changes are expected to be minimal and no impacts on California red-legged frog are expected.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 could result in significant impacts on California red-legged frog from removal of modeled habitat and potential loss of individuals. Operation of Alternative 1 or 3 could result in significant impacts on California red-legged frog as a result of new or increased contaminants entering habitat, vehicle strikes, introduction of exotic invasive species that prey on or compete with California red-legged frog, and impeded movement from new roadways. These impacts would be significant because the implementation of Alternative 1 or 3 could reduce the local California red-legged frog population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.17, and WILD-1.18 would reduce the level of impact from construction and operation to less than significant because surveys would be conducted to determine presence, protective measures would be implemented during construction, compensation would be provided for the permanent and temporary losses of suitable habitat, and if found to be necessary through a wildlife corridor study, suitable crossings would be installed at appropriate locations to facilitate safe crossings.

Mitigation Measure WILD-1.14: Assess Habitat Suitability and Survey Suitable Habitat for Western Spadefoot, California Red-legged Frog, and Western Pond Turtle

This mitigation measure is described above for western spadefoot.

Mitigation Measure WILD-1.15: Design and Construct Wildlife Crossings for New Roadways at Suitable Locations

This mitigation measure is described above for western spadefoot.

Mitigation Measure WILD-1.16: Monitor and Maintain Wildlife Crossings

This mitigation measure is described above for western spadefoot.

Mitigation Measure WILD-1.17: Implement California Red-legged Frog Protective Measures

If California red-legged frog is found in the Project area either incidentally or during surveys conducted in accordance with Mitigation Measure WILD-1.14, the Authority will implement the following protective measures. These measures will apply to upland

habitat (within 300 feet) and dispersal habitat (within 1 mile) of aquatic habitats that are found to be occupied during surveys.

- Occupied aquatic habitat will not be removed or filled until California red-legged frogs have been relocated to suitable habitat outside of disturbance areas or other actions that will avoid mortality of individuals or effects on the population as determined during ESA Section 7 consultation with USFWS.
- Occupied aquatic habitat that will not be removed or disturbed will be protected with exclusion fencing along the edge of the work area a minimum of 200 feet from the aquatic habitat. The fencing will be installed to prevent individuals from entering the work area but will not completely enclose the pond or exclude dispersal to and from the pond. The USFWS-approved biologist will assist with preparing the fence plans and will be present during installation. The fencing will be installed to a depth of 6 inches and extended at least 30 inches above grade. The contractor will avoid placing fencing on top of ground squirrel burrows. The fence will be pulled taut at each support to prevent folds or sagging. A USFWS-approved biologist will also walk all fence lines daily to look for individual frogs stranded along fence lines. Fencing will be inspected and maintained in good condition throughout work and will be removed after work is complete and all construction equipment is removed from the work area.
- A USFWS-approved biologist will be present during all ground-disturbing work in California red-legged frog upland and dispersal habitats during the rainy season (generally October 15 to May 1) when frogs are dispersing. The biologist will survey work areas for frogs and for rodent burrows in potential upland habitat immediately prior to the start of any ground-disturbing work (including moving equipment into the area). If a California red-legged frog is found, it will be moved out of the work area in accordance with the USFWS biological opinion for the Project. Disturbance of suitable habitat will be minimized to the maximum extent feasible.
- In the event a California red-legged frog is trapped, construction within 300 feet of the location will cease until the individual has been removed from the location per a USFWS-approved relocation plan. The plan will include trapping and relocation methods, relocation sites, and post-relocation monitoring. Only USFWS-approved biologists will be allowed to relocate listed species to outside of the construction area.
- If ground disturbance or vegetation removal will occur in suitable upland or dispersal habitats during or 24 hours following a rain event between October 15 and May 1, a USFWS-approved biologist will be onsite to monitor the work and ensure that the exclusion fencing is intact. Following a rain event, no work will proceed until a USFWS-approved biologist has inspected the work areas and verified that there are no California red-legged frogs present. A rain event is to be considered precipitation of at least 0.25 inch within a 24-hour period.
- Activities within suitable upland/dispersal habitat will cease no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Except when necessary for driver or pedestrian safety artificial lighting at a worksite will be prohibited during the hours of darkness when working in suitable California red-legged frog upland/dispersal habitat.

- For any night work, the driving path and work area will be surveyed for California red-legged frog immediately prior to work and nighttime work will be monitored by a USFWS-approved biologist.

- If work must be conducted at night, all lighting will be directed away and shielded from California red-legged frog habitat outside the work area to minimize light spillover to the greatest extent possible.

Mitigation Measure WILD-1.18: Compensate for Permanent and Temporary Losses of Occupied California Red-legged Frog Aquatic and Upland Habitats

The Authority will compensate for the permanent and temporary losses of occupied California red-legged frog aquatic habitat and associated upland habitat through the purchase of mitigation credits at a USFWS-approved mitigation or conservation bank or through acquiring or preserving and protecting habitat in perpetuity at a location approved by USFWS. Permanent impacts on habitat will be mitigated by restoring or preserving habitat at a 2:1 ratio (habitat restored or preserved : habitat affected) or by an equivalent or greater amount as determined during Section 7 ESA consultation with USFWS. Temporary impacts on habitat will be mitigated by restoring or preserving habitat at a 1:1 ratio (habitat restored or preserved : habitat affected), or by an equivalent or greater amount as determined during Section 7 ESA consultation with USFWS for the Project. The purchase of mitigation credits or the establishment of onsite or offsite mitigation areas (or a combination of these options) would be completed as agreed upon by the Authority, Reclamation, and USFWS.

USFWS-approved conservation banks have long-term adaptive management plans with performance standards. Therefore, if mitigation occurs through a USFWS-approved conservation bank, the bank's performance standards and success criteria will be applied.

If credits are not purchased at a USFWS-approved conservation bank, the Authority will implement standards for long-term management and protection of conservation areas. The Authority will work closely with USFWS during the planning and development of conservation areas. Conservation areas will have suitable aquatic and upland habitat. Once established, conservation areas will be surveyed by a USFWS-approved biologist a minimum of two times between January 1 and June 30. The biologist will survey aquatic habitat for California red-legged frog, evaluate the adequacy of site protection (e.g., fencing, signage), assess potential threats to the frog, and take photographs of the site. The biologist will also survey a set of reference ponds or other aquatic habitat known to be occupied by California red-legged frog to compare to the preserved and created/restored aquatic habitat. The reference ponds/habitat should be located within proximity to the conservation area and exhibit characteristics similar to the preserved and created/restored habitat.

Performance standards for management of non-mitigation bank ponds are as follows: (1) > 10% of the shoreline is vegetated; (2) 30%–60% of the pond has emergent vegetation; and (3) 40%–70% of the pond is open water. Performance standards are not included for California red-legged frog occupancy since the objective of the Project mitigation is to

establish compensatory suitable habitat rather than to ensure occupancy. Therefore, the successful establishment of aquatic and upland habitats based on the floristic, physical, and hydrologic components of the habitats will be used to evaluate the success of offsite California red-legged frog habitat compensatory mitigation. If the performance standards cannot be achieved, the Authority and Reclamation will consult with USFWS to implement an alternative compensatory mitigation approach.

Working closely with USFWS during planning and development of the conservation area and monitoring the conservation area to ensure performance standards are achieved and adaptive management actions are applied when the performance standards are not achieved will ensure that the compensatory mitigation is effective and compensates for the losses resulting from the Project.

NEPA Conclusion

Construction and operation effects on California red-legged frog would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on California red-legged frog as compared to the No Project Alternative from removal of modeled habitat and potential loss of individuals. With implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.17, and WILD-1.18, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for California red-legged frog is present at the TRR West, west of Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, and recreation areas.

Construction

Construction of Alternative 2 would result in permanent and temporary losses of modeled aquatic and upland habitat for California red-legged frog (Table 10-2c). Impacts would be similar to those for Alternatives 1 and 3 except that construction of South Road and TRR West would result in additional loss of modeled habitat and the smaller inundation area would result in reduced loss of modeled habitat. Overall, permanent impacts on modeled California red-legged frog habitat would be less under Alternative 2 than under Alternatives 1 and 3 because of the smaller inundation area and reduced impacts from construction of dams, and dikes (Appendix 10C, Table 10C-7). Temporary impacts on California red-legged frog modeled habitat would be similar to Alternatives 1 and 3 (Appendix 10C, Table 10C-7). A reduction in the removal of potential habitat would also result in a decreased potential for injury or mortality of California red-legged frog. A smaller area could be affected by construction lighting and potential contamination from spills or leaks of gasoline, oil, or other contaminants during construction.

Operation

Potential operation effects on California red-legged frog under Alternative 2 would be similar to those under Alternatives 1 and 3. The length of new roadway would be substantially longer (more than 10 miles) for Alternative 2 than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway would impede

movement over a larger area and increase the potential for California red-legged frog to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that permanent impacts on modeled California red-legged frog habitat would be less under Alternative 2 than under Alternatives 1 and 3 because of the smaller inundation area and reduced impacts from construction of dams and dikes (Appendix 10C, Table 10C-7). A net decrease in the amount of habitat removed would also decrease the potential for individuals to be crushed or buried by equipment or struck by vehicles and equipment traveling along access roads. The operation impacts of Alternative 2 would be similar to those for Alternatives 1 and 3 except that the increased amount of roadway could impede movement over a larger area and result in additional mortality from vehicle strikes. These impacts would be significant because the implementation of Alternative 2 could reduce the local California red-legged frog population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.17, and WILD-1.18 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on California red-legged frog would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on California red-legged frog as compared to the No Project Alternative from removal of modeled habitat and potential loss of individuals. Construction of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that permanent effects on modeled California red-legged frog habitat would be less under Alternative 2 than under Alternatives 1 and 3 because of the smaller inundation area and reduced effects from construction of dams and dikes (Appendix 10C, Table 10C-7). A net decrease in the amount of habitat removed would also decrease the potential for individuals to be crushed or buried by equipment or struck by vehicles and equipment traveling along access roads. The operation effects of Alternative 2 would be similar to those for Alternatives 1 and 3 except that the increased amount of roadway could impede movement over a larger area and result in additional mortality from vehicle strikes. With implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.17, and WILD-1.18, effects would be reduced to no adverse effect.

Impact WILD-1h: Western Pond Turtle

Western pond turtle populations have declined substantially, although they are still found within most of their historical range in California (Yarnal 2019:10–13).

Alternatives 1 and 3

Modeled habitat for western pond turtle is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, Sites Reservoir, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline. Potential habitat is also present along the Sacramento River in the operations study area.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled habitat for western pond turtle (Table 10-2c). Clearing and grubbing, excavation, and other construction activities could result in the destruction of nest sites and mortality or injury of eggs or individuals from being crushed or buried by equipment. Western pond turtle could be struck by vehicles and equipment traveling along access roads during construction. Construction activities could also result in disruption of foraging activities or dispersal. Spills or leaks of gasoline, oil, or other contaminants during construction could contaminate suitable aquatic habitat and cause illness or mortality of individuals.

Operation

Under Alternative 1 or 3, new or increased amounts of contaminants such as gasoline, oil, and herbicides could enter suitable western pond turtle aquatic habitat from adjacent new or widened roads, or new facilities, which could cause illness or mortality of individuals.

Impacts on western pond turtle from routine maintenance activities are not expected because maintenance activities would be conducted mostly in previously disturbed areas during daylight hours and using existing roadways. If present, western pond turtle could be struck by vehicles and equipment traveling along access roads during operation. The LMP will include measures and practices to avoid or minimize operations and maintenance impacts on western pond turtle where suitable or occupied habitat is present.

Modeled habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. There is potential for visitors to access undeveloped areas and disturb existing habitat (e.g., walk through habitat, increase trash). In addition, increased human activity at the recreation areas and near the reservoir could cause western pond turtle to avoid habitat in these areas. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into western pond turtle aquatic habitat.

New roadways, once completed, could create barriers to movement and increase the potential for western pond turtle to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

Stone Corral and Funks Creeks would have increased flows that would range from 0 to 100 cfs, with larger pulse flows to emulate natural flood conditions, and lower flows in the drier months (e.g., summer). A Flow Characterization and Geomorphic Study (Appendix 2D) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. These flow increases would support the existing geomorphic functions and characteristics of each channel. Because the bypass flows would emulate natural conditions and would not exceed 100 cfs, they would not substantially change the length of time that there is flow in the creeks or the length of ponding in the creeks. The addition of impervious surfaces would not substantially alter the existing drainage patterns of a site or area because of the limited area of impervious surfaces and the ability of the surrounding open area to allow infiltration of precipitation. While increased flows from bypass releases may result in minor increases in

erosion and changes in sediment deposition, the changes are expected to be minimal and no impacts on western pond turtle are expected.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle, operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect western pond turtle or its aquatic or upland habitat.

Based on observations during North Delta Flow Actions (Davis pers. comm.), the comparable August–October habitat flows from Sites Reservoir through the Yolo Bypass may cause limited inundation of low-elevation parcels in the upper Yolo Bypass (north of the I-80 causeway). The intent of the releases from Sites Reservoir to the Yolo Bypass during this period is to temporally and spatially distribute food resources for fish species. If the water inundates floodplain areas (i.e., areas outside existing channels) the food would be deposited and would fail to move into the Delta. As such, Sites Reservoir would be operated to maintain flows within the existing Toe Drain, Tule Canal, and other channels, and adjustments in operations would be coordinated between the Authority and parcel owners using the existing Yolo Bypass monitoring network. As a result, impacts on potential western pond turtle habitat in the Yolo Bypass are not anticipated.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on western pond turtle from removal of potential habitat and potential loss of individuals. Operation of Alternative 1 or 3 could result in significant impacts on western pond turtle as a result of new or increased contaminants entering habitat, vehicle strikes, and new roads creating impediments to movement. These impacts would be significant because the implementation of Alternative 1 or 3 could reduce the local western pond turtle population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.19, VEG-2.2, VEG-3.1, VEG-3.2, and VEG-3.3 would reduce the level of impact from construction

and operation to less than significant because surveys would be conducted to identify suitable habitat, qualified biologists would conduct preconstruction surveys and monitor initial work in suitable aquatic habitat, compensation would be provided for the permanent and temporary losses of suitable habitat, and if found to be necessary through a wildlife corridor study, suitable crossings would be installed at appropriate locations to facilitate safe crossings.

Mitigation Measure WILD-1.14: Assess Habitat Suitability and Survey Suitable Habitat for Western Spadefoot, California Red-legged Frog, and Western Pond Turtle

This measure is described above for western spadefoot.

Mitigation Measure WILD-1.15: Design and Construct Wildlife Crossings for New Roadways at Suitable Locations

This mitigation measure is described above for western spadefoot.

Mitigation Measure WILD-1.16: Monitor and Maintain Wildlife Crossings

This mitigation measure is described above for western spadefoot.

Mitigation Measure WILD-1.19: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Initial In-Water Work

The Authority will retain qualified biologists (i.e., experienced in the identification of and knowledge of the life history and habitats of western pond turtle) to conduct preconstruction surveys within 24 hours of the start of activities that disturb occupied or suitable western pond turtle aquatic habitat. The biologist will survey the aquatic habitat and adjacent marsh, riparian, and grassland habitat in the construction area. If in-water work does not start immediately, the biologist will return to the construction site immediately prior to the start of in-water work to conduct another preconstruction survey. The biologist will remain onsite until initial in-water work is complete. If a turtle becomes trapped during initial in-water work, a biologist who is CDFW-approved to capture and relocate turtles during construction of the Project will relocate the individual to suitable aquatic habitat upstream or downstream of the construction area. The construction crew will be instructed to notify the crew foreman who will contact the biologist if a turtle is found trapped in the construction area. Work in the area where the turtle is trapped will stop until the biologist arrives and removes and relocates the turtle. The biologist will report their activities to CDFW within 24 hours of relocating any turtle.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.1: Avoid and Minimize Disturbance of Wetlands and Non-Wetland Waters During Construction Activities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.3: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Non-Wetland Waters

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction and operation effects on western pond turtle would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on western pond turtle as compared to the No Project Alternative from removal of potential habitat and potential loss of individuals. With implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.19, VEG-2.2, VEG-3.1, VEG-3.2, and VEG-3.3, effects would be reduced to no adverse effect.

Alternative 2

Suitable habitat for western pond turtle is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR/Funks pipelines, TRR West, Funks Reservoir, Sites Reservoir, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and the Sacramento River discharge. Potential habitat is also present along the Sacramento River in the operations study area.

Construction

Construction of Alternative 2 would result in permanent and temporary losses of modeled aquatic and upland habitat for western pond turtle (Table 10-2c). Impacts would be similar to those for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge would result in additional loss of modeled habitat and the smaller inundation area would result in smaller impacts on modeled habitat. Overall, permanent and temporary impacts on modeled western pond turtle aquatic habitat would be greater under Alternative 2 because of the construction of South Road and TRR West. Overall, permanent and temporary impacts on modeled western pond turtle upland habitat would be less under Alternative 2 than under Alternative 1 or 3 because of the smaller inundation area and reduced impacts from construction of dams, and dikes (Appendix 10C, Table 10C-8). Additional removal of modeled aquatic habitat would also result in an increased potential for injury or mortality of western pond turtle. There would be a larger area that could be affected by potential contamination from spills or leaks of gasoline, oil, or other contaminants during construction.

Operation

Potential effects on western pond turtle from operation would be similar under Alternative 2 as described for Alternatives 1 and 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway would impede movement over a larger area and increase the potential for western pond turtle to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3 except that permanent and temporary impacts on modeled western pond turtle aquatic habitat would be greater under Alternative 2 because of the construction of South Road and TRR West and permanent and temporary impacts on modeled western pond turtle upland habitat would be less under Alternative 2 because of the smaller inundation area and reduced impacts from construction of dams, and dikes. A net increase in the amount of modeled aquatic habitat removed would also increase the potential for individuals to be crushed or buried by equipment. Operation of Alternative 2 would be the same as Alternatives 1 and 3 except that the increased amount of roadway would impede movement over a larger area and result in additional mortality from vehicle strikes. These impacts would be significant because the implementation of Alternative 2 could reduce the local western pond turtle population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.19, VEG-2.2, VEG-3.1, VEG-3.2, and VEG-3.3 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on western pond turtle would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on western pond turtle as compared to the No Project Alternative from removal of potential habitat and potential loss of individuals. Construction of Alternative 2 would result in similar effects to Alternatives 1 and 3 except that permanent and temporary effects on modeled western pond turtle aquatic habitat would be greater under Alternative 2 because of the construction of South Road and TRR West and permanent and temporary effects on modeled western pond turtle upland habitat would be less under Alternative 2 because of the smaller inundation area and reduced effects from construction of dams and dikes. A net increase in the amount of modeled aquatic habitat removed would also increase the potential for individuals to be crushed or buried by equipment. Operation of Alternative 2 would be the same as Alternatives 1 and 3 except that the increased amount of roadway would impede movement over a larger area and result in additional mortality from vehicle strikes. With implementation of Mitigation Measures WILD-1.14, WILD-1.15, WILD-1.16, WILD-1.19, VEG-2.2, VEG-3.1, VEG-3.2, and VEG-3.3, effects would be reduced to no adverse effect.

Impact WILD-1i: Giant Gartersnake

Giant gartersnake distribution and abundance has declined in the San Joaquin Valley and giant gartersnake abundance has declined in the Sacramento Valley (U.S. Fish and Wildlife Service 2017b:I-9).

Alternatives 1 and 3

Modeled habitat for giant gartersnake is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East, road improvements, and Dunnigan Pipeline.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of potential giant gartersnake habitat (Table 10-2c). Clearing and grubbing, excavation, structure improvements associated with road improvements, and other construction activities could result in the destruction of burrows and mortality or injury of individuals from being crushed or buried by equipment. Giant gartersnake could be struck by vehicles and equipment traveling along access roads during construction. Construction activities could also result in disruption of foraging activities or dispersal. Spills or leaks of gasoline, oil, or other contaminants during construction could contaminate suitable aquatic habitat and cause illness or mortality of individuals.

Operation

Under Alternative 1 or 3, new or increased amounts of contaminants such as gasoline, oil, and herbicides could enter suitable giant gartersnake aquatic habitat from adjacent new or widened roads, or new facilities, which could cause illness or mortality of individuals.

Maintenance activities required for operation of Alternative 1 or 3 facilities could result in impacts on giant gartersnake. For most areas of operation, impacts are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas using existing roadways. Maintenance of ditches or waterway crossings that provide suitable giant gartersnake habitat could result in injury or mortality of individuals. If present, giant gartersnake could be struck by vehicles and equipment traveling along access roads during operation. The LMP will include measures and practices to avoid or minimize operations and maintenance impacts on giant gartersnake, where suitable or occupied habitat is present.

Based on observations during North Delta Flow Actions (Davis pers. comm.), the comparable August–October habitat flows from Sites Reservoir through the Yolo Bypass may cause limited inundation of low-elevation parcels in the upper Yolo Bypass (north of the I-80 causeway). The intent of the releases from Sites Reservoir to the Yolo Bypass during this period is to temporally and spatially distribute food resources for fish species. If the water inundates floodplain areas (i.e., areas outside existing channels) the food would be deposited and would fail to move into the Delta. As such, Sites Reservoir would be operated to maintain flows within the existing Toe Drain, Tule Canal, and other channels, and adjustments in operations would be coordinated between the Authority and parcel owners using the existing Yolo Bypass monitoring network. As a result, impacts on potential giant gartersnake habitat in the Yolo Bypass are not anticipated.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on giant gartersnake from removal of suitable habitat and potential loss of individuals. Operation of Alternative 1 or 3 could result in significant impacts on giant gartersnakes if individuals are injured or killed during maintenance of waterway structures or are struck by vehicles during maintenance activities. These impacts would be significant because the implementation of Alternative 1 or 3 could reduce the local giant gartersnake population through direct mortality and habitat loss. Implementation of Mitigation Measure WILD-1.20 would reduce the level of impact from construction and operation to less than significant because construction in suitable habitat would be conducted during this species' active period to the extent feasible, surveys would be conducted to determine presence of giant gartersnake, construction would be suspended if giant gartersnakes are observed in work areas, exclusion fencing would be installed along the edge of the construction area where suitable habitat is present, and additional measures would be implemented to avoid causing giant gartersnake injury and mortality. Furthermore, implementation of Mitigation Measures VEG-2.2, VEG-3.2, VEG-3.3, and WILD-1.21 would reduce the level of impact to less than significant because temporarily disturbed aquatic and upland habitats would be restored and compensation would be provided for the permanent and temporary losses of suitable aquatic and upland habitat. The Authority will also implement measures specified in the biological opinion from USFWS and the incidental take permit from CDFW for the Project.

Mitigation Measure WILD-1.20: Implement Protective Measures for Giant Gartersnake

The Authority will implement the following protective measures when working in or near giant gartersnake habitat.

- When possible, all construction activity in suitable giant gartersnake aquatic habitat, and upland habitat within 200 feet of suitable aquatic habitat, will be conducted during the snake's active period (between May 1 and October 1). For work that cannot be conducted between May 1 and October 1, additional protective measures, such as installing exclusion fencing or additional biological monitoring, or other measures determined during consultation with USFWS and CDFW, will be implemented.
- Any dewatered habitat will remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.
- The movement of heavy equipment within 200 feet of the banks of potential giant gartersnake aquatic habitat will be confined to designated haul routes to minimize habitat disturbance.
- Vegetation clearing within 200 feet of the banks of suitable giant gartersnake aquatic habitat will be limited to the minimum area necessary. Avoided giant gartersnake habitat in or adjacent to the Project area will be flagged and designated as an activity exclusion zone, to be avoided by all construction personnel.

- To reduce the likelihood of snakes entering the construction area, exclusion fencing will be installed along the edge of the construction area that is within 200 feet of suitable aquatic habitat. The exclusion fencing will be installed during the active period for giant gartersnakes (May 1 to October 1) to reduce the potential for injury and mortality during this activity. The exclusion fencing will consist of 3-foot-tall silt fencing buried 4 to 6 inches below ground level.
- A USFWS- and CDFW-approved biologist will conduct a preconstruction survey of work areas within 200 feet of suitable giant gartersnake habitat no more than 24 hours before the start of work in that area.
- Prior to construction activities each morning, construction personnel will inspect exclusion and orange barrier fencing to ensure they are both in good working order. If any snakes are observed in the construction area during this inspection or at any other time during construction, the USFWS- and CDFW-approved biologist will be contacted to survey the site for snakes. The work area will be re-inspected and surveyed whenever a lapse in construction activity of 2 weeks or more has occurred. If a snake (believed to be a giant gartersnake) is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed.
- The Authority will prepare a giant gartersnake relocation plan for review and approval by USFWS and CDFW prior to Project implementation. The plan will include trapping and relocation methods, relocation sites, and post-relocation monitoring. If a giant gartersnake becomes trapped, construction will cease until the individual has been relocated to an appropriate location as described in the approved relocation plan. Only USFWS and CDFW-approved biologists will conduct surveys and move listed species in accordance with the approved relocation plan.

Mitigation Measure WILD-1.21: Compensate for Permanent and Temporary Losses of Giant Gartersnake Aquatic and Upland Habitats

The Authority will compensate for the permanent and temporary losses of suitable giant gartersnake aquatic habitat and associated upland habitat through the purchase of mitigation credits at a USFWS- and CDFW-approved mitigation or conservation bank or through acquiring and protecting habitat in perpetuity at a location approved by USFWS and CDFW. Permanent impacts on habitat will be mitigated by restoring or preserving habitat at a 3:1 ratio (habitat restored or preserved: habitat affected) or by an equivalent or greater amount as determined through consultation with USFWS or CDFW. Temporary impacts on habitat will be mitigated by restoring or preserving habitat at a 1:1 ratio (habitat restored or preserved : habitat affected), or by an equivalent or greater amount as determined during consultation with USFWS or CDFW. The purchase of mitigation credits or the establishment of onsite or offsite mitigation areas (or a combination of these options) would be completed as agreed upon by the Authority, Reclamation, USFWS, and CDFW.

USFWS and CDFW-approved conservation/mitigation banks have long-term adaptive management plans with performance standards. If mitigation occurs through a USFWS

and CDFW-approved conservation/ mitigation bank, the bank's performance standards and success criteria will be applied.

If credits are not purchased at a USFWS and CDFW-approved conservation bank, the Authority will implement standards for long-term management and protection of conservation areas. The Authority will work closely with USFWS and CDFW during the planning and development of conservation areas. Conservation areas will have suitable aquatic and upland habitat. Once established, conservation areas will be surveyed annually by a USFWS- and CDFW- approved biologist. The biologist will assess the aquatic and upland habitat conditions, evaluate the adequacy of site protection (e.g., fencing, signage), assess potential threats to giant gartersnake, and take photographs of the site. The biologist will prepare monitoring reports that will include methods and results of monitoring and recommendations for adaptive management actions as needed.

Performance standards for non-mitigation bank aquatic and upland habitat compensation will provide the basis for monitoring parameters and will help determine the need for possible remedial actions after Project implementation. General performance standards for management of non-mitigation bank giant gartersnake habitat are as follows: (1) protected habitat is supplied with a reliable source of clean water from March through November or at a minimum, through the critical active summer months; (2) a sufficient amount of upland habitat is adjacent to aquatic habitat and is not inundated during the active season (May 1 through October 1); (3) the site provides available and abundant bankside vegetative cover (i.e., tule, cattail) for cover; and (4) permanent shelter, such as bankside cracks or crevices, holes, or small mammal burrows and upland winter refugia (areas that do not flood) must be present and maintained. During planning and development of the mitigation area, additional or more refined performance standards may be developed in coordination with USFWS and CDFW. Performance standards are not included for giant gartersnake occupancy since the objective of the Project mitigation is to establish compensatory suitable habitat rather than to ensure occupancy. Therefore, the successful establishment of aquatic and upland habitats based on the floristic, physical, and hydrologic components of the habitats will be used to evaluate the success of offsite giant gartersnake habitat compensatory mitigation.

Working closely with USFWS and CDFW during planning and development of the conservation area, monitoring the conservation area to ensure performance standards are achieved, and applying adaptive management actions when the performance standards are not achieved will ensure that the compensatory mitigation is effective and compensates for the losses resulting from the Project.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.3: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Non-Wetland Waters

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction and operation effects on giant gartersnake would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on giant gartersnake as compared to the No Project Alternative from removal of suitable habitat and potential loss of individuals. With implementation of Mitigation Measures WILD-1.20, WILD-1.21, VEG-2.2, VEG-3.2, and VEG-3.3, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for giant gartersnake is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR West, new and widened roadways, Dunnigan Pipeline, and the Sacramento River discharge.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for giant gartersnake (Table 10-2c). Impacts would be similar to those under Alternatives 1 and 3 except that permanent impacts on modeled upland habitat would be less under Alternative 2 because of reduced impacts from construction of the TRR West and temporary impacts on modeled aquatic and upland habitat would be greater under Alternative 2 because of the extended Dunnigan Pipeline and construction of the Sacramento River discharge under Alternative 2 (Appendix 10C, Table 10C-9).

Operation

Potential effects on giant gartersnake from operation would be similar under Alternative 2 to those described for Alternatives 1 and 3 except that additional maintenance activities at the Sacramento River discharge could result in additional potential for injury or mortality of giant gartersnakes.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in similar impacts to those under Alternatives 1 and 3 except that permanent impacts on modeled upland habitat would be less under Alternative 2 because of reduced impacts from construction of TRR West and temporary impacts on modeled aquatic and upland habitat would be greater under Alternative 2 because of the extended Dunnigan Pipeline and construction of the Sacramento River discharge. Operation of Alternative 2 could also result in additional potential for injury or mortality of giant gartersnakes from maintenance activities at the Sacramento River discharge. These impacts would be significant because the implementation of Alternative 2 could reduce the local giant gartersnake population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.20,

WILD-1.21, VEG-2.2, VEG-3.2, and VEG-3.3 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on giant gartersnakes would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on giant gartersnake as compared to the No Project Alternative removal of suitable habitat and potential loss of individuals. Construction of Alternative 2 would result in similar effects to those under Alternatives 1 and 3 except that permanent effects on modeled upland habitat would be less under Alternative 2 because of reduced effects from construction of TRR West and temporary effects on modeled aquatic and upland habitat would be greater under Alternative 2 because of the extended Dunnigan Pipeline and construction of the Sacramento River discharge. Operation of Alternative 2 could also result in additional potential for injury or mortality of giant gartersnakes from maintenance activities at the Sacramento River discharge. With implementation of Mitigation Measures WILD-1.20, WILD-1.21, VEG-2.2, VEG-3.2, and VEG-3.3, effects would be reduced to no adverse effect.

Birds

Permanent and temporary impacts on modeled habitat for special-status birds from Alternatives 1, 2, and 3 are shown in Table 10-2d.

Table 10-2d. Acreages of Permanent and Temporary Impacts on Modeled Special-Status Bird Habitats in the Study Area

	Alternatives 1 and 3 Permanent Impacts	Alternatives 1 and 3 Permanent Impacts	Alternatives 1 and 3 Temporary Impacts	Alternatives 1 and 3 Temporary Impacts	Alternative 2 Permanent Impacts	Alternative 2 Permanent Impacts	Alternative 2 Temporary Impacts	Alternative 2 Temporary Impacts
	Nesting Habitat	**Foraging Habitat**	**Nesting Habitat**	**Foraging Habitat**	**Nesting Habitat**	**Foraging Habitat**	**Nesting Habitat**	**Foraging Habitat**
Golden Eagle	1,006	13,109	43	916	947	12,752	41	868
Swainson's Hawk and White-tailed Kite	1,083	14,184	50	1,023	970	13,637	48	998
Mountain Plover	N/A	14,166	N/A	980	N/A	13,621	N/A	929
Bank Swallow	0	15,664	0	1,413	0	15,111	0	1,472
Tricolored Blackbird	42	13,501	19	1,037	43	12,955	16	1,115
	Nesting and Foraging		**Nesting and Foraging**		**Nesting and Foraging**		**Nesting and Foraging**	
Northern Harrier	14,286		1,078		13,733		1,156	
Burrowing Owl	14,00		977		13,491		947	
Bald Eagle	407		253		482		253	
Western Yellow-billed Cuckoo	0		0		0		0	
Yellow-breasted Chat and Yellow Warbler	71		10		104		8	
Song Sparrow ("Modesto" Population)	112		28		147		25	

Impact WILD-1j: Northern Harrier and Burrowing Owl

Conversion of wetlands and pasturelands in the Central Valley has resulted in a decline of northern harrier and local extirpations. Ground nests are particularly vulnerable to disturbance or destruction by human activity, and to predation by wild and domestic animals (Shuford and Gardali 2008:152, 153). Burrowing owl populations have declined in central and southern coastal breeding areas, and the species has experienced modest breeding range reductions statewide. Burrowing owl population declines are attributed to the loss, degradation, and modification of suitable habitat, and the eradication of ground squirrels that provide the owls with burrows for nesting, protection from predators, and shelter (California Department of Fish and Game 2012:1).

Alternatives 1 and 3

Modeled habitat for northern harrier (*Circus hudsonius*) and burrowing owl (*Athene cunicularia*) is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled northern harrier and burrowing owl habitats (Table 10-2d). Habitat loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation. Clearing and grubbing, excavation, and other construction activities could result in destruction of nests and burrows or nest abandonment, which could cause injury or mortality of eggs or nestlings.

Nighttime construction lighting could temporarily disturb active nest sites if they are in the illuminated area. Noise and vibration from operation of vehicles and equipment, and presence of construction crews could result in temporary disturbance of active northern harrier and burrowing owl nests and foraging activities. Rock quarries and batch plants in the inundation area and dam and dike footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance from noise and vibration in those areas.

Operation

Impacts from maintenance activities required for operation of Alternative 1 or 3 facilities are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. Suitable northern harrier nesting habitat is not anticipated to be located near facilities that would be maintained, and noise and other disturbances from maintenance are not expected to affect nesting northern harriers. If burrowing owls were nesting near the facilities, they could be disturbed by noise, vibrations, or presence of maintenance workers. Use of rodenticides at the facilities could cause illness or mortality of northern harrier or burrowing owl because they could feed on rodents that have ingested rodenticide. The LMP will include specifications on rodenticide use in operations and maintenance areas to minimize or prevent potential secondary poisoning of northern harrier or

burrowing owl. The LMP will also include an Integrated Pest Management Plan that focuses on long-term prevention of pest damage through habitat modification (Van Vuren et al. 2014), incorporating biological control methods such as raptor perches and owl boxes to increase natural raptor predators, and limited and targeted rodenticide use when necessary.

The new transmission lines installed for the reservoirs could cause mortality of northern harrier and burrowing owl through collision or electrocution.

New or widened roadways and additional vehicles traveling on roadways could increase the potential for injury or mortality of northern harrier and burrowing owl from being struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

Modeled habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. Although most of the human activity would be in the developed areas, there is potential for visitors to access undeveloped areas, which could increase proximity of visitors to nests and disturb nesting activities. In addition, increased noise and activity in developed and undeveloped areas could cause northern harrier and burrowing owl to avoid foraging or nesting in the recreation areas or in suitable habitat near the reservoir. The Authority would implement the Recreation Management Plan (Section 2D.8), which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into habitat.

Safety nighttime lighting would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, recreation areas, TC Canal intake, and CBD outlet. Artificial lighting could deter northern harrier or burrowing owl from nesting in illuminated areas. The Authority will implement BMP-17 that requires permanent safety lighting be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on northern harrier and burrowing owl nesting.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on northern harrier and burrowing owl from removal of modeled habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 could result in disturbance of northern harrier and burrowing owl from human-generated noise and disturbance at recreation areas and near the reservoir, or illness or mortality of northern harrier or burrowing owl from ingestion of rodents that have consumed rodenticide. Collision with new transmission lines could cause injury or death of individuals from the collision impact or electrocution. New or widened roadways and additional vehicles traveling on roadways could increase the potential for injury or mortality of northern harrier and burrowing owl from vehicle strikes. These impacts would be significant because the implementation of Alternative 1 or 3 could reduce the local northern harrier and burrowing owl populations through direct mortality and habitat loss.

Implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.24, WILD-1.25, WILD-1.26, WILD-1.27, VEG-2.2, and VEG-3.2 would reduce the level of impact from construction and operation to less than significant because vegetation would be removed during

the non-breeding season, surveys would be conducted to determine if northern harrier and burrowing owl are nesting (or for burrowing owl, wintering) in or near work areas, no-disturbance buffers would be established around active nest (or wintering) sites, rodenticides would be used minimally and appropriately, transmission lines would be fitted with protective devices, and impacts on sensitive natural communities in which northern harriers or burrowing owls may nest or forage would be compensated for through habitat restoration or protection.

Mitigation Measure WILD-1.22: Conduct Vegetation Removal During the Non-Breeding Season of Nesting Migratory Birds

The Authority will, to the maximum extent feasible, remove trees, shrubs, and herbaceous vegetation during the non-breeding season for most migratory birds (generally between September 1 and January 31) to remove nesting substrate and avoid potential delays in construction caused by the presence of nesting birds. If vegetation cannot be removed between September 1 and January 31, or if ground cover re-establishes in areas where vegetation has been removed, the affected area will be surveyed for nesting birds, as discussed in Mitigation Measure WILD-1.23.

Mitigation Measure WILD-1.23: Conduct Preconstruction Surveys for Non-Raptor Nesting Migratory Birds and Implement Protective Measures if Found

For special-status species where survey protocols have been established by CDFW, USFWS, or technical advisory committees, those survey protocols will supersede this measure (i.e., Mitigation Measures WILD-1.24, WILD-1.28, and WILD-1.29 for burrowing owl, golden eagle/bald eagle, and Swainson's hawk/white-tailed kite). The Authority will retain qualified wildlife biologists with knowledge of the relevant species to conduct non-raptor nesting bird surveys no more than 14 days prior to the start of construction. Where suitable habitat is present to support bank swallow, yellow-breasted chat, tricolored blackbird, yellow warbler, and song sparrow (Modesto population), wildlife biologists will thoroughly survey habitat and listen for calls and songs of these species. Surveys for non-raptor nesting migratory birds will include examining all potential nesting habitat in and within 50 feet of work areas on foot and/or using binoculars. Surveys for nesting raptors will conducted during Swainson's hawk/white-tailed kite surveys. If no active nests are detected during these surveys, no additional measures are required. During all nesting bird surveys, the biologist will document any state-listed bird species detected in the survey area.

If an active nest is found in the survey area, a no-disturbance buffer will be established around the nest site to avoid disturbance or destruction of the site until the end of the breeding season (August 31) or until after a qualified wildlife biologist determines that the young have fledged and moved out of the Project area (this date varies by species). The extent of these buffers will be determined by the biologist in coordination with USFWS and CDFW and will depend on the species, level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. If it is determined that the no-disturbance buffer cannot be maintained, the Authority and the qualified biologist will consult with USFWS and CDFW about implementing a reduced buffer but

requiring full-time nest monitoring by a qualified biologist to watch for signs of stress. If behaviors indicating stress or potential nest abandonment (e.g., visible or audible agitation, leaving the nest at an unusual time or for an unusual length of time), the biologist will have the authority to stop work until the bird has returned to the nest or otherwise shows signs of recovery from the stress.

For state-listed species, the above protective measures will be implemented, and the Authority will contact CDFW to discuss the need for CESA take authorization, if the Authority does not already have such authorization.

Mitigation Measure WILD-1.24: Conduct Surveys for Western Burrowing Owl Prior to Construction and Implement Avoidance and Minimization Measures if Found

The Authority will retain qualified biologists (experienced at identification of burrowing owls and their habitat) to conduct burrowing owl surveys in accordance with CDFW's *2012 Staff Report on Burrowing Owl Mitigation* (2012 Staff Report) (California Department of Fish and Game 2012). Biologists will conduct four surveys during the breeding season as follows: (1) one survey between February 15 and April 15, and (2) a minimum of three surveys at least 3 weeks apart between April 15 and July 15, with at least one survey after June 15. Biologists will also conduct four surveys spread evenly throughout the non-breeding season (September 1 to January 31). A report describing the methods and results of the survey will be submitted to CDFW within 30 days of completing the surveys.

The Authority will retain qualified biologists to conduct preconstruction take avoidance surveys for active burrows according to methodology in the 2012 Staff Report. If burrowing owls are found during any of the surveys, the Authority will implement Mitigation Measure WILD-1.25, which requires habitat to be replaced at a conservation area before permanent impacts occur. Because ample lead time is necessary to acquire and protect replacement habitat, these efforts should begin as soon as possible after presence of burrowing owls is determined.

Regardless of results from the surveys described above, if suitable habitat is present in the Project area, take avoidance (preconstruction) surveys will be conducted in the Project area (i.e., the area of ground disturbance and surrounding 500 feet) no less than 14 days prior to and 24 hours before initiating ground-disturbing activities (i.e., two surveys). If suitable habitat within 500 feet of ground disturbance is not accessible because of landowner restrictions, then the survey will extend to the edge of where access is allowed. Because burrowing owls may re-colonize a site after a few days, subsequent surveys will be conducted if more than 48 hours pass between Project activities. If no burrowing owls are found, no further mitigation is required. If burrowing owls are found, the Authority will implement the following measures summarized from the 2012 Staff Report.

- Occupied burrows will not be disturbed during the breeding season (February 1–August 31).

- Depending on the time of year and level of disturbance, a 164-foot to 1,640-foot-wide buffer area will be established around occupied burrows. No construction will be authorized within the buffer unless a qualified biologist determines through non-invasive methods that egg laying and incubation have not begun or that juveniles are foraging independently and are capable of independent survival.
- To the maximum extent possible, burrows occupied during the non-breeding season by migratory or non-migratory resident burrowing owls will be avoided.
- To the maximum extent possible, destruction of unoccupied burrows in temporary impact areas will be avoided, and visible markers will be placed near burrows to ensure they are not collapsed.
- Occupied burrows that cannot be avoided will have exclusion devices installed and be collapsed. Burrow exclusion will be conducted only by qualified biologists during the non-breeding season, before breeding behavior is exhibited and after the burrow is confirmed empty by site surveillance and/or scoping.
- Qualified biologists will conduct additional take avoidance surveys, as described above.
- Qualified biologists will monitor the Project site for burrowing owls during Project construction activities.
- Impacts on burrowing owls and their habitat will be minimized by using buffer areas, visual screens, and other measures during Project construction activities. Recommended buffer distances in the 2012 Staff Report will be used or site-specific buffers and visual screens will be determined through information collected during site-specific monitoring and consultation with CDFW.

Mitigation Measure WILD-1.25: Restore Temporarily Disturbed Habitat and Compensate for the Permanent Loss of Occupied Burrowing Owl Habitat

If burrowing owls have been documented to occupy burrows at the Project site in the last 3 years, CDFW considers the site occupied and mitigation is required (California Department of Fish and Game 2012:6).

The Authority will restore temporarily disturbed areas to pre-Project conditions. The Authority will mitigate for permanent impacts on occupied burrowing owl habitat in accordance with the 2012 Staff Report Permanent impacts will be mitigated by creating or preserving habitat at a 1:1 ratio (habitat created or preserved : habitat permanently affected) or by an equivalent or greater amount as determined in coordination with CDFW. Replacement habitat will be established through onsite mitigation, offsite mitigation, and/or credits purchased at a CDFW-approved mitigation or conservation bank. The purchase of mitigation credits or the establishment of onsite or offsite mitigation areas (or a combination of these options) would be completed as agreed upon by the Authority and CDFW.

CDFW-approved mitigation banks have long-term adaptive management plans with performance standards. If mitigation occurs through a CDFW-approved conservation/ mitigation bank, the bank's performance standards and success criteria will be applied.

If credits are not purchased at a CDFW-approved conservation bank, the Authority will implement standards for long-term management and protection of mitigation areas. A conservation easement would be placed on offsite mitigation land. A mitigation monitoring plan will be prepared for onsite and offsite mitigation to ensure the long-term success of the habitat. The mitigation monitoring plan will describe the requirements for monitoring and maintaining the site, performance standards, adaptive management techniques, and reporting requirements.

The Authority will work closely with CDFW during the planning and development of onsite and offsite mitigation areas. Mitigation areas will provide suitable nesting and foraging habitat. Once established, mitigation areas will be periodically monitored by a CDFW-approved biologist. The biologist will survey the site for presence of western burrowing owl, assess the suitability of the site in providing nesting and foraging habitat (including the abundance of prey), evaluate the adequacy of site protection (e.g., fencing, signage), assess potential threats to burrowing owls, and take photographs of the site. The biologist should determine the number of adult burrowing owls and pairs, and if the numbers are maintained between monitoring years. The frequency of monitoring will be determined based on site-specific conditions in coordination with CDFW and will be included in the mitigation monitoring plan.

Performance standards for management of burrowing owl habitat will be based on site-specific conditions and included in the mitigation monitoring plan. Performance standards may include managing vegetation height to between 4.7 and 13 centimeters through grazing or mowing (California Department of Fish and Game 2012) and maintaining conditions that promote or support natural prey distribution and abundance, especially in proximity to occupied burrows. The successful establishment or maintenance of suitable breeding and foraging habitat based on the vegetation height and prey abundance will be used to evaluate the success of the burrowing owl habitat compensatory mitigation.

Working closely with CDFW during planning and development of the conservation area, monitoring the conservation area to ensure performance standards are achieved, and applying adaptive management when performance standards are not achieved will ensure that the compensatory mitigation is effective and compensates for the permanent habitat loss resulting from the Project.

Mitigation Measure WILD-1.26: Protect Special-Status Wildlife from Rodenticide Use

To minimize the potential for wildlife to be poisoned by ingesting rodenticide, use of rodenticides will be minimized to the maximum extent feasible and limited to areas immediately surrounding Project facilities. Facilities will be maintained in a manner to reduce the potential for nuisance rodents, including sealing openings in structures,

securely storing trash bins, and installing signage at recreation areas discouraging feeding of wildlife and encouraging disposal of food and other trash in designated containers. Signage will include text from the California Code of Regulations that states it is illegal to feed big game mammals and that feeding of wildlife is considered harassment and should not be done under any circumstances.

Wherever feasible, alternatives to rodenticide will be used for rodent eradication, such as traps, if they can be used safely around other wildlife. Additionally, to minimize the risk to non-target species from directly ingesting rodenticides, anticoagulant and non-anticoagulant rodenticides will not be broadcast. The Authority will consult with California Department of Pesticide Regulation's PRESCRIBE database (https://www.cdpr.ca.gov/docs/endspec/prescint.htm) prior to any vertebrate pest control activity. The database incorporates section by section coordination with CDFW's Biogeographic Information and Observation System and the CNDDB to provide species-specific use restrictions that are not on pesticide labels, including use of modified bait stations and what those modifications must be.

Mitigation Measure WILD-1.27: Construct Overhead Power Lines and Associated Equipment Following Suggested Practices to Reduce Bird Collisions with Power Lines

The Authority will ensure that new transmission lines and associated equipment will be properly fitted with wildlife protective devices to isolate and insulate structures to prevent injury or mortality of birds. Protective measures shall follow the guidelines provided in *Reducing Avian Collisions with Power Lines: The State of the Art* (Avian Power Line Interaction Committee 2012), or the current Avian Power Line Interaction Committee guidelines in place at the time the transmission lines are installed, and will include insulating hardware or conductors against simultaneous contact, using poles that minimize impacts to birds, and increasing the visibility of conductors or wires to prevent or minimize bird collisions.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction and operation effects on northern harrier and burrowing owl would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on northern harrier and burrowing owl as compared to the No Project Alternative. Construction of Alternative 1 or 3 would result in effects on northern harrier and burrowing owl from removal of modeled habitat and potential loss or disturbance of active nests.

Operation of Alternative 1 or 3 could result in disturbance of northern harrier and burrowing owl from human-generated noise and disturbance at recreation areas and near the reservoir, or illness or mortality of northern harrier or burrowing owl from ingestion of rodents that have consumed rodenticide. Collision with new transmission lines could cause injury or death of individuals from the collision effect or electrocution. New or widened roadways and additional vehicles traveling on roadways could increase the potential for injury or mortality of northern harrier and burrowing owl from vehicle strikes. With implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.24, WILD-1.25, WILD-1.26, WILD-1.27, VEG-2.2, and VEG-3.2, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for northern harrier and burrowing owl is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR/Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and the Sacramento River discharge.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of nesting and foraging habitats for northern harrier and burrowing owl (Table 10-2d) and potential destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings.

Potential impacts on northern harrier and burrowing owl under Alternative 2 would be similar to those for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge under Alternative 2 would result in additional loss of modeled habitat and the smaller inundation area would result in reduced loss of modeled habitat. Overall, permanent and temporary impacts on burrowing owl habitat and permanent impacts on northern harrier habitat would be less under Alternative 2 because of the smaller inundation area and reduced impacts from dams and dikes (Appendix 10C, Tables 10C-10 and 10C-11). Temporary impacts on northern harrier habitat would be greater under Alternative 2 because of construction associated with conveyance to the Sacramento River and new and widened roads (Appendix 10C, Table 10C-10).

Operation

Potential effects on northern harrier and burrowing owl from operation of Alternative 2 would be similar to Alternatives 1 and 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway could increase the potential for northern harrier and burrowing owl to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those under Alternatives 1 and 3 except that permanent and temporary impacts on burrowing owl habitat and permanent impacts on northern harrier habitat would be less under Alternative 2 and temporary impacts on northern harrier habitat would be greater under Alternative 2. Operation of Alternative 2 would

result in similar impacts as those described above for Alternatives 1 and 3 except that the greater amount of roadway could increase the potential for northern harrier and burrowing owl to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. These impacts would be significant because the implementation of Alternative 2 could reduce the local northern harrier and burrowing owl populations through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.24, WILD-1.25, WILD-1.26, WILD-1.27, VEG-2.2, and VEG-3.2 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on northern harrier and burrowing owl would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on northern harrier and burrowing owl as compared to the No Project Alternative. Construction of Alternative 2 would result in effects similar to those under Alternatives 1 and 3 except that permanent and temporary effects on burrowing owl habitat and permanent effects on northern harrier habitat would be less under Alternative 2 and temporary effects on northern harrier habitat would be greater under Alternative 2. Operation of Alternative 2 would result in similar effects as those described above for Alternatives 1 and 3 except that the greater amount of roadway could increase the potential for northern harrier and burrowing owl to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. With implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.24, WILD-1.25, WILD-1.26, WILD-1.27, VEG-2.2, and VEG-3.2, effects would be reduced to no adverse effect.

Impact WILD-1k: Golden Eagle and Bald Eagle

The population trend of golden eagle in California is largely unknown, but the species is threatened by loss of foraging areas, loss of nesting habitat, pesticide poisoning, lead poisoning and collision with human-made structures such as wind turbines (California Department of Fish and Wildlife 2021g). Bald eagle population decline has been attributed to habitat modification from urban developments; agriculture; timber harvest; pesticides and contaminants, including lead poisoning; off-road vehicles and other human disturbances; electrocution and collision with power lines; and shooting (California Department of Fish and Wildlife 2021h).

Alternatives 1 and 3

Modeled habitat for golden eagle and bald eagle is present at the GCID Main Canal improvements, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, and recreation areas. Additional modeled habitat for golden eagle is present at the TC Canal intake. Modeled bald eagle habitat is also present at the GCID Main Canal diversion, TRR East, and Dunnigan Pipeline. Potential bald eagle nesting habitat is also present along the Sacramento River in the operations study area.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled nesting and foraging habitats for golden eagle and bald eagle (Table 10-2d). Habitat

loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation. Clearing and grubbing, excavation, and other construction activities could result in destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Destruction of nests and nest abandonment would have to be avoided because both species are fully protected under the California Fish and Game Code.

Nighttime construction lighting could temporarily disturb active nest sites if they are in the illuminated area. Noise and vibration from operation of vehicles and equipment, and presence of construction crews could result in temporary disturbance of active golden eagle and bald eagle nests and foraging activities. Rock quarries and batch plants in the inundation area and dam and dike footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance from noise and vibration in those areas.

Operation

Operation impacts that could result in mortality of golden eagle and bald eagle would have to be avoided because both species are fully protected under the California Fish and Game Code. Maintenance activities required for operation under Alternative 1 or 3 could result in impacts on golden eagle and bald eagle. While small mammals are not their preferred prey, bald eagles could become ill or die from eating rodents that have ingested rodenticides used at the facilities. Use of rodenticides at the facilities could also cause illness or mortality of golden eagle from eating rodents that have ingested rodenticide. The LMP will include specifications on rodenticide use in operations and maintenance areas to minimize or prevent potential secondary poisoning of golden eagle and bald eagle.

Noise and vibration from vehicles and equipment, and presence of maintenance crews could disturb golden eagles or bald eagles if maintenance activities are near active nests. Although maintenance activities would be temporary and short term, they could result in disturbance of active nests if conducted during a sensitive period in the nesting process (e.g., when eaglets are learning to fly). The Authority will implement the LMP to avoid maintenance impacts on golden eagle and bald eagle.

The new transmission lines installed for the reservoirs could cause mortality of golden eagle and bald eagle through electrocution or collision.

Modeled habitat for golden eagle and bald eagle is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. Although most of the activity would be in the developed areas, there is potential for visitors to access undeveloped areas, which could increase proximity of visitors to nests and disturb nesting activities. In addition, increased noise and activity in developed and undeveloped areas could cause golden eagle and bald eagle to avoid foraging or nesting in the recreation areas or in suitable habitat near the reservoir. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into habitat.

Safety nighttime lighting would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, recreation areas, and CBD outlet where suitable nesting habitat may be present. Lighting could deter golden eagles or bald eagles from nesting in areas that are illuminated by these new sources of light. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on golden eagle and bald eagle nesting.

Stone Corral and Funks Creeks, which may have suitable nest trees associated with them, would have increased flows that would range from 0 to 100 cfs, with larger pulse flows to emulate natural flood conditions, and lower flows in the drier months (e.g., summer). A Flow Characterization and Geomorphic Study (Section 2D.4.3) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. These flow increases would support the existing geomorphic functions and characteristics of each channel. While increased flows from bypass releases may result in minor increases in erosion and changes in sediment deposition, the changes are expected to be minimal and there would be no impacts on suitable golden eagle or bald eagle nesting habitat associated with the creeks.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle, operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect suitable bald eagle nesting habitat along the river.

The completed reservoir would provide new bald eagle foraging habitat (fish in the reservoir) and result in new nesting sites or wintering habitat because of the proximity to new foraging habitat. Although these would be beneficial effects, they would not occur for the first 12 to 20 years of operation (2 to 10 years for reservoir filling and 10 years after filling before fish are introduced [see *Construction* in Chapter 6, *Surface Water Quality*]).

Consumption of fish that have bioaccumulated methylmercury could result in illness or mortality of bald eagle. Potential bioaccumulation of methylmercury in reservoir fish during the first 10 years of operation is discussed in Chapter 6.

CEQA Significance Determination and Mitigation Measures

Implementation of Alternative 1 or 3 would have the beneficial effects of providing new bald eagle foraging habitat (Sites Reservoir) and new nesting sites or wintering habitat because of the proximity to the new foraging habitat (12 to 20 years after reservoir filling begins). Construction of Alternative 1 or 3 would result in significant impacts on golden eagle and bald eagle from removal of suitable habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 may result in disturbance of bald eagle and golden eagle if nesting or foraging at or near recreation areas and the use of rodenticides could cause illness, injury, or mortality of bald eagle or golden eagle if rodenticides are ingested. Collision with new transmission lines could cause injury or death of individuals from the collision impact or electrocution. Consumption of fish that have bioaccumulated methylmercury could cause illness or mortality of bald eagle. These impacts would be significant because the implementation of Alternative 1 or 3 could reduce the local golden eagle and bald eagle populations through direct mortality and habitat loss.

Implementation of Mitigation Measures WILD-1.22, WILD-1.26, WILD-1.27, WILD-1.28, WILD-1.29, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, VEG-4.2, and WQ-1.1 would reduce the level of impact on bald eagle from construction and operation to less than significant because vegetation would be removed during the non-breeding season, surveys would be conducted to determine if bald eagle are nesting in or near work areas, no-disturbance buffers would be established around active nest sites, rodenticides would be used minimally and appropriately, transmission lines would be fitted with protective devices; steps would be taken to reduce, monitor, and manage mercury in the reservoir; and impacts on sensitive natural communities in which bald eagles may nest or forage would be compensated for through habitat restoration and preservation. Implementation of Mitigation Measures WILD-1.22, WILD-1.26, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, and VEG-4.2 would reduce the level of construction impacts on golden eagle; however, the removal of mature trees within blue oak woodland, foothill pine, and oak savanna communities would be a long-term impact on golden eagle because of the length of time that would be required for newly planted trees to reach mature size and fully replace the habitat function and habitat value of the removed trees. This impact on golden eagle would remain significant and unavoidable even with mitigation because of the long-term loss of blue oak woodland, foothill pine, and oak savanna habitat. Implementation of Mitigation Measures WILD-1.27 and WILD-1.28 would reduce the level of impact on golden eagle from operation to less than significant because rodenticides would be used minimally and appropriately, and transmission lines would be fitted with protective devices. The Authority will also implement measures specified in an Eagle Conservation Plan, which will be prepared in coordination with USFWS and CDFW to address Project impacts on bald eagle and golden eagle.

Mitigation Measure WILD-1.22: Conduct Vegetation Removal During the Non-Breeding Season of Nesting Migratory Birds

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.26: Protect Special-Status Wildlife from Rodenticide Use

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.27: Construct Overhead Power Lines and Associated Equipment Following Suggested Practices to Reduce Bird Collisions with Power Lines

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.28: Conduct Focused Surveys for Golden Eagle and Bald Eagle and Implement Protective Measures if Found

Prior to the start of construction, the Authority will retain qualified wildlife biologists (experienced with raptor identification and behaviors) to conduct focused surveys for golden eagle and bald eagle nests in suitable habitat in the Project area and within a 2-mile radius of the Project area.

The surveys will be conducted in accordance with the *Interim Golden Eagle Inventory and Monitoring Protocols; and other Recommendations* (Pagel et al. 2010), *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004), *Bald Eagle Breeding Survey Instructions* (California Department of Fish and Wildlife 2017) and *Updated Eagle Nest Survey Protocol* (U.S. Fish and Wildlife Service 2020b).

Prior to conducting surveys, any known breeding area records will be reviewed, and a map of potential nest sites will be created using GIS mapping of suitable nesting habitat. If feasible, an initial survey will be conducted during the fall or winter, prior to the initial occupancy survey, to identify existing nest sites. Nest locations will be mapped using GPS software and will be used during the occupancy surveys.

For golden eagle, based on the results of the initial survey, aerial (helicopter) or ground surveys will be conducted to assess nest occupancy. A minimum of two aerial surveys or ground observation periods lasting at least 4 hours each will be conducted in a single breeding season (January 1 through August 31) to confirm presence/absence of golden eagle. Each survey will be conducted at least 30 days apart. Surveys will be conducted in the morning during favorable weather conditions.

For bald eagle, based on the results of the initial survey, a minimum of three surveys will be conducted during the bald eagle nesting season (January 1 to July 31) in the year that construction will begin, and each year during the construction period, to look for new nests. The first survey will be conducted in the early breeding period in early March, and additional surveys will be conducted in mid-nesting season (late April or early May) and late in the season (mid-June). Surveys will be conducted in the morning, if feasible, during favorable weather conditions.

For both species, the final survey methods and survey area boundaries will be determined based on coordination with USFWS and CDFW, and all survey results will be submitted to these agencies.

No active bald eagle or golden eagle nest trees will be removed during the nesting season. If an occupied golden eagle or bald eagle nest is identified in the survey area, a no-disturbance buffer will be established around the nest site to avoid disturbance or destruction of the site, consistent with the USFWS's *Recommended Buffer Zones for Human Activities around Nesting Sites of Bald Eagles in California and Nevada* and the USFWS *Recommended Buffer Zones for Ground-based Human Activities around Nesting Sites of Golden Eagles in California and Nevada* (U.S. Fish and Wildlife Service 2017c, 2020c). If it is determined that the no-disturbance buffer cannot be maintained, the Authority and the qualified biologist will consult with USFWS and CDFW about implementing a reduced buffer but requiring full-time nest monitoring by a qualified biologist to watch for signs of stress. If behaviors indicating stress or potential nest abandonment (e.g., visible or audible agitation, leaving the nest at an unusual time or for an unusual length of time), the biologist will have the authority to stop work until the bird has returned to the nest or otherwise shows signs of recovery from the stress. Work will be delayed as long as necessary to ensure that nest abandonment does not occur.

Mitigation Measure WILD-1.29: Compensate for the Loss of Eagle Nest Trees

Prior to the start of construction, the Authority will purchase compensatory mitigation credits from the Bald Eagle and Golden Eagle Electrocution Prevention In-lieu Fee Program for the loss of eagle nest trees. The number of credits to be purchased will depend on the results of eagle nest surveys (Mitigation Measure WILD-1.28) and consultation with USFWS and CDFW during preparation of the Eagle Conservation Plan and will be specified in the Eagle Take Permit from USFWS.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.3: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Non-Wetland Waters

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-4.1: Avoid and Minimize Potential Adverse Effects on Oak Woodlands During Construction

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-4.2: Compensate for Adverse Effects on Oak Woodlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure WQ-1.1: Methylmercury Management

This measure is described in Chapter 6, Section 6.4, *Impact Analysis and Mitigation Measures*.

NEPA Conclusion

Construction and operation effects on golden eagle and bald eagle would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on golden eagle and bald eagle as compared to the No Project Alternative. Implementation of Alternative 1 or 3 would have the beneficial effects of providing new bald eagle foraging habitat (Sites Reservoir) and new nesting sites or wintering habitat because of the proximity to the new foraging habitat. Construction of Alternative 1 or 3 would result in effects on golden eagle and bald eagle from removal of suitable habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 may result in disturbance of bald eagle and golden eagle if nesting or foraging at or near recreation areas and the use of rodenticides could cause illness, injury, or mortality of bald eagle or golden eagle if rodenticides are ingested. Collision with new transmission lines could cause injury or death of individuals from the collision effect or electrocution. With implementation of Mitigation Measures WILD-1.22, WILD-1.28, WILD-1.29, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, and VEG-4.2, effects on bald eagle from construction would be reduced to no adverse effect. With implementation of Mitigation Measures WILD-1.22, WILD-1.28, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, and VEG-4.2, construction effects on golden eagle would be reduced, however, the removal of mature trees within blue oak woodland, foothill pine, and oak savanna communities would be a long-term adverse effect on golden eagle and would remain a substantial adverse effect even with mitigation. Operation of Alternative 1 or 3 would result in the same effects as those described above for CEQA, and with implementation of Mitigation Measures WILD-1.26 and WILD-1.27, there would be no adverse effect on golden eagle and bald eagle.

Alternative 2

Modeled habitat for golden eagle and bald eagle is present at the GCID Main Canal improvements, TRR/Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, and recreation areas. Additional modeled habitat for golden eagle is present at the TC Canal intake. Modeled bald eagle habitat is also present at the GCID Main Canal diversion, Dunnigan Pipeline, and the Sacramento River discharge.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for golden eagle and bald eagle (Table 10-2d) and potential destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Destruction of nests and nest abandonment would have to be avoided because both species are fully protected under the California Fish and Game Code.

Impacts would be similar to those for Alternatives 1 and 3 except that construction of South Road and TRR West under Alternative 2 would result in additional loss of suitable golden eagle habitat and the smaller inundation area would reduce the amount of permanent habitat loss. Overall, permanent and temporary impacts on golden eagle nesting and foraging habitat would be less under Alternative 2 because of the reduced inundation area and fewer construction impacts from dams and dikes (Appendix 10C, Table 10C-12).

For bald eagle, impacts would be similar to those for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge would result in additional habitat loss but would be offset by reduction in habitat loss from the smaller reservoir footprint. Overall, permanent impacts on bald eagle nesting and foraging habitat would be greater under Alternative 2 because of additional roadway. Overall, temporary impacts on nesting and foraging bald eagle habitat would be the same under Alternative 2 as for Alternatives 1 and 3 (Appendix 10C, Table 10C-13). Additional removal of potential bald eagle nesting habitat would also result in an increased potential for destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings.

Operation

Potential effects on golden eagle and bald eagle from operation of Alternative 2 would be similar to Alternatives 1 and 3. The completed reservoir under Alternative 2 would provide new but smaller bald eagle foraging habitat than Alternatives 1 and 3 and could result in new nesting sites or wintering habitat because of the proximity to new foraging habitat.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except permanent and temporary impacts on golden eagle nesting and foraging habitats would be less under Alternative 2 and permanent impacts on bald eagle nesting and foraging habitat would be greater under Alternative 2. A net increase in the amount of suitable bald eagle nesting habitat removed would also increase the potential for destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Operation of Alternative 2 would result in similar impacts as those described above for Alternatives 1 and 3 except that the completed reservoir under Alternative 2 would provide new but smaller bald eagle foraging habitat than Alternatives 1 and 3 and could result in new nesting sites or wintering habitat because of the proximity to new foraging habitat. These impacts would be significant because the implementation of Alternative 2 could reduce the local golden eagle and bald eagle populations through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.22, WILD-1.26, WILD-1.27, WILD-1.28, WILD-1.29, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, and

VEG-4.2 would reduce the level of construction and operation impacts on bald eagle to less than significant.

Implementation of Mitigation Measures WILD-1.22, WILD-1.26, WILD-1.27, WILD-1.28, WILD-1.29, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, and VEG-4.2 would reduce the level of construction and operations impacts on golden eagle; however, the removal of mature trees within blue oak woodland, foothill pine, and oak savanna communities would be a long-term impact on golden eagle because of the length of time that would be required for newly planted trees to reach mature size and fully replace the habitat function and habitat value of the removed trees. This impact on golden eagle would remain significant and unavoidable even with mitigation because of the long-term loss of blue oak woodland, foothill pine, and oak savanna habitat. The Authority will also implement measures specified in an Eagle Conservation Plan, which will be prepared in coordination with USFWS to address Project impacts on bald eagle and golden eagle.

NEPA Conclusion

Construction and operation effects on golden eagle and bald eagle would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on bald eagle and golden eagle as compared to the No Project Alternative. Construction of Alternative 2 would result in effects similar to those for Alternatives 1 and 3 except permanent and temporary effects on golden eagle nesting and foraging habitats would be less under Alternative 2 and permanent effects on bald eagle nesting and foraging habitat would be greater under Alternative 2. A net increase in the amount of suitable bald eagle nesting habitat removed would also increase the potential for destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Operation of Alternative 2 would result in similar effects as those described above for Alternatives 1 and 3 except that the completed reservoir under Alternative 2 would provide new but smaller bald eagle foraging habitat than Alternatives 1 and 3 and could result in new nesting sites or wintering habitat because of the proximity to new foraging habitat. With implementation of Mitigation Measures WILD-1.22, WILD-1.28, WILD-1.29, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, and VEG-4.2, construction effects on bald eagle would be reduced to no adverse effect. With implementation of Mitigation Measures WILD-1.22, WILD-1.28, VEG-2.2, VEG-3.2, VEG-3.3, VEG-4.1, and VEG-4.2, construction effects on golden eagle would be reduced, however, the removal of mature trees within blue oak woodland, foothill pine, and oak savanna communities, would be a long-term adverse effect on golden eagle and would remain a substantial adverse effect even with mitigation. Operation of Alternative 2 would result in the same effects as those described above for CEQA, and with implementation of Mitigation Measures WILD-1.26 and WILD-1.27, there would be no adverse effect on bald eagle and golden eagle.

Impact WILD-1l: Swainson's Hawk and White-tailed Kite

Swainson's hawk populations declined as much as 90% between the early 1900s and 1970; recent populations are still below historical numbers and this species has not reoccupied much of its previous range (California Department of Fish and Wildlife 2016:17, 21). Historically, white-tailed kite populations were substantially reduced by habitat loss, shooting, and egg collection, and the long-term trend suggests a continued decline (Cornell Lab of Ornithology 2019).

Alternatives 1 and 3

Modeled habitat for Swainson's hawk and white-tailed kite is present at the GCID Main Canal intake, GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and Sacramento River in the operations study area.

Construction

Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled habitat for Swainson's hawk and white-tailed kite (Table 10-2d). Habitat loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation. Clearing and grubbing, excavation, and other construction activities could result in destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Destruction of white-tailed kite nests and nest abandonment would have to be avoided because white-tailed kite is fully protected under the California Fish and Game Code.

Nighttime construction lighting could temporarily disturb active nest sites if they are in the illuminated area. Noise and vibration from operation of vehicles and equipment, and presence of construction crews could result in temporary disturbance of active Swainson's hawk and white-tailed kite nests and foraging activities. Rock quarries and batch plants in the inundation area and dam and dike footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance from noise and vibration in those areas.

Operation

Operation impacts that could result in mortality of white-tailed kite would have to be avoided because this species is fully protected under the California Fish and Game Code. Maintenance activities required for operation Alternative 1 or 3 could result in impacts on Swainson's hawk and white-tailed kite. Noise and vibration from vehicles and equipment, and presence of maintenance crews could disturb individuals if maintenance activities are near active nests. Although maintenance activities would be temporary and short term, they could result in disturbance of active nests if conducted during a sensitive period in the nesting process (e.g., when fledglings are beginning to fly). Use of rodenticides at the facilities could cause illness or mortality of individuals because they could feed on rodents that have ingested rodenticide. The Authority will implement the LMP to avoid maintenance impacts on Swainson's hawk and white-tailed kite, including specifications on rodenticide use in operations and maintenance areas to minimize or prevent potential secondary poisoning of Swainson's hawk and white-tailed kite.

The new transmission lines installed for the reservoirs could cause mortality of Swainson's hawk and white-tailed kite through electrocution or collision.

Modeled habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas, as well as additional roadway traffic. Although most of the activity would be in the developed areas, there is potential for visitors to access undeveloped areas, which could increase proximity of visitors to nests and disturb nesting activities. In addition, increased noise and activity in

developed and undeveloped areas could cause Swainson's hawk and white-tailed kite to avoid foraging or nesting in the recreation areas or in suitable habitat near the reservoir. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into habitat.

Safety nighttime lighting would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, recreation areas, and CBD outlet where suitable nesting habitat may be present. Lighting could deter individuals from nesting in areas that are illuminated by these new sources of light. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on Swainson's hawk and white-tailed kite nesting.

Stone Corral and Funks Creeks, which may have suitable nest trees associated with them, would have increased flows that would range from 0 to 100 cfs, with larger pulse flows to emulate natural flood conditions, and lower flows in the drier months (e.g., summer). A Flow Characterization and Geomorphic Study (Section 2D.4.3) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. These flow increases would support the existing geomorphic functions and characteristics of each channel. While increased flows from bypass releases may result in minor increases in erosion and changes in sediment deposition, the changes are expected to be minimal and there would be no impacts on suitable Swainson's hawk and white-tailed kite nesting habitat associated with the creeks.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle, operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect suitable Swainson's hawk and white-tailed kite nesting habitat along the river.

Based on observations during North Delta Flow Actions (Davis pers. comm.), the comparable August–October habitat flows from Sites Reservoir through the Yolo Bypass may cause limited inundation of low-elevation parcels in the upper Yolo Bypass (north of the I-80 causeway). The intent of the releases from Sites Reservoir to the Yolo Bypass during this period is to temporally and spatially distribute food resources for fish species. If the water inundates floodplain areas (i.e., areas outside existing channels) the food would be deposited and would fail to move into the Delta. As such, Sites Reservoir would be operated to maintain flows within the existing Toe Drain, Tule Canal, and other channels, and adjustments in operations would be coordinated between the Authority and parcel owners using the existing Yolo Bypass monitoring network. As a result, impacts on potential Swainson's hawk and white-tailed kite habitat in the Yolo Bypass are not anticipated.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on Swainson's hawk and white-tailed kite from removal of suitable habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 may result in disturbance of Swainson's hawk and white-tailed kite if nesting or foraging at or near recreation areas, and the use of rodenticides could cause illness, injury, or mortality of Swainson's hawk and white-tailed kite if rodenticides are ingested. Collision with new transmission lines could cause injury or death of individuals from the collision impact or electrocution. These impacts would be significant because the implementation of Alternative 1 or 3 could reduce the local Swainson's hawk and white-tailed kite populations through direct mortality and habitat loss.

Implementation of Mitigation Measures WILD-1.22, WILD-1.26, WILD-1.27, WILD-30, WILD-1.31, VEG-2.2, VEG-4.1, and VEG-4.2 would reduce the level of impact from construction and operation to less than significant because vegetation would be removed during the non-breeding season, surveys would be conducted to determine if Swainson's hawk or white-tailed kite is nesting in or near work areas, no-disturbance buffers would be established around active nest sites, rodenticides would be used minimally and appropriately, transmission lines would be fitted with protective devices, and impacts on foraging habitat and other sensitive natural communities in which Swainson's hawk or white-tailed kite may nest or forage would be mitigated through habitat restoration and preservation. Mitigation Measure WILD-1.29 would ensure that mitigation lands fulfill both the foraging and nesting requirements for Swainson's hawk, and that they support nesting Swainson's hawks at equal or greater densities than the habitat lost. Mitigation Measures VEG-2.2 and VEG-4.2 would further mitigate the loss of nesting habitat through restoration or creation of riparian and oak woodland at a ratio of at least 1:1. Mitigation of riparian and oak woodland at a 1:1 ratio in conjunction with Swainson's hawk foraging habitat mitigation (Mitigation Measure WILD-1.31) is more than sufficient to reduce impacts on Swainson's hawk and white-tailed kite habitat to less than significant.

Mitigation Measure WILD-1.22: Conduct Vegetation Removal During the Non-Breeding Season of Nesting Migratory Birds

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.26: Protect Special-Status Wildlife from Rodenticide Use

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.27: Construct Overhead Power Lines and Associated Equipment Following Suggested Practices to Reduce Bird Collisions with Power Lines

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.30: Conduct Focused Surveys for Nesting Swainson's Hawk, White-tailed Kite, and Other Raptors Prior to Construction and Implement Protective Measures During Construction

The Authority will retain qualified wildlife biologists (experienced with raptor identification and behaviors) to conduct focused surveys for Swainson's hawk, white-tailed kite, and other raptor nesting areas before construction begins. Survey methodology will follow the Swainson's Hawk Technical Advisory Committee's methodology (Swainson's Hawk Technical Advisory Committee 2000). A minimum of six surveys will be conducted during the appropriate timeframes discussed in the methodology. If needed, the qualified biologists will coordinate with CDFW regarding the extent and number of surveys. Surveys will generally be conducted from February to July. Survey methods and results will be reported to CDFW within 30 days of the completion of the surveys.

Because the area surrounding the Project area is largely undeveloped, focused surveys for Swainson's hawk and white-tailed kite will be conducted in the Project area and in a buffer area up to 0.5 mile around the Project area. The survey area for other nesting raptors will encompass potential habitat within 500 feet of work areas. The portions of the Swainson's hawk/white-tailed kite buffer area containing unsuitable nesting habitat and/or with an obstructed line of sight to the Project area will not be surveyed.

No active Swainson's hawk or white-tailed kite nest trees will be removed during the nesting season. If the biologists find an active Swainson's hawk or white-tailed kite nest, the contractor will maintain a 0.25-mile no-work buffer between construction activities and the active nest(s) until it has been determined that the young have fledged. The biologists will mark the no-work buffer with stakes and signs and will check the location at least weekly to ensure that the signs are in place and the buffer is being maintained. No work will be authorized within the buffer except for vehicle travel. If a 0.25-mile buffer around the nest cannot be maintained, the Authority and a qualified biologist will consult with CDFW about implementing alternative protective measures that are sufficient to minimize the risk of disturbance, such as a reduced buffer with full-time nest monitoring by a qualified biologist. If nesting raptors exhibit agitated behavior indicating stress, the biological monitor will have the authority to stop construction in that area until they determine that the young have fledged.

For active nests of other raptors, no-disturbance buffers will be established around the nest sites to avoid disturbance or destruction of the sites until the end of the breeding season (August 31) or until after a qualified wildlife biologist determines that the young have fledged and moved out of the Project area (this date varies by species). The extent of these buffers will be determined by the biologist in coordination with USFWS and CDFW and will depend on the species, level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers.

Mitigation Measure WILD-1.31: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk and White-tailed Kite

The Authority will compensate for permanent loss of suitable Swainson's hawk and white-tailed kite foraging habitat by restoring or preserving habitat onsite or offsite. The Authority will consider all suitable foraging habitat within 10 miles of an active Swainson's hawk nest (i.e., determined active during current surveys or within the last 5 years based on available data from prior surveys, if any) to be occupied by the species. Mitigation ratios (occupied habitat restored or preserved: habitat affected) will be as follows, or by an equivalent or greater amount as determined through consultation (for Swainson's hawk) with CDFW.

- 1:1 for foraging habitat within 1 mile of an active Swainson's hawk nest.
- 0.75:1 for foraging habitat within 5 miles but greater than 1 mile from an active Swainson's hawk nest.
- 0.5:1 for foraging habitat within 10 miles but greater than 5 miles from an active Swainson's hawk nest.

Onsite or offsite mitigation lands will provide suitable foraging habitat and sufficient potential nesting trees to support Swainson's hawk (including protected trees or planted trees, or both), as determined by a qualified biologist, in an area with Swainson's hawk nesting densities equal to or greater than nesting densities in the Project area. The Authority may purchase mitigation credits for Swainson's hawk habitat from a CDFW-approved mitigation or conservation bank in lieu of or in addition to onsite or offsite habitat preservation. The purchase of mitigation credits or the establishment of onsite or offsite mitigation areas (or a combination of these options) would be completed as agreed upon by the Authority and CDFW.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-4.1: Avoid and Minimize Potential Adverse Effects on Oak Woodlands During Construction

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-4.2: Compensate for Adverse Effects on Oak Woodlands

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction and operation effects on Swainson's hawk and white-tailed kite would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on Swainson's hawk and white-tailed kite as compared to the No Project Alternative. Construction of Alternative 1 or 3 would result in effects on Swainson's hawk and white-tailed kite from removal of suitable habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 may result in disturbance of Swainson's hawk and white-tailed kite if nesting or foraging at or near recreation areas, and the use of rodenticides could cause illness, injury, or mortality of Swainson's hawk and white-tailed kite if rodenticides are ingested. Collision with new transmission lines could cause injury or death of individuals from the collision effect or electrocution. With implementation of Mitigation Measures WILD-1.22, WILD-1.26, WILD-1.27, WILD-1.30, WILD-1.31, VEG-2.2, VEG-4.1, and VEG-4.2, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for Swainson's hawk and white-tailed kite is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR/Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and the Sacramento River discharge.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of potential habitat for Swainson's hawk and white-tailed kite (Table 10-2d) and potential destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Destruction of white-tailed kite nests and nest abandonment would have to be avoided because this species is fully protected under the California Fish and Game Code.

Impacts would be similar to those described for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge would result in additional loss of modeled nesting and foraging habitat and permanent impacts on potential nesting and foraging habitat would be less under Alternative 2 because the inundation area would be smaller. Overall, permanent and temporary impacts on Swainson's hawk and white-tailed kite nesting and foraging habitats would be less under Alternative 2 because of the reduced inundation area and fewer construction impacts from dams and dikes (Appendix 10C, Table 10C-14).

Operation

Potential effects on Swainson's hawk and white-tailed kite from operation of Alternative 2 would be similar to Alternatives 1 and 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway could

increase the potential for Swainson's hawk and white-tailed kite to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except that permanent and temporary impacts on Swainson's hawk and white-tailed kite nesting and foraging habitats would be less under Alternative 2. Operation of Alternative 2 would result in similar impacts to those described above for Alternatives 1 and 3 except that the greater amount of roadway could increase the potential for Swainson's hawk and white-tailed kite to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. These impacts would be significant because the implementation of Alternative 2 could reduce the local Swainson's hawk and white-tailed kite populations through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.22, WILD-1.26, WILD-1.27, WILD-1.30, WILD-1.31, VEG-2.2, VEG-4.1, and VEG-4.2 would reduce the level of construction and operation impacts to less than significant.

NEPA Conclusion

Construction and operation effects on Swainson's hawk and white-tailed kite would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on these species as compared to the No Project Alternative. Construction of Alternative 2 would result in effects similar to those for Alternatives 1 and 3 except that permanent and temporary effects on Swainson's hawk and white-tailed kite nesting and foraging habitats would be less under Alternative 2. Operation of Alternative 2 would result in similar effects to those described above for Alternatives 1 and 3 except that the greater amount of roadway could increase the potential for Swainson's hawk and white-tailed kite to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. With implementation of Mitigation Measures WILD-1.21, WILD-1.26, WILD-1.27, WILD-1.30, WILD-1.31, VEG-2.2, VEG-4.1, and VEG-4.2, effects would be reduced to no adverse effect.

Impact WILD-1m: Mountain Plover

About half of the mountain plover wintering population occurs in California and there has been a decrease in the wintering population in the Central Valley; the loss of and inadequate management of wintering areas in California is a conservation concern for this species (Andres and Stone 2009:1, 19).

Alternatives 1 and 3

Modeled wintering habitat for mountain plover is present at the GCID Main Canal intake, GCID Main Canal improvements, TRR East/Funks pipelines, inundation area, I/O Works, dams, new and widened roadways, recreation areas, and Dunnigan Pipeline.

Construction

Construction of Alternatives 1 and 3 would result in the permanent and temporary losses of modeled mountain plover wintering habitat (Table 10-2d). Habitat loss would result from conversion to unsuitable land cover types and reservoir inundation. Potential injury or mortality

of eggs or nestlings from nest destruction or nest abandonment would not occur because the area of disturbance under Alternatives 1 and 3 is outside mountain plover's nesting range.

Operation

Maintenance would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. Suitable mountain plover wintering habitat would not be in maintenance areas and operation would not result in impacts on mountain plover.

Modeled habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. Increased noise and activity in developed and undeveloped areas could cause mountain plover to avoid foraging in the recreation areas or in suitable habitat near the reservoir.

The new transmission lines installed for the reservoirs could cause injury to or mortality of mountain plover through collision or electrocution.

CEQA Significance Determination and Mitigation Measures

Construction of Alternatives 1 and 3 would result in significant impacts on mountain plover from removal of suitable wintering habitat. Operation of Alternative 1 or 3 could result in significant impacts if mountain plovers are injured or die from electrocution from colliding with new transmission lines or electrocution. These impacts would be significant because Alternative 1 or 3 could affect the local wintering mountain plover population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.27, VEG-2.2, VEG-3.2, and AG-1.1 would reduce the level of impact from construction and operation to less than significant because permanent loss of sensitive natural communities in which mountain plover may forage would be compensated for through habitat restoration or preservation and purchasing conservation easements on Important Farmland (defined in Chapter 15, *Agriculture and Forestry Resources*).

Mitigation Measure WILD-1.27: Construct Overhead Power Lines and Associated Equipment Following Suggested Practices to Reduce Bird Collisions with Power Lines

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure AG-1.1: Purchase Agricultural Conservation Easements to Preserve Regional Important Farmland

This measure is described in Chapter 15, Section 15.4, *Impact Analysis and Mitigation Measures*.

NEPA Conclusion

Construction and operation effects on mountain plover would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on mountain plover as compared to the No Project Alternative due to the removal of suitable wintering habitat or potential direct mortality during construction or injury or mortality during operation. With implementation of Mitigation Measures WILD-1.27, VEG-2.2, VEG-3.2, and AG-1.1, effects would be reduced to no adverse effect.

Alternative 2

Modeled habitat for mountain plover is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR/Funks pipelines, TRR West, inundation area, I/O Works, dams, new and widened roadways, recreation areas, and Dunnigan Pipeline.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled mountain plover wintering habitat (Table 10-2d). Impacts would be similar to those described for Alternatives 1 and 3 except that permanent impacts on modeled wintering habitat would be less under Alternative 2 because the inundation area would be smaller and temporary impacts on wintering habitat would be less under Alternative 2 because of fewer construction impacts from the regulating reservoirs and conveyance complex, I/O Works, and dams and dikes (Appendix 10C, Table 10C-15).

Operation

Potential effects on mountain plover from operation of Alternative 2 would be similar to Alternatives 1 and 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway could increase the potential for mountain plover to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except that permanent and temporary impacts on modeled wintering habitat would be less under Alternative 2. Operation of Alternative 2 would result in similar impacts to those described above for Alternatives 1 and 3 except that the greater amount of roadway could increase the potential for mountain plover to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. These impacts would be significant because Alternative 2 could affect the local wintering mountain plover population through direct mortality and habitat

loss. Implementation of Mitigation Measures WILD-1.27, VEG-2.2, VEG-3.2, and AG-1.1 would reduce the level of construction and operation impacts to less than significant.

NEPA Conclusion

Construction and operation effects on mountain plover would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on mountain plover as compared to the No Project Alternative. Construction of Alternative 2 would result in effects similar to those for Alternatives 1 and 3 except that permanent and temporary effects on modeled wintering habitat would be less under Alternative 2. Operation of Alternative 2 would result in similar effects to those described above for Alternatives 1 and 3 except that the greater amount of roadway could increase the potential for mountain plover to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. With implementation of Mitigation Measures WILD-1.27, VEG-2.2, VEG-3.2, and AG-1.1, effects would be reduced to no adverse effect.

Impact WILD-1n: Western Yellow-billed Cuckoo, Yellow-breasted Chat, Yellow Warbler, and Song Sparrow (Modesto Population)

Yellow-breasted chat populations have declined in the Sacramento Valley as a result of riparian habitat loss and nest parasitism (Shuford and Gardali 2008:353–355). Yellow warblers are nearly extirpated in the Central Valley, primarily from loss of riparian habitat and from predation (Shuford and Gardali 2008:333). The substantial loss of wetlands and riparian forests in the Central Valley is thought to have greatly reduced the overall numbers of song sparrow and resulted in local extirpation within its range (Shuford and Gardali 2008:401).

Alternatives 1 and 3

Modeled habitat for yellow-breasted chat, yellow warbler, and song sparrow (Modesto population; herein song sparrow) is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East/Funks pipelines, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline. Modeled habit for song sparrow is also present at Funks Reservoir. Potential habitat is also present for all four bird species along the Sacramento River in the operations study area; this is the only area in which potential habitat for western yellow-billed cuckoo is present.

Construction

Alternative 1 or 3 would not result in any construction impacts on western yellow-billed cuckoo or modeled western yellow-billed cuckoo habitat. Construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled habitat for yellow-breasted chat, yellow warbler, and song sparrow (Table 10-2d). Habitat loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation. Vegetation removal and other construction activities could result in destruction of nests, which could cause injury or mortality of eggs or nestlings.

Nighttime construction lighting could temporarily disturb active nest sites if they are in the illuminated area. Noise and vibration from operation of vehicles and equipment, and presence of

construction crews could result in temporary disturbance of yellow-breasted chat, yellow warbler, and song sparrow nests and foraging activities. Rock quarries and batch plants in the inundation area and dam and dike footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance from noise and vibration in those areas.

Operation

Alternative 1 or 3 would not result in any operation impacts on potential western yellow-billed cuckoo habitat. Maintenance would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. Noise and vibration from vehicles and equipment, and presence of maintenance crews could disturb nesting yellow-breasted chat, yellow warbler, and song sparrow if maintenance activities are near active nests. Although maintenance activities would be temporary and short term, they could result in disturbance of active nests if conducted during a sensitive period in the nesting process. The LMP will include measures and practices to avoid or minimize operations and maintenance impacts on nesting yellow-breasted chat, yellow warbler, and song sparrow.

Modeled habitat for yellow-breasted chat, yellow warbler, and song sparrow is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. Although most of the activity would be in the developed areas, there is potential for visitors to access undeveloped areas, which could increase proximity of visitors to nests and disturb nesting activities. In addition, increased noise and activity in developed and undeveloped areas could cause individuals to avoid foraging or nesting in the recreation areas or in suitable habitat near the reservoir. The Authority would implement the Recreation Management Plan, which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into habitat.

New or widened roadways and additional vehicles traveling on roadways could increase the potential for injury or mortality of yellow-breasted chat, yellow warbler, and song sparrow from being struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. Increased or new roadway noise could also interfere with communication between individuals and result in altered behaviors (i.e., discontinuing use of habitat near roads, nesting further from roads). Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present.

Safety nighttime lighting would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, recreation areas, TC Canal intake, and CBD outlet. Lighting could deter individuals from nesting in areas that are illuminated by these new sources of light. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on yellow-breasted chat, yellow warbler and song sparrow nesting.

Stone Corral and Funks Creeks, which may have suitable nesting habitat for yellow-breasted chat, yellow warbler, and song sparrow associated with them, would have increased flows that would range from 0 to 100 cfs, with larger pulse flows to emulate natural flood conditions, and

lower flows in the drier months (e.g., summer). A Flow Characterization and Geomorphic Study (Section 2D.4.3) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. These flow increases would support the existing geomorphic functions and characteristics of each channel. While increased flows from bypass releases may result in minor increases in erosion and changes in sediment deposition, the changes are expected to be minimal and there would be no impacts on suitable yellow-breasted chat, yellow warbler, and song sparrow nesting habitat associated with the creeks. No potential western yellow-billed cuckoo habitat is associated with Stone Corral or Funks Creeks.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle, operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect suitable western yellow-billed cuckoo, yellow-breasted chat, yellow warbler, and song sparrow nesting habitat along the river.

Based on observations during North Delta Flow Actions (Davis pers. comm.), the comparable August–October habitat flows from Sites Reservoir through the Yolo Bypass may cause limited inundation of low-elevation parcels in the upper Yolo Bypass (north of the I-80 causeway). The intent of the releases from Sites Reservoir to the Yolo Bypass during this period is to temporally and spatially distribute food resources for fish species. If the water inundates floodplain areas (i.e., areas outside existing channels) the food would be deposited and would fail to move into the Delta. As such, Sites Reservoir would be operated to maintain flows within the existing Toe Drain, Tule Canal, and other channels, and adjustments in operations would be coordinated between the Authority and parcel owners using the existing Yolo Bypass monitoring network. As a result, impacts on potential yellow-breasted chat, yellow warbler, and song sparrow habitat in the Yolo Bypass are not anticipated.

The completed reservoir would provide an additional food source (insects associated with the reservoir) for yellow-breasted chat, yellow warbler, and song sparrow. This would be a beneficial effect of the Project.

CEQA Significance Determination and Mitigation Measures

Construction and operation of Alternative 1 or 3 would have no impact on western yellow-billed cuckoo. Construction of Alternative 1 or 3 would result in significant impacts on yellow-breasted chat, yellow warbler, and song sparrow from removal of modeled habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 could result in impacts on yellow-breasted chat, yellow warbler, and song sparrow from disturbance during the nesting season if nesting or foraging at or near recreation areas, injury or mortality from vehicle strikes, and changes in communication or behavior from new or increased roadway noise. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present. Construction impacts would be significant because Alternative 1 or 3 could reduce the local yellow-breasted chat, yellow warbler, and song sparrow populations through direct mortality and habitat loss.

Implementation of Mitigation Measures WILD-1.22, WILD-1.23, VEG-2.2, VEG-3.2, and VEG-3.3 would reduce the level of impact from construction to less than significant for yellow-breasted chat, yellow warbler, and song sparrow because vegetation would be removed during the non-breeding season, preconstruction surveys for nesting birds would be conducted, no-disturbance buffers would be established around active nest sites, and impacts on sensitive natural communities in which yellow-breasted chat, yellow warbler, and song sparrow may nest or forage would be compensated for through habitat restoration. The completed reservoir would also benefit yellow-breasted chat, yellow warbler, and song sparrow by providing additional insect prey.

Mitigation Measure WILD-1.22: Conduct Vegetation Removal During the Non-Breeding Season of Nesting Migratory Birds

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.23: Conduct Preconstruction Surveys for Non-Raptor Nesting Migratory Birds and Implement Protective Measures if Found

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.3: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Non-Wetland Waters

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction and operation effects on western yellow-billed cuckoo, yellow-breasted chat, yellow warbler, and song sparrow would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would have no adverse effect on western yellow-billed cuckoo as compared to the No Project Alternative. Construction of Alternative 1 or 3 but would result in a substantial adverse effect on yellow-breasted chat, yellow warbler, and song sparrow as compared to the No Project Alternative. Construction of Alternative 1 or 3 would result in adverse effects on yellow-breasted chat, yellow warbler, and song sparrow from removal of modeled habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 could result in adverse effects on yellow-breasted chat, yellow warbler, and song sparrow from disturbance during the nesting season if nesting or foraging at or near recreation areas, injury or mortality from vehicle strikes, and changes in communication or behavior from new or increased roadway noise. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present. With implementation of Mitigation Measures WILD-1.22, WILD-1.23, VEG-2.2, VEG-3.2, and VEG-3.3, construction effects would be reduced to no adverse effect for yellow-breasted chat, yellow warbler, and song sparrow. Operation of Alternative 1 or 3 would result in no adverse effect on western yellow-billed cuckoo, yellow-breasted chat, yellow warbler, or song sparrow.

Alternative 2

Modeled habitat for yellow-breasted chat, yellow warbler, and song sparrow is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR West/Funks pipelines, TRR West, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and Sacramento River discharge. Modeled habit for song sparrow is present at Funks Reservoir. Potential habitat is also present for all four bird species along the Sacramento River in the operations study area; this is the only area in which potential habitat for western yellow-billed cuckoo is present.

Construction

Alternative 2 would not result in any construction impacts on western yellow-billed cuckoo or potential western yellow-billed cuckoo habitat. Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for yellow-breasted chat, yellow warbler, and song sparrow (Table 10-2d) and potential destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Impacts would be similar to those for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge under Alternative 2 would result in additional loss of modeled yellow-breasted chat, yellow warbler, and song sparrow habitat, and permanent impacts on modeled habitat would be less under Alternative 2 because the inundation area would be smaller. Overall, permanent impacts on modeled yellow-breasted chat, yellow warbler, and song sparrow habitat would be greater under Alternative 2 because of the greater permanent impacts associated with

of new and widened roads (Appendix 10C, Tables 10C-17 and 10C-18). Temporary impacts on modeled habitat would be less than for Alternatives 1 and 3 because of reduced impacts associated with regulating reservoirs and conveyance complex. Additional removal of permanently affected habitat would also result in an increased potential for injury or mortality of eggs or individuals.

Operation

Operation under Alternative 2 would have no impact on western yellow-billed cuckoo. Potential impacts on yellow-breasted chat, yellow warbler, and song sparrow nesting and foraging activities from operation under Alternative 2 would be similar to Alternatives 1 and 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway could increase the potential for yellow-breasted chat, yellow warbler, and song sparrow to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas, and new or increased roadway noise could affect yellow-breasted chat, yellow warbler, and song sparrow communication and behaviors over a larger area.

CEQA Significance Determination and Mitigation Measures

Construction and operation of Alternative 2 would have no adverse effect on western yellow-billed cuckoo. Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except that permanent impacts on modeled yellow-breasted chat, yellow warbler, and song sparrow habitat would be greater under Alternative 2 as a result of greater permanent impacts associated with new and widened roads. A net increase in the amount of modeled habitat removed would also increase the potential for destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Operation of Alternative 2 would result similar impacts to those described for Alternatives 1 and 3 except that the greater amount of roadway could increase the potential for yellow-breasted chat, yellow warbler, and song sparrow to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas and new or increased roadway noise could affect yellow-breasted chat, yellow warbler, and song sparrow communication and behaviors over a larger area. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present. Construction impacts would be significant for yellow-breasted chat, yellow warbler, and song sparrow because Alternative 2 could reduce the local populations through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.22, WILD-1.23, VEG-2.2, VEG-3.2, and VEG-3.3 would reduce the level of impact from construction to less than significant.

NEPA Conclusion

Construction and operation effects on western yellow-billed cuckoo, yellow-breasted chat, yellow warbler, and song sparrow would be the same as described above for CEQA. Construction and operation of Alternative 2 would have no adverse effect on western yellow-billed cuckoo as compared to the No Project Alternative. Construction of Alternative 2 would have a substantial adverse effect on yellow-breasted chat, yellow warbler, and song sparrow as compared to the No Project Alternative. Construction of Alternative 2 would result in effects

similar to those for Alternatives 1 and 3 except that permanent effects on modeled yellow-breasted chat, yellow warbler, and song sparrow habitat would be greater under Alternative 2 as a result of greater permanent effects associated with new and widened roads. A net increase in the amount of modeled habitat removed would also increase the potential for destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Operation of Alternative 2 would result similar effects to those described for Alternatives 1 and 3 as compared to the No Project Alternative except that the greater amount of roadway could increase the potential for yellow-breasted chat, yellow warbler, and song sparrow to be struck by vehicles of workers or visitors and new or increased roadway noise could affect yellow-breasted chat, yellow warbler, and song sparrow communication and behaviors over a larger area. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present. With implementation of Mitigation Measures WILD-1.22, WILD-1.23, VEG-2.2, VEG-3.2, and VEG-3.3, effects would not be adverse. Operation of Alternative 2 would result in no adverse effect on western yellow-billed cuckoo, yellow-breasted chat, yellow warbler, or song sparrow.

Impact WILD-1o: Bank Swallow

Monitoring of the bank swallow population along the Sacramento River showed a 39% reduction in the number of burrows (nests) between 1986 and 2012 (Bank Swallow Technical Advisory Committee 2013:1).

Alternatives 1 and 3

Modeled foraging habitat for bank swallow is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake and Dunnigan Pipeline. Potential bank swallow nesting habitat is present along the Sacramento River in the operations study area.

Construction

Construction of facilities under Alternatives 1 and 3 would result in the permanent and temporary losses of foraging habitat for bank swallow (Table 10-2d). Habitat loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation.

Noise and vibration from operation of vehicles and equipment, and presence of construction crews could result in temporary disturbance of bank swallow foraging activities. Rock quarries and batch plants in the inundation area and dam and dike footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance from noise and vibration in those areas.

Operation

Impacts from maintenance activities required for operation under Alternative 1 or 3 are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. Noise and other disturbances from maintenance are not anticipated to affect foraging bank swallows.

Modeled foraging habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. Increased noise and activity in developed and undeveloped areas could cause bank swallow to avoid foraging in recreation areas or in suitable habitat near the reservoir.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle, operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect suitable bank swallow nesting habitat along the river.

CEQA Significance Determination and Mitigation Measures

Construction of Alternatives 1 and 3 could result in significant impacts on bank swallow from removal of suitable foraging habitat. Operation of Alternative 1 or 3 could result in disturbance of bank swallow foraging activities from human-generated noise and disturbance at recreation areas and near the reservoir, but these impacts would not be significant. Construction impacts would be significant because Alternatives 1 and 3 could affect the local bank swallow population through loss of foraging habitat. Implementation of Mitigation Measures WILD-1.23, VEG-2.2, VEG-3.2, and VEG-3.3 would reduce the level of impact for construction to less than significant because surveys for nesting bank swallows would be conducted and impacts on sensitive natural communities in which bank swallow may forage would be compensated for through habitat restoration and preservation.

Mitigation Measure WILD-1.23: Conduct Preconstruction Surveys for Non-Raptor Nesting Migratory Birds and Implement Protective Measures if Found

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.3: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Non-Wetland Waters

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction effects on bank swallow would be the same as described above for CEQA. Construction of Alternatives 1 and 3 would result in a substantial adverse effect on bank swallow as compared to the No Project Alternative due to removal of suitable foraging habitat. Operation effects on bank swallow of Alternative 1 or 3 would be the same as described above for CEQA and could result in disturbance of bank swallow foraging activities as compared to the No Project Alternative, but would not be adverse. With implementation of Mitigation Measures WILD-1.23, VEG-2.2, VEG-3.2, and VEG-3.3, construction effects would be reduced to no adverse effect. Operation of Alternative 1 or 3 would result in no adverse effect on bank swallow.

Alternative 2

Modeled foraging habitat for bank swallow is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR/Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, Dunnigan Pipeline, and the Sacramento River discharge. Potential bank swallow nesting habitat is present along the Sacramento River in the operations study area.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled foraging habitat for bank swallow (Table 10-2d). Impacts would be similar to those described for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge under Alternative 2 would result in additional loss of modeled habitat and permanent impacts on potential habitat would be less under Alternative 2 because the inundation area would be smaller. Overall, permanent impacts on modeled bank swallow foraging habitat would be less under Alternative 2 because of the reduced inundation area and fewer construction impacts from dams and dikes and the regulating reservoirs and conveyance complex (Appendix 10C, Table 10C-19). Temporary impacts on modeled foraging habitat would greater under Alternative 2 because of greater impacts from conveyance to the Sacramento River and new and widened roads.

Operation

Potential effects on bank swallow from operation would be the same under Alternative 2 as described for Alternatives 1 and 3.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except that permanent impacts on modeled bank swallow foraging habitat would be less under Alternative 2 because of the reduced inundation area and fewer construction impacts from dams and dikes and the regulating reservoirs and conveyance complex. Temporary impacts on modeled foraging habitat would be greater under Alternative 2 because of greater impacts from conveyance to the Sacramento River and new and widened roads. Operation of Alternative 2 would result in the same impacts as those described above for Alternatives 1 and 3 and there would be no adverse effect on bank swallow. Construction impacts would be significant because Alternative 2 could affect the local bank swallow population through loss of foraging habitat. Implementation of Mitigation Measures WILD-1.23, VEG-2.2, VEG 3.2, and VEG-3.3 would reduce the level of impact from construction to less than significant.

NEPA Conclusion

Construction and operation effects on bank swallow would be the same as described above for CEQA. Construction of Alternative 2 would result in a substantial adverse effect on bank swallow as compared to the No Project Alternative. Construction of Alternative 2 would result in effects similar to those for Alternatives 1 and 3 except that permanent effects on modeled bank swallow foraging habitat would be less under Alternative 2 because of the reduced inundation area and fewer construction effects from dams and dikes and the regulating reservoirs and conveyance complex. Temporary effects on modeled foraging habitat would be greater under Alternative 2 because of greater effects from conveyance to the Sacramento River and new and widened roads. With implementation of Mitigation Measures WILD-1.23, VEG-2.2, VEG-3.2, and VEG-3.3, construction effects would be reduced to no adverse effect. Operation of Alternative 2 would result in no adverse effect on bank swallow.

Impact WILD-1p: Tricolored Blackbird

Urban development, agricultural conversion, and harvesting of silage fields have caused a dramatic decline in the tricolored blackbird population from loss of suitable breeding and foraging habitats and loss of reproductive breeding efforts (U.S. Fish and Wildlife Service 2019c:14, 28, 36, 37).

Alternatives 1 and 3

Modeled habitat for tricolored blackbird is present at the GCID Canal diversion, GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline.

Construction

Construction of Alternatives 1 and 3 would result in the permanent and temporary losses of nesting and foraging habitats for tricolored blackbird (Table 10-2d). Habitat loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation. Clearing and grubbing, excavation, and other construction activities could result in destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings.

Nighttime construction lighting could temporarily disturb active nest sites if they are in the illuminated area. Noise and vibration from operation of vehicles and equipment, and presence of construction crews could result in temporary disturbance of active tricolored blackbird nests and foraging activities. Rock quarries and batch plants in the inundation area and dam and dike footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance from noise and vibration in those areas.

Operation

Impacts from maintenance activities required for operation under Alternative 1 or 3 are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. Suitable tricolored blackbird nesting habitat is not anticipated to be located near facilities that would be maintained, and noise and other disturbances from maintenance are not anticipated to affect tricolored blackbird nesting or foraging activities.

There is no modeled breeding habitat at the recreation areas. There are a few areas of modeled breeding habitat (freshwater marsh) along the perimeter of the reservoir footprint. These areas could be occasionally disturbed by people visiting the reservoir, but potential disturbance is expected to be minimal and would not result in impacts on tricolored blackbirds nesting in the immediate vicinity. Increased noise and activity in developed and undeveloped areas would cause tricolored blackbird to avoid foraging or nesting in the recreation areas or in suitable habitat near the reservoir.

New or widened roadways and additional vehicles traveling on roadways could increase the potential for injury or mortality of tricolored blackbird from being struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. Increased or new roadway noise could also interfere with communication between individuals and result in altered behaviors (i.e., discontinuing use of habitat near roads, nesting further from roads). Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present.

Safety nighttime lighting that would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, and CBD outlet have the potential to deter tricolored blackbirds from nesting in areas that are illuminated by these new sources of light. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on tricolored blackbird nesting.

Based on observations during North Delta Flow Actions (Davis pers. comm.), the comparable August–October habitat flows from Sites Reservoir through the Yolo Bypass may cause limited inundation of low-elevation parcels in the upper Yolo Bypass (north of the I-80 causeway). The intent of the releases from Sites Reservoir to the Yolo Bypass during this time period is to temporally and spatially distribute food resources for fish species. If the water inundates floodplain areas (i.e., areas outside existing channels) the food would be deposited and would fail to move into the Delta. As such, Sites Reservoir would be operated to maintain flows within the existing Toe Drain, Tule Canal, and other channels, and adjustments in operations would be coordinated between the Authority and parcel owners using the existing Yolo Bypass monitoring network. As a result, impacts on potential tricolored blackbird habitat in the Yolo Bypass are not anticipated.

The completed reservoir would provide an additional food source (insects associated with the reservoir) for tricolored blackbird. This would be a beneficial effect of the Project.

CEQA Significance Determination and Mitigation Measures

Construction of Alternatives 1 and 3 could result in significant impacts on tricolored blackbird from removal of suitable habitat and potential loss or disturbance of active nests. Operation of Alternative 1 or 3 could result in impacts on tricolored blackbird from injury or mortality from vehicle strikes and changes in communication or behavior from new or increased roadway noise. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present. Construction impacts would be significant because they could reduce the local tricolored blackbird population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.31, VEG-2.2, VEG-3.2, and VEG-3.3 would reduce the level of impact from construction to less than significant because vegetation would be removed during the non-breeding season, surveys would be conducted to determine if tricolored blackbird is nesting in or near work areas, no-disturbance buffers would be established around active nest sites, and impacts on sensitive natural communities in which tricolored blackbird may nest or forage would be compensated for through habitat restoration and preservation. Implementation of Mitigation Measures VEG-2.2, VEG-3.2, and VEG-3.3 would avoid and compensate for permanent loss of potential tricolored blackbird nesting habitat. Annual grassland foraging habitat would be preserved at a minimum 1:1 ratio though implementation of Mitigation Measures WILD-1.31 and VEG-2.2. Implementation of Mitigation Measure AG-1.1 would compensate for the loss of agricultural foraging habitat through preservation and purchasing conservation easements on Regional Important Farmland (defined in Chapter 15). The completed reservoir would also benefit tricolored blackbird by providing additional insect prey.

Mitigation Measure WILD-1.22: Conduct Vegetation Removal During the Non-Breeding Season of Nesting Migratory Birds

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.23: Conduct Preconstruction Surveys for Non-Raptor Nesting Migratory Birds and Implement Protective Measures if Found

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.31: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk and White-tailed Kite

This measure is described above for Swainson's hawk and white-tailed kite.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.3: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Non-Wetland Waters

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure AG-1.1: Purchase Agricultural Conservation Easements to Preserve Regional Important Farmland

This measure is described in Chapter 15, Section 15.4.

NEPA Conclusion

Construction and operation effects on tricolored blackbird would be the same as described above for CEQA. Construction of Alternatives 1 and 3 would result in a substantial adverse effect on tricolored blackbird as compared to the No Project Alternative due to the removal of suitable habitat and potential loss or disturbance of active nests resulting in direct mortality and habitat loss. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present, as compared to the No Project Alternative, under operation of Alternative 1 or 3. With implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.31, VEG-2.2, VEG-3.2, VEG-3.3, and AG-1.1, effects would be reduced to no adverse effect. Operation of Alternative 1 or 3 is not anticipated to result in adverse effects on tricolored blackbird.

Alternative 2

Modeled habitat for tricolored blackbird is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR West/Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, Dunnigan Pipeline, TC Canal intake, and Sacramento River discharge.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of potential habitat for tricolored blackbird (Table 10-2d) and potential destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Impacts under Alternative 2 would be similar to those described for Alternatives 1 and 3 except that construction of South Road, TRR West, and the Sacramento River discharge would result in additional loss of modeled habitat and the smaller inundation area would result in reduced loss of modeled habitat. Overall, permanent impacts on nesting habitat and temporary impacts on foraging habitat would be greater under Alternative 2 because of greater impacts associated with the regulating reservoirs and conveyance complex and conveyance to the Sacramento River, respectively. Overall, permanent impacts on tricolored blackbird foraging habitat and temporary impacts on nesting habitat would be less under Alternative 2 because of the smaller inundation area and fewer temporary impacts on nesting habitat from the regulating reservoirs and conveyance complex, respectively (Appendix 10C, Table 10C-20). Additional removal of potential nesting habitat would result in an increased potential for injury or mortality of eggs or individuals.

Operation

Potential effects on tricolored blackbird from operation under Alternative 2 would be similar to Alternatives 1 and 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway could increase the potential for tricolored blackbird to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas, and new or increased roadway noise could affect tricolored blackbird communication and behaviors over a larger area.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except that permanent impacts on nesting habitat and temporary impacts on foraging habitat would be greater under Alternative 2 and permanent impacts on tricolored blackbird foraging habitat and temporary impacts on nesting habitat would be less under Alternative 2. A net increase in the amount of nesting habitat removed would also increase the potential for destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Operation of Alternative 2 would result in similar impacts to those described above for Alternative 1 or 3 except that the greater amount of roadway could increase the potential for tricolored blackbird to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas and new or increased roadway noise could affect tricolored blackbird communication and behaviors over a larger area. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present. Impacts from construction would be significant because they could reduce the local tricolored blackbird population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.31, VEG-2.2, VEG-3.2, VEG-3.3, and AG-1.1 would reduce the level of impact from construction to less than significant.

NEPA Conclusion

Construction and operation effects on tricolored blackbird would be the same as described above for CEQA. Construction of Alternative 2 would result in a substantial adverse effect on tricolored blackbird as compared to the No Project Alternative. Construction of Alternative 2 would result in effects similar to those for Alternatives 1 and 3 except that permanent effects on nesting habitat and temporary effects on foraging habitat would be greater under Alternative 2 and permanent effects on tricolored blackbird foraging habitat and temporary effects on nesting habitat would be less under Alternative 2. A net increase in the amount of nesting habitat removed would also increase the potential for destruction of nests or nest abandonment, which could cause injury or mortality of eggs or nestlings. Operation of Alternative 2 would result in similar effects to those described above for Alternative 1 or 3 except that the greater amount of roadway under Alternative 2 could increase the potential for tricolored blackbird to be struck by vehicles and new or increased roadway noise could affect tricolored blackbird communication and behaviors over a larger area. Vehicle strikes are anticipated to be infrequent and road noise is not anticipated to substantially affect populations, if present. With implementation of Mitigation Measures WILD-1.22, WILD-1.23, WILD-1.31, VEG-2.2, VEG-3.2, VEG-3.3, AG-1.1, effects would be reduced to no adverse effect. Operation of Alternative 2 would result in no adverse effect on tricolored blackbird.

Mammals

Permanent and temporary impacts on modeled habitat for special-status mammals from Alternatives 1, 2, and 3 are shown in Table 10-2e.

Table 10-2e. Acreages of Permanent and Temporary Impacts on Modeled Habitat for Special-Status Mammals in the Study Area

	Alternatives 1 and 3 Permanent Impacts	Alternatives 1 and 3 Temporary Impacts	Alternative 2 Permanent Impacts	Alternative 2 Temporary Impacts
Pallid Bat and Long-eared Myotis	15,893	1,435	15,380	1,495
Townsend's Big-eared Bat and Silver-haired Bat	15,893	1,435	15,380	1,495
Western Red Bat and Hoary Bat	15,893	1,437	15,380	1,495
American Badger	14,184	972	13,756	918

Impact WILD-1q: Pallid Bat, Townsend's Big-eared Bat, Silver-haired Bat, Western Red Bat, Hoary Bat, Long-eared Myotis and Colonies of Non-special-status Roosting Bats

Many bat species are rare, declining, or have unknown population sizes. Historical and ongoing challenges affecting bats include habitat loss, alteration, and disturbance; and new challenges include wind energy, climate change, and emerging diseases such as white-nose syndrome (U.S. Geological Survey n.d.).

Alternatives 1 and 3

Modeled habitat for pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), silver-haired bat (*Lasionycteris noctivagans*), western red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), long-eared myotis (*Myotis evotis*), and colonies of non-special-status roosting bats (referred to as special-status bats herein) is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline. Potential habitat is also present along the Sacramento River in the operations study area.

Construction

Construction of Alternatives 1 and 3 would result in the permanent and temporary losses of modeled habitat for special-status bats (Table 10-2e). Habitat loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation. Clearing and grubbing, excavation, and other construction activities could result in destruction of roost or roost abandonment, which could cause injury or mortality of individuals, including non-volant (i.e., non-flying) pups.

Removal of existing human-made structures and trees during construction could result in the permanent loss of roosting habitat for bats, including maternity, seasonal migration, and/or winter roosting habitats. Tree and structure removal during construction could also result in injury or mortality of bats, including non-volant pups, or eviction from roosts during the daytime when they would be disoriented and vulnerable to predation. Bats displaced from roost sites would have to compete with other bats for new roost locations.

Nighttime construction lighting could temporarily disturb bat foraging activities. Noise and vibration from operation of vehicles and equipment, and presence of construction crews could result in temporary disturbance of bats roosting near work areas. Rock quarries and batch plants in the inundation area and dam and dike footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance of roosting bats from noise and vibration in those areas.

Operation

Impacts from maintenance activities required for operation under Alternative 1 or 3 are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. Noise and vibration from vehicles and equipment, and presence of maintenance crews could disturb individuals if maintenance activities are near active roosts. These types of disturbances would be temporary and short term and are not anticipated to adversely affect special-status bats.

Modeled habitat is present at the recreation areas and near the reservoir, which would be used by visitors on a regular basis and would result in an increased human presence in these areas. Although most of the activity would be in the developed areas, there is potential for visitors to access undeveloped areas, which could increase proximity of visitors to roosting bats and disturb existing habitat. In addition, increased noise and activity in developed and undeveloped areas

may cause bats to avoid foraging or roosting in the recreation areas or in suitable habitat near the reservoir. While these activities may disturb bats, they would not result in injury or mortality of individuals.

Safety nighttime lighting would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, recreation areas, TC Canal intake, and CBD outlet. New lighting could deter bats from using areas that are illuminated by these new sources of light, but lighting may also attract insects and increase foraging opportunities around the lights. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on special-status bats.

The completed reservoir would provide a new drinking water source and foraging habitat (insects associated with the reservoir) for bats. This would be a beneficial effect of the Project.

Bats could be affected by methylmercury or harmful algal blooms (HABs). As described in Chapter 6, *Surface Water Quality*, methylmercury concentrations in organisms increase from simpler to more complex organisms in a process called biomagnification. Methylmercury uptake into algae occurs passively through diffusion and concentrations can be 100,000 times higher in algae than in surface water. Concentrations again increase by two to five times in the invertebrates that consume algae. Aquatic insects contaminated with methylmercury that emerge from aquatic ecosystems as adults can transfer methylmercury to terrestrial predators, such as bats, when consumed (Korstian et al. 2018). Mercury impacts various systems in the body, resulting in altered behavior, reduced productivity, and increased infections in wild mammals (Scheuhammer et al. 2007). If bats were to consume a substantial number of insects contaminated with methylmercury from Sites Reservoir, they could become ill or die.

Limited information is available on the potential impacts of HABs on bats. In one study, little brown bats (*Myotis lucifugus*) were found to be not highly affected by the ingestion of microcystin, a hepatotoxin (Jones 2016). Dead bats have also been found near HABs (Pybus et al. 1986). If HABs were to occur in Sites Reservoir (see Chapter 6), cyanobacteria and cyanotoxins could be ingested by bats either through drinking water or eating insects contaminated with the toxins, which could have little effect, or could cause sickness or death.

Stone Corral and Funks Creeks, which have potentially suitable roost trees associated with them, would have increased flows that would range from 0 to 100 cfs, with larger pulse flows to emulate natural flood conditions, and lower flows in the drier months (e.g., summer). A Flow Characterization and Geomorphic Study (Section 2D.4.3) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. These flow increases would support the existing geomorphic functions and characteristics of each channel. While increased flows from bypass releases may result in minor increases in erosion and changes in sediment deposition, the changes are expected to be minimal and there would be no impacts on roosting habitat for special-status bats associated with the creeks.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle,

operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect trees that may provide roosting habitat for special-status bats along the river.

CEQA Significance Determination and Mitigation Measures

Construction of Alternatives 1 and 3 would result in significant impacts on special-status bats from removal of suitable habitat and potential loss or disturbance of active roosts and displacement of bats from roost sites. Impacts from construction would be significant because they could reduce the local populations of these special-status bats through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.32, WILD-1.33, WILD-1.34, VEG-2.2, VEG-3.2, VEG-4.1, and VEG-4.2 would reduce the level of impact from construction to less than significant because surveys for special-status bats would be conducted, protective measures would be implemented, roosting habitat that is permanently lost would be replaced and protected onsite or at an offsite preservation area, impacts on oak woodland would be minimized, and impacts on sensitive natural communities in which special-status bats may roost or forage would be compensated for through habitat restoration and preservation. Operation of Alternative 1 or 3 may result in disturbance of roosting or foraging bats but is not anticipated to result in injury or mortality or destruction of habitat. Consumption of insects contaminated with methylmercury could cause illness or mortality of bats. Implementation of Mitigation Measure WQ-1.1 would reduce the impact from operation to less than significant because steps would be taken to reduce, monitor, and manage mercury in the reservoir. Ingestion of HABs by bats either through drinking water or eating insects contaminated with the toxins could cause illness or death of bats. The water quality monitoring program and a HABs action plan described under *Harmful Algal Blooms* in the Reservoir Management Plan in Appendix 2D, *Best Management Practices, Management Plans, and Technical Studies*, would minimize the potential for HABs to be present and ingested by bats. The completed reservoir would also benefit special-status bats by providing a new drinking water source and additional insect prey.

Mitigation Measure WILD-1.32: Conduct Surveys and Implement Protection Measures for Special-Status Bat Species Prior to Building/Structure Demolition

Prior to building/structure demolition, the Authority will retain a qualified biologist (defined below) to conduct preconstruction surveys and implement protective measures for pallid bat, Townsend's big-eared bat, silver-haired bat, long-eared myotis, and other bats that roost in or on buildings and structures. At least 30 days prior to the demolition of the existing buildings and structures, qualified biologists will conduct an initial daytime survey to assess the buildings/structures for potential bat roosting habitat, and to look for bats and indications of bat use. The qualified biologists will have knowledge of the natural history of the species that may be present, have sufficient experience determining bat occupancy, and be familiar with bat survey techniques. The qualified biologist will examine both the inside and outside of the buildings/structures for potential roosting habitat, as well as routes of entry to the building and structures. Locations of any roosting bats, signs of bat use, and entry and exit points will be noted and mapped on a drawing of the buildings and structures. Roost sites will also be photographed as feasible. Depending on the results of the habitat assessment, the Authority will ensure the following steps are taken:

- If the building and structures can be assessed (i.e., sufficient areas of the buildings and structures can be examined) and no habitat or limited potential habitat for roosting bats is present and no signs of bat use are present, the building may be demolished within 24 hours. If the building is not demolished within 24 hours, another survey of the interior and exterior of the buildings/structure by a qualified biologist will be conducted within 24 hours of the scheduled demolition.
- If moderate or high potential habitat for roosting bats is present and habitat can be thoroughly surveyed, the structure may be demolished within 24 hours. If there are no signs of bat use but the habitat cannot be thoroughly surveyed, measures will be implemented under the guidance of the qualified biologists to exclude bats from using the buildings and structures as a roost site to the extent feasible given the conditions of the structures, such as sealing off entry points. Prior to installing exclusion measures, the qualified biologists will re-survey the buildings and structures to ensure that no bats are present. In addition, a preconstruction survey of the interior and exterior of the buildings and structures will be conducted within 24 hours of demolition to confirm that no bats are present.

If moderate or high potential habitat is present and bats or bat sign are observed, exclusion measures are not installed as described above, or the buildings or structures provide suitable habitat but cannot be fully assessed, the Authority will implement the following protective measures:

- Prior to initiating demolition activities, follow-up surveys will be conducted to determine if bats are present and the species of bats present. The qualified biologists will develop a survey plan (number, timing, and type of surveys) and conduct surveys using night vision goggles and/or active acoustic monitoring using full spectrum bat detectors will be conducted.

- The qualified biologist will develop a plan to discourage or exclude bat use of buildings/structures prior to demolition based on the timing of demolition, extent of evidence of bat use or occupied habitat, and species present. The plan may include modifying the structure to be less appealing for roosting without causing harm to bats, installing exclusion measures, or using light or other means to deter bats from using the buildings and structures to roost. The plan will be submitted to CDFW for review and comment.
- A preconstruction survey of the interior and exterior of the building and structures will be conducted within 24 hours of demolition to confirm that no bats are present.

Depending on the species of bats present, size of the bat roost, and timing of the demolition, the Authority will implement the following additional protective measures as applicable:

- To avoid impacts on maternity colonies and/or hibernating bats, buildings/structures where bats are confirmed to be present will not be demolished during the maternity season (generally assumed to be between April 15 and August 15 for this Project) or the hibernation season (generally from November 1 to March 1). Removal of occupied roosting habitat will be conducted only following the maternity season and prior to hibernation, generally between August 16 and October 31, unless exclusionary devices are first installed. Other measures, such as using lights to deter bat roosting, may be used as developed by the qualified biologist and as approved by CDFW, if applicable.
- Installation of exclusion devices will be conducted only before maternity colonies establish (generally after March 1) or after they disperse (generally August 15 to October 31) to prevent bats from occupying a roost site during demolition to the extent feasible. Exclusionary devices will be installed by or under the supervision of a qualified biologist.

Mitigation Measure WILD-1.33: Conduct Surveys and Implement Protection Measures for Special-Status Bat Species Prior to Tree Trimming and Removal

Prior to tree trimming or removal, the Authority will retain a qualified biologist to conduct preconstruction surveys and implement protective measures for pallid bat, Townsend's big-eared bat, silver-haired bat, western red bat, hoary bat, long-eared myotis, and other tree-roosting bats. Prior to initiating tree trimming or removal, a qualified biologist will examine the trees to be removed or trimmed to identify suitable bat roosting habitat. Because of the limited timeframe for tree removal (September 15 to October 31), the tree habitat assessment should be conducted early enough to provide information to inform tree removal planning. The biologists will identify high-quality habitat features (e.g., large tree cavities, basal hollows, loose or peeling bark, larger snags), and the area around these features will be searched for bats and indications of bat use. If the tree can be assessed and no habitat for roosting bats is present, no further actions are necessary and tree removal or trimming may commence. Because signs of bat use are not easily found, and trees cannot be completely surveyed for bat roosts, the

Authority will implement the following protective measures listed below for trees containing potential roosting habitat.

- Trimming or removal of trees with potentially suitable bat roosting habitat will be avoided during the maternity season (generally between April 1 and July 31) and the hibernation season (generally from November 1 to March 1).
- Removal of trees providing bat roosting habitat will be conducted only before maternity colonies establish (generally after March 1) or after they disperse (generally August 1 to October 31).
- If a maternity roost is found, the roost will be protected until July 31or until the qualified biologist has determined the maternity roost is no longer active. Appropriate no-work buffers around the roost will be established under direction of the qualified biologist. Buffer distances may vary depending on the species and activities being conducted.
- Trimming and removal of trees (between July 31 and October 31) with suitable roosting habitat will be monitored by a qualified biologist. Tree trimming and removal will be conducted using a two-phase removal process conducted over two consecutive days. In the afternoon on the first day, limbs and branches will be removed using chainsaws only. Only branches or limbs without cavities, crevices, or deep bark fissures will be removed; branches and limbs with these features will be avoided. On the second day, the entire tree will be removed. The qualified biologist will search through downed vegetation for injured or dead bats. Observation of injured or dead special-status bats will be reported to CDFW.

Mitigation Measure WILD-1.34: Compensate for Permanent Impacts on Occupied Roosting Habitat

The Authority will compensate for the permanent loss of occupied roosting habitat by constructing and/or installing suitable replacement habitat onsite or at an offsite preservation area. The roosting habitat type and design will be developed in coordination with CDFW. A monitoring plan will be prepared to ensure the replacement habitat is maintained and functions as intended. Annual reports will be submitted to CDFW to document compliance with monitoring requirements.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-3.2: Compensate for Temporary and Permanent Impacts on State- or Federally Protected Wetlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-4.1: Avoid and Minimize Potential Adverse Effects on Oak Woodlands During Construction

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure VEG-4.2: Compensate for Adverse Effects on Oak Woodlands

This measure is described in Chapter 9, Section 9.5.

Mitigation Measure WQ-1.1: Methylmercury Management

This measure is described in Chapter 6, Section 6.4.

NEPA Conclusion

Construction and operation effects on special-status bats would be the same as described above for CEQA. Construction of Alternative 1 or 3 would result in a substantial adverse effect on special-status bats as compared to the No Project Alternative due to the removal of suitable habitat and potential loss or disturbance of active roosts and displacement of bats from roost sites. Operation of Alternative 1 or 3 may result in disturbance of roosting or foraging bats as compared to the No Project Alternative but is not anticipated to result in injury or mortality of individuals or destruction of habitat. Furthermore, implementation of Alternative 1 or 3 would have the beneficial effects of providing a new drinking water source and foraging habitat for bats. With implementation of Mitigation Measures WILD-1.32, WILD-1.33, WILD-1.34, VEG-2.2, VEG-3.2, VEG-4.1, and VEG-4.2, effects would be reduced to no adverse effect. Operation of Alternative 1 or 3 would result in no adverse effect on special-status bats.

Alternative 2

Modeled habitat for special-status bats is present at the GCID Main Canal diversion, GCID Main Canal improvements, TRR East, TRR/Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, Dunnigan Pipeline, TC Canal intake, and the Sacramento River discharge. Potential habitat is also present along the Sacramento River in the operations study area.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for special-status bats (Table 10-2e) and potential destruction of roosts or roost abandonment, which could cause injury or mortality of individuals or non-volant pups. Impacts would be similar to those described for Alternatives 1 and 3 except that construction of South Road, TRR West, and Sacramento River discharge would result in additional loss of modeled habitat and the smaller inundation area would result in reduced loss of modeled habitat. Overall, permanent impacts on bat roosting/foraging habitat and temporary impacts on foraging habitat would be greater under Alternative 2. Overall, permanent impacts on bat foraging habitat would be less under Alternative 2 because of the smaller inundation area and impacts associated with dams and dikes, and temporary impacts on roosting/foraging habitat would be less under Alternative 2 because fewer impacts on roosting/foraging habitat from the regulating reservoirs and conveyance complex (Appendix 10C, Tables 10C-21, 10C-22, and 10C-23). Additional removal of roosting habitat would also result in an increased potential for injury or mortality of individuals.

Operation

Potential effects on special-status bats from operation would be the same under Alternative 2 as described for Alternative 1 or 3.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except that permanent impacts on bat roosting/foraging habitat and temporary impacts on foraging habitat would be greater under Alternative 2 and permanent impacts on bat foraging habitat and temporary impacts on roosting/foraging habitat would be less under Alternative 2. A net increase in the amount of suitable roosting habitat removed would also increase the potential for destruction of roosts or roost abandonment, which could cause injury or mortality of individuals, including non-volant pups. These impacts would be significant because Alternative 2 could reduce the local special-status bat populations through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.32, WILD-1.33, WILD-1.34, VEG-2.2, VEG-3.2, VEG-4.1, and VEG-4.2 would reduce the level of impact from construction to less than significant. Operational impacts for Alternative 2 would be less than significant for the same reasons as Alternatives 1 and 3.

NEPA Conclusion

Construction and operation effects on special-status bats would be the same as described above for CEQA. Construction of Alternative 2 would result in a substantial adverse effect on special-status bats as compared to the No Project Alternative. Construction of Alternative 2 would result in effects similar to those for Alternatives 1 and 3 except that permanent effects on bat roosting/foraging habitat and temporary effects on foraging habitat would be greater under Alternative 2 and permanent effects on bat foraging habitat and temporary effects on roosting/foraging habitat would be less under Alternative 2. A net increase in the amount of suitable roosting habitat removed would also increase the potential for destruction of roosts or roost abandonment, which could cause injury or mortality of individuals, including non-volant pups. With implementation of Mitigation Measures WILD-1.32, WILD-1.33, WILD-1.34, VEG-2.2, VEG-3.2, VEG-4.1, and VEG-4.2, effects would be reduced to no adverse effect. Operational impacts for Alternative 2 would be the same reasons as Alternatives 1 and 3 as compared to the No Project Alternative. Operation of Alternative 2 would result in no adverse effect on special-status bats.

Impact WILD-1r: American Badger

American badger was once common in California, but the population was reduced by as much as 90% in the early 1900s from trapping. Although the current population numbers are not known, this species is now considered uncommon and is threatened by habitat loss and fragmentation, vehicle strikes, trapping, predation, and depredation, including ingestion of rodenticide (Quinn 2008:108, 109).

Alternatives 1 and 3

Modeled habitat for American badger (*Taxidea taxus*) is present at the GCID Main Canal improvements, TRR East, TRR East/Funks pipelines, Funks Reservoir, inundation area, dams,

I/O Works, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline.

Construction

Construction of Alternatives 1 and 3 would result in the permanent and temporary losses of modeled habitat for American badger (Table 10-2e). Habitat loss would result from vegetation removal, conversion to unsuitable land cover types, and reservoir inundation. Clearing and grubbing, excavation, and other construction activities could result in the destruction of dens and mortality or injury of individuals from being crushed or buried by equipment. American badger could also be struck by vehicles and equipment traveling along access roads during construction.

Construction activities, including ongoing human presence in the inundation area, and roadway use, could result in disruption of breeding or foraging activities or other movements in individuals' home ranges. Noise and vibration created during operation of vehicles, equipment, and construction crews could result also in temporary disruption of foraging or breeding behaviors or alteration of movement patterns. Rock quarries and batch plants in the inundation area and dam and dikes footprints, drill and blast activities for tunneling at the I/O Works site, and pile drilling for the bridge would result in additional temporary disturbance from noise and vibration in those areas.

Operation

Impacts from maintenance activities required for operation under Alternative 1 or 3 are expected to be minimal because maintenance activities would be conducted mostly in previously disturbed areas during daytime hours and using existing roadways. American badgers are not anticipated to den near facilities that would be maintained, as they infrequently occupy developed areas (Williams 1986:66; Lay 2008:4), and noise and other disturbances from maintenance are not anticipated to affect denning American badgers. Use of rodenticides at the facilities could cause illness or mortality of American badger because they could feed on rodents that have ingested rodenticide.

New roadways could impede movement and increase the potential for American badger to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas. Fencing along roadways could cause individuals to become trapped on roadways, resulting in additional risk of vehicle strikes. The presence of Sites Reservoir would also impede movement of American badger.

The recreation areas and reservoir would be used by visitors on a regular basis, which would result in an increased human presence and noise in these areas. Although most of the activity would be in the developed areas, there is potential for visitors to access undeveloped areas, which could increase proximity of visitors to potential dens and disturb existing habitat. In addition, increased noise and activity in developed and undeveloped areas could cause American badger to avoid foraging or denning in the recreation areas or in suitable habitat near the reservoir.

Safety nighttime lighting would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, recreation areas, TC Canal intake, and CBD outlet. Lighting could deter American

badger from denning in areas and may affect foraging movements. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on American badger.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would result in significant impacts on American badger from removal of suitable habitat and potential loss or disturbance of active dens. Operation of Alternative 1 or 3 could result in significant impacts if American badger denning sites at or near recreation areas are disturbed or if the use of rodenticides causes illness, injury, or mortality of individuals from ingestion of rodenticides. These impacts would be significant because Alternative 1 or 3 could reduce the local American badger population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.15, WILD-1.16, WILD-1.26, WILD-1.35, and VEG-2.2 would reduce the level of impact from construction and operation to less than significant because surveys would be conducted to determine if suitable or occupied dens are present in or near work areas, no-disturbance buffers would be established around potentially active and active den sites, impacts on sensitive natural communities in which American badger may den or forage would be compensated for through offsite habitat restoration and preservation, and if found to be necessary through a wildlife corridor study, suitable crossings would be installed at appropriate locations to facilitate safe crossings.

Mitigation Measure WILD-1.15: Design and Construct Wildlife Crossings for New Roadways at Suitable Locations

This mitigation measure is described above for western spadefoot.

Mitigation Measure WILD-1.16: Monitor and Maintain Wildlife Crossings

This mitigation measure is described above for western spadefoot.

Mitigation Measure WILD-1.26: Protect Special-Status Wildlife from Rodenticide Use

This measure is described above for northern harrier and burrowing owl.

Mitigation Measure WILD-1.35: Implement Protective Measures to Avoid and Minimize Potential Impacts on American Badger

Where suitable habitat is present for American badger in and within 200 feet of work areas where ground disturbance will occur, the Authority will implement the following protective measures.

- The Authority will retain qualified biologists (experienced with the identification of suitable badger dens) to conduct a preconstruction survey for active badger dens prior to temporary or permanent ground disturbance. The preconstruction survey will be conducted no less than 14 days and no more than 30 days before the beginning of ground disturbance. The biologists will conduct den searches by systematically

walking transects through the area to be disturbed and a 200-foot buffer area. Transect distance should be based on the height of vegetation such that 100% visual coverage of the disturbance area is achieved. If a suitable or occupied den is found during the survey, the biologist will record the den dimensions, the shape of the den entrance, presence of tracks, scat, or prey remains, den occupancy (i.e., suitable, potentially occupied, or occupied), recent excavations at the den site, and the den location.

- To the maximum extent feasible, disturbance or destruction of suitable dens for American badger in temporary impact areas will be avoided.
- Any occupied or potentially occupied American badger den will be avoided by establishing an exclusion zone around the den. For potentially occupied dens, a 50-foot exclusion zone will be applied around the den; for occupied dens, a 100-foot exclusion zone will be applied around the den. The width of exclusion zones around maternity dens may exceed 100 feet, will be determined through coordination with CDFW, and will remain in place throughout the pup-rearing season (February 15 through July 1). Any adjustments to buffers will require prior written approval by CDFW. If the den cannot be avoided, the Authority will contact CDFW for direction on additional steps to be taken.
- Unoccupied suitable dens that would be destroyed by construction may be removed by hand excavation by a biologist or under the supervision of a biologist; a mini excavator may be used to facilitate excavation of dens.

Mitigation Measure VEG-2.2: Avoid and Compensate for Adverse Effects on Sensitive Natural Communities

This measure is described in Chapter 9, Section 9.5.

NEPA Conclusion

Construction and operation effects on American badger would be the same as described above for CEQA. Construction and operation of Alternatives 1 and 3 would result in a substantial adverse effect on American badger as compared to the No Project Alternative due to potential reductions of the local American badger population through direct mortality and habitat loss. With implementation of Mitigation Measures WILD-1.15, WILD-1.16, WILD-1.26, WILD-1.35, and VEG-2.2, construction and operation effects on American badger would be reduced to no adverse effect.

Alternative 2

Modeled habitat for American badger is present at the GCID Main Canal improvements, TRR, TRR/Funks pipelines, TRR West, Funks Reservoir, inundation area, I/O Works, dams, new and widened roadways, recreation areas, TC Canal intake, and Dunnigan Pipeline.

Construction

Construction of Alternative 2 would result in the permanent and temporary losses of modeled habitat for American badger (Table 10-2e) and potential destruction of dens or den abandonment,

which could cause injury or mortality of individuals. Impacts under Alternative 2 would be similar to those described for Alternatives 1 and 3 except that construction of the new South Road and TRR West under Alternative 2 would result in additional loss of potential habitat and the smaller inundation area would result in reduced loss of modeled habitat. Overall, permanent and temporary impacts on modeled habitat for badger would be less under Alternative 2 than Alternatives 1 and 3 because of the smaller inundation area and reduced impacts from construction of dams and dikes (Appendix 10C, Table 10C-24).

Operation

Potential effects on American badger from operation would be similar under Alternative 2 as described for Alternative 1 or 3. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Because additional roadway would be constructed under Alternative 2, the greater amount of roadway would impede movement over a larger area and increase the potential for American badger to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would result in impacts similar to those for Alternatives 1 and 3 except that permanent and temporary impacts on modeled habitat for badger would be less under Alternative 2 than Alternatives 1 and 3 because of the smaller inundation area and reduced impacts from construction of dams and dikes. Operation impacts under Alternative 2 would be similar to those under Alternative 1 or 3 except that the increased amount of roadway would impede movement over a larger area and could result in additional mortality from vehicle strikes. These impacts would be significant because Alternative 2 could reduce the local American badger population through direct mortality and habitat loss. Implementation of Mitigation Measures WILD-1.15, WILD-1.16, WILD-1.26, WILD-1.35, and VEG-2.2 would reduce the level of impact from construction and operation to less than significant.

NEPA Conclusion

Construction and operation effects on American badger would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on American badger as compared to the No Project Alternative due to potential reductions of the local American badger population through direct mortality and habitat loss. Construction of Alternative 2 would result in effects similar to those for Alternatives 1 and 3 except that permanent and temporary effects on modeled habitat for badger would be less under Alternative 2 than Alternatives 1 and 3 because of the smaller inundation area and reduced effects from construction of dams and dikes. Operation effects under Alternative 2 would be similar to those under Alternative 1 or 3 except that the increased amount of roadway would impede movement over a larger area and could result in additional mortality from vehicle strikes. With implementation of Mitigation Measures WILD-1.15, WILD-1.16, WILD-1.25, WILD-1.35, and VEG-2.2, construction and operation effects would be reduced to no adverse effect.

Impact WILD-2: Substantial interference with the movement of a native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impediment of the use of native wildlife nursery sites

As discussed under Impact WILD-1 and in Appendix 10A, there is potential habitat for multiple special-status species that could be used for reproduction, migration and dispersal in the areas affected by Project components. In addition, there is potential for non-listed wildlife, including deer, tule elk, bobcats, foxes, raccoons, skunks, squirrels, and various species of birds, reptiles, and amphibians that could breed in, or disperse or migrate through, the study area.

No Project

Under the No Project Alternative, new Project facilities would not be constructed or operated and there would be no temporary or permanent impacts on wildlife movement, wildlife corridors, or use of wildlife nursery sites. In addition, under the No Project Alternative the operations of existing facilities, such as TC Canal, RBPP, and GCID Main Canal, would continue. The owner/operators of these facilities would operate within the conditions and requirements of existing permits and agreements meant to protect special-status species and not interfere with the movement of a native resident or migratory wildlife. Finally, activities that currently occur within the study area such as grazing or other rural agricultural activities would continue and may result in effects wildlife movement, wildlife corridors, or use of wildlife nursery sites but would do so in the context of existing regulations, requirements, and activities.

Significance Determination

The No Project Alternative would not substantially interfere with the movement of a native resident or migratory wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. There would be no impact/no effect.

Alternatives 1 and 3

Construction

As discussed under Impact WILD-1, construction of Alternative 1 or 3 would result in the permanent and temporary losses of modeled habitat for special-status wildlife species, including migration and dispersal habitats. Some of this habitat loss would be within existing natural landscape blocks and essential connectivity areas identified in the California Essential Habitat Connectivity Project mapping. Construction noise and activities and nighttime lighting could result in temporary disruption of wildlife movement by creating barriers or impediments to movement. Wildlife may adjust their typical foraging, migration and/or dispersal movements to avoid construction areas. These adjustments could result in increased energy expenditure or exposure to predation.

Temporary and permanent habitat loss would reduce availability or access to breeding/nursery sites in the study area, including breeding sites for aquatic invertebrates and amphibians, upland burrow and den sites for reptiles, raptors, and mammals, nesting sites for migratory birds, and roosting sites for bats. Construction activities, noise, vibration, and increased human presence could also cause wildlife to avoid existing breeding/nursery sites, impeding the use of these areas. Removal or disturbance of active nests that results in mortality of migratory birds either

directly or through nest abandonment would violate the California Fish and Game Code Sections 3503 and 3503.5 and the Migratory Bird Treaty Act.

Operation

Sites Reservoir would be a new physical barrier for wildlife movement through the study area. Because the length of the reservoir would be nearly 13 miles from north to south and up to 4 miles from west to east, wildlife moving through the area would need to travel a greater distance around the reservoir to reach the other side. The reservoir would be constructed within several existing natural landscape blocks and essential connectivity areas identified in the California Essential Habitat Connectivity Project maps. Other facilities under Alternatives 1 and 3 would also fragment existing habitat blocks and linkages used by wildlife, which could impede or prevent use of these corridors.

Maintenance activities required for operation of Alternative 1 or 3 could result in wildlife being struck by vehicles and equipment traveling along access roads during operation. The presence of new facilities, fencing, noise, and presence of humans could cause wildlife to avoid the facilities and modify their movement paths, which could result in increased energy expenditure or exposure to predation.

Recreation areas would be used by visitors on a regular basis, which would result in an increased human presence in these areas. The increased proximity of visitors to natural areas could cause wildlife to modify their movement patterns to avoid these areas. In addition, increased human activity could result in reduced use or avoidance of these areas by wildlife for breeding.

Safety nighttime lighting would be installed at the TRR East, Funks Reservoir, Sites Reservoir, bridge, dams, recreation areas, TC Canal intake, and the CBD outlet. Lighting could cause wildlife to avoid using areas illuminated by these new sources of light or modify movement pathways to avoid the lighted areas, which could result in increased energy expenditure or exposure to predation. The Authority will implement BMP-17 that requires permanent safety lighting to be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize potential impacts from new lighting on wildlife movement.

New roadways would create physical barriers or impediments for some wildlife, including amphibians and reptiles, which may have a difficult time crossing the roadways. There are numerous waterways and wetlands in the study area, and new or larger roadways could disrupt existing connections between aquatic and upland habitats, and result in increased habitat fragmentation, which could affect seasonal movements of amphibians and reptiles. Roadways may deter some larger animals from moving through those areas, even if they are able to physically cross the roadways. In addition, some of the roadways may be fenced, which would create a greater impediment to large animals attempting to cross the road. New roadways would also increase the potential for wildlife to be struck by vehicles of workers traveling to operations facilities or visitors traveling to recreation areas, and the presence of fences could trap animals in the roadway and make them more prone to being struck by vehicles.

Maintenance activities and human activity at recreation areas could result in disturbance of

active bird nests and bat roosting sites if the activities or disturbance are conducted during a sensitive period in the nesting process (e.g., when fledglings are just learning to fly) or are close to nests or roost sites. The Authority would implement the Recreation Management Plan (Section 2D.8), which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into habitat. New lighting could deter birds from nesting in areas that are illuminated by these new sources of light. Implementation of BMP-17 would minimize potential impacts from new lighting on nesting sites.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 1 or 3 would create barriers to or impede wildlife movement within existing natural landscape blocks and essential connectivity areas. Fragmentation and loss of natural landscape blocks and essential connectivity areas would result in a significant impact on wildlife movement and wildlife corridors. Construction of Alternative 1 or 3 would also result in removal or disturbance of nursery sites. Operation of Alternative 1 or 3 would result in additional vehicles on roadways and fencing that would create barriers to or impede wildlife movement. These impediments would also result in a significant impact on wildlife movement. Maintenance activities and human activity at facilities and recreation areas could cause disturbance of breeding sites or cause wildlife to avoid these areas as breeding sites. Implementation of mitigation measures discussed in Impact WILD-1 would reduce construction and operation impacts on nursery sites, wildlife movement, and the loss of habitat connectivity within existing habitat blocks, but they would not mitigate the substantial barrier created by Sites Reservoir. Impacts on wildlife movement and habitat connectivity after mitigation would remain significant and unavoidable.

NEPA Conclusion

Construction and operation effects on wildlife movement would be the same as described above for CEQA. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on wildlife movement and habitat connectivity as compared to the No Project Alternative due to the creation of barriers to, or impeding wildlife movement within, existing natural landscape blocks and essential connectivity areas. Implementation of mitigation measures discussed in Impact WILD-1 would reduce construction and operation impacts on nursery sites, wildlife movement, and habitat connectivity; however, they would not fully reduce effects associated with the movement barrier created by Sites Reservoir. Construction and operation of Alternative 1 or 3 would result in a substantial adverse effect on wildlife movement and habitat connectivity before and after mitigation.

Alternative 2

Construction

Construction of Alternative 2 would create barriers to or impede wildlife movement within existing habitat blocks and linkages and would remove or disturb nursery sites. Construction of Alternative 2 would result in similar impacts to Alternatives 1 and 3, except that Alternative 2 would include the construction of South Road, TRR West, and the Sacramento River discharge, which would increase the extent of construction noise and activities that could disrupt or impede wildlife movement. Wildlife may adjust their typical foraging, migration and/or dispersal

movements to avoid construction areas. These adjustments could result in increased energy expenditure or exposure to predation.

Operation

Operation of Alternative 2 would result in impacts similar to those for Alternative 1 or 3, except that the reservoir would be a smaller barrier to movement (yet still a barrier) and South Road would be a potential impediment to wildlife movement over a larger area and additional wildlife trying to cross a longer segment of road could be struck by vehicles.

CEQA Significance Determination and Mitigation Measures

Construction of Alternative 2 would create barriers to or impede wildlife movement within existing natural landscape blocks and essential connectivity areas. Under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Fragmentation and loss of natural landscape blocks and essential connectivity areas would result in a significant impact on wildlife movement and wildlife corridors. Construction of Alternative 2 would also result in removal or disturbance of nursery sites. Operation of Alternative 2 would result in additional vehicles on roadways and fencing that would create barriers to or impede wildlife movement. These impediments would also result in a significant impact on wildlife movement. Maintenance activities and human activity at facilities and recreation areas could cause disturbance of breeding sites or cause wildlife to avoid these areas as breeding sites. Implementation of mitigation measures discussed in Impact WILD-1 would reduce construction and operation impacts on nursery sites, wildlife movement, and the loss of natural landscape blocks and essential connectivity areas, but they would not mitigate the substantial barrier created by Sites Reservoir. Impacts on wildlife movement and habitat connectivity after mitigation would remain significant and unavoidable.

NEPA Conclusion

Construction and operation effects on wildlife movement would be the same as described above for CEQA. Construction and operation of Alternative 2 would result in a substantial adverse effect on wildlife movement and habitat connectivity as compared to the No Project Alternative due to the creation of barriers to, or impeding wildlife movement within, existing natural landscape blocks and essential connectivity areas. Effects under Alternative 2 would be similar to those described for Alternatives 1 and 3. However, under Alternative 2, the length of new roadway would be substantially longer (more than 10 miles) than under Alternatives 1 and 3. Implementation of mitigation measures discussed in Impact WILD-1 would reduce construction and operation effects on nursery sites, wildlife movement, and habitat connectivity, but they would not fully reduce effects associated with the movement barrier created by Sites Reservoir. Construction and operation of Alternative 2 would result in a substantial adverse effect on wildlife movement and habitat connectivity before and after mitigation.

Impact WILD-3: Conflict with any local policies or ordinances protecting wildlife resources

Local policies and ordinances protecting wildlife resources that could pertain to the Project are described in Appendix 4A, Section 4A.6.3, *Local/Regional Policies and Regulations*.

No Project

Under the No Project Alternative, new Project facilities would not be constructed or operated and there would be no temporary or permanent impacts on wildlife resources that would potentially conflict with the goals and policies of the applicable county general plans for the protection of wildlife resources. In addition, under the No Project Alternative the operations of the existing facilities, such as TC Canal, RBPP, and GCID Main Canal, would continue. The owner/operators of these facilities would operate within the conditions and requirements of existing permits and agreements in accordance with local policies or ordinances. Finally, activities that currently occur within the study area such as grazing or other rural agricultural activities would continue and would do so in the context of existing regulations, including local policies or ordinances, and activities.

Significance Determination

The No Project Alternative would not conflict with any local policies or ordinances protecting wildlife resources. There would be no impact/no effect.

Alternatives 1, 2, and 3

Construction

As discussed under Impacts WILD-1 and WILD-2, construction of Alternative 1, 2, or 3 could result in impacts on wildlife resources, which are protected under the Tehama County, Glenn County, Colusa County, and/or Yolo County General Plans. In Tehama County, work at the RBPP would not result in any impacts on wildlife resources. In Glenn County, construction of the GCID Main Canal diversion and GCID Canal improvements would result in permanent and temporary impacts on special-status wildlife species and their habitats. In Colusa County, construction of the TRR East, TRR/Funks pipelines, TRR West (Alternative 2), Funks Reservoir, Sites Reservoir and related facilities, and roadways would result in permanent and temporary impacts on special-status wildlife species, their habitats, habitat linkages, and wildlife corridors. In Yolo County, construction of the Dunnigan Pipeline, TC Canal intake, CBD outlet, and the Sacramento River discharge (Alternative 2) would result in permanent and temporary impacts on special-status wildlife species and their habitats.

Operation

As discussed under Impacts WILD-1 and WILD-2, operation of Alternative 1, 2, or 3 could result in impacts on special-status wildlife species during facility maintenance. In addition, lighting would be installed at several locations that could affect foraging and breeding activities and wildlife movements. Human activity at recreation areas could result in disturbance of breeding or foraging activities and wildlife movement. The reservoir would create a physical barrier to terrestrial wildlife movement and new roadways could impede movement and result in additional vehicle strikes.

In Tehama County, operation of the RBPP would not result in any impacts on special-status wildlife species. In Glenn County, operation of the GCID Main Canal diversion and GCID Canal improvements could result in periodic impacts on special-status wildlife during maintenance activities, but these impacts would mostly be temporary and short term. In Colusa County,

operation of the TRR East, TRR East/Funks pipelines, TRR West (Alternative 2), Funks Reservoir, Sites Reservoir and related facilities, recreation areas, and roadways would result in impacts on special-status wildlife species, their habitats, habitat linkages, and wildlife corridors. In Yolo County, operation of the Dunnigan Pipeline, TC Canal intake, CBD outlet, and the Sacramento River discharge (Alternative 2) could cause periodic impacts related to maintenance activities but impacts from maintenance activities would mostly be temporary and short term. The Authority would implement the LMP, which will include measures and practices to avoid or minimize operations and maintenance impacts on special-status wildlife. The Authority would implement the Recreation Management Plan (Section 2D.8), which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into habitat. The Authority would implement BMP-17 for permanent lighting that specifies that safety lighting will be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize potential impacts from new lighting on wildlife breeding and foraging activities.

Stone Corral and Funks Creeks, which may provide habitat for special-status wildlife, would have increased flows that would range from 0 to 100 cfs, with larger pulse flows to emulate natural flood conditions, and lower flows in the drier months (e.g., summer). A Flow Characterization and Geomorphic Study (Section 2D.4.3) would be conducted to determine appropriate discharges in these streams, including the appropriate timing of the releases. These flow increases would support the existing geomorphic functions and characteristics of each channel. While increased flows from bypass releases may result in minor increases in erosion and changes in sediment deposition, the changes are expected to be minimal and there would be no impacts on special-status wildlife or habitats associated with the creeks.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle, operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of less than 6% to a decrease of less than 5% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect habitat along the river.

CEQA Significance Determination and Mitigation Measures

Construction and operation of Alternative 1, 2, or 3 would conflict with policies and local ordinances protecting wildlife resources and would result in a significant impact. Implementation of mitigation measures discussed under Impacts WILD-1 would require habitat assessments and focused surveys for special-status wildlife, avoidance and minimization measures to reduce impacts on special-status wildlife and their habitats during construction and operation, replacement of permanently lost habitat, and reduction of new impediments to wildlife movement through design, construction, monitoring, and the maintenance of wildlife crossings at strategic locations. With the implementation of these measures, Alternatives 1, 2, and 3 would not conflict with the goals and policies in the Tehama County, Glenn County, Colusa County, and Yolo County General Plans, and impacts would be reduced to a less-than-significant level.

NEPA Conclusion

Construction and operation effects related to conflicts with policies and local ordinances protecting wildlife resources would be the same as described above for CEQA. Construction and operation of Alternatives 1, 2, and 3 would result in a substantial adverse effect on local policies and ordinances protecting wildlife resources as compared to the No Project Alternative. Through implementation of mitigation measures discussed under Impacts WILD-1, effects would be reduced to no adverse effect.

Impact WILD-4: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan

The adopted plans that pertain to the study area are Yolo County Habitat Conservation Plan/Natural Community Conservation Plan (Yolo County HCP/NCCP) (Yolo Habitat Conservancy 2018) and the Yolo Bypass Wildlife Area Land Management Plan (Yolo Bypass Wildlife Area LMP) (California Department of Fish and Game 2008). These plans are described in Appendix 4A, Section 4A.6.3, *Local/Regional Policies and Regulations*. The Project facilities in the planning areas for these plans are the Dunnigan Pipeline, TC Canal intake, CBD outlet (Alternatives 1 and 3), and the Sacramento River discharge (Alternative 2). All facilities are in Yolo County, and the Yolo Bypass is within the operations study area.

No Project

Under the No Project Alternative, no new Project facilities would be constructed or operated and there would be no temporary or permanent impacts on wildlife resources that would potentially conflict with the provisions of an adopted or approved local, state, or regional habitat conservation plan. Existing facilities, such as the TC Canal or GCID Main Canal, are not located within an adopted Habitat Conservation Plan or Natural Community Conservation Plan and therefore have no ability to conflict.

Significance Determination

The No Project Alternative would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. There would be no impact/no effect.

Alternatives 1, 2, and 3

Construction

As discussed under Impacts WILD-1, WILD-2, and WILD-3, construction of the Dunnigan Pipeline, CBD outlet, and the Sacramento River discharge (Alternative 2) would result in impacts on special-status species, including valley elderberry longhorn beetle, western pond turtle, giant gartersnake, Swainson's hawk, white-tailed kite, burrowing owl, bank swallow, and tricolored blackbird and their habitats. These special-status species are covered species in the Yolo County HCP/NCCP. There would be no construction in the Yolo Bypass area.

Operation

As discussed under Impacts WILD-1, WILD-2, and WILD-3, operation of Alternative 1, 2, or 3 could result in impacts on species covered in the Yolo County HCP/NCCP (valley elderberry longhorn beetle, western pond turtle, giant gartersnake, Swainson's hawk, white-tailed kite, burrowing owl, bank swallow, and tricolored blackbird and their habitats) during facility maintenance, including maintenance of the Dunnigan Pipeline, CBD outlet, and the Sacramento River discharge. Operational impacts associated with maintenance would mostly be temporary and short term. Implementation of the LMP would reduce potential operations and maintenance impacts on species covered in the Yolo County HCP/NCCP. Human activity at recreation areas could cause disturbance of elderberry longhorn beetle, western pond turtle, Swainson's hawk, white-tailed kite, burrowing owl, and tricolored blackbird or their habitats. The Authority would implement the Recreation Management Plan (Section 2D.8), which will require signs, fencing in strategic areas, or other deterrents to avoid or minimize human intrusion into habitat. In addition, lighting would be installed at the TC Canal intake and the CBD outlet, which could reduce the potential for some wildlife species to use existing habitat in these areas. The Authority would implement BMP-17 that requires that permanent safety lighting be shielded to minimize offsite light spill and glare and be screened and directed away from adjacent uses to the highest degree possible. This BMP would minimize the operational impacts of new lighting on species covered by the Yolo County HCP/NCCP.

Potential impacts on the Sacramento River, Yolo Bypass, and Delta as a result of diversions from and flow releases to the Sacramento River as a result of operation of Alternatives 1 and 3 are discussed in Chapters 5 and 7. As discussed above for valley elderberry longhorn beetle, operation of Sites Reservoir (flow releases) would not have substantial effects on the Sacramento River downstream of the release locations. Based on CALSIM II modeling, the percent change in maximum monthly average flow (in January, February, or April) in the Sacramento River would be a less than 0.4% increase to a less than 2.5% decrease under Alternative 1 or 3 when compared to the No Project Alternative (Table 5-34). The differences (primarily reductions) in monthly average flow exceeded 10% of the time (in February or June) between the No Project Alternative and Alternatives 1 and 3 (based on the USRDOM modeled flood flows) at various Sacramento River locations are shown in Table 7-3. Except for the Red Bluff Diversion, these values show an increase of 1% to a decrease of less than 6% when compared to No Project Alternative, depending on the location (Table 7-4). These percent differences are minor when considered in the context of the larger system and consequently, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient,

substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal. The overall volume of water in the Sacramento River under Alternative 1 or 3 would generally be similar to the amount of water in the river under baseline conditions. The minor changes that would result from diversions from and releases to the Sacramento River would not affect habitat along the river for species covered in the Yolo County HCP/NCCP.

Based on observations during North Delta Flow Actions (Davis pers. comm.), the comparable August–October habitat flows from Sites Reservoir through the Yolo Bypass may cause limited inundation of low-elevation parcels in the upper Yolo Bypass (north of the I-80 causeway). The intent of the releases from Sites Reservoir to the Yolo Bypass during this period is to temporally and spatially distribute food resources for fish species. If the water inundates floodplain areas (i.e., areas outside existing channels) the food would be deposited and would fail to move into the Delta. As such, Sites Reservoir would be operated to maintain flows within the existing Toe Drain, Tule Canal, and other channels, and adjustments in operations would be coordinated between the Authority and parcel owners using the existing Yolo Bypass monitoring network. As a result, impacts on habitat in the Yolo Bypass for species covered in the Yolo County HCP/NCCP are not anticipated.

CEQA Significance Determination and Mitigation Measures

Construction and operation of Alternative 1, 2, or 3 would not conflict with provisions of the Yolo Bypass Wildlife Area LMP but would conflict with provisions of the Yolo County HCP/NCCP. The conflict of Alternatives 1, 2, and 3 with the provisions of the Yolo County HCP/NCCP would be a significant impact. Implementation of mitigation measures discussed under Impact WILD-1 would avoid, minimize, and compensate for impacts on special-status wildlife included in the Yolo County HCP/NCCP. With implementation of these measures, Alternatives 1, 2, and 3 would not conflict with the provisions of the Yolo County HCP/NCCP, and impacts would be reduced to a less-than-significant level.

NEPA Conclusion

Construction and operation effects related to conflicts the Yolo County HCP/NCCP and the Yolo Bypass Wildlife Area LMP would be the same as described above for CEQA. Construction and operation of Alternative 1, 2, or 3 would not conflict with provisions of the Yolo Bypass Wildlife Area LMP but would conflict with provisions of the Yolo County HCP/NCCP as compared to the No Project Alternative. Alternatives 1, 2, and 3 would result in a substantial adverse effect from conflicting with provisions of the Yolo County HCP/NCCP, but through implementation of mitigation measures under Impact WILD-1, effects would be reduced to no adverse effect.

10.5 References

10.5.1. Printed References

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10.5.2. Personal Communications

Davis, Brittany E. Environmental Program Manager. California Department of Water Resources. July 6, 2021—Email to John Spranza, Senior Ecologist/Regulatory Specialist, HDR, Sacramento, CA, and Mallory Bedwell, California Department of Water Resources.