Appendix L – Wildlife Technical Report

WILDLIFE TECHNICAL REPORT

INCLUDING BIOLOGICAL EVALUATION FOR SENSITIVE WILDLIFE SPECIES AND ANALYSIS FOR ENDANGERED SPECIES ACT LISTED WILDLIFE SPECIES

TRINITY RIVER WATERSHED RESTORATION PROJECT

CGB-ED-2025-034

DOI-BLM-CA-N060-2025-0010-EA

PROJECT #63121 (FOREST SERVICE)

MAY 2025

Prepared by: **Jacqueline White, Wildlife Biologist, Ironwood Consulting Inc.**
Reviewed by: **Carla De Juilio, Wildlife Biologist, U.S. Forest Service**

Project Proponent and Federal Lead Agency:
U.S. Department of the Interior, Bureau of Reclamation

Federal Cooperating Agencies:
U.S. Department of the Interior, Bureau of Land Management
U.S. Department of Agriculture, Forest Service

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ACS	Aquatic Conservation Strategy
ACU	Adaptive capacity unit
AGOS	American goshawk
BiOp	Biological Opinion
BLM	U.S. Bureau of Land Management
BMPs	best management practices
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act

CFR	Code of Federal Regulations
CMs	conservation measures
CNDDB	California Natural Diversity Database
dB	Decibels
DPS	Distinct Population Segment
EA	Environmental Assessment
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FYLF	foothill yellow-legged frog
GPM	General Protection Measure
HUC	Hydrologic Unit Code
LTPBR	low-tech process-based restoration
MMs	Minimization Measures
NMFS	National Marine Fisheries Service
NRIS	Natural Resource Information System
NSO	Northern spotted owl
NWPT	Northwestern Pond turtle
Project	Trinity River Watershed Restoration Project
Reclamation	Bureau of Reclamation
RWQCB	Regional Water Quality Control Board
SLJ	structured log jam
SR	seasonal restriction
STNF	Shasta-Trinity National Forest
TMDL	total maximum daily load
TRRP	Trinity River Restoration Program
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

1 Executive Summary

This Wildlife Technical Report analyzes the effects of restoration activities proposed to be implemented in the Trinity River Watershed, on U.S. Forest Service (USFS) sensitive species, Bureau of Land Management (BLM) sensitive species, and federal and state Endangered Species Act- (ESA-) listed species with the potential to occur within the watershed. Table 1-1 summarizes effect determinations for sensitive wildlife species analyzed in detail in this technical report. ESA-listed species affect determinations are outlined in Table 1-2. For the species with suitable habitat or known occurrences within or near the project area, the tables also summarize conservation measures (CMs) and minimization measures (MMs) that reduce the potential impacts of proposed activities. Species outside of the project range or with no suitable habitat and marked as low or moderate potential to occur in Table 3-1 are not analyzed in detail because the Project would have no effect on them.

Table 1-1. Summary of Effects to Special Status Wildlife Species[1]

Species	Effects Summary	Conservation Measures/Minimization Measures[2]
American goshawk *Accipiter atricapillus*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. AGBE-1 – AGBE-5
Golden Eagle *Aquila chrysaetos*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. AGBE-1 – AGBE-5
Bald eagle *Haliaeetus leucocephalus*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. AGBE-1 – AGBE-5
Pallid bat *Antrozous pallidus*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. BAT-1 – BAT-5
Fringed myotis *Myotis thysanodes*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. BAT-1 – BAT-5
Townsend's big-eared bat *Corynorhinus townsendii*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. BAT-1 – BAT-5
Pacific/American marten *Martes caurina*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. MRCF-1 – MRCF-2
Fisher *Pekania pennanti*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. MRCF-1 – MRCF-2

Species	Effects Summary	Conservation Measures/Minimization Measures[2]
Ringtail cat *Bassariscus astutus*	**Minor**: Effects would be detectable but would be small and localized.	USFWS Statewide Restoration BiOp conservation measures for NSO[3]. MRCF-1 – MRCF-2
California Mountain Kingsnake *Lampropeltis zonata*	**Minor**: Effects would be detectable but would be small and localized.	WPT-1 – WPT-7
Foothill yellow-legged frog *Rana boylii* North Coast DPS (pop. 1*)*	**Minor**: Effects would be detectable but would be small and localized.	FYLF-4 – FYLF-7 USFWS Statewide Restoration BiOp conservation measures AMPs and FYLF-1 through FYLF-3.[4]
Cascades Frog *Rana Cascades*	**Minor**: Effects would be detectable but would be small and localized.	FYLF-4 – FYLF-7 USFWS Statewide Restoration BiOp conservation measures AMPs and FYLF-1 through FYLF-3.[4]
Coastal giant salamander *Dicamptodon tenebrosus*	**Minor**: Effects would be detectable but would be small and localized.	FYLF-4 – FYLF-7 USFWS Statewide Restoration BiOp conservation measures AMPs and FYLF-1 through FYLF-3.[4]
Big Bar Hesperian snail *Vespericola pressleyi*	**Minor**: Effects would be detectable but would be small and localized.	INV-1 – INV-2
Trinity bristlesnail *Monadenia infumata setosa*	**Minor**: Effects would be detectable but would be small and localized.	INV-1 – INV-2
Western bumble bee *Bombus occidentalis*	**Minor**: Effects would be detectable but would be small and localized.	INV-2 – INV-3 No use of herbicides or pesticides during project activities.

1. Occurrence data pulled from IPaC Information and Planning (USFWS 2024a), California Natural Diversity Database (CNDDB) (CDFW 2024d), and the Natural Resource Information System (NRIS) (USFS 2024a).
2. See Appendix B of the EA for detailed information on all GPMs, CMs, MMs, and design guidelines.
3. Northern spotted owl (NSO) conservation measures are applied to multiple species due to the nature of overlapping habitat. This is described further in Section 5.
4. AMPs and FYLF-1 through FYLF-3 would only be implemented if the North Coast DPS becomes an ESA-listed species within the lifespan of the EA and project implementation.

Table 1-2. Summary of Effects to ESA-listed Species[1]

Species and Listing Status	Effects Summary[2,3]	Conservation Measures/Minimization Measures
Northern spotted owl *Strix occidentalis caurina* ESA and CESA Threatened	The Project may affect, is likely to adversely affect northern spotted owls and designated critical habitat.	USFWS Statewide Restoration BiOp conservation measures NSO-1 through NSO-8.
Northwestern pond turtle *Actinemys marmorata* ESA Proposed Threatened	The Project may affect, is likely to adversely affect Northwestern pond turtles because many of the proposed activities would occur in suitable habitat.	WPT-1 – WPT-7 USFWS Statewide Restoration BiOp for NWPTs.
Monarch butterfly *Danaus Plexippus* ESA Proposed Threatened	The Project may affect, is likely to adversely affect western monarch butterflies because many of the proposed activities would occur in suitable habitat.	INV-2 – INV-3 No use of herbicides or pesticides during project activities.

1. Occurrence data pulled from IPaC Information and Planning (USFWS 2024a), CNDDB (CDFW 2024d), and the NRIS (USFS 2024a).
2. Effects to federal ESA-listed species would be determined during the site-specific restoration project analysis. In alignment with the 2025 USFWS Statewide Restoration Biological Opinion (BiOp), the goal for each site-specific restoration project is to have only discountable adverse effects to federal ESA-listed species and their critical habitat through implementation of relevant environmental commitments (Appendix B) and/or offsetting habitat restoration or enhancement as part of the site-specific project design and within the project footprint, when feasible.
3. Effect determinations for federal ESA-listed species included in the analysis below are at the Project-level and reflect those included in the 2025 USFWS Statewide Restoration BiOp. If either proposed species is listed as threatened during the implementation of the Project, the effect determination language would be updated to match those in the most current USFWS Statewide Restoration BiOp.

2 Proposed Action

The Trinity River Restoration Program (TRRP) was established to restore the fisheries of the Trinity River affected by dam construction and related diversions of the Trinity River Division of the Central Valley Project. Administered by the Bureau of Reclamation (Reclamation), TRRP is a partnership of federal and state resource agencies, Tribes, and Trinity County. TRRP works to restore the processes and attributes of a properly functioning river and watershed to support the recovery of diminished salmon and steelhead populations while retaining the Trinity and Lewiston dams' delivery of water and power to the Trinity River and California's Central Valley.

The purpose of the Trinity River Watershed Restoration Project (the Project), of which TRRP is the lead federal agency and USFS and BLM are cooperating agencies, is to improve instream and riparian habitat at a watershed-scale and to accelerate the recovery of north coast salmon populations (coho salmon, steelhead, and Chinook salmon), thereby fulfilling tribal trust responsibilities and obligations to local communities as well as recreational and commercial fishing industries (per the Shasta-Trinity National Forest Land and Resource Management Plan and state and federal recovery plan goals [NMFS 2014, CDFG 2004]).

The following describes the objectives of the Proposed Action:

- Restore and improve instream conditions sufficient to support all life stages of salmonids and other aquatic species;
- Restore upstream and downstream fish passage for all life stages of salmonids;
- Restore continuous paths for wood dispersal, nutrient cycling, sediment transport, and movement of other vegetative material essential for productive aquatic habitat;
- Maintain or restore native plant communities and vegetative structure impacted by invasive plants and pathogens, while rehabilitating eroding streambanks to improve water quality, shade conditions, and large wood recruitment;
- Repair, replace, or remove ineffective instream structures;
- Restore and improve riparian and meadow habitat in order to promote healthy conditions for aquatic and terrestrial wildlife populations;
- Improve late summer/fall base flow conditions through process-based restoration, water conservation improvements, and meadow restoration;
- Increase nutrient inputs through salmon carcass placement in the watershed; and
- Stabilize upslope areas around road infrastructure to minimize erosion and sediment discharges within the watershed to bring the sediment impaired watersheds into compliance with sediment reduction total maximum daily loads (TMDLs) for the South Fork Trinity and Trinity Mainstem rivers (EPA 1998 & EPA 2001).

The Proposed Action consists of a suite of instream and riparian restoration activities that are designed to meet the objectives described above. Detailed descriptions of each of the proposed activities are included in chapter 4 of the Project's Environmental Assessment (EA) document. Proposed Activities are grouped into three general categories: instream habitat restoration; upslope habitat restoration; and road maintenance, rehabilitation, and decommissioning activities. The activities proposed under each of these categories are summarized below:

Instream Habitat Restoration

1. Restoration and Enhancement of In-Channel Habitat
2. Floodplain Restoration
3. Removal or Retrofitting of Fish Passage Barriers, Small Dams, Flood Gates, Pilings and Other In-Water Structures
4. Water Conservation Projects
5. Salmon Carcass Placement
6. Remote Site Incubators

Upslope Habitat Restoration

7. Bioengineered Bank Stabilization
8. Aquatic, Wetland, Riparian, and Upslope Habitat Enhancement Including Removal of Nonnative Invasive Species and Revegetation with Native Plants

Road Maintenance, Rehabilitation, and Decommissioning Activities

9. Road Maintenance
10. Road Rehabilitation
11. Road Decommissioning

The removal of nonnative wildlife species would occur opportunistically during project implementation. However, this project does not encompass design criteria for the removal of nonnative wildlife. If bullfrogs, nonnative snails, or any other species known as invasive to Trinity County are encountered during project activities, they would not be salvaged and would be removed opportunistically.

2.1 Project Location and Timing

The proposed activities would occur within a portion of the Trinity River basin (Figure 2-1). Individual restoration actions would take place in the Shasta-Trinity National Forest along the tributaries to the Mainstem Trinity River and within the Mainstem Trinity River (both above and below the Lewiston and Trinity dams) on both private (with permission of the landowner) and public lands (primarily USFS- and BLM-managed). Key Watersheds within the restoration activity area include North Fork Trinity River, South Fork Trinity River, Canyon Creek, and New River. The analysis at the watershed-scale is performed for each of the hydrological unit code 10 (HUC 10) watersheds. Table 2-1 presents watersheds included within the Project activity area.

Table 2-1. Sub-Watersheds within the Trinity River Basin

Subregion (HUC 4)	Basin (HUC 6)	Subbasin (HUC 8)	Watershed (HUC 10)	HUC 10 Number	Acres in Project Activity Area
Klamath-Northern California Coastal 1801	Northern California Coastal 180102	Trinity California 18010211	Big French Creek-Trinity River[1]	1801021111	153,325
			Browns Creek	1801021106	47,110
			Canyon Creek	1801021108	41,033
			Coffee Creek	1801021101	74,835
			East Fork Trinity River	1801021103	74,335
			Horse Linto Creek-Trinity River[2]	1801021112	0
			New River	1801021110	149,597
			North Fork Trinity River	1801021109	97,483
			Stuart Fork	1801021104	88,264
			Swift Creek-Trinity River	1801021105	121,055
			Tangle Blue Creek-Trinity River	1801021102	101,393
			Weaver Creek	1801021107	142,030
		South Fork Trinity 18010212	Lower South Fork Trinity River[3]	1801021205	44,229
			Lower Hayfork Creek	1801021203	142,161
			Upper Hayfork Creek	1801021202	105,697
			Middle South Fork Trinity River	1801021204	145,776
			Upper South Fork Trinity River	1801021201	73,634

1. A portion of Big French Creek is excluded from the Project activity area, namely the Sharber Creek HUC 12 subwatershed, because it is in the Six Rivers National Forest.
2. Horse Linto Creek is located in the Six Rivers National Forest and is not included in the Project activity area and therefore is not analyzed further.
3. A portion of Lower South Fork Trinity River is excluded from the Project activity area, namely Grouse, Mingo, and Old Campbell creeks (HUC 12 subwatersheds), because they are located in the Six Rivers National Forest.

General Protection Measures (GPMs), design guidelines, and CMs have been developed for proposed activities to avoid and minimize effects to fish, freshwater mussels, and terrestrial and aquatic wildlife species. These would be incorporated into the planning, design, and implementation phases of each site-specific project. These have been developed as part of the Project's Endangered Species Act (ESA) Section 7 consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) and collaborative Project planning efforts by TRRP, USFS, and BLM. A detailed list of all GPMs, design guidelines, and CMs by resource is included in Appendix B of the EA.

Project activities within any wetted or flowing channel of the Trinity River below the Trinity and Lewiston dams shall be restricted to the dry season (June 15 to October 15 for tributaries and July 15 to October 15 for the mainstem) before coho begin spawning in tributaries. Revegetation outside of the active channel is typically implemented during the wet season, between October and April. Work in intermittent streams may continue beyond November 1, as long as weather conditions permit, and the stream channel remains dry. Construction and restoration work within intermittent stream channels must be completed before cumulative seasonal rainfall is sufficient to result in surface flow within the channel.

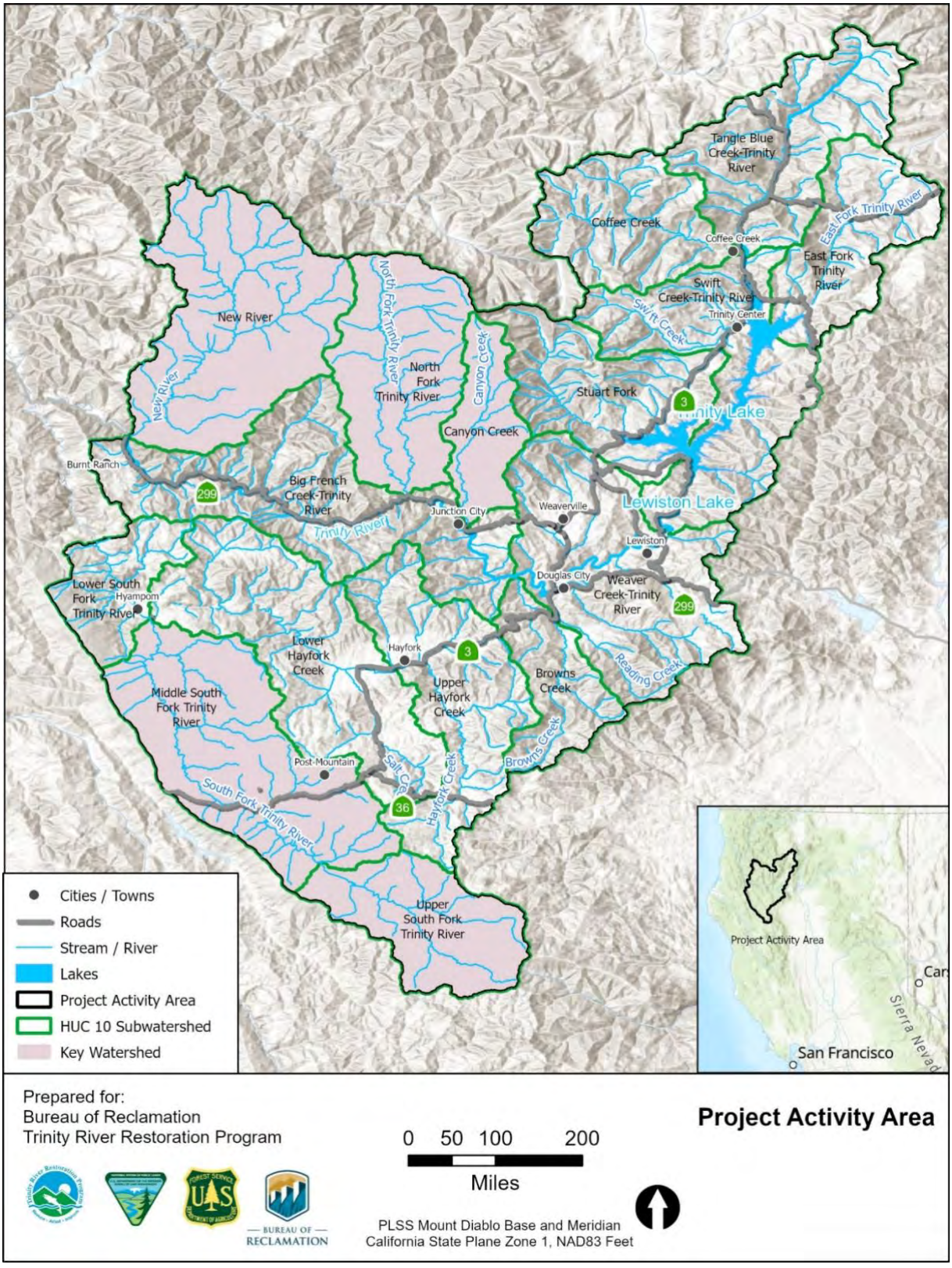

Figure 2-1. Project activity area map.

2.2 Wildlife Avoidance and Minimization

GPMs, CMs, MMs, and design guidelines were developed for the Project to avoid and minimize effects to special status species and other environmental resources. The 2020 NMFS Biological Opinion (NMFS BiOp, NMFS No. WCRO-2019-03827) specifies a suite of GPMs and CMs related to instream construction, water quality, riparian vegetation, and research and fish capture intended to protect federal ESA-listed fish species. The NMFS BiOp is anticipated to undergo reinitiation to better address the suite of activities that are part of the Proposed Action. Also, in 2020 as part of the ESA Section 7 consultation, a partial concurrence letter from USFWS (AFWO-19B0031-20I0203) was provided to TRRP stating an NLAA determination for three wildlife species and their critical habitat (northern spotted owl, marbled murrelet, and gray wolf). However, in 2022 the USFWS California Statewide Programmatic Restoration Effort BiOp (USFWS Statewide Restoration BiOp, FWS Ref. 2022-0005149-S7) was issued. The Statewide BiOp provides ESA coverage for federal ESA-listed wildlife species for restoration activities overlapping with those of the Proposed Action. This BiOp was reinitiated on February 7, 2025, and now includes Reclamation as an Action Agency and ESA coverage for northwestern pond turtle. The USFWS Statewide Restoration BiOp also provides a suite of GPMs, CMs, and design guidelines specific to wildlife species and these are discussed below and included in Appendix B of the EA. These are discussed below and would be incorporated into each individual restoration effort during the planning, design, implementation, post-construction, and monitoring phases. Applicable CMs and MMs are discussed in the context of each special status species in Section 5.

2.2.1 Limits on Proposed Activities Frequency and Location

Due to the large-scale nature of the Project, there are concerns about the potential for physical changes to the environment as a result of implementation at the watershed scale. A key design guideline entails setting annual project limits on the number of projects, which would limit adverse effects to ESA-listed species.

The 2020 TRRP BiOp limits instream watershed restoration projects covered by the BiOp annually to:

- 2 fish passage/dam removal projects;
- 8 channel/floodplain rehabilitation projects (4 mainstem and 4 tributary);
- 2 in-stream habitat enhancement projects;
- 3 streambank stabilization projects; and
- 4 road-related projects with in-water activities (i.e. road decommissioning with culvert removal).

TRRP is in the process of reinitiating consultation with NMFS to include all project activity categories described in the Proposed Action that were not previously analyzed in the 2020 TRRP BiOp. Project limitations will also be reviewed during the reinitiated consultation and are anticipated to change. During meetings with NMFS in regard to the ESA Section 7 consultation for this Project, NMFS recommended setting Project limits to control sedimentation and turbidity that would adversely affect ESA-listed salmonids. Preliminarily, it is being proposed that in addition to utilizing GPMs and CMs, such as erosion and sediment control BMPs, effects of turbidity would be controlled by limiting the number of floodplain reconnection projects that are over 100 acres as well as small dam removals, to one site-specific restoration project (of these specific project types) per HUC-12 watershed, per year. However, the latest applicable BiOp should be referred to, to determine current Project limits during site-specific project implementation.

2.2.2 Wildlife Species Protection Measures

The USFWS Statewide Restoration BiOp and TRRP Master Environmental Impact Report (EIR) (RWQCB and Reclamation 2009) provide wildlife species protection measures that have been incorporated into the Project's CMs included in Appendix B of the EA. These CMs would be followed and implemented during Project restoration activities and include providing qualified biologists and guidance for conducting preconstruction surveys, species capture, handling and translocation, ESA-listed species entrapment prevention, and airborne noise reduction. A qualified biologist would complete a variety of tasks across species prior to and during construction activities. The qualified biologist would need to meet general qualifications including a Bachelor's degree, previous experience with similar habitat types and species, as well as prior construction monitoring experience. A USFWS-Approved Biologist may be required for species handling, relocation, or other activities.

Seasonal restrictions or preconstruction surveys would be implemented based on what species are determined to be present. Clearance surveys may be required for migratory bird species as well as reptile and amphibian species if potential habitat is present within or in proximity to site-specific restoration activity areas. See section 5, Environmental Consequences, for specific protection measures outlined for each species.

Airborne noise reduction would be implemented using noise abatement systems (e.g., mufflers or spark arrester) if there is potential for noise to adversely affect ESA-listed species during site-specific project implementation.

Site-specific protection measures for construction activities to reduce effects to ESA-listed species would be employed. For species-specific CM's provided by the USFWS Statewide Restoration BiOp, see species accounts in Section 5.

3 Methodology

Key considerations for the analysis of potential project effects include the presence of a species or suitable habitat in or near the Project activity area; the scope and nature of the proposed activities; and the potential for these activities to affect habitat suitability, habitat use, or species behavior. This wildlife technical report analyzes the potential for effects to wildlife species and associated habitat by analyzing effects to breeding, foraging, and sheltering activities as well as habitat suitability and population viability.

Wildlife data used in this technical report originate from species and habitat surveys; USFS and State wildlife records and databases, primarily the Natural Resource Information System (NRIS) database managed by USFS and the California Natural Diversity Database (CNDDB) managed by the California Department of Fish and Wildlife (CDFW); literature reviews; personal communications with USFS and BLM personnel; and local wildlife expertise.

3.1 Characterization of Habitat in the Project Activity Area

The Project activity area encompasses a total area of 1,601,525 acres that includes sixteen HUC 10 subwatersheds. Due to the large geographical size and broad scope of the Project, characterizing habitat at a subwatershed-scale provides insights into existing conditions at a smaller, more comprehensive, scale thereby

allowing for an accurate effects analysis. Within this technical report, five datasets were used to characterize habitat and therefore analyze potential effects on terrestrial wildlife species: land cover types, Riparian Reserves and Key Watersheds, northern spotted owl (NSO) Critical Habitat, historic wildfire impacts, and habitat connectivity and fragmentation.

Land cover types from the National Land Cover Database provided by the U.S. Geological Survey characterize landscapes at a broad scale for the conterminous U.S. and is incorporated into the technical report to analyze effects by providing the basic characteristics of the land within the Project activity area. Using land cover types as the basis for habitat characterization allows for a detailed analysis when linking other datasets such as habitat connectivity, habitat fragmentation, and wildfire impacts to demonstrate recent changes to the landscape and current environmental conditions that impact terrestrial wildlife species. Riparian Reserves and Key Watersheds are also used as an additional dataset to provide further characterization of riparian habitat and watersheds within the Project activity area. NSO critical habitat and recent wildfire impacts help determine the likelihood of species occurrences that rely on late seral-evergreen forests. See Section 4 for detailed information on the affected environment included in this technical report.

Based on the Project habitat characterization, special status species were analyzed with the potential to occur in each of the sixteen HUC 10 subwatersheds. Determining which wildlife species have the potential to occur at the HUC 10 level would inform the incorporation of appropriate BMPs, CMs, and design guidelines during the project planning, design, and implementation phases for future site-specific restoration activities.

3.2 Methods of Characterizing Effects

Specific to wildlife species, Project effects are associated with implementation of the Proposed Action as described in the EA and considers documented special status wildlife species presence and suitable habitat occurrence for each HUC 10 subwatershed. This analysis looks at short- and long-term effects to wildlife species and their associated habitats. Short-term effects to wildlife as a result of construction activities are commonly related to ground disturbance within the floodplains, disturbance to riparian vegetation, and airborne noise. Long-term effects are caused by the action and are later in time or farther removed in distance. Long-term effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

For the purposes of analysis for this project, the intensity of effects is described using the following terms:

- Negligible/No effect: Effects would not be measurable, with no perceptible consequences.
- Minor: Effects are detectable but are small and localized.
- Moderate: Effects are detectable, can be measured, and cover a larger area (e.g., a tributary stream).
- Major: Effects are easily measured, regional, and at the population-scale.

Effect analyses also consider avoidance and minimization measures that would either avoid causing a particular effect or minimize the effect's intensity. Effect analyses do not consider compensatory mitigation.

3.3 Species Analyzed in Detail

To determine what wildlife species needed to be analyzed for the Project, five special status groups were reviewed: Federal ESA-listed, California ESA-listed, USFS Sensitive, BLM Sensitive, and California Fully Protected species. Table 3-1 below displays those species with special statuses and with the potential to occur within the Project Activity Area according to the CNDDB, BLM sensitive species list provided by the Redding Field Office, USFS sensitive species list within Trinity County, and consultation with local expertise. Table 3-1 includes species and their legal status, potential and known occurrences within each HUC 10, habitat presence or absence and preferred habitat and range information. Species with low or moderate potential for occurrence are not analyzed further as no effects are anticipated for these species.

Table 3-1. Special Status Species with Potential to Occur within the Project Activity Area

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
American goshawk *Accipiter atricapillus*	BLM-S / USFS-S / SSC	High	Known occurrences within all HUC 10 units except Canyon Creek.	Yes	Occupies mature conifer and deciduous forests that are interspersed with meadows for hunting. Riparian areas are required for this species and nesting habitat includes, but is not limited to north-facing slopes near water. Goshawks nest in the densest parts of tree stands but close to forest openings. Occupies much of Northern California including Shasta, Trinity and Humboldt counties yearlong in the mid to higher elevation ranges.
Golden eagle *Aquila chrysaetos*	BLM-S / BGEPA / CFP / WL	High	Known occurrences within Big French Creek, Browns Creek, Canyon Creek, Coffee Creek, East Fork Trinity River, Lower South Fork Trinity River, Middle South Fork Trinity River, Lower Hayfork Creek, Stuart Fork, Swift Creek, Upper Hayfork Creek, and Weaver Creek	Yes	Occupies large trees, cliffs, and overhanging ledges. Open, rugged habitat with escarpments and canyons used for nesting and soars above ground for prey. Multiple nest sites are maintained, and previous nests are reused. Yearlong range throughout Shasta and Trinity Counties. More common in Central and Southern California

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Bald eagle *Haliaeetus leucocephalus*	SE / USFS-S / CFP / BGEPA	High	Year-round range and known occurrences. HUC 10 units: Big French Creek, East Fork Trinity River, Swift Creek, Stuart Fork, Lower South Fork Trinity River, Middle South Fork Trinity River, Lower Hayfork Creek, North Fork Trinity River, Tangle Blue Creek, Upper Hayfork Creek, Upper South Fork Trinity River, ad Weaver Creek.	Yes	Occupies lower montane coniferous forest and old growth forests. Perches in large, stoutly limbed trees, snags, and broken topped trees. Bald eagles require large bodies of water, or free flowing rivers with fish for hunting. They use live large trees for nesting, typically with open branching including ponderosa pines. Permanent resident in Shasta and Trinity counties with winter migrants. About half of the wintering population is in the Klamath Basin.
Bank swallow *Riparia riparia*	ST / BLM-S	Low	No known occurrences within Project activity area.	Potential suitable habitat	Requires cliffs and vertical banks near streams, rivers ponds, lakes, and the oceans. Grassland, shrubland, savannah, and open riparian areas are used for feeding. Digs holes in cliffs and riverbanks for cover. Found primarily in lowland and riparian habitats in California. Colonies persist in Northern California in Shasta County.
Northern spotted owl *Strix occidentalis caurina*	FT / ST	High	Year-round range Known occurrences within all HUC 10 units.	Yes Critical habitat present	Occurs in dense, multi-layered and old-growth mixed-conifer, redwood, and Douglas-fir habitats up to 7,545 feet in elevation. Roosts in dense, multi-layered canopies typically located near a water source. Uses tree cavities or broken topped trees as nest sites. Requires mature forests with permanent water source and suitable nesting trees or snags. Permanent resident in Northern California along the Sierra Nevada and Cascade Range.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Pallid bat *Antrozous pallidus*	BLM-S / SSC / USFS-S	Moderate	Year-round range with known occurrences in Project activity area. HUC 10 unit: Canyon Creek, New River, Upper Hayfork Creek, Upper South Fork Trinity River, and Weaver Creek.	Yes	Occupies a variety of habitats including grasslands, shrublands, woodlands, and forests. More common in open, dry habitats with rocky areas. Roosts in caves, crevices, mines and hollow trees and buildings that protect species from high temperatures. Forages in open habitats. Occurs in the low elevations of California throughout the state.
Ringtail *Bassariscus astutus raptor*	CDFW FP	High	Year-round range with known occurrences. HUC 10 unit: Big French Creek, Lower Hayfork Creek, Middle South Fork Trinity River, Stuart Fork, Swift Creek Trinity River, Upper Hayfork Creek, and Weaver Creek.	Yes	Occurs in riparian habitats and in brush stands of most forest and shrub habitats, and at low to middle elevations. Species uses hollow trees, logs, snags, and cavities in rocky area for cover and nesting. Usually found close to water sources (within 1 km). Distribution and relative abundance is not well known.
Fringed myotis *Myotis thysanodes*	BLM-S / USFS-S	High	Year-round range with known occurrences. HUC 10 unit: Canyon Creek, Lower South Fork Trinity River, Middle South Fork Trinity River, North Fork Trinity River, and Upper Hayfork Creek.	Yes	Occupies pinyon-juniper, valley foothill hardwood and hardwood-conifer up to 9,350 feet in elevation. Roosts in caves, mines, buildings, and crevices and uses open habitats, streams, lakes, and ponds for foraging. Widespread throughout California except the Central Valley and Colorado and Mojave Deserts.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Townsend's big-eared bat *Corynorhinus townsendii*	BLM-S / SSC / USFS-S	High	Year-round range and known occurrences within Shasta and Trinity Counties. HUC 10 units: Swift Creek, Weaver Creek, Lower Hayfork Creek, Upper Hayfork Creek, Middle South Fork Trinity River, Stuart Fork	Yes	Occupies many habitats except alpine and subalpine habitats and is abundant in mesic habitats. Roosts in caves, mines, tunnels, buildings, or other structures. Requires water and gleans from brush or trees or feeds along habitat edges. Widespread throughout California.
North America wolverine *Gulo gulo luscus*	FT / ST / CFP / USFS-S	Low	Scarce resident of the North Coast Mountains and Sierra Nevada. HUC 10 units: Big French Creek, New River, Lower Hayfork Creek	Yes	In northern coastal and north Sierra Nevada areas, habitat includes Douglas-fir and mixed conifer and potentially red fir, lodgepole, subalpine conifer, alpine dwarf-shrub, wet meadow, and montane riparian. Feeds primarily on small mammals and carrion and uses caves, cliffs, hollow logs, cavities in the ground, and rocks as den sites. Yearlong range in Sierra Nevada mountains and North Coast Mountains. This species is not likely to occur within California or the Project.
Pacific/ American marten *Martes caurina*	USFS-S	Moderate	Year-round range in the Project activity area. HUC 10 units: Coffee Creek, East Fork Trinity River, Middle South Fork Trinity River, Stuart Fork, Swift Creek, Tangle Blue Creek, Trinity River, Canyon Creek, and Weaver Creek.	Yes	Optimal habitat includes mixed evergreen forests with greater than 40% canopy closure with large trees and snags typically at higher elevations above 4,500 feet. Red fir, lodgepole pine, subalpine conifer, mixed conifer, Jeffrey pine, and eastside pine are important habitat types. Uses stumps, logs, trees, burrows, caves, and crevices as cover and are mostly carnivorous. Occupies Northern California and Oregon.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Fisher *Pekania pennanti*	BLM-S / SSC / USFS-S	High	Year-round range and known occurrences in all HUC 10 units.	Yes	Habitat types include intermediate to large-tree stages of coniferous forests and deciduous-riparian habitats with a high percent canopy closure. Den sites include large trees, rocks, snags, logs, and slash or brush piles. Feeds on rabbits, hares, and rodents primarily. Mature dense forest stands are preferred habitat. Permanent, uncommon resident of the Sierra Nevada Mountains, Cascades, and Klamath mountains.
Gray Wolf *Canis Lupus*	FE / SE	Low	Not known to occur in Trinity County but have large home ranges and are known to disperse.	Yes	A generalist species that can occur in a wide range of habitats that include temperate forests, mountains, tundra, taiga, and grasslands. Seven known packs in California, including the Whaleback pack in Siskiyou County.
Northwestern pond turtle *Actinemys marmorata*	FPT / BLM-S / SSC / USFS-S	High	Year-round range and known occurrences within Project activity area. HUC 10 units: Canyon Creek, Swift Creek, Stuart Fork, Weaver Creek, Big French Creek, Lower South Fork Trinity River, Middle South Fork Trinity River, Lower Hayfork Creek, Upper Hayfork Creek, Upper South Fork Trinity River, Browns Creek, and Tangle Blue Creek	Yes	Occupies permanent or almost permanent water in habitats including ponds, lakes, streams, irrigation ditches and permanent pools along intermittent streams. Feeds on plants and aquatic invertebrates. Occurs west of the Sierra-Cascade crest and is common in California in suitable aquatic habitats.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
California mountain kingsnake *Lampropeltis zonata*	BLM-S	High	Year-round range and known occurrences within Project activity area. HUC 10 units: Coffee Creek, Stuart Fork, Canyon Creek, North Fork Trinity River, Lower South Fork Trinity River, Middle South Fork Trinity River	Yes	Seeks cover in rocks or boulders near streams or lake shores as well as rotting logs and dense shrubs. Found near wet meadows, streams or lakes and occupies valley-foothill hardwood, hardwood conifer, mixed and montane chaparral, valley-foothill riparian, and coniferous forests. Uncommon resident of Sierra, Cascade and Coast Ranges.
Coastal (Pacific) giant salamander *Dicamptodon tenebrosus*	SSC	High	Within range Known occurrences within Weaver Creek, Big French Creek, Canyon Creek, Swift Creek, Tangle Blue Creek, Upper Hayfork Creek, and Browns Creek.	Yes	Occurs in humid coastal forests like Klamath mixed conifer, Douglas-fir, redwood, red fir, and montane and valley-foothill riparian habitats. Preys on snails, slugs, small mice, shrews and potentially reptiles. Uses spaces between rocks in streambeds or surface litter and tunnels for terrestrial cover. Cold flowing water is ideal for egg-laying. Eggs are laid in the spring several feet below the surface of water and beneath rocks and course woody debris. Year-round residents in northwestern California and are known to occur in Shasta, Trinity and Humboldt Counties.
Foothill yellow-legged frog *Rana boylii pop. 1*	BLM-S / SSC / USFS-S	High	Within range and known occurrences within Project activity area. HUC 10 units: All HUC 10 units	Yes	Inhabits rocky streams in a variety of habitats including wet meadow, mixed chapparal, coastal scrub, mixed conifer, ponderosa pine, valley-foothill riparian, valley-foothill hardwood-conifer, and valley-foothill hardwood. Typically encountered near permanent water. Occurs in the Coast Range from the Oregon border south to the Transverse Mountains in Los Angeles County. Found west of the Sierra Nevada and Cascade Range crest.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Cascades frog *Rana cascadae*	SC / SSC / USFS-S	High	Within range and known occurrences within Project activity area. HUC 10 units: Tangle Blue Creek, East Fork Trinity River, Swift Creek, Coffee Creek, Stuart Fork, Canyon Creek, North Fork Trinity River	Yes	Inhabits mountain lakes, small streams, and ponds in meadows up to timber line. Restricted to water and surrounding vegetation. Hibernates in mud at the bottom of ponds and lakes during the winter. Occurs in Siskiyou, Trinity, Shasta, and Tehama Counties in mainly two locations and 2,400-8,200 feet in elevation.
Southern torrent salamander *Rhyacotriton variegatus*	SSC / USFS-S	High	Within range and known occurrences within Project activity area. HUC 10 units: Big French Creek, Lower South Fork Trinity River, Middle South Fork Trinity River	Yes	Inhabits cold, well-shaded permanent streams and spring seepages in redwood, Douglas fir, mixed conifer, montane riparian and montane hardwood-conifer. Typically found among pebbles and rocks within seepages and streams. Terrestrial use within splash zone or on moss-covered rock with trickling water. Ranges from northwestern California to Mendocino County up to 3,940 feet in elevation.
Hooded lancetooth *Ancotrema voyanum*	BLM-S	High	Within range and known occurrences within Project activity area HUC10 units: Canyon Creek, North Fork Trinity River, New River, Big French Creek, Lower South Fork Trinity River, Lower Hayfork Creek, Upper Hayfork Creek, Middle South Fork Trinity River	Yes	Inhabits intermittent stream channels where substrate remains damp. Course woody debris, riparian hardwood trees, deep leaf mold, and a closed forest canopy provides suitable habitat. Occurs in Trinity and Shasta Counties.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Low	Within range of species, however no known documented occurrences within Project activity area.	No	Found in the Central Valley and other valley locations throughout California. This species requires specific habitat (vernal pools) that are characterized by filling and drying of pools in areas where surface water becomes trapped on a nearly impermeable layer. No critical habitat for this species occurs within the Project activity areas.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	Low	Within range of species, however no known documented occurrences within Project activity area	No	Found in the Central Valley and other valley locations throughout California. This species requires specific habitat (vernal pools) that are characterized by filling and drying of pools in areas where surface water becomes trapped on a nearly impermeable layer. No critical habitat for this species occurs within the Project activity areas.
Franklin's bumble bee *Bombus franklini*	FE / SC	Low	One known occurrence along Willow Creek in 1969. HUC 10 unit: Stuart Fork	Yes	Found in southern Oregon/Northern California between the coast and Sierra-Cascade ranges. Not much is known about this species' habitat requirements. This species does not have an obligate host plant and uses a variety of flora found across the western United States. Documented occurrence within the Project area over 50 years ago.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Western bumble bee *Bombus occidentalis*	SC / USFS-S	High	Within range and known occurrences within Project activity area. HUC 10 units: Coffee Creek, East Fork Trinity River, Tangle Blue Creek, Swift Creek, Stuart Fork, North Fork Trinity River, Weaver Creek, New River, and Middle South Fork Trinity River	Yes	Distribution is from southern British Columbia to Central California. Habitat requirements include continuously blooming florals from spring to autumn. This species typically occupies rodent nests 16 to 18 inches below ground for nesting purposes. However, they will also use clumps of grass above ground to nest as well. Bumble bees also require more than isolated habitat patches, as these are not sufficient to fully support this species.
Monarch butterfly *Danaus Plexippus pop. 1*	FPT / USFS-S	High	Within range and known occurrences within Project activity area. HUC 10 units: Tangle Blue Creek, Swift Creek, Stuart Fork, Weaver Creek, Big French Creek, and Lower Hayfork Creek	Yes	This species is distributed throughout 90 countries, islands, and island groups. These butterflies are well known for their phenomenal long-distance migration in the North American populations. Descendants of these migratory monarch populations expanded from North America to other areas of the world where milkweed (their larval host plant) was already present or introduced. Inhabits Trinity and Humboldt Counties.
Klamath (Trinity) shoulderband snail *Helminthoglypta talmadgei*	BLM-S	Low	Within range Known occurrences within Stuart Fork and Big French Creek.	Yes	Inhabits limestone substrates with stable talus and rockslides typically near springs or streams. Shrubs and trees provide shading and food supplies. Trinity and Humboldt Counties and Klamath National Forest.

Common Name / Scientific Name	Listing Status	Potential for Occurrence	HUC 10 Watershed Known Occurrences	Suitable Habitat Present	Habitat and Range (CDFW)
Trinity bristlesnail *Monadenia infumata setosa*	ST	High	Within range and known occurrences within Project activity area. HUC 10 units: Big French Creek, Upper Hayfork Creek, Lower Hayfork Creek, Middle South Fork Trinity River	Yes	Inhabits riparian corridors and uplands within Klamath mixed-conifer forests with a deciduous hardwood understory. Found in moist, well drained, shaded canyons or streamside benches with at least four-inch leaf layer. Occurs along the Trinity-Humboldt County line east to Forest Glen in Trinity County.
Big Bar hesperian snail *Vespericola pressleyi*	USFS-S	Moderate	Within range and known occurrences within Project activity area. HUC 10 units: Big French Creek, Lower Hayfork Creek, Lower South Fork Trinity River, Middle South Fork Trinity River, and Upper Hayfork Creek	Yes	Inhabits conifer and/or hardwood forests in permanently damp areas close to seeps, springs, and streams. Occurs in Shasta-Trinity National Forest.

NRIS and CNDDB were referenced for occurrences and range for species.

Federal
- FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range
- FPT = Proposed for federal listing as a threatened species
- BCC = Fish and Wildlife Service: Birds of Conservation Concern
- BGEPA = Bald and Golden Eagle Protection Act

State
- SSC = California Species of Special Concern
- CFP = California Fully Protected
- SE = State listed as endangered
- ST = State listed as threatened
- SC = State candidate for listing as endangered or threatened
- WL = State watch list
- CPF = California Protected Furbearing Mammal
- CDFW-FP = California Department of Fish and Wildlife Fully Protected

Bureau of Land Management
- BLM-S = BLM Sensitive

United States Forest Service
- USFS-S = United States Forest Service sensitive species

3.4 Common Wildlife Species

Common wildlife species (non-special status species) within the Project activity area could be affected by the proposed Project activities. Focused restoration efforts are proposed to occur within or near aquatic, riparian, wetland, and upslope areas. These habitat types are inhabited by common wildlife species that could be impacted during implementation. For detailed information on restoration activities, see Chapter 3 of the EA. Table 3-2 lists some of the common wildlife species that occur within the Trinity River Basin.

Table 3-2. Common Wildlife Species within the Trinity River Basin[1]

Common Name	Scientific Name
Reptiles/Amphibians	
Pacific chorus frog	*Pseudacris regilla*
Western toad	*Anaxyrus boreas*
Aquatic garter snake	*Thamnophis atratus*
Ensatina	*Ensatina eschscholtzii*
North American racer	*Coluber constrictor*
Common garter snake	*Thamnophis sirtalis*
Klamath black salamander	*Aneides klamathensis*
Northern rubber boa	*Charina bottae*
Western skink	*Plestiodon skiltonianus*
California king snake	*Lampropeltis californiae*
Ring-necked snake	*Diadophis punctatus*
Sharp-tailed snake	*Contia tenuis*
Coastal tailed frog	*Ascaphus truei*
Birds	
California scrub-jay	*Aphelocoma californica*
Great blue heron	*Ardea herodias*
Anna's hummingbird	*Calypte anna*
American dipper	*Cinclus mexicanus*
Pileated woodpecker	*Dryocopus pileatus*
Dark-eyed junco	*Junco hyemalis*
Common merganser	*Mergus merganser*
Osprey	*Pandion haliaetus*
Red-breasted sapsucker	*Sphyrapicus ruber*
American robin	*Turdus migratorius*
Mammals	
Golden-mantled ground squirrel	*Callospermophilus latreralis*
American Beaver	*Castor canadensis*
North American river otter	*Lontra canadensis*
American shrewmole	*Neurotichus gibbsii*
American mink	*Neogale vison*
Western gray squirrel	*Sciurus griseus*
Douglas' squirrel	*Tamiasciurus douglasii*

1. Other common species could be affected during project implementation; this is not an exhaustive list of all common species that occur within the Project activity area.

4 Affected Environment

The Trinity River originates in the rugged Salmon-Trinity Mountains of Northern California in the northeast corner of Trinity County, California. The entire Trinity River watershed is approximately 2,861 square miles in size and is the largest Klamath River tributary. From Lewiston Dam, the Trinity River flows westward for 112 miles until it enters the Klamath River near the town of Weitchpec on the Yurok Reservation. The Trinity River passes through Trinity and Humboldt counties and the Hoopa Valley (Hoopa Tribe) and Yurok Indian Reservations. The Klamath River flows northwesterly for approximately 40 miles from its confluence with the Trinity River before entering the Pacific Ocean.

The Trinity River Watershed offers a variety of habitats that are important to numerous wildlife species. Whether or not wildlife habitat is suitable for any given species is based on factors including latitude, vegetation communities, topography, proximity to water features including wetlands, streams, lakes, oceans, anthropogenic influences, and natural disturbances, including wildfire and increased average temperatures and precipitation extremes. Wildlife habitat in the Project activity area is characterized in this chapter and summarized in Table 4-3.

4.1 Land Cover Types

The National Land Cover Database provides land use data for environmental modelling applications and is used in the technical report to describe baseline landscape conditions throughout the Project activity area. The baseline conditions provide general habitat information in a quantifiable way to analyze potential impacts within the Project activity area. The fifteen land cover classes found within the Project activity area are described in Table 4-1.

In general, forests make up most of the project's landscape at approximately 56%. Scrub and shrub cover types are next common at approximately 25% of the Project activity area. Pastures, grassland and herbaceous cover types follow at approximately 12%. Urban areas account for approximately 5% of the Project activity area. Open, natural land features including barren land, perennial snow and ice, and open water make up approximately 2% of the Project activity area.

Wetlands including emergent herbaceous and woody wetlands cover types make up the smallest amount of cover at approximately 0.4% and the open water land cover type accounts for 0.7%. Collectively, wetlands and open water account for 1.1% and approximately 18,303 acres within the Project activity area. This area typically overlaps with areas mapped as "Riparian Reserves" and "Key Watersheds" and is where many restoration activities are anticipated to be proposed by implementors.

Riparian Reserves, Key Watersheds, NSO modeled habitat, historic wildfire impacts, and habitat connectivity and fragmentation are described in the following sections to further quantify suitable habitat based on national land cover types described in this section.

Table 4-1. National Land Cover Types within the Project Activity Area

National Land Cover Types	Classification Description	Percentage of the Project Activity Area	Acres within the Project Activity Area
Evergreen Forest	Areas dominated by trees generally greater than 16.5 feet (5 meters) tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.	55.9%	895,805
Shrub/Scrub	Areas dominated by shrubs; less than 16.5 feet (5 meters) tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.	24.1%	385,472
Grassland/Herbaceous	Areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling but can be utilized for grazing.	11.7%	186,657
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.	4%	64,856
Mixed Forest	Areas dominated by trees generally greater than 16.5 feet (5 meters) tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.	1.6%	25,965
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil.	0.7%	11,977
Barren Land	Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.	0.7%	10,516
Deciduous Forest	Areas dominated by trees generally greater than 16.5 feet (5 meters) tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.	0.3%	4,879
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.	0.3%	4,832
Emergent Herbaceous Wetland	Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	0.3%	4,075

National Land Cover Types	Classification Description	Percentage of the Project Activity Area	Acres within the Project Activity Area
Woody Wetlands	Areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	0.1%	2,251
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.	0.1%	1,798
Perennial Snow/Ice	Areas characterized by a perennial cover of ice and/or snow, generally greater than 25% of total cover.	0.1%	1,633
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.	0%	779
Hay/Pasture	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.	0%	31
Total:		**~100%**	**1,601,525**

4.2 Riparian Reserves and Key Watersheds

Under the Aquatic Conservation Strategy (ACS), which was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on all public lands, Riparian Reserves, otherwise known as Riparian Management Areas, are portions of watersheds where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply. Based on the Project's objectives, Riparian Reserves are an integral part of project planning to implement best practices during restoration activities and to increase or restore function for native wildlife species by focusing on ecological processes and conditions within and contributing to the physical and ecological health, function, and resiliency of these areas.

Riparian Reserves occur at the margins of standing and flowing water, intermittent stream channels, lakes, ponds, springs, and wetlands and the location of Riparian Reserves for the Trinity River Watershed has been estimated based on proximity to water. These areas provide important fish and wildlife habitat functions and estimated Riparian Reserves support the Project by quantifying areas where restoration and enhancement activities are anticipated (and prioritized) to take place. There are 196,983 total acres of Riparian Reserves throughout the Project activity area. For a detailed explanation of Riparian Reserves, see Appendix C of the EA.

Key Watersheds, as described by the ACS, are watersheds that provide refugia and high-quality habitat crucial to at-risk fish species and populations. Key watersheds provide both high quality habitat and degraded habitat. The intent is that if a comprehensive restoration program is implemented, the lower quality habitat areas could become restored to high quality habitat. The Project would enhance habitat in Key Watersheds with a particular

focus on native anadromous fish species. The Key Watersheds that are within the Project Activity Area are the North Fork Trinity River, South Fork Trinity River, Canyon Creek, and New River (Figure 2-1).

4.3 Northern Spotted Owl Critical Habitat

Within the Project there are 458,970 acres of northern spotted owl designated critical habitat which is modeled and updated periodically by the USFWS (Figure 4-1). Critical habitat is defined under section 3(5)(A) of the ESA as specific areas within the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the ESA, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protections; and as specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species. Under Section 7(a)(2), the ESA requires Federal agencies to ensure that actions they authorize, fund, or carry out are not likely to destroy or adversely modify that habitat (16 U.S.C.1536(a)(2)). NSO critical habitat within the Project activity area encompasses documented NSO Protected Activity Centers, nest sites, and observations of individuals as well as other physical and biological features necessary for the continued existence of the species. See the environmental consequences sections for the analysis of effects to NSO (Section 5.1).

Physical and biological features describe habitat that support NSO which are essential to their continued existence. Physical features that support NSO include old-growth forests typically in the late seral phase with an open understory in which NSO seeks cover and can maneuver and fly beneath the canopy to forage. High canopy layers and snags within late seral forests provide cover and nesting sites for this species, protecting it from inclement weather and predators such as great horned owls. Some biological features for NSO include the presence of small mammals for their diet, large territories for nesting, hunting and reproduction, and predation and competition. For more information on NSO habitat and their behavioral ecology, see Section 5.1.

NSO habitat is closely tied to evergreen forest land cover type as described in Section 4.1. Within the Project Activity Area, evergreen forests make up the greatest land cover type with a total of 895,805 acres. Evergreen forests (taiga/boreal forests) is a biome characterized by coniferous forests consisting of pines, spruces, and firs found in the northern circumpolar forested regions. These regions are also characterized by long winters and moderate to high annual precipitation. Other species that are dependent on evergreen forests and similar habitats to NSO are fishers, American goshawks, Pacific martens, and bald eagles as well as other generalist species that use a multitude of habitat types including species like the gray wolf and North American wolverine. Critical habitat is determined by the USFWS by evaluating occupied areas with the consideration of physical and biological features the species requires for life processes and successful reproduction. There can be unoccupied areas that are designated as critical habitat but only under certain circumstances including where the amount of occupied areas would not be enough to ensure the conservation of the species. It also must be determined that there is reasonable certainty that the area will contribute to the conservation of the species and the areas must contain habitat features that are essential to the conservation of the species (USFWS 2024). NSO designated critical habitat and evergreen forest land cover types provide the greatest potential for NSO occupancy along with other species reliant of this habitat type within the Project activity area (USFWS 2024).

4.4 Historic Wildfire Impacts

Fire serves as an ecosystem process influencing vegetation patterns, wildlife distribution and nutrient cycling. Historically, Sierran mixed conifer and ponderosa pine forests burned at low to moderate intensity many times per century, often burning for months (Skinner and Chang 1996). It is estimated that before 1800, 4.4 million acres burned annually in California (Stephens et al. 2007). After the establishment of the USFS in 1905, fire exclusion policies, logging, livestock grazing and suppression of Native American fire regimes, the structure and function of many forests were altered. Fire suppression has led to higher tree densities, stand homogeneity and greater fuel loads, making forests more susceptible to high severity wildfires (Vaillant and Stephens 2009). Fire severity is typically defined by the loss of organic matter above and below ground. In high severity fire areas, root wads can burn creating unstable soils and heavy white ash deposition, indicating loss of substantial levels of organic matter (Keeley 2009).

Prior to European settlement, forests were open, containing larger trees with timber stands more resilient to fire. These late seral-stage forests contained more old-growth stands with understory brush fuels controlled by fire which frequently burned lightly on the forest floor. Forests today are much denser with early seral-stage forest types that contain fewer fire-resistant species. Dense conifer forests act as continuous fuel loads from the forest floor to tree canopy, thereby increasing the potential for a canopy fire. Canopy fires in modern forests can become stand-replacing events that are extremely difficult to control, thereby impacting wildlife that occupy or use conifer forests as habitat.

In the last two centuries, increased average temperatures and precipitation extremes and land use for human activities have impacted wildfire regimes. Increasing ambient temperature has led to drier air, creating fire seasons that begin earlier and end later in the year. Furthermore, sustained population growth and anthropogenic influence has increased the wildland-urban interface, increasing impacts on people and wildlife affected by wildfire (Nur et al. 2022).

Within Trinity County and the surrounding areas, historical fires have impacted the landscape through large complex fires, and in recent years, smaller scale fires (Table 4-2). According to some studies, recent impacts from fires have the potential to adversely affect NSO when high severity burns impact NSO critical habitat at a large scale that further shrink remnant old growth forests (Ganey et al. 2017). To demonstrate the impact of wildfires on wildlife habitat within the Trinity River Basin, recent high severity fire impacts (occurring within the last two years) were analyzed in relation to designated NSO critical habitat within the Project activity area. A total of 503,919 acres of the Project activity area burned since 2020. Historical fires were mapped since 2008 representing a total of 530,760 acres burned within the Project activity area (Figure 4-1).

NSO designated critical habitat is closely associated with the evergreen forest land cover type. Other species such as fishers, American goshawks, Pacific martens, and bald eagles also use evergreen forest habitat, as previously discussed. Therefore, it can be surmised that these species and others have also been similarly affected by recent wildfires in the Trinity River Basin.

Table 4-2.Wildfire Locations within the Project Activity Area and Total Burn Acreage

Wildfire Name	Total Acreage	Date	Cause	Impacted HUC 10 Subwatersheds
Deep Fire	4,198	August 2023	Unknown	• Stuart Fork
Monument Fire	223,124	July 2021	Lightning	• Canyon Creek • North Fork Trinity River • New River • Upper Hayfork River • Lower Hayfork River • Middle South Fork Trinity River • Big French Creek • Lower South Fork Trinity River
River Complex	199,359	July 2021	Lightning	• Swift Creek • Coffee Creek • Tangle Blue Creek • North Fork Trinity River • New River
McFarland Fire	122,653	July 2021	Lightning	• Middle South Fork Trinity River • Upper South Fork Trinity River • Upper Hayfork Creek • Lower Hayfork Creek
August Complex	1,032,648	August 2020	Lightning	• Upper Hayfork Creek • Middle South Fork Trinity River • Upper South Fork Trinity River
Red Salmon Complex	144,698	July 2020	Lightning	• New River
Carr Fire	229,651	July 2018	Vehicle	• Swift Creek • Weaver Creek

Data obtained from Cal Fire Incidents web page: https://www.fire.ca.gov/incidents

Burn acres include acres burned within and outside of the project activity area.

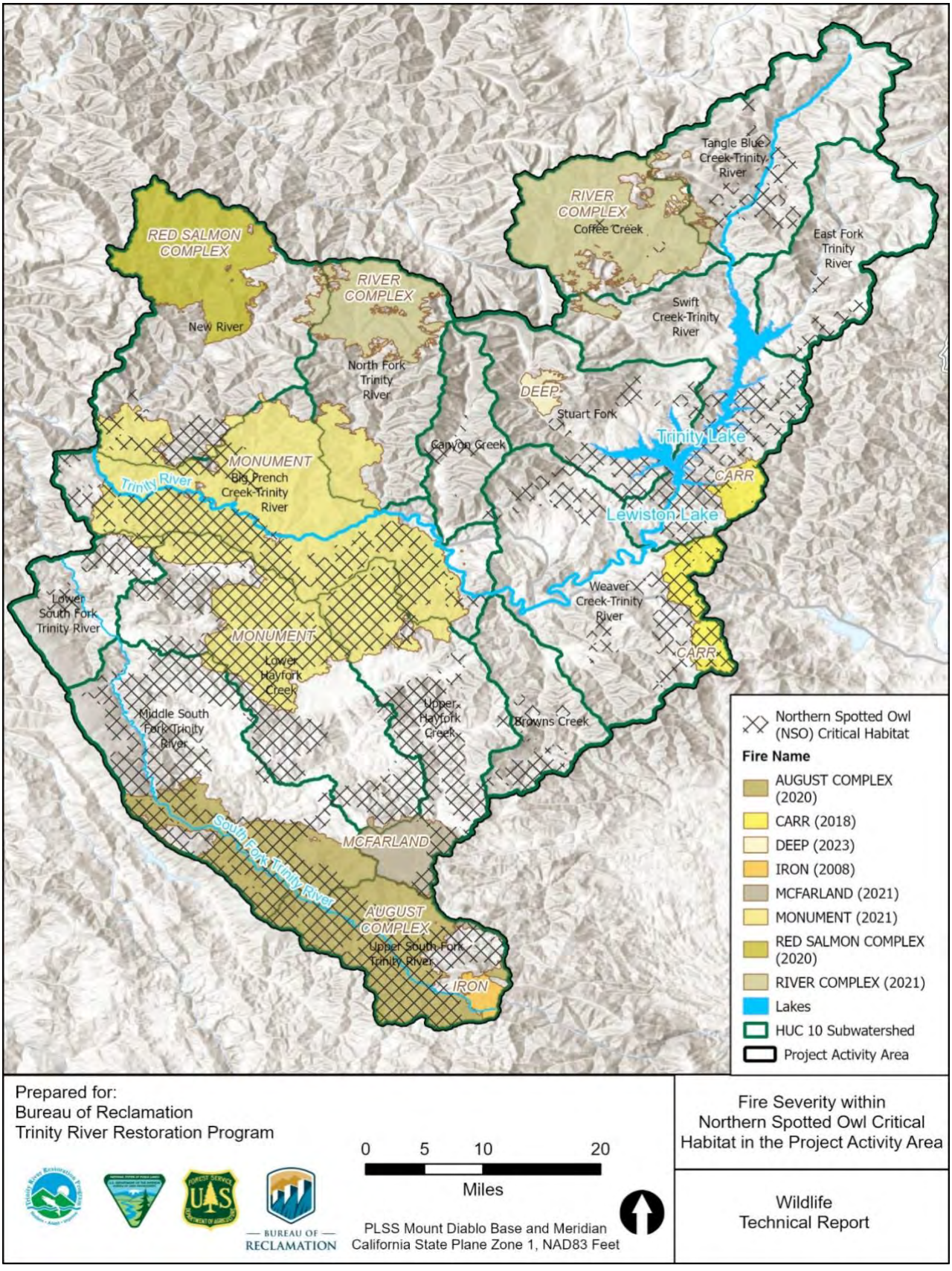

Figure 4-1. Northern Spotted Owl Critical Habitat Overlayed with Historical Wildfires

4.5 Habitat Connectivity and Fragmentation

Terrestrial habitat connectivity has been mapped throughout California and is measured by how well habitats on the landscape are connected to allow for the flow of ecological processes and terrestrial wildlife movement. CDFW has compiled regional linkage models that had been developed to date in California and brought them together with the California Essential Habitat Connectivity project in 2010 to create a current Statewide Terrestrial Connectivity Map (Figure 4-2). The map identifies connectivity attributes in each area across multiple studies (CDFW 2024c).

Habitat linkages can be impeded by anthropogenic barriers. Linear infrastructure such as roads, railways, canals and fences, can act as barriers to wildlife movement through otherwise natural habitats. Barriers contribute to genetic isolation by preventing gene flow between neighboring populations. This can cause long term impacts on populations and can lead to local extinctions. Because of road barriers, roadkill hotspots occur where wildlife frequently attempt to cross roads. In 2022, CDFW identified priority wildlife movement barriers and nearly all known barriers are associated with the State Highway System (CDFW 2022).

The Project includes two barriers identified by CDFW (CDFW 2024c). These barriers are listed as “Barriers” and not as “Priority Barriers” or “Top Priority Barriers.” One is located along California State Route 3 starting north of Coffee Creek and runs south to north of Weaverville. The other is located on California State Route 299 near Phillips Gulch and runs through State Route 3 and Weaverville west on State Route 299 to Oregon Gulch. Barrier priorities for remediation are defined as follows (CDFW 2022):

- Wildlife barriers: locations where infrastructure or incompatible land uses impede wildlife movement or population connectivity between habitat areas;
- Priority wildlife barriers: the ten highest priority barriers for remediation in each of the six terrestrial CDFW Regions; and
- Statewide top priorities: the two barrier segments with the highest priority for remediation in each of the 6 terrestrial CDFW regions (CDFW 2024a).

According to Areas of Conservation Emphasis Terrestrial Connectivity data (CDFW 2024a), the Project activity area contains essential and irreplaceable corridors (rank 5), as well as conservation planning linkages (rank 4), connections with implementation flexibility (rank 3), large natural habitat areas (rank 2), and limited connectivity opportunities (rank 1) (Figure 4-2). In rank 1 areas, the connectivity opportunities are minimal, as land use may limit options for providing connectivity (e.g., agriculture, urban) or no connectivity importance has been identified in models.

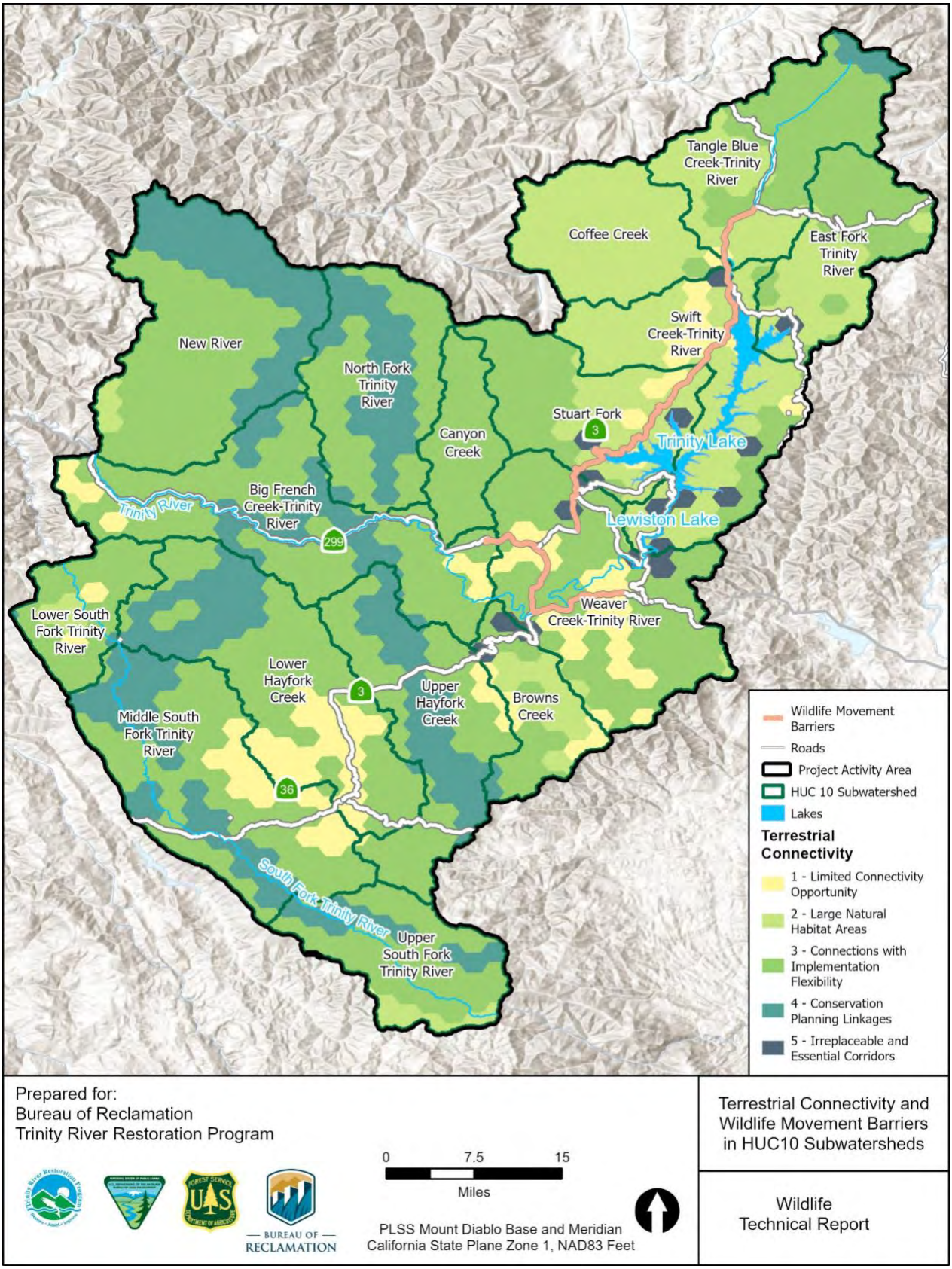

Figure 4-2. Terrestrial Connectivity and Wildlife Barriers within the Project Activity Area

4.6 Summary Table

Table 4-3. HUC 10 Watershed Habitat Characterization

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
Big French Creek-Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	223 551 30 501 130 5,077 55 91,949 0 3,482 1,800 341 0 49,127 60	19,010	No	Yes Barrier present from State Highway 299 that travels east/west in the northeastern section of the watershed.	56,654	American goshawk Northern spotted owl Bald eagle Ringtail North American Wolverine Fisher Northwestern pond turtle Southern torrent salamander Hooded lancetooth Trinity bristlesnail Foothill yellow-legged frog Big Bar Hesperian snail
Browns Creek	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	0 474 0 46 5 1,412 0 32,087 0 1,420 1,495 0 0 10,128 28	2,441	No	No	9,063	American goshawk Northern spotted owl Fisher Foothill yellow-legged frog

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
Canyon Creek	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	1,058 131 3 27.9 16 919 8 21,463 0 7,032 907 56 606 8,789 20	4,905	Yes	No	3,909	Pacific/American marten Fringed myotis Pallid bat Northwestern pond turtle California mountain kingsnake Cascades frog Hooded lancetooth Foothill yellow-legged frog
Coffee Creek	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	320 121 55 276 111 2,070 142 54,572 0 2,719 867 82 4 12,468 1,002	6,821	No	Yes Barrier present from State Highway 3 traveling north/south passing through a small portion of the eastern section of the watershed.	1,336	American goshawk Northern spotted owl Pacific/American marten California mountain kingsnake Cascades frog Foothill yellow-legged frog Western bumble bee

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
East Fork Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	590 9 2 208 32 895 676 53,963 0 6,126 598 586 0 10,515 102	7,325	No	No	4,153	American goshawk Bald eagle Northern spotted owl Pacific/American marten Fisher Cascades frog Foothill yellow-legged frog Western bumble bee
Lower Hayfork Creek	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	4 224 63 522 196 8,771 3 78,762 24 6,550 2,244 46 0 44,715 36	22,370	No	No	87,287	American goshawk Bald eagle Golden eagle Northern spotted owl Burrowing owl Townsend's big-eared bat North American wolverine Fisher Ringtail Northwestern pond turtle Hooded lancetooth Trinity bristlesnail Foothill yellow-legged frog Big Bar Hesperian snail

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
Lower South Fork Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	286 269 22 158 90 2,306 19 17,385 0 5,108 367 149 0 18,071 0	6,545	Yes	No	11,096	American goshawk Bald eagle Northern spotted owl Fringed myotis Fisher Northwestern pond turtle California Mountain kingsnake Southern torrent salamander Hooded lancetooth Foothill yellow-legged frog Big Bar Hesperian snail
Middle South Fork Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	26 532 26 491 114 10,555 65 76,288 0 31,129 1,833 178 0 24,513 1	17,521	Yes	No	79,921	American goshawk Bald eagle Northern spotted owl Fringed myotis Townsend's big-eared bat Pacific/American marten Fisher Ringtail Northwestern pond turtle California mountain kingsnake Southern torrent salamander Hooded lancetooth Western bumble bee Trinity bristlesnail Foothill yellow-legged frog Bif Bar Hesperian snail

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
New River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	64 33 22 172 82 3,245 1 50,095 0 49,053 248 4 0 46,401 0	18,487	Yes	No	14,180	American goshawk Northern spotted owl Pallid bat North American wolverine Fisher Hooded lancetooth Western bumble bee Foothill yellow-legged frog
North Fork Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	786 224 270 146 138 1,307 6 54,965 0 615 1,337 77 376 37,211 13	12,483	Yes	No	19	American goshawk Northern spotted owl Bald eagle Fringed myotis Fisher California mountain kingsnake Cascades frog Hooded lancetooth Western bumble bee Foothill yellow-legged frog

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
Stuart Fork	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	2,705 633 58 135 71 4,112 949 54,624 0 2,703 2,108 3,128 586 16,436 7	17,088	No	Yes Barrier present from State Highway 3 traveling north/south along Trinity Lake and bisecting the watershed.	12,581	American goshawk Bald eagle Northern spotted owl Pacific/American marten Fisher Ringtail Northwestern pond turtle California mountain kingsnake Cascades frog Western bumble bee Foothill yellow-legged frog
Swift Creek-Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	2,457 364 56 593 193 6,547 2,093 70,618 1 7,515 3,665 6,970 59 19,590 310	25,429	No	Yes Barrier present from State Highway 3 traveling north/south along Trinity Lake and bisecting the watershed.	30,750	American Goshawk Bald eagle Northern spotted owl Ringtail Townsend's big-eared bat Pacific/American marten Northwestern pond turtle Cascades frog Western bumble bee Foothill yellow-legged frog

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
Tangle Blue Creek-Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	1,963 33 64 417 166 415 16 81,894 4 1,237 590 152 0 13,958 441	8,075	No	Yes Barrier present from State Highway 3 traveling north/south bisecting southern extent of the watershed.	10,690	American goshawk Northern spotted owl Bald eagle Fisher Northwestern pond turtle Cascades frog Western bumble bee Foothill yellow-legged frog
Upper Hayfork Creek	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	0 229 3 215 33 6,658 0 55,909 3 8,001 1,533 2 0 33,101 11	15,761	No	No	53,245	American goshawk Northern spotted owl Bald eagle Townsend's big-eared bat Pallid bat Fisher Ringtail Northwestern pond turtle Hooded lancetooth Trinity bristlesnail Foothill yellow-legged frog Big Bar Hesperian snail

HUC 10	National Land Cover Types	National Land Cover Types (acres) [1]	Riparian Reserves (acres)	Key Watershed	Habitat Fragmentation (Terrestrial Barriers) Present	NSO Critical Habitat (acres)	Documented Occurrences of Special Status Species[2]
Upper South Fork Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	4 25 3 93 33 4,585 2 20,187 0 43,662 135 6 0 4,862 3	7,632	Yes	No	52,201	American goshawk Northern spotted owl Bald eagle Pallid bat Fisher Northwestern pond turtle Foothill yellow-legged frog
Weaver Creek-Trinity River	Barren Land Deciduous Forest Developed, High Intensity Developed, Low Intensity Developed, Medium Intensity Developed, Open Space Emergent Herbaceous Wetlands Evergreen Forest Hay/Pasture Herbaceous Mixed Forest Open Water Perennial Snow/Ice Shrub/Scrub Woody Wetlands	30 1,029 101 831 388 5,984 42 81,043 0 10,307 6,237 199 1.4 35,590 218	5,089	No	Yes Two barriers present from State Highway 3 and 299 bisecting both eastern and western sections and well as southern and northern sections of the watershed.	31,888	American goshawk Golden eagle Bald eagle Northern spotted owl Pallid bat Fisher Ringtail Townsend's big-eared bat Pacific/American marten Northwestern pond turtle Western bumble bee Foothill yellow-legged frog

1. Based on GIS data from the United States Geological Survey for National Land Cover Types
2. CNDDB and NRIS were referenced for species occurrences as well as open-source platforms including Audubon, eBird, iNaturalist, for range for species. Only "research grade" occurrences are included from iNaturalist

5 Environmental Consequences

During project implementation and post implementation, proposed activities could have effects to terrestrial and aquatic wildlife species. Project GPMs, CMs, MMs, and design guidelines would be implemented to reduce effects to species and their habitat. This section discusses both general and species-specific short- and long-term effects that could occur as a result of Project activities and CMs and MMs that are recommended to avoid and minimize impacts to wildlife species during implementation. Proposed activities are grouped into three general categories and include instream habitat restoration; upslope habitat restoration; and road maintenance, rehabilitation, and decommissioning activities. Most activities would require the use of heavy equipment and hand tools to complete site-specific projects which would cause ground and noise disturbance, impaired air and water quality, and temporary loss of native vegetation. The table below summarizes the potential construction components or construction impacts by restoration activity category that could affect individual species and their habitat. Effects of particular concern are described in more detail below in Table 5-1.

Construction-related effects to wildlife species could potentially occur during project implementation. These effects are more likely to affect species with relatively small home ranges that are reliant and well adapted to freshwater habitats of the Trinity River and its tributaries including species such as the northwestern pond turtle, foothill yellow-legged frog, and Big Bar hesperian snail. Construction-related effects to wildlife from Project activities could include loss of nesting habitat, potential take of ESA-listed species, harm (injury or death) of individuals, interference with habitat use, interruption to foraging activities, noise disturbance, and reduced air and water quality.

Short-term effects to wildlife as a result of airborne noise could result from activities such as use of heavy construction equipment, pile driving during bridge replacement, large wood placement via helicopters, bedrock fracturing, and instream structure removal. Airborne noise effects would likely affect nesting birds if migratory birds were using habitat in or in the vicinity of the site-specific project areas for nesting and rearing during implementation. Preconstruction surveys would be performed to identify specific wildlife activity areas and applicable seasonal restrictions (SRs) would be applied or noise-generating activities would be deferred until after the nesting season is complete or until a qualified biologist has determined the young have fledged their nest. Noise effects could have adverse effects to wildlife; however, these effects would be temporary and localized and minimized with the implementation of CMs (see Table 4-5 in Appendix B of the EA).

Native and nonnative vegetation removal would occur during site-specific project implementation inducing temporal effects associated with construction activities. Heavy equipment would produce noise that could disturb or deter wildlife species from occupying or using project work areas and surrounding habitat. Heavy equipment would also produce exhaust and dust, affecting air quality and potentially affecting wildlife. Sedimentation from earth-moving activities and project activities within streams and floodplains could increase turbidity within project waterways temporarily and potentially long-term, in turn affecting aquatic wildlife species. To reduce effects to protected species, GPMs, design guidelines, CMs, and MMs would be incorporated into site-specific activities including SRs, preconstruction surveys, species salvage and translocation, and biological monitoring. For a full list of these measures see Appendix B of the EA. Avoidance and minimization measures would ensure that implementation would not lead to long-term adverse effects on wildlife species.

Table 5-1. Construction-related effects on special-status wildlife species per activity category.

Restoration Activity Category	Potential Construction-Related Effects
1. Restoration and Enhancement of In-Channel Habitat	Construction impacts to riparian vegetation, in-channel heavy equipment use, turbidity, incidental chemical contamination, bedrock fracturing hydroacoustic noise, airborne noise, dewatering, nest abandonment, frog and turtle relocation
2. Floodplain Restoration	Construction impacts to riparian vegetation, in-channel heavy equipment use, turbidity, incidental chemical contamination, dewatering, airborne noise, nest abandonment, frog and turtle relocation
3. Removal or Retrofitting of Fish Passage Barriers, Small Dams, Flood Gates, Pilings, and Other In-water Structures	Construction impacts to riparian vegetation, in-channel heavy equipment use, sedimentation, incidental chemical contamination, dewatering, hydroacoustic noise from blasting, airborne noise, nest abandonment, frog and turtle relocation
4. Water Conservation Projects	Turbidity, incidental chemical contamination, potential for dewatering/frog and turtle relocation associated with fish screen installation, airborne noise
5. Salmon Carcass Placement	No adverse short-term effects anticipated
6. Remote Site Incubators	Minor streambed disturbance during install of system and demobilization
7. Bioengineered Bank Stabilization	Construction impacts to riparian vegetation, incidental chemical contamination, sedimentation, airborne noise, nest abandonment and frog and turtle relocation
8. Aquatic, Wetland, Riparian, and Upslope Habitat Enhancement Including Removal of Nonnative Invasive Species and Revegetation with Native Plants	Construction impacts to riparian vegetation, incidental chemical contamination, sedimentation, airborne noise, watershed restoration-related tree removal
9. Road Maintenance	Incidental chemical contamination, sedimentation, airborne noise,
10. Road Rehabilitation	Construction impacts to riparian vegetation, in-channel heavy equipment use, sedimentation, incidental chemical contamination, dewatering, airborne noise, nest abandonment, frog and turtle relocation, hydroacoustic noise from pile driving
11. Road Decommissioning	Incidental chemical contamination, sedimentation, airborne noise

Habitat enhancement and revegetation with native species would take place in aquatic, meadows, wetland, riparian, and upslope areas within the watershed where the vegetative community has been disturbed by past land practices, wildfire, introduction of nonnative species, or construction activities and where habitat functions are impaired. Design guidelines would be implemented to avoid removal of special status plant species by leaving plants in situ, when possible, during project activities reducing the impacts to wildlife species dependent on the presence of native vegetation. ACS objectives would also be implemented to maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability (Appendix C of the EA).

Long-term benefits to wildlife species and associated habitat as a result of proposed activities may include improved foraging opportunities (with expected increases to fish populations), improved vegetative community with a higher percentage of native species, and improvements to upslope habitats (wetlands, meadows, floodplain areas, etc.). Long-term beneficial effects to wildlife species as a result of the Project also includes improving nutrient cycling within Project waterways, which would increase instream biodiversity. Habitat use by wildlife species is anticipated to return to or exceed pre-project levels post implementation, with potential reduction of nonnative wildlife species. Restoration of rivers and streams creates complex stream morphology and can lead to increased habitat availability for wildlife. Lowering floodplains, restoring and creating wetlands and riparian areas, and restoring stream geomorphic processes can help to improve water temperature and quality by creating conditions that allow for water to be retained in the watershed for longer periods of time. This provides refugia for wildlife species during temperature extremes and wildfire and increases habitat for rearing and spawning amphibian species. Long-term beneficial effects to water quality and wildlife habitat are expected to occur. Long-term negative effects are not anticipated to occur.

ACS objectives would be incorporated into site-specific project designs by ensuring that riparian habitat would be maintained and restored to support well-distributed populations of native plant, invertebrate, and vertebrate species. Coordination with upstream operators to control dam releases or instream flow levels to provide water during plant establishment would occur to ensure revegetation success. Site-specific project size, timing, and duration would ensure reduced effects to wildlife species reoccupying habitat following project implementation with the goal of improving habitat long-term. For a full list of project activities including habitat enhancements, see the Activity Cards in Appendix H of the EA.

The following section analyzes effects to individual special-status wildlife species that may occur within the Project area. Project CMs and MMs are listed for each species and an effect determination is made.

5.1 Northern spotted owl (*Strix occidentalis caurina*)

5.1.1 Species Account

NSO occupy coastal ranges and intervening forested lands from Washington to northern California. In California it ranges from south of Marin County in the coast ranges and across the Klamath Mountains where it meets the range of the California spotted owl (*Strix occidentalis occidentalis*) on the eastern edge of the Cascade Range near the Pit River (USFWS 2025). NSO rely on intact stands of old-growth forests and the particular structures and characteristics within them. This includes high canopy closure, large accumulations of woody debris, snags, and broken topped trees for roosting and nesting cavities (Center for Biological Diversity 2024). Multilayered forests are also strongly associated with this species and provide perching sites, various microclimates, and higher prey diversity. Typical vegetation communities found within NSO habitat include Douglas fir/hardwood, mixed conifer, mixed evergreen forests, and Oregon white oak forests. The species can range in elevation from 70 to 6,600 feet (20-2,010 m) with the majority of individuals and populations occurring within the lower portions of the elevation range (Meyer 2007).

The NSO is a relatively long-lived species and has a reproductive lifespan estimated at 26 years (Center for Biological Diversity 2024); however, they do not breed every year. When they do breed, their breeding cycle begins in early spring with nesting, in summer nestlings fledge and dispersal happens in the fall. A spotted owl clutch size is typically 2 eggs but can vary between 1 and 4 and incubation period lasts approximately 30 days.

NSO are also monogamous breeders that will rarely renest after a failed breeding attempt (Meyer 2007). Within California dusky-footed woodrats (*Neotoma fuscipes*) are the main component of their diet (CDFW 2024b) and tend to occur in early successional shrublands. Flying squirrels (*Glaucomys sabrinus*) also make up the NSO diet and are typically found in older growth forests compared to younger stands. Accounts of home range sizes within the scientific literature vary greatly depending on location. The average home range size varies from 1,030 acres to 14,169 acres (Meyer 2007). The estimated mean annual home range of a northern spotted owl pair in the California Klamath Province (where the Shasta-Trinity National Forest is located) is represented by a 1.3-mile radius circle (3,397 acres) (USDI Fish and Wildlife Service 2011).

On June 26, 1990, NSO was first listed as a threatened species under the ESA due to concerns over habitat loss from logging operations in the Pacific Northwest. A petition was filed to increase protection for this species on August 15, 2012, and a five-year review ensued. In 2020, after a 12-month finding on a petition to reclassify NSO from threatened to endangered, the USFWS announced that the reclassification was warranted but precluded by higher priority actions (85 FR 81144). Today, the owl is listed as threatened under the ESA with designated critical habitat.

Within the Project activity area, there are documented occurrences within all HUC 10 units (CDFW 2024d and USFS 2024a). Due to the high probability that NSO nests and protected activity centers would occur in or near a project site, NSO SRs would be implemented and applicable NSO CMs described below would be followed when working within potential NSO habitat.

5.1.2 Effects Analysis

Potential pathways for effects to NSO as a result of Project activities could include the following:

- Death or injury of owls due to felling an active nest tree (incidental take).
- Loss of active nest site due to disturbance from construction noise and human presence during breeding season (adverse effect to reproductive success).
- Disturbance at post-fledging area due to activities associated with construction and human presence (adverse effects to fledgling survival).
- Loss of habitat due to reduction of high canopy cover stands with open understories, large trees, snag habitat, or down log habitat (adverse effects to prey, nesting, roosting and foraging habitat).

5.1.2.1 Avoidance and Minimization Measures

The potential for adverse effects would be limited due to the following CMs (USFWS 2025):

- NSO-1: The local USFS, County, or other biologists would provide northern spotted owl survey, activity center, and habitat suitability data for the project area.
- NSO-2: If surveys are planned, they would be conducted according to the 2012 Northern Spotted Owl Survey Protocol and 2019 guidelines revision following seasonal restrictions for “Surveyed Landscape.” If surveys are not conducted, seasonal restrictions would apply if a site-specific project is within 0.25 miles of nesting/roosting or foraging habitat (as described below).
- NSO-3: In all suitable nesting, roosting, and foraging habitat removal or damage of known and potential nest trees and associated screen trees would be avoided, unless they must be removed to implement the proposed project or are a confirmed safety hazard according to guidance documents from the implementing agency or another agency with jurisdiction in the project area. Removal of

large (20 inches DBH or larger) snags would be avoided, unless they must be removed to implement the proposed project or are a confirmed safety hazard.

- NSO-4: Project activities would not result in net loss of habitat or downgrade or remove the function of suitable nesting, roosting, and foraging habitat to the degree that the habitat does not function in the capacity that existed prior to treatment.
- NSO-5: Projects would avoid downgrading or removing suitable foraging habitat function in northern spotted owl core areas (a 0.5-mile radius or 500-acre area around an Activity Center) and in suitable foraging habitat in northern spotted owl home ranges (a 1.3-mile radius, including core, or a 3,398-acre area around an Activity Center).
- NSO-6: Work restrictions would apply in previously surveyed landscapes if a known (active) nest site is present within 0.25 miles (or 1,320 ft).
    - Activities that result in loud and continuous noise (for >=2 hours per day) above ambient levels would not be conducted between February 1 and July 9 within 0.25 miles of a nest site.
    - Activities that modify suitable (nesting/roosting or foraging) habitat or generate smoke would not be conducted between February 1 and September 15 within 0.25 miles of a nest site.
- NSO-7: Work restrictions in non-surveyed landscapes would apply when there is presence of suitable nesting, roosting, or foraging habitat for NSO within 0.25 miles (or 1,320 ft).
    - Activities that result in loud and continuous (for >=2 hours per day) noise above ambient levels would not be conducted between February 1 and July 9 within 0.25 miles of unsurveyed suitable (nesting/roosting/foraging) habitat.
    - Activities that modify suitable (nesting/roosting or foraging) habitat or generate smoke would not be conducted between February 1 and September 15 within 0.25 miles of unsurveyed suitable (nesting/roosting/foraging) habitat.
- NSO-8: When working in designated critical habitat, adhere to all measures described in NSO-5, NSO-6, and NSO-7 for reducing impacts in suitable nesting, roosting, and foraging habitat.

For full details on all avoidance and minimization measures see Appendix B of the EA.

5.1.2.2 Effects Summary

Project activities may cause intermittent disturbance to spotted owls within or near activity areas, and individual owls may move away from work areas temporarily during project implementation due to the presence of humans and equipment. Although some owls may be affected by noise disturbance, the potential to cause mortality, harm, or significant disruption to normal behaviors of owls, especially during their breeding season, is low. The Federal ESA requires protection of this species and other federally listed species by prohibiting harm, harassment, or injury to NSO individuals, and is defined under the ESA as “take.” To this end, SRs would be imposed to avoid potential disturbance or harm during the NSO breeding season (as described in the Section 5.1.2.1 above and in the CMs in Appendix B of the EA). These would apply to activities manipulating NSO habitat or producing loud and continuous noise or smoke that could potentially disturb spotted owls. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix B of the EA.

NSO critical habitat is anticipated to be minimally affected by Project activities. Large tree removal is intended to be fairly minimal: some trees large trees or snags may need to be removed from restoration sites if the tree/snag poses a hazard risk during construction operations; some trees may need to be removed for site

access; and some tree removal may be necessary in upslope areas for watershed habitat enhancement. Trees removed would be salvaged to support: loose wood placement in both aquatic and upslope habitats; structured log jams (SLJs); and low-tech process-based restoration (LTPBR) techniques. It should be noted that wooded areas with old growth characteristics, where present, would be preserved to the extent possible. Potential effects to NSO critical habitat would be considered during the site-specific analysis and CMs would be incorporated to minimize effects and ensure that effects stay within the limits described in the 2025 USFWS Statewide Restoration BiOp.

The proposed activities could have short-term construction effects related to noise disturbance or air quality that could potentially affect NSO, particularly individuals, moving through the forest while foraging, nesting or engaging in other activities. However, because there would be SRs on activities during the nesting season, tree removal would be limited, and suitable (nesting/roosting or foraging) habitat would not be removed or downgraded, effects would be minor. No injury or mortality is anticipated to occur and no more than 18 nesting individuals would be harmed from disturbance annually (USFWS 2025).

The implementation of the Project may affect and is likely to adversely affect NSO and its designated critical habitat. Site-specific analysis would be conducted for each restoration effort to ensure that effects are avoided and minimized to the extent possible.

5.2 American goshawk (*Accipiter atricapillus*)

5.2.1 Species Account

The American goshawk (formerly known as the northern goshawk) is a widely distributed predator inhabiting boreal and temperate forests throughout the northern hemisphere (Shuford and Garaldi 2008). In North America, it breeds throughout Alaska and Canada, and the mountains of the eastern and western U.S. (Squires and Kennedy 2006). American goshawks primarily occupy mid- and high-elevation ponderosa pine, mixed-species, and spruce-fir forests, often with little understory vegetation, on flat or moderately sloping terrain. Although they nest in a variety of habitat types, goshawks prefer even-aged mature forests with large trees and open understories. Nest sites tend to be in large trees associated with water and riparian corridors (Squires and Reynolds 1997, Squires and Kennedy 2006, Zeiner et al. 1990). Saunders (1982, in USDI Fish and Wildlife Service 1998) found mean diameter of nest trees on the Shasta-Trinity National Forest was 29 inches. Eggs are typically laid in mid-April to early May and incubation lasts about 30 days. Nestlings remain in the nest for 36-42 days, typically fledging between late June and late July (Squires and Reynolds 1997).

American goshawks forage in an array of habitats, preying primarily on birds and small mammals (Squires and Reynolds 1997; Reynolds et al. 1992). Foraging habitats typically contain abundant large snags and logs for prey habitat and plucking posts (Squires and Reynolds 1997). In the southern Cascades, goshawks prefer to forage in mature and older stands with canopy closure greater than 40 percent. However, early-successional patches and openings also provide foraging opportunities. Reynolds et al. (1992) determined that small and medium sized openings (less than four acres) likely enhance prey availability, whereas larger openings are less favorable for most goshawk prey species. Important prey for goshawks in California include squirrels (chipmunks, Douglas squirrels (*Tamiasciurus douglasii*), golden-mantled ground squirrels (*Callospermophilus lateralis*), gray squirrels (*Sciurus carolinensis*), northern flying squirrels (*Glaucomys sabrinus*), Steller's jays (*Cyanocitta stelleri*), grouse (ruffed and blue) (*Bonasa umbellus, Dendragapus obscurus*), and northern flickers (*Colaptes auratus*). Squirrels

occur in most goshawk diets due to their high abundance and broad distribution (USDI Fish and Wildlife Service 1998). Accounts of home range sizes in the scientific literature for this species vary widely depending on sex and habitat characteristics but are generally between 1,410 to 8,650 acres (Squires and Reynolds 1997).

Within the Project activity area, there are documented occurrences of American goshawk within all HUC 10 units except Canyon Creek (CDFW 2024d and USFS 2024a).

5.2.2 Effects Analysis

Potential pathways for effects to American goshawks as a result of Project activities include the following:

- Death or injury of goshawks due to felling an active nest tree;
- Loss of active nest site due to disturbance from construction noise and human activity during breeding season (negative effect to reproductive success);
- Disturbance at post-fledging area due to activities associated with construction activities and human presence (negative effects to fledgling survival); and
- Loss of habitat due to reduction of high canopy cover stands with open understories, large trees, snag habitat, or down log habitat (negative effects to prey, foraging and nesting habitat).

5.2.2.1 Avoidance and Minimization Measures

The Shasta-Trinity National Forest (STNF) Plan requires protection of known goshawk nest sites (Forest Plan pages 4-30 and 4-44). To this end, a SR would be imposed from February 1 through August 15 within 0.25 mile of any known goshawk nest sites in the project area to avoid potential disturbance during the goshawk breeding season (as described in the CMs below and in Appendix B of the EA). A SR has also been incorporated into the CMs to avoid disturbance to NSO during their breeding season. This would apply to activities manipulating NSO habitat or producing loud and continuous noise or smoke that could potentially disturb AGOS (American goshawks). As a result, where/when the NSO SRs are applied, disturbance to breeding American goshawks would be reduced as their breeding seasons overlap, and in many areas, their habitats overlap. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix B of the EA.

The potential for adverse effects would be limited due to the following CMs :

- Within NSO nesting, roosting, and foraging habitat, NSO CMs would be implemented when applicable and goshawk habitat largely overlaps with NSO suitable habitat, thus the CMs would also help reduce disturbances to American goshawk and retain goshawk habitat.
- AGBE-1: SR would be imposed from February 1 through August 15 within 0.25 mile of any known goshawk nest sites in the project area to all activities causing above-ambient loud and continuous noise (for >=2 hours per day) to avoid potential disturbance during the goshawk breeding season (USFS 1995).
    - For smoke producing activities within 0.25 mile of active nests, employ firing techniques that provide good smoke dispersion and ventilation aloft and/or away from active nests.
    - If effects of smoke cannot be avoided or minimized within 0.25 mile of an active nest site, prescribed burning would be conducted outside the seasonal restriction period.
    - Seasonal restrictions may be lifted if surveys determine no nesting activity within 0.25 mile of proposed activities.

- Activities are designed to create ecological conditions that are more resilient over the long-term. Therefore, activities would help protect remaining goshawk habitat and future habitat.

The potential for adverse effects could be limited due to the following MMs (RWQCB and Reclamation 2009):

- AGBE-2: Prior to the start of construction, a qualified biologist would conduct a survey of the project site(s) to determine whether suitable nesting habitat for the species is present.
- AGBE-3: Construction would be scheduled to avoid the nesting season for bald eagles and American goshawks to the extent feasible.
- AGBE-4: Pre-construction surveys for nesting American goshawks would be conducted by a qualified biologist to ensure that no nests would be disturbed during project implementation.
- AGBE-5: If vegetation is to be removed by the project and all necessary approvals have been obtained, potential nesting habitat (i.e., trees) that would be removed by the project would be removed before the onset of the nesting season, if feasible.

5.2.2.2 Effects Summary

Project activities may cause intermittent disturbance to goshawks within or near activity areas, and individual goshawks may move away from activity areas temporarily during project implementation due to the presence of humans and equipment. Effects to goshawk habitat would be limited due to the site-specific project scale, but habitat suitability may be negatively affected by cutting and removal of trees, which would reduce canopy cover and abundance of large trees. These activities would potentially affect habitats beneficial to goshawk prey species and may reduce the availability of perching sites for foraging goshawks. However, tree removal would be minimal and would also open up the understory which may improve goshawk access to prey in overgrown areas.

Large tree removal could affect AGOS habitat, however it is intended to be fairly minimal: some large trees or snags may need to be removed from restoration sites if the tree/snag poses a hazard risk during construction operations; some trees may need to be removed for site access; and some tree removal may be necessary in upslope areas for watershed habitat enhancement. Trees removed would be salvaged to support: loose wood placement in both aquatic and upslope habitats; SLJs; and LTPBR techniques. It should be noted that wooded areas with old growth characteristics, where present, would be preserved to the extent possible. Potential effects to AGOS habitat would be considered during the site-specific analysis and CMs would be incorporated to minimize effects.

The proposed activities could have short-term construction effects related to noise disturbance or air quality that could potentially affect AGOS, particularly individuals, moving through the forest while foraging, nesting or engaging in other activities. However, because there would be SRs on activities for American goshawk and during NSO nesting seasons, and tree removal would be limited, effects are anticipated to be minor. The project may affect individual American goshawks, but potential effects to the reproduction and population demography of this species are limited and insignificant and would not cause a trend toward listing.

5.3 Bald eagle (*Haliaeetus leucocephalus*) & Golden eagle (*Aquila chrysaetos*)

5.3.1 Species Account

Bald eagles typically utilize large trees protected from disturbance for nesting, and late successional and old growth forests close to large rivers or lakes for nesting and winter roosting sites. Their primary food source is fish, which are taken live or as carrion (USDI Fish and Wildlife Service 2013; Anthony et al. 1992; USDI Fish and Wildlife Service 1986). Average home range sizes in Oregon and Washington, respectively, were 1,650 and 1,216 acres (Snyder 1993, Kalasz and Buchanan 2016). In the STNF, many large conifers provide potential nest sites on slopes overlooking Trinity Lake, Lewiston Lake, the Trinity River, and South Fork Trinity River. Other nests are located near major tributaries.

Suitable habitat for nesting and foraging within the project area is concentrated around Trinity Lake, Lewiston Lake, and the mainstem and South Forks of the Trinity River. These areas provide large enough fish-bearing waterbodies for foraging and high-quality habitat for bald eagles. Documented occurrences within the Project's HUC 10s include Big French Creek, East Fork Trinity River, Swift Creek, Stuart Fork, Lower South Fork Trinity River, Middle South Fork Trinity River, Lower Hayfork Creek, North Fork Trinity River, Tangle Blue Creek, Upper Hayfork Creek, Upper South Fork Trinity River, and Weaver Creek and are areas where bald eagles are likely to nest and forage (CDFW 2024d and USFS 2024a).

Golden eagles are an uncommon permanent resident in California and occupy rolling foothills and mountain terrain, wide arid plateaus, open mountain slopes and cliff and rock outcrops (CDFW 2020). Cliffs and rock outcrops with large trees provide protected nesting habitat. This species will tend to build multiple large stick nests within its territory during the breeding season from late January through August. The nesting cycle spans about five months for migratory individuals and as long as twelve months for non-migratory birds. Pairs will raise one to three young per year (Katzner et al. 2020). This species can be found from sea level up to 11,500 feet in elevation with an average territory size of 22 mi^2. Open space is required for foraging activities and golden eagles will prey on lagomorphs and rodents as well as other small mammals, birds, reptiles, and some carrion (CDFW 2020).

Suitable habitat for golden eagles occurs within the Project with known occurrences in Big French Creek, Browns Creek, Canyon Creek, Coffee Creek, East Fork Trinity River, Lower South Fork Trinity River, Middle South Fork Trinity River, Lower Hayfork Creek, Stuart Fork, Swift Creek, Upper Hayfork Creek, and Weaver Creek HUC 10s (CDFW 2024d and USFS 2024a).

5.3.2 Effects Analysis

Potential pathways for effects to bald and golden eagles as a result of Project activities include the following:

- Death or injury of eagles due to felling an active nest tree;
- Loss of active nest site due to disturbance from construction noise and human activity during breeding season (adverse effects to reproductive success);
- Disturbance at post-fledging area due to activities associated with construction activities and human presence (adverse effects to fledgling survival); and
- Loss of habitat due to reduction of high canopy cover stands with large trees (adverse effects to nesting habitat).

5.3.2.1 Avoidance and Minimization Measures

The TRRP Master EIR requires protection of known bald eagle nest sites (RWQCB and Reclamation 2009). To this end, construction is planned to take place outside of the January 1 through July 31 window within 0.25 miles of any known bald eagle nest sites in the project area to all activities causing above-ambient loud and continuous noise (for >=2 hours per day) to avoid potential disturbance at these sites during the bald and golden eagle breeding season as described below. If work occurs within that window and within 0.25 mile of nesting eagles, MM AGBE-5 would be implemented. A SR has also been incorporated into the CMs to avoid disturbance to NSO during their breeding season. This would apply to activities manipulating NSO habitat or producing loud and continuous noise or smoke that could potentially disturb spotted owls. As a result, where/when the NSO SRs are applied, disturbance to breeding eagles would be reduced as their breeding seasons overlap. However, if NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix B of the EA.

The potential for adverse effects would be limited due to the following CMs:

- MMs could be applied when a known bald and/or golden eagle nest site is within the vicinity of the Project Activity Area and the local USFWS Field Office would be contacted to determine appropriate size and configuration of buffers when appropriate (USFWS 2007).
- AGBE-1: SR would be imposed from January 1 through July 31 within 0.25 mile of any known eagle nest sites in the project area to all activities causing above-ambient loud and continuous noise (for >=2 hours per day) to avoid potential disturbance during the eagle breeding season.
    - For smoke producing activities within 0.25 miles of active nests, employ firing techniques that provide good smoke dispersion and ventilation aloft and/or away from active nests.
    - If effects of smoke cannot be avoided or minimized within 0.25 miles of an active nest site, prescribed burning will be conducted outside the seasonal restriction period.
    - Seasonal restrictions may be lifted if surveys determine no nesting activity within 0.25 miles of proposed activities.
- NSO CMs, including seasonal restrictions would be implemented when applicable and the eagle breeding season largely overlaps with the NSO breeding season, thus the CMs would also help reduce disturbances to eagles.

The potential for adverse effects could be limited due to the following MMs (RWQCB and Reclamation 2009):

- AGBE-2: Prior to the start of construction, a qualified biologist would conduct a survey of the project site(s) to determine whether suitable nesting habitat for the species is present.
- AGBE-3: Construction would be scheduled to avoid the nesting season for eagles to the extent feasible.
- AGBE-4: Pre-construction surveys for nesting eagles will be conducted by a qualified biologist to ensure that no nests would be disturbed during project implementation.
- AGBE-5: If vegetation is to be removed by the project and all necessary approvals have been obtained, potential nesting habitat (i.e., trees) within 0.25 miles of a known eagle nest that would be removed by the project, would be removed before the onset of the nesting season, if feasible.

5.3.2.2 Effects Summary

Project activities may cause intermittent disturbance to bald and golden eagles within or near site-specific activity areas, and individual eagles may move away from activity areas temporarily during project implementation due to the presence of humans and equipment. However, State Route 299 runs along the Trinity River where anthropogenic influences like noise from cars and recreational areas are prevalent. Similarly, known occurrences of bald eagles are documented around Lewiston Lake and Trinity Lake where campgrounds, boat docks, and fishing activities occur throughout the year. Bald and golden eagles are observed in areas of regular human use indicating some habituation to disturbances and although some eagles may be affected by noise disturbance, the potential to cause mortality, harm, or significant disruption to normal behaviors of eagles, especially during their breeding season, is limited due to CMs and MMs. Effects to bald and golden eagles would be minor.

Large tree removal could affect eagle habitat; however it is intended to be fairly minimal: some large trees or snags may need to be removed from restoration sites if the tree/snag poses a hazard risk during construction operations; some trees may need to be removed for site access; and some tree removal may be necessary in upslope areas for watershed habitat enhancement. Trees removed would be salvaged to support: loose wood placement in both aquatic and upslope habitats; SLJs; and LTPBR techniques. It should be noted that wooded areas with old growth characteristics, where present, would be preserved to the extent possible. Potential effects to eagle habitat would be considered during the site-specific analysis and CMs would be incorporated to minimize effects.

Eagles could experience temporary effects during project implementation. However, there are extensive CMs and MMs to minimize long-term effects to these species. Noise disturbance from construction activities is most likely to cause effects, specifically nest failure, if proper CMs and MMs are not implemented. However, with implementation of nest surveys in suitable habitat, buffers, seasonal windows, and the alteration of construction activities when nests are observed within the vicinity of the project, the potential of effects to sensitive nesting raptors would be minimized.

The proposed action may affect individual bald and/or golden eagles, but potential effects to the reproduction and population demography of these species are limited and insignificant and would not cause a trend toward listing.

5.4 Pallid bat (*Antrozous pallidus*) and Fringed myotis (*Myotis thysanodes*)

5.4.1 Species Account

Pallid bats have a wide distribution throughout the western United States, and can be abundant in many arid, low elevation regions (Sherwin and Rambaldini 2005; California Department of Fish and Wildlife 2020). They occur throughout California except in the high elevation Sierra Nevada from Shasta to Kern counties, and the northwestern corner of the state from Del Norte and western Siskiyou Counties to northern Mendocino County (CDFW 2020). Summer roost sites are in cavities in live trees or snags, deep crevices in rock faces, caves, mines and bridges, and occasionally in open buildings (Baker et al. 2008). This species feeds primarily on the ground, commonly preying on crickets, grasshoppers, beetles and scorpions. They generally forage in open areas with limited ground cover (Rambaldini and Brigham 2011).

Wildlife databases show observations of pallid bats within the Project activity area including Canyon Creek, New River, Upper Hayfork Creek, Upper South Fork Trinity River, and Weaver Creek HUC 10 subwatersheds (CDFW 2024d and USFS 2024a).

Fringed myotis bats range from southern British Columbia south through southern Mexico, with an isolated population in the Black Hills of South Dakota and Wyoming. They are generally found between 3,000 and 5,000 feet in elevation but also inhabit lower elevations near coastal areas. This species is rare in California, but is found throughout the state, from the coast to 5,900 feet or greater in elevation in the Sierra Nevada (Keinath 2003). They occur within a broad range of vegetative types but are mostly reported to occur in pinyon juniper, oak, ponderosa pine, and mixed conifer forest types (Keinath 2004).

This species often forages along small streams (Pierson et al. 2001). Fringed myotis bats living in temperate forests must drink water shortly after emerging from their day roosts each evening and may require up to half their body weight in water each day depending on the type of prey consumed (Christy and West 1993; Keinath 2004). Consequently, they are generally found to roost in areas within close proximity to a water source, though the size and extent of that source can be highly variable. The limited information available on its diet indicates they consume primarily beetles, supplemented by moths and fly larvae captured in the air or on foliage (Keinath 2004). Fringed myotis are morphologically adapted to forage in areas of relatively high vegetative diversity such as interior forests and/or their edges, but not in wide openings such as clear-cuts or meadows where their chief prey taxa (coleopterans) would be less abundant (Pierson et al. 2001).

Fringed myotis will use caves, mines, and buildings as solitary day/night roosts and hibernacula. They may also use bridges and rock crevices as solitary day/night roosts (Christy and West 1993). Weller and Zabel (2001) found that many day and night roosts in northern California were under tree bark and in tree hollows, and medium to large diameter snags provided important day and night roosting sites for this species. However, Lacki and Baker (2007) found that fringed myotis in Oregon and Washington use trees/snags as roosts much less than previously reported and instead favored caves, mines, and buildings as solitary day and night roosts and hibernacula. Roosts in more permanent structures such as bridges and rock crevices elicit high roost fidelity compared to more temporary roosts such as trees and snags (Lewis 1995, Weller and Zabel 2001). Maternity colonies have been documented in caves, mines, abandoned buildings, bridges, and rock crevices, and can range in size from a few dozen bats to several hundred (Keinath 2004, Keinath 2003). Like many cave roosting species, fringed myotis colonies are susceptible to disturbance in hibernacula and maternal colonies. Few hibernacula have been well documented, but those that have are generally cool and usually in caves or mines with little temperature fluctuation throughout the winter (Keinath 2004, Keinath 2003). Fringed myotis tend to move to lower and more southerly hibernacula in the fall months (Keinath 2003) and may leave the project area entirely by the time these areas are treated.

Wildlife databases show observations of fringed myotis bats within the Project activity area. Records occur within the Canyon Creek, Lower South Fork Trinity River, Middle South Fork Trinity River, North Fork Trinity River, and Upper Hayfork Creek of the HUC 10 subwatersheds (CDFW 2024d and USFS 2024a).

5.4.2 Effects Analysis

Potential pathways for effects to pallid bats and fringed myotis as a result of Project activities include the following:

- Death or injury of bats due to felling roosting or hibernacula trees and/or during bridge replacements.
- Loss of active maternity colonies due to disturbance from construction noise and human activity during breeding season (negative effect to reproductive success).
- Loss of access to drinkable water from construction noise and human activity and reduction in water quality during project implementation (negative effect to behavior).
- Loss of habitat due to reduction of snags and large trees (negative effects to roosting/hibernacula sites).

5.4.2.1 Avoidance and Minimization Measures

Although harm to pallid bats and fringed myotis could potentially result from felling trees and snags and during bridge rehabilitation, CMs are in place to reduce potential harm to these species. CMs specific to caves, mines, bridges, and bats are described in the STNF Forest Plan and are described below and included in Appendix B of the EA. The SR to avoid disturbance to NSO during their breeding season would also reduce potential construction-related effects to bats roosting in trees, as well as noise/smoke disturbance to pallid and fringed myotis bats during their breeding seasons, where/when it is applied.

The potential for adverse effects would be limited due to the following CMs (USFS 1995):

- BAT-1: Surveys would be conducted of crevices in caves, mines, and abandoned wooden bridges and buildings for the presence of roosting bats.
- BAT-2: No noise-generating or habitat-modification activities (including timber harvest) will take place within 250 feet from caves, mines and mine adits to protect known or potential sensitive bat species (Townsend's big-eared bat, pallid bat, and fringed myotis) roost sites. Activities necessary to address safety threats (e.g. hazard trees to the road or operations) will prevail over this measure.
- BAT-3: Options for conducting burning around caves/mines could include the following:
    - Limit burning to outside the breeding season (do not burn March 1 through August 31); or
    - Burn under prevailing wind conditions that disperse smoke away from cave/mine entrances.

The potential for adverse effects could be limited due to the following MMs (RWQCB and Reclamation 2009):

- BAT-4: A pre-construction survey for roosting bats would be conducted prior to the start of construction activities.
- BAT-5: If an active maternity roost or hibernaculum is found, the project would be redesigned to avoid the loss of the tree or structure occupied by the roost, if feasible.

5.4.2.2 Effects Summary

Pallid and fringed myotis bats may use large trees, snags, bridges, caves, or mines in or near the Project activity area. Project activities may cause intermittent disturbance to pallid or fringed myotis bats and individual bats may move away from activity areas temporarily during project implementation due to the presence of humans and equipment. This may increase exposure to predation, but any increase in predation resulting from these activities is likely to be limited and short in duration. Bats may have limited access to water which could impact their survivability searching for water sources beyond their normal territory. However, in-channel activities would occur during the dry season (to correspond with reducing impacts to anadromous salmonids) and when water levels are typically low, reducing the likelihood of impacts to bats due to project activities. Potential

disturbance to bats is also limited by the CMs described above and the upper limits on activities to bridges annually. As a result, some bats may be affected by noise disturbance, bridge rehabilitation and in-channel activities, but the potential to cause mortality, harm, or significant disruption to normal behaviors of bats, especially during their breeding season, is limited and minor.

Habitat suitability may be negatively and positively affected by project activities. Cutting trees would remove some potential roost sites, however tree removal would be limited. Although trees and snags would be cut during project activities, they do not have the structure suitable for maternity colonies or hibernation. Therefore, disturbance of these structures may result in temporary displacement of bats to alternative day roost sites but is unlikely to impact breeding or hibernating individuals or breeding habitat. Clearing riparian areas of nonnative vegetation could provide open areas for pallid bats supporting greater foraging opportunities in open landscapes temporarily until native vegetation is planted and reoccupies the project area. CMs for the project include buffering project activities, including timber harvest, near bat hibernacula and maternity colonies reducing effects to bats.

Furthermore, bats are unlikely to be affected during foraging activities due to construction constraints with planned daylight working hours, reducing likelihood that noise or human disturbance would affect bat foraging behavior. Seasonal construction timing (autumn) is also conducive to when bats tend to move to a more southerly hibernacula, reducing likelihood that bat hibernacula and maternity colonies would be affected within the summer months.

The Proposed Action may affect individual pallid and fringed myotis bats, but potential effects to the reproduction and population demography of these species is limited and insignificant and would not cause a trend toward listing.

5.5 Townsend's big-eared bat (*Corynorhinus townsendii*)

5.5.1 Species Account

This species occurs in the western and southeastern United States and in southern British Columbia, with isolated populations on the Southern Plains and southward to Mexico. It is found throughout California from low desert to mid elevation montane habitats and is most abundant in mesic habitats (Zeiner et al. 1990). It occupies a variety of habitats ranging from coniferous forests and woodlands to deciduous riparian woodlands, semi-desert and montane shrub habitats. Townsend's big-eared bats are strongly correlated with the availability of caves and cave-like roosting habitat, although they occasionally make use of man-made structures such as abandoned buildings and bridges (Zeiner et al. 1990). Townsend's big-eared bats are very sensitive to disturbance at roost sites and may abandon sites following a single disturbance (Zeiner et al. 1990). This species feeds primarily on small moths. It prefers foraging along edges of riparian vegetation where conifers and deciduous riparian species support lepidopteran prey species and tends to avoid foraging in open areas (Fellers and Pierson 2002, Gruver and Keinath 2006).

Townsend's big-eared bat occurs within Trinity County with documented observations in the following HUC 10's: Swift Creek-Trinity River, Weaver Creek-Trinity River, Lower Hayfork Creek, Upper Hayfork Creek, Stuart Fork, and Middle South Fork Trinity River (CDFW 2024d and USFS 2024a).

5.5.2 Effects Analysis

Sensitive bat species within the Project may be affected by project activities and include the potential for death or injury to individuals through removal of hibernacula or maternity colonies if disturbed during project activities. Individuals occupying bridge structures have a high potential for disturbance during bridge replacement activities and harassment or injury of individuals could occur. Bats are sensitive to disturbance and therefore construction noise or human presence could cause a bat to abandon a site reducing future site fidelity, impacting behavior and causing adverse effects. Townsend's big-eared bats are at a greater risk due to their use of riparian habitat for foraging. When restoration activities occur within riparian areas, foraging behavior could be altered leading to inadequate energy intake contributing to reduced survivability.

Potential pathways for effects to Townsend's big-eared bat as a result of Project activities include the following:

- Death or injury of bats due to bridge replacement activities.
- Loss of active maternity colonies due to disturbance from construction noise and human activity during breeding season (negative effect to reproductive success).
- Loss of access to foraging habitat from construction noise and human activity and removal of riparian vegetation during project implementation (negative effect to behavior).

5.5.2.1 Avoidance and Minimization Measures

The potential for adverse effects would be limited due to the following CMs (USFS 1995):

- BAT-1: Surveys would be conducted of crevices in caves, mines, and abandoned wooden bridges and buildings for the presence of roosting bats.
- BAT-2: No noise-generating or habitat-modification activities (including timber harvest) will take place within 250 feet from caves, mines and mine adits to protect known or potential sensitive bat species (Townsend's big-eared bat, pallid bat, and fringed myotis) roost sites. Activities necessary to address safety threats (e.g. hazard trees to the road or operations) will prevail over this measure.
- BAT-3: Options for conducting burning around caves/mines could include the following:
    - Limit burning to outside the breeding season (do not burn March 1 through August 31); or
    - Burn under prevailing wind conditions that disperse smoke away from cave/mine entrances.
- In riparian areas, activities are designed to create ecological conditions that are more resilient over the long-term. Therefore, certain activities would help protect remaining habitat and enhance future habitat.

The potential for adverse effects could be limited by employing the following MMs (RWQCB and Reclamation 2009):

- BAT-4: A pre-construction survey for roosting bats would be conducted prior to the start of construction activities.
- BAT-5: If an active maternity roost or hibernaculum is found, the project would be redesigned to avoid the loss of the tree or structure occupied by the roost, if feasible.

5.5.2.2 Effects Summary

Townsend's big-eared bats may use buildings, bridges, caves, or mines near the Project activity area. All potential adverse effects listed above would be minimized with Project CMs and MMs. Surveys for bats would occur at caves, mines and bridges within 250 feet of project areas prior to construction activities and construction plans would be altered if sensitive bat species were encountered. Furthermore, bats are unlikely to be affected during foraging activities due to construction constraints with planned daylight working hours, reducing likelihood that noise or human disturbance would affect bat foraging behavior. Seasonal construction timing (autumn) is also conducive to when bats tend to move to a more southerly hibernacula, reducing likelihood that bat hibernacula and maternity colonies would be affected within the summer months. In addition, there are extensive CMs for riparian areas, as well as for caves, mines, bridges and bats (Appendix B of the EA). As a result, effects to Townsend's big-eared bats would be minor.

The Proposed Action may affect individual Townsend big-eared bats, but potential effects to the reproduction and population demography of this species is limited and insignificant and would not cause a trend toward listing.

5.6 Pacific/American marten (*Martes caurina;* aka *M. americana*)

5.6.1 Species Account

Martens are closely associated with late-successional conifer forests with closed canopies and abundant, complex physical structure at or near the ground. They tend to use higher elevation forest above 4,500 feet and multi-storied mature and old growth conifers (white fir/red fir). Abundant slash, rotten logs, and stumps that provide cover and den sites are preferred habitats (Buskirk and Zielinski 1997; Krohn et al. 1997; Small et al. 2003). Abundant downed woody material also provides protection from predators, access to the subnivean (under snow) environment for hunting and resting, and thermal protection from heat and cold (Ruggiero et al. 1994). Lower branches of live trees, tree boles of all age/decay classes, coarse woody debris, shrubs and rock fields/talus slopes and caves can all contribute to structural requirements (Buskirk and Zielinski 1997). Late-successional habitat provides marten with rest and den sites they require, as well as higher density of preferred prey species (Kirk 2007). Martens eat primarily small mammals, lagomorphs, and birds, but also insects, fruit, and carrion opportunistically (Powell et al. 2003). Accounts of home range sizes in the scientific literature for this species vary widely (Stone 2010). Home ranges in the Sierra Nevada Mountains in largely unlogged forest landscapes averaged 1.2–1.9 mi^2 for males and 1.2–1.5 mi^2 for females, and similar home range estimates were reported in coastal areas of California and Oregon (USDI Fish and Wildlife Service 2015).

Databases show documented occurrences of Pacific/American martens within the Project activity area in HUC 10 subwatersheds including Coffee Creek, East Fork Trinity River, Middle South Fork Trinity River, Stuart Fork, Swift Creek, Tangle Blue Creek, Trinity River, Canyon Creek, and Weaver Creek (CDFW 2024d and USFS 2024a).

5.6.2 Effects Analysis

Potential pathways for effects to martens as a result of Project activities include the following:

- Death or injury of martens due to vegetation and dead/downed log removal of an active den site.
- Death and injury of martens due to the felling of standing trees.

- Loss of active den site due to disturbance from construction noise and human presence during breeding season (negative effect to reproductive success).
- Reduction in foraging habitat and resting areas due to reduction and removal of large hazard trees or large trees necessary to create course woody debris for restoring aquatic habitats (negative effects to prey and protection from predators).

5.6.2.1 Conservation Measures

A SR has been incorporated into the CMs to avoid disturbance to NSO during their breeding season. These protection measures, when/where they are applied, would also decrease potential construction-related effects to martens during their denning season. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix B of the EA.

The potential for adverse effects would be limited due to the following CMs (USFWS 2025):

- Within NSO nesting, roosting, and foraging habitat, NSO CMs would be implemented when applicable. Marten habitat largely overlaps with NSO suitable habitat, thus the CMs would also help reduce disturbances to martens and help retain marten habitat.
- Protection measures, including general wildlife conservation measures (WL-1 through WL-17) as outlined in Appendix B (Environmental Commitments) would minimize effects to martens.
- Activities are designed to create ecological conditions that are more resilient over the long-term. Therefore, certain activities would help protect remaining habitat and enhance future habitat.

5.6.2.2 Effects Summary

If martens do use the higher elevations in the Project activity area, project activities may cause intermittent disturbance to martens within or near work areas, and individual martens may move away from work areas temporarily during project implementation due to the presence of humans and equipment. Intermittent disturbance may cause some shifting of foraging or resting behavior, but it is unlikely to be sufficiently adverse to lead to disturbances in breeding behavior for this species due to the scale of site-specific projects and the upper limits on proposed activities.

Reduction in habitat is unlikely to occur due to the nature of the restoration project which focuses on enhancing future aquatic and riparian habitat and decommissioning of roads. Furthermore, large tree removal is intended to be fairly minimal: some large trees or snags may need to be removed from restoration sites if the tree/snag poses a hazard risk during construction operations; some trees may need to be removed for site access; and some tree removal may be necessary in upslope areas for watershed habitat enhancement. Trees removed would be salvaged to support: loose wood placement in both aquatic and upslope habitats; SLJs; and LTPBR techniques. It should be noted that wooded areas with old growth characteristics, where present, would be preserved to the extent possible. Potential effects to marten habitat would be considered during the site-specific analysis and CMs would be incorporated to minimize effects. In addition, CMs for NSO limit tree removal and prevent NSO suitable habitat from being removed or downgraded, which would also help retain marten habitat.

The proposed action may affect individual martens, but potential effects to the reproduction and population demography of this species is limited and insignificant and would not cause a trend toward listing.

5.7 Fisher (*Pekania pennanti*) & Ringtail (*Bassariscus astutus*)

5.7.1 Species Account

Fishers in western North America are often associated with complex vertical and horizontal structural elements typical of late-successional forests, including large trees, snags, logs, and dense canopy (Raley et al. 2012). At a landscape scale, fisher typically occupy a mosaic of forest types and seral stages, generally with high proportions of mid- and late-seral forest and low proportions of open or non-forested habitats. They appear to be obligate cavity users for reproduction, relying on cavities to moderate temperature extremes and provide security for kits from potential predators. They use cavities in live trees or snags to give birth and raise their young (Aubry and Raley 2006; USFWS 2016a). There is a strong association with hardwoods, particularly black oaks with large-enough cavities that allow for entry of fisher but preclude predators (Zielinski et al. 2004). Mast-producing black oak and tanoak are important for fisher and their prey, particularly along riparian areas (Yaeger 2005). Fishers are relatively large and opportunistic predators. They forage primarily on small mammals, lagomorphs, and birds, but will also eat insects, fruit, carrion, and other items (Powell et al. 2003).

Fishers are closely associated with drainage bottoms (Yaeger 2005) and riparian areas, usually selecting resting and denning sites within 300 to 500 feet, and rarely more than 1,100 feet, from water (Self and Kerns 2001). Riparian areas provide important rest site elements, such as broken tops, large snags, and large down wood (Seglund 1995). In forest types subject to frequent fires that remove woody structures near the ground, fishers are closely associated with riparian areas (Powell et al. 2003), which typically do not burn as often.

Accounts of home range sizes in the scientific literature for this species are highly variable (USDI Fish and Wildlife Service 2014). Zielinski et al. (2004) found average home range size for female fishers in northern California of 980.5 ha (2,422 ac), while males ranged over larger areas (9,722 ac). As a result, home ranges in the project area are likely to be small compared to those reported in some other parts of this species' range.

Wildlife databases show Pacific fisher observations in all HUC 10 subwatersheds in the Project activity area (CDFW 2024d and USFS 2024a).

Ringtails are found on the lower western slope of the Sierra Nevada as well as the Pacific slopes of the Coast Range from west of mount Shasta south to Ventura County in California (Belluomini 1980). Their range extends from southwestern Oregon throughout the west to eastern Kansas including California, southern Nevada, Utah, Colorado, Arizona, New Mexico, Oklahoma, Texas, Baja California, and northern Mexico (Goldberg 2003). This species occurs in habitats including rocky outcroppings, canyons, or talus slopes. They may utilize chapparal, and riparian areas and are typically found near a consistent water source. They will use the hollows of trees or abandoned wooden structures, rock recesses, logs, snags, abandoned burrows, or woodrat nests as nesting sites. Ringtails can occupy habitat in elevations up to 9,500 feet, however, they typically use elevations up to approximately 4,500 feet (AWD 2024). Their home range size can vary and with males typically using a larger home range than females from 109-1,280 acres (CDFW 2020).

Ringtails have a gestation period of 45-50 days and mate in the spring. The male will procure food for the female during gestation and the female can produce two to four kits in a litter. After one month, the cubs can open their eyes and begin to hunt for themselves around 4 months of age. Sexual maturity comes at ten months (Belluomini 1980).

The ringtail is omnivorous and an opportunistic feeder relying on insects, fruits, and berries in addition to birds and mammals. Seasonal variation occurs within their diet with insects making up the majority of the diet during summer and fall while mammals, birds, and carrion are more common in the winter and spring seasons (Belluomini 1980).

Ringtails are documented within the Project in Big French Creek, Lower Hayfork Creek, Middle South Fork Trinity River, Stuart Fork, Swift Creek Trinity River, Upper Hayfork Creek, and Weaver Creek (CDFW 2024d and USFS 2024a).

5.7.2 Effects Analysis

Fishers and ringtails are closely tied to riparian areas (or permanent water sources [ringtail]) for denning, and resting sites and effects from project restoration activities could result in death or injury of individuals and abandonment of den sites through construction activities, leading to loss of den sites during project implementation. Fishers and ringtails could also lose their den sites through presence of heavy equipment with the removal of rocky outcroppings, downed wood, and human disturbance at a site.

Potential pathways for effects to fishers and ringtails as a result of Project activities include the following:

- Death or injury due to felling a tree or moving/removing a log with an occupied den (adverse effects to reproductive success).
- Death of injury to ringtails due to the removal of rocky outcroppings with an occupied den (adverse effects to reproductive success).
- Loss of an active den or nest site due to construction and noise disturbance of a den tree in the vicinity of a project during breeding season (adverse effects to reproductive success).
- Reduction in denning or nesting habitat and resting areas due to reduction and removal of riparian vegetation and woody debris (adverse effects to behavior and predator avoidance).

5.7.2.1 Avoidance and Minimization Measures

A SR has been incorporated into the project avoidance and MMs to avoid disturbance to NSO during their breeding season. These protection measures, when/where they are applied, would also decrease potential construction-related effects to fishers and ringtails during their denning season. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix B of the EA.

The potential for adverse effects would be limited due to the following CMs (USFWS 2025):

- Within NSO nesting, roosting, and foraging habitat, NSO CMs would be implemented when applicable. Fisher and ringtail habitat can overlap with NSO suitable habitat, thus the CMs would also help reduce disturbances to fishers and ringtails and would help retain suitable habitat.
- Activities are designed to create ecological conditions that are more resilient over the long-term. Therefore, certain activities would help protect remaining habitat and enhance future habitat.

The potential for adverse effects to fishers or ringtails could be limited due to the following MMs (RWQCB and Reclamation 2009):

- MRCF-1: A pre-construction survey for ringtails will be conducted prior to the start of construction activities. The survey will be conducted by a qualified biologist. No activities that would result in disturbance to active dens of ringtails will proceed prior to completion of the surveys. If no active dens are found, no further action is needed. If a ringtail den is present, Minimization Measure MRCF-2 will be implemented.
- MRCF-2: If an active ringtail nest is found, the project will be redesigned to avoid the loss of the tree occupied by the nest if feasible. If the project cannot be redesigned to avoid removal of the occupied tree, demolition of that tree will commence outside of the breeding season (February 1 to August 30). If a non-breeding den is found in a tree scheduled to be removed, the individuals will be safely evicted under the direction of a qualified biologist. Trees with dens that need to be removed will first be disturbed at dusk, just prior to removal that same evening, to allow ringtails to escape during the darker hours.

5.7.2.2 Effects Summary

Project activities may cause intermittent disturbance to fishers and ringtails within or near work areas, and individual fishers or ringtails may move away from activity areas temporarily during project implementation due to the presence of humans and equipment. Due to the large home range and foraging habits of these species and the relatively small footprint of the proposed activities, individuals may experience slight changes to their foraging patterns, but project effects are unlikely to negatively impact the ability of fishers or ringtails to successfully forage or disperse across the project area. Intermittent disturbance may cause some shifting of resting behavior, but it is unlikely to be sufficiently adverse or lead to disturbances in breeding behavior for these species.

NSO nesting/roosting habitat would have the highest likelihood of fisher and ringtails use during the reproductive season, as these areas contain the highest canopy closure, highest amounts of snags, large trees, and large downed logs which provide potential areas for denning. Rock outcroppings and cliffs could also provide denning habitat specifically for ringtails. The fisher breeding season in California and Oregon generally occurs from late February through early April. Females typically give birth to kits from early March to early April, with variations depending on weather and habitat conditions (Lofroth et al. 2010). Young are mobile and capable of normal locomotion by 10-12 weeks of age (Aubry and Raley 2006). Therefore, by early July to early August, kits are old enough to move away from a source of noise or smoke disturbance. Ringtail cubs are often born between May and June and are mobile within one month (CDFW 2020). Therefore, where/when the NSO SRs are applied, most Project activities would occur after fisher and ringtail young are out of the den and mobile.

Habitat suitability could be adversely affected by cutting and removal of large trees, which would reduce canopy cover and abundance of large trees, as well as reducing course woody debris. Trees removed would be salvaged to support: loose wood placement in both aquatic and upslope habitats; SLJs; and LTPBR techniques. It should be noted that wooded areas with old growth characteristics, where present, would be preserved to the extent possible. These activities would potentially affect habitats beneficial to fisher and ringtails and their prey species. However, CMs for NSO limit tree removal and prevent NSO suitable habitat from being removed or downgraded, which would also help retain fisher and ringtail habitat. Furthermore, CMs outlined in the EA state that existing large wood would be retained at a rate of at least five logs/acre ensuring nutrient cycling.

Although some individuals may be affected by noise disturbance, the potential to cause mortality, harm, or significant disruption to normal behaviors of these species, especially during their breeding season, is limited

and would be minor due to Project timing and avoidance and minimization measures. The Project may affect individual fishers and ringtails, but potential effects to the population demography of this species are very limited and insignificant and would not cause a trend toward listing.

5.8 Northwestern pond turtle (*Actinemys marmorata*) & California mountain kingsnake (*Lampropeltis zonata*)

5.8.1 Species Accounts

Western pond turtles range from northwestern Baja California, Mexico, north to the Puget Sound in Washington. It is generally restricted to areas west of the Sierra Nevada and Cascade Mountains (Rosenberg et al. 2009). Northwestern pond turtles (NWPT) range diverges from the southwestern pond turtle range along the western edge of southern central valley of California and occupies areas along the coast north of the San Franscisco Bay including portions of Washington, Oregon, Nevada and northern and central California. In California, the range includes areas of the Coast Range from the Oregon-California border down to northern Monterey County, the lower elevation and foothills of the southern Cascades and Sierra Nevada Mountains, and areas within the Sacramento and San Joaquin Valleys (USFWS, 2023). Western pond turtles occur in a variety of habitat types associated with permanent or nearly permanent water. They concentrate in ponds and low flow regions of rivers and creeks such as side channels and backwater areas, and prefer creeks that have deep, still water and sunny banks. Basking sites such as rocks and floating or partially submerged logs are important habitat components. Western pond turtles are omnivorous, but their diet typically consists primarily of insects, crayfish, carrion, and other aquatic invertebrates (Jennings and Hayes 1994, Holland 1994, Wilson et al. 1991).

During the spring or summer females may travel away from ponds to find sites suitable for nesting, although the travel distance to most nest sites is less than 984 feet (300 meters). Dry grassy areas are often used as nest sites. Young emerge the following spring (March-April) and travel from nest sites to watercourses (Jennings and Hayes 1994, Holland 1994). In warm climates they may be active year-round, but in colder areas they hibernate during winter in muddy bottoms or upland areas, including forests. Upland hibernation sites were found up to 1,640 feet (500 meters) from aquatic habitats (Jennings and Hayes 1994, Reese and Welsh 1998). Therefore, the analysis area for this species extends out 1,640 feet (500 meters) from aquatic areas within activity zones.

Western pond turtles were first petitioned for listing by the Center for Biological Diversity on July 11, 2012, with 53 other species. In June 2014, a publication was sent to USFWS by the Center for Biological Diversity recommending that the western pond turtle be split into two separate species. On April 10, 2015, the 90-day findings indicated that the listing may be warranted and on October 3, 2023, USFWS proposed to list the northwestern pond turtle as a threatened species. There has been no designation of critical habitat for this species (88 FR 68370).

In the STNF, NWPTs are known to occur in Trinity Lake, Lewiston Lake, the Trinity River, South Fork Trinity River, Hayfork Creek and other tributaries as well as numerous ponds/lakes. Wildlife databases show occurrences within Canyon Creek, Swift Creek, Stuart Fork, Weaver Creek, Big French Creek, Lower South Fork Trinity River, Middle South Fork Trinity River, Lower Hayfork Creek, Upper Hayfork Creek, Upper South Fork Trinity River, Browns Creek, and Tangle Blue Creek (CDFW 2024d and USFS 2024a).

California mountain kingsnake is designated as a BLM sensitive species and ranges from the southern Sierra Nevada Mountains north to the Coast Ranges north of Monterey Bay, California, north into the Klamath Mountains in Oregon, with a disjunct population occurring along the Columbia Gorge in Washington. It occupies elevations from sea level up to around 8,000 feet or higher in southern mountain ranges and can grow twenty to fifty inches long. This species inhabits a diverse array of ecosystems including coniferous forest, oak-pine woodlands, riparian woodland, chaparral, manzanita, and coastal sage scrub. They tend to be found near streams with rocky outcroppings, talus or rotting logs that have exposure to sunlight (Lockington ex Blainville 1876). California mountain kingsnakes actively forage for their prey and will consume lizards, skinks, mammals, and birds. Juveniles typically feed on lizards and skinks (Greene and Rodriguez-Robles 2003). This species can be crepuscular, nocturnal, or diurnal depending on daytime and nighttime temperatures for thermoregulation (Lockington ex Blainville 1876).

Documented reproduction of the California mountain kingsnake is described to occur during the spring and summer months. Mating occurs between the months of April and May with the laying of three to nine eggs in June and July in loose, well-aerated soils and under rocks or other cover objects like decaying logs (CDFW 2020). Hatching typically takes place in August (Goldberg 1995).

In the Project area, the California mountain kingsnake has documented occurrences within Lower South Fork Trinity River (CDFW 2024d and USFS 2024a).

5.8.2 Effects Analysis

During restoration activities, road decommissioning, or bridge replacements there is the potential to cause death or injury of individuals with the use of heavy machinery working within and near waterways as well as upland areas. Eggs or individuals could be missed during preconstruction surveys and harmed or killed. Potential contamination from spills or heavy machinery could occur affecting individuals. Introduction of sediment into a water system could negatively affect NWPT, however, turbidity caps have been issued to keep sedimentation effects below a level that could potentially reduce survivability of this species within the ecosystem. California mountain kingsnake could be affected by project activities such as road decommissioning and bridge repair.

In terms of hydroacoustic noise, little is known regarding the hearing sensitivity of reptiles and potential for acoustic trauma (hearing loss, ruptured internal organs, modification of behavior, etc.) in NWPT. Recent research shows turtles may experience acoustic or hydroacoustic (below water) exposure to noise greater than 100 dB and construction-related vibration with variations in recovery (Salas et al. 2023). Construction-related activities that generate 100 dB or higher (e.g., pile driving and blasting) or vibration (e.g., installation of large wood structures with a vibratory hammer) would be considered to determine effects to NWPT for site-specific activities. It is expected that construction activities with the potential to produce noise levels that could result in acoustic trauma for NWPT could be subject to additional CMs when the listing status is finalized.

Potential pathways for effects to NWPTs and the California mountain kingsnake as a result of Project activities include the following:

- Injury or mortality of reptiles and their eggs at nest sites from construction activities within Riparian Reserves or upland habitat (negative effect to population abundance and reproduction).
- Disturbance and displacement due to work activities within upland, riparian, wetland, and in-channel areas.

- Temporary habitat degradation and potential exposure of reptiles to chemicals, dewatering, exhaust, and fugitive dust.
- Habitat degradation from increased turbidity within a pond, river, stream, or tributary due to construction activities.
- Injury or mortality of reptiles due to species salvage and translocation (negative effect on population abundance and range).
- Stress, injury, or mortality of reptiles from pile driving and blasting activities in or near waterways.

5.8.2.1 Avoidance and Minimization Measures

Due to the proposed listing of the NWPT, coordination with the USFWS would occur if the species were to be listed under the ESA to develop environmental commitments for projects implemented under this EA. To reduce potential effects to the species, conservation measures are described below and outlined in the USFWS Statewide Restoration BiOp. The CMs described are based on the reissuance of the USFWS Statewide Restoration BiOp on February 7, 2025, and formally include the NWPT. In addition, CMs specific to the effects of hydroacoustic noise may be addressed during future consultation. For full details on CMs for NWPT see Appendix B of the EA. There are no CMs outlined for the California mountain kingsnake in the USFWS Statewide Restoration BiOp, however CMs protecting NWPT could in turn help protect the California mountain kingsnake.

When/where the NSO SRs are applied, they would decrease potential construction-related effects to this species during its breeding seasons as well as to adult and young NWPTs as they disperse from nesting areas. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix B of the EA.

The potential for adverse effects would be limited due to the following CMs for the NWPT (USFWS 2025):

- WPT-1: A Qualified Biologist would survey and flag the work area for suitable overwintering habitat (e.g. leaf litter layer under trees and shrubs) or nesting habitat to avoid.
- WPT-2: Before construction activities occur, a Qualified Biologist would search all suitable aquatic habitat in the project area a minimum of three times during appropriate weather conditions (e.g. sunny periods between 8am to 12pm, and from 3pm until an hour before dusk; air temperatures 55.0-90.0 degrees Fahrenheit; wind speeds less than 12.0 mph).
- WPT-3: For project areas where the northwestern pond turtle is known or assumed to occur, avoid work during the following windows. For project activities that involve in-water/dewatering work, work will be avoided from October 1 to March 31. For all work window stipulations see Appendix B of the EA.
- WPT-4: Fencing and/or monitoring will be used to protect western pond turtles and will be implemented in coordination with a Qualified Biologist. If the project site is suitable for fencing, the USFWS requires an Exclusion Fencing Plan, and Qualified Biologist will determine where environmentally sensitive area fencing will be installed to protect western pond turtle habitat adjacent to the proposed project footprint.
- WPT-5: Western pond turtles will only be captured and relocated when it is the only option to prevent injury or mortality, and after all attempts to avoid interactions with the species have been used.
- WPT-6: Maintain existing basking structures (e.g. logs, rocks, shorelines, emergent vegetation, algal mats, and substrate) adjacent to aquatic habitat whenever possible. Avoid planting trees and shrubs

that would shade suitable basking habitat and maintain an open riparian canopy to allow sufficient solar exposure for basking. Install basking structures as necessary for any basking habitat that is removed.

- WPT-7: Avoid planting trees and shrubs that would shade suitable nesting habitat if nesting habitat is limited near the project area.

5.8.2.2 Effects Summary

Project activities may cause disturbance, injury or death to individual NWPTs and California mountain kingsnakes using suitable habitats in or near activity areas. To reduce impacts, the project would incorporate NWPT CMs (WPT-1 – WPT-7) into restoration activity planning, design, and implementation to conserve habitat, individuals, and populations. During the implementation of NWPT CMs, the California mountain kingsnake will likely benefit from survey efforts and if individuals are encountered, they would be avoided. Effects to riparian habitat and environmentally sensitive areas would be minimized by identifying and flagging, in the field, areas to be protected during construction activities reducing the potential for reduction of shaded riverine aquatic habitat and reducing the potential for harm or disturbance to pond turtle nests. Riparian revegetation activities would occur to enhance and maintain functional habitat and would result in no net loss of riparian habitat and jurisdictional wetlands decreasing the likelihood that NWPTs or California mountain kingsnakes would lose suitable habitat. As a result, the potential to cause mortality or significant disruption to normal behavior and suitable habitat of these species would be limited.

Project design guidelines for restoration activities are focused on enhancement of anadromous salmonid habitat. Long-term restoration goals of enhancing salmonid habitat correlates closely with NWPT habitat enhancement including restoring structural features such as cover objects and basking logs and working towards maintaining natural flow regimes to address water temperature, flow velocities, and water depths within the Trinity River (Reese and Welsh 1998). Temporary effects from project activities would be minor and long-term beneficial effects are expected to occur post-project implementation.

The Project may affect, is likely to adversely affect Northwestern pond turtle because many of the proposed activities would occur in habitat suitable for this species. The Project may affect individual California mountain kingsnakes, but potential effects to the population demography of this species are very limited and insignificant and would not cause a trend toward listing.

5.9 Foothill yellow-legged frog (*Rana boylii*), Cascades Frog (*Rana cascadae*), & Coastal giant salamander (*Dicamptodon tenebrosus*)

5.9.1 Species Account

Foothill yellow-legged frogs are found in or near permanent rocky streams in a variety of habitats, including ponderosa pine, mixed conifer, and mixed chaparral. They are highly aquatic, spending most or all of their life in or near streams. They require shallow, flowing water, and display an apparent preference for small to moderate-sized streams with at least some cobble-sized substrate (Jennings and Hayes 1994). They breed in shallow, slow flowing water with partial shading. Insects are likely the primary food source for adults. Adult foothill yellow-legged frogs are often seen breeding in pools on the main stem of the Trinity River in spring and moving to basking and foraging sites in the tributaries in the summer (Wheeler et al. 2014, Jennings and Hayes 1994).

Mating and egg-laying occurs exclusively in streams and rivers (not in ponds or lakes) from April until early July, after streams have slowed from winter runoff (Nafis 2000-2016). They are also known to occur in the South Fork Trinity River, Hayfork Creek and other tributaries. Home ranges are typically very small, but movements of up to 165 feet (50 meters) may occur during high water conditions (CDFW 2020).

Wildlife databases show foothill yellow-legged frog occurrences within every HUC 10 subwatershed along waterbodies creating a high likelihood that this species could be impacted as a result of Project activities (CDFW 2024d and USFS 2024a).

Cascades frogs range from Washington within the Cascade Mountains south to California where they occur in the Trinity Alps and to the east in Lassen National Forest. Cascade frogs are a montane aquatic invertebrate that require fresh water including mountain lakes, small streams, and ponds and meadows up to timberline. They are active during the spring and summer months and burrow into muddy bottoms of streams and ponds during the winter months for hibernation (USFWS 2024). During the non-breeding season, adults will use open, sunny areas, often along shorelines for basking and foraging opportunities. This species are generalists, and their diet typically consists of aquatic and terrestrial insects as adults though they have been found to prey on Pacific chorus frogs and conspecifics (Pope et al. 2014).

Reproduction cycle for the Cascade frogs occurs from late-May to mid-August in shallow still waters including stream pools, lake margins and clear mountain ponds. Eggs are laid typically in fish free waters and take eight to twenty days to hatch, with larvae developing over three months to metamorphose by late-August or early-September (CDFW 2020).

Wildlife databases have documented occurrences of Cascades frogs in Tangle Blue Creek, East Fork Trinity River, Swift Creek, Coffee Creek, Stuart Fork, Canyon Creek, and North Fork Trinity River (CDFW 2024d and USFS 2024a).

The **coastal giant salamanders'** range extends along the western coast of North America from southwestern British Columbia, through the Cascade and Coast Ranges, to northern California and Trinity County and occupies elevational ranges from sea level to 7,000 feet. This species can grow up to 13 inches long (Baird and Girard 1852) and some individuals remain aquatic for the entirety of their lifespan while others will transform from larvae into terrestrial adults (Johnston 2004). They spend most of their lives in and adjacent to one stream. They require cool, fast-flowing, and well-oxygenated streams with step-pool morphology with sufficient cover for hiding (i.e. rocks, and debris) and are typically found within fifty meters of a water source. Coastal giant salamander larvae require small, shallow pools with cover and substrate crevices while terrestrial salamanders inhabit moist forested areas with ample cover for hiding.

These salamanders will sit and wait for their prey to come within proximity of reach and will lunge quickly to grab their prey with their mouth. They will consume anything that they can overpower and fit in their mouth including invertebrates such as insects, worms, and snails as well as vertebrate species such as rodents, lizard, snakes, and other salamanders. Larvae will consume aquatic insects, mollusks, crayfish, and small fish (Baird and Girard 1852).

In order to reproduce, adult individuals must move from their terrestrial hiding places to a stream. Courtship takes place in a water-filled nest chamber beneath logs or rocks where the female will then deposit an entire clutch of 135 to 200 eggs within the nest chamber typically in May (Nussbaum et al. 1983). The female protects

her eggs for up to seven months. Due to the ample care of eggs and territorial behavior, females only breed once every two or more years (Baird and Girard 1852).

Documented occurrences of coastal giant salamanders occur in Weaver Creek, Big French Creek, Canyon Creek, Swift Creek, Tangle Blue Creek, Upper Hayfork Creek, and Browns Creek HUC 10 subwatersheds.

5.9.2 Effects Analysis

Potential pathways for effects to the coastal giant salamander, foothill yellow-legged and Cascades frogs as a result of Project activities include the following:

- Injury or mortality of amphibians and their eggs at nest sites from construction activities within Riparian Reserves (negative effect to population abundance and reproduction).
- Disturbance and displacement due to work activities within riparian, wetland, and in-channel areas.
- Temporary habitat degradation and potential exposure of amphibians to chemicals, dewatering, exhaust, and fugitive dust.
- Habitat degradation from increased turbidity within a pond, river, stream, or tributary due to construction activities.
- Injury or mortality of amphibians due to species salvage and translocation (negative effect on population abundance and range).
- Stress, injury or mortality of reptiles from pile driving and blasting activities in or near waterways.

5.9.2.1 Avoidance and Minimization Measures

The USFWS Statewide Restoration BiOp has designated CMs for foothill yellow-legged frog populations that are listed as threatened or endangered under the ESA. The North Coast Distinct Population Segment (DPS) that occurs in Trinity County is not listed as an endangered or threatened species. However, general Amphibian Protection Measures relevant to the project activities could be implemented if the North Coast DPS is listed under the ESA within the life of the EA. CMs including AMP-1 through AMP-9 from the USFWS Statewide Restoration BiOp would minimize the effects to foothill yellow-legged frogs, coastal giant salamander and Cascades frog. For detailed information on amphibian CMs and MMs see Appendix B of the EA.

When/where the NSO SRs are applied, they would decrease potential construction-related effects to this species during its breeding season, as well as to other wildlife species during their breeding season. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix B of the EA. Furthermore, to reduce the intensity and effects from pile driving, max dB of 207 dB L_{EAK} and 203 dB $SEL_{CUMULATIVE}$ thresholds (or the most current thresholds accepted by NMFS) have been determined for the project to reduce injury to fish species within waterways. This max threshold will also protect reptiles from injury or mortality from underwater pressure and hydroacoustic effects. Blasting has similar hydroacoustic effects to pile driving and similar avoidance and minimization measures would be implemented to reduce effects to fish, providing protection measures for foothill yellow-legged frogs, Cascades frog, and coastal giant salamander. Avoidance and minimization measures for pile driving and blasting include (Sections 3.6.11 and 3.6.12 of the Fisheries Technical Report):

- Utilize vibratory hammers when considered an appropriate installation method according to site conditions.

- Design channel spanning bridge structures so that in-channel pile driving would not be required.
- Avoid installing 24-inch and larger piles when possible
- Pile driving would be performed during recommended in-water work window.
- TRRP personnel and implementors would coordinate with NMFS when blasting is determined to be unavoidable.
- Blasting would be performed during recommended in-water work windows.
- Accomplish pile driving and blasting in dry conditions utilizing dewatering techniques as necessary and without impeding fish passage to the extent possible.
- Incorporate attenuation methods into blasting activities as directed by NMFS (e.g., bubble curtain, isolation casing, and dewatered cofferdam).

The potential for adverse effects could be limited due to the following MMs throughout the duration of project implementation (RWQCB and Reclamation 2009):

- FYLF-4: If any construction in the Trinity River Mainstem, South Fork Trinity channels, or tributaries within the project boundary, would occur prior to August 1 of any construction season, a preconstruction survey for yellow-legged frog larvae and/or eggs would be conducted by a qualified biologist.
- FYLF-5: In the event that a yellow-legged frog individuals, larvae, or nests are observed within the construction boundary, the contractor would temporarily halt in-stream construction activities until the species has been moved to a safe location with suitable habitat outside of the construction limits.
- FYLF-6: Mitigation measures for addressing erosion and sedimentation and accidental spills would be fully implemented to mitigate for potential long-term impacts to dispersal habitat for the yellow-legged frog due to sedimentation and accidental spills.
- FYLF-7: The mitigation measure associated with the disturbance to riparian habitat would be fully implemented.

The potential for adverse effects would be limited due to the following CMs, if the North Coast DPS becomes an ESA-listed species within the lifespan of the EA and project implementation (USFWS 2025):

- FYLF-1: In areas where foothill yellow-legged frogs are known or assumed to occur, project activities in upland areas would be confined to August 1 through October 31.
    - For project activities in occupied aquatic breeding habitat that typically dries before the end of the autumn, grading and other disturbance will be confined to May 1 through November 15, and to when the breeding habitat feature (or portion of the feature where work would occur) has been dry for a minimum of 30 days before initiating work.
    - These frogs have a multi-year larval development stage and are present in aquatic breeding habitat year-round. Therefore, project activities in occupied aquatic breeding habitat that does not dry before the end of autumn will be confined to May 1 through November 15 and will require a USFWS-Approved capture and relocation plan prior to initiating grading and other disturbance in the aquatic breeding habitat. Dewatering sites will be located and timed to avoid and minimize adverse effects to instream flows and depletion of pool habitat.
- FYLF-2: Project activities would not result in long-term deleterious changes to water temperatures in occupied or potential habitat.

- FYLF-3: Any borrow sites used would be developed so that the topsoil is removed and piled at the base of the slope to act as a berm catching any sediment that may be transported downslope.

5.9.2.2 Effects Summary

Project activities may cause disturbance to individual foothill yellow-legged frogs, Cascades frogs, and coastal giant salamanders occupying suitable riparian habitats in or near activity areas. To reduce impacts, the project would incorporate foothill yellow-legged frog CMs if the North Coast DPS is listed under the ESA (FYLF-1 – FYLF-3), all MMs described above (FYLF-4 – FYLF-7), and pile driving and blasting avoidance and MMs listed above into restoration activity planning, design, and implementation to conserve habitat, individuals, and populations. Foothill yellow legged frog CMs and MMs would likely protect Cascades frogs and the coastal giant salamanders minimizing negative effects to these species as well.

Effects to riparian habitat and biologically sensitive areas will be minimized by identifying and flagging in the field areas to be protected during construction activities reducing the potential for reduction of shaded riverine aquatic habitat. Riparian revegetation activities would occur to enhance and maintain functional habitat and would result in no net loss of riparian habitat and jurisdictional wetlands decreasing the likelihood that amphibians would lose suitable habitat. As a result, the potential to cause mortality or significant disruption to normal behavior patterns of these species is limited.

Future positive effects could occur as a result of restoring aquatic systems to a more habitable state for amphibians. Project design guidelines for restoration activities are focused on enhancement of anadromous salmonid habitat. Long-term restoration goals of enhancing salmonid habitat correlates closely with amphibian habitat enhancement including restoring structural features such as cover objects including logs and gravel/rock and working towards maintaining natural flow regimes to address water temperature, flow velocities, and water depths within the Trinity River (Reese and Welsh 1998). Furthermore, providing slow moving pools where frogs and salamanders can breed successfully. Temporary effects from project activities would be minor and long-term beneficial effects are expected to occur post-project implementation.

The Project may affect individual foothill yellow-legged frogs, Cascades frog, and the coastal giant salamander but potential effects to the population demography of these species are very limited and insignificant with implementation of CMs and MMs and would not cause a trend toward listing.

5.10 Big Bar [Pressley] hesperian snail (*Vespericola pressleyi*) & Trinity bristlesnail (*Monadenia infumata setosa*)

5.10.1 Species Account

Big Bar hesperian snails inhabit conifer and/or hardwood forest habitat in permanently damp areas within 656 feet (200 meters) of seeps, springs and stable streams. Herbaceous vegetation and leaf litter are common habitat elements associated with this species. Woody debris and rock refugia near water are used by this species during dry and cold periods. Recommended protection measures include conserving favorable canopy cover, woody debris and herbaceous vegetation in suitable habitats (USDI Bureau of Land Management 1999, Duncan et al. 1999, Roth 1984). This species is known primarily from the Big Bar area of the Trinity River but has also been found in limited locations in HUC 10 subwatersheds outlined below.

Trinity bristlesnails occupy areas along riparian corridors and uplands within Klamath mixed-conifer forests. Deciduous hardwood understory is a typical habitat trait where these snails are found. They also require plenty of leaf litter (depth of four inches), moss covered forest floors, and hard woody debris for cover. This snail can occasionally use dry sites that are not typically considered habitat; however, terrestrial gastropods are susceptible to thermal variances and depend on narrow temperature ranges. They will enter dormancy when their temperatures are too extreme and unfavorable for activity. They also rely heavily on the subterranean environment that provides the right temperature, humidity, and space for dispersing (Sullivan 2022).

Wildlife databases observations of Big Bar Hesperian snails occur within the Project activity area including Big French Creek, Lower Hayfork Creek, Lower South Fork Trinity River, Middle South Fork Trinity River, and Upper Hayfork Creek HUC 10 subwatersheds. Trinity bristlesnail are documented in Big French Creek, Upper Hayfork Creek, Lower Hayfork Creek, Middle South Fork Trinity River (CDFW 2024d and USFS 2024a).

5.10.2 Effects Analysis

Potential pathways for effects to Big Bar hesperians and Trinity bristlesnail as a result of Project activities include the following:

- Injury or mortality of snails from vegetation removal activities within forested areas (negative effect to population abundance and reproduction).
- Disturbance and displacement due to construction activities within forested areas near seeps and springs.
- Temporary habitat degradation and potential exposure, injury or mortality of snails to chemicals, exhaust, and fugitive dust.
- Habitat degradation from the removal of native vegetation, woody debris and leaf litter.

5.10.2.1 Avoidance and Minimization Measures

The potential for adverse effects would be limited due to the following CMs (RWQCB and Reclamation 2009):

- INV-1: Applicable ACS standards and guidelines outlined in the Master EIR would be followed including felling trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet coarse woody debris objectives.

The potential for adverse effects could be limited due to the following MMs (RWQCB and Reclamation 2009):

- INV-2: All MMs for vegetation would be implemented during project activities to ensure reclamation and retention of riparian vegetation.

5.10.2.2 Effects Summary

The Big Bar hesperian is known from several sites within the Shasta-Trinity National Forest and it is unlikely, based on Strategic Survey results, that there are additional significant populations (USDA and USDI 2007). Project activities may cause disturbance to individual Big Bar hesperian snails or Trinity bristlesnails within work areas in the HUC 10 subwatersheds mentioned above. However, the potential for habitat alteration/impacts is limited due to the scale of projects that are planned to be implemented and the nature of the project aiming at restoring ecosystem functions and reducing erosion around roads.

Both snails are closely associated with moist or wet forested habitats, and the avoidance and minimization measures incorporated into the technical report will minimize negative effects to these species. Maintenance and restoration activities would enhance species composition and structural diversity of plant communities including upland habitats. As a result, the potential to cause mortality or significant disruption to normal behavior patterns of snails is very limited.

In summary, potential effects to snails would be minor with effects to individuals with the implementation of extensive avoidance and minimization measures for riparian zones and best management practices with the retention of large wood, further reducing potential effects to these species and their habitat (Appendix B of the EA).

The proposed action may affect individual Trinity bristlesnails and Big Bar hesperian snails, but potential effects to the reproduction and population demography of these species is limited and insignificant and would not cause a trend toward listing.

5.11 Western bumble bee (*Bombus occidentalis*), & Monarch butterfly (*Danaus plexippus*)

5.11.1 Species Account

Western bumblebees are generalist foragers on pollen and nectar from a diverse array of plant species. They are commonly found in riparian habitats, meadows, and recently disturbed areas. Nests are often in abandoned rodent burrows, and less frequently in abandoned bird nests or open grassy areas (Evans et al. 2008, Koch et al. 2012, Xerces Society 2013). In studies in the Sierra Nevada, abundance of these bees was influenced positively by the presence and proportion of meadows in surrounding habitat, in addition to meadow wetness (Hatfield and LeBuhn 2007).

This species inhabits the western United States from the Great Plains to the Pacific Coast and from Alaska to Southern California. Populations in west coast states have declined dramatically since the 1990's. The most likely cause of this decline is the spread of pests and diseases from the commercial bee industry (Evans et al. 2008). Other threats include habitat alteration and removal in the form of agricultural intensification, livestock grazing, urban development, and landscape fragmentation, which may reduce pollen and nectar sources and affect potential nest sites. Use of broad-spectrum herbicides may also reduce pollen and nectar sources. Additional reported threats include invasive species, use of insecticides, and increased average temperatures and precipitation extremes. Fire suppression may result in conversion of open meadows to forested habitats, reducing availability of meadow nest sites for this species (Evans et al. 2008, Koch et al. 2012, Xerces Society 2013). Accounts of foraging ranges for bumblebees in scientific literature vary widely (Greenleaf et al. 2007). Within the project area there are some meadows and open areas in forest lands, and some of these areas may support habitats suitable for this species; however, grassland/herbaceous land cover types make up about 11% of the entire Project activity area, limiting available habitat.

The western bumble bee, along with three other bumble bee species, were petitioned for listing under the California Endangered Species Act (CESA) in 2018 and it was determined that listing may be warranted in June 2019. Candidacy was reinstated for the western bumble bee on September 30, 2022, after litigation. This species

is afforded the same legal protection to endangered or threatened species under the CESA and Fish and Game Code, §§ 2074.2 and 2085.

According to wildlife databases, the western bumble bee has documented occurrences in the following HUC 10 subwatersheds: Coffee Creek, East Fork Trinity River, Tangle Blue Creek, Swift Creek, Stuart Fork, North Fork Trinity River, Weaver Creek, New River, and Middle South Fork Trinity River (CDFW 2024d and USFS 2024a).

Monarch butterflies can be found throughout the contiguous U.S., and its range extends into southern Canada at least as far north as milkweed can be found. Monarch populations also exist in Hawaii, Central and South America, the Caribbean, Australia, New Zealand, and the Iberian Peninsula, along with several Indo-Pacific island groups; these populations are thought to be anthropogenically assisted but are considered naturalized (since 1800's). In 2020, the USFWS completed the Monarch (*Danaus plexippus*) Species Status Assessment Report, version 2.1. This report provides extensive information about the monarch's life history, ecology, population trends, and information about their obligate host plant milkweed (primarily *Asclepias* spp.).

During the breeding season, monarchs lay their eggs on milkweed, and larvae emerge after two to five days. Larvae develop through five larval instars (intervals between molts) over a period of 9 to 18 days, feeding on milkweed and sequestering toxic chemicals (cardenolides) as a defense against predators. The larva then pupates into a chrysalis before emerging 6 to 14 days later as an adult butterfly. There are multiple generations of monarchs produced during the breeding season, with most adult butterflies living approximately two to five weeks; overwintering adults enter into reproductive diapause (suspended reproduction) and live six to nine months.

In many regions where monarchs are present, monarchs breed year-round. Individual monarchs in temperate climates, such as eastern and western North America, undergo long-distance migration, and live for an extended period of time. In the fall, in both eastern and western North America, monarchs begin migrating to their respective overwintering sites. This migration can take monarchs distances of over 3,000 km and last for over two months. In early spring (February-March), surviving monarchs break diapause and mate at the overwintering sites before dispersing. The same individuals that undertook the initial southward migration begin flying back through the breeding grounds and their offspring start the cycle of generational migration over again.

Western North American monarchs form a separate adaptive capacity unit (ACU) because they contribute unique variation in migratory behavior, ecology, reproductive behavior, wing morphology, flight performance, and disease/parasite resistance. In addition, along with the eastern North American ACU, the western North American ACU serves as the ancestral origin for the species worldwide (Pierce et al. 2014; Zhan et al. 2014). Like the monarchs in the eastern North American ACU, monarchs in the western North American ACU possess the unique migratory phenotype that is absent in the other six ACUs (Tenger-Trolander et al. 2019). Western North American monarchs also migrate long distances, although their migration is shorter than monarchs in the eastern North American ACU. Whereas eastern monarchs may fly well over 3,000 km to reach the Mexican overwintering sites, western monarchs reach the California coast by flying ~500 km to 1,600 km (Yang et al. 2016). Western monarchs occupy warmer climates throughout the summer to include the farther reaches of their range while they continue to breed in the hotter regions (expand their range). Eastern monarchs, in contrast, follow more of a stepping-stone path into the northern states, vacating areas as they warm and recolonizing their range.

Additionally, western monarchs use ecologically different breeding, migrating, and overwintering habitats (Brower et al. 1995), and the western North American ACU comprises as much as 30% of the area occupied by monarch butterflies in North America (Dilts et al. 2019). Differences in breeding habitat include climate (Zalucki and Rochester 2004) and availability and abundance of native nectar and native milkweed plants (Borders and Lee-Mäder 2015). It is hotter and drier in the west than the east, and the milkweed and nectar resources used by monarchs in west and east differ (Dilts et al. 2019). In the fall, western monarchs migrate from Canada and states west of the Rockies to overwintering groves located primarily along the California coast south into Baja California, Mexico (Jepsen and Black 2015). Roosting tree species used by western monarchs are different than those of the eastern population, and include blue gum eucalyptus, Monterey pine, and Monterey cypress (Griffiths and Villablanca 2015). There are fewer monarchs in the western population, spread out among hundreds of overwintering sites compared to fewer than 20 sites in Mexico for the eastern population (Jepsen and Black 2015; Vidal and Rendón-Salinas 2014).

Thus, in order to maintain representation within the western North American monarch population, it is crucial to conserve the long-distance migratory phenotype in the west for the unique adaptive capacity this behavior and its associated traits may offer.

The monarch butterfly was initially petitioned for listing as a threatened species under the ESA on August 26, 2014, by the Center for Biological Diversity, Center for Food Safety, Xerces Society for Invertebrate Conservation, and Dr. Lincoln Bower. On December 17, 2020, it was determined that listing the species as an endangered or threatened species was warranted but precluded by higher authority actions (85 FR 81813). On December 12, 2024, the monarch butterfly was proposed as threatened. 4,395 acres of critical habitat was also proposed for areas in Alameda, Marin, Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura counties (89 FR 10066).

The monarch butterfly has documented occurrences in the following HUC 10 subwatersheds: Tangle Blue Creek, Swift Creek, Stuart Fork, Weaver Creek, Big French Creek, and Lower Hayfork Creek.

5.11.2 Effects Analysis

Potential pathways for effects to western bumble bees and monarch butterflies as a result of Project activities include the following:

- Injury or mortality of bumble bees and butterflies from vegetation removal activities within meadows and areas suitable for milkweed (negative effect to population abundance and reproduction).
- Disturbance and displacement due to construction activities within riparian and wetland areas.
- Temporary habitat degradation and potential exposure of bumble bees and butterflies to chemicals, exhaust, and fugitive dust.
- Habitat degradation from the removal of native vegetation.

5.11.2.1 Avoidance and Minimization Measures

The proposed activities would not result in a significant or long-term reduction in food availability to these species for the following reasons:

- The Western bumble bee is a generalist forager, utilizing a wide variety of flowering species as food sources.
- Activities are likely to have a very limited effect on flowering plants due to native revegetation activities post project implementation.
- This project does not include the use of herbicides or insecticides, so there would be no effects to flowering plants, bumble bees, or butterflies from their use.

The potential for adverse effects would further be limited by the implementation of the following MMs for site-specific projects (RWQCB and Reclamation 2009; SRGO 2022):

- INV-2: A qualified biologist would identify potential construction access routes to ensure that these features avoid and/or minimize to the fullest extent impacts to jurisdictional waters. In addition, the project proponent will clearly identify, and flag in the field, biologically sensitive areas (e.g., jurisdictional waters and riparian habitat) to be protected.
- INV-3: Site restrictions, biological monitoring, environmentally sensitive areas (e.g. milkweed habitat and flowering plants) and dust control measures could be implemented to protect monarch butterfly habitat, individuals and larvae.

5.11.2.2 Effects Summary

If western bumble bees or monarch butterflies use the Project activity area, construction activities may cause disturbance to individuals near activity areas, and individuals may move away from activity areas temporarily during Project implementation due to the presence of humans and equipment. However, a bumble bee's and monarch's greatest threats include habitat alteration and removal in the form of agricultural intensification, livestock grazing, urban development, and landscape fragmentation which would not result from the Project activities. Use of broad-spectrum herbicides and insecticides that could reduce pollen and nectar sources or harm bees or monarchs would not be used at any point during site-specific project implementation.

The potential for habitat alteration/impacts would be very limited because non-native invasive plants would be removed during construction and site-specific project disturbance areas would be planted with native species following construction. This would decrease the likelihood that suitable habitat would be modified in such a way that would affect future populations. CMs specific to protecting existing wetland, meadow, and riparian habitat would prevent potential effects to this species and associated habitat (Appendix B of the EA). As a result, the potential to cause mortality or significant disruption to normal behavior patterns of western bumble bees and monarch butterflies would be very limited. With the removal of invasive species and native species planting, improvements to wetland, meadow, and riparian areas, bumblebees and butterflies could experience improved habitat in the long-term.

In summary, the Project may affect, is likely to adversely affect western monarch butterflies because the Project activity area overlaps with monarch habitat. However, with the implementation of CMs and MMs, and the fact that no insecticides or herbicides would be used, effects would be minor. The Project may affect individual western bumblebees, but potential effects to the population demography of this species are very limited and insignificant and would not cause a trend toward listing.

6 Regional Effects

Regional effects include the short- and long-term impacts of the Project together with the past, present, and future actions of other projects. This analysis looks at other actions that have affected or could affect the same resources as action alternatives, in this case, watershed resources. The effects of past actions are reflected in the descriptions of current existing conditions. Lands in the vicinity of the Project activity area include USFS-, BLM-, and privately-owned land.

6.1 Cannabis Farming

In 2018, the State of California legalized the recreational use of cannabis, as well as the cultivation and manufacture of cannabis plants and products. In Trinity and Humboldt counties, there are many cannabis farms which collectively reduce flow volume and increase discharge of waste and pollutants in streams which affects water quantity and quality in the Project activity area. Presently, there is no watershed scale evaluation of the effects of cannabis farming on aquatic habitat in the Trinity River or to particular streams from cannabis farms. The operation of cannabis farms throughout the watershed will continue to negatively affect wildlife resources in the Trinity River and tributaries (NMFS 2020).

6.2 Residential Development

Human population growth in the Project activity area is expected to remain relatively stable over the next 10 years as California's economy continues to recover from a long-lasting nationwide recession. The recession has had significant economic impacts at both the statewide and local scales with widespread impacts to residential development and resource industries such as timber and fisheries. However, some development will continue to occur which, on a small-scale, can affect localized aquatic habitat. Once development and associated infrastructure (e.g., roads, drainage, and water development) are established, the effects to aquatic species are expected to be permanent (NMFS 2020).

Anticipated effects to aquatic resources include loss of riparian vegetation, changes to channel morphology and dynamics, altered hydrologic regimes (increased storm runoff and increased water diversions for residential use), increased sediment loading, and elevated water temperatures where shade-providing canopy is removed (NMFS 2020).

The presence of structures and/or roads near waters may lead to the removal of large wood in order to protect those structures from flood impacts. The anticipated impacts to wildlife from continued residential development are expected to be sustained and locally intense. Commonly, there are also effects of home pesticide use and roadway runoff of automobile pollutants, introductions of invasive species to nearby streams and ponds, attraction of piscivorous animals due to human occupation (e.g., raccoons), increased incidences of poaching, and loss of riparian habitat due to land clearing activities. All of these factors associated with residential development can have negative impacts on wildlife populations broadly. However, population growth rate in Trinity County decreased by about 11% between 2010 and 2019 (U.S. Census Bureau 2020). This may indicate a trend that could ameliorate or reduce the effects of residential development (NMFS 2020).

6.3 Resource Extraction

Resource-based industries are likely to continue to have an influence on environmental conditions within the Project activity area for the indefinite future. Logging continues to be conducted on both public and private lands throughout the tributaries of the Trinity River, except in Canyon Creek (Reclamation 2019). STNF's vegetation management projects include those for forest health/thinning and fuels reduction. Some mining for gravel, aggregate, and minor precious metals occurs on the Trinity River floodplain and a few tributary watersheds. Mining operations can affect coarse sediment supplies and impair water quality via contaminated and sediment-laden runoff from operations. The lack of protective measures in existing regulatory mechanisms, including land management plans (e.g., State Forest Practice Rules), contribute in varying degrees to the decline of ESA-listed wildlife species. Sedimentation and loss of gravels associated with poor forestry practices and roadbuilding are particularly chronic problems that can reduce the productivity of riparian dependent wildlife species as well as affecting all wildlife species at a broader scale through trophic level disruption. However, resource extraction industries have adopted management practices that reduce many of their most harmful impacts, which were unknown or not commonly used until recently (NMFS 2020). The STNF regularly implements forestry projects using resource protection measures and BMPs to reduce sedimentation into streams and otherwise reduce effects to environmental resources.

6.4 Wildland Fire Control

Control of wildland fires may include the removal or modification of vegetation due to the construction of firebreaks or setting of backfires to control the spread of fire. This removal of vegetation can trigger post-fire landslides as well as create chronic sediment erosion that can negatively affect aquatic habitat that is important to wildlife. In addition, the use of fire retardants may adversely affect aquatic habitat if used in a manner that does not sufficiently protect streams, with the potential for aquatic organisms to be exposed to lethal amounts of the retardant (NMFS 2020).

6.5 Aquatic Habitat Restoration

Since 2009, the TRRP has implemented Trinity River mainstem channel rehabilitation projects at all the Phase 1 channel rehabilitation sites named in the 2000 Master EIR and at nine of the Phase 2 sites. The Deep Gulch and Sheridan sites were constructed in 2017. The Bucktail site constructed in 2008 was expanded in 2016 to include additional areas. The Dutch Creek project was constructed in 2020. The Chapman Ranch Phase A site was constructed in 2019 and the Phase B site was completed in 2021. The Oregon Gulch project was completed in 2023. These mainstem projects have improved anadromous fish spawning and rearing habitat throughout the extent of the Trinity River and in turn improve ecosystem functions for wildlife species.

TRRP continues to add sediment within the 40-mile reach downstream of Lewiston Dam. In addition, TRRP-managed flows have been implemented yearly since 2004. Ongoing monitoring efforts by TRRP partners continues to document improvements in aquatic habitat use, alluvial processes, and riparian vegetative communities along the mainstem. Continued sediment and wood augmentation projects are intended to improve anadromous fish spawning and rearing habitat which will contribute to the improved habitat for riparian and freshwater dependent wildlife species in the Trinity River mainstem.

Beyond TRRP's mainstem channel rehabilitation and sediment augmentation projects, there have been several restoration and road sediment reduction projects implemented by various agencies and organizations throughout the Trinity River watershed. While some of these were considered in the 2009 Master EIR, USFS, Five Counties Salmonid Conservation Program, Watershed Research and Training Center, Trinity County Resource Conservation District, Yurok Tribe, Hoopa Valley Tribe, Nor Rel Muk Wintu Nation, and other local nonprofits and governments have been funded for and/or completed additional projects intended to improve watershed conditions, restore aquatic habitat, improve aquatic connectivity, and reduce road-related sediment delivery to streams and rivers. These watershed restoration projects are intended to improve water quantity and quality as well as rearing habitat in the Trinity River watershed.

6.6 Proposed Action

The Proposed Action is a continuation and expansion of the watershed restoration efforts that have already been accomplished to date. The Project is an effort to streamline design and planning processes, including environmental compliance, for proposed restoration actions across the watershed, thereby increasing the number of restoration actions that can be implemented over time. Ultimately, as previously discussed, the Proposed Action intends to improve instream and riparian habitat to accelerate the recovery of north coast salmonid populations (coho salmon, steelhead, and Chinook salmon) and other special status aquatic species through site-specific restoration actions implemented to address the following objectives:

- Restore and improve instream conditions sufficient to support all life stages of salmonids and other aquatic species;
- Restore upstream and downstream fish passage for all life stages of salmonids;
- Restore continuous paths for wood dispersal, nutrient cycling, sediment transport, and movement of other vegetative material essential for productive aquatic habitat;
- Maintain or restore native plant communities and vegetative structure impacted by invasive plants and pathogens, while rehabilitating eroding streambanks to improve water quality, shade conditions, and large wood recruitment;
- Repair, replace, or remove ineffective instream structures;
- Restore and improve riparian and meadow habitat in order to promote healthy conditions for aquatic and terrestrial wildlife populations;
- Improve late summer/fall base flow conditions through process-based restoration, water conservation improvements, and meadow restoration;
- Increase nutrient inputs through salmon carcass placement in the watershed; and
- Stabilize upslope areas around road infrastructure to minimize erosion and sediment discharges within the watershed to bring the sediment impaired watersheds into compliance with sediment reduction TMDLs for the South Fork Trinity and Trinity Mainstem rivers (EPA 1998 & EPA 2001).

Each of the regional activities mentioned are discussed in the context of effects relative to the Proposed Action below.

6.7 Conclusion

Historically, species analyzed in the technical report and present within the STNF have been affected by cannabis farming, residential development, resource extraction, stream alteration, and wildfires. Historical disturbances can have confounding effects to wildlife species and future restoration projects such as this Project are aimed at reducing future ecological degradation and restoring ecosystem functions. Riparian Reserves and aquatic habitats that have been anthropogenically altered in the past would receive primary emphasis for improving quality of habitat and ecosystem functions for salmonids and wildlife species that rely heavily on complex aquatic systems. With future restoration efforts within the Trinity River watershed, wildlife species would benefit from improved habitat for years following implementation of the Project.

Long-term beneficial effects to wildlife species would occur as a result of restoration activities once construction activities are completed. Beneficial regional effects include an increase in habitat diversity; improved water quality and hydrologic regimes; which, in turn, provides refugia from high velocity flows for salmonids while also providing habitats important for thermal regulation for species such as NWPTs and foothill yellow-legged frogs. More basking structures would be installed during project construction with the addition of large wood and SLJs within the channel which provide cover habitat, high velocity flow refugia, and habitat diversity for prey species. Removal of non-native vegetation and planting of native vegetation will improve overall habitat quality including foraging and nesting areas for riparian dependent species. Long-term, restoration activities along with road decommissioning are likely to provide higher quality habitat for NWPT, foothill yellow-legged frog, and Big Bar hesperian snails and would not contribute to species decline.

Beneficial long-term effects to Pacific martens and fishers include providing high quality habitat following implementation. Native revegetation and adding or retaining large wood into the ecosystem would provide future denning opportunities and restore ecosystem functions that would also improve prey availability and foraging opportunities. Fishers would have a net gain of riparian denning and resting habitat through the revegetation management plan within site-specific project areas. A long-term net benefit is predicted for these species.

Bats could benefit from restoration activities long-term with restored riparian habitat. A net gain is anticipated post implementation in riparian habitat and would lead to improved foraging habitat for fringed myotis. Decommissioned roads and bridge replacements could lead to improved habitat for roosting and hibernacula after implementation. Long-term, positive regional effects are anticipated for bat species.

Positive regional effects for sensitive avian species include improved foraging habitat and reduction of anthropogenic disturbances with the decommissioning of roads. Restoration of riparian habitat within tributaries could improve foraging opportunities as well and improve habitat for salmonid species within tributaries in turn providing bald eagles with greater foraging opportunities for fish or carrion. Effects to NSO would be avoided and minimized through CMs incorporated into restoration designs during site-specific project analysis. In addition, the Proposed Action does not include activities that involve large amounts of tree removal and old growth trees would be retained to the extent possible.

Monarch butterflies rely heavily on native milkweed within their summer breeding zone which includes the Project activity area. In regard to western monarch butterfly conservation, the USFWS recommends maintaining and enhancing suitable monarch habitat within their summer breeding zone (USFWS 2023a). With

implementation of the recommended MMs as outlined in Section 5.11.2.1, western monarch habitat would be protected during Project implementation. Regional effects that benefit western monarchs could occur as a result of the Proposed Action if existing habitat is protected effectively and habitat improvements within wetland, meadow, and riparian areas are successful.

Habitat connectivity would not likely be impacted by the Project. Minimal fragmentation (rank 5) and limited connectivity opportunities (rank 1) occur within the Project activity area and there are likely to be negligible impacts to habitat connectivity as a result of the Project. No new permanent roads or urbanization would be implemented within the Project activity area therefore, the project will not contribute to habitat fragmentation. There could be short temporal habitat connectivity effects in localized areas to species with smaller home ranges (less than 3 acres) during implementation. However, overall, the Project would improve habitat connectivity long-term, benefitting wildlife.

Overall, potential effects to wildlife species as a result of the Proposed Action would be limited in intensity (through the use of avoidance and minimization measures during construction activities) and would be limited to the time required for project implementation. In addition, SRs would be incorporated into each site-specific restoration activity to reduce noise disturbance and harm/injury during the breeding season.

7 References

Anthony, Robert G.; Knight, Richard L.; Allen, George T.; McClelland, B. Riley; Hoges, John I. 1992. Habitat use by nesting and roosting bald eagles in the Pacific Northwest. Trans. N. Am. Wildl. Nat. Res. Conf. 68pp.

Aubry, K. B. and Raley, C. M. (2006). Ecological characteristics of fishers (Martes pennanti) in the southern Oregon Cascade Range. Update: July 2006. 30. UDSA Forest Service, Pacific Northwest Research Station, Olympia, WA, USA.

Baird, S.F. and Girard, C. 1852. Descriptions of new species of reptiles, collected by the U.S. exploring expedition under the command of Capt. Charles Wilkes, U.S.N. First part. - Including the species from the Western coast of America. Proc. Acad. Nat. Sci. Philadelphia 6: p. 174

Baker, Michael D.; Lacki, Michael J.; Falxa, Greg A.; Droppelman, P. Lee; Slack, Ryan A.; Slankard, Scott A. 2008. Habitat Use of Pallid Bats in Coniferous Forests of Northern California. Northwest Science, Vol. 82, No. 4, 2008. Pp. 269-278.

Belluomini, L. 1980. “Status of the Ringtail in California.” Department of Fish and Game Nongame Wildlife Investigations. https://sdmmp.com/upload/SDMMP_Repository/0/h5z3t2wfrn6p1cj490m7xsbgdy8qv.pdf

Borders B, Lee-Mäder E. 2015. Project Milkweed: A strategy for monarch habitat conservation. Pp. 190-196 in Oberhauser KS, Nail KR, Altizer SM, eds. Monarchs in a Changing World: Biology and Conservation of an Iconic Insect. Ithaca, NY: Cornell University Press.

Brower LP, Fink LS, Leong K, Oberhauser K, Altizer S, Taylor O, Vickerman D, Calvert WH, Van Hook T, Alonso-Mejia, A, Malcolm, SB. 1995. On the dangers of interpopulational transfers of monarch butterflies – discussion. Bioscience 45:540-544

Buskirk, Steven W.; Zielinski, William J. 1997. American marten (Martes americana) ecology and conservation. In: J.E. Harris, and C.V. Ogan, (eds.). Mesocarnivores of northern California: biology, management, and survey techniques, workshop manual workshop manual. August 12–15, Humboldt State University, Arcata, California. The Wildlife Society, pp. 17-22.

California Department of Fish and Game. 1981. California Fish and Game Journal, July 1981. Volume 67, Number 3.

California Department of Fish and Wildlife (CDFW). 2020. CWHR Life History and Range Maps. Accessed at: https://wildlife.ca.gov/Data/CWHR/Life-History-and-Range

California Department of Fish and Wildlife (CDFW). 2022. *Restoring California's Wildlife Connectivity.* https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=204648&inline

---. 2024a. *Ace Dataset Fact Sheet Terrestrial Connectivity.* https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=150835&inline

---. 2024b. "Northern Spotted Owls in California." Accessed May 7th. https://wildlife.ca.gov/Conservation/Birds/Northern-Spotted-Owl

---. 2024c. "Science: Habitat Connectivity." Accessed May 7th. https://wildlife.ca.gov/Science-Institute/Habitat-Connectivity

---. 2024d. "California Natural Diversity Database (CNDDB). Accessed May 10th. https://apps.wildlife.ca.gov/myaccount/login?ReturnUrl=%2frarefind%2fview%2fRareFind.aspx

Center for Biological Diversity. 2024. "Natural History – Northern Spotted Owl } Strix occidentalis caurina." Accessed May 7th. https://www.biologicaldiversity.org/species/birds/northern_spotted_owl/natural_history.html

Christy, Robin E; West, Stephen D. 1993. Biology of bats in Douglas-fir forests. USDA Forest Service Pacific Northwest Research Station, Portland, Oregon. General Technical Report PNW-GTR-308. February 1993.

Dilts TE, Steele MO, Engler JD, Pelton EM, Jepsen SJ, McKnight SJ, Taylor AR, Fallon CE, Black SH, Cruz EE, Craver DR, and Forister ML. 2019. Host plants and climate structure habitat associations of the western monarch butterfly. Frontiers in Ecology and Evolution 7:188 (17 pp.)

Duncan, Nancy (Editor); Burke, Thomas E.; Applegarth, John S.; Weasma, Ted R. 1999. Management Recommendations for Survey and Manage Terrestrial Mollusks. Version 2.0. USDA Forest Service and USDI Bureau of Land Management, October 1999. 305 pp.

Evans, Elaine; Thorp, Robbin; Jepsen, Sarina; Black, Scott H. 2008. Status review of three formerly common species of bumble bee in the subgenus Bombus. Report to Xerces Society for Invertebrate Conservation. Accessed at http://www.xerces.org/wpcontent/uploads/2009/03/xerces_2008_bombus_status_review.pdf.

Fellers, Gary M.; Pierson, Elizabeth D. 2002. Habitat use and foraging behavior of Townsend's big-eared bat (Corynorhinus townsendii) in coastal California. Journal of Mammalogy: February 2002, Vol. 83, No. 1. Pp. 167-177.

Ganey, J.L., H.Y. Wan, S.A. Cushman, and et al. 2017. "Conflicting Perspectives on Spotted Owls, Wildfire, and Forest Restoration." *Fire Ecology* 13: 146-165. https://doi.org/10.4996/fireecology.130318020

Goldberg, J. 2003. "Bassariscus astutus." Animal Diversity Web. Accessed July 18, 2024. https://animaldiversity.org/accounts/Bassariscus_astutus/

Goldberg, Stephen R. 1995. Reproduction in the California Mountain Kingsnake, *Lampropelis zonata* (Colubridae). Vol. 94(3), pgs. 218-221. in Southern California. Department of Biology, Whittier College, Whittier, California. https://www.researchgate.net/profile/Stephen-Goldberg-4/publication/342052371_Reproduction_in_the_California_mountain_kingsnake_Lampropeltis_zonata_Colubridae_in_southern_California/links/5edfe1d445851516e6657e7b/Reproduction-in-the-California-mountain-kingsnake-Lampropeltis-zonata-Colubridae-in-southern-California.pdf

Greene, Harry W.; Rodriguez-Robles, Javier A. 2003. Feeding Ecology of the California Mountain Kingsnake, *Lampropeltis zonata* (Colubridae). Vol. (2): 308–314. https://doi.org/10.1643/0045-8511(2003)003[0308:FEOTCM]2.0.CO;2

Greenleaf, Sarah S.; Williams, Neal M.; Winfree, Rachael; Kremen, Claire. 2007. Bee foraging ranges and their relationship to body size. Oecologia, 153, 589-596.

Griffiths J, Villablanca F. 2015. Managing monarch butterfly overwintering groves: Making room among the eucalyptus. California Fish and Game 101:40-50.

Gruver, Jeffery C.; Keinath, Douglas A. 2006. Townsend's Big-eared Bat (*Corynorhinus townsendii*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region, October 25, 2006.

Hatfield, Richard G.; LeBuhn, Gretchen. 2007. Patch and landscape factors shape community assemblage of bumble bees, Bombus spp. (Hymenoptera: Apidae), in montane meadows. Biological Conservation 139: 150-158.

Holland, Dan C. 1994. The Western pond turtle: habitat and history. Report to the US Department of Energy, Bonneville Power Administration. Portland, OR.

Jennings, Mark R.; Hayes, Marc P. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game. 255 pp.

Jepsen S, Black SH. 2015. Understanding and conserving the western North American monarch population. Pp. 147-156 in Oberhauser KS, Nail KR, Altizer SM, eds. Monarchs in a Changing World: Biology and Conservation of an Iconic Insect. Ithaca, NY: Cornell University Press.

Johnston, B. E. 2004. Coastal Giant Salamander (*Dicamptodon tenebrosus*). Accounts and Measures for Managing Identified Wildlife – Accounts V. Pgs. 1-12. https://www.env.gov.bc.ca/wld/frpa/iwms/documents/Amphibians/a_coastalgiantsalamander.pdf

Kalasz, K. S.; Buchanan, J. B. 2016. Periodic status review for the Bald Eagle in Washington. Washington Department of Fish and Wildlife, Olympia, Washington. 18+iii pp.

Katzner, T. E., M. N. Kochert, K. Steenhof, C. L. McIntyre, E. H. Craig, and T. A. Miller (2020). Golden Eagle (Aquila chrysaetos), version 2.0. In Birds of the World (P. G. Rodewald and B. K. Keeney, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.goleag.02

Keeley, Jon E. 2009. "Fire Intensity, Fire Severity and Burn Severity: a Brief Review and suggested Usage." *International Journal of Wildland Fire* 18(1): 116-126. DOI:10.1071/WF07049

Keinath, Douglas A. 2004. Fringed Myotis (Myotis thysanodes): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Accessed at http://www.fs.fed.us/r2/projects/scp/assessments/fringedmyotis.pdf.

Keinath, Douglas A. 2003. Species assessment for fringed myotis (Myotis thysanodes) in Wyoming. USDI Bureau of Land Management, Wyoming State Office, Cheyenne, Wyoming.

Kirk, Thomas A. 2007. Landscape-scale habitat associations of the American marten (Martes americana) in the greater Southern Cascades Region of California. MS Thesis Humboldt State University.

Koch, Jonathan; Strange, James; Williams, Paul. 2012. Bumble bees of the western United States. USDA Forest Service, Agricultural Research Service. 144 pp. Accessed at http://www.fs.fed.us/wildflowers/pollinators/documents/BumbleBeeGuideWestern2012.pdf.

Krohn, William B.; Zielinski, William J.; Boone, Randall B. 1997. Relations among fishers, snow and martens in California: Results from small-scale spatial comparisons. Pp. 211-232 in Proulx, G.; Bryant, H.N; Woodard, P.M. Martes: taxonomy, ecology, techniques, and management. Provincial Museum of Alberta, Edmonton, Canada.

Lacki, Michael J.; Baker, Michael D. 2007. Day roosts of female fringed myotis (Myotis thysanodes) in xeric forests of the Pacific Northwest. Journal of Mammalogy, Vol. 88, No. 4 (Aug. 2007), pp. 967-973.

Lewis, Susan E. 1995. Roost fidelity of bats: a review. Journal of Mammalogy, Vol. 76, No. 2 (May 1995). Pp. 481-496.

Lockington, 1876 ex Blainville, 1835. *Lampropeltis zonata*. Proc. California Acad. Sci., Vol. 7, p. 52 ex Blainville, Ann. Mus. Hist. Nat. Paris., Ser. 3, Vol. 4, p. 293. https://californiaherps.com/snakes/pages/l.zonata.html

Lofroth, E.C., C.R. Raley, J.M. Higley, R.L. Truex, J.S. Yaeger, J.C. Lewis, P.J. Happe, L.L. Finley, R.H. Naney, L.J. Hale, A.L. Krause, S.A. Livingston, A.M. Myers, and R.N. Brown. 2010. Conservation of Fishers (Martes pennanti) in South-Central British Columbia, Western Washington, Western Oregon, and California – Volume I: Conservation Assessment. USDI Bureau of Land Management, Denver, CO.

Meyer, Rachelle. 2007 "Strix occidentalis." *Fire Effects Information System* 2023 (May 7th). https://www.fs.usda.gov/database/feis/animals/bird/stoc/all.html#:~:text=Northern%20spotted%20owls%20occur%20at,32%2C62%2C84%5D

Nafis, G. (2000-2016). California Herps - A Guide to the Amphibians and Reptiles of California. Available at: http://www.californiaherps.com/frogs/pages/r.boylii.html (accessed April 22, 2020).

National Marine Fisheries Service (NMFS). 2020. *Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Trinity River Restoration Program's Mechanical Channel Rehabilitation, Sediment Management, Watershed Restoration, and Monitoring Actions in Trinity County, California.* (Santa Rosa, California). https://www.trrp.net/library/document?id=2472.

North Coast Regional Water Quality Control Board (RWQCB), and U.S. Bureau of Reclamation (Reclamation). 2009. Channel Rehabilitation and Sediment Management for Remaining Phase 1 and Phase 2 Sites. Trinity River Restoration Program (Weaverville, California). Master Environmental Impact Report, Environmental Assessment/Environmental Impact Report. August 2009. SCH#2008032110. http://www.trrp.net/library/document/?id=476.

Nur A. S., Y. J. Kim, and C. Lee. 2022. "Creation of Wildfire Susceptibility Maps in Plumas National Forest Using InSAR Coherence, Deep Learning, and Metaheuristic Optimization Approaches." *Machine Learning and Remote Sensing for Geohazards* 14(17): 4416. https://doi.org/10.3390/rs14174416

Nussbaum, R. A., E. D. Brodie Jr., and R. M. Storm. Amphibians and Reptiles of the Pacific Northwest. Moscow, Idaho: University Press of Idaho, 1983. Pierson, Elizabeth D.; Rainey, William E.; Corben, Chris J. 2001. Seasonal patterns of bat distribution along an altitudinal gradient in the Sierra Nevada. Report to California State University at Sacramento Foundation, Yosemite Association, and Yosemite Fund. 70 pp.

Pierce AA, Zalucki MP, Bangura M, Udawatta M., Kronforst MR, Altizer S, Haeger JF, de Roode JC. 2014. Serial founder effects and genetic differentiation during worldwide range expansion of monarch butterflies. Proceedings of the Royal Society B 281:20142230.

Pope, K.; Brown, C.; Hayes, M.; Green, G.; and Macfarlane, D. 2014. "Cascades Frog Conservation Assessment." Pacific Southwest Research Station. General Technical Report PSW-GTR-244.

Powell, Roger A.; Buskirk, Steven W.; Zielinski, William J. 2003. Fisher and marten. Pp. 635-649 in Wild mammals of North America: biology, management and conservation. Second Edition. Edited by Feldhamer, George A.; Thompson, Bruce C.; Chapman, Joseph A. Johns Hopkins University Press. Baltimore and London.

Raley, Catherine M.; Lofroth, Eric C.; Truex, Richard L.; Yaeger, J. Scott; Higley, J. Mark. 2012. Habitat ecology of fishers in western North America: A new synthesis. Pp. 231-254 in Biology and conservation of martens, sables, and fishers: A new synthesis. Edited by Aubry, Keith B.; Zielinski, William J.; Raphael, Martin G.; Proulx, Gilbert; Buskirk, Steven W. Cornell University Press. Ithaca and London.

Rambaldini, Daniela A.; Brigham, R. Mark. 2011. Pallid bat (Antrozous pallidus) foraging over native and vineyard habitats in British Columbia, Canada. Can. J. Zool. 89: 816-822.

Reclamation (Bureau of Reclamation). 2019. Biological Assessment and Essential Fish Habitat Assessment for the Trinity River Restoration Program, California. Prepared by Hamer Environmental LP for the U.S. Department of Interior; Bureau of Reclamation.

Reese, Devin A.; Welsh, Hartwell H., Jr. 1998. Habitat use by western pond turtles in the Trinity River, California. Journal of Wildlife Management (62)3:842-53.

Reynolds, Richard T.; Graham, Russell T.; Reiser, M. Hildegard; Bassett, Richard L.; Kennedy, Patricia L.; Boyce, Douglas A., Jr.; Goodwin, Greg; Fisher, E. Leon. 1992. Management Recommendations for the American goshawk in the Southwestern United States. Rocky Mountain Forest and Range Experiment Station General Technical Report RM 217. 93 pp.

Rosenberg, Daniel K.; Gervais, Jennifer; Vesely, Dave; Barnes, Susan; Holts, Lauri; Horn, Robert; Swift, Roberta; Todd, Laura; Yee, Chris. 2009. Conservation assessment for western pond turtles in Oregon. Oregon Wildlife Institute, Contribution No. 203. Report to USDI Bureau of Land Management, USDI Fish and Wildlife Service, USDA Forest Service, Oregon Department of Fish and Wildlife and City of Portland. 80 pp.

Roth, Barry. 1984. A new species of Vespericola (Gastropoda: Pulmonata: Polygyridae) from the Klamath Mountains, California. Wasmann Journal of Biology, Volume 42 [for 1984], number 1-2, pp. 84-91.

Ruggiero, Leonard F.; Aubry, Keith B.; Buskirk, Steven W.; Lyon, L. Jack; Zielinski, William J., tech. eds. 1994. The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx and Wolverine in the Western United States. Gen. Tech. Rep. RM-254. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 184 pp.

Salas, et. al., Temporary noise-induced underwater hearing loss in an aquatic turtle (Trachemys scripta elegans). J. Acoust. Soc. Am. 154, 1003–1017 (August 2023).

Seglund, A.E. 1995. The use of rest sites by the fisher. Master's Thesis. Humboldt State University, Arcata, CA.

Self, S. E. & S. J. Kerns. 2001. Fisher use of a managed forest landscape in northern California. Unpublished report - Sierra Pacific Industries. Anderson, CA.

Sherwin, R., and D.A. Rambaldini. 2005. Pallid Bat (Antrozous pallidus). Species Account. Western Bat Working Group. Accessed at http://wbwg.org/western-bat-species.

Shuford, W. David; Gardali, Thomas, (editors). 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Skinner, Carl N., and C. Chang. 1996. "Fire Regimes, Past and Present." *Sierra Nevada Ecosystem Project: Final Report to Congress* II: 1041-1069. https://www.fs.usda.gov/research/treesearch/36570

Small, Maureen P.; Stone, Karen D.; Cook, Joseph A. 2003. American marten (Martes americana) in the Pacific Northwest: population differentiation across a landscape fragmented in time and space. Molecular Ecology (12)89-103.

Snyder, S. A. 1993. Haliaeetus leucocephalus. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed at: http://www.fs.fed.us/database/feis/animals/bird/hale/all.html.

Squires, John R.; Kennedy, Patricia L. 2006. American goshawk ecology: an assessment of current knowledge and information needs for conservation management. Studies in Avian Biology 31:8-62.

Squires, John R.; Reynolds, Richard T. 1997. Birds of North America Online: American goshawk (Accipiter atricapillus). Cornell Lab of Ornithology Birds of North America Online. Accessed at http://bna.birds.cornell.edu/bna/species/298.

State Water Resources Control Board (SRGO). 2022. *Restoration Projects Statewide Order Program Environmental Impact Report Consolidated Final.* Sacramento: State Water Resources Board.

Stephens, S. L., R. E. Martin, and N. E. Clinton. 2007. " Prehistoric Fire Area and Emissions from California's Forests, Woodlands, Shrublands, and Grasslands." *Forest Ecology and Management* 251 (3): 205-216. https://doi.org/10.1016/j.foreco.2007.06.005

Stone, Katharine. 2010. Martes americana, American marten. In Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed at: http://www.fs.fed.us/database/feis/animals/mammal/maam/-all.html.

Sullivan, Robert. 2022. Macrohabitat suitability model for the Trinity bristle snail in the Greater Trinity Basin of northern California. Accessed at: https://journal.wildlife.ca.gov/2022/05/13/macrohabitat-suitability-model-for-the-trinity-bristle-snail-in-the-greater-trinity-basin-of-northern-california/

Tenger-Trolander A, Lu W, Noyes M, Kronforst MR. 2019. Contemporary loss of migration in monarch butterflies. Proceedings of the National Academy of Sciences of the United States of America 116(29):14671-14676.

U.S. Census Bureau. 2020. QuickFacts, Trinity County, California. Retrieved from: https://www.census.gov/quickfacts/trinitycountycalifornia.

USDA and USDI. 2007. Final Supplement to the 2004 Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines. Volume 1 - Chapters and Text. U.S. Forest Service National Forests in Regions 5 and 6 and Bureau of Land Management Districts in Washington, Oregon, and California Within the Range of the Northern Spotted Owl. Portland, Oregon.

USDI Bureau of Land Management. 1999. Field Guide to Survey and Manage Terrestrial Mollusk Species from the Northwest Forest Plan. BLM, Oregon State Office. June 1999.

USDI Fish and Wildlife Service. 2015. Coastal Oregon and Northern Coastal California Populations of the Pacific Marten (Martes caurina) species report. April 2015.

USDI Fish and Wildlife Service. 2014. Fisher (Pekania pennanti), West Coast Population. Draft species report. January 13, 2014.

USDI Fish and Wildlife Service. 2013. Bald eagle natural history and sensitivity to human activity. March 28, 2013. Accessed at http://www.fws.gov/midwest/eagle/conservation/baea_nhstry_snstvty.html.

USDI Fish and Wildlife Service. 1998. Status review of the northern goshawk in the forested west. Office of Technical Support, Forest Resources, Portland Oregon. 250 pp.

USDI, Fish and Wildlife Service. 1986. Pacific Bald Eagle Recovery Plan. U.S. Fish and Wildlife Service. Portland, Oregon. 163pp.

U.S. Fish & Wildlife Service (USFWS). 2007. National Bald Eagle Management Guidelines. https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf.

U.S. Fish and Wildlife Service, (USFWS). 2025. *Programmatic Biological and Conference Opinion California Statewide Programmatic Restoration Effort.* FWS Reference: 2022-0005149-S7. https://www.fws.gov/sites/default/files/documents/2025-02/final-reinitiated-pbo-20250207-2022-005149-s7.pdf

U.S. Fish and Wildlife Service, (USFWS). 2023. *Species Status Assessment Report for Northwestern Pond Turtle (Actinemys marmorata) and Southwestern Pond Turtle (Actinemys pallida).* https://ecos.fws.gov/ServCat/DownloadFile/241273

---.2023a. *Western Monarch Butterfly Conservation Recommendations.* Accessed February 10th. https://xerces.org/publications/planning-management/western-monarch-butterfly-conservation-recommendations

U.S. Fish and Wildlife Service, (USFWS). 2024. "Critical Habitat." Accessed May 7th. https://www.fws.gov/project/criticalhabitat#:~:text=Critical%20habitat%20is%20a%20tool,federally%20funded%20or%20permitted%20activities

---. 2024a. "IPaC Information for Planning Consultation." Accessed January 11th. https://ipac.ecosphere.fws.gov/

U.S. Forest Service Pacific Southwest Region (USFS). 1995. Shasta-Trinity National Forests Land and Resource Management Plan. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5209391.pdf.

---.2024a. "Natural Resource Information System." Accessed July 20th. U.S. Forest Service database provided by Carla De Juilio.

Vaillant, N. M., and S. L. Stephens. 2009. "Fire History of a Lower Elevation Jeffrey Pine-Mixed Conifer Forest in the Eastern Sierra Nevada, California, USA." *Fire Ecology* 5: 4-19. https://doi.org/10.4996/fireecology.0503004

Vidal O, Rendón-Salinas E. 2014. Dynamics and trends of overwintering colonies of the monarch butterfly in Mexico. Biological Conservation 180:165-175

Weller, Theodore J.; Zabel, Cynthia J. 2001. Characteristics of fringed myotis day roosts in northern California. Journal of Wildlife Management 66(3):489–497.

Wheeler, C. A.; Bettaso, J. B.; Ashton, D. T.; Welsh, H. H., Jr. 2014. Effects of water temperature on breeding phenology, growth, and metamorphosis of foothill yellow-legged frogs (Rana boylii): a case study of the regulated mainstem and unregulated tributaries of California's Trinity River. River Research and Applications 2014: DOI: 10.1002/rra.2820.

Wilson, Randolph A.; Lind, Amy J.; Welsh, Hartwell, Jr. 1991. Trinity River Riparian Wildlife Survey, final report. USDA Forest Service, Pacific Southwest Experiment Station. Redwood Sciences Laboratory, Arcata, California. 98 pp.

Xerces Society. 2013. Bumble bees: western bumble bee (Bombus occidentalis). Species summary. Accessed at http://www.xerces.org/western-bumble-bee.

Yaeger, Scott J. 2005. Habitat at fisher resting sites in the Klamath Province of northern California. Arcata, CA . 75p.

Yang LH, Ostrovsky D, Rogers MC, Welker JM. 2016. Intra-population variation in the natal origins and wing morphology of overwintering western monarch butterflies Danaus plexippus. Ecography 39:998-1007.

Zalucki MP, Rochester WA. 2004. Spatial and temporal population dynamics of monarch down under: Lessons for North America. Pp. 219-228 in Oberhauser KS, Solensky MJ, eds. The Monarch Butterfly: Biology and Conservation. Ithaca, NY: Cornell University Press.

Zeiner, David C.; Laudenslayer, William F., Jr.; Mayer, Kenneth E.; White, Marshall. 1990. California's Wildlife. Volume III: Mammals. Sacramento, California: California Statewide Wildlife Habitat Relationships System, Department of Fish and Game.

Zhan S, Zhang W, Niitepold K, Hsu J, Haeger JF, Zalucki MP, Altizer S, de Roode JC, Reppert SM, Kronforst MR. 2014. The genetics of monarch butterfly migration and warning colouration. Nature 514:317-321.

Zielinski, William J.; Truex, Richard L.; Schmidt, Gregory A.; Schlexer, Fredrick V.; Schmidt, Dristin N.; Barrett, Reginald H. 2004. Home range characteristics of fishers in California. Journal of Mammalogy. Vol. 85, 4, pp. 649-657.