

BIOLOGICAL EVALUATION

Digital 299 Broadband Proposed Action

Humboldt, Trinity, and Shasta counties, California

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ABBREVIATIONS

AC	Activity Center
ADSS	All-Dielectric Self-Supporting Cable
AMM	Avoidance and Minimization Measure
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BLM-S	BLM Sensitive Species
BMP	Best Management Practice
CAI	Community Anchor Institution
CDFW	California Department of Fish and Wildlife
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings Database
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Ranks
CWHR	California Wildlife Habitat Relationship
dB	Decibel
DBH	Diameter at Breast Height
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESHA	Environmentally Sensitive Habitat Areas
ESU	Evolutionary Significant Unit
F	Fahrenheit
FC	Federal Candidate
FD	Federal Delisted
FE	Federal Endangered
FSS	USFS Sensitive Species
FP	Fully Protected
FT	Federal Threatened
HDD	Horizontal Directional Drilling
ILA	In-Line Amplifier
LOP	Limited Operating Period
LSR	Late-Successional Reserves
MAMU	Marbled Murrelet
MBTA	Migratory Bird Treaty Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NHD	National Hydrography Dataset
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration

NRA	National Recreation Area
NRIS	Natural Resource Information System
NSO	Northern Spotted Owl
NWFP	Northwest Forest Plan
NWI	National Wetland Inventory
PBF	Physical and Biological Features
PCE	Primary Constituent Elements
ROD	Record of Decision
ROW	Right-of-Way
RR	Riparian Reserves
SCE	State Candidate Endangered
SCT	State Candidate Threatened
SE	State Endangered
S&M	Survey and Manage Species
SPPP	Spill Prevention and Pollution Plan
SRNF	Six Rivers National Forest
SR	State Route
SSC	Species of Special Concern (CDFW)
ST	State Threatened
STNF	Shasta-Trinity National Forest
SWPPP	Stormwater Pollution and Prevention Plan
USBR	Bureau of Reclamation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

CHAPTER 1 INTRODUCTION

1.1 Purpose of Assessment

The Digital 299 Broadband Proposed Action (Digital 299) is the installation of a proposed regional telecommunications network that will support portions of Humboldt, Trinity, and Shasta counties between Cottonwood and Eureka, California, known to have no or poor broadband infrastructure. Internet connectivity is provided via middle-mile facilities (primary infrastructure delivering backhaul broadband through the region) and last-mile facilities (e.g., connections to homes, businesses, etc.). Last-mile facilities can be either wireline or wireless technology, but middle-mile networks are typically fiber optic cables. Digital 299 is comprised of middle-mile fiber optic facilities with the ability to connect to various Community Anchor Institutions (CAIs) and local last-mile providers along the route. The network route generally follows California State Route (SR) 299, with portions traveling over privately owned property (64.6 percent), federally managed public land (33.9 percent), Tribal lands (1 percent), and state-owned or controlled property (0.5 percent). The Proposed Action is part of a broader initiative to close the digital divide in the region and stimulate technology-based economic development.

Vero Networks (Vero) contracted Transcon Environmental (Transcon) to prepare this Biological Evaluation to review the Proposed Action in sufficient detail to determine the potential impacts the Proposed Action may have on special-status species, which include:

- Threatened, endangered, candidate, or sensitive species (referred to as “special-status”) and designated or proposed critical habitats of species protected by the Endangered Species Act (ESA) and California Endangered Species Act (CESA)
- Species listed as sensitive by the U.S. Forest Service (USFS) and Bureau of Land Management (BLM)
- Wildlife species listed as sensitive by the California Department of Fish and Wildlife (CDFW)
- Plants listed by the California Native Plant Society (CNPS) as rare
- Bird species protected under the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA)

In this report, the term “alignment” refers to the primary underground conduit; “Construction Corridor” refers specifically to the Proposed Action footprint, a 25-foot corridor around the alignment where construction-related disturbance and structures may be located (described in detail in Chapter 1.2); “survey area” refers to the Proposed Action footprint plus a 50-foot corridor; and “Action Area” includes the footprint or area of direct disturbance of the Proposed Action facilities (permanent occupation of conduit and vaults, and in-line amplifier [ILA] locations) as well as lands needed to construct the facilities (temporary construction, staging, and laydown areas). The analysis presented in this report is based on currently available data and site conditions at the time of the site visits, which occurred from April 2019 to May 2021.

1.2 Proposed Action Description

The Proposed Action is to install approximately 300 miles of fiber optic cable mostly buried along existing roads. New road construction is not proposed. Construction of the Proposed Action would be in two phases, the first phase including construction of the middle-mile fiber optic facilities and vaults, which would be entirely buried. During the second phase of the project, Vero will partner with last-mile providers to build out last-mile connections planned to be attached to existing utility poles. This Biological Evaluation analyzes impacts from both phases of the Proposed Action. Wireless facilities (e.g., cellular towers or equipment) are not proposed as part of this Proposed Action.

The Proposed Action also includes the construction of up to five prefabricated buildings to support signal regeneration, distribution, and interconnection, also referred to as in-line amplifier buildings, or “ILA locations.” These buildings would be installed during the first phase of the project and are sited off public land.

Proposed Action Location

The Proposed Action extends through three counties in northern California: Humboldt, Trinity, and Shasta. The various aerial attachments for the conduit/cable, or “spurs,” along the Proposed Action branch from the main backbone to connect to outlying communities along the route. The main route and alternative segments are described below, following the route from west to east.

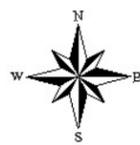
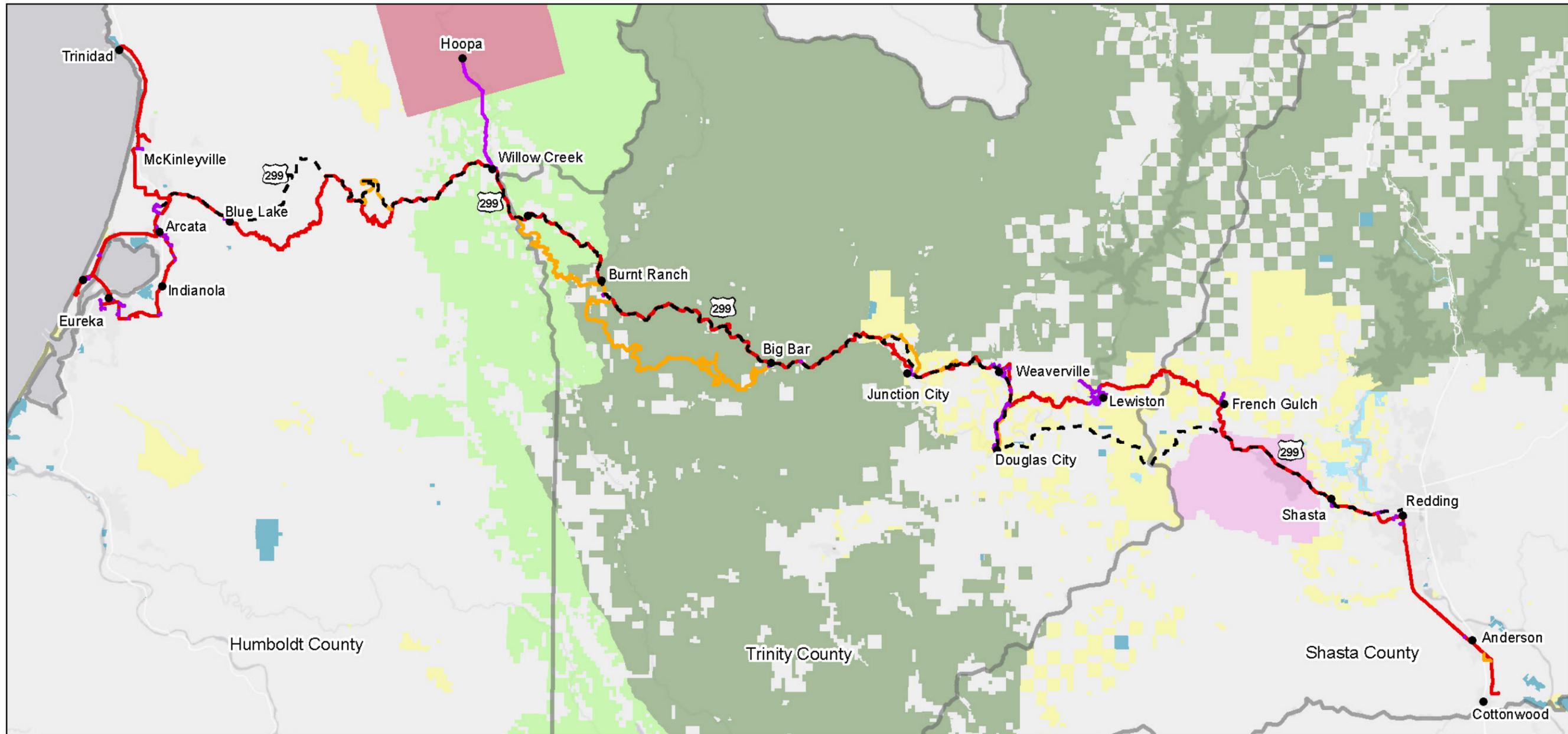
The main route begins along the coast with terminus points in Samoa and Eureka. The alignment follows two routes north around Humboldt Bay, including a crossing of Samoa Bridge from the Peninsula to Eureka, with the two routes connecting Arcata. From Arcata, the main route heads north to its junction with SR 299. From here, it follows two routes: one north for 16 miles through McKinleyville and Clam Beach to a terminus point in Trinidad, and the other continuing eastward as the main route following SR 299 to Blue Lake, where it departs from SR 299 through residential Blue Lake, then for 16 miles following Maple Creek Road, Bald Mountain Road, and Snow Camp Road, connecting back to SR 299 at the intersection of Old Highway 200. The main route follows SR 299 for 5 miles to Saber Tooth Road, with an alternative segment continuing on SR 299 and the main route following the Saber Tooth Road and County Route 7K1000 for 6 miles, where it reconnects and continues along SR 299 for about 50 miles through Willow Creek, Salyer, Burnt Ranch, and Big Bar, to Junction City. At Willow Creek, an aerial spur breaks off from the main route north to serve Hoopa.

Between Salyer and Junction City, three alternative segments are proposed in case the main route along SR 299 is not able to be constructed. One alternative segment departs SR 299 just west of Salyer following Route 447 and Hennessey Road southeast for 15 miles. Another alternative segment departs the main route from Burnt Ranch and follows Route 16, Forest Route 5N09, 5N25, and Eagle Rock Road for 20 miles, including a 5-mile spur up to Eagle Rock Peak. This alternative reconnects with the main route along SR 299 in Big Bar. The third alternative in this area departs the main route west of Helena, breaking into alternate paths around Junction City, the main route heading south along Wintu Pass Road, Forest Route 33N41, Red Hill Road, and Dutch Creek Road, and the alternative segment running north from Valdor Road, an unnamed Forest Road, PowerHouse Road, and Canyon Creek Road. Both alternatives reconvene at SR 299 in Junction City.

From Junction City, the main route follows SR 299 to Slattery Pond, with an alternative segment continuing on SR 299 and the main route following La Grange Road and Castle Road for 2 miles back to SR 299 to Weaverville. In Weaverville, the main route breaks from SR 299 to follow Trinity Lake Boulevard, Lance Gulch Road, and Route 3 for 4 miles. An aerial route continues following Route 3 south to Douglas City, while the main route continues east along Browns Mountain Road for 10 miles into Lewiston. Within Lewiston, it follows Lewiston Road, Trinity Dam Boulevard, and other residential roads. It continues east for 17 miles following Deadwood Road, French Gulch Road, and Trinity Mountain Road before the route connects back to SR 299 south of French Gulch.

Connected again with SR 299 south of French Gulch, the main route continues for 14 miles through Whiskeytown and Shasta, breaking south in Redding to follow Buenaventura Boulevard, Placer Street, and other residential roads. It follows Route 273/South Market Street south for 9 miles to Anderson, where it follows Barney Road and Locust Street, with an alternative segment following South Barney Road and Industry Road, and the main route following Locust Road to Trefoil Lane, terminating on Trefoil Lane northeast of Cottonwood.

Table 1 lists distances crossed per county under each agency jurisdiction, and **Figure 1** displays an overview map of the Proposed Action.



0 2.5 5 10
Miles

Legend

- | | | |
|----------------------|--------------------------------|---|
| Proposed Alignment | County Line | Six Rivers National Forest |
| Alternative Segments | Bureau of Land Management | State Lands |
| Aerial Attachments | Bureau of Reclamation | Whiskeytown-Shasta-Trinity National Recreation Area |
| State Route 299 | Hoopa Valley Reservation | |
| City | Shasta-Trinity National Forest | |

Proposed Action Overview Map
Digital 299 Broadband Project

Figure 1



Table 1. Proposed Action Location by Landowner

Agency/Landowner	County	Distance Crossed (miles)
BLM Redding Field Office	Humboldt	0
	Trinity	18.02
	Shasta	4.94
Total BLM Crossing		22.96
USFS Shasta-Trinity National Forest (STNF)	Humboldt	0
	Trinity	62.08
	Shasta	0
USFS Six Rivers National Forest (SRNF)	Humboldt	2.81
	Trinity	11.79
	Shasta	0
Total USFS Crossing		76.68
Tribal Hoopa Reservation	Humboldt	3.15
	Trinity	0
	Shasta	0
Tribal Blue Lake Rancheria	Humboldt	0.37
	Trinity	0
	Shasta	0
Total Tribal Crossing		3.52
National Park Service Whiskeytown National Recreation Area (NRA)	Humboldt	0
	Trinity	0
	Shasta	10.05
Total National Park Service Crossing		10.05
State Lands	Humboldt	1.72
	Trinity	0.08
	Shasta	0.06
Total State Lands Crossing		1.85
Private/Other	Humboldt	119.51
	Trinity	59.78
	Shasta	34.29
Total Private/Other Crossing		213.58
Bureau of Reclamation (USBR)	Humboldt	0
	Trinity	2.63
	Shasta	0
Total USBR		2.63
	Humboldt	0.06

Agency/Landowner	County	Distance Crossed (miles)
U.S. Army Corps of Engineers (USACE)	Trinity	0.05
	Shasta	0.12
Total USACE		0.23
Total		330.87

Proposed Action Facilities and Construction

Digital 299 will consist of four conduits constructed underground that will house the fiber optic cable. Barrel vaults will also be installed underground within the area of direct disturbance adjacent to the line to splice the cable and provide access to the underground conduits. Spurs will extend from the fiber optic cable to connect neighboring communities. Prefabricated buildings will be constructed at up to six locations to facilitate regeneration. These Proposed Action facilities and associated construction methods are described in further detail below.

Buried Conduit and Vaults

There will be four 1.25-inch buried conduits to house the fiber optic cable. At least one conduit will be left empty for maintenance and/or future capacity. The conduit will be placed along the shoulder of existing roadways or through the existing roadway if shoulders are narrow. Three methods of conduit construction will be used to account for variations in geology, route accessibility, terrain, or environmental sensitivities: horizontal directional drilling (HDD), plowing, and trenching with either a trencher, backhoe, or rock saw. Each of these methods are described below. **Table 2** details estimates of the maximum noise produced by each construction method as well as the expected rate of construction for each method. Regardless of construction method, minimal vegetation will be removed as part of the Proposed Action because the alignment follows existing roads and rights-of-way (ROWs). Vegetation removal may be necessary to allow for plowing operations or ILA location construction or to allow for equipment access on narrow roads. As described below, no trees greater than 6 inches in diameter will be removed.

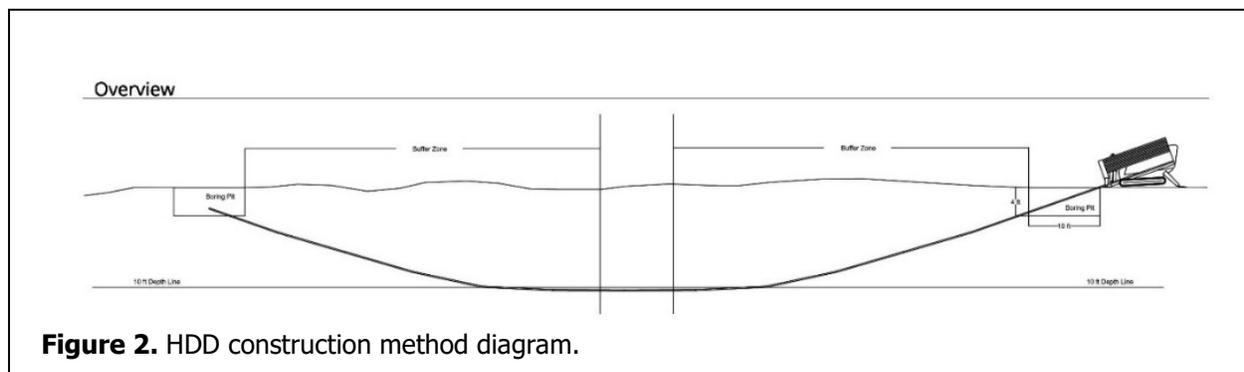
There is one portion of the Project, around Humboldt Bay near Arcata and Eureka, where fiber cables would be installed in existing conduit which has been installed as part of the Samoa-Arcata-Eureka project. For those approximately 16 miles of the alignment around the bay, conduit would be accessed, and new fiber installed, via existing manholes. While ground disturbance would not occur in this area, it is included in analyses to ensure all future work employs BMPs and AMMs. The rest of the project (~300 miles) would entail new conduit being installed using construction methods described below.

Horizontal Directional Drilling

Most of the Proposed Action (approximately 90 percent) will be constructed using the HDD method. HDD is a steerable, trenchless method of installing underground conduits along a prescribed bore path by using a surface drilling rig (**Figure 2**). HDD causes minimal impacts; ground disturbance occurs only at each entry/exit point, referred to as “bore pits.” Bore pits would be sized to a maximum area of 10 feet by 10 feet and a maximum depth of 4.5 feet, although most bore pits would be no larger than 3 feet by 6 feet. Bore pits would be sited outside sensitive areas and within the 25-foot-wide temporary Construction Corridor.

An HDD bore normally installs conduit in 500- to 700-foot ranges, and in some cases over 2,500-foot ranges can be obtained, depending on the substrate. The bore diameter to house the conduit would be 4 inches and would be buried between 36 and 42 inches deep, with a maximum depth of 10 feet achievable when necessary.

The HDD process involves drilling a hole with guidance equipment and continuous drill bit position monitoring. Once drilling is complete, the conduit is pulled through the bore hole. HDD uses a clay/water mixture that is pumped down the drill stem to lubricate the drill head and drill pipe, maintain the bore hole opening, and remove bore cuttings.



Frac-outs may occur when the pressure of the clay/water mixture is greater than the pressure of the surrounding ground/rock, or when a pathway or crack opens in the ground that allows the mixture to seep out of the bore hole. Vero will employ a Contingency Frac-Out Plan, which describes preventative and response measures related to frac-outs. The Contingency Frac-Out Plan would include overarching best management practices (BMPs) as well as site-specific plans and designs for the above major waterways. General BMPs include but are not limited to installing temporary sediment barriers and storing spoils away from riparian boundaries when boring under waterways and keeping a vacuum and spill kit on-site. Additionally, as described in the Plan, the HDD operation would be continually monitored for pressure changes or visual observations of seepage. Monitoring devices allow the crews to track the exact location of the drill bit including depth, and detects pressure changes which may indicate a frac-out risk or occurrence. The Contingency Frac-Out Plan would incorporate agency input prior to issuing permits.

Plowing and Trenching

In areas where HDD is not feasible (e.g., terrain, environmentally sensitive areas), the plow or trench construction method would be used. Where trenching occurs along the alignment, the trench size will be a maximum of 3 feet wide and 5 feet deep. Plowing involves a 2- to 3-inch-wide stationary or vibrating blade splitting the ground to cut a narrow slit for the conduit to be inserted below ground. As the ground is cut, the conduit is installed at the desired depth by feeding it down a chute located on the back of the blade. As the tractor passes the insertion point, the ground is then packed behind it, restoring it to its original condition. This allows soil compaction to take place at the same time as the conduit being installed. After the conduits are installed, the furrow is compacted back in place by the back end of the plow or a following compaction vehicle. Plowing creates minimal temporary disruption to the soil; soil disturbance from the plow blade is anticipated to occur within a 4- to 6-inch width. Equipment for this operation are tracked vehicles 10 to 12 feet long.

The plowing method may include two possible pre-treatment activities: pre-ripping and/or clearing/grubbing. If pre-treatment is required, disturbance to soils from the pre-treatment activity may increase up to 4 feet in width, not including the wheels/tracks of the equipment. Caterpillar D6 or D8 tractors will be used for “pre-ripping” hard soil and removing obstacles in advance of the plow. Where paving is involved, equipment with rubberized treads will be used. Clearing/grubbing of vegetation will be limited to plowed areas (11 inches) and a 6-foot-wide area where vegetation may be crushed by tractor wheels/treads. If additional areas require significant vegetation removal, the U.S. Fish and Wildlife Service

(USFWS) and any other appropriate agency will be contacted prior to the activity. Where soil conditions allow, the Proposed Action will use a smaller DitchWitch RT115 vibratory plow to deploy the conduit. Plows will be configured to install a total of three 1.25-inch conduits with depths of up to 48 inches, allowing for at least 42 inches of cover.

Areas of fracture rock or that are otherwise unsuitable for plowing or HDD would be constructed through using trenching machines, excavators, backhoes, or rock saws. The trenches are opened, and material is stacked to the side within the 25-foot-wide Construction Corridor. Conduit is placed and stacked material is returned to the trench and compacted. Temporary soil disturbance from trenching is anticipated to be approximately 6 feet wide. The typical bucket size on a backhoe used for trenching would be 18 inches, up to a maximum of 24 inches.

Rock sawing is used to dig trenches in rock or extremely compacted soil conditions. The trenching component of the rock saw consists of a large rotating cutting wheel with blades or teeth that cut up/crush the ground as it rotates, breaking rocks or compacted soil. Rock saws are placed along the trench line with the blade lowered to the desired depth. Then the vehicle cuts along the trench line. Spoils from the trench are fine, 0.25-inch to 0.5-inch gravel which is deposited adjacent to the trench for backfill. In shallow trenches, spoils are removed, and a slurry backfill is used. The slurry protects the conduit and cable from inadvertent dig ups or damage.

Barrel/Access Vaults

Underground vaults will be placed along the alignment to splice the cables and provide access to the buried conduit. Vaults are excavated and placed at the same time as conduit installation. They would be sized 4 feet by 4 feet by 4 feet deep, spaced approximately every 2,500 feet. Specific vault locations are unknown but would be placed along the centerline of the conduit within the proposed temporary disturbance area (i.e., 25-foot-wide corridor). Vaults are covered with metal access lids flush with the ground.

Fiber Optic Cable Placement

Once a conduit is fully installed, as described above, it will be tested and then the fiber optic cable will be placed. Fiber optic cable will be placed using two primary methods: 1) pulling cable using Kevlar tape or 2) pneumatically using compressed air, colloquially known as “blowing” or “jetting.”

For both methods, a reel of cable is transported via flatbed truck to access vaults along the alignment. For cable pulling, Kevlar tape is attached to the fiber line and fed into the conduit. Once the fiber/tape reaches the next vault location, it is retrieved and spliced to the next section of fiber. To aid in the speed and length that a cable can be pulled, lubricants are manually placed into the conduit during the threading of pull rope and applied to the cable itself during cable pulling. Although the lubricants are composed of non-toxic materials, proper spill containment materials to isolate potential spills will be utilized.

To use compressed air, a truck- or trailer-based compressor and a 3-foot by 2-foot “blowing machine” channels the cable and compressed air along a tube and into the conduit. The fiber line flows through the conduit with the compressed air, is retrieved at the next vault location, and is spliced to the next section of cable. To aid in the speed and length that a cable can be blown, lubricants may be applied to the cable as it enters the conduit or to the insides of the conduit walls by blowing a lubricant-soaked sponge through the conduit; the amount of lubricant used for cable blowing is typically less than cable pulling. As with cable-pulling lubricants, modern cable-blowing lubricants comprise non-toxic, water-based polymer materials, and proper spill containment materials to isolate potential spills will be utilized.

Table 2. Maximum Noise Estimates and Approximate Rates of Conduit Placement For Each Construction Method

Construction Method	Maximum Noise (Decibels [dB])*	Approximate rate (feet/day)**
Plowing	85	10,560
Trenching with Trenching Machines, Excavators, or Backhoes	91	1,000
Trenching with Rock Saw	110	1,000
Horizontal Directional Drilling	85	500
Cable Pulling, Blowing, and Vault Placement	82	N/A
Building Delivery and Finishing	94	N/A
*With the exception of building delivery and finishing work, all methods require a cable reel trailer and/or equipment trailer, which produce occasional impulse noise. Cable pulling and blowing require a truck-mounted crane, which also produces occasional impulse noise. For comparison, a lawn mower generates 68 to 72 dB, a jackhammer 82 to 89 dB, a helicopter 101 to 112 dB, and a jet taking off 132 dB (USFWS 2006)		
**Rates are approximate and depend upon soil conditions, geology, topography, etc.		

Bridge Attachments

For perennial and intermittent waterways that have bridges, conduit would be attached to the existing bridge, or the fiber cable would be installed in existing conduit already attached to the bridge, if available. **Table 3** lists bridge crossings along the alignment and their jurisdictions.

Table 3. Bridge Crossing

Bridge ID ^a	Roadway	Jurisdiction	Bridge ID ^a	Roadway	Jurisdiction
04 0228	SR 255	Non-public land	04 0036R	SR 299	Non-public land
04 0229	SR 255	Non-public land	04 0050	SR 299	SRNF
04 0230	SR 255	Non-public land	04 0054	7th Street	Non-public land
04 0281	SR 255	Non-public land	04 0056	Highway 101	Non-public land
05 0006	SR 299	Non-public land	04 0057	6th Avenue	Non-public land
05 0009	SR 299	STNF	04 0079R/ 04 0079L	Highway 101	Non-public land
05 0011	SR 299	BLM	04 0135	SR 96	Non-public land
05 0043	SR 299	SRNF	04 0169L/ 04 0169R	Highway 101	Non-public land
05 0044	SR 299	SRNF	04 0170	Murray Rd.	Non-public land
05 0081	SR 299	SRNF	04 0184	North Bank Road	Non-public land
05 0082	SR 299	SRNF	04 0186	SR 299	Non-public land
06 0007	SR 299	Non-public land	04 0188	SR 299	Non-public land
06 0036	SR 299	Whiskeytown NRA	04 0189	SR 299	Non-public land
06 0090	State Highway 273	Non-public land	04 0222	SR 299	Non-public land
06 0096	SR 299	Whiskeytown NRA	04 0257	SR 299	Non-public land

Bridge ID ^a	Roadway	Jurisdiction	Bridge ID ^a	Roadway	Jurisdiction
06 0203	SR 299	Non-public land	04C0083	Myrtle Avenue	Non-public land
05C0049	Powerhouse Road	Non-public land	04C0123	Myrtle Avenue	Non-public land
05C0070	Dutch Creek Road	Non-public land	04C0182	Old Arcata Rd.	Non-public land
05C0162	Corral Bottom Road	STNF	04C0238	Myrtle Avenue	Non-public land
05C0166	Canyon Creek Road	BLM	05 0015	SR 3/SR 299	Non-public land
05C0175	Browns Mountain Road	Non-public land	05 0086	SR 299	Non-public land
05C0207	Browns Mountain Road	BLM	04C0026	Maple Creek Rd.	Non-public land
06C0029	Happy Valley Road	Non-public land	Vance Mill & Lumber Co. RR Bridge	Bike path	Non-public land
06C0145	Canyon Creek Road	Non-public land	04 0162	SR 299	Non-public land
06C0284	French Gulch Road	BLM	04 0163	SR 299	SRNF
06C0285	French Gulch Road	Non-public land	04 0042	SR 299	Non-public land
06C0316	Locust Road	Non-public land	04 0217	SR 299	SRNF
04C0177	Myrtle Avenue	Non-public land	04 0026	Highway 101	State lands
04 0042	SR 299	Non-public land			
a. Caltrans Bridge ID #					

All bridge attachments would be certified by a professional civil engineer registered in the State of California. Conduit would be affixed on the side or underside of the bridge to meet visual needs of the particular structure and location. Bolts, clips, or anchors would be used to secure the conduit to the bridge in such a way that it would not impact the structural integrity of the bridge. Typically, a standard drill is used to install hardware on bridges. Conduit would be housed in a single 6-inch steel pipe installed by crews using a “reach around” boom that operates on a trailer that sits on the roadway, with an extension that reaches out from the railing of the bridge and extends below the bridge surface to the work platform.

At either end of bridge crossings, an area 3 feet wide by 10 feet long (the same size as a bore pit) would be disturbed to bring the buried conduit above ground to attach to bridges. This area would generally be in line with the bridge alignment and up to 50 feet from where the bridge and conduit attachments begin.

For water crossings that do not have bridges suitable for conduit attachment but do have culverts, the conduit would be installed using HDD under the waterway or culvert. Note that the Proposed Action crosses the Trinity River at one location using the HDD method.

Pole Attachments

Fiber cable would be attached to existing utility poles during the second phase of the Proposed Action. Pole attachments would be utilized only for last-mile attachments to serve communities and CAIs. Additionally, Digital 299 would support the provision of last-mile services in the community of Lewiston, which would be delivered via aerial utility poles within the town. This Proposed Action includes building out the fiber

line to strategic pole locations for future connections to homes and businesses within Lewiston; specific connections in Lewiston would be determined between Vero and interested parties.

Aerial attachments would be installed on existing poles using existing access. New poles or access roads are not proposed as part of this Proposed Action. Although unlikely, it is possible that existing poles would have to be replaced if loading calculations indicate pole structures need to be reinforced to handle increased loads. Vero would coordinate with the pole and landowners regarding any needed pole replacements.

Existing poles would be accessed using bucket trucks, or crew members would climb the poles to manually attach the cable. Cable would be pulled through rollers from the uphill end of the route. Once the cable is pulled through the rollers, the linemen would return to the poles, detach the rollers, and permanently affix the cable to the pole.

In-Line Amplifier Buildings

The Proposed Action will include the installation of up to five ILA locations to regenerate transmission signals and serve as points of interconnection to other service providers. Typical ILA buildings can measure from 10 to 24 feet wide and from 24 to 40 feet long. The buildings would be enclosed by fencing and secured by locked gates. Fencing would be installed with a minimum distance of 10 feet from the ILA buildings. The fenced-in area would vary based on the property size and shape but would typically range between 200 and 400 linear feet. The specific locations for ILA locations have not yet been determined but will be sited in previously disturbed areas. This Biological Evaluation provides parameters for placement of ILA locations to avoid sensitive areas. No vegetation greater than 6 inches diameter at breast height (DBH) will be removed.

The prefabricated buildings would have finished concrete walls, composite or metal roofs, metal doors, and no windows. They are manufactured off-site and placed on-site with equipment. The buildings are secured to concrete slabs, which would likely require grading to create a level surface prior to installation. The buildings require electricity, which would be provided primarily by existing commercial power. Each building's commercial power system would be backed up by battery (a minimum of 8-hour capacity) and a 75-kilowatt to 200-kilowatt diesel, propane- or natural gas-powered generator. ILA buildings will be sited, designed, and maintained free from vegetation and brush that could spark fires from generator use. These buildings also may be supported by solar power, and all buildings would have an air conditioning system, similar to large, window-mounted units. These buildings would not be occupied but can accommodate one to two persons to work on equipment. Visits to check on equipment would typically occur monthly; after power outage or major weather events, Vero will inspect ILA buildings for safety or equipment issues.

ILA locations will be located off public land. The proposed ILA building locations would be in the communities of Willow Creek, Junction City, and Shasta. However, adjustments to the fiber optic backbone may necessitate moving the placement of ILA buildings to private land in one or more of the following communities: Salyer, Burnt Ranch, Big Bar, Weaverville, Lewiston, French Gulch, Shasta, Redding, Anderson, and/or Cottonwood. Specific locations have not been determined for any of the ILA buildings. Landowners would be coordinated in the siting of the buildings.

Construction Operations

Equipment needed to construct the Proposed Action would include a Caterpillar D8, backhoe, 10-wheeler truck, semi-trailer truck, ¾-ton pickup truck, excavator, HDD rig, vacuum, trencher, dozer/plow, loader, cable reel trailer, air blower device, air compressor, mechanical pusher/puller, and water truck. All equipment will stay within the 25-foot Construction Corridor plus staging areas, as described below. Vehicles would be staged adjacent to bore pits, and the length of vehicles staged around bore pits would not exceed 20 feet. Multiple crews would be working concurrently along the route, all in a generally linear

fashion. Construction pace would be between 500 feet and 2 miles per day, depending on construction method and terrain. Access and egress to and from construction sites would occur along existing roadways.

Staging and laydown areas are used to store equipment and materials during construction and to conduct fueling and maintenance work. Laydown areas are areas identified for vehicle parking and/or short-term placement of equipment, conduit, and cable. Typical laydown areas will be located in previously disturbed/developed areas (e.g., dirt parking lots, pullouts). Temporary parking of vehicles (overnight) will occur within laydown areas or as permitted along remote unpaved backroads. The Proposed Action biologist will flag or mark sensitive areas adjacent to laydown areas. Not all of the laydown areas that have been identified will be used during construction.

Although crews would arrive by pickup truck and staging could occur on the roadway, only 2 to 3 pieces of equipment would be operating at once and needing to maneuver within the ROW: an excavator to excavate the bore pit (present before and after boring), a drilling rig to install the conduit (present during boring only), and a vacuum to remove excess mud (present during boring only). The largest possible bore pit would be 10 feet by 10 feet, and with most bore pits at 3 feet by 6 feet, there would be sufficient space for equipment.

Vero would implement sediment control BMPs around every bore pit, as described in the Stormwater Pollution and Prevention Plan (SWPPP). Sediment control practices may include filtration devices and barriers (such as fiber rolls, silt fence, straw bale barriers, and gravel inlet filters) and/or settling and separation devices (such as a “Mud Puppy”). Effective filtration devices, barriers, and settling devices would be selected, installed, and maintained properly.

Construction Schedule

The total duration of construction for the Proposed Action is estimated at up to 24 months, beginning in the second quarter of 2022. Construction crews generally work 8 to 10 hours a day, 5 days a week during daylight hours. Saturday work may be required in some areas as needed; approval from the proper agency would be obtained prior to construction on weekends. No work is anticipated to occur on major holidays or during Native American ceremonies. No work is anticipated to occur on major holidays.

Digital 299 would avoid lane closures during times of inclement weather, including but not limited to rain, snow, and ice. Construction schedules will be coordinated and in compliance with ordinances by land management agencies and ROW owners (i.e., California Department of Transportation and counties).

Phase 2 of the Project (last-mile connections) would begin construction as soon as last-mile providers and Vero finalize interconnection points and locations of service drops. Phase 2 of construction is expected to begin in 2024. Most or all last-mile connections are expected to be attached to existing utility poles requiring no ground disturbance.

Traffic Control

This Proposed Action would follow federal, state, and local guidelines for temporary traffic control in construction zones. Guidelines include signage, cones, barricades, flagging, and pilot cars. Traffic control plans would be submitted for encroachment approval from state and local agencies, based on the specific conditions of the roadways and construction sites involved. Active flagging and the use of pilot cars would likely be used along SR 299 and on city streets, while a combination of signage and flagging would be used in more remote areas. Advanced notification of traffic control measures would be given to the community under certain conditions. The Proponent will develop Traffic Control Plans prior to the start of construction and as required by city and county agencies.

Other Proposed Action Components

Subsurface Warning Tape and Cable Locating Technology

A continuous ribbon of buried cable warning tape will be placed above, and parallel to, the new conduit within the ground during construction. The warning tape will be imprinted with a message as a final warning to excavators that fiber optic cable is buried below. The tape will be impervious to soil acid, alkali, and/or other natural soil agents. Installation of the tape will occur simultaneously with the installation of the conduit. The subsurface tape may be magnetic, which would allow engineers to locate the fiber optic cable conduit without having to resort to ground-disturbing activities, such as potholing.

Fiber Optic Cable Marker Posts

Aboveground warning marker posts would be placed along the entire cable route at intervals of approximately 700 feet. The posts would be contained within the ROW directly above or offset of the conduit. These 4-foot-tall metal, poly-vinyl, or fiberglass posts are installed to provide visible evidence of the presence of buried cable, identify the owner of the cable, and provide a telephone number for emergency notifications. The location of the marker post may be adjusted to accommodate sensitive environments (e.g., sensitive vegetation communities) or physical limitations (e.g., rocks). Land management agencies would be consulted on preference for marker posts regarding color, placement, or other features.

Operation and Maintenance

Operation and maintenance needs for fiber optic networks are generally minimal, but they are required when a risk is identified or damage to the cable is discovered. The fiber line would be electronically monitored continuously for such risk or damage. Surveyors may also drive along the existing roads to inspect the line after a significant weather or seismic event; existing roads would be utilized for operation and maintenance activities. If the conduit requires access, the barrel vaults installed as part of the Proposed Action would be utilized to inspect or repair the line. Ground-disturbing activities associated with ongoing operation and maintenance procedures are typically minor and would only occur as a result of erosion control repair in the event of storm damage, landslides, or other emergencies. The scope of this analysis assumes maintenance activities would be confined to the existing roadway and the 10-foot fiber optic ROW. The appropriate agencies will be contacted if extraordinary maintenance activities beyond the scope previously authorized maintenance permits allow.

CHAPTER 2 REGULATORY REQUIREMENTS AND RELEVANT MANAGEMENT DIRECTION

2.1 Federal Regulations

Endangered Species Act of 1973

The federal ESA and its subsequent amendments protect plants and wildlife (and their habitats) listed as endangered or threatened by the USFWS and National Marine Fisheries Service (NMFS). Section 9 of the ESA specifically prohibits the taking of ESA-protected wildlife and lists prohibited actions. The ESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct” (50 Code of Federal Regulations [CFR] 17.3). The ESA also governs the removal, possession, malicious damage, or destruction of endangered plants on federal land (United States 1983). A designation of critical habitat identifies areas essential to conservation of a species. Pursuant to the requirements of the ESA, an agency seeking to carry out a Proposed Action or reviewing a Proposed Action within its jurisdiction (action agency) must determine whether any federally-listed species may be present in the area and determine whether the Proposed Action will have a significant effect upon such species or its habitat. The action agency is also encouraged to determine whether the Proposed Action is likely to jeopardize any proposed or candidate species in an effort to avert any potential future conflict.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) is the primary law governing marine fisheries management in United States federal waters. First passed in 1976, the MSA fosters long-term biological and economic sustainability of United States marine fisheries. Provisions of the MSA require consultation with the NMFS for actions that may adversely affect essential fish habitat (EFH) for federally managed fish and invertebrates. For the purposes of the MSA, EFH includes “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (MSA § 3(10)). In relation to EFH, “waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle.

Migratory Bird Treaty Act

The MBTA (16 U.S.C. 703-712) implements international treaties between the United States and other nations to protect migratory birds and their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized by regulation or permit (MBTA 2019). The law, which protects all native birds regardless of their status, applies to the removal of occupied nests (such as swallow nests on bridges) during the breeding season. Any disturbance at a level that causes nest abandonment is considered take. However, it should be noted that incidental take is no longer prohibited per U.S. Department of the Interior Memorandum M-37050 (DOI 2017).

Bald and Golden Eagle Protection Act

The BGEPA of 1940 (16 U.S.C. 668-668c, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. The BGEPA defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb,” while “disturb” means “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3)

nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” (72 FR 31132; 50 CFR 22.3) (BGEPA 2019).

2.2 Federal Land Management Direction

Northwest Forest Plan

The Northwest Forest Plan (NWFP), implemented in 1994, is a landscape approach plan for federal land management in the Pacific Northwest designed to protect “habitat for late-successional and old-growth forest related species within the range of the northern spotted owl” (NSO) while also contributing to social and economic sustainability in the region (USDA 1994). In addition, further safeguards are granted to lesser-known species under the Survey and Manage Program. The federal lands that fall under the purview of the NWFP primarily include national forests, BLM lands, national parks, national wildlife refuges, and military bases. All National Forest and BLM lands traversed by the Proposed Action are subject to the management guidance and policies within the NWFP. The directives outlined in the NWFP are “added to the existing management directions for those administrative units without adopted Forest or District Plans and will supersede management direction contained in existing plans where it differs for specific resources or areas, except as otherwise specifically provided” (USDA 1994).

The NWFP designates specific areas, or land allocation categories, within its management area where responsible agencies must adhere to additional management standards and guidelines. Those land allocations relevant to the Proposed Action include:

Late-Successional Reserves—Late-Successional Reserves (LSRs) are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional- and old-growth-related species, including the NSO. These reserves are designed to maintain a functional, interacting, late-successional, and old-growth forest ecosystem. The Proposed Action intersects several LSRs on BLM, SRNF, and STNF lands.

The SRNF has completed a Forest-wide LSR Assessment (USDA 1999), the Smith River Basin, and Sub-basin analyses and LSR Assessment (USDA 1995a). Each document outlines management recommendations for reaching desired conditions in LSRs. Treatment of early-seral stage vegetation in Riparian Reserves (RRs) and LSRs will promote the accelerated development of late-successional characteristics and will help in the attainment of Aquatic Conservation Strategy and late-successional objectives.

Riparian Reserves—RRs provide an area along all streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. The Proposed Action intersects several RRs on BLM, SRNF, and STNF lands.

Bureau of Land Management

Portions of the Proposed Action alignment that cross BLM lands (Arcata and Redding field offices) are subject to BLM land management regulations and directives. Specific management direction for these lands are informed by the following management plans:

- Redding Field Office Resource Management Plan (1993)
- Arcata Field Office Resource Management Plan (1993)
- Northwest Forest Plan (1994)

In addition to these management plans, BLM offices maintain a regional list of special-status plant and wildlife species that are not federally-listed and that occur on BLM public lands. Specific to BLM

management activities, BLM's policy is to "ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered." (Bureau Manual 6840.06). BLM Sensitive Species (BLM-S) specific to the Arcata and Redding field offices were considered in the following evaluation of impacts from the Proposed Action (BLM 2014).

U.S. Forest Service

Portions of the Proposed Action alignment that cross USFS lands (SRNF and STNF) are subject to USFS land management regulations and directives (USDA 1994, 1995a, 1995b). Specific management direction for these lands is informed by the following management plans and directives:

- SRNF Land and Resource Management Plan (1995)
- STNF Land and Resource Management Plan (1995)
- Northwest Forest Plan (1994)
- USFS Manual and Handbooks (FSM 2900/H 2670)
- National Forest Management Act, 1976

In addition, USFS regions maintain a list of special-status plant and wildlife species that are not federally-listed and that occur on USFS lands. Specifically, U.S. Department of Agriculture Regulation 9500-4 directs the USFS to avoid actions that may cause a sensitive species to become threatened or endangered (FSM 2670.12). Populations of all sensitive species of wildlife, fish, and plants must be maintained at viable levels in habitats distributed throughout their geographic range on National Forest System lands (FSM 2670.22). USFS Sensitive Species (FSS) specific to SRNF and STNF were considered in the following evaluation of impacts from the Proposed Action.

Northern Spotted Owl Recovery Plan

On June 28, 2011, the USFWS released the *Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina)*. The purpose of any recovery plan is to describe reasonable actions and criteria that are considered necessary to recover a listed species. Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened or when the protections afforded by the ESA are no longer necessary and the species may be delisted. Recovery actions are the USFWS's recommendations to guide the activities needed to accomplish the recovery criteria. The 2011 Revised Recovery Plan for the NSO represents the "best available science," recognizing the importance of maintaining and restoring habitat for the recovery and long-term survival of the spotted owl. The 2011 Recovery Plan relies on federal lands to provide the major contribution for recovery (USFWS 2011b).

Northern Spotted Owl Critical Habitat

On December 4, 2012, the Final 2012 Northern Spotted Owl Critical Habitat rule was published (77 Fed Reg. 71876-72068) (USFWS 2012a). Critical habitat consists of those areas which have "physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection" 16 U.S.C. § 1532(5) (A). In total, approximately 9,577,969 acres (3,876,064 hectares) in 11 units and 60 subunits in California, Oregon, and Washington fall within the boundaries of the critical habitat designation, and federal agencies are required to consult on any project that may affect newly designated critical habitat under the ESA. The rule became effective on January 3, 2013. The Construction Corridor of the Proposed Action crosses a total of 170 acres of NSO critical habitat. Chapter 4.9 includes further discussion of the critical habitat present in the Construction Corridor and Action Area.

Marbled Murrelet Recovery Plan

Conservation management is contained in the NWFP Record of Decision (ROD) and was incorporated into the Land and Resource Management Plan land allocations and standards and guides. The Recovery Plan for the marbled murrelet (MAMU; *Brachyramphus marmoratus*) in Washington, Oregon, and California (USFWS 1997) forms the basis for the management direction, in part. The Recovery Plan calls for the protection of habitat essential for recovery in larger contiguous blocks; maintaining occupied habitat; and monitoring trends, productivity, and reproduction. In addition, the NWFP ROD contains standards and guidelines for management and protection of the MAMU, including the requirement for surveys to regional protocol prior to any modification of potentially suitable MAMU habitat.

Marbled Murrelet Critical Habitat

MAMU critical habitat was revised in 2009, with a final rule published on October 5, 2011 (76 Fed Reg. 61599-61621) (USFWS 2011a) and confirmed on August 4, 2016 (81 Fed Reg. 51348-51370). A designation of critical habitat identifies areas essential to conservation of a species. The USFWS has determined that the physical and biological features (PBFs) of the habitat (also commonly referred to as the primary constituent elements [PCE]) associated with the terrestrial environment that support nesting and other normal behaviors are essential to the conservation of the MAMU and require special management considerations. Within the boundaries of designated critical habitat, only those areas that contain one or more PCE are, by definition, critical habitat. The Construction Corridor of the Proposed Action crosses a total of two acres of MAMU critical habitat. Chapter 4.9 includes further discussion of PBFs and the critical habitat present in the Action Area (**Table 7**).

Fish Critical Habitat

The Construction Corridor intersects waterways that are designated critical habitat for eight species of fishes. Discussion of the characteristics of these critical habitats can be found in Chapter 4.9. **Table 12** details the distribution of critical habitat and EFH in the waterways and watersheds that are traversed by the Proposed Action.

2.3 State Regulations

California Coastal Act

The California Coastal Act was established in 1976 to regulate development along the coast of California, prioritizing public access to the coast and the preservation of sensitive coastal resources while still allowing for balanced commercial and residential development. This area of the coast, called the “coastal zone,” comes under the jurisdiction of the California Coastal Commission, the agency responsible for implementing the policies set forth in the California Coastal Act. In general, the “coastal zone” extends seaward for approximately 3 miles and inland for approximately 1,000 yards from the high tide line, depending on land uses and habitat values. Several segments of the Construction Corridor fall within the Coastal Zone, specifically those segments around Humboldt Bay and between the communities of Arcata and Trinidad.

The portion of the Coastal Act most relevant to the assessment presented in this report relates to Section 30240, which provides special protection for Environmentally Sensitive Habitat Areas, often referred to as ESHA. This section states:

- (a) *Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas and shall be compatible with the continuance of those habitat and recreation areas.

California Endangered Species Act

The CESA (California Fish and Game Code Sections 2050-2116) provides that certain species of fish, wildlife, and plants that are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of California are of statewide concern and should be conserved, protected, and enhanced along with their habitats. The CESA establishes that it is the policy of the state that state agencies should not approve projects that would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) (California Public Resources Code §§ 21000-21177) requires state agencies, local governments, and special districts to evaluate and disclose impacts from "projects" in the state. Section 15380 of the CEQA Guidelines clearly indicate that wildlife and plant species designated by the CDFW as Fully Protected (FP) or Species of Special Concern (SSC) should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein, as well as those plants designated as California Rare Plant Ranks (CRPR) 1B and 2B (CEQA 2019a).

California Fish and Game Code

The California Fish and Game Code outlines protection for FP species of mammals, birds, reptiles, amphibian, and fishes. Species that are FP may not be taken or possessed at any time. The CDFW has designated certain species native to California as SSC to “focus attention on animals at conservation risk by the Department, other State, Local and Federal governmental entities, regulators, land managers, planners, consulting biologists, and others; stimulate research on poorly known species; achieve conservation and recovery of these animals before they meet CESA criteria for listing as threatened or endangered.” California SSC and FP were considered in the following evaluation of impacts from the Proposed Action.

CHAPTER 3 STUDY METHODOLOGY

The following chapter describes how the Action Area was determined for the impacts analysis, defines which special-status species and other sensitive resources were assessed, and summarizes the methods used to conduct the assessment of any special-status species that may be directly or indirectly affected by the Proposed Action.

3.1 Action Area

The Construction Corridor includes only areas proposed for ground disturbance and the associated construction activities (e.g., underground portions of the Proposed Action’s alignment, facilities, and staging areas). The area considered in this impacts analysis, or the “Action Area,” is defined as all areas that have the potential to be affected directly or indirectly by the Proposed Action.

In general, the Action Area encompasses the Construction Corridor in addition to a 0.25-mile buffer (or 0.5-mile-wide corridor). In some cases, the Action Area is larger or smaller, depending on the life history of the species being evaluated. For special-status wildlife species with disturbance buffer areas larger than the survey corridor, GIS and orthophotography were used to identify suitable habitat in the Action Area. For special-status plants, the Action Area was limited to a 25-foot buffer (in most cases resulting in a 50-foot-wide corridor) around the alignment. Specific parts of the Construction Corridor are referred to as “work areas.”

3.2 Special-Status Species

For the purposes of this evaluation, special-status species are plants or animals that are legally protected or prioritized under the regulations and management plans addressed in Chapter 2. Special-status species reviewed in this evaluation include:

- Species listed or proposed for listing as threatened or endangered under the ESA (50 CFR. 17.12, 50 CFR. 17.11, and various notices in the Federal Register [proposed species])
- Species that are candidates for possible future listing as threatened or endangered under the ESA (73 FR 75176, December 10, 2008)
- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (14 C.C.R. 670.5)
- Species that meet the definitions of rare or endangered under CEQA (Guidelines Sections 15380 and 15125) (CEQA 2019b)
- CDFW SSC (CDFW 2018b)
- CDFW FP Species (California Fish and Game Code Sections 3511) (CDFW 2018b)
- FSS (FSM 2670.22)
- BLM-S (Bureau Manual 6840.06)
- Plant species listed as rare under the California Native Plant Protection Act (Fish and Game Code 1900 et seq.)
- Plants listed by CNPS per the CRPR (CNPS 2019)
 - CRPR 1A List—Plants presumed by the CNPS to be “extinct in California”
 - CRPR List 1B and 2—Plants considered by the CNPS to be “rare, threatened, or endangered in California”
 - CRPR List 3—Plants listed by CNPS as plants about which more information is needed to determine their status, which may be included as special-status species on the basis of local significance or recent biological information

- Hoopa Valley Tribe Traditional Plants of Special Concern—These plants are considered SSC due to their historical and ceremonial uses by the Hoopa Valley Tribe (Hoopa 2011)

3.3 Study Methodology

Background Research

Transcon biologists conducted initial background research by compiling a comprehensive list of special-status species and sensitive natural communities that may be present in the Action Area. Transcon biologists also queried available spatial geodatabases for known special-status species occurrences within 1.5 miles of the Construction Corridor. A 1.5-mile search radius was chosen to identify potential special-status species because it encompasses a sufficient distance to accommodate for local habitat diversity and account for species most likely to migrate into the Action Area. Information on potential special-status species were obtained from the following resources:

- BLM-S Lists for Arcata and Redding Field Office (BLM 2014)
- CDFW Special Animals List (CDFW 2018b)
- California Natural Diversity Database (CNDDDB) (CNDDDB 2021)
- Classification and Assessment with Landsat of Visible Ecological Groupings Database (CALVEG) (CALVEG 2018a, 2018b)
- CNPS Inventory of Rare Plants of California (CNPS 2019)
- National Hydrography Dataset (NHD) (USGS 2018)
- NWFP Survey and Manage Species (S&M) List (USDA 1994)
- USFWS National Wetland Inventory (NWI) data
- FSS Lists for SRNF and STNF (USDA 2013)
- USFS Natural Resource Information System; Invasive Plants, Plants and Wildlife (NRIS) (NRIS 2021)
- USFWS Information for Planning and Consultation Database (USFWS 2019)
- Current and historical aerial imagery (Google Earth 2018; Esri 2018)

Site Assessment

Using the data gathered during background research, Transcon biologists assessed the extent of special-status species, their habitats, and sensitive biological resources within the Action Area where access was possible. Due to access issues and safety concerns associated with surveying highways and roads in mountainous terrain, approximately 36 percent of the assessment was conducted via desktop applications and vehicle only. When deemed safe to do so, portions of the Construction Corridor were surveyed on foot by Transcon biologists (64 percent of the assessment).

Desktop Analysis

Prior to conducting field reconnaissance surveys, Transcon biologists utilized CALVEG data and aerial imagery to map habitat/vegetation community types within and adjacent to the Construction Corridor. Biologists also used NWI and NHD spatial data to map potential sensitive aquatic resources within and adjacent to the Construction Corridor. In accessible portions of the Construction Corridor, these habitat types and sensitive aquatic resources identified during desktop analysis were ground-truthed during field reconnaissance surveys.

Field Reconnaissance Surveys

Transcon biologists conducted reconnaissance-level field surveys within 25 feet of the proposed alignment on multiple occasions between April 2019 and May 2021 to characterize potential habitat for special-status species, map/confirm the presence of sensitive aquatic resources, and identify any special-status plants that may occur within 25 feet of the Construction Corridor. Incidental sightings of plant and wildlife species were also documented, although protocol-level surveys were not conducted for any special-status species. The entire survey area was accessible and investigated either on foot or from a vehicle when areas of the alignment followed major roads, passed through cities/towns, were unsafe to walk, or where desktop review determined that natural habitat or vegetation communities were not likely to be present.

During field surveys, Transcon biologists primarily used Esri mapping applications (Survey123, Collector) on tablet computers with GPS capabilities to collect data. Biologists collected habitat-specific data, including habitat type, canopy cover, community successional stages, presence of habitat structures, and georeferenced photos. Biologists also collected data on aquatic resources such as feature type, periodicity, site-specific data, and georeferenced photos.

Special-Status Plant Surveys

Surveys for special-status plants were conducted in portions of the Construction Corridor where direct impacts to plants might be possible. These areas were primarily along the more remote, narrow dirt roads where suitable habitat directly abuts the roads. Special-status plant surveys were conducted in accordance with the CNPS Botanical Survey Guidelines (CNPS 2001) and the Protocols for Surveying and Evaluating Impacts to Special-status Native Plant Populations and Natural Communities (CDFW 2018a). Two rounds of surveys were conducted in order to capture the varying blooming periods of target special-status plants, including a spring season (mid-April to mid-May 2019) and early summer (mid-June 2019) survey. The early summer survey was restricted to only a few target special-status plants and only occurred in those portions of the Action Area with suitable habitat. Surveys were floristic in nature, where every plant taxon that occurs in the Construction Corridor is identified to the taxonomic level necessary to determine rarity and listing status. All segments of the Construction Corridor were surveyed for special-status plants, with the exception of Segments 11A and 14A, which were surveyed from a vehicle due to safety concerns. These segments are located along SR 299 between Salyer and Burnt Ranch, and Burnt Ranch and Big Bar, respectively.

CHAPTER 4 AFFECTED ENVIRONMENT

4.1 Climate

The Action Area overlaps two Mediterranean subtype climate zones. The warm-summer Mediterranean climate subtype exists primarily along the immediate coast and coastal mountain ranges. Known for its warm (but not hot) and dry summers, average summer temperatures rarely exceed 70 degrees Fahrenheit (F) while average winter temperatures rarely drop below 40 degrees F. Much of the yearly precipitation in warm-summer Mediterranean climates, averaging 40 inches annually, occurs during the colder winter months (USCD 2019).

The hot-summer Mediterranean climate subtype exists primarily in some of the inland mountain valleys and Central Valley portion of the Action Area. Known for its very hot, dry summers and cool, wet winters, average summer temperatures often exceed 90 degrees F while average winter temperatures occasionally drop below 40 degrees F. Precipitation primarily occurs during the winter months, averaging 35 inches annually (USCD 2019).

4.2 Land Use

The Action Area overlaps three counties with a variety of zoned land use types. In Humboldt County, the Action Area overlaps both public and private lands that are zoned for residential development, commercial/industrial development, agriculture (primarily livestock), recreation, and forest resources/timber production (Humboldt County 2017). In Trinity County, the alignment primarily crosses public and private lands primarily dedicated to forest resources/timber production and recreation, with limited residential development along the SR 299 corridor and around the communities of Douglas City, Weaverville, Junction City, and Lewiston (Trinity County 2002). In Shasta County, the alignment primarily crosses public and private lands with limited forest resources/timber production, recreation (Whiskeytown NRA), and increased residential development around the City of Redding and surrounding communities (Shasta County 2004).

4.3 Landscape Setting

The Action Area overlaps three main ecoregions, including the Coast Range on the western end, the Klamath Mountains/California High North Coast Range in the center of the alignment, and the Central California Foothills and Coastal Mountains on the eastern end. The Coast Range region consists of coastal headlands, marine terraces, sand dunes, and beaches on the immediate coast and the inland coastal mountain range, which is dominated by highly productive evergreen forests. The Klamath Mountains/California High North Coast Range region consists of highly dissected mountains and valleys of the Klamath and Siskiyou mountains dominated by mixed conifer and hardwood forests. The Central California Foothills and Coastal Mountains region primarily consists of low mountains, foothills, and narrow valleys dominated by chaparral and oak woodlands (Griffith et al. 2016).

Topography varies considerably throughout the Action Area. On the western end of the alignment, topography is generally flat in and around Humboldt Bay and inland until the community of Korb, rarely exceeding 200 feet in elevation. Between Korb and Shasta (the majority of the alignment), the topography varies between 1,000 to 5,000 feet in elevation, reaching its maximum elevation near Monument Peak. On the eastern end of the alignment near the city of Redding, topography is fairly flat, varying between 500 and 1,000 feet in elevation.

Geology

The western portion of the Action Area is within the Northern Coast Ranges subset of the Coast Ranges Geomorphic Province. The Coast Ranges of California are north-west-trending mountain ranges (typically

2,000 to 4,000 feet elevation above sea level) and valleys that run subparallel to the San Andreas Fault. The province is bordered to the west by the Pacific Ocean, to the east by the Great Valley Geomorphic Province, to the south by the Transverse Ranges of southern California, and to the north by the Klamath Mountain Range. The middle portion of the Action Area is within the Klamath Mountains, a range of mountains reaching 6,000 to 8,000 feet in elevation that straddle the California-Oregon border. They have a varied geology consisting of significant formations of metamorphic, granitic, and serpentinite-derived rock. In California, the Klamath Mountains are bordered to the south and west by the Northern Coast Ranges and to the east by the Cascade Range. The eastern end of the proposed Action Area is within the Great Valley, a basin formed between the Coast Range Province to the west and Sierra Nevada Province to the east, and is characterized by alluvial deposit fill from the Sierra Nevada and Coast Ranges (Schoenherr 2017).

Serpentine Soils

Portions of the Action Area on both private and federal lands traverse isolated patches of serpentine soil, an uncommon soil type produced by the weathering of ultramafic rocks such as serpentinite. Serpentinite, a metamorphic rock, is composed of minerals high in magnesium and heavy metals such as chromium, cobalt, iron, lead, and nickel. Soils derived from this rock tend to have high levels of heavy metals while lacking vital nutrients, making it difficult for many plants to survive in such extreme conditions. Plants found on these soils are specifically adapted to these soil conditions and are often found exclusively on serpentine soils (Schoenherr 2017).

4.4 Vegetation/Habitat Communities

Since most of the Action Area is within lands managed by federal agencies, vegetation/habitat communities were mapped using the CALVEG system to conform with federal mapping standards (USDA 2008). Each CALVEG community was also matched with the equivalent California Wildlife Habitat Relationship (CWHR) community (Mayer and Laudenslayer 1988). Community types are summarized in **Table 4**, and community descriptions are detailed below. Pacific Douglas-fir communities are the dominant habitat type found along much of the central portion of the Proposed Action at elevations below 5,000 feet.

Table 4. Vegetation/Habitat Communities Present Within 100 Feet of the Proposed Action Alignment (Acres)

CALVEG Alliances	CWHR Equivalent	Manual of California Vegetation Equivalent	Six Rivers	Shasta-Trinity	Hoopa	BLM	Whiskeytown	Caltrans*	Non-agency/Private
<i>Conifer Forest/Woodlands</i>									
Beach Pine**	Closed-Cone Pine-Cypress	California Forest and Woodland	-	-	-	-	-	4.53	55.29
Douglas-Fir—Pine	Douglas-Fir	Californian—Vancouverian Montane and Foothill Forest	-	386.31	-	72.87	-	3.38	43.75
Douglas-Fir—White Fir	Douglas-Fir Klamath Mixed Conifer	Californian—Vancouverian Montane and Foothill Forest	-	124.82	-	-	-	-	-
Gray Pine	Blue Oak-Foothill Pine	California Forest and Woodland	-	42.56	-	-	-	13.82	2.26
Knobcone Pine	Closed-Cone Pine-Cypress	California Forest and Woodland	-	-	-	-	96.13	32.78	-
Mixed Conifer—Pine	Klamath Mixed Conifer	Californian—Vancouverian Montane and Foothill Forest	55.27	62.26	-	28.07	-	48.6	214.76
Pacific Douglas-Fir	Douglas-Fir; Klamath Mixed Conifer	Californian—Vancouverian Montane and Foothill Forest	141.71	242.73	9.65	51.15	-	107.15	788.67
Ponderosa Pine	Ponderosa Pine	Californian—Vancouverian Montane and Foothill Forest	-	2.45	-	44.93	-	1.55	86.92
Redwood—Douglas-Fir	Redwood	Vancouverian Rainforest	-	-	-	-	-	-	135.4

CALVEG Alliances	CWHR Equivalent	Manual of California Vegetation Equivalent	Six Rivers	Shasta-Trinity	Hoopa	BLM	Whiskeytown	Caltrans*	Non-agency/Private
<i>Hardwood Forest/Woodlands</i>									
California Black Oak	Montane Hardwood; Montane Hardwood-Conifer	Californian–Vancouverian Montane and Foothill Forest	-	3.9	-	64.54	-	-	62.27
Canyon Live Oak	Montane Hardwood; Montane Hardwood-Conifer	Californian–Vancouverian Montane and Foothill Forest	-	112.05	-	90.01	13.07	57.66	95.08
Interior Mixed Hardwood	Montane Hardwood; Montane Hardwood-Conifer	Californian–Vancouverian Montane and Foothill Forest	100.27	67.21	27.19	5.24	-	80.3	209.53
Riparian Mixed Hardwood	Montane Riparian; Valley-Foothill Riparian	Vancouverian Flooded and Swamp Forest; Warm Southwest Riparian Forest	0.79	124.87	3.11	37.23	20.33	54.04	84.67
Valley Oak	Valley-Foothill Riparian; Valley Oak Woodland	Warm Southwest Riparian Forest; California Forest and Woodland	-	-	-	17.18	8.19	20.86	90.07
<i>Shrubland/Chaparral</i>									
Coyote brush	Coastal Scrub	California Coastal Scrub	-	-	-	-	-	2.35	13.31
Deerbrush	Mixed Chaparral;	California Chaparral; Western	-	52.67	-	-	-	-	-

CALVEG Alliances	CWHR Equivalent	Manual of California Vegetation Equivalent	Six Rivers	Shasta-Trinity	Hoopa	BLM	Whiskeytown	Caltrans*	Non-agency/Private
	Montane Chaparral	Cordilleran Montane Shrubland and Grassland							
Manzanita	Mixed Chaparral; Montane Chaparral	California Chaparral; Western Cordilleran Montane Shrubland and Grassland	-	66.25	-	14.82	15.44	12.62	0.94
Ultramafic Mix Shrub	Mixed Chaparral; Montane Chaparral	California Chaparral; Western Cordilleran Montane Shrubland and Grassland	-	3.58	-	2.05	-	-	22.74
Wedgeleaf Ceanothus	Mixed Chaparral Montane Chaparral	California Chaparral; Western Cordilleran Montane Shrubland and Grassland	-	18.18	-	43.32	-	20.73	36.02
<i>Herbaceous</i>									
Annual Grasses and Forbs	Annual Grassland	California Annual and Perennial Grassland	0.59	5.53	5.45	8.36	3.73	50.4	327.64
Annual Grasses and Forbs (Dunes)	Annual Grassland	California Annual and Perennial Grassland	-	-	-	0.04	-	16.85	94.5
Non-Native/Invasiv	Annual Grassland	California Annual and	0.16	-	-	-	-	2.66	7.8

CALVEG Alliances	CWHR Equivalent	Manual of California Vegetation Equivalent	Six Rivers	Shasta-Trinity	Hoopa	BLM	Whiskeytown	Caltrans*	Non-agency/Private
e Forb and Grass		Perennial Grassland							
Non-Native/Ornamental	Urban	n/a	-	-	0.76	-	-	-	19.84
<i>Developed/Non-Vegetated</i>									
Barren	Barren	n/a	1.02	4.84	-	14.12	24.59	30.44	59.84
Agriculture	Irrigated Grain Crops Irrigated Hayfield Pasture Vineyard	n/a	-	-	-	-	-	3.6	127.98
Urban or Developed	Urban	n/a	51.4	163.24	30.25	76.53	55.04	867.81	1918.1
<i>Wetland Habitats</i>									
Pickleweed-Cordgrass**	Saline Emergent Wetland	North American Pacific Coastal Salt Marsh	-	-	-	-	-	0.84	8.09
Tule/Cattail	Fresh Emergent Wetland Wet Meadow	Western North American Freshwater Marsh	-	-	-	-	-	-	0.38
Wet Meadows (Wet Grasses and Forbs)	Fresh Emergent Wetland; Wet Meadow	Western North American Montane/Boreal Peatland	-	-	-	-	-	10.68	57.36
Willow**	Fresh Emergent Wetland	Western North American Freshwater Marsh	-	0.06	0.59	0.07	-	9.87	87.87

CALVEG Alliances	CWHR Equivalent	Manual of California Vegetation Equivalent	Six Rivers	Shasta-Trinity	Hoopa	BLM	Whiskeytown	Caltrans*	Non-agency/Private
<i>Aquatic Habitats</i>									
Water	Estuarine Lacustrine Riverine	Temperate Pacific Intertidal Shore; Western North American Freshwater Aquatic Vegetation	2.71	6.41	-	1.86	6.65	11.5	38.36
*Caltrans acreages may be duplicative to acreages shown under other landowners **Denotes S3 ranked Sensitive Natural Communities (CDFW) and ESHA per the California Coastal Act (when occurring in the Coastal Zone)									

Conifer Forest/Woodlands

Beach Pine Alliance

In this vegetation community type, the canopy is dominated by beach pine (*Pinus contorta* ssp. *contorta*), the coastal subspecies of lodgepole pine (*P. contorta* ssp. *murrayana*). The understory typically consists of other trees and shrubs such as Sitka spruce (*Picea sitchensis*), coyote brush (*Baccharis pilularis*), red alder (*Alnus rubra*), California huckleberry (*Vaccinium ovatum*), and various willows (*Salix* spp.). Beach pine communities are present on the far western coastal portions of the Action Area on the landward edges of sand dunes. This community is an S3 ranked CDFW Sensitive Natural Community.

Douglas-Fir—Pine Alliance

In this vegetation community type, the canopy is co-dominated by Douglas-fir (*Psuedotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). The understory typically consists of Pacific madrone (*Arbutus menziesii*), California black oak (*Quercus kelloggii*), canyon live oak (*Quercus chrysolepis*), and/or bigleaf maple (*Acer macrophyllum*). These Douglas-fir—pine communities are present in the Weaverville-Lewiston portion of the Action Area, functioning as a transition community between the Pacific Douglas-fir forests to the west and Ponderosa pine forests to the east.

Douglas-Fir—White Fir Alliance

In this vegetation community type, the canopy is co-dominated by Douglas-fir and white fir (*Abies concolor*). Depending on environmental conditions, the understory typically consists of other tree species such as ponderosa pine, tree chinquapin (*Chrysolepis chrysophylla*), California black oak, canyon live oak, and/or bigleaf maple. A small stretch of Douglas-fir—white fir communities are present in the central portion of the Action Area within STNF.

Gray Pine Alliance

In this vegetation community type, other common canopy species include blue oak (*Quercus douglasii*), Oregon white oak (*Q. garryana*), canyon live oak (*Q. chrysolepis*), and Pacific madrone (*Arbutus menziesii*). Stands typically include a mixture of low-elevation chaparral shrubs or annual grassland in or adjacent to open stands. Gray pine communities are present along SR 299 in the central portion of the Action Area within STNF.

Knobcone Pine Alliance

In this vegetation community type, knobcone pine (*Pinus attenuata*) is typically the dominant canopy cover but is often co-dominant with a variety of hardwoods such as California black oak and canyon live oak. The understory typically consists of shrubby species like manzanita (*Arctostaphylos* sp.), chamise (*Adenostoma fasciculatum*), and shrubby oaks (*Quercus* sp.). Knobcone pine communities are present along the Whiskeytown NRA portion of the alignment, often intergrading with Manzanita and Valley Oak communities.

Mixed Conifer—Pine Alliance

In this vegetation community type, multiple conifer species typically co-dominate the overstory, including ponderosa pine, Douglas-fir, and incense cedar (*Calocedrus decurrens*). Depending on environmental conditions, the understory typically consists of hardwood tree species such as California black oak, Oregon white oak (*Quercus garryana*), and canyon live oak in addition to shrub species such as greenleaf manzanita (*Arctostaphylos patula*), whiteleaf manzanita (*Arctostaphylos viscida*), poison oak (*Toxicodendron diversilobum*), and mountain whitethorn (*Ceanothus cordulatus*). Mixed conifer—pine communities are present intermittently along the central portion of the Action Area.

Pacific Douglas—Fir Alliance

In this vegetation community type, the overstory is dominated by Douglas-fir. The understory is typically dominated by tanoak (*Lithocarpus densiflorus* var. *densiflorus*) in western sites, with other tree species such as redwood (*Sequoia sempervirens*), ponderosa pine, incense cedar, Oregon white oak, bigleaf maple, California bay (*Umbellifera californica*), and tree chinquapin present in varying amounts depending upon environmental conditions. Pacific Douglas-fir communities are the dominant habitat type found along much of the central portion of the Action Area at elevations below 5,700 feet.

Ponderosa Pine Alliance

In this community, the overstory is dominated by ponderosa pine. The understory typically consists of other trees such as California black oak, canyon live oak, Oregon white oak, and Douglas-fir, in addition to shrub species such as whiteleaf manzanita and wedgeleaf ceanothus (*Ceanothus cuneatus*). Ponderosa pine communities were identified intermittently throughout the eastern portion of the Action Area between Weaverville and Redding.

Redwood—Douglas-Fir Alliance

In this vegetation community type, the canopy is co-dominated by redwood and Douglas-fir with an understory consisting of tanoak, red alder, Pacific madrone, California bay, and Oregon white oak. Redwood—Douglas-fir communities are present in the western coastal portions of the Action Area, typically on protected upland slopes up to 3,200 feet in elevation. This community is an S3 ranked CDFW Sensitive Natural Community.

Hardwood Forest/Woodlands

California Black Oak Alliance

The overstory of this vegetation community is often dominated by California black oak. However, Oregon white oak and/or canyon live oak may share dominance with California black oak on drier or harsher sites. The understory typically consists of low growing shrubs like various species of manzanita, shrub oaks, deerbrush (*Ceanothus intergerrimus*), and Brewer oak (*Quercus garryana breweri*). A small section of California black oak communities is present in the Action Area just east of the town of Weaverville.

Canyon Live Oak Alliance

Dominated by canyon live oak, this community is often found on steep and rocky south- or southwest-facing slopes. Associated trees typically include low- to mid-elevation conifers such as Douglas-fir, ponderosa pine, knobcone pine (*Pinus attenuata*), and redwood, as well as hardwoods such as Oregon white oak, California black oak, and tanoak. Canyon live oak communities are present intermittently throughout the central portion of the Action Area.

Interior Mixed Hardwood Alliance

This vegetation community type typically does not have one dominant species but is rather a diverse mixture of Oregon white, canyon live, and blue (*Quercus douglasii*) oaks, with lesser amounts of California bay and coast live oak (*Quercus agrifolia*). Conifer associates are mainly Douglas-fir and in western areas, redwood. Interior mixed hardwood communities are present along the western portions of the Action Area between the coast and the town of Willow Creek.

Riparian Mixed Hardwood Alliance

This vegetation community type typically consists of a mixture of tree willows, cottonwoods (*Populus* spp.), white alder (*Alnus rhombifolia*), and red alder that occurs near moist areas and adjacent to waterways

in coastal and inland areas. Riparian mixed hardwood communities are present in varying degrees throughout the Action Area where it abuts major waterways such as the Trinity River.

Valley Oak Alliance

Dominated primarily by valley oak (*Quercus lobata*), this community is primarily found in the foothill woodlands, valleys, and floodplains west of the Sacramento River. Other associated species include blue oak, Oregon white oak, low elevation shrubs like chamise (*Adenostoma fasciculatum*), and annual grasses. Valley oak communities are present at the far eastern end of the Action Area just west and south of the city of Redding.

Willow (Tree) Alliance

This community can vary from a tree to shrub vegetation type. Dominated primarily by willow species such as coastal willow (*Salix hookeriana*), Pacific willow (*Salix lasiandra*), arroyo willow (*Salix lasiolepis*), and Coulter willow (*Salix sitchensis*), this riparian-type community can be found in riparian floodplains, seeps, springs, swamps, and along watercourses. Willow thickets occur intermittently along the entire Action Area but are usually concentrated along the coast and mountain valleys. Willow thickets identified within or adjacent to coastal dunes are S3 ranked CDFW Sensitive Natural Communities.

Shrubland/Chaparral

Deerbrush Alliance

This vegetation type, often dominated by deerbrush, typically occurs as a successional community after stand-replacing disturbances such as fire, landslides, or logging. Associated tree species include Douglas-fir, ponderosa pine, and knobcone pine, while associated shrub species include scrub oaks, chamise, and other ceanothus species. Deerbrush communities occur intermittently on STNF in the Action Area between the communities of Burnt Ranch and Big Bar.

Manzanita Alliance

This vegetation community is typically dominated by a variety of manzanita (*Arctostaphylos* spp.) species, often to the exclusion of other shrub species. Typical manzanita species include hoary manzanita (*A. canescens*), hairy manzanita (*A. columbiana*), common manzanita (*A. manzanita*), eastwood manzanita (*A. glandulosa*), and stanford manzanita (*A. stanfordiana*). Manzanita communities are often adjacent to lower elevation conifers such as Douglas-fir, gray pine (*Pinus sabiniana*), ponderosa pine, and knobcone pine. Manzanita communities are present in the Action Area within STNF near Monument Peak.

Ultramafic Mix Shrub Alliance

Located on nutrient-poor, serpentinite-derived soils that cannot support open woodlands, these communities typically support a mixture of shrubs and often, rare herbaceous plants. Common shrub species include Jepson ceanothus (*C. cuneatus*), wedgeleaf ceanothus, huckleberry oak (*Quercus vacciniifolia*), California coffeeberry (*Frangula californica*), creeping barberry (*Berberis aquifolium* var. *repens*), dwarf siltkassel (*Garrya buxifolia*), shrub tanoak (*Notholithocarpus densiflorus* var. *echinoides*), and Siskiyou mat (*Ceanothus pumilus*). Ultramafic mix shrub communities are present at two locations in the Action Area near the communities of Big Bar and Douglas City.

Wedgeleaf Ceanothus Alliance

This vegetation community is dominated by various single or mixed species of ceanothus that include wedgeleaf ceanothus, blueblossom (*C. thyrsiflorus*), deerbrush (*C. integerrimus*), and snowbrush (*C. velutinus*). Ceanothus chaparral communities are present in the Action Area east and west of the community of Weaverville. This community is an S3 ranked CDFW Sensitive Natural Community.

Herbaceous

Annual Grasses and Forbs Alliance

This vegetation community is dominated by annual grasses and forbs. Species include introduced and native annual grasses such as brome (*Bromus* spp.), bluegrass (*Poa* spp.), wildoats (*Avena* spp.), fescue (*Vulpia* spp.), dogtail (*Cynosurus* spp.), barley (*Hordeum murinum*), needlegrass (*Stipa* spp.), oatgrass (*Danthonia* spp.), and a variety of forbs such as checker mallow (*Sidalcea* spp.), brodiaea (*Brodiaea* spp.), wild hyacinth (*Dichelostemma* spp.), yampah (*Perideridia* spp.) and mariposa lily (*Calochortus* spp.). Annual grasses and forb communities are present throughout the Action Area.

Annual Grasses and Forbs Alliance (Dunes)

This community is similar to the Annual Grasses and Forbs Alliance but occurs on the back-dunes of the Samoa Peninsula. Other non-native species present include rattlesnake grass (*Briza maxima*), iceplant (*Carpobrotus chilensis*, *C. edulus*), yellow bush lupine (*Lupinus arboreus*), and European beachgrass (*Ammophila arenaria*). Native grasses and forbs are present to a lesser degree in this community type adjacent to the Action Area.

Non-Native/Ornamental

Ornamental or non-native shrubs or trees dominate this alliance. Mapped areas of this community type, present around more developed portions of the Action Area, are usually in developed areas, including urban and residential landscapes, parks, recreational areas, highways, cemeteries, etc.

Developed/Non-Vegetated

Barren

Areas generally devoid of vegetation such as exposed bedrock, interior sandy areas, and bare dirt.

Agriculture

Agriculture areas are those lands used primarily for the production of food and fiber, including orchards, vineyards, and other field crops. Land used for livestock pasture may be mapped as annual grasses and forbs.

Urban or Developed

This category applies to landscapes that are dominated by urban structures, residential units, or other developed land use elements such as highways, city parks, or parking lots.

Wetland Habitats

The Construction Corridor intersects several wetland habitats, primarily willow thickets along the coast and around Humboldt Bay. The exact locations, extent, and potential jurisdiction (e.g., U.S. Army Corps of Engineers) of these wetlands are described in further detail in the Digital 299 Preliminary Jurisdictional Delineation Report (Transcon 2021).

Pickleweed-Cordgrass Alliance

This wetland community commonly occurs within coastal brackish and saltwater marshes. Usually dominated by common pickleweed (*Salicornia virginica*) and California cordgrass (*Spartina foliosa*), these communities may also include invasive non-native species such as saltwater and dense-flowered cordgrasses (*Spartina alterniflora*, *Spartina densiflora*). Pickleweed-cordgrass communities are present on

the western portion of the Action Area adjacent to Humboldt Bay. This community is an S3 ranked CDFW Sensitive Natural Community.

Tule/Cattail Alliance

This wetland community consists of permanently flooded freshwater areas dominated by bulrush (*Scirpus* spp.) and/or cattails (*Typha latifolia*, *T. domingensis*, *T. angustifolia*). Tule/cattail communities, adjacent to inland rivers, lakes, and springs, are present in a few areas adjacent the Action Area.

Wet Meadows (Wet Grasses and Forbs) Alliance

This perennial or seasonal wetland community commonly occurs on grasslands or gently sloping areas that are adjacent to perennial streams, seeps, springs or lakes. These are usually small sites that are dominated by obligate hydrophytes such as sedges (*Carex* spp.), rushes (*Juncus* spp.), and bulrushes as well as perennial grasses such as bluegrass, brome, fescue, oniongrass (*Melica* spp.), and reedgrass (*Calamagrostis* spp.). Wet meadows are present occasionally along the entire length of the Action Area.

Willow Alliance

Dominated primarily by willow species such as coastal willow (*Salix hookeriana*), Pacific willow (*Salix lasiandra*), arroyo willow (*Salix lasiolepis*), and Coulter willow (*Salix sitchensis*), this riparian-type community can be found in riparian floodplains, seeps, springs, swamps, and along watercourses. Willow thickets occur intermittently along the entire Action Area but are usually concentrated along the coast and mountain valleys. Willow thickets identified within or adjacent to coastal dunes are S3 ranked CDFW Sensitive Natural Communities.

Aquatic Habitats

The Construction Corridor intersects several major waterbodies, rivers, sloughs, and smaller waterways at numerous locations. The exact locations, extent, and potential jurisdiction (e.g., U.S. Army Corps of Engineers) of these waters are described in further detail in the Digital 299 Preliminary Jurisdictional Delineation Report (Transcon 2021).

Whiskeytown Lake

Whiskeytown Lake is a reservoir in Shasta County about 8 miles west of Redding that intersects the survey area at one bridge location. The lake supports a variety of native and non-native species of fishes.

Major Rivers

Six major rivers intersect the Construction Corridor, including Mad River, North Fork Mad River, Trinity River, South Fork Trinity River, North Fork Trinity River, and Little River. These rivers intersect the Construction Corridor at 13 separate locations. All fiber optic line crossings will be via bridge, with the exception of an HDD crossing of the Trinity River. These rivers support a number of native and non-native fishes and aquatic animal species, including several anadromous fish populations (**Table 6** and Chapter 5.3). The banks of most of these rivers are dominated by woody riparian plant species such as cottonwood, willow, and alders.

Sloughs

Five sloughs, or tidal channels, intersect the Construction Corridor along SR 255 adjacent to Humboldt Bay and along Old Arcata Road, including the Mad River Slough, Freshwater Slough, and three unnamed sloughs. These sloughs support a variety of saltwater and anadromous fish species (**Table 6** and Chapter 5.3). The banks of most of the sloughs are dominated by emergent estuarine plant species such as common pickleweed, seaside arrowgrass, seablite, and cordgrass.

Perennial Streams

Perennial streams consisting of both named creeks and unnamed streams intersect the Construction Corridor at 129 separate locations either under bridges or through culvert crossings. The larger perennial creeks (e.g., Redwood Creek, Willow Creek, Canyon Creek) support a variety of native and non-native fish species (including anadromous fish) and are dominated by a canopy of riparian tree species such as cottonwoods, willows, and alders. When present, emergent wetland vegetation includes a variety of sedges, rushes, and other forbs and grasses.

Intermittent and Ephemeral Streams

The Construction Corridor is also intersected by 237 intermittent streams and 201 ephemeral streams. The intermittent streams often support anadromous fish and other aquatic species when water is present (during the rainy season) but are dry during the hot summer months. The ephemeral streams, which are typically dry except during periods of high rainfall, do not typically support fish or other aquatic species. The intermittent waterways are typically dominated by a canopy of upland trees (e.g., Douglas-fir, redwoods, or oaks), a mid-story of alder and dogwood, and occasionally an herbaceous layer of emergent wetland vegetation such as sedges, rushes, and other forbs and grasses. Ephemeral streams are dominated by a similar canopy of upland trees but typically lack the mid-story and emergent wetland species.

Seeps and Springs

Several seeps and springs often associated with intermittent streams also occur along the Action Area and are typically found emerging from roadcuts on some of the more remote dirt roads. Many of these seeps and springs flow year-round.

4.5 Sensitive Natural Communities and Environmentally Sensitive Habitat Areas

Sensitive natural communities, as defined by CDFW, were also identified in the Action Area. Sensitive natural communities are those communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects (CDFW 2018a). Sensitive natural communities are tracked by the CNDDDB and may or may not contain individual plants or animals classified as special-status species. Although sensitive natural communities have no legal status alone (with the exception of some sensitive natural communities [i.e., wetlands, riparian areas] that are afforded protection separately under federal and/or state regulations), lead and trustee agencies may request that impacts to these communities be addressed in environmental documents. Local agencies may also have policies requiring avoidance of rare community types.

Five sensitive natural communities have been identified within the study area: beach pine, redwood–Douglas-fir, willow thickets, ceanothus chaparral, and pickleweed-cordgrass communities. These communities are described in detail in the preceding chapter and their status noted in **Table 4**.

Additionally, portions of the Action Area within the Coastal Zone that may be considered ESHAs were identified per the California Coastal Act. These include “any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities” (CPRC 30107.5). Potential ESHA identified within the Action Area include the aforementioned willow thickets and pickleweed-cordgrass communities, emergent wetlands, and one egret/heron rookery.

4.6 Wildfire Effects to Habitat

Three recent wildfires occurred within natural areas through which the Construction Corridor crosses. The Helena Fire burned 18,316 acres south and east of the community of Helena in late 2017, while the Carr Fire burned 229,651 acres in Shasta and Trinity counties in late 2018. In 2021, the Monument Fire burned 223,124 acres in Trinity County and is still burning as of this writing (October 2021). The habitats in which these fires burned varied but primarily included conifer and oak woodlands. While the areas burned by the Helena Fire have begun to recover, the segments of the Construction Corridor within the area burned by the Carr Fire are in the initial stages of recovery and very little perennial vegetative cover is present (USDA 2019). Vegetation affected by the Monument Fire has not yet begun recovery. An additional wildfire, the Knob Fire, burned 2,421 acres within the project Action Area in the summer of 2021 in eastern Humboldt County; this fire is not known to have reached the Construction Corridor. The habitat types identified by CALVEG in this area and displayed in **Appendix D** are based on those that were likely present before the Carr and Monument fires but do not necessarily represent the current state of these habitats. Project effects analysis for special-status species within these areas are based on post-fire conditions for the Helena and Carr fires, and the lack of suitable habitat in this area was considered during the analysis. As of this writing the Monument Fire has not been fully contained, and since it is not possible to fully ascertain impacts to vegetation and habitat within the footprint of the fire, Project effects analysis for these areas was primarily done with the assumption that the fire had no significant effects to vegetative communities in order to take a conservative approach regarding where sensitive species may potentially occur.

4.7 General Wildlife

The Action Area includes a wide array of habitats which support a diversity of wildlife species. Common bird species found in the habitats present in the Action Area include marbled godwit (*Limosa fedoa*), osprey (*Pandion haliaetus*), Canada goose (*Branta canadensis*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), mallard (*Anas platyrhynchos*), red-winged blackbird (*Agelaius phoeniceus*), yellow-rumped warbler (*Setophaga coronata*), Anna's hummingbird (*Calypte anna*), California quail (*Callipepla californica*), spotted towhee (*Pipilo maculatus*), black phoebe (*Sayornis nigricans*), acorn woodpecker (*Melanerpes formicivorus*), common raven (*Corvus corax*), wild turkey (*Meleagris gallopavo*), black-capped chickadee (*Poecile atricapillus*), northern flicker (*Colaptes auratus*), Steller's jay (*Cyanocitta stelleri*), mourning dove (*Zenaidura macroura*), and western kingbird (*Tyrannus verticalis*).

Common mammal species found in the habitats present in the Action Area include western gray squirrel (*Sciurus griseus*), California ground squirrel (*Otospermophilus beecheyi*), gray fox (*Urocyon cinereoargenteus*), ring-tailed cat (*Bassariscus astutus*), black bear (*Ursus americanus*), black-tailed jackrabbit (*Lepus californicus*), California mule deer (*Odocoileus hemionus californicus*), desert cottontail (*Sylvilagus audubonii*), and yellow-pine chipmunk (*Neotamias amoenus*).

Common reptile and amphibian species found in the habitats present in the Action Area include coast gartersnake (*Thamnophis elegans terrestris*), Pacific gophersnake (*Pituophis catenifer catenifer*), western yellow-bellied racer (*Coluber constrictor mormon*), California toad (*Anaxyrus boreas halophilus*), mountain gartersnake (*Thamnophis elegans elegans*), northern pacific treefrog (*Pseudacris regilla*), rough-skinned newt (*Taricha granulosa*), forest alligator lizard (*Elgaria multicarinata multicarinata*), northwestern fence lizard (*Sceloporus occidentalis occidentalis*), California whiptail (*Aspidoscelis tigris munda*), gopher snake (*Pituophis catenifer*), and western fence lizard (*Sceloporus occidentalis*).

Common fish species found in aquatic habitats in the Action Area include native species such as rainbow trout/steelhead (*Oncorhynchus mykiss*), chinook/king salmon (*Oncorhynchus tshawytscha*), freshwater sculpin (*Cottus* sp.), Pacific lamprey (*Lampetra tridentata*), and suckers (*Catostomus* sp.). Common non-native fish species include green sunfish (*Lepomis cyaneus*), bluegill (*Lepomis macrochirus*), smallmouth

bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), brown trout (*Salmo trutta*), and brook trout (*Salvelinus fontinalis*).

4.8 Special-Status Plants and Fungi

Forty state-listed and/or other special-status plant and fungi species may be present within the Action Area, including 25 vascular plants (perennial and annual herbs), 1 bryophyte, 1 fern, 12 fungi, and 1 lichen. There are no federally-listed plants that are likely to occur within the Action Area.

There are 53 special-status plant and fungi species that may be present in the region but *not* within the Action Area because it is either outside of the current known range of the species or there is no suitable habitat for the species within the Action Area. Also, while the Construction Corridor occurs near or adjacent to several vegetation community types, much of the disturbance from Proposed Action-related activities will be restricted to road shoulders and previously disturbed areas. Therefore, many of the other special-status plants were removed from further consideration due to lack of suitable habitat. **Appendix E** details the habitat requirements and justification for why these species were removed from further consideration.

Due to the length of the Action Area and the large number of special-status plant species that may be present, abbreviated natural history and occurrence information is presented in **Table 5**. Lists of special-status plants of specific concern to each federal land management agency in which the Action Area crosses are presented in **Appendices H through K**.

Table 5. Special-Status Plants That May Be Present in the Action Area

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Bryophyte	Elongate copper moss <i>Mielichhoferia elongata</i>	CRPR 4.3 FSS (SRNF & STNF)	This species can be found in acidic or vernal mesic (often roadside) sites, meadows, and seeps in broad-leaved upland forest, chaparral, cismontane woodland, coastal scrub, and lower and subalpine montane coniferous forests.	Two CNDDDB records and nine NRIS records (1983 to 2010)	Suitable habitat is present between the communities of Burnt Ranch and Helena.
Bryophyte	Flagella-like atractylocarpus <i>Campylopodia stenocarpa</i>	CRPR 2B.2 FSS (STNF)	This species occurs in low- to mid-elevation cismontane woodland.	Two CNDDDB records (1983 and 2003)	Suitable habitat is present between the communities of Big Bar and Helena.
Vascular Plant (Perennial herb)	Bald Mountain milk-vetch <i>Astragalus umbraticus</i>	CRPR 2B.3	This species occurs in cismontane woodlands and lower montane coniferous forests.	One CNDDDB record (1883)	Suitable habitat is present between the communities of Blue Lake and Willow Creek.
Vascular Plant (Perennial herb)	California globe mallow <i>Iliamna latibracteata</i>	CRPR 1B.2 FSS (SRNF and STNF)	This species can be found in mesic and streamside sites	Three CNDDDB record (1919 to 2004)	Suitable habitat is present between the communities of

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			in coniferous forests.		Korbel and Hoopa.
Vascular Plant (Perennial herb)	Canyon Creek stonecrop <i>Sedum obtusatum</i> <i>ssp. paradisum</i>	CRPR 1B.3 FSS (STNF)	This species can be found in granitic and rocky areas within chaparral, lower montane and subalpine coniferous forests, and broad-leaved upland forest habitats.	Four NRIS records (2003 to 2018)	Suitable habitat is present along a small segment of the Construction Corridor between the communities of Big Bar and Junction City.
Vascular Plant (Perennial herb)	Clustered lady's-slipper <i>Cypripedium fasciculatum</i>	CRPR 4.2 FSS (SRNF and STNF) BLM-S	This species can often be found at serpentine seeps, streams, and other riparian areas in late successional yellow pine, redwood, and Douglas-fir forests.	No records	Suitable habitat is present along several segments near the communities of Big Bar and Douglas City.
Vascular Plant (Perennial herb)	Coast checkerbloom <i>Sidalcea oregana</i> <i>ssp. exima</i>	CRPR 1B.2 BLM-S	This species occurs in meadows or seeps within North Coast and lower montane coniferous forests habitats.	No records	Between the coast and inland to Willow Creek

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Vascular Plant (Perennial herb)	Coast fawn lily <i>Erythronium revolutum</i>	CRPR 2B.2	This species can be found at streambanks and moist sites in redwood and mixed evergreen forests.	Eight CNDDDB records (1918 to 2020)	Suitable habitat is present between the communities of Korbel and Hoopa and between Salyer and Burnt Ranch.
Vascular Plant (Perennial herb)	Dudley's rush <i>Juncus dudleyi</i>	CRPR 2B.3	This species can be found in mesic sites in lower montane coniferous forests.	Two CNDDDB records (1879 to 1978)	Suitable habitat is present east and west of the community of Weaverville.
Vascular Plant (Perennial herb)	Giant fawn lily <i>Erythronium oregonum</i>	CRPR 2B.2	This species can be found at openings, meadows, or seeps in mixed evergreen forests.	Ten CNDDDB records (1964 to 2011)	Suitable habitat is present between the towns of Blue Lake and Hoopa and between the communities of Willow Creek and Burnt Ranch.
Vascular Plant (Perennial herb)	Heckner's lewisia <i>Lewisia cotyledon</i> var. <i>heckneri</i>	CRPR 1B.2 BLM-S	This species can be found on cliff crevices and rocky granitic or basalt slopes in coniferous forests.	Eighteen CNDDDB records and 14 NRIS records (1883 to 2010)	Suitable habitat is present within STNF between the communities of Burnt Ranch and Big Bar.
Vascular Plant (Annual herb)	Howell's montia <i>Montia howellii</i>	CRPR 2B.2	This species occurs a vernally	Six CNDDDB records and	Suitable habitat is present from

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			mesic sites (sometimes roadsides) in North Coast coniferous forests.	six NRIS records (1916 to 2019)	the western end of the Construction Corridor inland to the community of Burnt Ranch.
Vascular Plant (Perennial herb)	Lyngbye's sedge <i>Carex lyngbyei</i>	CRPR 2B.2	This species occurs in coastal salt marshes and freshwater marshes.	Thirteen CNDDDB records (1922 to 2014)	Suitable habitat is present along the coastal segments of the Construction Corridor near the communities of Samoa, Eureka, and Arcata.
Vascular Plant (Perennial herb)	Maple-leaved checkerbloom <i>Sidalcea malachroides</i>	CRPR 4.2	This species can be found in disturbed areas in coastal prairies, mixed evergreen forests, and redwood forests.	Eight CNDDDB occurrences (1921 to 2002)	Suitable habitat is present at numerous portions of the Construction Corridor from Humboldt Bay east to Lord Ellis Summit.
Vascular Plant (Perennial herb)	Mountain lady's slipper <i>Cypripedium montanum</i>	CRPR 4.2 FSS (SRNF and STNF) BLM-S	This species occurs in mesic to moist areas in broad-leaved upland forests, cismontane woodlands, and coniferous forests. Prefers	Six NRIS records (1977 to 1983)	Suitable habitat is present between the town of Hoopa and Whiskeytown NRA.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			mid- to late-successional forests.		
Vascular Plant (Perennial herb)	Northern meadow sedge <i>Carex praticola</i>	CRPR 2B.2	This species can be found in meadows, seeps, riparian edges, and open forest habitats.	One CNDDDB record (1915)	Suitable habitat is present along the coastal segments of the Construction Corridor near the communities of Samoa, Eureka, and Arcata.
Vascular Plant (Perennial herb)	Oregon fireweed <i>Epilobium oreganum</i>	CRPR 1B.2 FSS (SRNF and STNF) BLM-S	This species is often found serpentine bogs and fens in lower and upper montane coniferous forests.	No records	Suitable habitat is present between the communities of Burnt Ranch and Del Loma.
Vascular Plant (Perennial herb)	Oregon golden thread <i>Coptis laciniata</i>	CRPR 4.2	This species can be found in redwood and Douglas-fir forests as well as wetland-riparian areas.	Six CNDDDB records (1979 to 2013)	Suitable habitat is present along small portions of the Construction Corridor from Korbel east to Willow Creek.
Vascular Plant (Annual herb)	Pacific gilia <i>Gilia capitata</i> ssp. <i>pacifica</i>	CRPR 1B.2	This species occurs in coastal bluff scrub, chaparral (openings), coastal prairie,	Three CNDDDB records (1905 to 2014)	Suitable habitat is present between the communities of Korbel and Hoopa.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			and valley and foothill grasslands.		
Vascular Plant (Perennial)	Port Orford cedar <i>Chamaecyparis lawsoniana</i>	None	This species occurs at streamsides, bogs, and other (often serpentine) sites in coastal conifer, mixed evergreen, and yellow-pine forests.	One record was identified during surveys within the Construction Corridor (2019).	Suitable habitat is present along portions of the Construction Corridor around the town of Willow Creek.
Vascular Plant (Perennial herb)	Robust false lupine <i>Thermopsis robusta</i>	CRPR 1B.2 FSS (SRNF)	This species occurs in broad-leaved upland forests and North Coast coniferous forest.	Five CNDDDB records (2018 to 2019)	Suitable habitat is present between the communities of Korbel and Hoopa.
Vascular Plant (Annual herb)	Round-headed chinese houses <i>Collinsia corymbosa</i>	CRPR 1B.2	This species can be found in coastal dune habitats	One CNDDDB record (1900)	Suitable dune habitat is present at portions of the Construction Corridor in Samoa.
Vascular Plant (Fern)	Running pine <i>Lycopodium clavatum</i>	CRPR 4.1	This species occurs in freshwater marshes within Douglas-fir forests.	Fifteen CNDDDB records (1959 to 2002)	Suitable habitat is present through some sections of the Construction Corridor between Korbel

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					and Lord Ellis Summit.
Vascular Plant (Annual herb)	Short-leaved evax <i>Hesperivax sparsiflora</i> var. <i>brevifolia</i>	CRPR 1B.2	This species can be found in coastal dune habitats.	One CNDDDB record (1984)	There is suitable habitat present in the Action Area from Samoa north to the town of Manila.
Vascular Plant (Perennial herb)	Siskiyou checkerbloom <i>Sidalcea malviflora</i> ssp. <i>patula</i>	CRPR 1B.2 BLM-S	This species can be found in prairies, roadcuts, and bluff habitats of open coastal forests.	Four CNDDDB record and one NRIS record (1944 to 2018)	Suitable habitat is present along several coastal segments of the Construction Corridor around Humboldt Bay and along the Hammond Trail.
Vascular Plant (Perennial herb)	Trinity River jewelflower <i>Streptanthus oblancoelatus</i>	CRPR 1B.2 FSS (SRNF and STNF)	This species can be found on cliffs and canyon walls in cismontane woodland habitats.	One CNDDDB record and two NRIS records (2009 to 2018)	Suitable habitat is present along a small segment of the Construction Corridor between the communities of Burnt Ranch and Del Loma.
Vascular Plant (Perennial herb)	White-flowered rein orchid <i>Piperia candida</i>	CRPR 1B.2 BLM-S	This species occurs in open or shady sites in coniferous and mixed evergreen forests.	Four CNDDDB occurrences (1975 to 2011)	Suitable habitat is present between the communities of Salyer and

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Vascular Plant (Perennial herb)	Wolf's evening primrose <i>Oenothera wolfii</i>	CRPR 1B.2 BLM-S	This species can be found at roadsides or moist sites of coastal dune and coastal bluffs habitats.	Five CNDDDB records (1949 to 2013)	Burnt Ranch (2005). Suitable habitat is present along the western coastal portions of the Construction Corridor north of Samoa and along the Hammond Trail between McKinleyville and Clam Beach.
Lichen	Sulcaria lichen <i>Sulcaria badia</i>	FSS (SRNF and STNF)	This species can be found in warm but moist oak woodlands and Douglas-fir forests.	Twenty-four NRIS records (2004 to 2020)	There is suitable habitat present in the Action Area from Salyer to the community of Burnt Ranch within SRNF.
Fungus	Branched collybia <i>Dendrocollybia racemosa</i>	FSS (SRNF and STNF)	This species is usually found on remains of decayed mushrooms or in duff of mixed hardwood-conifer woods.	Two NRIS records (2011)	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Fungus	California phaeocollybia <i>Phaeocollybia californica</i>	BLM-S	This species is associated with the roots of Sitka spruce, Douglas-fir, western hemlock, and Pacific silver fir in late successional forests.	Two NRIS records (2005 to 2010)	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.
Fungus	Hypogeous truffle <i>Choiromyces venosus</i>	BLM-S	This species forms sporocarps beneath the soil surface associated with various pine species, Douglas-firs and western hemlock at low elevations primarily in late successional forests.	No records	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.
Fungus	Little brown mushroom <i>Mycena quinaultensis</i>	BLM-S	This species is typically found in gregarious, caespitose clusters on senescent conifer needles or uncommonly on decayed wood in primarily in late	No records	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			successional conifer forests.		
Fungus	Little green mushroom <i>Dermocybe humboldtensis</i>	BLM-S	This species forms sporocarps beneath the soil surface associated with various pine species in a variety of seral stages.	No records	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.
Fungus	Olive phaeocollybia <i>Phaeocollybia olivacea</i>	FSS (SRNF and STNF)	This species can be found scattered or in arcs in mixed late successional forests containing beech or pine species in coastal lowlands.	Three NRIS records (2005 to 2009)	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.
Fungus	Orange coral mushroom <i>Ramaria largentii</i>	BLM-S	This species fruits in humus or soil and matures above the surface of the ground. Associated with firs, Douglas-fir, and western hemlock in late	No records	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			successional forests.		
Fungus	Pinkish coral mushroom <i>Ramaria amyloidea</i>	BLM-S	This species fruits in humus or soil and matures above the surface of the ground. Associated with firs, Douglas-fir, and western hemlock in late successional forests.	No records	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.
Fungus	Red-pored bolete <i>Boletus pulcherrimus</i>	FSS (SRNF and STNF)	This species is typically found in humus in association with the roots of mixed conifers (grand fir, Douglas-fir) and hardwoods (tanoak) in coastal forests in a variety of seral stages.	Two NRIS records (1972 to 2006)	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.
Fungus	Spruce phaeocollybia <i>Phaeocollybia piceae</i>	BLM-S	This species is associated with the roots of Douglas-fir, western hemlock, and Pacific silver fir primarily in late	No records	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			successional forests.		dirt roads through USFS and BLM lands.
Fungus	Yellow coral mushroom <i>Ramaria aurantiisiccescens</i>	BLM-S	This species fruits in humus or soil and matures above the surface of the ground. Associated with firs, Douglas-fir, and western hemlock primarily in late successional forests.	No records	Suitable habitat is present along segments of the Construction Corridor within woodland habitats that parallel rural dirt roads through USFS and BLM lands.
Fungus	Yellow earth tongue <i>Spathularia flavida</i>	S&M Cat. B (STNF), BLM-S	This species fruits in clusters or fairy rings on litter or woody debris primarily in late successional conifer and hardwood forests.	Two NRIS records (2005)	Suitable habitat is present within STNF from the town of Big Bar east to Weaverville.

Special-Status Vascular Plants

The special-status vascular plants identified for analyses can be generally categorized based on suitable habitat preference, including mesic–moist habitats (springs, seeps, emergent wetlands, and riparian areas), cliffs/roadcuts, and forest openings in broad-leaved or coniferous forests. Species generally found in mesic–moist habitats include Lyngbye’s sedge (*Carex lyngbyei*), northern meadow sedge (*Carex praticola*), Dudley’s rush (*Juncus dudleyi*), clustered lady’s-slipper (*Cypripedium fasciculatum*), mountain lady’s slipper (*Cypripedium montanum*), giant fawn lily (*Erythronium oregonum*), coast fawn lily (*Erythronium revolutum*), Oregon fireweed (*Epilobium oregonum*), California globe mallow (*Iliamna latibracteata*), Howell’s montia (*Montia howellii*), coast checkerbloom (*Sidalcea oregana* ssp. *exima*), and running pine (*Lycopodium clavatum*). Species often found on cliffs, canyon walls, sandy areas, or roadcuts include Canyon Creek stonecrop (*Sedum obtusatum* ssp. *paradisum*), Heckner’s lewisia (*Lewisia cotyledon* var. *heckneri*), Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*), short-leaved evax (*Hesper-evax sparsiflora* var. *brevifolia*) Trinity River jewelflower (*Streptanthus oblanceolatus*), and Wolf’s evening primrose (*Oenothera wolffi*). Species generally found in forest openings in broad-leaved or coniferous forests include Bald Mountain milk-vetch (*Astragalus umbraticus*), Pacific gilia (*Gilia capitata* ssp. *pacifica*), white-flowered rein orchid (*Piperia candida*), and robust false lupine (*Thermopsis robusta*). Habitat requirements, range, and occurrence information for these species are detailed in **Table 5**.

Special-status plant surveys conducted in the spring and summer of 2019 positively identified one white-flowered rein orchid on Hennessey Road within the Construction Corridor. While no other special-status vascular plants were identified, surveys did identify suitable habitat (i.e., roadsides, roadcuts) for the following species that, due to their habitat preferences and natural history, are most sensitive to potential Proposed Action-induced stressors:

- Clustered lady’s-slipper
- Coast fawn lily
- Giant fawn lily
- Maple-leaved checkerbloom
- Mountain lady’s slipper
- Siskiyou checkerbloom
- White-flowered rein orchid
- Wolf’s evening primrose

Primary ongoing threats to these species include logging, road construction/maintenance, grazing, and competition from non-native invasive plants. Other threats include horticultural collecting (e.g., orchids, lilies, and stonecrops), alteration of fire regimes, and off-highway vehicle use.

Port Orford Cedar

Port Orford cedar, a conifer in the cypress family, is endemic to southwest Oregon and northwest California. Mature trees can often reach up to 200 feet tall with 4- to 7-foot-diameter trunks. Port Orford cedar is found sporadically throughout its range, primarily along stream sides, bogs, and other (often serpentine) mesic sites. In 1943, a root-colonizing fungus (*Phytophthora lateralis*) was identified as the primary cause of large-scale die offs of Port Orford cedar trees. This fungus can be spread from infected trees to non-infected areas via living spores in water and soil on vehicles, boots, logging trucks, and other off-road vehicles. Although there is no federal or state listings or designations, Port Orford cedar is a highly valued commercial species and the USFS and BLM actively take measures to prevent the spread of the disease. Although only one Port Orford cedar was identified within the survey area, several known populations occur nearby at East Fork Campground, Hennessey Ridge, Brannon Mountain, and in the Willow Creek drainage between Berry Summit and the town of Willow Creek (personal communication Lee 2021;

personal communication Merae 2019). In association with these areas, sub-watersheds with Port Orford cedar plant communities include Brannan Creek, Boise Creek, East Fork Creek, and Ruby Creek (personal communication Hoover 2020).

Special-Status Fungi

Several special-status fungi (FSS, BLM-S) may be present within the Action Area, including branched collybia (*Dendrocollybia racemosa*), California phaeocollybia (*Phaeocollybia californica*), Hypogeous truffle (*Choiromyces venosus*), little brown mushroom (*Mycena quinaultensis*), little green mushroom (*Dermocybe humboldtensis*), olive phaeocollybia (*Phaeocollybia olivacea*), orange coral mushroom (*Ramaria largentii*), pinkish coral mushroom (*Ramaria amyloidea*), red-pored bolete (*Boletus pulcherrimus*), spruce phaeocollybia (*Phaeocollybia piceae*), yellow coral mushroom (*Ramaria aurantiisiccescens*), and yellow earth-tongue (*Spathularia flavida*).

These fungi species have similar habitat requirements; the main body (or thallus) is usually concealed in humus or decaying wood and growing in association with the roots of conifer tree species such as Douglas-fir, western hemlock, Sitka spruce, Pacific silver fir, pines, and certain hardwood tree species. Proper identification of these fungi is dependent on the infrequent emergence of their fruiting bodies (or sporocarps). Suitable habitat is present in the Action Area within the broad-leaved and coniferous forest habitats adjacent to narrow dirt roads that cross USFS or BLM lands. Habitat requirements, range, and occurrence information for these species are detailed in **Table 5**.

Threats to special-status fungi in these forested habitats typically stem from large-scale, landscape-level impacts that affect suitable substrate for the underground fungal organism. These include high intensity wildfires/burns, fuel reduction activities (e.g., mastication and chipping), use of long-term fire retardants, activities that remove large numbers of host tree species, and intensive mushroom harvesting/raking (Cushman and Huff 2007).

4.9 Special-Status Fish and Wildlife

A total of 97 special-status wildlife species were evaluated to determine if the Proposed Action would result in disturbance, injury, or mortality. After review and analysis, 37 wildlife species were excluded from further review because the Action Area is either outside of the current known range of the species or the nearest suitable habitat is outside of established disturbance noise buffers. **Appendix E** details the habitat requirements and justification for why these species were removed from further consideration. A total of 60 wildlife species were retained for further review and analysis.

A total of 24 special-status fishes were evaluated to determine if the Proposed Action would result in disturbance, injury, or mortality. After review and analysis, five fishes were excluded from further review. A total of 19 fishes were retained for further review and analysis. Rationale for excluding certain fishes is the same as the rationale for excluding certain other special-status species as discussed above.

Due to the length of the Action Area and the large number of special-status wildlife species that may be present, abbreviated natural history and occurrence information is presented in **Table 6**. More detailed descriptions of natural history, habitat requirements, and environmental baseline are presented below for special-status species with the greatest potential to be impacted by work activities. **Appendices H through K** include special-status species tables and mapsets specific to each federal land management agency whose land is crossed by the Action Area.

Table 6. Special-Status Wildlife and Fish Species that May be Present in the Action Area

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Amphibian and Reptile	California mountain kingsnake <i>Lampropeltis zonata</i>	BLM-S (Arcata, Redding)	The California mountain kingsnake is found near streams with rock outcrops, talus, or rotting logs with sun exposure in diverse habitats such as mixed conifer forests, oak-pine woodlands, riparian woodland, chaparral, and coastal sage scrub (Nafis 2019). Their range extends through the coast ranges of northern California south through the Sierra Nevada Mountains.	None	There is suitable habitat present in the Action Area from Willow Creek east to the town of Shasta.
Amphibian and Reptile	Coast horned lizard <i>Phrynosoma blainvillii</i>	SSC BLM-S (Redding)	Coast horned lizards occur in California along the Pacific coast to the west side of the Sierra Nevada mountains and inland as far north as the Shasta Reservoir, inhabiting open areas of sandy soil and low vegetation in valleys, foothills, and semiarid mountains. They are often found near anthills in lowlands along sandy washes with scattered shrubs and along dirt roads (Nafis 2019).	None	There is suitable habitat and range overlap in the Action Area directly surrounding the town of Shasta.
Amphibian and Reptile	Coastal tailed frog <i>Ascaphus truei</i> *CDFW recognizes <i>Ascaphus truei</i> as the coastal tailed frog while USFWS recognizes the species as the Pacific tailed frog.	SSC	The coastal tailed frog is typically found in cold (59 degrees F or less), clear, permanent rocky streams in wet forests from Humboldt County east to Shasta County. Rocky streambeds are necessary as protective cover for adults, eggs, and larvae. Following heavy rains, adults can be observed in woods away from streams (Nafis 2019). Coastal tailed frogs occur more frequently in mature or late-successional stands than in younger stands (CWHR 2000a). Occasionally, individuals will inhabit areas without trees. The tadpoles prefer rocks in more turbulent water to ones in smooth, swiftly flowing water (CWHR 2000a).	There are 2 CNDDDB occurrences that overlap the Construction Corridor and 20 CNDDDB occurrences within 1.5 miles (1967 to 2017).	Suitable habitat for coastal tailed frog is present in the Action Area near Willow Creek and between Burnt Ranch and Big Bar.
Amphibian and Reptile	Del Norte salamander <i>Plethodon elongatus</i>	S&M Category D (SRNF)	The Del Norte salamander has a fairly limited range, occurring in northern California in Humboldt and western Trinity County and southwest Oregon. They are strongly associated with moist talus in humid, shaded, and closed-	There are 3 CNDDDB occurrences and 1 NRIS	Suitable habitat is present in the Action Area between Korbel

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			<p>canopy mixed hardwood and conifer forests but can also be found in rock rubble of old riverbeds and under logs and bark on the forest floor, usually in rocky areas (Nafis 2019). Late successional forests are preferred, but they will also utilize habitat in recently harvested forests. They are a terrestrial species and are active on rainy or wet nights in the fall through spring. Some Del Norte salamanders have been reported to be inactive in the summer, retreating far underground, but there have been instances where individuals were observed in shaded areas under wet streamside rocks in the dry summer months in coastal redwood forest (Nafis 2019).</p>	<p>occurrence for Del Norte salamander that overlap the Construction Corridor and 11 CNDDDB occurrences and 22 NRIS occurrences within 1.5 miles (1947 to 2017).</p>	<p>and Salyer where humid, shaded, closed-canopy mixed hardwood and conifer forests are present.</p>
Amphibian and Reptile	<p>Foothill yellow-legged frog (Northwest/North Coast Clade)* <i>Rana boylei</i></p> <p>*As of the September 2019 status review, the Northwest/North Coast Clade is not State Candidate Threatened (CDFW 2019).</p>	<p>SSC FSS (SRNF, STNF) BLM-S (Arcata)</p>	<p>Foothill yellow-legged frogs occur in rocky streams and rivers with rocky substrate and open, sunny banks in woodlands, chaparral, and forests. They are occasionally found in isolated pools, vegetated backwaters, as well as shaded and deep spring-fed pools. Unlike the majority of other ranid frogs in California, foothill yellow-legged frogs are rarely encountered far from permanent water, even on rainy nights (CWHRS 2000b). Their range extends from Humboldt County east to Shasta County.</p>	<p>There are 14 CNDDDB occurrences that overlap the Construction Corridor and 61 CNDDDB and 17 NRIS occurrences within 1.5 miles of the alignment from western Humboldt County, eastward to Whiskeytown in Shasta County (1911 to 2019).</p>	<p>Suitable habitat for foothill yellow-legged frogs intersects multiple sections of the proposed Action Area from Arcata east to Whiskeytown; particularly along USFS Road 6N12 between Salyer and Burnt Ranch. Positive observations of both breeding adults and metamorphosed juveniles have</p>

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					been recorded during field surveys at USFS Road 6N12.
Amphibian and Reptile	Northern red-legged frog <i>Rana aurora aurora</i>	SSC FSS (SRNF, STNF)	The northern red-legged frog is found throughout Humboldt County in humid forests, woodlands, grasslands, and streamsides with plant cover, but most commonly in lowlands or foothills (Nafis 2019). Individuals are frequently found in woods adjacent to streams.	There are 8 CNDDDB occurrences that overlap the Construction Corridor and 41 CNDDDB and one NRIS occurrence within 1.5 miles (1965 to 2016).	Several portions of the Action Area from Humboldt Bay north to Clam Beach and eastward to Korbel contain suitable habitat for northern red-legged frog. Positive observations have been made near a freshwater wetland in Manila at the intersection of Lupin Drive and SR 255 less than 25 feet from the Construction Corridor (personal communication with Elissa Blair, Biologist,

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					Transcon, April 17, 2019).
Amphibian and Reptile	Southern torrent salamander <i>Rhyacotriton variegatus</i>	SSC FSS (SRNF, STNF)	Southern torrent salamanders are endemic to western Oregon and northwestern California, occurring in shallow, cold and clear well-shaded streams and seeps, particularly those running through talus and under rocks year-round in mature to old-growth forests. They are highly dependent on moisture and are primarily aquatic, although they are occasionally active outside of water (Nafis 2019). Southern torrent salamanders are found primarily in waters on north-facing slopes in the southern part of their range where forests are warmer and drier.	There are 4 CNDDDB occurrences that overlap the Construction Corridor and 32 CNDDDB occurrences within 1.5 miles (1941 to 2018).	Well-shaded intermittent and perennial streams and riparian areas within mature forest habitat are present in the Action Area west of Big Bar.
Amphibian and Reptile	Western pond turtle <i>Emys marmorata</i>	SSC FSS (SRNF, STNF)	<p>Western pond turtles occur in a wide variety of intermittent and perennial freshwater aquatic habitats (Rosenberg et al. 2009). In streams and rivers, this species is associated with low-velocity flows and deep pools. Terrestrial activity includes nesting, overwintering (typically late fall to early spring), dispersal, and basking. Nest sites are most often located within 650 feet of aquatic habitat. They feature compact soil, sparse vegetation, and sun exposure. Overwintering sites can be within aquatic habitats, in undercut stream banks, or upland sites in a variety of habitats. Some individuals are not reliant on refugia during winter months and may be active year-round.</p> <p>Although turtles are most likely to be encountered in aquatic habitats, suitable terrestrial nesting and aestivation habitat can be as much as 650 feet from perennial water.</p>	There are 9 NRIS occurrences and 3 CNDDDB occurrences for western pond turtle that overlap the Construction Corridor and 122 NRIS occurrences and 17 CNDDDB occurrences within 1.5 miles (1993 to 2021).	There is suitable aquatic and terrestrial habitat throughout the Action Area, including the Trinity River (especially between the Lewiston Dam and the north fork of the Trinity River), the north and south fork of the Trinity River, and Whiskeytown Lake.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Bird	Bald eagle <i>Haliaeetus leucocephalus</i>	Federal Delisted (FD) State Endangered (SE) BGEPA FSS (SRNF, STNF), FP	This species nests primarily in large trees that are generally within 0.5 mile of rivers, ocean shores, lake margins, and other fish-bearing waters (USFWS 1986).	One NRIS-identified active nest site is 0.15 mile west of Segment 8. No other known nests are within 0.5 mile; however, 9 CNDDDB occurrences (all nests), 26 NRIS occurrences, and 3 NRIS sites (all nests) are within 1.5 miles (1997 to 2018).	Suitable nesting habitat is present throughout the Action Area but especially at areas surrounding Humboldt Bay, along the Mad River, Trinity River, and Whiskeytown Lake.
Bird	Bank swallow <i>Riparia riparia</i>	State Threatened (ST) BLM-S (Redding)	This species can be found at vertical banks, cliffs, and bluffs in alluvial, friable soils along rivers and lakes.	There are two CNDDDB occurrences that overlap the Construction Corridor at the northern segment in Eureka and just west of Blue Lake. However, the date of these occurrences is listed as 1904	There is suitable nesting habitat in the Action Area adjacent to the Mad and Sacramento Rivers.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				and 1946, respectively. There are 7 CNDDDB and 1 NRIS occurrence within 1.5 miles (1904 to 2013).	
Bird	Bryant's savannah sparrow <i>Passerculus sandwichensis alaudinus</i>	SSC	This species can be found in tidal wetlands and adjacent ruderal areas, grasslands, and pasture. They breed in vegetation along levee banks and are mostly found within and near the fog belt.	None	There is suitable habitat present throughout much of the Action Area surrounding Humboldt Bay east to Blue Lake and Korbel.
Bird	Burrowing owl <i>Athene cunicularia</i>	SSC BLM-S (Redding)	Burrowing owls occur in open treeless areas such as grasslands, coastal dunes, and agricultural or disturbed areas. They are found in a larger variety of habitats in winter and during migration.	None	Suitable habitat is present in the Action Area for overwintering individuals at Clam Beach and Little River State Beach.
Bird	Golden eagle <i>Aquila chrysaetos</i>	FP BLM-S (Redding)	In coastal northern California, golden eagles will nest in large Douglas-fir trees in proximity to open areas used for foraging. In other areas of California, golden eagles are most likely to nest in chaparral and oak woodlands, oak savannas, and grassland habitats among low, rolling hills characterized by diverse vegetation. Nest sites for golden eagles are most often located on cliffs, but they will also	Three NRIS occurrences (1981 to 2013).	Suitable habitat is present at numerous sections of the Action Area from Humboldt

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			use trees and a variety of man-made structures, including transmission structures.		Bay east to Redding.
Bird	Great gray owl <i>Strix nebulosa</i>	SE S&M Category A (SRNF) S&M Category C (STNF)	Great gray owls can be found in montane and subalpine forests of the western United States. Great gray owls rely on old hawk and raven stick nests or natural depressions on broken-top snags or stumps for nest sites (Duncan and Hayward 1994). In southcentral Oregon as well as the Sierra Nevada mountains, coniferous forests associated with meadow systems are used for nesting.	None	Individuals have been observed during the breeding season in the Klamath and Cascades Physiographic provinces but have not been confirmed to be breeding in those areas (eBird 2019). Currently, the Action Area within SRNF and STNF is only known to serve as wintering sites.
Bird	Greater sandhill crane <i>Grus canadensis tabida</i>	ST FP BLM-S (Redding)	This species occurs in open freshwater wetlands and shallow marshes, including bogs, sedge meadows, fens, open grasslands, pine savannahs, and agricultural lands.	None	The far eastern extent of the Action Area contains suitable habitat and overlaps a small portion of the northern extent of their wintering range.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Bird	Little willow flycatcher <i>Empidonax traillii brewsteri</i>	SE FSS (STNF)	This species occurs in moist, shrubby areas, often with standing or running water and favor thickets of willows along streams in broad valleys, in canyon bottoms, around mountainside seepages, or at the margins of ponds and lakes. High foliage-volume willow cover favored but with willow clumps being separated by openings. In their overwintering range, they will occupy shrubby clearings, pastures, and lighter woodland, often near water.	Fifty-five NRIS occurrences (1995 to 2016).	There are several sections of the Action Area between Salyer and French Gulch that contain suitable migration habitat where individuals can potentially be observed. The breeding range of the little willow flycatcher is just outside of the Action Area.
Bird	Marbled murrelet <i>Brachyramphus marmoratus</i>	FT (Federal Threatened) SE	This species nests on high platforms in mature conifers within mature, old growth coniferous forests within 32 miles of the coast. Further discussion can be found in Chapter 5.3.	None. USFWS-designated critical habitat overlaps the Construction Corridor just west of Willow Creek.	Suitable habitat is present in mature coniferous forest in the Action Area west of Willow Creek.
Bird	Mountain plover <i>Charadrius montanus</i>	SSC BLM-S	This species utilizes dry plains in California as overwintering sites. In their overwintering range, mountain plovers prefer heavily grazed annual grasslands or burned fields (Knopf and Wunder 2006).	There is one CNDDDB occurrence that overlaps the Construction	Suitable habitat is present at portions of the Action Area running through the

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				Corridor (2012).	agricultural lands of Arcata along SR 255. This area is currently overwintering habitat only.
Bird	Northern goshawk <i>Accipiter gentilis</i>	SSC BLM-S (Redding)	This species nests in mature, dense, closed-canopy conifer forests. Nest sites are generally in close proximity to water.	There is 1 CNDDDB and 1 NRIS occurrence that overlap the Construction Corridor and 2 CNDDDB occurrences, 12 NRIS occurrences, and 5 NRIS sites (4 nests, 1 management area) within 1.5 miles (1979 to 2013).	There are several portions of the Action Area with suitable forest habitat from Salyer to Junction City, including on SRNF and STNF lands. Field surveys identified one individual in flight approximately 4.5 miles west of Big Bar.
Bird	Northern harrier <i>Circus hudsonius</i>	SSC	This species nests and forages in freshwater, brackish and saltwater marshes, wet meadows, vernal pool complexes, weedy borders of lakes, rivers and streams, annual and perennial grasslands, weedy fields, ungrazed or lightly grazed pastures, some croplands, sagebrush flats, and desert sinks.	One CNDDDB occurrence (2017).	Suitable nesting and foraging habitat is present at the Action Area surrounding Humboldt Bay.
Bird	Northern spotted owl	FT ST SSC	The species occurs in old growth and mature second growth coniferous forests that contain old trees and snags with high basal areas, as well as forests with dense	<i>See Chapter 5.1 for a detailed</i>	<i>See Chapter 5.1 for a</i>

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
	<i>Strix occidentalis caurina</i>	BLM-S (Redding)	canopies, multiple canopy layers, and downed woody debris. Their nests are often located in tree cavities or on broken-topped trees or snags in trees with a 35 inch or greater DBH. Further discussion can be found in Chapter 4.9.	<i>description (Table 5).</i>	<i>detailed description.</i>
Bird	Olive-sided flycatcher <i>Contopus cooperi</i>	SSC	The olive-sided flycatcher can be found in semi-open and dense conifer forests, often near edges and openings as well as stands of cypress and eucalyptus.	None	Both suitable nesting and foraging habitat are present at numerous portions of the Action area from Humboldt Bay east to Redding.
Bird	Peregrine falcon <i>Falco peregrinus anatum</i>	FP	This species nests predominantly on cliff faces but is also known to utilize buildings, bridges, and transmission structures (USFWS 1982).	There are 46 NRIS occurrences and 4 NRIS sites (3 usable nesting cliffs and an additional nest site) for peregrine falcon within 1.5 miles of the Construction Corridor (1978 to 2019).	Suitable cliff habitat is present between Salyer and Big Bar. Large bridges, such as the Samoa bridge, may also support nesting.
Bird	Purple martin <i>Progne subis</i>	SSC	This species breeds in a variety of habitats, most commonly in coniferous and oak-conifer forests. Their nests are cavities in trees and artificial structures, such as bridges and wooden electrical poles. The purple martin is a colonial nester.	None	There is both suitable nesting and foraging habitat present at the Action

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					Area from Humboldt Bay east to Blue Lake, Hoopa, and Willow Creek.
Bird	Tricolored blackbird <i>Agelaius tricolor</i>	ST SSC BLM-S (Redding)	Tricolored blackbird nesting habitat has changed over the last century, as the availability of the historic wetland nesting habitat has declined and the species has had to switch to newly available nesting substrates (Beedy et al. 2018). Colony sites require nearby water, suitable nesting substrate, and open-range foraging habitat of natural grassland, shrubland, or agricultural cropland.	There are 3 CNDDDB occurrences that overlap the Construction Corridor and 7 CNDDDB occurrences that are within 1.5 miles (1932 to 2008).	Suitable nesting and foraging habitat is present in the Action area from Redding to Cottonwood.
Bird	Vaux's swift <i>Chaetura vauxi</i>	SSC	Vaux's swifts require large cavities in redwoods and other conifers and occasionally sycamores, chimneys, and buildings. They are especially common in old growth forests.	Four NRIS occurrences (1995 to 2013).	There are several locations along the entirety of the Action area where there is suitable nesting and foraging habitat for Vaux's swifts.
Bird	White-tailed kite <i>Elanus leucurus</i>	FP BLM-S (Redding)	This species occurs in open grasslands, marshes, agricultural areas, and oak savannas. White-tailed kites can also frequently be found in disturbed areas.	Two CNDDDB occurrences (2015 to 2019).	Suitable nesting and foraging habitat is present at numerous sections of the Action Area, including

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					Humboldt Bay and northward and east to Blue Lake, Hoopa, and Redding.
Bird	Yellow rail <i>Coturnicops noveboracensis</i>	SSC FSS (STNF)	This species occurs in marshes and sloughs in dense, low undergrowth. Breeding yellow rails favor sedge marsh habitat.	There are 2 CNDDB occurrences that overlap the Construction Corridor and 3 CNDDB occurrences within 1.5 miles (1884 to 2013).	Although the species is rarely observed and has limited data, there is suitable habitat in the Action Area at the southern end of Dead Mouse Marsh and Fay Slough.
Bird	Yellow warbler <i>Setophaga petechia</i>	SSC	Yellow warblers occur most commonly in wet, deciduous thickets, especially those dominated by willows, and in disturbed and early successional habitats (Lowther et al. 1999).	There are 381 NRIS occurrences (1991 to 2017).	Suitable nesting and foraging habitat for yellow warblers is present intermittently throughout the Action Area.
Bird	Yellow-breasted chat <i>Icteria virens</i>	SSC	This species nests in riparian thickets and brush associated with rivers, creeks, ponds, and other mesic areas.	There are 632 NRIS occurrences (1991 to 2017).	Suitable nesting and foraging habitat for yellow-breasted chat is present intermittently

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					throughout the Action Area.
Fish	Chinook salmon—California Coastal Evolutionary Significant Unit (ESU) <i>Oncorhynchus tshawytscha</i>	FT	This species occurs in flowing freshwater migration corridors and estuarine areas, spawning from October to December in gravel river bottoms.	There is USFWS-designated critical habitat in the Construction Corridor at Freshwater Creek, Jacoby Creek, Mad River, Little River, and the North Fork Mad River.	Suitable habitat is present in the Action Area at Mad River, Little River, and the North Fork Mad River.
Fish	Chinook salmon—Central Valley spring-run ESU <i>Oncorhynchus tshawytscha</i>	FT ST	This species occurs in flowing freshwater migration corridors and estuarine areas, spawning from August to October in gravel river bottoms.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor and 2 CNDDDB occurrences within 1.5 miles (1995 to 2018) and USFWS-designated critical habitat at the Sacramento River and Clear Creek.	Suitable habitat is present in the Action Area east of Whiskeytown at the Sacramento River and Clear Creek below Whiskeytown Dam.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Fish	Chinook salmon— Sacramento River winter-run ESU <i>Oncorhynchus tshawytscha</i>	Federal Endangered (FE) SE	This species occurs in flowing freshwater migration corridors and estuarine areas, spawning from April to August in gravel river bottoms.	There is 1 CNDDDB occurrence within 1.5 miles of the Construction Corridor (1995) and USFWS-designated critical habitat at the Sacramento River east of Whiskeytown.	Suitable habitat is present in the Action Area east of Whiskeytown at the Sacramento River and its tributaries.
Fish	Chinook salmon—Upper Klamath/ Trinity ESU <i>Oncorhynchus tshawytscha</i>	ST FSS (SRNF, STNF)	This species occurs in perennial and intermittent rivers and streams for spawning and rearing as well as flowing freshwater migration corridors and estuarine areas. The spring run spawns from September to October while the fall run spawns from November to December.	There is 1 CNDDDB occurrence and 33 NRIS occurrences that overlap the Construction Corridor as well as 2 CNDDDB and 95 NRIS occurrences within 1.5 miles (1993 to 1999).	Suitable habitat is present at the Trinity River and its tributaries up to the Lewiston Dam.
Fish	Coastal cutthroat trout <i>Oncorhynchus clarkii clarkii</i>	FSS (SRNF)	This species has diverse life history strategies occurring both in fresh and saltwater habitats. They require cool, clean water with deep pool habitat and cover. Coastal cutthroat trout rear in coastal lagoons and ponds. Individuals in large streams spawn from November to	There are 12 CNDDDB occurrences that overlap waterways	Suitable habitat is present at Mad River, Lindsay Creek, Hall Creek, and

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			December while those in smaller streams spawn from January to February.	crossed by the Construction Corridor and 16 CNDDDB occurrences within 1.5 miles (1969 to 2016).	the North Fork of the Mad River where they cross through Construction Corridor.
Fish	Coho salmon— Southern Oregon/ Northern California ESU <i>Oncorhynchus kisutch</i>	FT ST	This species occurs in flowing freshwater migration corridors and estuarine areas, spawning from November to January in gravel river bottoms.	There are 3 CNDDDB occurrences, 17 NRIS occurrences, and USFWS-designated critical habitat that overlap the Construction Corridor, as well as 4 CNDDDB, 55 NRIS occurrences, and SRNF data within 1.5 miles (1998 to 2018).	There is suitable habitat and range overlap at the Mad River and its tributaries as well as the Trinity River and its tributaries up to the Lewiston Dam.
Fish	Green sturgeon— Southern DPS <i>Acipenser medirostris</i>	FT	This species spawns in rivers and feeds in bays, estuaries, and sloughs.	There is National Oceanic and Atmospheric Administration (NOAA)-designated critical habitat	While not known to presently <i>spawn</i> in the sloughs that intersect the Action Area, adults and sub-

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				in the Construction Corridor at Freshwater Creek and Humboldt Bay and one CNDDDB occurrence (2007) within Humboldt Bay.	adults may be found foraging in these sloughs (Lindley et al. 2011)
Fish	Hardhead <i>Mylopharodon conocephalus</i>	SSC FSS (STNF)	This species occurs in relatively undisturbed, clear, cool, foothill streams with high water quality, spawning from April to May near their resident pools or larger rivers or lakes in gravel and rocky substrate.	None	Suitable habitat is present at the far eastern portions of the Action Area at the Sacramento River and its larger tributaries.
Fish	Klamath River lamprey <i>Entosphenus similis</i>	SSC	This species is considered non-migratory. Spawning likely occurs in gravel riffles of tributary streams, far enough upstream such that there is adequate muddy backwater habitat for ammocetes downstream from the breeding area (NatureServe 2014).	None	Suitable habitat is present at the Trinity River and its tributaries (UCDCWS 2015).
Fish	Longfin smelt <i>Spirinchus thaleichthys</i>	FC ST	This species occurs in coastal lagoons, bays, estuaries, sloughs, and tidal freshwater streams, spawning from February to April in areas with gravel or sandy substrate where rocks and aquatic plants are present.	There is 1 CNDDDB occurrence for longfin smelt that overlaps the Construction Corridor and 4	Suitable habitat is present at the Mad River Slough where it crosses under SR 255 as well as Humboldt Bay and its

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				CNDDDB occurrences that are within 1.5 miles (1968 to 2005).	nearshore tributaries (CDFW 2009).
Fish	Pacific eulachon— Southern Distinct Population Segment (DPS) <i>Thaleichthys pacificus</i>	FT	This species occurs in the lower reaches of coastal rivers with moderate water velocities, woody debris, and sand and pea-sized gravel substrate. Most spawning (March through April) occurs within tidal influence though some spawning areas are located much further upstream of the river mouth.	There is 1 CNDDDB occurrence within 1.5 miles in lower reaches of the North Fork Mad River.	Although this DPS is believed to be extirpated from the Mad River, suitable habitat still remains at Humboldt Bay and its tributaries, and the species can potentially occur in the Construction Corridor.
Fish	Pacific lamprey <i>Entosphenus tridentatus</i>	SSC FSS (SRNF, STNF) BLM-S (Redding)	This species occurs in streams, rivers, lakes, and nearshore saltwater environments. Nests and ammocetes are typically located in freshwater streams. Spawning occurs from March through July.	There are 3 CNDDDB occurrences that overlap the Construction Corridor and 3 CNDDDB occurrences within 1.5 miles (1994 to 2014).	Suitable habitat is present at the Action Area at Jolly Giant Creek and Campbell Creek as well as Trinity River and its tributaries.
Fish	Riffle sculpin <i>Cottus gulosus</i>	SSC	This species occurs and spawns from February to April in headwater streams with cold water and rocky or gravelly substrate. Riffle sculpins may occupy riffles or pools, though they tend to favor areas that have adequate cover.	None	Suitable habitat is present in the Action Area east of

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					Whiskeytown in the Sacramento River and its tributaries.
Fish	River lamprey <i>Lampetra ayresii</i>	SSC	This species occurs in intermittent and perennial streams and is anadromous, with ammocetes likely spending 3 to 5 years in a freshwater stream. Spawning occurs in natal streams from February to May.	None	Suitable habitat is present in the Trinity River watershed (UCDCWS 2015).
Fish	Steelhead— Central Valley DPS <i>Oncorhynchus mykiss irideus</i>	FT	This species occurs in clean, cold water over gravel beds with water temperatures between 42 and 60 degrees F for spawning from November through February in the Sacramento and San Joaquin rivers and their tributaries.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor, 3 CNDDDB occurrences within 1.5 miles (2009 to 2011), and USFWS-designated critical habitat that overlaps the Construction Corridor at the Highway 273 crossing of Clear Creek.	Suitable habitat is present east of Whiskeytown in the Sacramento River and its tributaries, specifically Clear Creek below Whiskeytown Dam.
Fish	Steelhead— Klamath Mountains	SSC FSS (SRNF, STNF)	This species occurs in riverine and ocean environments, spawning in gravel river bottoms and stream tributaries. Stream-maturing races spawn from October through	None	Suitable habitat is present at the Action Area in

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
	Province ESU <i>Oncorhynchus mykiss irideus</i>		February while ocean-maturing races spawn from January to March.		the Trinity River and its tributaries up to the Lewiston Dam.
Fish	Steelhead— Northern California DPS <i>Oncorhynchus mykiss irideus</i>	FT	This species occurs in riverine and ocean environments, spawning in gravel river bottoms and stream tributaries. The summer run spawns from December to February while the winter run spawns from December to April.	There are 2 CNDDDB occurrences that overlap the Construction Corridor, 2 CNDDDB occurrences within 1.5 miles, and USFWS-designated critical habitat with overlap at Jacoby Creek and Freshwater Creek.	Suitable habitat is present at the Action Area at Jacoby Creek and Freshwater Creek.
Fish	Tidewater goby <i>Eucyclogobius newberryi</i>	FE	This species occurs and spawns year-round in brackish water in shallow lagoons and lower stream reaches where the water is fairly still. They are restricted to waters with moderate to low salinity.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor, 6 CNDDDB occurrences within 1.5 miles (1982 to 2010), and USFWS-designated	Suitable habitat for tidewater goby is present in the lower stream reaches of the Mad River as well as brackish perennial and intermittent streams with connectivity to Humboldt Bay.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				critical habitat at Humboldt Bay.	
Fish	Western brook lamprey <i>Lampetra richardsoni</i>	SSC FSS (SRNF)	This species inhabits gravel riffles and runs of clear, cool streams. Ammocetes occur in muddy and sandy backwaters and pools of streams. Spawning takes place from March to August.	There are 2 CNDDDB occurrences that overlap the Construction Corridor and 2 CNDDDB occurrences within 1.5 miles (2014).	Suitable habitat is present at the northern extent of the Eel River drainage as well as Humboldt Bay and its tributaries.
Insect	Crotch's bumble bee <i>Bombus crotchii</i>	State Candidate Endangered (SCE)	Crotch's bumble bee inhabits relatively warm and dry sites at open grassland and scrub habitats with nesting occurring underground.	There is 1 CNDDDB occurrence within 1.5 miles (1976).	Although the species is thought to be extinct north of Sacramento Valley, suitable habitat is present from Lewiston east to Redding and south to Anderson.
Insect	Franklin's bumble bee <i>Bombus franklini</i>	SCE	Franklin's bumble bee occurs in a variety of grassland and shrubland habitats where lupine (<i>Lupinus</i>), California poppy (<i>Eschscholzia californica</i>), horsemint (<i>Agastache</i>), and mountain penny-royal (<i>Monardella</i>) can be found (Kevan 2008).	None	There is little distribution data available for Franklin's bumble bee; however, they are presumed to occur uncommonly in northern

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					California. Suitable habitat is present at numerous sections of the Action Area from Willow Creek east to Lewiston.
Insect	Suckley's cuckoo bumble bee <i>Bombus suckleyi</i>	SCE	This species can be found in a variety of forest, grassland, and shrubland habitats.	None	There is little distribution data available for Suckley's cuckoo bumble bee, but they are presumed to occur uncommonly throughout California. Therefore, suitable habitat would extend throughout the entire Action Area.
Insect	Western bumble bee <i>Bombus occidentalis</i>	SCT FSS (SRNF, STNF)	The western bumble bee occurs in a wide variety of habitats and forages on an array of flowering plants. The species is extirpated from most of its historic range in California, particularly from lower elevations. Their current distribution is not well described but is likely limited to the Sierra and Cascade regions. Western bumble bees are known to persist in Lassen and Plumas national forests and other recent observations have been made in Tahoe and Shasta-Trinity national forests.	There are 6 CNDDDB occurrences that overlap the Construction Corridor and 1 NRIS occurrence and 9 CNDDDB	Suitable habitat is present throughout much of the Action Area, especially portions around Humboldt Bay, McKinleyville,

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				occurrences that are within 1.5 miles (1967 to 1993).	Clam Beach, east to SRNF, and STNF.
Mammal	American badger <i>Taxidea taxus</i>	SSC	This species is primarily found in open habitats such as grasslands, pastures, sagebrush, and desert scrublands with friable soils. American badgers are fossorial animals, using burrows for natal dens between February 1 to July 15. They are often found association with moderate to high densities of their main prey item, fossorial mammals.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor and 1 CNDDDB occurrence within 1.5 miles (unknown occurrence year).	Suitable habitat is present where open habitats and drier soil exist east of Korbel, near Big Bar, and south of Anderson.
Mammal	Fisher—West Coast DPS Northern California—Southwestern Oregon ESU <i>Pekania pennanti</i>	SSC FSS (SRNF, STNF) BLM-S (Arcata, Redding)	This species occurs in dense, mature, mixed-conifer and ponderosa pine forests at elevations that support the greatest aboveground forest biomass (many large trees) and in areas that do not accumulate as much deep and persistent snow as higher elevations. Cavities in hardwoods greater than 15 inches DBH and conifer greater than 22 inches DBH as well as logs and snags are used for resting and denning. Denning season is February 1 to July 9.	There are 15 CNDDDB occurrences that overlap the Construction Corridor and 58 CNDDDB and 131 NRIS occurrences that are within 1.5 miles (1911 to 2015).	Suitable habitat is present where dense, mature, mixed-conifer and ponderosa pine forests exist, including several portions of the alignment from Korbel north to Hoopa and continuing east to French Gulch. Although habitat was

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
					once present in the Action Area along the SR 299 corridor from Whiskeytown NRA east to the town of Shasta, suitable habitat was burned in the Carr Fire.
Mammal	Fringed myotis <i>Myotis thysanodes</i>	FSS (SRNF, STNF) BLM-S (Arcata, Redding)	This species occurs in old growth pine and hardwood forests. They roost in crevices in rocky outcrops, trees, mines, caves, and other man-made structures. Fringed myotis have also been found roosting in large conifer snags as well as rock crevices in chaparral or scrub habitat. Nursery roosts in northern California can be in abandoned mines or buildings and in the basal hollows of large redwoods and sequoias. Individuals are known to travel considerable distances (up to 12.8 kilometers) from their roost to their foraging area (Pierson and Rainey 2007).	There is 1 CNDDDB occurrence that overlaps the Construction Corridor and 2 CNDDDB records within 1.5 miles (2000).	Suitably sized roosting trees are present at several sections of the Action Area between Salyer and Big Bar. Mines are present intermittently throughout the Action Area and could support maternity colonies.
Mammal	Humboldt mountain beaver <i>Aplodontia rufa humboldtiana</i>	None (Locally Rare)* *Considered at the request of CDFW	Mountain beavers occur in moist forests and forest openings, where cool, moist environments such as overgrown thickets and seepage areas are preferred. They are most abundant near water courses in early to mid-seral stage forests. Humboldt mountain beavers prefer damp soils, digging networks of tunnels along stream banks that generally are just below the ground surface, usually on	There are 6 CNDDDB occurrences that overlap the Construction Corridor and 13 CNDDDB	Suitable habitat is present from Clam Beach south to the Highway 101 Vista Point west of the

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			north slopes. They are primarily fossorial but can climb trees and swim well. They primarily live underground in the winter (Fellers et al. 2016).	occurrences within 1.5 miles (1917 to 2014).	Arcata-Eureka Airport.
Mammal	Long-eared myotis <i>Myotis evotis</i>	FSS (SRNF, STNF) BLM-S (Arcata, Redding)	This species occurs in forested habitats up to 9,000 feet in elevation. The long-eared myotis forages by both gleaning and pursuing moths and beetles at the edges of mature forests, especially in riparian zones. Natural and man-made roosts are in crevices in caves, mines, snags, and trees. Hibernation sites are generally in caves and mines.	There are three CNDDDB occurrences that overlap the Construction Corridor at Willow Creek between Salyer and Burnt Ranch, and South of French Gulch (1957 to 2002).	There are several sections of suitable habitat in the Action Area from Willow Creek east to Lewiston.
Mammal	Oregon snowshoe hare <i>Lepus americanus klamathensis</i>	SSC	Snowshoe hares are residents of middle and higher elevation habitats within the Klamath range. They are often found near montane riparian vegetation, in young or dense stands of conifers (especially firs, lodgepole pines, and subalpine forests), and in chaparral.	There is one CNDDDB occurrence that overlaps the Construction Corridor (1922).	Portions of the Action Area from Salyer east to Whiskeytown contain suitable habitat for Oregon snowshoe hare.
Mammal	Pallid bat <i>Antrozous pallidus</i>	SSC FSS (SRNF, STNF) BLM-S (Arcata, Redding)	This species can be found in mature oak woodland, ponderosa pine, and other dry conifer forests. Large snags are preferred for roosting.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor and 2 CNDDDB occurrences that are within	There are several other portions of the Action Area that contain suitable habitat in between Salyer and Burnt Ranch,

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				1.5 miles (1939 to 2002).	as well as Big Bar.
Mammal	Ring-tailed cat <i>Bassariscus astutus</i>	FP	This species dens in rock crevices, living and dead hollow trees, logs, brush piles, buildings, and other man-made structures in deserts, chaparral, oak woodlands, and conifer forests. Natal denning season is May 1 to July 15.	There are 2 NRIS occurrences that overlap the Construction Corridor and 66 NRIS occurrences within 1.5 miles (1989 to 2018).	Suitable habitat is present at numerous sections of the Action Area from Willow Creek east to the town of Shasta.
Mammal	Sonoma tree vole <i>Arborimus pomo</i>	SSC	This arboreal species occurs in Douglas-fir and redwood and montane hardwood-conifer forests and feeds almost exclusively on Douglas-fir needles. Breeding season is March 24 to September 15.	There are 7 CNDDDB occurrences within 1.5 miles (1981 to 1993).	Suitable Douglas-fir and montane hardwood forest habitat is present in the forests east of Humboldt Bay, through Korbel, and northeast to Willow Creek.
Mammal	Townsend's big-eared bat <i>Corynorhinus townsendii</i>	SSC FSS (SRNF, STNF) BLM-S (Arcata, Redding)	This species roosts in caves, mines, man-made structures, and basal hollows in large trees.	There are 3 CNDDDB occurrences that overlap the Construction Corridor and 11 CNDDDB occurrences within 1.5 miles (1949 to 2002).	Portions of the Action Area with man-made structures or large trees with basal hollows.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Mammal	Western red bat <i>Lasiurus blossevillii</i>	SSC	This species is often associated with riparian woodland but may roost in other wooded habitats. Roost sites are typically in foliage of trees, often riparian species and those with large leaves.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor and 1 NRIS occurrence and 2 CNDDDB occurrences within 1.5 miles (1999 to 2014).	Suitable roosting and foraging habitat is present at several locations throughout the Action Area from Humboldt Bay to Anderson.
Mammal	White-footed vole <i>Arborimus albipes</i>	SSC	This species occurs along small, alder-lined streams in redwood forests. Very small clearings created by fallen timber are likely important habitat.	There is 1 CNDDDB occurrence that overlap the Construction Corridor and 2 occurrences within 1.5 miles (1926 to 1949).	Suitable alder habitat is present at numerous sections of the Action Area from Blue Lake northeast through Korbel and continuing on Snow Camp Road until it intersects with SR 299.
Mammal	Yuma myotis <i>Myotis yumanensis</i>	BLM-S (Arcata, Redding)	This species is highly associated with open water at low to mid-elevations. Yuma myotis roost in crevices and man-made structures such as abandoned buildings, mines, and caves.	There are 5 CNDDDB occurrences that overlap the Construction Corridor and 8 CNDDDB and 1 NRIS	Suitable roosting and foraging habitat is present at several locations throughout the Action Area

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				occurrence within 1.5 miles (1997 to 2002).	from Humboldt Bay to Redding.
Mollusk	Big Bar hesperian <i>Vespericola pressleyi</i>	FSS (STNF) S&M Category A (SRNF, STNF) BLM-S (Redding)	This species occurs below 3,000 feet in conifer and/or hardwood forest habitat in a variety of seral stages in permanently damp areas within 200 meters of seeps, springs, and stable streams. Woody debris and rock refugia near water are used by the species during dry and cold periods. Herbaceous vegetation and leaf litter are common habitat elements associated with this species.	There are 2 CNDDDB occurrences that overlap the Construction Corridor and 4 CNDDDB and 17 NRIS occurrences (1954 to 2014) within 1.5 miles.	Suitable habitat is present in the Action Area in SRNF and STNF.
Mollusk	Black juga <i>Juga nigrina</i>	FSS (STNF)	This species is found in seeps, streams, and perennial drainages in a variety of seral stages.	None	Suitable habitat exists in seeps and perennial drainages.
Mollusk	Blue-gray tailedropper slug <i>Prophysaon coeruleum</i>	S&M Category A (SRNF, STNF)	This species is found in a wide range of moist mixed conifer forests in a variety of seral stages. In open or dry areas, it is typically located in sites with relatively higher shade and moisture levels than those of the general forest habitat. It is usually found in moist plant communities, such as big-leaf maple and sword-fern and is associated with leaf and needle litter, wood chips from decomposing logs, and mosses. They are known to browse on mycorrhizal fungi species. Fecal analysis in spring of 1998 showed fungal hyphal fragments and structures associated with mycorrhizal fungi root attachment. Spores of hypogeous fungi were also found.	One NRIS occurrence (2000) approximately 300 feet north of the Construction Corridor on Forest Route 5N25 in STNF.	Suitable habitat was observed at several portions of the survey area from Salyer to Big Bar.
Mollusk	California floater <i>Anodonta californiensis</i>	FSS (SRNF, STNF)	This species occurs in shallow muddy or sandy habitats in slow rivers and lakes, though they are also observed in some reservoirs. They can inhabit streams and rivers but	None	Suitable habitat exists at several portions of the

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			usually are found in stable areas with fine sediments and little shear stress.		Action Area at shallow, slow-moving streams as well as stable lakes and reservoirs.
Mollusk	Hooded lancetooth <i>Ancotrema voyanum</i>	S&M Category D (STNF) BLM-S (Redding, Arcata)	This species is associated with streams or intermittent stream channels where the ground is permanently damp, often under a closed forest canopy with riparian hardwood trees. This species seems to be associated with limestone substrates and is primarily found between elevations of 550 and 3,150 feet.	There are 2 CNDDDB and 3 NRIS occurrences that overlap the Construction Corridor as well as 6 CNDDDB and 55 NRIS occurrences within 1.5 miles (1960 to 2014).	Suitable habitat is present in the Action Area between Salyer and Big Bar.
Mollusk	Klamath sideband <i>Monadenia fidelis klamathica</i>	Formerly S&M Category B (STNF)	This species is associated with stable riparian zones within semi-dry mixed deciduous and conifer forests, but not necessarily restricted to riparian zones. Late successional forest with high canopy closure, a mixed conifer and hardwood component, and the presence of large, down woody debris or rock talus is considered optimum habitat. This species has been found under logs, in rocky areas, and on pine needle and oak leaf litter.	There are 64 NRIS occurrences within 1.5 miles (1980 to 2015).	Suitable habitat is present intermittently from Salyer to Burnt Ranch.
Mollusk	Nugget pebblesnail <i>Fluminicola seminalis</i>	FSS (STNF) S&M Category A (STNF)	This species is typically found in large creeks and rivers, preferring cool, clear, flowing water and gravel-cobble substrate. They can occur on soft, mud substrates in large spring pools.	None	Suitable habitat is present in STNF and in the Whiskeytown NRA.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
Mollusk	Oregon shoulderband <i>Helminthoglypta hertleini</i>	S&M Category B (SRNF) BLM-S (Redding, Arcata)	This species is generally associated with, though not restricted to, talus and other rocky substrates. It is suspected to be found within its range wherever permanent ground cover and/or moisture is available. This may include rock fissures or large woody debris sites. This species is also adapted to somewhat dry conditions during a portion of the year and is found in variety of seral stages.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor and 1 CNDDDB occurrence within 1.5 miles (occurrence dates unknown).	Suitable habitat is present within STNF.
Mollusk	Shasta chaparral <i>Trilobopsis roperi</i>	FSS (STNF) S&M Category A (STNF)	This species occurs in areas within 330 feet of lightly to deeply shaded limestone rockslides, draws, or caves with a cover of shrubs or oak in a variety of seral stages.	There is 1 CNDDDB occurrence that overlaps the Construction Corridor and 1 CNDDDB occurrence within 1.5 miles (1898).	Suitable habitat is present in STNF, Lewiston, and French Gulch.
Mollusk	Shasta hesperian <i>Vespericola shasta</i>	FSS (STNF) S&M Category A (STNF)	This species has been found in moist bottom lands in most seral stages, such as riparian zones, springs, seeps, marshes, and in the mouths of caves.	None	Suitable habitat is present between Whiskeytown and Redding.
Mollusk	Trinity bristle snail <i>Monadenia infumata setosa</i>	ST	This species prefers relatively moist areas but are not dependent on specific water sources. They are often found in damp, cool shaded areas with dense canopy cover and near dependable sources of moisture (e.g., streams, seeps, or springs). They feed in the leaf litter on the forest floor and on tree trunks.	There are 2 CNDDDB occurrences that overlap the Construction Corridor as well as 9	Suitable habitat is present at several portions of the Action Area from Salyer to Big Bar.

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
				<p>CNDDDB and 54 NRIS occurrences within 1.5 miles (1980 to 2017). A CDFW mitigation site located at Collin's Bar Creek, south of Burnt Ranch, is within 0.5 mile of the Construction Corridor.</p>	
Mollusk	<p>Trinity shoulderband <i>Helminthoglypta talmadgei</i></p>	<p>S&M Category D (STNF) BLM-S (Redding, Arcata)</p>	<p>This species is associated with deciduous tree species (especially oaks) in mixed hardwood and conifer stands in a variety of seral stages. At moister sites, it is associated with woody debris or root structures, moss, and leaf litter. Rock refugia may be used in dry situations. Partial shading (or a combination of dense shade and open areas) is preferred and the presence of seasonal, herbaceous plants or grass may be a limiting factor.</p>	<p>There are 3 CNDDDB and 1 NRIS occurrence that overlap the Construction Corridor and 4 CNDDDB and 107 NRIS occurrences within 1.5 miles (1978 to 2015).</p>	<p>Suitable habitat is present at several portions of the Action Area from Salyer to Junction City.</p>
Mollusk	<p>Yellow-base sideband <i>Monadenia infumata ochromphalus</i></p>	<p>S&M Category D (STNF)</p>	<p>This species is generally associated with stable riparian zones within semi-dry mixed deciduous and conifer forests but not necessarily restricted to riparian zones. Late successional forest with high canopy closure, a mixed conifer and hardwood component, and the presence of large, down woody debris or rock talus is considered</p>	<p>There is 1 NRIS occurrence (2002) within 1.5 miles.</p>	<p>There is suitable habitat present at several portions of the Action Area from</p>

Lifeform	Species	Status	Habitat Requirements	Records Within 1.5 Miles of the Construction Corridor	Suitable Habitat in the Action Area
			optimum habitat. This species has been found under logs, in rocky areas, and on pine needle and oak leaf litter.		Salyer to Big Bar.

Federally-Listed Wildlife and Fishes

Birds

Two federally-listed bird species may occur in the Action Area: MAMU and NSO.

Marbled Murrelet

The MAMU is a small, nearshore seabird species that nests on high platforms in mature conifers within 32 miles of the coasts of Washington, Oregon and Northern California (USFWS 1997, 2009). Suitable nest structures include large, mossy horizontal branches 4 to 25 inches in diameter and at least 33 feet high in the live crown (Evans et al. 2003; Nelson and Hamer 1995). Squirrel nests, mistletoe (*Phoradendron* spp.) burls, and structural tree deformities are also utilized as nesting substrate for the single egg clutch (Nelson 1997). Nest trees found to date have been Douglas-fir, coast redwood, western hemlock, western red cedar, yellow cedar, mountain hemlock, and Sitka spruce (Hamer and Nelson 1995). MAMU has been found nesting in small areas of suitable habitat that are surrounded by unsuitable habitat (Nelson and Wilson 2001). In Northern California, the USFWS official nesting season is March 24 to September 15, with most MAMU fledged by August 5 (USFWS 2014). The Action Area is in NWFP MAMU Conservation Zone 4.

Suitable MAMU nesting habitat is present in mature conifer and mixed conifer-hardwood forest in the Action Area west of Burnt Ranch. The nearest confirmed nesting location of MAMU is mapped approximately 8.5 miles south of the Construction Corridor (CNDDDB [ds85] 2019). However, many individuals have been observed during the breeding season foraging off-shore or in flight over the Eureka and McKinleyville coast (CNDDDB [ds31] 2019; eBird 2019) directly east of the Action Area. Annual presence in foraging habitat during the breeding season suggests that this species may nest in the Action Area in suitable habitat. MAMU nests are cryptic and even focused surveys can fail to identify their inconspicuous nests high in the canopy of large trees. The distribution and abundance of this species is not well understood due to insufficient survey and monitoring efforts. As a result, available occurrence data is unlikely to accurately reflect species presence in the vicinity of the Action Area.

Estimates of the amount of suitable MAMU nesting/roosting habitat, displayed in **Table 7**, were calculated using the “Existing Vegetation-CALVEG” data layers (USDA 2008). Within CALVEG, Transcon used CWHR attributes to define suitable MAMU nesting/roosting habitat as follows:

- CWHR Type = RDW (redwood) or DFR (Douglas-fir)
- CWHR Density = D (~60 percent canopy closure)
- CWHR Size = 5 (~24 inches mean DBH)

Table 7. Acres of MAMU Nesting/Roosting Habitat in the Action Area

Land Ownership	Acres of Habitat
SRNF	117.2
STNF	N/A
Hoopa	24.7
BLM	N/A
Whiskeytown NRA	N/A
Private lands	2,966.1
TOTAL	3,108

Approximately 6 miles west of Willow Creek in SRNF, the Construction Corridor crosses 2 acres of MAMU Critical Habitat subunit CA-11-b. The Action Area crosses 115 acres, which represents 0.3 percent of the total acreage of subunit CA-11-b (**Table 8**). The PBFs for MAMU critical habitat are 1) forested stands containing large-sized trees, generally more than 32 inches in diameter with potential nesting platforms at sufficient height, generally greater than or equal to 33 feet in height, and 2) the surrounding forested areas within 0.5 mile of these stands with a canopy height of at least one-half the site potential tree height (USFWS 2006). PBFs 1 and 2 occur in the forested areas north and south of the Construction Corridor, which follows SR 299 at this location. Proposed Action activities will not lead to destruction or adverse modification of MAMU critical habitat.

Table 8. Marbled Murrelet Critical Habitat in the Action Area

Land Ownership	Subunit CA-11-b (acres)	
	Construction Corridor	Action Area
SRNF	2	112
Caltrans	2	115
Total acreage of Subunit CA-11-b	30,848	
<ul style="list-style-type: none"> • The Construction Corridor is a 25-foot corridor around Proposed Action facilities • Action Area is a 0.5-mile corridor around Proposed Action facilities • No critical habitat for MAMU falls within the Action Area on STNF, BLM, Whiskeytown NRA, or private lands 		

Northern Spotted Owl

The NSO is a medium-sized owl that inhabits the forests of the Pacific Coast region from southwestern British Columbia to Marin County in California, up to 5,800 feet in elevation (CDFW 2016; USFWS 2011b). Spotted owls are primarily nocturnal and normally spend their days perched in a protected roost. They prey on a wide range of mammals, birds, insects, amphibians, and reptiles. Small mammals such as the northern flying squirrel (*Glaucomys sabrinus*), red tree vole (*Arborimus longicaudus*), and dusky-footed woodrat (*Neotoma fuscipes*) make up the bulk of their diet (Gutiérrez et al. 1995).

Nest stands have high canopy cover (60 percent or higher) and, regardless of forest age, feature relatively high complexity and structure (e.g., with a hardwood understory or a variety of tree sizes). Nest sites are often broken-top trees and cavities, although NSO will also use existing platforms such as abandoned raptor nests, squirrel nests, mistletoe brooms, and debris piles. Nest sites are frequently sited near streams and creeks and are typically located low to mid-slope rather than near ridge lines (Folliard et al. 2000). NSO have strong breeding site fidelity, producing one brood per season. Regionally, NSO nests from approximately February 1 through July 31 (USFWS 2011b).

NSO habitat in many areas is intermixed with grasslands and other naturally occurring open habitats. Home ranges, which are often more than 1,000 acres in size, may include open areas. Nest stands are often adjacent to open areas, and recent clear cuts are well described in the literature. NSO may be found from sea level up to the transition to subalpine forest, where winter conditions are severe and forest structure is of suboptimal complexity.

NSO is most often associated with mature forest stands in redwood forests and mixed conifer-hardwood forests. However, along the coast of northwestern California, considerable numbers of NSO also occur in younger forest stands (USFWS 2011b), which is classified as “marginal” habitat. This phenomenon has been exacerbated in recent years by the colonization of NSO habitat by the invasive barred owl (*Strix varia*), which has pushed NSO to utilize younger forest stands (Dugger et al. 2016; USFWS 2004). This trend has

resulted in more strict protection measures for work in habitats that may have previously been considered marginal for NSO nesting. In addition to mature forest stands that meet the established definition of potentially suitable NSO nesting/roosting habitat, the Action Area contains such “marginal” habitat. Acreage calculations for both suitable and marginal habitat in both the Construction Corridor and Action Area are presented in **Table 9**.

NSO occupancy and nesting behavior is well described in Humboldt and Trinity counties (Gutierrez et al. 1995; USFWS 2011b), due in part to extensive efforts by land management and regulatory agencies (USDA 1994). The scientifically accepted size of an individual NSO home range is 1.3 miles. Based on CNDDDB, NRIS, and Green Diamond spatial data, there are 2,101 positive NSO observations, 199 NSO activity centers (ACs), and 433 NSO nests documented within 1.3 miles of the Construction Corridor. These records are summarized in **Table 9** and visually depicted in maps in **Appendix C**.

NSO may nest as close as 100 feet from the small, lightly traveled roads within the Construction Corridor and 200 feet from lightly or moderately traveled roads and heavily trafficked roads (e.g., stretches of Highway 101 in Humboldt County [CNDDDB 2019]). Chapter 6 discusses the sensitivity of NSO and other wildlife to noise disturbance and how existing, ambient sound levels can influence calculations of auditory disturbance due to construction.

Table 9. NSO Occurrences and ACs in Proximity to the Construction Corridor

Feature*	Distance from Construction Corridor**	
	Within 0.5 mile	Within 1.3 miles
Nests	174	433
ACs	53	199
Positive Observations	786	2,101
*Occurrence data from the following data sources: CNDDDB, NRIS, Green Diamond, SRNF, Hoopa Reservation. Multiple observations (i.e., over multiple years) of ACs/nests are included in these tallies. **0.5 mile represents the accepted nesting core area size and 1.3 miles represents the accepted home range area for NSO.		

Estimates of the amount of suitable NSO nesting/roosting habitat were calculated using the “Existing Vegetation-CAL VEG” data layers (USDA 2008). Within CALVEG, Transcon used CWHR attributes to define potential suitable NSO nesting/roosting habitat as follows:

- CWHR Type = RDW (redwood), DFR (Douglas-fir), or MHC (Montane Hardwood-Conifer).
- CWHR Density = D (~60 percent canopy closure)
- CWHR Size = 5 (~24 inches mean DBH) = “suitable nesting/roosting habitat”
- CWHR Size = 4 (11 to 23.9 inches mean DBH) “marginal nesting/roosting habitat”

These calculations determined that the Action Area contains 8,899 acres of suitable NSO nesting/roosting habitat and 10,477 acres of “marginal” NSO nesting/roosting habitat (**Table 10**).

Table 10. Acres of Potential NSO Nesting/Roosting Habitat in the Action Area

Land Ownership	Suitable	Marginal
SRNF	1,241	1,498
STNF	2,924	3,025
Hoopa	41	143
BLM	516	535
Whiskeytown NRA	0	0
Private lands	4,177	5,263
TOTAL	8,899	8,069
<ul style="list-style-type: none"> Action Area is a 0.5-mile corridor around Proposed Action facilities Acreages calculated using CWHR habitat classification attributes as described in text Acreage calculations exclude areas in which 50 percent or greater basal area was lost due to the Carr (2018) and/or Helena (2017) fires, as reported by RAVG (2019) Impact analysis and protection measures do not distinguish between “suitable” and “marginal” habitat 		

Between Salyer and Big Bar and along SR 299, approximately 6 miles west of Willow Creek, the Construction Corridor crosses in and out of NSO Critical Habitat Unit 9 for a total of approximately 33.5 linear miles. Approximately 2.5 miles east of Lewiston on Deadwood Road, the Construction Corridor crosses approximately 2 linear miles of Critical Habitat Unit 11 (USFWS 1992, 2013b). Acreage of critical habitat crossed by the Construction Corridor and the Action Area are presented in **Table 11**. A total of 132 acres of the Construction Corridor are in Unit 9, Klamath West, and 38 acres of the Construction Corridor are in Unit 11, Interior California Coast. The Action Area crosses approximately 7.1 percent of Unit 9 and 0.65 percent of Unit 11.

Table 11. Northern Spotted Owl Critical Habitat (Acres)

Land Ownership	Unit 9 (KLW-9)		Unit 11 (ICC-1 and ICC-7)	
	Construction Corridor	Action Area	Construction Corridor	Action Area
SRNF	22	2,328	-	-
STNF	97	8,268	32	2,281
BLM	-	-	6	649
Whiskeytown NRA	-	-	-	-
Caltrans	13	3,583	-	-
Private lands	0	0	-	-
TOTAL	132	10,596 (7.1% of KLW-9)	38	2,930 (0.65% of ICC-1 and ICC-7)
Total acreage of subunit	KLW-9: 149,656		ICC-1: 332,061, ICC-7: 119,742	
<ul style="list-style-type: none"> Construction Corridor = 25-foot corridor around Proposed Action facilities Action Area = 0.5-mile corridor around Proposed Action facilities 				

The PBFs specific to NSO critical habitat are 1) forest types that may be in early, mid-, or late seral stages and that support the NSO across its geographical range; 2) habitat that provides for nesting and roosting; 3) habitat that provides for foraging; and 4) habitat to support the transience and colonization phases of dispersal. Not all revised critical habitat contains all of the PBFs because NSO at various life stages require different habitat elements. However, PBF 1 must always occur and with it at least one additional PBF (2, 3, or 4) (USFWS 2012a). All four PBFs are represented in the Action Area within both Critical Habitat units. A total of 10,596 acres (7.1 percent) of Unit 9 and 2,930 acres (0.65 percent) of Unit 11 occur in the Action Area. The Construction Corridor crosses only 170 total acres of NSO critical habitat. Upon this small acreage, no vegetation with DBH greater than 6 inches will be removed. No destruction or adverse modification of NSO critical habitat will occur.

Although recent wildfires in Trinity and Shasta counties have burned suitable nesting habitat in the vicinity of the Proposed Action, patches of suitable nesting habitat are still present in the Action Area where it overlaps these critical habitat subunits. The Helena Fire (2017) burned patches of the Action Area where it crosses Unit 9 KLV-9 to the east of Helena. The Carr Fire (2018) burned patches of the Action Area from Deadwood Road in Lewiston (where it crosses Unit 11 ICC-7) east through Whiskeytown NRA (USDA 2019). Field visits by Transcon in spring 2019 as well as a positive observation of an individual NSO on Deadwood Road by the BLM in June confirmed that, despite fire activity, basal area loss does not preclude occupancy and PBFs are still present within the Action Area.

Fishes

Many of the waterways in the Action Area provide suitable spawning, rearing, and/or migration habitat for federally-listed fish, all of which have NOAA-designated critical habitat in the Action Area (CNDDDB 2019; NMFS 2005, 2014; Rupp 2019; USFWS 2005a). California Coastal, Central Valley spring-run, and Sacramento River winter-run ESU Chinook salmon (*Oncorhynchus tshawytscha*) are known to occur in waterways crossed by the Action Area. Southern Oregon/Northern California ESU (SONCC) coho salmon (*Oncorhynchus kisutch*) are well documented in the Trinity River and its tributaries west of Lewiston Dam. Central Valley and Northern California DPS steelhead (*Oncorhynchus mykiss irideus*) are also present in the waterways crossed by the Action Area. At the western extent of the Action Area, Humboldt Bay and its tributaries provide spawning habitat for tidewater goby (*Eucyclogobius newberryi*) and migratory/non-spawning habitat for green sturgeon—Southern DPS (*Acipenser medirostris*) and possibly Pacific eulachon—Southern DPS (*Thaleichthys pacificus*). Habitat requirements, range, and occurrence information for these species are detailed in **Table 6**. These special-status fishes have established populations in the Action Area and are assumed present within suitable habitat. **Table 12** indicates the waterways in the Action Area that are critical habitat for the three salmon ESU and/or two steelhead DPS. The waterways that serve as EFH are also denoted.

The PBFs that provide for anadromous salmonid life history requirements and that are essential to the conservation of Chinook salmon, coho salmon, and steelhead are as follows (NMFS 1993, 1999, and 2005):

1. Freshwater spawning sites accessible at the time of the ruling that also have sufficient water quantity and quality suitable to support spawning, incubation, and larval development
2. Freshwater rearing sites with sufficient water quantity and floodplain connectivity to form and maintain habitat conditions that support juvenile growth and mobility; sufficient water quality and forage to support juvenile development and provide sufficient natural cover as shade; submerged and overhanging large woody debris, log jams, beaver dams, or aquatic vegetation, large rocks and boulders, side channels, and undercut banks
3. Freshwater migration corridors free of obstruction and excessive predation risk, with water quantity and quality conditions, as well as natural cover, that support juvenile and adult mobility and survival

4. Estuarine areas free from obstruction and excessive predation risk, with water quantity and quality and salinity conditions that support juveniles and adults during their physiological transitions between fresh water and salt water, including natural cover for both juvenile and adult forage species

Table 12. Critical Habitat and Essential Fish Habitat of Salmonids in the Action Area

Watershed (Hydrological Unit Code 10)	Waterway	Steelhead— Northern California DPS	Steelhead Central Valley DPS	Coho salmon— Southern Oregon/Northern California ESU		Chinook salmon— California Coastal ESU		Chinook salmon— Central Valley Spring-run ESU	
		Critical Habitat	Critical Habitat	Critical Habitat	EFH	Critical Habitat	EFH	Critical Habitat	EFH
Big Lagoon- Frontal Pacific Ocean	Little River	✓	-	✓	✓	✓	✓	-	-
	Strawberry Creek	✓	-	✓	✓		✓	-	-
	Widow White Creek	✓	-	✓	✓		✓	-	-
Humboldt Bay-Frontal Pacific Ocean	Jacoby Creek	✓	-	✓	✓	✓	✓	-	-
	Freshwater Creek	✓	-	✓	✓	✓	✓	-	-
	Ryan Creek	✓	-	✓	✓	✓	✓	-	-
Lower Mad River	North Fork Mad River	✓	-	✓	✓	✓	✓	-	-
	Lindsay Creek	✓	-	✓	✓	✓	✓	-	-
	Leggit Creek	✓	-	✓	✓		✓	-	-
	Mill Creek	✓	-	✓	✓	✓	✓	-	-
Redwood Creek	Redwood Creek	✓	-	✓	✓	✓	✓	-	-
Horse Linto Creek-Trinity River	Campbell Creek	-	-	✓	✓	-	-	-	-
	Willow Creek	-	-	✓	✓	-	-	-	-
Big French Creek-Trinity River	McDonald Creek	-	-	✓	✓	-	-	-	-
	Trinity River	-	-	✓	✓	-	-	-	-
	Manzanita Creek	-	-	✓	✓	-	-	-	-
	Icebox Creek	-	-	✓	✓	-	-	-	-
	Pony Creek	-	-	✓	✓	-	-	-	-
	Gray Creek	-	-	✓	✓	-	-	-	-

Watershed (Hydrological Unit Code 10)	Waterway	Steelhead— Northern California DPS	Steelhead Central Valley DPS	Coho salmon— Southern Oregon/Northern California ESU		Chinook salmon— California Coastal ESU		Chinook salmon— Central Valley Spring-run ESU	
		Critical Habitat	Critical Habitat	Critical Habitat	EFH	Critical Habitat	EFH	Critical Habitat	EFH
	Hennessy Creek	-	-	✓	✓	-	-	-	-
	Collins Bar Creek	-	-	✓	✓	-	-	-	-
	Dixon Bar Creek	-	-	✓	✓	-	-	-	-
	Bidden Creek	-	-	✓	✓	-	-	-	-
	Mill Creek	-	-	✓	✓	-	-	-	-
	Cedar Flat Creek	-	-	✓	✓	-	-	-	-
	Don Juan Creek	-	-	✓	✓	-	-	-	-
	Stetson Creek	-	-	✓	✓	-	-	-	-
	Rowdy Bar Creek	-	-	✓	✓	-	-	-	-
	Sandy Bar Creek	-	-	✓	✓	-	-	-	-
	Little Sandy Bar Creek	-	-	✓	✓	-	-	-	-
	Italian Creek	-	-	✓	✓	-	-	-	-
	Swede Creek	-	-	✓	✓	-	-	-	-
	Little Swede Creek	-	-	✓	✓	-	-	-	-
	Pelletreau Creek	-	-	✓	✓	-	-	-	-
Big French Creek-Trinity River	Big French Creek	-	-	✓	✓	-	-	-	-
	Little French Creek	-	-	✓	✓	-	-	-	-
	Rock Bar Creek	-	-	✓	✓	-	-	-	-
	Prairie Creek	-	-	✓	✓	-	-	-	-
	Whites Bar Creek	-	-	✓	✓	-	-	-	-
	Monkey Creek	-	-	✓	✓	-	-	-	-

Watershed (Hydrological Unit Code 10)	Waterway	Steelhead— Northern California DPS	Steelhead Central Valley DPS	Coho salmon— Southern Oregon/Northern California ESU		Chinook salmon— California Coastal ESU		Chinook salmon— Central Valley Spring-run ESU	
		Critical Habitat	Critical Habitat	Critical Habitat	EFH	Critical Habitat	EFH	Critical Habitat	EFH
	Deer Creek	-	-	✓	✓	-	-	-	-
	Denny Creek	-	-	✓	✓	-	-	-	-
	Treolar Creek	-	-	✓	✓	-	-	-	-
	Price Creek	-	-	✓	✓	-	-	-	-
Canyon Creek	Canyon Creek	-	-	✓	✓	-	-	-	-
Lower South Fork Trinity River	Lower South Fork Trinity River	-	-	✓	✓	-	-	-	-
North Fork Trinity River	North Fork Trinity River	-	-	✓	✓	-	-	-	-
Weaver Creek-Trinity River	West Weaver Creek	-	-	✓	✓	-	-	-	-
	East Weaver Creek	-	-	✓	✓	-	-	-	-
	Little Browns Creek	-	-	✓	✓	-	-	-	-
	Trinity River	-	-	✓	✓	-	-	-	-
	Deadwood Creek	-	-	✓	✓	-	-	-	-
Clear Creek	Clear Creek	-	✓	-	-	-	-	✓	-
Churn Creek- Sacramento River	Olney Creek	-	✓	-	-	-	-	-	✓
	Oregon Gulch	-	✓	-	-	-	-	-	✓
	Calaboose Creek	-	✓	-	-	-	-	-	✓
	Jenny Creek	-	✓	-	-	-	-	-	✓
	Salt Creek	-	✓	-	-	-	-	-	✓
	Middle Creek	-	✓	-	-	-	-	-	✓

Watershed (Hydrological Unit Code 10)	Waterway	Steelhead— Northern California DPS	Steelhead Central Valley DPS	Coho salmon— Southern Oregon/Northern California ESU		Chinook salmon— California Coastal ESU		Chinook salmon— Central Valley Spring-run ESU	
		Critical Habitat	Critical Habitat	Critical Habitat	EFH	Critical Habitat	EFH	Critical Habitat	EFH
Ash Creek- Sacramento River	Anderson Creek	-	-	-	-	-	-	✓	✓

Although the species is believed to be extirpated from the area, Pacific eulachon critical habitat is present in lower reaches of the North Fork Mad River (NOAA 2011) (**Appendix B**). Physical or biological features essential to Pacific eulachon conservation are 1) freshwater spawning and incubation sites with water flow, quality and temperature, 2) freshwater and estuarine migration corridors, and 3) nearshore and offshore marine foraging habitat. No work is planned in the North Fork Mad River.

At the western end of the Action Area, tidewater goby Critical Habitat Unit HUM-3 is present in the perennial sloughs that run under Highway 255 adjacent to Humboldt Bay. PBFs for tidewater goby critical habitat include persistent, shallow, still- to slow-moving lagoons featuring 1) sand, silt, or mud substrates suitable for reproduction; 2) suitable aquatic vegetation; and 3) the presence of a sandbar across the mouth of the lagoon (USFWS 2013a) (**Appendix B**). PBFs 1 and 2 are present in the Action Area.

State-Listed and Other Special-Status Wildlife and Fish

Amphibians

Five special-status amphibians are potentially present in the Action Area: coastal (Pacific) tailed frog (*Ascaphus truei*), Del Norte salamander (*Plethodon elongatus*), foothill yellow-legged frog (Northwest/North Coast Clade) (*Rana boylei*), northern red-legged frog (*Rana aurora aurora*), and southern torrent salamander (*Rhyacotriton variegatus*). Although habitat preferences can vary during their adult stages, all amphibians require aquatic habitats early in their lifecycles (egg and larval stages) and for breeding. All special-status amphibians considered in this analysis require intermittent or perennial waters for early life stages and breeding. During their adult phases, they can often be found within a few feet of these waters, though adults can occasionally be found in surrounding woodland habitats. Specific habitat requirements and occurrence information for these species are detailed in **Table 6** (Stebbins and McGinnis 2012; Thomson et al. 2016). The species was observed during reconnaissance surveys. Due to the high potential for presence of foothill yellow-legged frog in the Action Area during construction, the life history and range of foothill yellow-legged frog are described in more detail below.

Foothill Yellow-Legged Frog (Northwest/North Coast Clade)

Although foothill yellow-legged frog occurs in a range of aquatic habitats, it is most strongly associated with rocky woodland streams and rivers that feature unconsolidated coarse substrates and shallow channels with riffles (CDFW 2018c). It is occasionally found in isolated pools, vegetated backwaters, and shaded or deep spring-fed pools. Unlike the majority of other ranid frogs in California, foothill yellow-legged frogs are rarely encountered more than 100 feet from permanent water, even following precipitation events (CWHRS 2000b). Their range extends throughout the Action Area, from Humboldt County east to Shasta County.

Mating and egg-laying occur in late spring and early summer (April through early July) when streams and rivers have slowed after winter runoff. Tadpoles remain near the egg mass for approximately 1 week, later

moving away to feed, utilizing rocks and gravel for cover. Tadpoles transform over a period of 3 to 4 months, generally from July to October. The newly metamorphosed juveniles typically migrate upstream from the hatching site (Nafis 2019). Terrestrial individuals are primarily diurnal. In the warmest localities, frogs may be active all year but can potentially become inactive or hibernate in colder areas (CWHRS 2000b). The main factor leading to the decline of the foothill yellow-legged frog is the alteration and destruction of aquatic habitat through stream scouring, non-selective logging practices, and the stabilization of historically fluctuating stream flows (Santos-Barrera et al. 2004).

Foothill yellow-legged frog is well documented in every watershed that overlaps the Action Area (CDFW 2018c; CNDDDB 2019). There are 61 CNDDDB and 17 NRIS occurrences of foothill yellow-legged frog within 1.5 miles of the Construction Corridor from the mouth of Jacoby Creek in Humboldt County eastward to Whiskeytown Lake in Shasta County. Field surveys from the present study identified both breeding adults and metamorphosed juveniles at the Construction Corridor along USFS Road 6N12 between Salyer and Burnt Ranch. Suitable habitat for foothill yellow-legged frog is present in the numerous intermittent and perennial creeks adjacent to the Construction Corridor west of the town of Shasta.

Birds

A total of 23 state and other special-status bird species may occur in the Action Area. Specific habitat requirements and occurrence information for these species are detailed in **Table 6**. **Table 13** presents the species and their associated habitats, which are present in the Action Area. Note that some species have affinities for more than one type of habitat.

Table 13. Special-Status Birds—Habitat Affinities

Species	Habitat	Distinguishing Features
Bald eagle	Coniferous Forest, Montane Hardwood-Conifer Forest	Large trees and snags within 0.5 mile of open, fish-bearing waters
Burrowing owl (<i>overwintering</i>) Mountain plover (<i>overwintering</i>) Northern harrier Tricolored blackbird White-tailed kite	Agriculture, Annual Grassland, Coastal Pasture	Agricultural grain fields or grassland with nearby water (includes irrigation ditches)
Golden eagle	Open, Semi-Open Areas	Large trees, snags, cliffs, bluffs in proximity to open or semi-open areas.
Little willow flycatcher Yellow-breasted chat Yellow warbler	Riparian	Moist, dense, shrubby areas, usually with a willow component
Olive-sided flycatcher Purple martin Vaux's swift Northern goshawk Great gray owl (<i>overwintering</i>) NSO MAMU	Coniferous Forest, Montane Hardwood-Conifer Forest	Semi-open to dense conifer or conifer- hardwood, mature to old growth
Peregrine falcon	Coastal Dunes and Bluffs, Coniferous Forest, Marsh and Slough, Open, Semi-Open Areas, Montane Hardwood- Conifer Forest	Cliffs, bluffs, rocky outcrops, steep terrain, tall artificial structures
Bank swallow Burrowing owl (<i>overwintering</i>) Northern harrier	Coastal Dunes and Bluffs	Coastal beaches and dunes with sparse vegetation; dune-backed or sandy bluff- backed beaches

Species	Habitat	Distinguishing Features
Yellow rail Bryant's savannah sparrow Northern harrier White-tailed kite Greater sandhill crane (overwintering)	Marsh and Slough	Fresh or salt water, with open, low, emergent, or mesic vegetation, wetlands, wet meadows, or moist grassland

Fishes

Waterways in the Action Area provide suitable spawning, rearing, and/or migration habitat for nine other special-status fish species, including chinook salmon—Upper Klamath/Trinity ESU, coastal cutthroat trout (*Oncorhynchus clarkii clarkii*), hardhead (*Mylopharodon conocephalus*), Klamath River lamprey (*Entosphenus similis*), Pacific lamprey (*Entosphenus tridentatus*), riffle sculpin (*Cottus gulosus*), river lamprey (*Lampetra ayresii*), steelhead—Klamath Mountains Province ESU, and western brook lamprey (*Lampetra richardsoni*). Habitat requirements, range, and occurrence information for these species are detailed in **Table 6**. Total barriers to fish passage were not identified in waterways downstream of the Action Area.

Insects

Suitable grassland, shrubland, and forested habitats are present throughout much of the Action Area for four special-status insect species: Crotch's bumble bee (*Bombus crotchii*), Franklin's bumble bee (*B. franklini*), Suckley's cuckoo bumble bee (*B. suckleyi*), and the Western bumble bee (*B. occidentalis*). All four species utilize many habitats and a wide variety of plants and nest in the ground. Specific habitat requirements and occurrence information for these species are detailed in **Table 6**.

Mammals

Thirteen special-status mammal species are potentially present in the Action Area. These include four denning mammals (American badger [*Taxidea taxus*], fisher [*Pekania pennanti*], Humboldt mountain beaver [*Aplodontia rufa humboldtiana*], and ring-tailed cat [*Bassariscus astutus*]), six bat species (fringed myotis [*Myotis thysanodes*], long-eared myotis [*Myotis evotis*], pallid bat [*Antrozous pallidus*], Townsend's big-eared bat [*Corynorhinus townsendii*], western red bat [*Lasiurus blossevillii*], and Yuma myotis [*Myotis yumanensis*]), two vole species (Sonoma tree vole [*Arborimus pomo*] and white-footed vole [*Arborimus albipes*]), and the Oregon snowshoe hare (*Lepus americanus klamathensis*).

Suitable roosting habitat for crevice-roosting bat species includes exfoliating bark, large snags, tree cavities, bridges, and rocky outcrops (Gellman and Zielinski 1996). Such habitat features are present intermittently throughout the Action Area. Suitable maternity roosting habitat for crevice-roosting bats such as caves, mines, and man-made buildings are also present within the Action Area. Due to the rich mineral resources present in the region, active and abandoned mines and associated man-made buildings are common in the Action Area (Mason and Arndt 1996). Suitable habitat for denning mammals is also present along much of the Action Area.

While there are no known gray wolf (*Canis lupus*) dens or rendezvous sites associated with the Shasta Pack within 50 miles of the Action Area (CNDDDB 2019; USFWS 2016), the species is highly nomadic and individuals have the potential of migrating into the northeastern extent of the Action Area.

Specific habitat requirements and occurrence information for these species are detailed in **Table 6**. While occurrence data does exist for some of these species, it is sparse and lacking due to insufficient survey efforts as well as the nocturnal and secretive nature of many of these species (Kunz and Fenton 2003).

Mollusks

Thirteen special-status mollusk species are potentially present in the Action Area. These include ten terrestrial mollusks and three aquatic mollusks. Terrestrial mollusks (snails and slugs) include Big Bar hesperian (*Vespericola pressleyi*), blue-gray tailedropper (*Prophysaon coeruleum*), hooded lancetooth (*Ancotrema voyanum*), Klamath sideband (*Monadenia fidelis klamathica*), Oregon shoulderband (*Helminthoglypta hertleini*), Shasta chaparral (*Trilobopsis roperi*), Shasta Hesperian (*Vespericola shasta*), Trinity bristle snail (*Monadenia infumata setosa*), Trinity shoulderband (*Helminthoglypta talmadgei*), and yellow-base sideband (*Monadenia infumata ochromphalus*). Aquatic mollusks include black juga (*Juga nigrina*), California floater (*Anodonta californiensis*), and nugget pebblesnail (*Fluminicola seminalis*). The aquatic mollusks considered in this analysis are dependent on aquatic habitats (i.e., seeps, springs, streams) while the terrestrial mollusks are mostly dependent on abundant litter from deciduous trees (Jordan and Black 2012). A CDFW mitigation site for the Trinity bristle snail is present at Collins Bar Creek, approximately 0.5 mile from the Action Area (personal communication, Jennifer Olson, CDFW). Specific habitat requirements and occurrence information for these species are detailed in **Table 5**.

Reptiles

California mountain kingsnake (*Lampropeltis zonata*), coast horned lizard (*Phrynosoma blainvillii*), and western pond turtle (*Emys marmorata*) are three special-status reptiles potentially present in the Action Area. California mountain kingsnake is found in montane coniferous forests and grasslands containing boulders and may be found in much of the Action Area. The coast horned lizard, despite its common name, could be encountered only in the sandy soils surrounding the town of Shasta. Western pond turtle is typically found in or within 650 feet of perennial waters. Specific habitat requirements and occurrence information for these species are detailed in **Table 6**.

CHAPTER 5 PROPOSED ACTION IMPACTS/EFFECTS ANALYSIS

The following impacts/effects analysis includes an assessment of the potential direct and/or indirect effects the Proposed Action may have on the sensitive natural communities, wetlands, ESHA, and all special-status species identified in Chapter 4.

5.1 Habitats and Natural Communities of Special Concern

The majority of the Proposed Action would be constructed along disturbed roadsides and other sparsely vegetated areas and permanent impacts to Habitats and Natural Communities of Special Concern are not expected. However, temporary impacts to some of these resources are discussed below. It should be noted that these communities often have multiple statuses associated with them. Potential temporary impacts to these communities are shown in **Table 14**.

Sensitive Natural Communities

Direct Effects

While beach pine, redwood–Douglas-fir, ceanothus chaparral, and pickleweed-cordgrass communities (all S3 ranked sensitive natural communities) all occur in the Action Area, direct effects to these communities are not expected. Any Proposed Action-related disturbances will not require the removal of vegetation within these communities and will be restricted to roadsides and other unvegetated areas.

Willow thickets (S3 ranked sensitive natural community) do occur at several locations immediately adjacent to the alignment, often immediately abutting the road in some coastal locations. AMM BIO-5 requires the Proponent use HDD to bore under and fully avoid willow thickets. Bore pits and access vaults will not be placed in or adjacent to these sensitive communities. Neither permanent nor temporary impacts are expected to willow thickets.

Indirect Effects

Indirect effects to sensitive natural communities may also occur from Proposed Action-related activities. Specifically, ground-disturbing activities during construction may cause indirect effects to willow thicket communities that include increased erosion and the potential introduction of non-native invasive species. Proposed Action Avoidance and Minimization Measures (AMMs) and BMPs will be implemented to minimize any indirect effects to wetlands.

Wetlands

Direct Effects

AMM BIO-5 requires the Proponent use HDD to bore under and fully avoid wetlands. Bore pits and access vaults will not be placed in or adjacent to wetlands. Neither permanent nor temporary impacts are expected to wetlands.

Indirect Effects

Indirect effects to wetlands may also occur from Proposed Action-related activities. Specifically, ground-disturbing activities during construction may cause indirect effects that include disruptions to the vegetative structure of the wetlands and/or changes to wetland hydrologic conditions. Possible indirect effects to the vegetative structure of wetlands in the Construction Corridor may include reduced wetland plant diversity and the potential introduction of non-native invasive species. Indirect effects to hydrologic conditions in wetlands from the Proposed Action may include changes to drainage patterns/characteristics, changes to the volume of water reaching the wetland via infiltration or surface run-off, or changes to water retention

times in the wetland. Proposed Action AMMs and BMPs will be implemented to minimize any indirect effects to wetlands.

Waterways

Direct Effects

Direct impacts to perennial and some intermittent waterways will be avoided by either employing HDD construction methods to bore under these waterways, attaching conduit to bridges (if present), or trenching/plowing above culverts conveying these waterways.

If it is not feasible to employ HDD, bridge attachments, or trenching above culverts, it may be necessary to trench/plow through some of the ephemeral drainages and intermittent waterways. Therefore, temporary impacts of up to 0.07 acre of ephemeral drainages and 0.11 acre of intermittent waterways identified within the Construction Corridor may occur during construction (**Table 14**). However, the trenching method would be used if there was no water present in the waterway and no precipitation was expected while work was being conducted. In addition, Proposed Action AMMs and BMPs (including the implementation of a SWPPP, Spill Prevention and Pollution Plan [SPPP], HDD Contingency and Resource Protection Plan, and Revegetation and Restoration Plan) would minimize any effects to waterways.

Indirect Effects

Indirect effects to waterways may also occur from the Proposed Action. Specifically, ground-disturbing activities during construction in or adjacent to waterways may cause indirect effects that include the potential introduction of hazardous materials (i.e., fuel, lubricants) from accidental spills, increased erosion, and increased sediment transport.

ESHA

Direct Effects

Coastal willow thickets and freshwater emergent wetlands identified within the Coastal Zone are also considered ESHA per the California Coastal Act. As mentioned in the two preceding chapters, permanent and temporary direct impacts to these coastal wetlands are not expected and construction activity will avoid ESHA.

Indirect Effects

Indirect effects to ESHA (coastal wetlands) equate to those indirect effects to wetlands described in the previous chapter.

Table 14. Potential Temporary Impacts to Habitats and Natural Communities of Special Concern

Community Type	Temporary Impacts (acres)			
	CDFW Sensitive Natural Community	Wetlands	Waterways	ESHA
Ephemeral drainages	-	-	0.07	-
Intermittent waterways	-	-	0.11	-

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, permanent impacts to habitats and natural communities of special concern are not expected (**Table 15**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-3—Restoration Plan**
- **AMM BIO-4—Intermittent Waterways & Ephemeral Drainages**
- **AMM BIO-5—Wetlands**
- **AMM BIO-7—Riparian Reserves (*federal land only*)**
- **AMM BIO-9—Invasive Species Prevention**
- **BMP BIO-1—General Bio**
- **BMP BIO-2—SWPPP**
- **BMP BIO-3—SPPP**
- **BMP BIO-4—HDD FRAC-OUT Plan**

Table 15. Findings for Habitats and Natural Communities of Special Concern

Community Type	CEQA Findings
Willow Thickets	Less than significant impacts
Freshwater Emergent Wetlands	
Ephemeral Drainages	
Intermittent Waterways	

5.2 Special-Status Plants and Fungi

The majority of the Proposed Action would be constructed along disturbed roadsides, other sparsely vegetated areas, or areas dominated by non-native plant species. However, some special-status plant and fungi species may occur in or immediately adjacent to the Construction Corridor, particularly along narrow dirt roads within USFS or BLM lands.

Direct Effects

Direct mortality to special-status plants could occur from Proposed Action-related construction activities; specifically, ground-disturbing activities from plowing, trenching, HDD (at bore holes), access vault installation, installation of additional support cables for aerial portions, laydown areas, and installation of ILA locations all have the potential to impact plants. Individual plants could be inadvertently crushed or buried by heavy machinery and vehicles or trampled by personnel. Soil disturbance from trenching also has the potential of removing entire plants or severing tree roots, which may cause mortality of some individuals. While direct impacts to perennial special-status plants are possible year-round, direct impacts to annuals are restricted to the growing season. ILA locations will be installed in previously disturbed areas, and direct impacts to special-status plants are not expected. Proposed Action activities do not include the removal of any trees greater than 6 inches in diameter, and any direct impacts to Port Orford cedar are not expected.

Direct mortality to special-status fungi during construction activities is not likely to occur. Although aboveground sporocarps (fruiting bodies) of fungal organisms may be crushed or trampled during construction, these impacts will not significantly impact the belowground portion (hyphae) of the organism nor will the impacts affect the population. Soil disturbance from trenching would not significantly impact any special-status fungal species since any soil disturbance would be limited to a small area as it relates to the entirety of the fungal hyphae.

Indirect Effects

Indirect effects to special-status vascular plants and fungi may also occur from the Proposed Action. Specifically, ground-disturbing activities during construction may cause indirect effects that include disruptions to the native seedbank, localized changes to hydrologic conditions, increased erosion and sediment transport, and the potential introduction of non-native invasive species.

Ground-disturbing activities like soil removal, subsequent mixing of topsoil with subsoil, and compaction can degrade soil structure and quality. This often affects the ability of the disturbed soils to sustain basic soil functions like native plant and fungal growth, a healthy soil microbiome, and adequate water infiltration and retention. Consequently, special-status species may not be able to reestablish on these disturbed soils, which often results in the establishment of weedy non-native invasive plants which thrive in disturbed habitats and crowd out native plants.

There is the potential for indirect effects to Port Orford cedar from the non-native fungus *Phytophthora lateralis*, which has caused widespread mortality in Port Orford cedars throughout its range. Since there are known occurrences of the fungus in the region, there is the possibility that the fungus may be transmitted during construction activities. However, Proposed Action AMMs and BMPs will be implemented to minimize the potential spread of the fungus during implementation.

As the majority of the Construction Corridor is located along existing roads and disturbed areas that often host invasive plants, a number of invasive plant species are considered widespread within the footprint of the Proposed Action. NRIS invasive plant data was queried to locate known populations of invasive plants in and adjacent to the Construction Corridor. Established invasive plants include Dyer’s woad (*Isatis tinctoria*), Scotch broom (*Cytisus scoparius*), tree of heaven (*Ailanthus altissima*), and yellow star-thistle (*Centaurea solstitialis*). AMM BIO-9 (Invasive Species Prevention) will minimize the potential spread of invasive plants and meet FSM 2900 direction on USFS lands.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, significant impacts from the Proposed Action to special-status plants and fungi are unlikely (**Table 16**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-3—Restoration Plan**
- **AMM BIO-8—Special-Status Plants**
- **AMM BIO-9—Invasive Species Prevention**
- **BMP BIO-1—General Bio**

Table 16. Findings for Habitats and Natural Communities of Special Concern for Special-Status Plants

Lifeform	Common Name	CRPR	CEQA Findings
Annual herb	Howell’s montia	2B.2	No potential significant impacts
	Pacific gilia	1B.2	
	Round headed Chinese houses	1B.2	
	Short-leaved evax	1B.2	
Bryophyte	Elongate copper moss	4.3	

Lifeform	Common Name	CRPR	CEQA Findings
	Flagella-like atractylocarpus	2B.2	
Fern	Running pine	4.1	
Perennial herb	Bald Mountain milk-vetch	2B.3	
	California globe mallow	1B.2	
	Canyon Creek stonecrop	1B.3	
	Clustered lady's-slipper	4.2	
	Coast checkerbloom	1B.2	
	Coast fawn lily	2B.2	
	Dudley's rush	2B.3	
	Giant fawn lily	2B.2	
	Heckner's lewisia	1B.2	
	Lyngbye's sedge	2B.2	
	Maple-leaved checkerbloom	4.2	
	Mountain lady's slipper	4.2	
	Northern meadow sedge	2B.2	
	Oregon fireweed	1B.2	
	Oregon golden thread	4.2	
	Robust false lupine	1B.2	
	Siskiyou checkerbloom	1B.2	
	Trinity River jewelflower	1B.2	
White-flowered rein orchid	1B.2		
Wolf's evening primrose	1B.2		
Note: No federal or state-listed plants have potential to occur			

5.3 Special-Status Fish and Wildlife

Analysis indicators facilitate the quantitative assessment of a proposed action's potential to effect special-status fish and wildlife species. This evaluation considers mortality, harm, or harassment (including failed breeding attempts) to be general analysis indicators for all species. All potential effects to these general analysis indicators (described below) are discountable. As a result, species-specific analysis indicators were not assigned.

What follows are assessments of federally-listed species, followed by assessments for other special-status species grouped by taxa at a level that is meaningful to the measures prescribed to protect them. For example, all amphibians have been grouped because similar AMMs will cover their most sensitive periods and habitat use areas. Mammals are grouped to a lesser extent due to the diversity in their habitat use and sensitivities. Following discussion of each species/taxa, AMMs specific to that group are listed. A complete list of AMMs that apply to the protection of all fish and wildlife species can be found in **Appendix F**.

The majority of the Construction Corridor follows existing roads in previously disturbed areas. In areas where the proposed line will travel aerially, existing poles in cleared ROWs will be utilized. Therefore, with the exception of six small buildings in previously disturbed areas, the Proposed Action will not require

new aboveground structures (i.e., poles) in existing habitat. Bore pits and access vaults will not be placed in or adjacent to riparian vegetation and wetlands; as such, riparian and wetland habitats will not be altered and herbicides will not be applied.

Desktop and field survey analyses have determined that the following Proposed Action-related factors may affect special-status wildlife and fish (detailed analysis follows):

- Noise from construction has the potential to disturb and directly affect the reproductive success of wildlife in and adjacent to the Construction Corridor. Species most sensitive to noise disturbance are bats, MAMU and NSO
- Foot traffic near aquatic resources during construction has the potential to directly injure or kill protected mollusk and amphibian species
- Ground disturbance could introduce sediment to waterways, thereby degrading water quality and altering stream substrates. Such disruption could decrease the suitability of aquatic habitat, causing direct (habitat) and indirect effects (water quality) to amphibians, mollusks, and fish downstream of work areas
- Accidental chemical spills (e.g., lubricating fluids or fuel) near waterways could also degrade water quality for aquatic wildlife in the Action Area
- Construction activities may temporarily decrease the ability of wildlife to move through the Action Area
- Increased vehicular and human traffic in work areas, on roads, and in staging areas could disturb wildlife in the Action Area

Federally-Listed Wildlife and Fish

Birds

Marbled Murrelet

Direct Effects

Suitable MAMU nesting/roosting habitat will not be degraded, downgraded, or removed by the Proposed Action's activities because large-scale clearing of vegetation is not anticipated during construction, operations, and maintenance activities. As such, there is very low potential of direct injury or mortality to MAMU. However, work during the nesting season may disturb nearby nesting birds and is therefore considered an analysis indicator. Noise and vibration created by heavy equipment during construction could lead to harassment of MAMU by causing birds to flush from their roosting or nesting sites. Harassment due to noise disturbance may occur when the sound level from Proposed Action-related activities exceeds ambient/pre-existing sound levels by 20 to 25 dB, as experienced by the animal (USFWS 2006). As a result, the required applied distance between work and potential MAMU nesting habitat will vary as a function of 1) ambient conditions (i.e., proximity to busy roads such as SR 299) and 2) the noise generated by construction equipment.

Depending upon the nature of the terrain, geology, and environmental conditions, conduits may be installed using any of the previously described methods including plowing, HDD, rock saw, and trenching. The equipment associated with all of these methods produce noise levels in excess of 70 dB (with rock sawing potentially to 110 dB). This anticipated level of sound falls into the "extreme" (100-110 dB) category of noise, as defined by USFWS Harassment Guidelines (USFWS 2006). Harassment of nesting MAMU due to noise disturbance may occur to a distance of 0.25 mile in areas where ambient, existing background sound levels are less than 50 dB. These conditions are likely on the more remote segments of the Proposed Action's alignment, particularly those segments along or adjacent to narrow dirt roads that run through late-

successional forest habitats. In proximity to busy roads such as SR 299, which has an estimated “high” (81 to 90 dB) ambient sound level, the USFWS estimated harassment distance drops to 500 feet.

In addition to the noise disturbance effects described above, MAMU individuals flying to and from nests are vulnerable to auditory and visual disturbance from construction that occurs within two hours of sunrise or sunset. During the nesting season, this disturbance may preclude the ability of MAMU to feed nestlings by interfering with the departure and/or return of foraging adults as they travel to and from marine feeding areas.

Indirect Effects

None anticipated.

Effects to MAMU Critical Habitat

The Construction Corridor overlaps portions of MAMU Critical Habitat unit CA-11-b, approximately 6 miles west of Willow Creek within SRNF. For MAMU, the PBFs are the specific physical characteristics that make areas suitable for nesting, roosting, foraging, and dispersal habitat (USFWS 1992). Proposed Action activities will not remove any vegetation larger than 6 inches DBH, and no destruction or adverse modification of MAMU critical habitat is expected.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, effects to MAMU are unlikely and therefore discountable (**Tables 17 and 18**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-10—Marbled Murrelet**
- **BMP BIO-1—General Bio**

Northern Spotted Owl

Direct Effects

Since large-scale clearing of vegetation is not anticipated during construction, operations, and maintenance activities, no change in the acreage of suitable nesting/roosting, foraging, or dispersal habitat is expected as a result of Proposed Action activities. critical habitat will not be directly downgraded or removed by Proposed Action activities. As such, there is no potential for direct injury or mortality to NSO. However, work during the nesting season may disturb nearby nesting birds. During construction, substantial increases in noise and vibration above existing (ambient) levels may be created by heavy equipment. This disturbance could lead to harassment of NSO by causing birds to flush from their roosting or nesting sites.

Like MAMU, harassment of nesting NSO due to noise disturbance may occur to a distance of 0.25 mile in areas where ambient, existing background sound levels are less than 50 dB. These conditions are likely on the more remote segments of the Proposed Action’s alignment, particularly those segments along or adjacent to narrow dirt roads that run through late-successional forest habitats. In proximity to busy roads such as SR 299, which has an estimated “high” (81 to 90 dB) ambient sound level, the USFWS estimated harassment distance drops to 500 feet. NSO can also be sensitive to visual disturbance. However, the Construction Corridor is not within the line of sight of previously documented nests.

According to the *Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls* (USFWS 2012b), this Proposed Action should qualify as a “Disturbance-Only Project.” As such, work in suitable habitat may occur during the breeding season within disturbance buffers if protocol

surveys determine that there is no NSO nesting within 0.25 mile of the work (USFWS 2012b). Due to high ambient noise levels along SR 299 at work areas within or adjacent to the SR 299 ROW, the survey area requirement drops from 0.25 mile to 165 feet.

In suitable and relatively undisturbed habitat, foraging individuals may be directly affected by brief human presence which may temporarily cause an individual to avoid areas during construction that may otherwise serve as foraging habitat (USFWS 2011b). Project noise above background levels will cease either as the noise source moves away from the occupied habitat or when the Proposed Action is completed. Future operation and maintenance activities are not expected to produce noise above background levels.

Indirect Effects

None anticipated.

Effects to NSO Critical Habitat

The Construction Corridor overlaps portions of NSO Critical Habitat Units 9 and 11. For NSO, the PBFs are the specific physical characteristics that make areas suitable for nesting, roosting, foraging, and dispersal habitat (USFWS 1992). The Proposed Action will not remove any vegetation larger than 6 inches DBH, and no effect to NSO critical habitat is expected.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, effects to NSO are unlikely and therefore discountable (**Tables 17 and 18**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-11—Northern Spotted Owl**
- **AMM BIO-12—Northern Spotted Owl**
- **BMP BIO-1—General Bio**

Table 17. Findings and Determinations for Federally-Listed Birds and Their Critical Habitat

Common Name	Federal Listing	Critical Habitat	ESA Determinations	NEPA Findings	Notes
Bald eagle	FD BGEPA	-	-	Not Likely to Adversely Affect (NLAA)	No BGEPA permit required
Golden eagle	BGEPA	-	-	No Effect	No BGEPA permit required
Marbled murrelet	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Northern spotted owl	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat

Table 18. Findings and Determinations for State-Listed Birds

Common Name	State Listing	CFGC Status	CESA Determinations	CEQA Findings
Bald eagle	SE	FP	No incidental take will occur	No potential significant impacts
Bank swallow	ST	-	No incidental take will occur	
Bryant's savannah sparrow	-	SSC	-	
Burrowing owl	-	SSC	-	
Golden eagle	-	FP	Will be fully avoided	
Great gray owl	SE	-	No incidental take will occur	
Greater sandhill crane	ST	FP	No incidental take will occur	
Little willow flycatcher	SE	-	No incidental take will occur	
Marbled murrelet	SE	-	No incidental take will occur	
Mountain plover	-	SSC	-	
Northern goshawk	-	SSC	-	
Northern harrier	-	SSC	-	
Northern spotted owl	ST	SSC	No incidental take will occur	
Olive-sided flycatcher	-	SSC	-	
Peregrine falcon	-	FP	Will be fully avoided	
Purple martin	-	SSC	-	
Tricolored blackbird	ST	SSC	No incidental take will occur	
Vaux's swift	-	SSC	-	
White-tailed kite	-	FP	Will be fully avoided	
Yellow rail	-	SSC	-	
Yellow warbler	-	SSC	-	
Yellow-breasted chat	-	SSC	-	

Fishes

Special-status fishes with suitable habitat in the Action Area are grouped for the following effects analysis because potential impacts and analysis indicators of these species are similar. These include both federally-listed species and other special-status species.

Direct Effects

No work is anticipated to occur below the ordinary highwater mark of any rivers, coastal lagoons, or perennial drainages. However, work has the potential to decrease water quality and to change channel substrate, which can be considered both direct and indirect effects to both the fish and to critical habitat, as described below.

If sediment or pollutants enter the waterway at the time of construction (USFWS and NMFS 1998), direct effects to fish and critical habitat may occur. A change in sediment levels or texture can decrease suitability for anadromous fish spawning, rearing and/or migration at, and also downstream of, the work area. Depending upon the composition of the sediment and the flow and turbidity of the waterway, sediment could fall out of the water column immediately or may be carried some distance and therefore, impact

downstream species. Hence, sediment deposition at the time of construction can be considered both a direct and an indirect effect to fish and fish habitat.

Similarly, contamination by petroleum products or other pollutants (e.g., frac out of bentonite) could cause direct effects to any individual fish present in the waterway at the time of the work and could also cause decreases in water quality downstream of the work. Respiration and other physiological processes may be negatively affected by such actions both directly and indirectly. The implementation of BMPs and AMMs, specifically the implementation of the SWPPP and HDD FRAC-OUT Plan, will avoid or minimize the potential for sediment entry or adverse effects to water quality.

Indirect Effects

The Proposed Action will not result in any new roads or permanent aboveground infrastructure (e.g., ILA locations) in aquatic habitats. Additionally, neither long-term ecological changes (e.g., quality, extent) to fish habitat, fish habits, nor changes in land use are anticipated as a result of the Proposed Action. As such, no indirect effects to fish or EFH are expected.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, effects to special-status fishes are unlikely and therefore discountable (**Tables 19 and 20**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-4—Intermittent Waterways & Ephemeral Drainages**
- **AMM BIO-7—Riparian Reserves (*federal lands only*)**
- **AMM BIO-14—Aquatic Resources / Fisheries**
- **BMP BIO-1—General Bio**
- **BMP BIO-2—SWPPP**
- **BMP BIO-3—SPPP**
- **BMP BIO-4—HDD FRAC-OUT Plan**
- **BMP BIO-5—Hazardous Materials**

Table 19. Findings and Determinations for Federally-Listed Fishes and Their Critical Habitat

Common Name	Federal Listing	Critical Habitat	ESA Determinations	NEPA Findings	Notes
Chinook salmon—California Coastal ESU	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Chinook salmon—Central Valley spring-run ESU	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Chinook salmon—Sacramento River winter-run ESU	FE	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Coho salmon—Southern Oregon/Northern California ESU	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat

Common Name	Federal Listing	Critical Habitat	ESA Determinations	NEPA Findings	Notes
Green sturgeon—Southern DPS	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Pacific eulachon—Southern DPS	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Steelhead—Central Valley DPS	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Steelhead—Northern California DPS	FT	X	NLAA	NLAA	No destruction or adverse modification of critical habitat
Tidewater goby	FE	X	No effect	No effect	No destruction or adverse modification of critical habitat

Table 20. Findings and Determinations for State-Listed Fishes

Common Name	State Listing	CFGC Status	CESA Determinations	CEQA Findings
Chinook salmon—Central Valley spring-run ESU	ST	-	No incidental take will occur	No potential significant impacts
Chinook salmon—Sacramento River winter-run ESU	SE	-	No incidental take will occur	
Chinook salmon—Upper Klamath/Trinity ESU	ST	-	No incidental take will occur	
Coho salmon—Southern Oregon/Northern California ESU	ST	-	No incidental take will occur	
Green sturgeon—Southern DPS		SSC		
Hardhead	-	SSC	-	
Klamath River lamprey	-	SSC	-	
Longfin smelt	ST	-	No incidental take will occur	
Pacific lamprey	-	SSC	-	
Riffle sculpin	-	SSC	-	
River lamprey	-	SSC	-	
Steelhead—Klamath Mountains Province ESU	-	SSC	-	
Tidewater goby	-	SSC	-	

State-Listed and Other Special-status Wildlife and Fish

Amphibians

Special-status amphibians with suitable habitat (**Table 6**) in the Action Area are grouped for the following effects analysis because potential impacts to each of these species are expected to be similar. All special-status amphibians considered in this analysis require intermittent or perennial waters for early life stages and breeding. During their adult phases they can often be found within a few feet of these waters, though adults can occasionally be found in surrounding woodland habitats. Since much of the Proposed Action

would be constructed along disturbed shoulders of major roads away from suitable habitat for these species, impacts to special-status amphibians are expected to be minimal. However, there is the potential for impacts along the more remote segments of the Proposed Action's alignment, particularly those segments along or adjacent to narrow dirt roads that run through late-successional forest habitats and intersect suitable aquatic habitats.

Potential impacts to amphibians are greatest where the Proposed Action will travel under or over intermittent and perennial streams, particularly along those segments that follow dirt roads immediately adjacent to these streams. Seeps and springs that support emergent vegetation are also common occurrences along these dirt roads, often forming strips of potential amphibian habitat in roadside ditches. Trenching, HDD, and other ground-disturbing activities along these roadsides have the potential to impact these habitats and any amphibians that reside therein.

Direct Effects

Direct mortality to individuals could occur in both aquatic and upland dispersal habitat as a result of Proposed Action-related construction activities. During construction, individuals may be crushed by heavy machinery and vehicles, trampled by personnel, or buried during soil-disturbing activities. If construction occurs during sensitive breeding seasons, noise and ground vibration from construction activities may result in physiological stress to breeding individuals, hampering their ability to find mates and reproduce (Megela and Narins 2018). Soil disturbance during construction could result in sedimentation of nearby waters, lowering water quality through increased turbidity. This increase in sediment has the potential to affect special-status amphibians by reducing overall abundance of eggs and larva, as well as affect overall growth and development rates (Woods and Richardson 2009). Lastly, the removal/disturbance of microhabitats (i.e., rocks, litter, large woody debris) due to ground-disturbing activities may temporarily eliminate suitable habitat for some species.

Indirect Effects

Indirect effects to special-status amphibians may also occur from Proposed Action-related activities in those areas deemed suitable for such species. Ground-disturbing and other construction activities have the potential to introduce non-native, invasive species (i.e., other amphibians, pathogens) that may displace or predate native amphibians. Amphibians can also be sensitive to environmental contaminants, and indirect effects may occur from unintentional chemical spills (e.g., fuel, lubricants, etc.) during construction activities (Mahaney 1994). Sedimentation from ground-disturbing activities has the potential to cause indirect effects to amphibians by altering water chemistry (increased pH), increasing water temperatures, and lowering macroinvertebrate productivity. The implementation of BMPs and AMMs, specifically the implementation of the SWPPP and HDD Contingency and Resource Protection Plan, will avoid or minimize the potential for sediment entry or adverse effects to water quality.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, impacts to special-status amphibians will be avoided or minimized, and no potential significant impacts are likely to occur (**Table 21**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-5—Wetlands**
- **AMM BIO-15—Special-Status Amphibians**
- **BMP BIO-1—General Bio**
- **BMP BIO-2—SWPPP**

- **BMP BIO-3—SPPP**
- **BMP BIO-4—HDD FRAC-OUT Plan**
- **BMP BIO-5—Hazardous Materials**
- **BMP BIO-6—Air Quality/Dust Prevention**

Table 21. Findings and Determinations for State-Listed Amphibians

Common Name	State Listing	CFGC Status	CESA Determinations	CEQA Findings
Coastal (Pacific) tailed frog	-	SSC	-	No potential significant impacts
Foothill yellow-legged frog (Northwest/North Coast Clade)	-	SSC	-	
Northern red-legged frog	-	SSC	-	
Southern torrent salamander	-	SSC	-	
Note: No federally-listed amphibians have potential to occur.				

Birds

Direct Effects

During nesting season (February 15 to August 31; January 1 to August 31 for bald and golden eagles) in all habitat assemblages, elevated noise from construction could interfere with avian mating and territorial defense calls, possibly inhibiting or delaying breeding. Construction noise and activities and human presence could result in nest abandonment or neglect or disrupt foraging activity, reducing reproductive success. Construction disturbance to overwintering birds may cause individuals to temporarily change foraging locations. Direct effects are expected to be short term and temporary while construction and installation pass through a given area and are not expected to extend beyond one breeding season or overwintering period. Long-term effects are not expected because the Proposed Action will not modify or remove suitable roosting, hibernation, or foraging habitat for birds, and any soil disturbance will be reseeded to minimize noxious weed establishment. Only minimal vegetation removal (DBH<6 and <0.1 acre) is planned and no large trees or snags suitable for roosting will be removed.

Indirect Effects

None expected.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, impacts to nesting birds may occur but Proposed Action-related activities will avoid or minimize impacts to the greatest extent practicable (**Table 23**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-13—Nesting Birds**
- **BMP BIO-1—General Bio**

Fishes

See federally-listed fishes above.

Insects

Direct Effects

Direct mortality to individuals could occur as a result of Proposed Action-related construction activities in parts of the Construction Corridor that occur on the shoulder of small roads. During construction in these areas, individuals could be crushed by heavy machinery and vehicles, trampled by personnel, or buried during soil disturbing activities. Vibration from ground-disturbing activities has the potential to temporarily disturb nesting bees.

Indirect Effects

Indirect effects to special-status insects are not expected.

Measures and Determinations

With the implementation of biological and standard construction BMPs and the AMM described below, impacts to special-status insects will be avoided or minimized, and no potential significant impacts are likely to occur (**Table 22**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-9—Invasive Species Prevention**
- **BMP BIO-1—General Bio**
- **BMP BIO-6—Air Quality/Dust Prevention**

Table 22. Findings and Determinations for State-Listed Insects

Common Name	State Listing	CFGC Status	CESA Determinations	CEQA Findings
Crotch's bumble bee	SCE	-	No incidental take will occur	No potential significant impacts
Franklin's bumble bee	SCE	-		
Suckley's cuckoo bumble bee	SCE	-		
Western bumble bee	SCT	-		

Mammals

Work occurring during twilight hours has the potential to disrupt foraging behavior of special-status mammals (species which are generally nocturnal or crepuscular) that may be present in the Action Area. Although work does not have the potential to remove or alter important habitat elements, impacts to individual mammals are possible due to noise from construction equipment, as described below.

Direct Effects

American Badger

Project construction in areas with friable soils could directly impact occupied American badger dens located within or adjacent to the Construction Corridor. Ground vibration from heavy equipment and machinery, particularly trenching machines or rock saws, could disturb natal dens located outside the ROW, possibly causing den collapse or prompting removal of young to another den or burrow.

Bats

Special-status bats with suitable habitat (**Table 6**) in the Action Area are grouped for the following effects analysis because potential impacts to each of these species are expected to be similar. Since work will not occur at night, sensitive bats are unlikely to be encountered during work. The Proposed Action will not modify or remove suitable roosting, hibernation, or foraging habitat for bats. Only minimal vegetation

removal (DBH<6 and <0.1 acre) is planned and no large trees or snags suitable for roosting will be removed. Bats are nocturnal and forage for arthropods in mesic, riparian, and forest edge habitats. Work is not expected to significantly impact the foraging habitat or composition of swarming insects.

However, roosting bats, especially Townsend's big-eared bats, are highly sensitive to noise disturbance (Gruver et al. 2006; Pierson and Rainey 1998). Elevated sound levels from construction equipment interferes with echolocation calls and could cause adult bats to abandon maternity roosts (Bunkley and McClure 2015). It is expected that roosting individuals will flee the area during construction and not be injured. However, the following adverse effects are possible: 1) maternity colony collapse due to abandonment by adults and 2) disruption to hibernating individuals. Potential for these effects is highest where work will occur on bridges and in the vicinity of abandoned man-made structures. These effects will be avoided and minimized by the implementation of BMPs and AMMs. AMM-15 requires surveys in suitable habitat when work will occur during maternity and hibernation seasons. In addition, pre-construction bat roost surveys will occur prior to conduit installation on any bridge no matter the time of year. At bridges determined to be suitable maternity roosting habitat, construction will not occur during the maternity season.

Fisher

Both in and outside of natal season, noise may disturb fisher in day resting sites (Purcell 2009). Increased vehicular and human traffic in work areas, on roads, and in staging areas may temporarily decrease the ability of wildlife such as fisher to move through the Action Area. During natal denning season, noise from construction equipment and the presence of humans in the Construction Corridor could prompt change of denning sites, possibly impacting reproductive success. Foraging is unlikely to be affected because it occurs at night when work will not be performed. However, the fisher is curious in nature and may be attracted to work areas by open trash and food. Proposed Action activities will not modify or remove suitable denning or foraging habitat for fisher. Since the Proposed Action will be located in previously disturbed, existing road ROWs or utility easements, no large trees, logs, snags, or brush piles suitable for fisher will be removed.

Ring-Tailed Cat

The Action Area contains extensive habitat suitable for ring-tailed cat including rock crevices, living and dead hollow trees, logs, snags, and brush piles. Since the Construction Corridor is located in previously disturbed, existing road ROWs or utility easements, it does not have potential to modify or remove suitable denning or foraging habitat for ring-tailed cat. During natal denning season, noise from construction equipment and the presence of humans in the Construction Corridor could prompt change of denning sites, possibly impacting reproductive success.

Oregon Snowshoe Hare, Sonoma Tree Vole, and White-footed Vole

Similar to the mammals described above, the Proposed Action will not modify or remove suitable habitat for these species. Direct effects to individuals are not expected because work will occur during the day and these species are active at night.

Indirect Effects

None expected.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, impacts to special-status mammals will be avoided or minimized, and no potential significant impacts are likely to occur (**Table 23**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-16—Special-Status Bats**
- **AMM BIO-17—Special-Status Mammals**
- **BMP BIO-1—General Bio**

Table 23. Findings and Determinations for State-Listed Mammals

Common Name	State Listing	CFGC Status	CESA Determinations	CEQA Findings
American badger	-	SSC	-	No potential significant impacts
Fisher	-	SSC	-	
Oregon snowshoe hare	-	SSC	-	
Pallid bat	-	SSC	-	
Ring-tailed cat	-	FP	Will be fully avoided	
Sonoma tree vole	-	SSC	-	
Townsend's big-eared bat	-	SSC	-	
Western red bat	-	SSC	-	
White-footed vole	-	SSC	-	

Mollusks

For the following effects analysis, special-status mollusk species with potential suitable habitat in the Action Area are grouped by those species found primarily in terrestrial habitats and those found primarily in aquatic habitats. These species are grouped as such because potential impacts to species within each group are expected to be similar.

The aquatic mollusks considered in this analysis are dependent on aquatic habitats (i.e., seeps, springs, streams) while the terrestrial mollusks are mostly dependent on abundant litter from deciduous trees (Jordan and Black 2012). Since the majority of the Proposed Action would be constructed along disturbed roadsides and other unvegetated areas where litter is limited, impacts to special-status mollusks are unlikely to occur. However, there is the potential for mortality of individuals along the more remote segments of the Proposed Action alignment, particularly along or adjacent to narrow dirt roads that run through late-successional forest habitats and intersect suitable aquatic habitats.

Direct Effects

Mollusks are small and inherently have limited mobility. As such, in areas with suitable habitat, direct mortality to individuals could occur as a result of Proposed Action-related construction activities. During construction, individuals could be crushed by heavy machinery and vehicles, trampled by personnel, or buried during soil-disturbing activities. In addition, the removal/disturbance of microhabitats (i.e., litter, woody debris, rocks) due to ground-disturbing activities may temporarily eliminate suitable habitat for some species. Finally, terrestrial and aquatic mollusks can also be sensitive to environmental contaminants and indirect effects may occur from unintentional chemical spills (e.g., fuel, lubricants, etc.) during construction activities.

Indirect Effects

Indirect effects to special-status mollusks may also occur from Proposed Action-related activities in those areas deemed suitable for such species. Ground-disturbing and other construction activities also have the potential to introduce non-native, invasive species (e.g., other mollusks, pathogens) that may displace or predate native mollusks. Finally, ground-disturbing activities in or adjacent to waterways intersecting the alignment may result in increased sedimentation that could indirectly affect aquatic mollusks by reducing downstream water quality (Jordan and Black 2012). The implementation of BMPs and AMMs, specifically the implementation of the species-specific protocol level surveys (Duncan et al. 2003; Kelley et al. 1999), SWPPP, and HDD Contingency and Resource Protection Plan, will avoid or minimize the potential for sediment entry or adverse effects to water quality.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, potential impacts to mollusks will be avoided or minimized, and no potential significant impacts are likely to occur (Table 24). Full text of AMMs are provided in Appendix F.

- **AMM BIO-1—Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **AMM BIO-3—Restoration Plan**
- **AMM BIO-5—Wetlands**
- **AMM BIO-18—Big Bar Hesperian**
- **AMM BIO-19—Blue-gray tail dropper**
- **AMM BIO-20—Trinity bristle snail**
- **BMP BIO-1—General Bio**
- **BMP BIO-5—Hazardous Materials**
- **BMP BIO-6—Air Quality/Dust Prevention**

Table 24. Findings and Determinations for State-Listed Mollusks

Common Name	State Listing	CFGC Status	CESA Determinations	CEQA Findings
Trinity bristle snail	ST	-	No incidental take will occur	No significant impacts

Note: No federally-listed mollusks have potential to occur.

Reptiles

California mountain kingsnake and western pond turtle were grouped for the following effects analysis because potential impacts to each of these species are expected to be similar. While California mountain kingsnake is a habitat generalist and may be found along much of the Proposed Action alignment, western pond turtle is typically found in or within 650 feet of perennial waters. Since much of the Proposed Action would be constructed along disturbed shoulders of major roads away from suitable habitat for these species, impacts to special-status reptiles are expected to be minimal. However, there is the potential for impacts along the more remote segments of the Proposed Action alignment, particularly those segments along narrow dirt roads that are often immediately adjacent to suitable habitat for both species.

Direct Effects

Direct mortality to individuals could occur as a result of Proposed Action-related construction activities. During construction, individuals could be crushed by heavy machinery and vehicles, trampled by personnel, or buried during soil-disturbing activities. Since work is not occurring in any perennial aquatic resources,

direct impacts to western pond turtle would only occur in upland habitats within 650 feet of perennial waters where Western pond turtle nests could be found or where nesting females may travel. California mountain kingsnake and coast horned lizard could be present in upland habitats much further from water.

Indirect Effects

Western pond turtles can be sensitive to environmental contaminants, and effects may occur from unintentional chemical spills (e.g., fuel, lubricants, etc.) in or near aquatic habitats during construction activities (Rosenberg et al. 2009). Indirect effects to California mountain kingsnake are not expected.

Measures and Determinations

With the implementation of standard construction BMPs and the following AMMs and biological BMPs, impacts to special-status reptiles will be avoided or minimized, and no potential significant impacts are likely to occur (**Table 25**). The full text of AMMs and BMPs are provided in **Appendix F**.

- **AMM BIO-1— Biological Monitoring Requirements**
- **AMM BIO-2—Environmental Awareness Training**
- **BMP BIO-1—General Bio**
- **BMP BIO-2—SWPPP**
- **BMP BIO-3—SPPP**

Table 25. Findings and Determinations for State-Listed Reptiles

Common Name	State Listing	CFGC Status	CESA Determinations	CEQA Findings
Coast horned lizard	-	SSC	-	No potential significant impacts
Western pond turtle	-	SSC	-	
Note: No federally-listed reptiles have potential to occur.				

CHAPTER 6 CONCLUSIONS AND DETERMINATIONS

6.1 Determinations—Federally-Listed Species

May affect, not likely to adversely affect due to discountable effects

- Chinook salmon—California Coastal ESU
- Chinook salmon—Central Valley spring-run ESU
- Chinook salmon—Sacramento River winter-run ESU
- Coho salmon—Southern Oregon/Northern California ESU
- Green sturgeon—Southern DPS
- Marbled murrelet
- Northern spotted owl
- Pacific eulachon—Southern DPS
- Steelhead—Central Valley DPS
- Steelhead—Northern California DPS
- Tidewater goby

Critical Habitat—No destruction or adverse modification

- Chinook salmon—California Coastal ESU
- Chinook salmon—Central Valley spring-run ESU
- Chinook salmon—Sacramento River winter-run ESU
- Coho salmon—Southern Oregon/Northern California ESU
- Green sturgeon—Southern DPS
- Marbled murrelet
- Northern spotted owl
- Pacific eulachon—Southern DPS
- Steelhead—Central Valley DPS
- Steelhead—Northern California DPS
- Tidewater goby

BGEPA—No permit required

- Bald eagle
- Golden eagle

The implementation of the proposed AMMs and BMPs will ensure that impacts are avoided or minimized to the greatest extent practicable.

6.2 Determinations—State-listed Species

CEQA Considerations—No potential significant impacts

Fish and Wildlife

- American badger
- Bald eagle
- Bank swallow
- Bryant's savannah sparrow
- Burrowing owl
- Chinook salmon—Central Valley spring-run ESU
- Chinook salmon—Sacramento River winter-run ESU
- Chinook salmon—Upper Klamath/Trinity ESU
- Coast horned lizard
- Coastal tailed frog
- Coho salmon—Southern Oregon/Northern California ESU
- Crotch's bumble bee
- Foothill yellow-legged frog
- Fisher
- Franklin's bumble bee
- Golden eagle
- Great gray owl
- Greater sandhill crane
- Green sturgeon—Southern DPS
- Hardhead
- Klamath River lamprey
- Little willow flycatcher
- Longfin smelt
- Marbled murrelet
- Mountain Plover
- Northern goshawk
- Northern harrier
- Northern red-legged frog
- Northern spotted owl
- Olive-sided flycatcher
- Oregon snowshoe hare
- Pacific lamprey
- Pallid bat
- Peregrine falcon
- Purple martin
- Riffle sculpin
- Ring-tailed cat
- River lamprey
- Sonoma tree vole
- Southern torrent salamander
- Steelhead—Klamath Mountains Province ESU

Fish and Wildlife continued

- Suckley's cuckoo bumble bee
- Tidewater goby
- Townsend's big-eared bat
- Tricolored blackbird
- Trinity bristle snail
- Vaux's swift
- Western bumble bee
- Western pond turtle
- Western snowy plover
- White-footed vole
- White-tailed kite
- Yellow rail
- Yellow warbler
- Yellow-breasted chat

Plants

- Howell's montia
- Pacific gilia
- Round headed chinese houses
- Running pine
- Bald Mountain milk-vetch
- California globe mallow
- Canyon Creek stonecrop
- Clustered lady's-slipper
- Coast checkerbloom
- Coast fawn lily
- Dudley's rush
- Giant fawn lily
- Heckner's lewisia
- Lyngbye's sedge
- Maple-leaved checkerbloom
- Mountain lady's slipper
- Northern meadow sedge
- Oregon fireweed
- Oregon golden thread
- Robust false lupine
- Siskiyou checkerbloom
- Trinity River jewelflower
- White-flowered rein orchid
- Wolf's evening primrose

Habitats and Natural Communities of Special Concern

- Willow Thickets
- Freshwater Emergent Wetlands
- Intermittent Waterways
- Ephemeral Drainages

CESA Considerations

Will be fully avoided

- Golden eagle
- Greater sandhill crane
- Peregrine falcon
- Ring-tailed cat
- White-tailed kite

No incidental take will occur

- Bald eagle
- Bank swallow
- Chinook salmon—Central Valley spring-run ESU
- Chinook salmon—Sacramento River winter-run ESU
- Chinook salmon—Upper Klamath/Trinity ESU
- Coho salmon—Southern Oregon / Northern California ESU
- Green sturgeon—Southern DPS
- Crotch's bumble bee
- Franklin's bumble bee
- Great gray owl
- Little willow flycatcher
- Longfin smelt
- Marbled murrelet
- Northern spotted owl
- Suckley's cuckoo bumble bee
- Tricolored blackbird
- Trinity bristle snail
- Western bumble bee

With the implementation of the proposed AMMs and BMPs, potential impacts to these species will be avoided or minimized, and no potential significant impacts are likely to occur.

6.3 Determination—Other Special-Status Species

Based upon the size, nature, and duration of the Proposed Action, it is our determination that the Proposed Action may impact individuals but will not cause a trend towards listing or loss of viability for any FSS, BLM-S, or S&M listed plant, fish, or wildlife species. The implementation of the proposed AMMs and BMPs will minimize potential impacts.

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