CALIFORNIA ENDANGERED SPECIES BIOLOGICAL ASSESSMENT

for the

RAIL-WITH-TRAIL CONNECTIVITY PROJECT

Humboldt County,
California

WINZLER & KELLY

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1.0 SUMMARY

The proposed Arcata Rail with Trail Connectivity Project involves construction, operation and maintenance of an approximately 4.5 mile long Class I, ADA accessible, non-motorized multiuse trail physically separated from motorized vehicular traffic by an open space or barrier.

The proposed project corridor would run from northern Arcata at Larson Park (near Sunset Avenue and the Arcata Skate Park), through the City of Arcata and the Arcata Marsh, and along the eastern edge of Humboldt Bay south to the Highway 101 and Bracut intersection. The existing corridor includes three transportation arteries: the North Coast Railroad Authority's railroad right of way, a portion of the Highway 101 corridor and also segments of City-owned road right of way.

Five plant and animal species (beach layia, western lily, Coho salmon, longfin smelt and bank swallow) were identified as State-Threatened or Endangered in the Arcata North and Arcata South quadrangles. It was determined that the beach layia and western lily have Low or No potential to occur, and Coho salmon, longfin smelt and bank swallow have Moderate or High potential to occur within the project corridor's action area.

Due to the nature of the project, there is a **potential for adverse effects** to some species and their habitats; however, avoidance measures have been applied through project design and further mitigation measures will be implemented to ensure that the project minimizes any adverse effects. These mitigative measures are described as conservation measures within the project description and they are specifically ascribed to address potential impacts to the range of plants, animals, birds and fishes that occur within the project area.

Since no habitat occurs within the study area to support beach layia or western lily, the project will have **"no effect"** on these plants. The project **"may affect, but is not likely to adversely affect"** the coho salmon and the longfin smelt as long as the detailed conservation measures are upheld during the project construction. Long term effects or changes in the project vicinity and the habitats for sensitive species are not expected.

2.0 INTRODUCTION

2.1 Purpose and Need

The purpose of this Biological Assessment (BA) is to assess the effects of the City of Arcata's Rails with Trails Connectivity project on special-status plant and animal species that are listed, proposed or candidate species in the state of California.

This BA is needed to meet the requirements of the California Endangered Species Act (CESA), which requires consultation with the California Department of Fish and Game for projects that may affect state-listed plant and animal species. A separate Biological Assessment was completed to meet the requirements of Section 7 of the federal Endangered Species Act (ESA) of 1973, which requires consultation with the United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) for projects that may affect federally-listed plant and animal species. If a species was listed at both the state and federal level, it was covered in the federal BA only.

2.2 Location

The Rail with Trail Connectivity project begins in the City of Arcata, in Humboldt County, California. The 4.5-mile alignment begins at Arcata's Larson Park in the north and runs south through the City of Arcata generally paralleling the NCRA railroad corridor near Foster Avenue, Alliance Road, and L Street within the City. South of Samoa Boulevard, the trail continues to parallel the railroad corridor, terminating south of Arcata at Bracut Industrial Park on the west side of Route 101. The northern 3.25 miles of the project are located in the City of Arcata and the southern 1.25 miles of the project are located in the County of Humboldt south of the City of Arcata. The project is entirely west of Route 101.

2.3 Project Description

The proposed Arcata Rail with Trail Connectivity Project involves construction and operation of an approximately 4.5 mile long Class I, ADA accessible, non-motorized multiuse trail, which is a paved or unpaved non-motorized facility physically separated from motorized vehicular traffic by an open space or barrier.

The proposed project corridor would run from northern Arcata, down through the City and the Arcata Marsh, and along the eastern edge of Humboldt Bay south to Route 101 and Bracut intersection. The existing corridor includes three transportation arteries: the North Coast Railroad Authority's railroad right of way, a portion of the Route 101 corridor and also segments of City-owned road right of way.

The trail will consist of asphalt paving for the trail surface with gravel used for the shoulders. The trail will predominately be 8-10' wide with 2 foot shoulders on either side, but can be up to approximately 30 feet. The width of the project consists of three elements: the paved tread surface, the trail's shoulders, and (in some cases) a fill prism designed to bring the trail surface to a required grade or elevation.

A complete project description is provided in Appendix A.

2.4. Background

The City of Arcata currently has 20 miles of off-road trails and 16 miles of bike lanes. Although the City's active non-motorized transportation system is institutionally established, there are several large gaps that make the City difficult to navigate for pedestrians and bicycles. In 2004, the City drafted the Arcata Pedestrian and Bicycle Master Plan, in which over 35 miles of projects were developed to meet the increasing local demand for non-motorized alternatives and connectivity to and from the Pacific Coast and Humboldt Bay.

The railroad right-of-way owned by the North Coast Railroad Authority (NCRA), which travels through the center of the City of Arcata on a north/south axis, was identified in the 2004 Master Plan as a corridor of significant potential for a non-motorized trail. This portion of the NCRA corridor passes through several City parks, across commercial areas within the City, across primary city streets and a state highway (SR255), through the City of Arcata Marsh and Wildlife Sanctuary, adjacent to the public works yard and wastewater treatment facility yard, and along the Eureka-Arcata Safety Corridor and Caltrans right-of-way.

The Bay Trail Feasibility Study (HCAOG, 2007) further studied the feasibility of a trail between Arcata and Eureka and presented alternative alignments and sections for trail construction. The

2007 Study covered a large portion of the current project including the section from South I Street in Arcata to the Bracut Intersection along Highway 101 on the Eureka-Arcata Corridor.

In 2009, the City received grant funding from the California Coastal Conservancy (CCC) to complete planning, engineering design, and permitting for a "Rails-with-Trails" facility (the proposed project). "Rails-with-Trails" is an arrangement in which an established shared-use trail runs parallel to a rail line that is either functional or has the capacity to become functional in the future. In such projects, the trail is designed and developed to operate in the railroad right-of-way in such a way as to avoid interference with the functionality of the adjacent rail line.

Relationship to Railroad

In 1975, the railroad in the study area shipped 65,000 cars or almost 200 cars per day. However, rail usage dropped dramatically in the following decade as the Humboldt County timber industry declined. In 1989, the North Coast Railroad Authority (NCRA) was formed by the California Legislature under the North Coast Railroad Authority Act to ensure continuation of railroad service in Northwestern California. By 1997, the railroad was running only three to four trains per week. In 1997, severe winter storms caused substantial rock slides and erosion, damaging much of the NCRA's tracks and infrastructure. This included tunnel closures on the NCRA line at the Eel River Canyon, which cut off the north end of the line from the rest of the NCRA track system. Since 1997, the NCRA has been engaged in trying to obtain federal and state funds to reopen the line. Though the tracks have not been in use for over 13 years, the NCRA maintains the stance that rail service will be restored in portions of the project area.

In May of 2009, in anticipation of the proposed project, the NCRA released Policy 0907 – "Trail Projects on the NWP Line Rights-of-Way: Design, Construction, Safety, Operations, and Maintenance Guidelines." This document outlines the NCRA's policies on "Rails-with-Trails" projects and provides uniform and consistent standards on NCRA's rights-of-way for the design, construction, safety, operations, and maintenance of Rails-with-Trails Projects.

Alignment Selection

The following details the process through which alignment options were generated and the preferred alignment selection process.

- Concept for alignment presented in the City RFP, generally followed railroad alignment through City or as developed in the Bay Trail Feasibility Study.
- During field reconnaissance, areas were identified that could accommodate a trail with less construction impacts to the environment and/or improved ease of construction.
- The project area was divided into segments and sub-segments for purposes of identification and evaluation.
- At least two alignment options (often three) through each segment were identified for evaluation.
- The potential alignment options were presented to the City of Arcata, steering team, and stakeholders.
- Comments were received from the City of Arcata, steering team, and stakeholders regarding the various alignment options within each segment.
- A decision matrix was developed which rated alignment alternatives for environmental and other trail considerations .

- A "Selected Alignment" was chosen with City of Arcata taking into consideration input by stakeholder group and steering team.
- The "Selected Alignment" was presented at a public meeting to receive input and to incorporate public comments as appropriate.

3.0 METHODS

3.1 Survey Methods

A Natural Features Inventory (NFI) of the project corridor consisted of the following biological and botanical sub-tasks:

1) Reviewed special-status species lists provided by California Fish and Game and the California Native Plant Society (see USFWS, 2010a; USFWS, 200b); and,
2) Conducted reconnaissance-level botanical and wildlife investigations.

Site visits were conducted to generally identify/map habitat types and significant sensitive wildlife areas within the potential trail alignment options from the Skate Park on Sunset Avenue/Jay Street to Bracut Industrial Park on Route 101. The reconnaissance field work was conducted on December 1-2, 2009, by Winzler & Kelly scientists Mr. Gary Lester (Biologist/Botanist) and Ms. Lia Webb (Soil Scientist/Plant Ecologist). Additionally, special-status species that have potential to exist at the project site (USFWS, 2010a; and USFWS, 2010b) based on presence of habitat were searched for during the reconnaissance level survey.

Three years of surveys of roosting Dunlin (*Calidris alpina*) documented the presence of several shorebird roosting locations along the railroad alignment between Arcata and Bracut. The actual railroad alignment is likely used for roosting mostly during high tides when more preferred locations are unavailable along the Bay margin. A Winzler & Kelly biologist conducted multiple field visits to identify those shorebird roosting locations and to evaluate the use of those areas along the railroad alignment during high tide events. The biologist did not observe use of the roosting locations on the railroad alignment other than piles that are away from the railroad bed and within the intertidal zone. One rocky area was mapped during a reconnaissance survey, near Bracut, where evidence of shorebird use was observed along the high tide line. This area was confirmed during wetland delineation field work in January 2010.

3.2 Evaluation Methods

Factors considered in evaluating project impacts included the species' dependence on specific habitat components removed or modified, the abundance and distribution of habitat, habitat components in the project vicinity, distribution and population levels of the species (if known), the possibility of direct impact to species, the degree of habitat impact, and the potential for mitigation of adverse effects. The analysis used the methods outlined in "*Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale*" (NMFS 1996) to determine the potential for project impacts on water quality, and in-stream and riparian habitat quality. This document assesses the environmental baseline for the watershed, discusses how the proposed action would affect the environmental baseline conditions, and uses that information in a dichotomous key to arrive at a determination of effect.

4.0 ENVIRONMENTAL DESCRIPTION

4.1 Baseline Conditions

The project study area is linear, spanning approximately 4.5 miles between Larson Park in the north (near the City of Arcata Skate Park on Sunset Avenue) and Bracut Industrial Park in the south. The project alignment runs through the City of Arcata generally paralleling the NCRA railroad corridor near Foster Avenue/Jolly Giant Creek, Alliance Road, and L Street within the City of Arcata. South of Samoa Boulevard, the trail alignment continues adjacent to the railroad to the Arcata Marsh. Within Arcata Marsh, the proposed trail alignment is located predominantly on existing Marsh trails. Once crossing Butcher Slough at the Arcata Wastewater Treatment Plant, the trail alignment leaves the Marsh and continues parallel to the railroad tracks adjacent to South G Street. The trail continues south beyond the Arcata city limits parallel to the railroad tracks between Highway 101 and Humboldt Bay, crossing Gannon Slough, Jacoby Creek, Old Jacoby Creek, and Brainard's Slough. The trail terminates at the Highway 101 entrance to the Bracut Industrial Park.

Human Environment

The project area has a long history of human disturbance, and the selected alignment passes by and through neighborhoods, commercial and industrial areas, public parks, road rights-of-way and public facilities. At numerous locations, the alignment is crossed by public roadways and driveways. Several segments of the alignment are currently used for access and there are several instances of encroachment by adjacent uses. The portion of the alignment from Alliance Avenue to Samoa Boulevard has the most human development and is expected to receive the highest level of use.

Railroad Right-of-Way and Railroad Facilities

The railroad right-of-way within the project area is approximately 43-47 feet wide. The facilities within this ROW include the railroad track, which in some areas is dilapidated with missing tracks and/or ties. The shoulders on either side of the railroad tracks are generally gravel, pavement, or soil with some sporadic vegetation. There are existing volunteer trails throughout this corridor.

Land use

All existing City land use designations and zones permit trail development. In addition to railroad and street rights-of-way, the project passes through City parks, private property, and the Arcata Marsh and Wildlife Sanctuary.

Physical Environment

The physical elements of the environment that occur within the project study area include geology and soils, topography, water quality, floodplains and hydrology.

Most of the project area consists of human-altered soils from cut and fill for road development, railroad development, berm/dike installation and manipulation, agricultural uses, urban development, and wastewater treatment infrastructure. Few natural soil conditions were noted except in the area of Shay Park. Much of the vegetation has similarly been altered from long-term land uses and consists of many non-native and disturbance-oriented species. The natural

hydrology is assumed to have been altered in agricultural areas from historical dike construction and conversion of land to agricultural and urban uses. Site hydrology is also assumed to be historically altered from road and infrastructure installation along the Route 101 corridor and near the Arcata wastewater treatment plant (WWTP) and within the Arcata Marsh.

Topography, Geology and Soils

The entire project area is along the shoreline of the Humboldt Bay, thus it is flat and subject to seismic forces and liquefaction. The principal soil is coarse to fine grained alluvium which consists mostly of unconsolidated, coarse-to-fine-grained sand and silt (alluvium) typically found on coastal plains, valley bottoms and along river flood plains. This material exhibits potential for liquefaction during earthquakes of sufficient magnitude and duration. Liquefaction is the loss of strength that can occur in loose, saturated soil during or following seismic shaking. The loss of strength is due to the tendency of loose soils to contract and compress when shaken. In a seismic event, liquefaction can produce a number of ground effects, including lateral spreading, boils, ground lurching, and settlement of the fill material. In the vicinity of Bracut, the soil primarily consists of non-marine sandstone with clay and gravel (Hookton Formation). The sandstone is usually medium-grained, well sorted, and poorly cemented. Minor beds of well-rounded pebbles and cobbles of chert, quartz, and green stone are also present. Elsewhere in the corridor there may be pockets of non-native marine deposits and sand indicative of fill that was brought in to construct embankments for the railroad and for the highways.

Flood plain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) indicate portions of the project area and adjacent lands lie within both Zone A and Zone C designated Floodplains. Zone A is defined as "*Areas of 100-year flood; Base Flood Elevations and flood hazard factors not determined.*" Zone C is defined as "*Areas of Minimal Flooding-Outside of the 100-year Base Floodplain Area*." The FEMA Flood Insurance Rate Maps showing the project limits are included in the 2003 floodplain report. FEMA maps showing floodplains in relation to Route 101 can also be viewed at *http://msc.fema.gov/webapp/*.

The California State Reclamation Board defines a designated floodway to mean either: (1) the channel of the stream and that portion of the adjoining floodplain reasonably required to provide passage of a base flood or (2) the floodway between existing levees as adopted by the California State Board or the Legislature. FEMA Floodway Maps for the project study area do not include any designated floodways within the project limits. Jacoby Creek, upstream from Old Arcata Road, is designated as a Floodway. However, downstream of the Old Arcata Road Bridge is listed as a Zone A Floodplain. No other floodways near the project have been established.

The floodplain areas for the Jacoby Creek/Gannon Slough watershed were calculated to be approximately 371 hectares (916 acres).

Except for the segments between Larson Park and the southern extent of urban development in the City of Arcata (Segment 1.0 to 5.1), the proposed trail would be within the FEMA Zone A floodplain. The water crossings at Segments 6.1 through 7.4 are all below mean high tide (8.0 feet elevation NAVD datum).

Water Quality

The Pacific Coastal Region experiences a cool maritime climate with a seasonal distribution of precipitation. The average annual rainfall for this area is approximately 1,000-mm (forty-inches) per year. The upper watershed consists of mountainous terrain. There is a high amount of vegetative cover, with minimal development and good soil infiltration. The lower watershed is flat, with a slightly higher concentration of development, good vegetative cover, and less permeable soils. The current land uses in the majority of the project vicinity are: pasturelands for grazing cattle; wildlife refuges; sporadic agriculture structures and homes; and, businesses. A Floodplain Report (Caltrans, 2003) was prepared for the Highway 101 corridor and provides additional information on the regional hydrology.

Project receiving water bodies include: Gannon Slough; Jacoby Creek; Old Jacoby Creek; Brainard's Slough (the receiving body of Rocky Gulch and Washington Gulch); an unnamed drainage channel parallel and to the east of Route 101 (herein referred to as the Route 101 slough); an unnamed drainage ditch parallel and between the railroad and Route 101; and Arcata Bay. However, due to existing earth dikes and site elevations, the trail alignment area is unlikely to drain to the slough channel to the east of the highway. Beneficial uses are critical to water quality management in California. State law defines beneficial uses of California's waters that may be protected against quality degradation to include (and not be limited to): "...domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(0)). Protection and enhancement of existing and potential beneficial uses are the primary goals of water quality planning. The most sensitive beneficial uses from the standpoint of water quality management are municipal, domestic, and industrial supply, recreation, and uses associated with maintenance of resident and anadromous fisheries. The North Coast Region's rivers and waters are renowned for salmon and steelhead fishing.

Biotic Environment

The biotic environmental setting within the project study area includes wetlands, sloughs and ditches; and natural communities including aquatic, riparian and upland habitat.

The Humboldt Bay Area, which includes Arcata Bay, provides habitat for a large diversity of native aquatic and terrestrial animal species. The City of Arcata and the railroad tracks and Highway 101 each limit the diverse and abundant habitat for use by wildlife species. Mammal species present in the vicinity include: black-tailed deer, gray fox, coyote, raccoon, fisher, river otter, rodents, weasels, skunks, and bats. Bird species include waterfowl (e.g. ruddy duck), shorebirds (e.g. snowy egret, black crowned night heron, dunlin/sandpiper), birds of prey (e.g. northern harrier), and songbirds (marsh wren, savannah sparrow). Gannon Slough could potentially serve as migration corridors for fish, such as salmon, that move between salt and freshwater to complete their life history. This slough also potentially provides resting and feeding habitat for migratory waterfowl and shorebirds. The brackish waters of the sloughs, drainage ditches, and the lower reaches of the streams provide potential habitat for special status species such as coastal cutthroat trout, southern Oregon/northern California Coho salmon, northern California steelhead, California Coastal Chinook salmon, and tidewater goby.

Disturbed sites were found throughout the study area dominated by non-native vegetation with well drained soils or compacted engineered fill. Upland areas on the field map are represented by

areas not identified as wetlands. Man-made freshwater areas (including waste water treatment ponds) parallel the railroad tracks through the Arcata Marsh.

Narrow, tree-dominated cover occurs parallel or adjacent to the tracks and adjacent to palustrine emergent wetlands. Riparian understory consisted typically of perennial wetland herbaceous species. These areas contain potential habitat for nesting birds. The adjacent riparian habitat nearest Shay Park has a high potential for migratory bird use.

Drainage ditches exist on the east side of the railroad tracks between Bracut and Arcata Wastewater Treatment Plant. The ditches are often dominated by herbaceous perennial wetland species, and been classified as Palustrine Emergent Wetlands. In some cases, in consultation with jurisdictional agencies, it could be determined that several ditches could possibly be reclassified as non-wetlands, such as those within Arcata city limits, both north and south of the Samoa Boulevard crossing, several blocks north of Samoa on both sides of the tracks, as well as on the west side of the tracks and immediately south of the storage units near Alliance Avenue. These ditches currently lack vegetation. The ditch that runs parallel along the east side of the railroad tracks widens and opens to a cattail marsh at the south end of G Street. Saltwater marshes exist on the lower end of Butcher Slough and brackish areas associated with some portions of the ditch on the east side of the tracks between the Arcata Wastewater Treatment Plant and Bracut.

On the west side of the tracks along the margin of Humboldt Bay, there exists dense, low salt marsh cover with scattered open mud with potential open wading bird foraging habitat. This entire area was classified as estuarine intertidal emergent due to proximity to the bay margin and predominantly vegetated nature of the area.

Significant wetland features within the project area that lacked vegetation and were either at the bay margin or considered backwater, were mapped as mudflats. No vegetation was identified within these areas. Where significant vegetation was present, areas were classified as estuarine intertidal emergent wetlands.

4.2 Special Status Species Considered

Table 1 shows the legal status of California state-listed plant and animal species that may be present in the project area, as well as California Department of Fish and Game species of Special Concern (SC) and California Native Plant Society (CNPS) listed species. Species information was obtained from the California Natural Diversity Database (CNDDB 2010) and the California Native Plant Society (CNPS 2010). As can be seen in Table 1, the search resulted in 19 plants, five fish, seven birds, five reptiles/amphibians, two mammals and one insect that may be present in the project area. Species that are federally-listed are not discussed in this document, but are discussed instead in the federal Biological Assessment.

Table 1. Plant and animal species that are State-listed as Endangered, Threatened, Proposed or Candidate that may be present within the Rail with Trail Connectivity project area. Also included are their state rankings and inclusion on other sensitive species lists.

Scientific Name	Common Name	State Status	State Ranking	Other Lists
Plants				
Abronia umbellate ssp. Breviflora [1]	Pink sand-verbena		S2.1	CNPS: 1B.1
Carex arcta [1]	Northern clustered sedge		S1S2	CNPS: 2.2
Carex lyngbyei [2]	Lyngbye's sedge		S2.2	CNPS: 2.2
Castilleja ambigua ssp. Humboldtiensis [1,2]	Humboldt Bay owl's clover		S2.2	CNPS: 1B.2
Cordylanthus maritimus ssp. palustris [2]	Point Reyes bird's-beak		S2.2	CNPS: 1B.2
Fissidens pauperculus [1,2]	Minute pocket moss		S1.2	CNPS: 1B.2
Layia carnosa [1]	Beach layia	E		
Lilium occidentale [2]	Western lily	E		
Lycopodium clavatum [2]	Running-pine		S4.1	CNPS: 4.1
Mitella caulescens [2]	Leafy-stemmed mitrewort		S4.2	CNPS: 4.2
Monotropa uniflora [2]	Ghost-pipe		S2S3	CNPS: 2.2
Montia howellii [2]	Howell's montia		S3	CNPS: 2.2
Sidalcea malachroides [1,2]	Maple-leaved checkerbloom		S3S4.2	CNPS: 4.2
Sidalcea malviflora ssp. patula [1]	Sisiyou checkerbloom		S1.1	CNPS: 1B.2
Sidalcea oregano ssp. eximia [1]	Coast sidalcia		S1.2	CNPS: 1B.2
Spergularia canadensis var. occidentalis [2]	Western sand-spurrey		S1.1	CNPS: 2.1
Trichodon cylindricus [1]	cylindrical trichodon		*S2.2*	CNPS 2.2
Usnea longissima [2]	Long-beard lichen		S4.2	
Viola palustris [2]	Alpine marsh violet		S1S2	CNPS: 2.2
Fish				
Acipenser medirostris [2]	Green sturgeon		S1S2	CDFG: SC
Eucyclogobius newberryi [2]	Tidewater goby		S2S3	CDFG: SC
Oncorhynchus clarkii clarkii [1,2]	Coastal cutthroat trout		S3	CDFG: SC
Oncorhynchus kisutch [1]	Coho salmon – S.OR/ N.CA ESU	T	S2?	CDFG: SC
Spirinchus thaleichthys	Longfin smelt	T		
Birds				
Ardea herodias [2]	Great blue heron		S4	
Charadruis alexandrines nivosus [1]	Western snowy plover		S2	CDFG: SC
Nycticorax nycticorax [2]	Black-crowned night heron		S3	
Pandion haliaetus [2]	Osprey		S3	
Phalacrocorax auritus [2]	Double-crested cormorant		S3	
Riparia riparia [1]	Bank swallow	T	S2S3	
Reptiles & Amphibians				
Actinemys marmorata [1]	Western pond turtle		S3	CDFG: SC
Ascaphus truei [2]	Pacific tailed frog		S2S3	CDFG: SC
Rana aurora [1,2]	Northern red-legged frog		S2?	CDFG: SC
Rana boylii [2]	Foothill yellow-legged frog		S2S3	CDFG: SC
Rhyacotriton variegates [1,2]	Southern torrent salamander		S2S3	CDFG: SC
Mammals				
Arborimus pomo [1,2]	Sonoma tree vole		S3	CDFG: SC
Myotis evotis [2]	Long-eared myotis		S4?	
Insects				
Cicindela hirticollis gravid [2]	Sandy beach tiger beetle		S1	
Habitats				
	Northern Coastal Salt Marsh [2]		S3.2	

Key to table:

[1] Arcata North quadrangle; [2] Arcata South quadrangle

S1 = Less than 6 Element Occurrences (Eos) OR less than 1,000 individuals OR less than 2,000 acres
- S1.1 = very threatened
- S1.2 = threatened
- S1.3 = no current threats known

S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres
- S2.1 = very threatened
- S2.2 = threatened
- S2.3 = no current threats known

S3 = 21-100 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres
- S3.1 = very threatened
- S3.2 = threatened
- S3.3 = no current threats known

S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.

S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK

CDFG: **SC** = California Department of Fish and Game: Special Concern

FP = Fully Protected

CNPS = California Native Plant Society
- List 1A: Plants presumed extinct in California
- List 1B.1: Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California
- List 1B.2: Plants rare, threatened, or endangered in California and elsewhere, fairly threatened in California
- List 1B.3: Plants rare, threatened, or endangered in California and elsewhere, not very threatened in California
- List 2.1: Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California
- List 2.2: Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California
- List 2.3: Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California
- List 3.1: Plants about which we need more information; seriously threatened in California
- List 3.2: Plants about which we need more information; fairly threatened in California
- List 3.3: Plants about which we need more information; not very threatened in California
- List 4.1: Plants of limited distribution; seriously threatened in California
- List 4.2: Plants of limited distribution; fairly threatened in California
- List 4.3: Plants of limited distribution; not very threatened in California

Plant Species Information

Scientific Name	Common Name	Preferred Habitat	Potential to Occur at Site
Abronia umbellata ssp. *breviflora*	Pink sand-verbena	Coastal dunes with sparse cover; usu. is plant closest to the ocean; flowers July-Oct.	**No potential** to occur at site, no dune habitat present.
Carex arcta	Northern clustered sedge	Wet areas in North Coast coniferous forests (from 60m).	**No potential.** Habitat not present. Not found during wetland delineation and habitat mapping Dec. 09-March 10. Project is below 60m elevation.
Carex lyngbyei	Lyngbye's sedge	Brackish or freshwater marshes and swamps; flowers May-Aug.	**High potential.** Found at mouth of Jacoby Creek in Caltrans surveys in 2005 & 2006 (CNDDB). Not observed during wetland delineation and habitat mapping in December 2009-March 2010.
Castilleja ambigua ssp. *humboldtiensis*	Humboldt Bay owl's clover	Coastal salt marsh and swamps; flowers April-Aug.	**High potential** in salt marsh to west of highway 101 and in vicinity of Butcher slough. Found on bank of Gannon Slough in Caltrans surveys in 2005 & 2006.
Cordylanthus maritimus ssp. *palustris*	Point Reyes bird's-beak	Coastal salt marsh and swamps; flowers June-Oct.	**High potential** in salt marsh to west of highway 101 and in vicinity of Butcher and Gannon Sloughs.
Erysimum menziesii ssp. *eurekense*	Humboldt Bay wall flower	Coastal dunes; flowers March-April.	**No potential.** No dune habitat present, not listed for Arcata south or north quads, but listed on adjacent quads and along margin of bay where dune habitat is present.
Fissidens pauperculus	Minute pocket moss	Coastal coniferous forests, damp coastal soil and bare, moist soil banks.	**Low potential** to occur at site, no coastal coniferous forests at site.
Layia carnosa	Beach layia	Coastal dunes; sparsely vegetated, usu. behind foredunes; flowers March-July.	**No potential**, no dune habitat present at site.
Lilium occidentale	Western lily	Coastal bluff scrub and prairies and openings in North coast coniferous forest; freshwater marshes bogs and fens; flowers June-July.	**No potential**, no habitat present at site.
Lycopodium clavatum	Running-pine	Understory of North coast coniferous forests; Marshes and swamps; 2nd growth timber (from 45m).	**No potential**. Project occurs below 45 m elevation.

Scientific Name	Common Name	Preferred Habitat	Potential to Occur at Site
Mitella caulescens	Leafy-stemmed mitrewort	Broadleaved upland forests; North coast coniferous forests; Meadows and seeps	**No potential**, no habitat present at site.
Monotropa uniflora	Ghost-pipe	North coast coniferous forest, Broadleaved upland forest, often under redwoods or western hemlock.	**No potential**, no habitat present at site.
Montia howellii	Howell's montia	Wet disturbed sites in North coast coniferous forests, usually on compacted surfaces with minimal vegetation coverage; seeps, meadows; flowers March-May.	**No potential** at site during 2006 surveys, no habitat present at site.
Sidalcea malachroides	Maple-leaved checkerbloom	Broadleaved upland forest; Coastal prairie; Coastal scrub; North coast coniferous forest; Woodlands and clearings, often disturbed areas	**Potentially present.**
Sidalcea malviflora ssp. *patula*	Siskiyou checkerbloom	Openings in redwood & open coastal forests; coast scrub and prairie; flowers late May-June.	**Potentially present.** Roadsides provide potential habitat.
Sidalcea oregana ssp. eximia	Coast checkerbloom	North coast coniferous forests; Meadows and seeps; Lower montane coniferous forests	**Potentially present.** Roadsides provide potential habitat.
Spergularia canadensis var. *occidentalis*	Western sand spurry	Coastal salt marshes and swamps; flowers June-Aug.	**Potentially present.**
Trichodon cylindricus	Cylindrical trichodon	Broadleaved upland forest; Upper montane coniferous forest; Sandy, exposed sandy soil, roadbanks (from 50m)	**No potential**. Project occurs below 50m elevation.
Usnea longissima	Long-beard lichen	North coast coniferous forest; Broadleaved upland forest; In Redwood zone on trees.	**No potential**, no habitat present at site.
Viola palustris	Marsh violet	Coastal scrub and coastal bogs and fens; flowers March-August.	**Low potential**.
	Northern Coastal Salt Marsh	Northeast shore of Humboldt Bay, South of Arcata, Eureka Slough	**Present.** Adjacent to proposed alignment along highway 101 corridor, within Butcher slough and adjacent habitat and NE shore of bay.

No state-listed plant species were observed during December 2009 botanical surveys by Winzler & Kelly. Botanical surveys performed in 2005 and 2006 for a Caltrans Draft Environmental Impact Statement observed two state-listed plant species within the Rail with Trail Connectivity project area—Humboldt Bay owl's clover was found on the bank of Gannon Slough and Lyngbye's sedge was found at the mouth of Jacoby Creek, which were the only special status plant species observed during their surveys. Caltrans consulted with Department of Fish and Game about minimization measures for construction activities for their Jacoby Creek bridge replacement and determined that with conservation measures there would not besignificant adverse effects to Lyngbye's sedge.

FISH

Please refer to the federal Biological Assessment for an evaluation of green sturgeon, tidewater goby and coho salmon.

Coastal cutthroat trout (*Oncorhynchus clarkii clarkii*), CDFG: SC

The coastal cutthroat trout is a medium-sized trout (up to 15 in.) that occupies small, slow coastal freshwater streams, estuaries and bays. Most individuals are anadromous, spending summers out at sea, close to the coast and usually not leaving the estuary. Others may spend their entire life in freshwater lakes and well-shaded streams (NatureServe, 2009).

Coastal cutthroat trout spawn on clean, small gravel substrates in late winter or early to mid-spring. The hatchlings emerge after approximately 2 months and may or may not migrate to sea in their first year. Migrations upstream occur in September and October following the first heavy rains. They may migrate up to 50 miles upstream and can live 4-10 years (NatureServe, 2009).

<u>Potential to occur</u>

There is high potential for cutthroat trout in the project area. This species has been found in Gannon Slough (PGE, 2005), Jacoby Creek (one was found during an electrofishing survey in September 2007) and Brainard's Slough—few to several were captured in 2007 and one was captured and tagged in April 2010 by CDFG personnel (Wallace, 2007). Cutthroat were also identified in Jolly Giant Creek in high school surveys in the early- to mid-1990s.

Coho salmon (*Oncorhynchus kisutch*), State Status: Threatened

The Southern Oregon/Northern California coho salmon (Southern Oregon/Northern California ESU) was federally listed as a threatened species by NOAA Fisheries on June 18, 1997 and is also listed as threatened by the State of California. The ESU is defined as all coho salmon naturally produced in streams between Cape Blanco in southern Oregon and Punta Gorda in northern California, Humboldt County

Marine invertebrates, such as copepods, euphausiids, amphipods, and crab larvae, are the primary food where coho first enter salt water. Fish represent an increasing proportion of the diet as coho salmon grow and mature.

In Southern Oregon/Northern California Coast ESU, the decline of coho salmon has been attributed to several human-caused factors such as: habitat degredation (i.e.) increased water temperatures, pesticides, non-point source runoff, etc.); harvesting of trees; water diversions; and artificial propagation of salmon. These factors, in turn, exacerbate the adverse effects of the natural environmental variability from drought and poor ocean conditions. Coho salmon spawn in coastal streams in fall or winter, and remain in fresh water for about a year.

Potential to occur

Coho spawn in all of the Humboldt Bay tributary watersheds, and juveniles and yearlings spend various amounts of time in the freshwater/estuary transition zone, averaging about a month but up to two months, with spring being the heaviest time of use (Wallace, 2010). Recorded observations of coho have been made at Jolly Giant Creek, Gannon Slough, Jacoby Creek and Brainard's Slough.

Longfin smelt (*Spirinchus thaleichthys*), State status: Threatened

The longfin smelt is an anadromous fish occupying bays, estuaries and near-shore coastal environments from San Francisco to Oregon.

Longfin smelt usually only live two years, reaching about five inches in length. They spend their adult life near the shore and migrate into freshwater rivers to spawn from January through March. After spawning, most adults die. Hatched larvae get carried down the river and into brackish water where they swim up and down the water column to stay within their preferred salinity concentration. Longfin smelt are usually found near the bottom or mid-water, but are known to swim up and down the water column (CDFG, 2009).

Potential to occur

Humboldt Bay is thought to rank second in longfin smelt abundance after San Francisco Bay. Twelve individuals were captured in Arcata Bay trawl surveys in 2003-2005 (CDFG, 2009), and low, but consistent numbers have been recorded in recent years about two miles offshore of Humboldt Bay (CDFG, 2009b).

BIRDS

Great blue heron (*Ardea herdias*) S4

The great blue heron is apparently secure in California. It is a wading bird in bays, wetlands, lagoons in fresh and brackish waters. They nest in tall trees close to foraging habitat. They usually forage on insects, reptiles, rodents and other animals, usually in shallow water, but may also forage in fields (NatureServe, 2009).

Potential to occur

The great blue heron has potential to occur in or near the project's fresh and brackish ponds and marshes of the project's action area. However, the Arcata Marsh and Wildlife Sanctuary has this species listed as uncommon in any season.

Western snowy plover (*Charadruis alexandrines nivosus*), CDFG: SC

Please refer to the federal Biological Assessment for an evaluation of the western snowy plover.

Black-crowned night heron (*Nycticorax nycticorax*), S3

The black-crowned night heron is a medium-sized wading bird occupying marshes, lake shores, ponds in saltwater, brackish and freshwaters. The species appears to be stable throughout its North American range, but California populations may be more vulnerable. They mostly eat small fish, amphibians and aquatic invertebrates, but may also feed on small land mammals. Nesting usually occurs during the day in trees near foraging areas. Threats to this species are mainly caused by disturbances to nesting and foraging habitats (NatureServe, 2009).

Potential to occur

The black-crowned night heron has potential to occur in or near the ponds and marshes of the project's action area. The Arcata Marsh and Wildlife Sanctuary has this species listed as common year-round.

Osprey (*Pandion haliaetus*), S3

The osprey has seen population increases in some parts of its range due to the reduction of certain pesticides across North America. However, there are still locally/state vulnerable populations including California. It is a large raptor that uses lakes, estuaries and riparian areas to feed on fish that they catch in-flight. In the marine environment they stay near the shore. They nest atop large snags, utility poles, cliffs and other tall standing objects near water. Nests are often used over several years (NatureServe, 2009).

Potential to occur

Osprey has potential to occur in or near the ponds, marshes, riparian and near-shore areas of the project's action area. The Arcata Marsh and Wildlife Sanctuary lists this species as rare in winter, but common the rest of the year.

Double-crested cormorant (*Phalacrocorax auritus*), S3

The double-crested cormorant tends to range from apparently secure to vulnerable across the U.S. and Canada, with California populations being vulnerable. The species is a diving bird, using deep water (≤ 50 feet) lakes, ponds, swamps and near-shore marine environments where it feeds on schooling fish in mid-water and on the bottom (NatureServe, 2009).

Potential to occur

The double-crested cormorant has potential to occur in the near-shore areas of the projects action area. It is listed as a common visitor to the Arcata Marsh and Wildlife Sanctuary year-round.

Bank swallow (*Riparia riparia*), State status: Threatened

The bank swallow is a small (5 in.) bird with a tiny bill and forked tail. It is dark brown on top with white underparts and a dark breast band. They nest in sand, dirt or gravel burrows in tops of banks, often near streams, and return to the same nesting vicinity each year. Bank swallows eat moths, flies, mosquitoes and other flying insects, and may forage up to 1 to 2 miles from their nest (NatureServe, 2009).

The main threats to the bank swallow are predominately human-caused. Streamflow regulation and erosion and flood-control projects can alter the banks they use for nesting habitat. Conversely, suitable habitat has also been created by humans, by sand and gravel mining and road building (NatureServe, 2009).

Potential to occur

The bank swallow is mentioned by the Arcata Marsh and Wildlife Sanctuary as a bird that casually visits in fall and spring. The project area contains no mud banks that currently provide nests sites for bank swallow; it is unlikely that the birds will frequent the project site.

REPTILES AND AMPHIBIANS

Western pond turtle (*Actinemys marmorata*), CDFG: SC

The western pond turtle is an olive, dark brown or blackish turtle about 7 inches long, having a relatively low/flat shell with yellow on the edges, head, limbs and tail. This species typically mates in April and May with egg-laying in June and July. Eggs hatch in September and October and remain in nests until the following March and April. Females first reproduce after 7-14 years, depending on the region. Individuals can live over forty years. They are mostly active in the daytime from April to October in northern California, eating (NatureServe, 2009).

Western pond turtles live in freshwater (occasionally brackish) perennial waterbodies, including rivers and creeks, ponds, marshes and ditches. Logs, rocks and land (riparian and upland) are used for basking. Most spend the winter in upland areas under leaf litter of woodlands and coastal sage scrub from October to February. Nesting may occur on sandy banks near water or up to a few hundred yards away (NatureServe, 2009).

Potential to occur

The western pond turtle has potential to occur in the freshwater or other slightly brackish rivers, ponds, marshes and ditches in the project area.

Pacific tailed frog (*Ascaphus truei*), CDFG: SC

The pacific tailed frog is small (~2 inches) long, and males are identifiable by a tail-like appendage. Adults over 6 or 7 years old tend to breed between May and October. Eggs laid in July hatch in mid to late summer. The larval stage often occurs for at least one year or more. Larvae are more common than adults. Adults are most active from April to October (NatureServe, 2009).

This species is found in cold, fast streams in mature mountain forests with adequate canopy cover and cooler temperatures. It prefers coarse substrates to silt (NatureServe, 2009).

Potential to occur

There is limited potential for pacific tailed frog to occur in the general vicinity of the project site. One unconfirmed account of pacific tailed-frog was in Jacoby Creek on October 12, 2000 (direct observation/dive, spp. unknown). However the necessary heavily wooded, high-gradient freshwater habitat is absent within the project area. The nearest suitable habitat on local streams is a considerable distance inland.

Northern red-legged frog (*Rana aurora*), CDFG: SC

The Northern red-legged frog is approximately 5½ inches long, with brown, gray, olive or reddish with blotching on top, a white jaw stripe and dark face mask and red undersides. It breeds in open, permanent water for 1 to 2 weeks from March to July. Eggs attach to underwater stems near the surface and usually hatch in 5-7 weeks (NatureServe, 2009).

Habitat needs include quiet permanent ponds, marshes, stream pools and the like. They are often found in wet areas away from water. Northern red-legged frogs are mostly nocturnal, but may be active day or night from late summer to early winter, or year-round in coastal areas (NatureServe, 2009).

Potential to occur

The Northern red-legged frog is locally common in parts of coastal Humboldt County, and has potential to occur in or near ponded areas and sloughs with low levels of salinity. One was recorded during electrofishing in 2002 in Rocky Gulch/Brainard's Slough. One CNDDB occurrence was reported where South I street touches Arcata Marsh and Wildlife Sanctuary.

Foothill yellow-legged frog (*Rana boylii*), CDFG: SC

The foothill yellow-legged frog is about 3 inches long, brown, gray, olive or reddish and may be plain or mottled. Adults have yellow undersides on the hind limbs and lower abdomen. They breed in pools of streams in early to mid spring, after stream flows subside. Egg masses are attached to cobbles and boulders of wide, shallow, low velocity reaches/confluences in early to mid May. Larvae can hatch within one week and metamorphose in summer (NatureServe, 2009).

Foothill yellow-legged frogs prefer small, shallow, perennial, rocky streams in partially shaded forests, woodlands and chaparral. They are active during the day, when temperatures are not too hot or too cold (NatureServe, 2009).

Potential to occur

There is low potential for foothill yellow-legged frog to occur as there is no suitable habitat of small, rocky streams in the project area.

Southern torrent salamander (*Rhyacotriton variegates*), CDFG: SC

The southern torrent salamander is approximately 4 ½ inches long with dark spotting on top—subtle differences distinguish from other salamander species. It can breed year round but more often in spring and early summer. They can remain in the larval stage for 3-5 years and become sexually mature 1-1.5 years after metamorphose (NatureServe, 2009).

This species prefers small, clear, cold, mountain streams and seeps with gravels and cobbles in coastal coniferous forests. They tend to occur in mature forests with large conifers, moss and thick canopy cover (>80%). Younger forests with similar microclimate and microhabitat conditions may also be used especially in more moderate coastal climates (NatureServe, 2009).

Potential to occur

There is low potential for southern torrent salamander to occur as there is no suitable habitat of small, cold mountain streams in mature forest.

MAMMALS

Sonoma tree vole (*Arborimus pomo*), CDFG: SC

The Sonoma tree vole is endemic to California; it is a red, furry nocturnal vole up to 8 inches long. They breed year-round, with gestation typically lasting 4-6 weeks, litter size of two and weaned for another 4-6 weeks.

This vole prefers moist, mature or old-growth Douglas-fir or mixed conifer forests with high canopy cover, high density of stumps and low density of snags, but it can use younger forests. It adopts old bird nests, 2-50 meters up in trees (mostly Douglas-fir), and is arboreal with some activity on the forest floor. It mostly eats the needles and inner twig bark of Douglas-fir trees, but also feeds on other firs, Sitka spruce and western hemlock.

Potential to occur

There is no potential for the Sonoma tree vole to occur in the project area as there is no mature Douglas-fir or mixed conifer forest habitat.

Long-eared myotis (*Myotis evotis*), S4?

The long-eared myotis is a bat, similar morphologically to other long-eared myotis (*M. keenii*) in the northwestern U.S. and is also genetically similar to *M. leibii*. Its range includes the western U.S. to Canada. Preferred habitat is often rocky outcrops in forested areas, as well as scrub and forested riparian areas.

Long-eared myotis are nocturnal, eating insects in forested areas. Roosting occurs in hollow trees, caves, cliffs, buildings, rocky outcrops (e.g. basalt) and other similarly suitable cavities. They may migrate to nearby hibernation locations (Norcalbats.org 2010).

Potential to occur

There is no potential for the long-eared myotis to occur in the project area as there are no mature forests or rocky outcrops in or near the project area.

INSECTS

Sandy beach tiger beetle (*Cicindela hirticollis gravid*), S1

The sandy beach tiger beetle is found near the ocean in moist sandy/dune habitat. This species lives and burrows in sandy soil. Their range is not fully known, but is thought to extend from Marin County on the north to San Diego County on the south (NatureServe, 2009).

Potential to occur

There is no potential for the sandy beach tiger beetle to occur in the project area as there are no dunes in or near the area that would be affected by the proposed trail.

5.0 POTENTIAL EFFECTS AND MITIGATION

Based on the project description, precautionary measures incorporated into the project design and with the proposed conservation measures, the project is not likely to adversely affect listed endangered threatened or sensitive species or their habitat.

5.1 Direct Effects

Direct effects of the proposed project are those immediate impacts resulting from construction. Potential direct effects of the proposed project to listed fish species and their habitats are typically related to habitat loss and noise from earthwork and bridge piling installation. Direct effects to non-aquatic plants and animal species are not expected to be significant. The new trail will follow existing dirt trails, existing paved areas and within, or adjacent to, existing railroad and highway right-of-ways; thus, the direct removal of specific plant or animal species or suitable habitat will be minor.

Direct effects to plants

No individual plants of Lyngbyei's sedge, Humboldt Bay owl's clover, or Point Reyes bird's-beak were found during the field surveys (conducted December 2009). The California Department of Transportation discovered a population of Lyngbye's sedge on the banks of Gannon Slough in the area proposed for the Highway 101 bridge replacement.

Suitable habitat for any sensitive plant is limited in the proposed trail corridor as well; therefore, direct effects or taking of individual plants can be avoided. There will be no direct take of the northern coastal salt marsh as a result of the project.

Direct effects to fish

Without mitigation, longfin smelt and coho salmon could be adversely affected during bridge construction and work at tide gates. The resource agencies have been consulted regarding measures that will be taken to avoid and minimize harm to listed species during construction (M. Hantmann, CDFG June 2010). These measures are listed in Appendix A under conservation measures and described in relation to the individual listed species in this section.

Although threats to longfin smelt survival differ somewhat from listed anadromous salmonids, because they share the anadromous reproductive strategy with winter spawning some mitigation

measures that protect anadromous salmonids may protect longfin smelt as well. Such measures include providing free, unimpeded passage to and from spawning habitat avoid disturbance to spawning areas when fish or eggs are present and minimizing hillslope erosion and sediment delivery to stream channels (Cannata and Downie, 2009). Any direct impacts to fish are short-term, temporary, and would be incurred during construction. Water quality forms a major component of salmonid habitat. The condition and quality of the water that the fish encounter on their migration is extremely important, and can determine such things as feeding and breeding success rates, disease levels, growth rates, and predation rates. Major elements of water quality critical to salmon consist of turbidity/sediment levels, chemical contamination, and temperature. Fine sediments can reduce prey detection, alter trophic levels, reduce oxygen along the substrate, smother redds, and damage gills, as well cause other deleterious effects.

The presence of construction equipment near/above/within streams and estuarine environments creates the potential for introducing new suspended sediment loads and toxic materials from ground disturbance, accidental spills, or mechanical failure.

Vibration and noise impacts from driving bridge piles into the shore will occur in segments 3.1, 6.1, 7.2, 7.4, 7.6 and 7.8; and below mean high tide at segment 7.2. The 12-inch steel pile can be expected to produce a maximum sound level of 208 dB Peak, 191 dB RMS and 175 dB SEL for a single strike. CalTrans (2003 pers. com.) has measured the sound energy emanating from driving 12-inch diameter steel piles to range between 180 – 190 dB, and 14-inch diameter steel piles to range between 195 and 200 dB. Although, vibratory driving has been shown to be 10 – 20 dB lower than impact driving steel piles of similar diameter (CalTrans personal. communication, 2003); this type of pile driver is difficult to use in the Humboldt Bay substrate. In other locations in Humboldt Bay, vibratory pile drivers have been used successfully for wood or steel piles. (West Coast Contractors, Personal Communication., June 2010). If the geology bears out that it can be constructed using a vibratory pile driver, that equipment is recommended as it lowers the magnitude of the risk of harm to all aquatic species.

Non-lethal injuries can occur to salmonids that are exposed to vibration and noise impacts. The body of literature on barotrauma comes primarily from experiments made using vibration that relate to the turbine related noise in major hydroelectric dams; however, the symptoms could potentially be similar but to a lesser extent in fish that are exposed to pile drivers in aqueous environments. The symptoms of barotrauma are loss of equilibrium and either or both swimbladder rupture and burping of swimbladder air. For the majority of fish that showed loss of equilibrium following rapid decompression, the condition persisted for at least two hours. Loss of equilibrium results in aberrant swimming behavior and most likely other motor and sensory impairment that probably reduces the ability of fish experiencing this condition to avoid predation. Burping of air from the swim bladder during decompression and resulting negative buoyancy would likely motivate these fish to move to the surface to refill their swimbladders where they would experience increased exposure to predation. Potentially more serious is swimbladder rupture where persistent negative or positive buoyancy might result. Persistent negative buoyancy is one of the two possible consequences of a ruptured swimbladder where the rupture prevents the fish from filling its swim bladder to recover buoyancy control. Persistent positive buoyancy is a condition created when air from a ruptured swim bladder is retained within the abdomen of a fish. Air entrained in the body cavity cannot be expelled and causes the fish to lose control of buoyancy. Any persistent condition leading to loss of control of buoyancy

would likely have consequences for general fitness as well as increased risk of predation (Brown, R.S. *et al.* 2007).

Listed fish species are known to use the brackish sloughs and tributaries of Butcher Slough, Gannon Slough, Jacoby Creek, Old Jacoby Creek and Brainard's Slough in Humboldt Bay (segments 6.1, 7.2, 7.4, 7.6 and 7.8, respectively). Some salmonids are also thought to use the recently daylighted Jolly Giant Creek in Arcata (segment 3.1) as suitable habitat has been identified.

Driving bridge piles, construction equipment, vehicles, and bridge construction may result in direct, temporary impacts that may affect all listed fish species present in the action area. Construction activities will take place below the mean high tide during the lowest tides to minimize the in-water work; however, bottom substrates will be disturbed for installation of four to six piles at each water crossing.

Any in-water activities have the potential to increase suspended sediment loads; affect temperature; and contribute chemicals, contaminants or nutrients from bank erosion and increased turbidity. During piling installation and bridge construction, noise and vibrations may cause an incidental take by preventing listed fish species from migrating and rearing through that segment.

Segments 3.1, 6.1, 7.2, 7.4, 7.6 and 7.8 will drive piles into the shore near the water's edge causing vibration and noise impacts. This activity has the potential to result in an incidental take of listed fish species by temporarily harassing their foraging, breeding or migrating behaviors.

Potential in-water and nearshore impacts such as disruption of habitat, potential for loss of vegetated inshore areas for juvenile nursery and adult feeding areas could alter normal feeding and passage activities for longfin smelt and for coho salmon. The impacts would be temporary and localized and cease after piles were installed and bridges were completed.

The longfin smelt spawns in late fall winter or spring at cooler water temperatures in the lower portion of freshwater streams. The direct effects can be avoided to spawning and reproduction of longfin smelt by limiting the in water or nearshore construction to a period between July and August. This is the period when smolts have emigrated and the adults have not initiated spawning (CDFG, 2009). Some habitat for longfin smelt may be taken in segment 7.7, where a roadside backwater/saltwater ditch will be partially filled to create a foundation for the trail.

Tidegate Work

Segments 7.6 and 7.8 currently have large culverts and tide gates that prevent upstream movement of fish. The project proposes to replace these tide gates with new ones with a fish door, which will open up habitat and should have a net benefit to listed fish species.

Direct effects to birds

Potential direct effects to shorebird foraging strategy could come from noise disturbances; however, the ambient-level noise from freeway traffic on Route 101 is substantial. The response to noise disturbances would be to forage away from the project site while construction occurs. Any flight patterns could temporarily change to avoid the noise disturbances.

Construction of the trail near Shay Park will create noise impacts from large trucks, grading and paving, so any bird species utilizing the park at the time of construction may temporarily leave the area while the construction disturbances occur.

Direct effects to reptiles and amphibians

At segment 5.1, direct effects could result from driving concrete pilings into the wetlands to build a boardwalk ramp connecting the trail from the railroad alignment up to an existing earthen berm. The noise and vibrations could cause any red-legged frogs that may be present to temporarily leave the area until the bridge is completed.

At segments 5.2, 5.3 and 5.4, direct effects may occur during grading and paving of the trail along the existing earthen berm. Construction noise may temporarily harass red-legged frogs in these segments. Construction-related erosion can also take frog habitat and could potentially disturb frog egg masses in the ponds.

5.2 Indirect Effects

Indirect effects of the project are those impacts from a project that are expected to occur later in time. Impacts could be both short- and/or long-term in nature. Short-term risks to aquatic species could include temporary increases in turbidity, the threat of construction-related hazardous materials entering a waterbody, and/or disturbance from a variety of construction-related activities (including embankment construction, material placement, filling, etc.).

The new trail will be a paved, impervious surface, which will increase runoff and erosion to adjacent soils. This stormwater will drain to open ditches, which along the Route 101 corridor will eventually flow into the sloughs as they currently do, and will likely be a slightly warmer temperature than would be if this water was allowed to infiltrate into the ground first.

Long-term use of the trail will increase pedestrian and bicycle traffic. Increased human use into an area could potentially result in increased harassment or stress to listed species over the long-term.

Long-term, the bridges at all creek and slough crossings will cause shading over the water, which will provide some protection from avian predators, but the bridges will also increase access to humans for fishing or other activities that could potentially result in a take to listed fish. Similarly, the ramp at segment 5.1 will cause permanent shading of this portion of the wetland causing long-term effects to any amphibian species at that location.

5.3 Cumulative Effects

Cumulative effects are those combined effects from all public or private, past, present, and reasonably foreseeable future projects that occur in the vicinity of the Rail with Trail Connectivity project.

- Caltrans is expected to replace their Route 101 bridge over Jacoby Creek at segment 7.4. This bridge replacement will include space for the pedestrian trail.

- Chevron conducts periodic dredging of the deep water channel of Humboldt Bay (Chevron, 2009).
- Restoration project is proposed for the Jacoby Creek area (S. Kramer, FWS, pers. com. June 2010).

5.4 Mitigation and Conservation Measures

Mitigation and conservation measures are intended to minimize or avoid environmental impacts to listed species or critical habitat. Various divisions and departments of the state and federal government may agree upon additional conservation measures. These agreements are not contractually binding, but may be made a condition of the resulting Letter of Concurrence or Biological Opinion.

Avoidance and Minimization

During alternative selection for the project, the trail alignment was rerouted outside the forested areas of Shay Park to avoid and minimize removal of trees in the riparian habitat.

All construction in or near waterways would be performed during the recommended in-water work period of July 1 to August 30 (M. H. CDFG, 2010).

Protection of fish by isolating them during construction is a primary mitigation. The ditch in Segment 7.7 will be partially filled in during construction; therefore, this segment will be examined by a fisheries biologist prior to construction and any fish present will be secured with a fike net or seine and excluded from the water column during construction.

Listed plants were not found in the project area during the field surveys; however, they may occur in the areas that would be disturbed during construction and not have been seen because it was past the flowering season. To err on the side of caution, it would be important to conduct a botanical field review just prior to project construction. If any of the listed plants are found, the plant community would be flagged in the field. Then to protect any sensitive plants during construction if the community is so broad that it can not be avoided, the applicant will place protective pads or rubber sheets on top of the stands of Lyngbye's sedge where equipment access is required. This mitigative action would prevent the equipment tracks/wheels from rutting and compressing the soil and uprooting or destroying the sedges.

Other conservation measures and best management practices for the construction activities in or near the waterways, sloughs, ditches are described as part of the project description in Section 5.0 of the Appendix A.

6.0 CONCLUSION AND DETERMINATIONS OF EFFECT

PLANTS

Please refer to the federal Biological Assessment for determinations of effect for the **beach layia** and **western lily**.

FISH

~~Please refer to the federal Biological Assessment for determinations of effect for the **green sturgeon**, **tidewater goby**.~~

The project construction "**may affect, but not likely to adversely affect"** the **coho salmon**. Potential impacts of impaired visibility, turbidity during in water pile driving and cutting would be minimized by conducting the work mostly in the low tide periods and distant from the aquatic habitat or floodway. If work is done in the waterway, the area would be cleared of any fish by physically isolating them and putting up a coffer dam to exclude fish from the construction area. Concurrence is requested for this finding.

The project construction "**may affect, but not likely to adversely affect"** the **longfin smelt**. Potential impacts such as disruption of habitat, potential for loss of vegetated inshore areas for juvenile nursery and adult feeding areas could alter normal feeding and passage activities and would be temporary and localized and cease after piles were installed and bridges were completed. In addition, longfin smelt are highly mobile and capable of avoiding the immediate pile driving areas. The project timing will avoid the outmigrating juvenile stage and spawning periods. Concurrence is requested for this finding.

BIRDS

The project construction **"may affect, but not likely to adversely affect"** the **bank swallow**. CDFG staff have indicated that this species is unlikely to occur in the project's action area (M. van Hattem, CDFG, pers. com., June 2010). Further, any bank swallows in the vicinity of construction activities can easily avoid the disturbances.

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