NATURAL FEARTURES INVENTORY
CITY OF ARCATA RAIL-WITH-TRAIL CONNECTIVITY PROJECT
HUMBOLDT COUNTY, CA

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

1) Review of the California Department of Fish and Game's Natural Diversity Database (CNDDB) for State special-status species in the associated USGS topo quads (see DFG, 2009a; DFG, 2009b);
2) Review of the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants (see CNPS, 2009a; CNPS, 2009b);
3) Review of list provided by the U.S. Fish and Wildlife Service and National Marine Fisheries of Federal special-status species (see USFWS, 2009a; USFWS, 2009b); and,
4) Conduct reconnaissance-level wetlands and biological investigation (botanical and wildlife) investigations (see results below).

A site visit was 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 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 (per DFG, 2009a; DFG, 2009b; CNPS, 2009a; CNPS, 2009b; USFWS, 2009a; and USFWS, 2009b) based on presence of habitat were searched for during the reconnaissance level survey.

Identified habitat types mapped during the NFI field work are as follows:

UPLANDS

Description: Disturbed sites were found throughout study area dominated by non-native vegetation with well drained soils or compacted engineered fill. Upland areas were not specifically mapped out and on the field map they are represented by areas not identified as wetlands. Typical dominant plant species with greater than 10% coverage for these areas are:

- *Baccharis pilularis*—coyote brush
- *Daucus carota*—Queen Anne's lace
- *Lotus corniculatus*—bird's foot trefoil
- *Anthoxanthum oderatum*—sweet vernal grass
- *Trifolium repens*—white clover
- *Bromus hordeaceus*—soft chess
- *Rubus discolor*—Himalayan blackberry
- *Foeniculum vulgare*—sweet fennel
- *Conyza canadensis*—horseweed
- *Trifolium pratensis*—red clover
- *Hypochaeris radicata*—perennial cat's ear
- *Taraxacum officinale*—dandelion

- *Lolium perenne*—perennial ryegrass

Shorebird Roosting / Rocky Shoreline: Existing study results from three years of surveys of roosting Dunlin (*Calidris alpina*) document the presence of several shorebird roosting locations along the railroad alignment between Arcata and Bracut and several more beyond that towards Eureka (particularly at the intersection/corner of the levee at Bracut). The actual railroad alignment is likely used for roosting mostly during high tides when more preferred locations are unavailable along the Bay margin. Additionally, according to Dr. Mark Colwell (pers. comm., Humboldt State University), radio tracking studies show that the same roosting location is not often repeatedly used by the same bird; thus, cumulative impacts to shorebird roosting in the Humboldt Bay region could be more of a concern than individual impacts to a single roosting location. Winzler & Kelly biologist conducted multiple field visits to identified shorebird roosting locations along the railroad alignment during high tide events to evaluate the use of these areas. 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 additional rocky area was mapped out near Bracut (see NFI map) along the high tide line that although no shorebirds were present at the time of site visit, there was evidence that at some point shorebirds congregate in this location.

Since shorebird use of the railroad alignment within the project footprint does not appear to be frequent based on high-tide site visits, it is unlikely that human movement effects associated with use of the new trail would significantly alter current shorebird use of the project site. If identified shorebird roosting locations are to be removed or impacted by the proposed trail alignment, mitigation measures can be developed if it is determined that a significant individual and/or cumulative impact could occur with implementation of the trail. Previous projects along the Bay margin have either determined less than significant impacts to shorebird roosting and/or have included mitigations such as habitat restoration and island creation within the slough(s).

OTHER NON-JURISDICTIONAL AREAS

Wastewater Treatment Facility Ponds: Man-made freshwater areas parallel the tracks through the Arcata Marsh. Typical vegetation within these areas consists of the following species:

- *Conium maculatum*—poison hemlock
- *Dipsacus fullonum*—teasel
- *Hydrocotyle ranunculoides*—marsh pennywort
- *Lemna minor*—lesser duckweed
- *Oenanthe sarmentosa*—water parsley
- *Salix lasiolepis*—Pacific willow
- *Salix laevigata*—red willow
- *Scripus acutus*—hardstem bulrush
- *Typha latifolia*—broad-leaved cattail

RIPARIAN (ONE-PARAMETER WETLANDS)

Riparian: Narrow, tree-dominated cover that occurs parallel or adjacent to the tracks and adjacent to palustrine emergent wetlands. Where the willows are within a mapped wetland they

are not called out as separate habitat layer. Where the riparian drip line extends beyond the mapped emergent wetlands then the riparian is mapped separately and would be considered to have upland soils and hydrology but with riparian overstory. Understory consisted typically of perennial wetland herbaceous species. Potential habitat for nesting birds, including the California Species of Special Concern (limited state distribution) Black-capped Chickadee. The adjacent riparian habitat nearest Shay Park has a high potential for migratory bird use. Typical vegetation within these areas consists of the following species:

- *Alnus rubra*—red alder
- *Salix lasiolepis*—Pacific willow
- *Crataegus douglasii*—Douglas's hawthorn
- *Myrica californica*—wax myrtle
- *Rubus ursinus*—California blackberry
- *Ranunculus repens*—creeping buttercup
- *Athyrium filix-femina*—lady fern
- *Rumex crispus*—curly dock

PALUSTRINE EMERGENT WETLANDS

CNPS listed plant species Lyngbye's sedge (*Carex lyngbyei)* [CNPS List 2.2] was searched for within this habitat type and no plant populations were identified. This species should be present at the time of year the site visit was conducted and therefore presence of this plant within the project boundaries is highly unlikely.

Ditches: Drainage ditch exists on east side of railroad tracks between Bracut and Arcata Wastewater Treatment Plant. The ditches are often dominated by herbaceous perennial wetland species, and for the purposes of the Natural Features Inventory have been classified as Palustrine Emergent Wetlands. In some cases, in consultation with jurisdictional agencies, it could be determined that several of the ditches are actual Uplands if they are man-made ditches dug in uplands, are not hydrologically connected to "Waters of the US" or wetlands, and do not meet 2-parameter wetland definition (if in City of Arcata and not in Coastal Zone). Several ditches that could possibly be reclassified as non-wetlands within the City of Arcata limits are present both north and south of the Samoa Boulevard crossing, also several blocks north of Samoa on both sides of the tracks, and as well on the west side of the tracks and immediately south of the storage units near Alliance Avenue. These ditches currently lack vegetation. Typical vegetation (when present) within ditches within the potential project footprint consist of the following species:

- *Agrostis stolonifera*—creeping bent grass
- *Aster chilensis*—common California aster
- *Ranunculus repens*—creeping buttercup
- *Athyrium filix-femina*—lady fern
- *Rumex crispus*—curly dock
- *Cyperus eragrostis*—tall flatsedge
- *Juncus effusus*—soft rush
- *Juncus patens*—spreading rush
- *Picris echinatus*—prickly ox-tongue

- *Scirpus microcarpus*—small-headed sedge

Freshwater Marsh Description: 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. Typical vegetation within this area consists of the following species:

- *Conium maculatum*—poison hemlock
- *Dipsacus fullonum*—teasel
- *Hydrocotyle ranunculoides*—marsh pennywort
- *Lemna minor*—lesser duckweed
- *Oenanthe sarmentosa*—water parsley
- *Salix lasiolepis*—Pacific willow
- *Salix laevigata*—red willow
- *Scripus acutus*—hardstem bulrush
- *Typha latifolia*—broad-leaved cattail

ESTUARINE INTERTIDAL EMERGENT

All areas mapped as estuarine intertidal emergent wetlands are considered potential habitat for Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. humboldtiensis), and Point Reyes bird's-beak (*Cordylanthus maritimus* ssp. palustris) [both CNPS List 1B.2]. During the site visit, these species were searched for but since this was not the seasonally appropriate time to be surveying, no populations were located. Additionally, a known population of Humboldt Bay owls-clover within the project vicinity was visited and no individual plants were visible, reiterating that this is not the seasonally appropriate time to be searching for these species. The brackish ditches on the east side of the tracks are considered low-quality potential habitat, but without seasonally appropriate survey's the potential presence cannot be discounted. The saltwater marsh associated with Butcher Slough and vegetated salt flats on the west side of the tracks along the margin of the bay are considered moderate to high value habitat for these species. Protocol level surveys for these species would require two site visits within the flowering period, which is April to May for Humboldt Bay owl's-clover and June to July for Point Reyes bird's-beak.

Saltwater marsh: Lower end of Butcher Slough and brackish areas associated with some portions of the ditch on east side of tracks between the Arcata Wastewater Treatment Plant and Bracut. Typical vegetation within these areas consists of the following species:

- *Atriplex patula*—spear oracle
- *Deschampsia cespitosa*—tufted hairgrass
- *Distichilis spicata*—seashore salt grass
- *Grindelia strica*—gumplant
- *Angelica lucida*—sea-watch angelica
- *Salicornia virginica*—pickleweed
- *Scirpus robustus*—alkali bulrush
- *Spartina densiflora*—dense-flowered cordgrass

On the west side of the tracks along the margin of the bay, 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 bay margin and predominantly vegetated nature of the area. Typical vegetation within these areas consists of the following species:

- *Atriplex patula*—spear oracle
- *Deschampsia cespitosa*—tufted hairgrass
- *Distichilis spicata*—seashore salt grass
- *Limonium californicum*—western marsh-rosemary
- *Salicornia virginica*—pickleweed
- *Spartina densiflora*—dense-flowered cordgrass

ESTUARINE INTERTIDAL SHORE

Mud flats: 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/mapped as estuarine intertidal emergent wetlands.

ENDANGERED SPECIES HABITAT

The brackish to saltwater areas of Gannon Slough and tidally influenced lower portion of Jacoby Creek have been mapped by the NFI as "Waters of the U.S." and are considered potential habitat for several endangered fishes, as listed below. Direct impact to the "Waters" are not anticipated given current plans for the project, unless project design necessitates pile installation directly into the "Waters". Indirect impacts could occur due to potential footings placed above the Ordinary High Water Mark (OHWM) for additional crossings and/or modifications to existing crossings, depending on final layout and design of the proposed project.

Potential species that could occur within the designated "Waters of the U.S." within the project boundaries are as follows:

Fishes

Tidewater Goby (*Eucyclogobius newberryi*): The tidewater goby is listed as endangered by the Federal Government (59 FR 5494; March 7, 1994). The tidewater goby is generally found in fresh or low salinity (brackish) water (less than ten parts per trillion) of shallow (less than one meter) lagoons, coastal wetlands, and lower stream reaches where the water is fairly still but not stagnant (USFWS, 2005). The preferred habitat for both spawning (usually occurs spring to early summer) and juveniles is slack, shallow water in seasonally disconnected (from ocean) or tidally muted lagoons, estuaries, and sloughs. High-water refugia for juveniles and adults include "perched" habitats, off-channel sloughs, and pockets of still water (Stillwater Sciences, 2006).

Currently, the tidewater goby has been found at the northeastern shore of Arcata Bay, at the mouth of the Jacoby Slough, and at the mouth and in ponds near Mad River Slough, and in McDaniel, Gannon, and Freshwater Sloughs (Stillwater Sciences, 2007). The tidewater goby does not inhabit the Humboldt Bay channels, as it is not a deep-water species. A tidewater goby observation was recorded in 1982 for Arcata Marsh/Klopp Lake (Humboldt State University Fisheries Museum). Tidewater gobies were not found in surveys of Arcata Marsh, Mad River Slough, and Freshwater Slough in Humboldt Bay in 1996, but they were found in Jacoby Creek

(USFWS, 2005). Subsequently, staff from the Arcata Fish and Wildlife Service field office found tidewater gobies in the upper end of Freshwater Slough in Wood Creek. Surveys conducted in ditches tributary to Eureka Slough in 2001, and in Butchers Slough (lower Jolly Giant Creek) in 2002 found no tidewater gobies in those small sites. In July 2005, a population of tidewater goby was discovered in Gannon Slough, near Jacoby Creek, during surveys related to a restoration project. No numerical estimates are available at this time, but this newly discovered population may number 1,000 or more individuals. Threats at numerous sites with suitable habitat in Humboldt Bay include operation of tide gates to control water flow, grazing, oil spill contamination, contamination from adjacent paper and lumber mill sites, highway construction and maintenance, alteration of stream flood flows, and possibly sedimentation (USFWS, 2005).

The potential habitat for goby within the project area is limited to the lower portions of Jacoby Creek, within Butcher Slough, and potentially backwaters associated with estuarine emergent wetlands and ditches that at some point have or had connectivity to inputs from the Bay and maintain water throughout the year.

Coho Salmon (*Oncorhynchus kisutch)*: The Southern Oregon/Northern California coho salmon (Southern Oregon/Northern California ESU) was federally listed as a threatened species by NMFS (62 FR 33038; dated June 18, 1997) and is also listed as threatened by the State of California. The coho salmon was listed as threatened in the Southern Oregon/Northern California Coast Evolutionary Significant Unit (ESU), 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 when coho first enter salt water. Fish represent an increasing proportion of the diet as coho salmon grow and mature.

In the Southern Oregon/Northern California Coast ESU, the decline of coho salmon has been attributed to several human-caused factors such as: habitat degradation (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.

Chinook Salmon (*Oncorhynchus tshawytscha)*: The California Coastal chinook salmon (Southern Oregon/California Coastal ESU) is listed by the Federal Government as a threatened species (64 FR 50393; September 16, 1999). The coastal chinook salmon was listed as threatened in the Southern Oregon/Northern California Coast Evolutionary Significant Unit (ESU). California coastal chinook salmon are a distinct population of chinook salmon that reside from Redwood Creek in Humboldt County, south through the Russian River in Sonoma County. Overall, they spawn and rear in coastal and interior rivers in Northern California and Southern Oregon, and forage in vast nearshore and marine zones of the Northern Pacific Ocean.

Longfin smelt (*Spirinchus thalyichthys*): The longfin smelt (*Spirinchus thalyichthys)* was listed as threatened by the California Fish and Game Commission, effective as of March 5, 2009. The decision was finalized on June 25, 2009. Longfin smelt generally live for two (sometimes three) years. Spawning takes place in late fall, winter, or spring at water temperatures less than 16 C, in

the lower portion of freshwater streams. Hatching is thought to occur primarily in January to March with a quick outmigration occurring typically within a month but is reported to occur within 30 to 90 days at the most. The larval to juvenile stage of the life cycle is reported for the San Francisco Bay region to occur from March to June. The Department of Fish and Game "Longfin Smelt Quick Reference" reports that "by June small juveniles and older longfin have mostly emigrated…and favor deeper channel habitats relative to shoal (<18 feet depth)." In the summer, adults inhabit bays, estuaries, or offshore waters, and reportedly prefer a temperature range of 16-18 C and salinities of 15-30 ppt. Adults are reported to congregate in deeper channels in the warmer months.

The longfin smelt has been reported from Humboldt Bay, the Mad River, and the Eel River. They were once abundant in the Klamath River estuary. In Humboldt Bay the species was common at least into the 1970s; however, recent surveys have generally captured only a few animals. There have also been recent winter and spring reports from several Humboldt Bay tributaries, including Freshwater Creek, the Elk River, and Hookton Slough/Salmon Creek. Again, these reports have generally been of relatively small numbers of fish. In Freshwater Creek, post-spawning adults were observed about 1.5 miles upstream of the limits of brackish water. Larvae and juveniles have been found in the ocean off Humboldt Bay.

Once considered abundant in Humboldt Bay, longfin smelt populations appear to have declined considerably and the species is now thought to be uncommon locally. Trawl samples in 1995 captured four (January) and six (September) longfin smelt in the Bay. From 2003 to 2005, 378 trawl surveys in Arcata Bay captured only 12 longfin smelt. Surveys in March of 2009 in streams, where spawning activity would be expected to result in aggregations of fish, noted eight individuals in Freshwater Creek, and "presence" in the Elk River. Some uncertainty remains about longfin smelt distribution because no specific studies to detect their presence have been conducted in most Humboldt County streams (Cannata and Downie, 2009). At present they are considered uncommon in Humboldt Bay and likely rare in the Klamath River (Cannata and Downie, 2009).

All life stages of longfin smelt are known to occur in Humboldt Bay and tributary streams; however, with some seasonal variability in presence. Adult longfin smelt could be present in the Bay at any season, and juvenile outmigration occurs in the spring. In the project vicinity, possible effects may be difficult to assess because of very limited available information on presence/distribution. Longfin smelt apparently occur in Humboldt Bay at very low density (0.032 fish per trawl event during 2003-2005 sampling in Arcata Bay). Potential project effects on species spawning can be avoided by seasonal implementation to avoid impacts to spawning streams. Adult longfin smelt present in the project vicinity during project implementation would presumably vacate the area during project activities.

Steelhead (*Oncorhynchus mykiss)*: The Northern California steelhead (Northern California ESU) is listed by the Federal Government as a threatened species within the "Northern California ESU" (FR 65:36074; August 7, 2000). This coastal steelhead ESU occupies river basins from Redwood Creek in Humboldt County, California to the Gualala River, inclusive. In the Northern California ESU, the decline of steelhead has been attributed to factors such as: watershed disturbances, including logging on steep slopes, grazing, road building; water diversions; and

severe habitat degradation caused by timber harvest and intensive agricultural practices, resulting in decreased flows, loss of riparian habitat, channel widening, and increased water temperatures. Despite this decline, North Coast rivers and streams have the greatest amount of steelhead habitat in the State and most abundant populations of steelhead (i.e. Klamath- Trinity River system).

Steelhead is the anadromous form of rainbow trout, although steelhead is more similar to Pacific salmon than trout in their ecological requirements. Therefore, steelhead is also known as "Pacific salmon." Unlike salmon, steelhead do not necessarily die after spawning, steelhead juveniles typically have a longer fresh water rearing requirement, and both adults and juveniles are much more variable in the amount of time spent in fresh and salt water.

Steelhead typically migrate to the marine environment after spending one to three years in fresh water. In the marine environment, steelhead typically rear for one to three years prior to returning to fresh water to spawn primarily as three- and four-year olds. "Half-pounders", which are sexually immature steelhead that return to fresh water after spending less than a year in the ocean, are unique to this ESU.

The Northern California ESU includes both winter and summer steelhead. Summer steelhead populations (i.e. in Smith, Klamath, Trinity, Mad, and Eel Rivers and Redwood Creek) are not as abundant, and runs in many streams consist of less than 100 fish. As with the Klamath River, some of the larger rivers in this ESU have migrating steelhead year-round, and seasonal runs have been named (i.e. Klamath, Mad, and Eel support a sizeable fall-run of steelhead that migrate into fresh water from late summer through fall). Generally, in this ESU, steelhead return to fresh water to spawn from August through June, spawn from December through April, with peak spawning in January in the larger basins, and late February and March in the smaller coastal basins.

A few additional potentially sensitive but non-listed fish species may be present in the general vicinity, as follows:

Coastal Cutthroat Trout (*Oncorhynchous clarki clarki*): The Southern Oregon/California Coast ESU of coastal cutthroat trout was determined to be a Federal Candidate species by NMFS. In Vol.63, No. 55, p. 13832; March 23, 1998 of the Federal Register, there was a petition to consider the listing of the coastal (sea-run) cutthroat trout as threatened or endangered, and designate critical habitat. On April 5, 1999, NMFS determined that listing was not yet warranted for this ESU (and species). This ESU of Coastal Cutthroat Trout includes populations of Cutthroat Trout from south of Cape Blanco to the southern extent of the subspecies' range near the Mattole River in California. Major river basins containing spawning and rearing habitat of this ESU comprise approximately 18,090 square miles in Southern Oregon and Northern California.

In Humboldt County, coastal cutthroat trout have been reared at a hatchery facility at Humboldt State University since at least 1990. Some of these fish have been used in a joint effort between the University, the California Department of Fish and Game (CDFG), and the City of Arcata to develop a coastal cutthroat brood stock for enhancing fisheries in northern California coastal

lagoons. Meanwhile, the coastal cutthroat trout exhibit a diverse array of migratory behaviors and a wide range in the timing of migration and reproduction. Coastal cutthroat trout do not necessarily die after spawning. Since coastal cutthroat trout do not constitute a commercially important fish, with fewer directed recreational fisheries than for co-occurring Pacific salmon and steelhead, no doubt has much to do with the paucity of data for this species. In addition, spawning cutthroat trout are more difficult to observe than spawning salmon, and there are almost no large runs that are clear for systematic monitoring.

Green Sturgeon (*Acipenser medirostris*): The green sturgeon Northern Distinct Population Segment (DPS), north of and including the Eel River, is a Federal Species of Concern. The Southern DPS is listed as threatened (71 FR 17757, April 7, 2006). Tagging or genetics data are needed to identify an individual fish to DPS (NMFS, 2008). The green sturgeon is a primitive fish that is a benthic feeder that feeds on small fish. It is found in estuaries, lower reaches of large rivers, and salt or brackish waters off river mouths. It is a demersal species that prefers saline waters and during high freshwater inflow, it may move out of the area. Eggs are broadcast-spawned and externally fertilized in relatively fast water flows in depths greater than 3 inches; silt is known to prevent the eggs from adhering to each other. Female green sturgeons produce 60,000 -140,000 eggs. The green sturgeon is a long-lived fish that can reach lengths of up to 7 feet. In 1974, nine green sturgeon were collected in Arcata Bay over a two-month period with total length ranging from 73-112 centimeters. Individuals of the Southern DPS are expected to be less abundant along the north coast than individuals of the Northern DPS, which are in close proximity to their known breeding areas in the Klamath and Rogue Rivers. Juveniles under 300 mm are not tolerant of salinity, and would not be expected to occur in Humboldt Bay.

Pacific eulachon (*Thalyichthys pacificus*, PT): This small, anadromous smelt has been proposed for federal threatened status (74 FR 10857, March 13, 2009). The species occurs from Alaska south to Humboldt Bay, where it has been found in the Bay and small tributary streams, and in the Mad River. Spawning occurs in the lower reaches of streams in late winter to early summer. Juveniles move fairly quickly into estuarine areas, and then into deeper offshore waters up to 182 meters in depth. Climate related changes in ocean conditions have been identified as the most significant threat to the species, with dams and overfishing noted as lesser threats. There is very little information available on the distribution or abundance of this species, but northern California populations are thought to have been dramatically reduced in size since the 1970s. At any given time most of their adult population would be expected to inhabit deeper waters beyond Humboldt Bay, and any fish present would most likely be active in the mid-water column.

Pacific Lamprey (*Lampetra tridentata*, SC): The Pacific lamprey, is a jawless fish that hatches in freshwater and spend its' early life in the bottom sediments of rivers. Adults usually stay in the ocean near the shore, and then return to freshwater to spawn.

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