

primrose (*Camissonia cheiranthifolia*) in more sheltered sites (Holland, 1986). The state rarity status for northern foredune grassland is very threatened (state rank S1) with less than 2,000 acres remaining in the state. A disturbed form of northern foredune grassland and dunemat vegetation is located throughout the western portion of the study area.

Sitka Spruce Forest. Sitka spruce grows in mild wet coastal climates and occurs in a narrow band along the Pacific coast from Northern California to Alaska. Sitka spruce forest is usually found growing on steep seaward upland slopes or topographically flat areas, but can also occur in wetlands, such as stream and river backwaters, bottoms, and floodplains. Species commonly associated with upland Sitka spruce forests include redwood (*Sequoia sempervirens*), western hemlock (*Tsuga heterophylla*), hazelnut (*Corylus cornuta*), cascara (*Rhamnus purshiana*), salmonberry (*Rubus spectabilis*), Douglas's iris (*Iris douglasiana*), false lily-of-the-valley (*Maianthemum dilatatum*), and sword fern. The state rarity status for Sitka spruce forest is very threatened (state rank S1.1) with less than 2,000 acres remaining in the state.

Palustrine forested wetlands that are dominated with Sitka spruce have a different assemblage of species. The overstory typically consists of Sitka spruce, Oregon crabapple (*Malus fusca*), red alder, with a subcanopy of cascara, willows, twinberry (*Lonicera involucrata*), and wax myrtle (*Myrica californica*). Dominant shrubs include salmonberry, thimbleberry (*Rubus parviflorus*), and elderberry (*Sambucus racemosa*). Common herbaceous species are sword fern, false lily-of-the-valley, milk maids (*Cardamine californica*), Douglas iris, and grass species including Pacific reed grass (*Calamagrostis nutkaensis*).

No Sitka spruce forests are located within the project area.

5.0 Survey Results

5.1 Special Status Plant Species

Out of the 22 special status plant species that have suitable habitat in the study area, the only species that was detected during the focused botanical surveys was Point Reyes bird's-beak. Four occurrences of this species were encountered in the Estuarine intertidal emergent habitat (Figure 3). Table 2 presents dominant species and phenological stage information for each occurrence.

Table 2 Point Reyes Bird's-Beak Occurrence Information Elk River Wildlife Trail Improvement Project, Eureka, California			
Occurrence No.	Number of Plants	Phenological Stage	Dominant Species
1	1	Flower	<i>Salicornia virginica</i> 50% <i>Spartina densiflora</i> 25% Bare ground 20% <i>Triglochin maritima</i> 5% <i>Cordylanthus maritimus</i> ssp. <i>palustris</i> 5%
2	>100	Half flower/ half fruit	<i>Salicornia virginica</i> 50% <i>Cordylanthus maritimus</i> ssp. <i>palustris</i> 25% <i>Spartina densiflora</i> 10% <i>Spergularia macrotheca</i> 10% <i>Jaumea carnosa</i> 5%
3	1	Flower	<i>Salicornia virginica</i> 50% <i>Distichlis spicata</i> 25% <i>Spartina densiflora</i> 10% <i>Jaumea carnosa</i> 5% <i>Atriplex patula</i> 5% <i>Cordylanthus maritimus</i> ssp. <i>palustris</i> 5%
4	44	Flower	<i>Salicornia virginica</i> 50% <i>Cordylanthus maritimus</i> ssp. <i>palustris</i> <i>Cordylanthus maritimus</i> ssp. <i>palustris</i> 20% <i>Spergularia macrotheca</i> 15% <i>Spartina densiflora</i> 10% Bare ground 5%

The northernmost occurrence consisted of only one individual flowering plant, without fruit developing. Occurrence number 2 was the largest out of the four occurrences and consisted of over 100 individuals (Figure 3). Occurrence number 3 was located in a salt marsh pocket that is infrequently tidally inundated and is located above the MHW. This occurrence was the only one where salt grass was a dominant species. Threats to the Point Reyes bird's-beak occurrences include competition with non-native species but, otherwise, the occurrences are relatively protected from other threats such as foot traffic and trampling. A CNDDDB occurrence form will be submitted to the database.

Pink sand verbena was not detected in the study area during the 2006 focused surveys but it should be noted that one plant was detected in the study area during a 1999 survey (SHN, 1999). The individual occurred in the foredune/dunemat habitat located west of the northern Crowley property (SHN, 1999).

5.2 Special Status Plant Wildlife Survey Results

Thirty-four avian species and two mammal species were observed during the field visits (Table 3). Three of the 27 special status species known to occur within the vicinity of the study area were observed including the Osprey, Brown Pelican, and Double-crested Cormorant.

Table 3 Wildlife Species Observed During Elk River Wildlife Trail Improvement Project 2006 Surveys, Eureka, California		
Species	Date Observed	Area where bird was observed
Violet Green Swallow	7/7	NIY ¹ , NCP ²
Cliff swallow	7/7	NIY, NCP
Barn Swallow	7/7	NIY, NCP
American Goldfinch	7/7/, 7/12	NIY, NCP, SCP ³
Lesser Goldfinch	11/30	SCP
House Sparrow	7/7	NIY, NCP
Song Sparrow	7/7/, 7/12	NIY, NCP, SCP
Fox Sparrow	11/29, 11/30	NCP, SCP
White-crowned Sparrow	7/12, 11/30	SCP
Osprey	7/7/, 7/12	Over Bay
Red-shouldered Hawk	11/29	SCP
American Kestrel	11/30	SCP
Forester's Tern	7/7/, 7/10	Estuary/Spit
Double-crested Cormorant	7/7, 11/29	Estuary/Spit
Brown Pelican	7/7	Estuary/Spit
Great Egret	7/7, 11/29	Estuary/Spit
Great Blue Heron	7/12, 11/29	SCP
European Starling	7/7	NIY, NCP
Cedar Waxwing	7/7/06	NIY, NCP
Marbled Godwit	7/7, 7/10, 11/29	Estuary/Spit
Western Sandpiper	7/7/06	Estuary/Spit
Western Gull	7/7, 11/29	Estuary/Spit
Herring Gull	7/7, 11/29	Estuary/Spit
Black Phoebe	7/12, 11/30	SCP
Bushtit	11/30	SCP
Marsh Wren	11/30	SCP
California Towhee	11/30	SCP
Western Meadowlark	11/30	SCP
American Robin	11/30	SCP
Purple Finch	7/12	SCP
Ruby-crowned Kinglet	11/29	NCP
Bufflehead	11/29	Estuary/Spit
Widgeon	11/29	Estuary/Spit
Mallard	7/7, 11/30	Estuary/Spit, SCP
Mammals		
Raccoon	7/7/06	Estuary/Spit
Gray Fox	7/12	SCP
1. NIY: Industrial yard located on the north end of the study area. 2. NCP: North Crowley Property located immediately north of Hilfiker Road. 3. SCP: South Crowley Property located immediately south and east of Hilfiker Road.		

6.0 Recommendations

6.1 Wetlands

The study area contains a total of approximately 8.12 acres of wetlands (Figure 3). Approximately 6.58 acres are Palustrine emergent/scrub shrub and approximately 1.54 acres are Estuarine intertidal. In addition to delineating jurisdictional wetlands, approximately 0.35 acres were delineated as ESHAs (Figure 3).

6.2 Special Status Plant Species

If the proposed trail improvement project includes any impacts to the high quality sand dune and northern foredune vegetation located south of the study area, adjacent to the existing EWWTP, a focused survey should be conducted for Humboldt Bay wallflower. This species flowers March through April and was not surveyed during the floristically appropriate period in 2006 because floristic surveys started in July.

Avoidance of the Point Reyes bird's-beak occurrences in the study area is highly recommended. Any impacts to these plants would not only require mitigation that reduces potential impacts to a less than significant level pursuant to §15380 of the California Environmental Quality Act (CEQA), but would also require state and federal permits if the wetland habitat that this special status species occurs in is impacted. The proposed project should avoid all salt marsh habitat, as this is a jurisdictional wetland that is regulated by a number of resource agencies and supports special status plant species. The proposed project should incorporate a buffer and best management practices during construction operations to ensure that there are no impacts, including but not limited to alteration of the hydrologic regime. Altering the hydrology of the salt marsh, which could include increased erosion into the salt marsh, could result in secondary impacts such as displacement of native salt marsh species and an increase in the cover of non-native species.

If the proposed project avoids the Point Reyes bird's-beak occurrences and does not include any impacts to suitable habitat for Humboldt Bay wallflower, no further botanical coordination is recommended for the proposed project.

6.3 Wildlife Species

The northern industrial yard currently offers little to no habitat value for wildlife and could be greatly improved by removing construction debris and human encampments. Replanting the northern industrial yard with native trees and shrubs would greatly improve the overall habitat values of this section of the study area. The majority of the northern Crowley property has the potential to be high quality habitat for wildlife. The wetland/upland mosaic is attractive to many bird species. Unfortunately, the current condition of the northern Crowley property is degraded due to human encampments in nearly every willow thicket. This portion of the study area would be greatly improved by the development of the Elk River Wildlife Trail and removal of human encampments and debris. The southern Crowley property has great potential for wildlife use primarily due to the extensive wetlands that exist on this portion of the study area. The estuarine habitat portion of the study area could be greatly improved for wildlife by removing invasive non-native plants that form low-diversity monocultures and restoring native plants.

All wetlands should be avoided to the extent possible and areas delineated as ESHAs should be preserved. Additionally, the clusters of American dunegrass in the western portion of the study area should be preserved and enhanced to the extent possible. There is a unique opportunity to incorporate the wetlands and ESHA throughout the project area with the proposed trail improvements. Quality wildlife viewing occurs on the northern Crowley property and placement of the trail between the ESHA and wetlands would contribute immensely to this opportunity. If the trail is placed on the southern Crowley property, we recommend locating it close to the wetlands to maximize viewing the area's natural resources. There is ample upland habitat along the western portion of the study area to place the trail in a manner to maximize viewing scenic and natural resources in Humboldt Bay and the Elk River Estuary. The trail should be routed around the Palustrine emergent wetland and salt marsh habitat in the parking and landscape area to avoid impacts to these environmentally sensitive resources.

7.0 References Cited

- Bureau of Land Management. (March 2005). *Status Report: Abronia umbellata Lamark var. breviflora (Standley) L. A. Galloway (Pink sand verbena)*. North Bend: BLM, Coos Bay District.
- California Department of Fish & Game. (June 2006). California Natural Diversity Database (CNDDB) RareFind 3 Program. <<http://www.dfg.ca.gov/whdab/html/cnddb.html>>. NR:DFG.
- . (June 2006). Biogeographical Information and Observation System (BIOS) viewed at <http://bios.dfg.ca.gov/>
- Chamberlain, C.D. (2006). *Environmental Variables of Northern California Lagoons and Estuaries and the Distribution of Tidewater Goby (Eucyclogobius newberryi)*. Arcata Fisheries Technical Report Number TR 2006-04. Arcata:USFWS, Arcata Fish and Wildlife Office,
- Colwell, M.A., C.B. Millet, J.J. Meyer, J.N. Hall, S.J. Hurley, S.E. McAllister, A.N. Transou, and R.R. LeValley. (2005). "Snowy Plover Reproduction Success in Beach and River Habitats." *J. Field Ornithology* 76:373-382. NR: U.S. Geological Survey, Biological Resources Division.
- Eicher, A. L. (1987). *Salt Marsh Vascular Plant Distribution in Relation to Tidal Elevation, Humboldt Bay, California*. A Thesis Presented to the Faculty of Humboldt State University. Arcata:HSU.
- Hickman, J. C., ed. (1993). *The Jepson Manual Higher Plants of California*. Berkeley:University of California Press Berkeley.
- Holland, R. F. (1986). *Preliminary Descriptions of Terrestrial Natural Communities of California*. Non-game Heritage Program. Sacramento:DFG. 156 pp.
- Hunter, J. E., D. Fix, G. A. Schmidt, and J. C. Power. (2005). *Atlas of the Breeding Birds of Humboldt County, California*. Seattle:Reischling Press, Inc., 440 pgs.
- Imper, D. K. (February 18, 2003). "Port Orford Sewage Offshore Discharge—Proposed Drilling Location." unpublished letter/email to Rob Burns, USFWS Roseburg Office. Arcata: USFWS.
- Imper, D. K. and John O. Sawyer, PhD. (October 1992). *Botanical Survey of the Crescent City Marsh Wildlife Area*. Arcata:CSU & DFG.
- Kalt, J. (Winter 2006). "Crescent City Marsh and Western Lily Threatened by Two Proposed Developments," *Darlingtonia*. Arcata: CNPS, North Coast Chapter.

- LeValley, R. (2006). Summary of Western Snowy Plover detections and survey effort. Received by electronic mail on 11/14/2006. Arcata:Mad River Biologists.
- Page, G. W., and L.E. Stenzel. (1981). "The Breeding Status of the Snowy Plover In California, *Western Birds* 12:1-39. Albuquerque: University of New Mexico.
- Pearl, C.A. (2005). "Rana aurora aurora (Northern red-legged frog)" in *Amphibian Declines--The Conservation Status of United States Species*. Berkeley: University of California Press.
- SHN Consulting Engineers & Geologists, Inc. (August 21, 2001). Sensitive Plant Survey, Happy Harp Timber Harvest Plan, Humboldt County, California . Eureka:SHN.
- . (December, 1999). Botanical Survey and Wetland Delineation City Of Eureka Crowley Property, Hilfiker Lane Eureka, California. . Eureka:SHN.
- Swift, C. C., J. L. Nelson, C. Maslow, and T. Stein. (1989). *Biology and Distribution of the Tidewater Goby, Eucyclogobius newberryi (Pisces: Gobiidae) of California*. Los Angeles Co. Museum of Natural History. Contributions in Science 404:1-19. Los Angeles: Los Angeles Co. Museum of Natural History.
- Tibor, David P., ed. (2001). *Inventory of Rare and Endangered Plants of California, 6th Edition; Special Publication No. 1*. Sacramento: California Native Plant Society.
- U.S. Fish & Wildlife Service. (1993). "Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Pacific Coast Population of the Western Snowy Plover. 50 CFR Part 17; Vol. 58, No. 42: 12864-12874." Portland: USFWS.
- . (2001). *Western Snowy Plover (Charadrius alexandrinus nivosus) Pacific Coast Population Draft Recovery Plan*, Xix + 630 pp. Portland: USFWS.
- . (2005). Western Snowy Plover Natural History Information viewed (11-2-2005) at http://ecos.fws.gov/docs/life_histories/B07C.html
- . (2005a). *Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*. 50 CFR Part 17; Vol. 70, No. 188: 56970-57119. Portland:USFWS.
- . (2005b). California Brown Pelican Natural History Information viewed (11-2-2005) at http://ecos.fws.gov/docs/life_histories/B02L.html
- . (2005c). Bald Eagle Natural History Information viewed (11-2-2005) at http://ecos.fws.gov/docs/life_histories/B008.html



Reference: 006107

January 30, 2007

Mr. Gary Bird
City of Eureka
531 K Street
Eureka, CA 95501-1146

Subject: Wetland Delineation for the Proposed Elk River Trail Improvement Project, Eureka, California

Dear Mr. Bird:

On July 10 and 31, August 1, and November 29 and 30, 2006, SHN Consulting Engineers & Geologists, Inc. (SHN) completed a wetland delineation within the city limits of Eureka, California (west ½ of Section 33, Township 5 North, Range 1 West Humboldt Base Meridian; Figure 1). The study area encompasses approximately 29 acres and is bordered to the north by industrial and residential property, to the east by railroad tracks and industrial/retail businesses, to the south by the Eureka Wastewater Treatment Plant, and to the west by the Elk River Estuary. A 2002 aerial photograph obtained from the City of Eureka (City) was used as the base map for fieldwork and reporting.

This wetland delineation was conducted in accordance with the U.S. Army Corps of Engineers (ACOE) 1987 *ACOE Wetland Delineation Manual* (Environmental Laboratories, 1987), *Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone* (California Coastal Commission, 1994), and the City of Eureka General Plan Policy Document (City of Eureka, 1999).

Under Section 404 of the Clean Water Act, waters of the United States (including associated wetlands) are placed under federal jurisdiction of the ACOE. Furthermore, within California's coastal zone, the Coastal Act as administered by the California Coastal Commission (CCC) affords wetlands additional protection and regulation. As stated in the 1987 *ACOE Wetland Delineation Manual* (Environmental Laboratories, 1987) and discussed further in the California Coastal Commission's *Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone* (California Coastal Commission, 1994), specific criteria are used to identify wetlands or determine wetland status, including: hydrophytic vegetation, hydric soils, and wetland hydrology.

The objective of this wetland delineation was to identify and delineate all wetlands within the study area using the specific criterion, as stated above. The following definitions are from ACOE (1987) unless specified otherwise. Hydrophytic vegetation is dominated by plant species known to be adapted to wetland sites, as specified in the regional index (U.S. National Ecology Research Center, 1988). Hydric soils have characteristics that developed in a reducing atmosphere, which exists when periods of prolonged soil saturation result in anaerobic conditions within the upper 12 inches of the soil profile. Hydric soils support the growth and regeneration of hydrophytic vegetation. Wetland hydrology is the sum total of wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation.

Wetland hydrology is demonstrated through direct or indirect evidence of flooding, ponding, or saturation for a significant portion of the growing season (Environmental Laboratories, 1987; California Coastal Commission, 1994; ODSL, 2005). Wetlands identified in this report had the presence of all three indicators. Refer to Section 4.3.6 of this report for other regulated/sensitive habitats that were delineated.

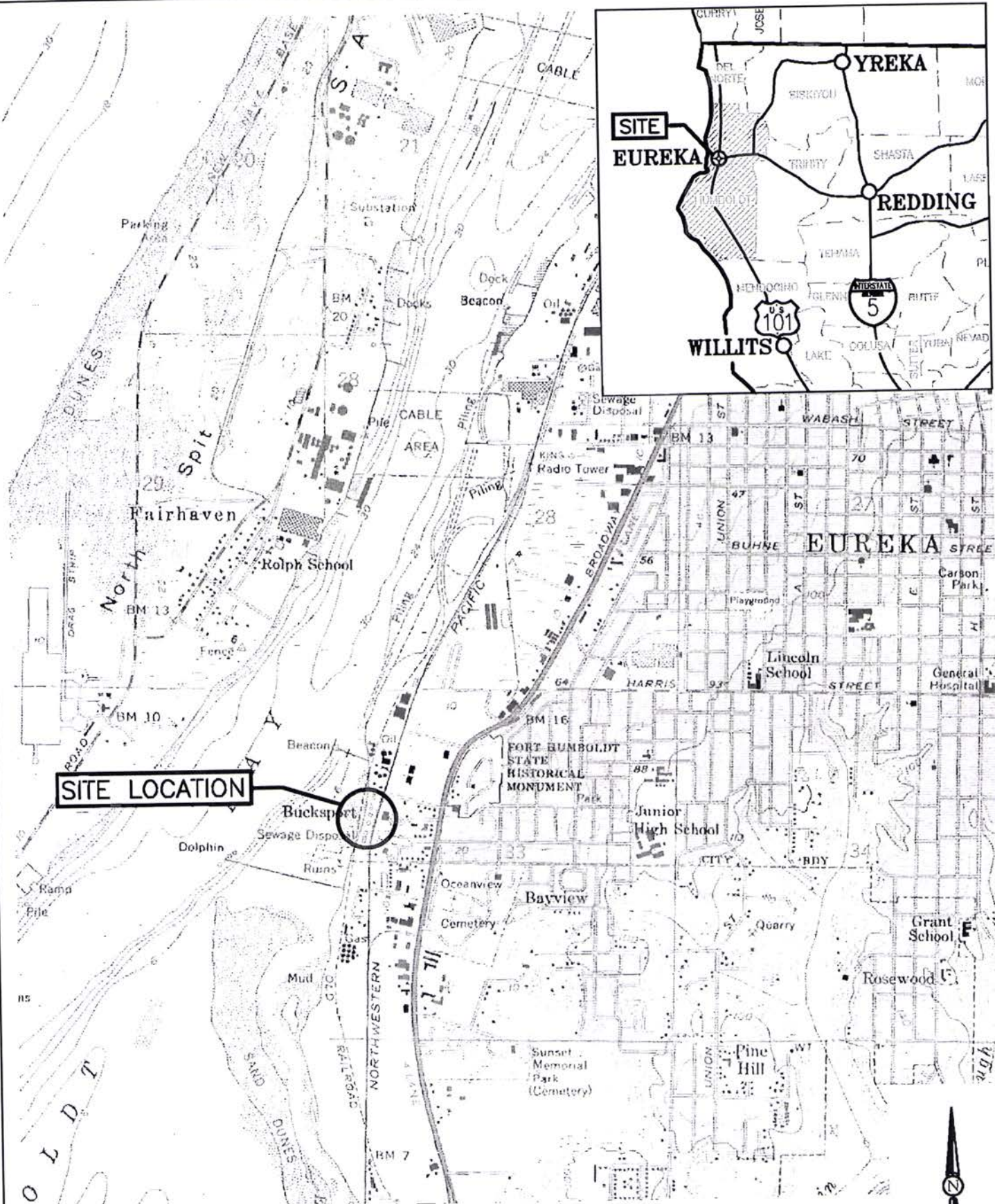
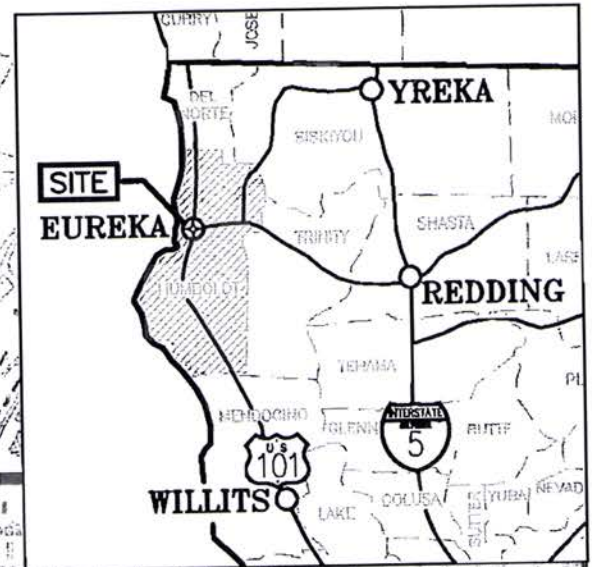
1.0 Environmental Setting

The study area is located on undeveloped land in the southwest portion of Eureka. For organizational purposes, portions of the study area are referenced as: 1) the northern industrial yard, 2) the northern Crowley property, 3) the southern Crowley property, 4) the parking and landscaping area, and 5) estuarine habitat (Figure 2). Assessors Parcel Numbers (APNs) that correspond with the five sections of the study area are as follows:

- Northern industrial yard: APNs 007-081-013, -015, -016; and APNs 007-091-002 and -003
- Northern Crowley property: APNs 007-091-005, -006, -007, -008, -011, and -012; and portions of APNs 019-321-009 and -012
- Southern Crowley property: APNs 019-321-004 and 019-271-004; and portions of APNs 091-321-005 and -012
- Parking and landscape area: APNs 091-331-001, -002, -011, and -009; and APN 019-321-006
- Estuarine habitat: APNs 007-081-001; APNs 007-091-001 and portions of -005, -011, and -012; and portions of APNs 091-321-006, 019-331-001 and 019-331-009.

The northern industrial yard contains miscellaneous construction material and debris, dilapidated fencing, and several human encampments and associated debris. The northern Crowley property is mostly natural, lacking construction debris or remnants of development/ industry; however, it contains several human encampments and associated debris, as well as dilapidated fencing along the railroad tracks on the east side and along the estuary. The southern Crowley property has intact perimeter fencing and an access road in the center of the property where the Eureka Fire Department conducts training exercises. Furthermore, the southern Crowley property contains various debris piles, and infrastructure remnants including building foundations, overhead lighting, ponds, and fencing. The southern Crowley property also appears to have been partially cleared of vegetation within the past five years and is now in early stages of regeneration or succession. The parking and landscaping section of the study area contains a parking lot for the Elk River Wildlife Trail and a mowed area directly north of the parking lot. The estuarine habitat extends the entire length of the study area from the northern industrial yard to the existing Elk River Wildlife Trail and contains mostly intact mud flat and salt marsh habitat. Other forms of relict industry including the former fuel line trestle and other miscellaneous pilings occur within the estuarine portion of the study area.

A tidally-influenced drainage ditch is located along the eastern boundary of the northern and southern Crowley properties. The ditch originates at the Elk River Estuary, passes under Hilfiker Lane, borders the eastern edge of the southern Crowley property and extends north along the railroad tracks before passing under Hilfiker Lane again. The ditch daylights at the southeast side



SOURCE: EUREKA
USGS 7.5 MINUTE
QUADRANGLE

42 of 66

1"=2000'±

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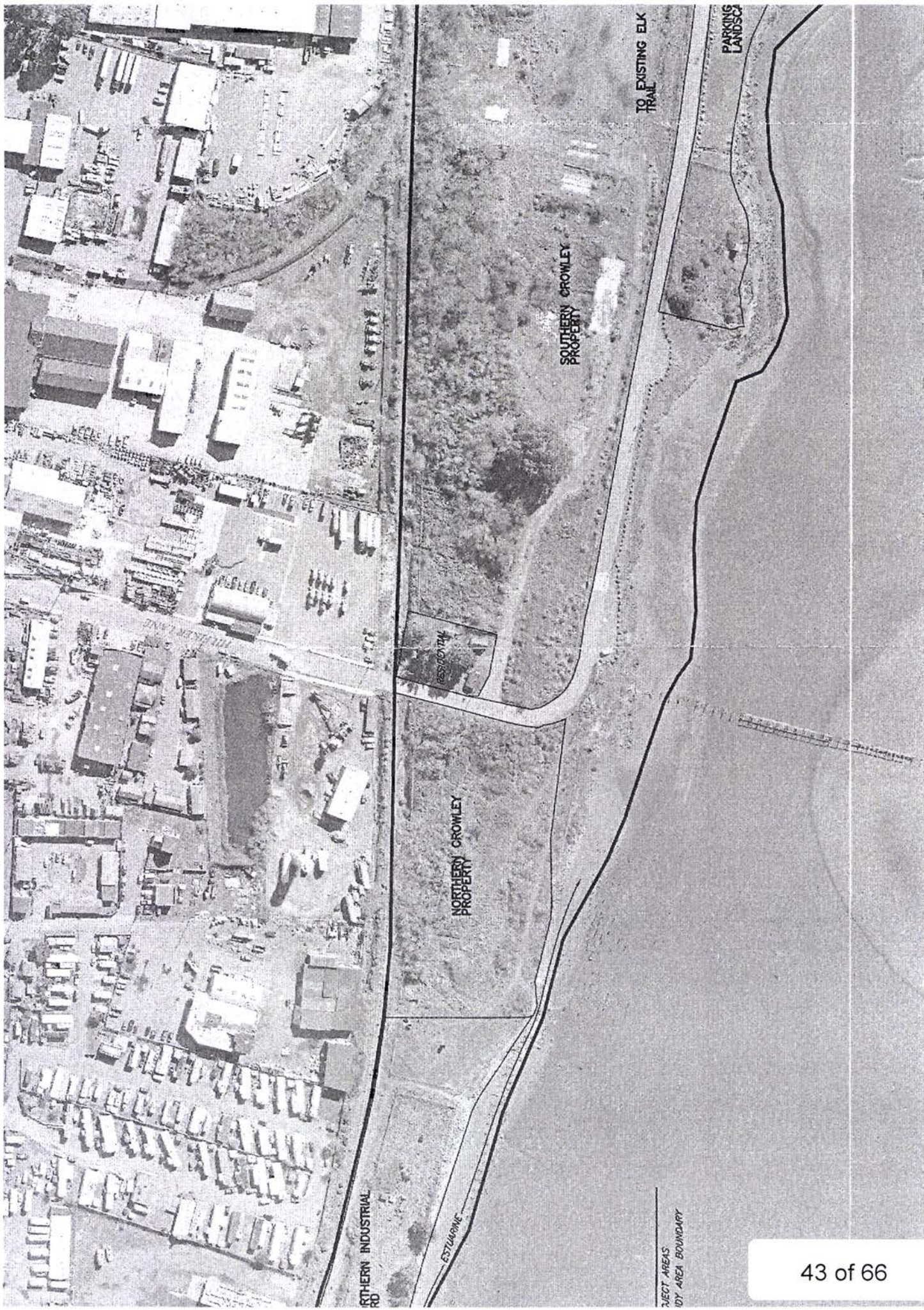
City of Eureka
Elk River Trail Improvement Project
Eureka, California

Site Location Map
Wetland Delineation
SHN 006107

January 2007

006107-LOCATION

Figure 1



SCALE
1"=100'

of the northern Crowley property and terminates near the northern end of that property. Vegetation within and along the ditch includes a mix of freshwater and brackish tolerant hydrophytes. Dominant species include silverweed (*Potentilla anserina*), spearscale (*Atriplex triangularis*), common rush (*Juncus effuses*), pickleweed (*Salicornia virginica*), brass-buttons (*Cotula coronopifolia*), and dense-flowered cordgrass (*Spartina densiflora*), with scattered seaside arrow grass (*Triglochin maritima*).

2.0 Soils

Elevations within the study area range from sea level to approximately 10 feet above Mean Sea Level (MSL). Soil types for the study area are described in the *Soils of Western Humboldt County California* (McLaughlin and Harradine, 1966) as Sand Dune (SD), and may include portions of Bayside silty clay loam (Ba6). According to McLaughlin and Harradine (1966), Bayside silty clay loam is formed in very low-lying areas, is very poorly drained and is often affected by salts, and the surface horizon is frequently puddled. The average annual precipitation is 38.10 inches and the average annual air temperature is 53.2 degrees Fahrenheit (NOWData-NOAA online weather data, 2006).

3.0 National Wetland Inventory

The U.S. Fish and Wildlife Service is the federal agency responsible for tracking wetland trends as well as maintaining a reliable inventory through its National Wetland Inventory (NWI; USDI, 1987). The NWI can be queried for specific locations throughout the United States to aid federal, state, and local agencies in making informed decisions concerning wetlands. The study area has both freshwater and estuarine wetland habitat types (Figure 3):

3.1 Freshwater Wetlands

According to the NWI (USDI, 1987), the northern and southern Crowley property portion of the study area contains a mix of two freshwater wetland types:

- PEM/SS1C: Palustrine Emergent, Scrub-Shrub, Broadleaved deciduous, and Seasonally Flooded. This wetland type is a combination of two common freshwater wetlands in the Eureka area, Palustrine emergent seasonally flooded wetland that is dominated by herbaceous species and Palustrine scrub-shrub seasonally flooded wetland that is dominated by broadleaved deciduous trees and shrubs.

3.2 Estuarine Wetlands

The NWI (USDI, 1987) identifies several wetland class and sub-class types within the estuary and mouth of Elk River. The following two types apply to the study area:

- E2AB3M: Estuarine, Intertidal, Aquatic Bed, Rooted Vascular, and Irregularly Exposed. The NWI identifies the tidally influenced wetlands in the northern portion of the study area as this type (Figure 3). This estuarine wetland is typical of salt marshes that occur near the

Mean High Water Mark (MHW) that are dominated with saline tolerant herbaceous hydrophytes and are regularly inundated.

- E2US3N: Estuarine, Intertidal, Unconsolidated Shore, Mud, and Regularly Exposed. The NWI identifies the tidally influenced wetlands in the southern portion of the study area as this type (Figure 3). This estuarine wetland is often referred to as mudflat, is regularly tidally inundated, and may be vegetated with brown and green algae.

While NWI maps are an excellent reference point for the presence or absence of wetlands, the resolution of the NWI tends to be on a macro scale, and can underestimate the full extent of a given wetland or miss wetlands that are dominated by herbaceous vegetation.

4.0 Wetland Delineation

4.1 Methodology

Prior to conducting fieldwork, the SHN wetland delineation team reviewed existing information to assist with the determination of wetland boundaries within the study area. This review included *Soils of Western Humboldt County California* (McLaughlin and Harradine, 1966); NWI maps (USDI, 1987), U.S. Geological Survey (USGS) topographic quadrangle maps (Eureka), and aerial photographs. All field mapping was completed with a Trimble GeoExplorer XT™ handheld Global Positioning System (GPS) differentially corrected for horizontal accuracy of less than three feet.

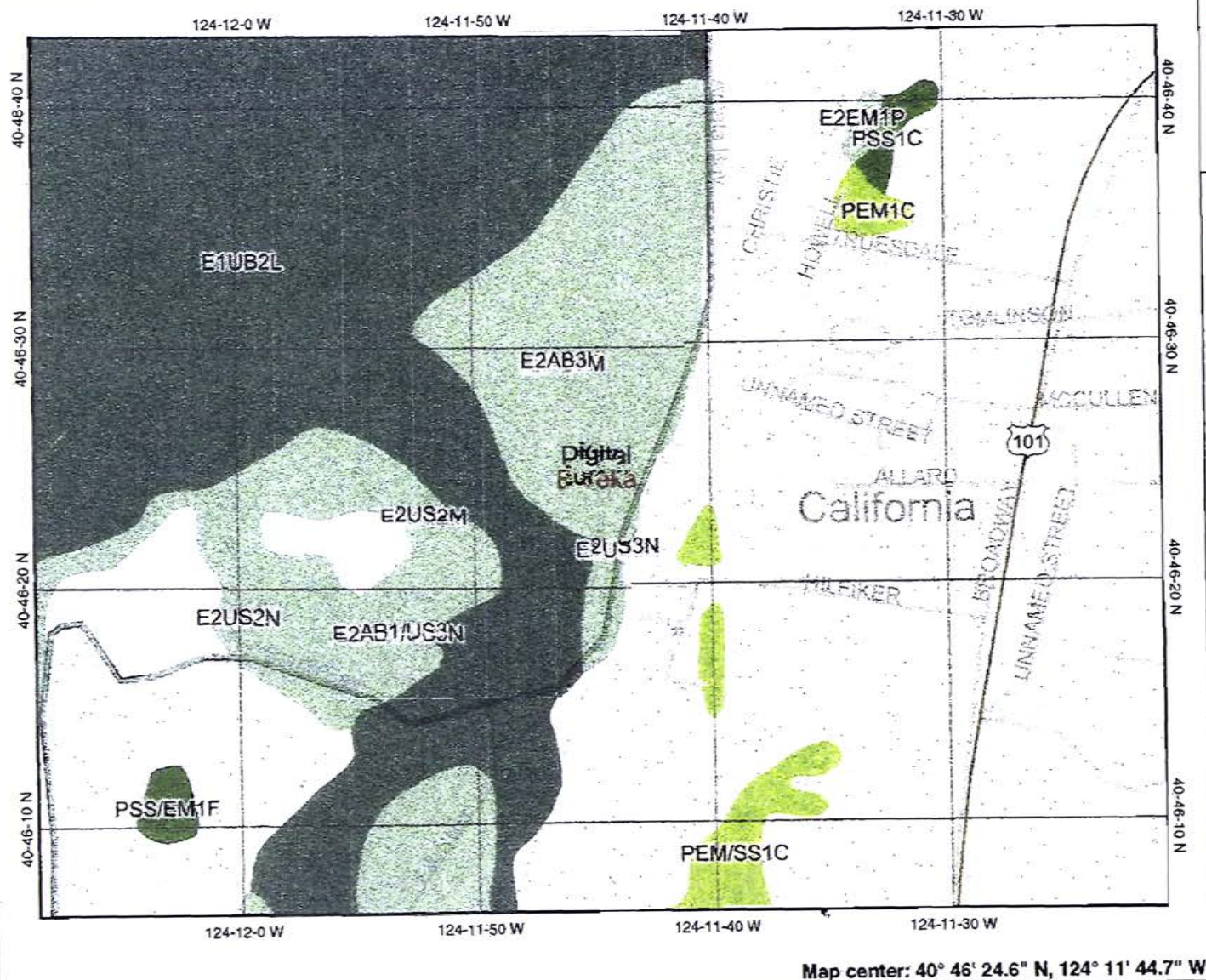
4.2 Overview

Twenty-eight sample points were characterized in the study area for the aforementioned botanical, hydrological, and soil parameters (Figure 4). Point locations were selected:

1. to achieve appropriate coverage and characterization of wetland and upland habitats;
2. to determine the approximate boundary line between wetlands and uplands by determining the extent of one or more key wetland criteria (hydrology, hydric soils, and hydrophytic vegetation);
3. to document potential changes in the vegetative community; and
4. in locations where habitat alteration has occurred, to verify presence/absence of hydric soils and hydrology.

With the exception of two sample points (14 SC and 17 SC), soils at all sample points were dug to a minimum depth of 12 inches, with most sample points dug to a depth of 16 inches. Sample points are typically paired or are located along a transect to determine wetland boundaries. Furthermore, the distribution of sampling points allows for extrapolation to other similar vegetation types and elevations within the study area. Soil profile depths were measured from the surface to each horizon, and the thickness of each horizon was also measured; the Munsell Soil Color Chart (Kollmorgen, 1990) was referenced to determine the matrix and mottle colors (if present). Soils

Elk River Access Project



Legend

- Interstate
- Major Roads
- Other Road
- Interstate
- State highway
- US highway
- Roads
- Cities
- USGS Quad Index 24K
- Lower 48 Wetland Polygons
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine
- Lower 48 Available Wetland Data
- Non-Digital
- Digital
- No Data
- Scan
- NHD Streams
- Counties 100K
- Urban Areas 300K
- States 100K
- South America
- North America



Scale: 1:10,577

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Map created from U.S. Fish and Wildlife's National Wetland Inventory webpage: <http://www.fws.gov/nwi/>

SHN
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& Geologists, Inc.

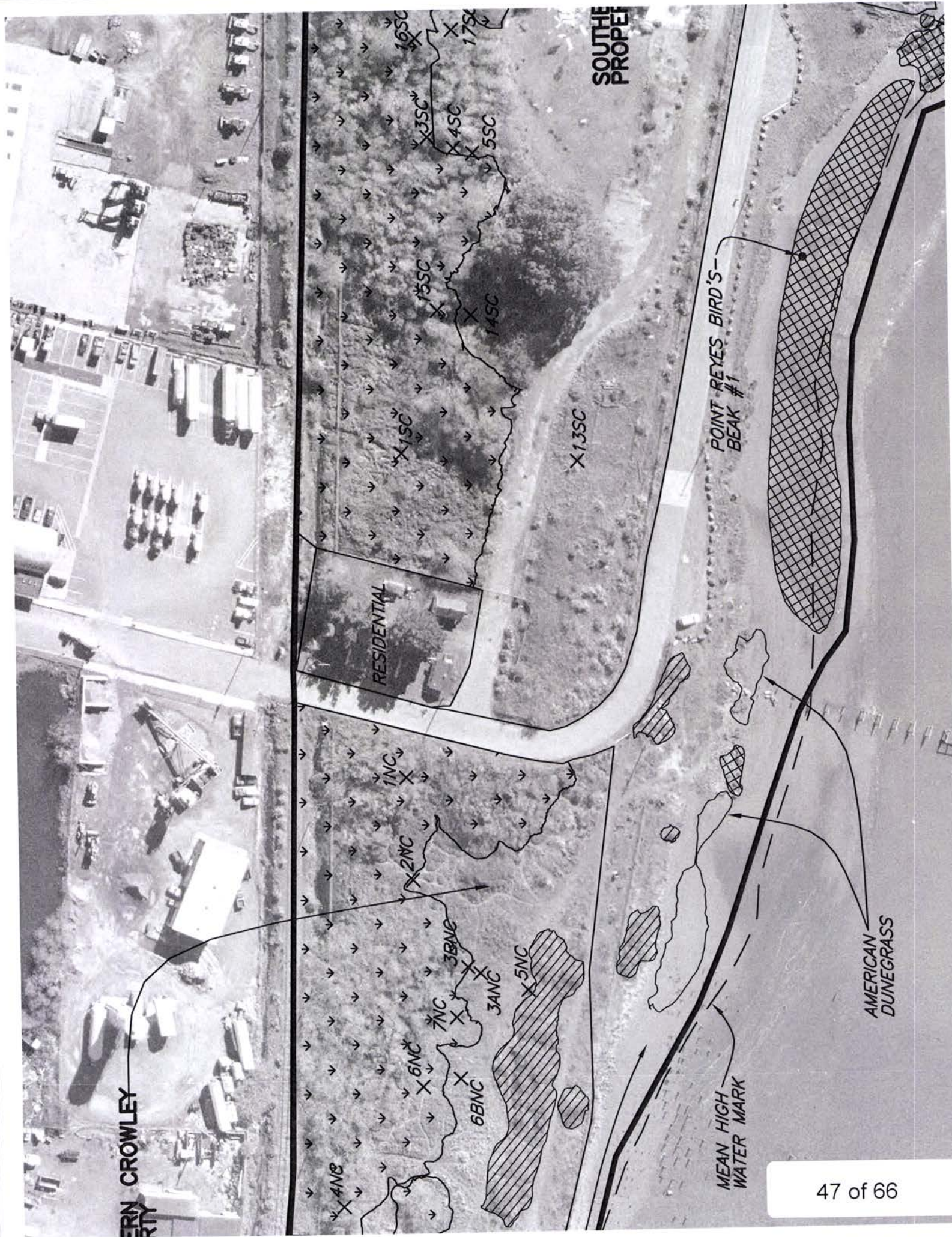
City of Eureka
Elk River Wildlife Trail Improvement Project
Eureka, California

Wetland Delineation
SHN 006107

January 2007

Wetland.cdr

Figure 3



were closely inspected for hydric soil indicators as well as primary and secondary hydrology indicators. Each pit was located by GPS, flagged with a pine stake, and refilled at the conclusion of data collection.

At each sample point, the vegetation stratum was inspected and identified to the lowest taxonomic level (species) possible at the time of the field visit. However, it should be noted that seasonality dictates species presence or absence so it is possible that some herbaceous species were not present during all the surveys. Relative percent cover of each plant species was visually estimated within the sample point and within each stratum. The 50/20 method was applied to each stratum to determine the dominant plant species and to satisfy the hydrophytic vegetation criteria. The herbaceous stratum was inspected at a 5-foot radius centered on the sample point; shrub and tree strata were inspected similarly at a 30-foot radius. The wetland indicator status of plant species for this investigation was based on the regional index (U.S. National Ecology Research Center, 1988); botanical nomenclature follows *The Jepson Manual, Higher Plants of California* (Hickman, 1993).

4.3 Results

For each sample point, an ACOE Routine Wetland Determination Data Form was completed. Copies of all data forms are included in Attachment 1. Photos of representative sample points are included in Attachment 2.

4.3.1 Northern Industrial Yard

The northern industrial yard portion of the study area does not contain any wetland features. The site is dry and heavily disturbed. This area is dominated by ruderal vegetation that is characteristic of disturbed upland habitat (Photo 1).

4.3.2 Northern Crowley Property

Nine sample points (4 paired, 5 single) were inspected to characterize the northern Crowley (NC) property.

Sample Points 1 NC and 4 NC were taken within the willow thicket (*Salix sitchensis* and *S. lucida*) in the eastern portion of the northern Crowley property (Photo 2). Vegetation is hydrophytic and indicative of Palustrine scrub-shrub wetland. Soils have low chroma (10YR 2/1), two or more horizons, a gley matrix color at 12 inches (where mottles became abundant and contrasted), and tended to be sandy in texture. These soils are likely native Bayside silty clay loam.

Sample points 2 NC, 3B NC, 6 NC and 7 NC were taken west of the willow boundary, within the Palustrine emergent and scrub-shrub transition zone that is dominated by the herbaceous hydrophyte slough sedge (*Carex obnupta*; Photo 3). At these points, vegetation remained predominately hydrophytic and indicative of Palustrine emergent/scrub-shrub type wetland. However, although soils were still low in chroma, their value increased to 10 YR 4/2 or 4/3. Profiles remained relatively uniform with one or two horizons, mottles were absent, and texture was sandy.

At sample point 7 NC a well-defined organic pan (approximately 1-inch in diameter) was observed 12 inches from the surface; the formation of an organic pan is an indicator of hydric conditions within sandy soils (Environmental Laboratories, 1987).

Sample points 3A NC and 6B NC are upland points based on the shift in vegetation communities from a preponderance of hydrophytes found at 3B NC and 6 NC (wetland paired plot sample points) to upland species. Though sample points 3A NC and 6B NC have relatively low chroma (10YR 4/2), this indicator appears to be relatively widespread in this portion of the study area and is not necessarily a good indicator of wetland status. Furthermore, both sample point profiles were uniform, showed little to no variation in matrix color, mottles and streaking were absent, and lacked organic pan formation or organic horizons. Likewise, hydrology indicators were completely absent from these sample points.

Sample point 5 NC is an upland point characterized on the edge of the arroyo willow (*Salix lasiolepis*) thicket on the western portion of the northern Crowley property (Figure 4). Although arroyo willow is a hydrophyte (FACW), it is found in drier portions of the study area when compared to sample points where Sitka willow was dominant (FACW+; sample points 1 NC and 4 NC). Furthermore, the sandy soils at sample point 5 NC are clearly well drained, and both value and chroma are higher (10YR 5/2 dry; 10YR 3/1 wetted) than wetland points located nearby. This sample point was inspected during both the dry and wet weather seasons. The soil profile showed no horizon change or mottle formation, and hydrology indicators were absent during both field inspections.

The northern Crowley property portion of the study area contains approximately 1.55 acres of wetland habitat but it is degraded from ongoing human encampments and associated debris (Photo 4).

4.3.3 Southern Crowley Property

The southern Crowley property (SC) was characterized using 17 sample points (five single points, six paired points, and six points along two transects). The western half of the southern Crowley property is clearly defined from the eastern half by the placement of fill from historic industrial activities. Topography is several feet higher on the western half due to the historic fill.

Sample points 10 SC, 13 SC, 14 SC, and 17 SC are upland points located on fill. In general, fill sample points lacked hydrophytes; contain non-native gravel and debris-dominated soils, and generally lacked hydrology. Sample point 2 SC also occurs on the fill prism; however, soil compaction and the wet climate has allowed for standing water to persist long enough to form a small isolated wetland dominated by the obligate hydrophyte pennyroyal (*Mentha pulegium*; Photo 5).

Sample points 1 SC, 15 SC, 3 SC, 16 SC, 8 SC, 7 SC, 6 SC, 11SC, 9 SC, and 12 SC occur in wetlands in the eastern and southern halves of the southern Crowley property (Figure 4). These sampling points are hydrophyte dominated (Photo 6), contain soils low in chroma and value; furthermore, soils tended to be well developed with abundant mottles and contrast, and hydrology is evident.

Evidence of recent vegetation removal or other disturbance is scattered in the eastern portion of the northern Crowley property (Photo 7). These soils appear to be consistent with Bayside silty clay loam.

At sample points 4 SC and 5 SC recent disturbance (dumping of gravel and wood chips, as well as goat grazing) made determining the wetland boundary more difficult (Photo 8). These two sample points were inspected during both the dry and wet weather seasons. No evidence of hydrology or redoximorphic features in the soil was observed during either of the site inspections therefore these sample points were determined to be upland.

Two transects were used to determine wetland boundaries through remnant industrial infrastructure on the southern Crowley property. One transect includes sample points 3 SC, 4 SC, and 5 SC and the other transect corresponds with sample points 6 SC, 7 SC, and 8 SC. As stated above, sample points 4 SC and 5 SC are upland and have been recently disturbed. Sample point 3 SC is wetland; it had a predominance of hydrophytes, hydrology was detected during the August field inspection, and the soil was low chroma with an abundance of gley mottles between 10 and 16 inches of the surface. Sample points 6 SC, 7 SC, and 8 SC were all determined to be wetland but 6 SC and 7 SC are separated from 8 SC by an old road prism, which was confirmed with upland sample point 17 SC. The road prism lacked hydrology and hydric soil indicators.

Sample points 9 SC, 10 SC, and 12 SC are located in the southern portion of the southern Crowley property (Photo 10). All three characterizations points are dominated by hydrophytes and hydrology was evident with saturation in the upper 12-inches of the soil profile. The three-sample points contained mottles in the lower profile, while sample points 9 SC and 12 SC where gley within 8-10 inches of the surface. Sample point 12 SC has been by construction of the historic pond features in that area of the site.

The southern Crowley property also contains two cattail (*Typha latifolia*) dominated human-made ponds (Photo 11). Sample points were not necessary to characterize these wetlands because hydrophyte vegetation is highly confined by water levels and then rapidly transitions to upland dominated vegetation beyond the water line.

The southern Crowley property portion of the study area contains approximately 4.92 acres of wetlands. The wetlands within the northeastern portion of the site have been substantially altered, such as filled, during previous industrial activities or contain remnants of historic infrastructure. The wetlands within the southern portion of the site are far less disturbed, as evident by the intact soil profiles, and are relatively high quality.

4.3.4 Parking and Landscaping Area

The pre-existing parking and landscape area contains no wetlands except at the northern extent where paired sample points 8 PLA and 8B PLA were characterized. Sample point 8 PLA is located in a small depression that has a higher percentage of hydrophytes and a lower percentage of upland species than the upland sample point 8B PLA. Soil colors and values were similar between the sample points, however, saturation within the soil profile was apparent in 8 PLA.

The parking and landscape area of the study area contains approximately 0.11 acres of Palustrine emergent/scrub-shrub wetland and 0.04 acres of salt marsh for a total of approximately 0.15 acres of within this portion of the study area.

4.3.5 Estuarine Habitat

Estuarine habitat, including both NWI wetland classes E2AB3M and E2US3N, was not characterized with sample points because it either clearly resides below the MHWL or is vegetated with salt marsh species and/or there is evidence of periodic tidal intrusion, including eel grass remnants. Habitat delineated as salt marsh encompasses approximately 1.54 acres (Figure 4). This total includes the 0.04 acres of salt marsh delineated in the parking and landscape area. Habitat delineated as estuarine includes both of the NWI classes; however our delineation map varies from the NWI map. As stated above, the NWI maps depict wetlands on a macro scale and do not correspond with ground truthing, as is the case with this project.

4.3.6 Sensitive Areas

As stated at the beginning of this report, wetlands within the California Coastal Zone are under the regulation of a number of agencies including ACOE, CCC, California Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS), and local lead agencies. The definition of a wetland varies among the agencies ranging from a stricter mandate regarding the quality of water resources to a broader mandate concerning the protection of sensitive habitats (DFG, 1994). ACOE regulates wetlands pursuant to Section 404 of the Clean Water Act and requires the presence of all three wetland criteria to meet the ACOE definition of jurisdictional wetlands. CCC and DFG have broader mandates including the protection of coastal resources, biological resources (biodiversity), and ecological functions; therefore, the presence of all three wetland criteria is not required to identify these environmentally sensitive areas (CCC, 1994; DFG, 1994). For the purpose of this study, areas that provide important habitat for wildlife, contribute to the functional values of adjacent wetlands, and/or provide habitat for special status species are considered Environmentally Sensitive Habitat Areas (ESHA) and have been identified. Areas identified as ESHA are not meant to meet a strict regulatory definition of any resource agency but instead have been delineated based on SHN's scientific understanding of the important values of these areas and our best professional judgment. Habitat that has been delineated as ESHA is consistent with Section 6.A.6 of the City of Eureka General Plan Policy Document (City of Eureka, 1999).

4.3.7 Wetland/Upland Acreage

Out of the approximately 29-acre study area, approximately 8.12 acres were delineated as wetlands (Figure 4). Although portions of the study area tend to dry out due to the lack of an impermeable confining layer, hydrologic factors (such as, a high and fluctuating water table and high precipitation) exert an overriding influence on the plant species that occur in the wetland portions (Environmental Laboratories, 1987), as well as the morphology and structure of the soils present in the study area. The majority of the study area included some species considered to be hydrophytic. However, in Humboldt County, many species listed as facultative wetland indicators occur frequently in transitional or upland habitats, and are poor indicators of wetland status in the

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absence of the other corroborating soils and hydrological factors. Overall, the combination of hydrophytic vegetation, hydric soils, and saturation or ponding was used in this delineation to define wetlands. Please see Attachment 2 for representative photos of the study area.

4.3.8 ESHA Acreage

Areas that have been identified as ESHA are located adjacent to habitat delineated as wetlands, particularly on the southern Crowley property, or are distinct segments particularly on the northern Crowley property. ESHA encompasses approximately 0.35 acres in the study area.

5.0 Limitations

The conclusions in this wetland delineation reflect the best professional judgment of the SHN wetland delineation team and should not be considered final until verified by the ACOE and California Coastal Commission, as well as reviewed by the California Department of Fish and Game, and/or other local agencies with interest in wetland regulation/conservation. Property boundaries and wetland/upland mapping is approximate. Furthermore, the conclusions in this report represent a "snap shot in time" and not all herbaceous species were present at the time of the fieldwork. In addition, the delineation was not completed at the height of the wet season.

Please feel free to call us anytime at 707-441-8855 regarding the results of this report or the project.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.



Aimee C. Weber, CAE
Botanist and Certified Associate Ecologist



Michael G. van Hattem
Wildlife Biologist

ACW:MvH:lms

Attachments: 1. Wetland Delineation Data Forms
2. Study Area Photos

References Cited

- California Coastal Commission. (1994). *Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone*. Downloaded on 11-11-2005 at <http://www.coastal.ca.gov/wetrev/wetttitle.html>.
- California Department of Fish & Game. (December 14, 1994). *Wetland Resources Policy*. NRDFG. City of Eureka. (1999). *City of Eureka General Plan and Policy Document*. Eureka:City of Eureka.
- Environmental Laboratory. (1987). *Corps of Engineers Wetland Delineation Manual*. Technical Report Y-87-1. Vicksburg: U.S. Army Engineers Waterways Experiment Station.
- Hickman, J.C., ed. (1993). *The Jepson Manual, Higher Plants of California*. Berkeley: University of California Press.
- Kollmorgen Instruments Corporation. (1990). *Munsell Soil Color Charts*. Baltimore: Macbeth Division of Kollmorgen Instruments Corporation.
- McLaughlin James and F. Harradine. (March 1966). *Soils of Coastal Del Norte County California*. Davis: UC Davis, Department of Soils and Plant Nutrition and County of Del Norte County, California.
- National Oceanic & Atmospheric Administration. (viewed January 2007). NOAA online weather data, years 1971-2000. http://nowdata.rcc.acic.org/EKA/pubACIS_results. NR:NOAA.
- Oregon Department of State Lands. (2005). *Wetland Delineation Report Guidelines July 2005*; Oregon Department of State Lands, Portland District Corps of Engineers, U.S. Environmental Protection Agency, Region 10- Interagency Wetland Delineation Report Guidance. Viewed at http://www.oregon.gov/DSL/PERMITS/docs/wet_det_rpt_guidance.pdf
- U.S. Department of the Interior. (1987). "National Wetland Inventory Map," Eureka California Quadrangle. U.S. Department of the Interior Fish and Wildlife Service. Downloaded on 12-23-2006 at <http://www.fws.gov/nwi/>.
- U.S. National Ecology Research Center. (1988). *National List of Plant Species That Occur in Wetlands: California (Region 0)*. Biological Report 88(26.10), Springfield:U.S. Dept. of Commerce, National Technical Information Center.
- U.S. Geological Survey. (1972). 7.5-minute USGS Quadrangle Map: Eureka, California. NR:USGS.



Photo 1. Photo 1 shows the northern industrial yard with ruderal vegetation, historic and ongoing disturbance, and a lack of wetland habitat. Photo taken by SHN on 11-29-2006, orientation is to the south.



Photo 2. Photo 2 shows the willow dominated Palustrine scrub-shrub wetland on the northern Crowley property portion of the study area. Photo taken by SHN on 11-29-2006, orientation is to the east.



Photo 3. In the foreground (green arrow), slough sedge is dominant similar to sample points 2 NC, 3B NC, 6 NC and 7 NC, whereas sample point's 3A NC, 6B NC, and 5 NC are upland sample points (red arrow). Photo taken by SHN on 11-29-2006, orientation is to the south.



Photo 4. Willow dominated (Palustrine scrub-shrub) portions of the study area were degraded due to human encampments and debris.



Photo 5. A small depression on the compacted fill prism holds water long enough to support a small wetland dominated by pennyroyal (*Mentha pulegium*). Photo taken by SHN on 7-31-2006, orientation is to the south.



Photo 6. Sample point 1 SC is dominated by obligate hydrophytes, remains wet year round, and exhibits well developed hydric soils. Photo taken by SHN on 7-31-2006, orientation is to the south.



Photo 7. Sample point 15 SC is dominated by obligate hydrophytes, but also was hand cleared of willows within the last five years. Photo taken by SHN on 7-31-2006, orientation is to the south.



Photo 8. Wetland boundaries at sample point 4 SC and 5 SC were difficult to discern due to relatively recent disturbance and goat grazing. Photo taken by SHN on 7-31-2006, orientation is to the north.



Photo 9. Remnant industrial infrastructure remains at several wetland locations on the southern Crowley property. Photo taken at sample points 16 SC and 17 SC just north of sample points 6 SC through 8 SC. Photo taken by SHN on 7-31-2006, orientation is to the south.



Photo 10. All three characterizations points (9 SC, 10 SC, and 12 SC) are dominated by hydrophytes, hydrology is evident, and hydric soils are present including gley horizons in the profile. Photo taken by SHN on 7-31-2006, orientation is to the south.



Photo 11. Two cattail-dominated ponds occur on the south Crowley property. The soil removed to create these depression forms the upland berm enclosing each pond. Photo taken by SHN on 7-31-2006, orientation is to the south.

Species List Elk River Wildlife Trail Improvement Project 2006 Surveys, Eureka, California		
Scientific Name	Common Name	Presence (1=tree, 2=shrub, 3=herb)
<i>Alnus rubra</i>	red alder	1
<i>Eucalyptus globulus</i>	blue gum	1
<i>Ilex aquifolium</i>	English holly	1
<i>Malus fusca</i>	Oregon crab apple	1
<i>Pinus attenuata</i>	knobcone pine	1
<i>Pinus contorta</i> ssp. <i>contorta</i>	beach pine	1
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas-fir	1
<i>Rhamnus purshiana</i>	cascara	1
<i>Salix hookeriana</i>	Hooker's willow	1
<i>Salix lasiolepis</i>	arroyo willow	1
<i>Salix sitchensis</i>	Sitka willow	1
<i>Sequoia sempervirens</i>	coast redwood	1
<i>Baccharis pilularis</i>	coyote brush	2
<i>Cytisus scoparius</i>	Scotch broom	2
<i>Gaultheria shallon</i>	sala	2
<i>Genista monspessulana</i>	French broom	2
<i>Lonicera involucrata</i> var. <i>ledebourii</i>	black twinberry	2
<i>Lupinus arboreus</i>	yellow bush lupine	2
<i>Myrica californica</i>	wax myrtle	2
<i>Ribes sanguineum</i> var. <i>glutinosum</i>	pink-flowering currant	2
<i>Rosa</i> sp.	rose	2
<i>Rubus discolor</i>	Himalaya berry	2
<i>Rubus parviflorus</i>	thimbleberry	2
<i>Rubus spectabilis</i>	salmonberry	2
<i>Sambucus racemosa</i>	red elderberry	2
<i>Vaccinium ovatum</i>	evergreen huckleberry	2
<i>Abronia latifolia</i>	yellow sand-verbena	3
<i>Achillea millefolium</i>	common yarrow	3
<i>Agrostis exarata</i>	western bent-grass	3
<i>Agrostis</i> sp.	bent grass	3
<i>Agrostis stolonifera</i>	creeping bent-grass	3
<i>Aira caryophylla</i>	silver European hairgrass	3
<i>Ambrosia chamissonis</i>	silver burweed	3
<i>Anemophila arenaria</i>	European beachgrass	3
<i>Anagallis arvensis</i>	scarlet pimpernel	3
<i>Anaphalis margaritacea</i>	pearly everlasting	3
<i>Anthoxanthum odoratum</i>	sweet vernal grass	3
<i>Armeria maritima</i> ssp. <i>californica</i>	sea-pink	3
<i>Artemisia</i> sp.		3

Species List Elk River Wildlife Trail Improvement Project 2006 Surveys, Eureka, California		
Scientific Name	Common Name	Presence (1=tree, 2=shrub, 3=herb)
<i>Aster chilensis</i>	common California aster	3
<i>Athyrium filix-femina</i>	lady fern	3
<i>Atriplex leucophylla</i>	beach saltbush	3
<i>Atriplex patula</i>	spear oracle	3
<i>Atriplex triangularis</i>	spearscale	3
<i>Bellis perennis</i>	English daisy	3
<i>Blechnum spicant</i>	deer fern	3
<i>Brassica nigra</i>	black mustard	3
<i>Briza maxima</i>	large quaking or rattlesnake grass	3
<i>Briza minor</i>	small quaking or rattlesnake grass	3
<i>Bromus</i> spp.	brome grasses	3
<i>Cakile maritima</i>	sea rocket	3
<i>Calystegia soldanella</i>	beach morning-glory	3
<i>Camissonia cheiranthifolia</i>	beach primrose	3
<i>Cardamine oligosperma</i>	western bittercress	3
<i>Cardionema ramosissimum</i>	sandmat	3
<i>Carex deweyana</i> ssp. <i>leptopoda</i>	short-scaled sedge	3
<i>Carex obnupta</i>	slough sedge	3
<i>Carex</i> sp.	sedge	3
<i>Chamomilla suaveolens</i>	pineapple weed	3
<i>Cichorium intybus</i>	chicory	3
<i>Cirsium arvense</i>	Canada thistle	3
<i>Cirsium vulgare</i>	bull thistle	3
<i>Claytonia sibirica</i>	Siberian candyflower	3
<i>Conium maculatum</i>	poison hemlock	3
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	Point Reyes bird's-beak	3
<i>Cortaderia jubata</i>	pampas grass	3
<i>Crocosmia</i> sp.	crocosmia	3
<i>Cuscuta salina</i>	Dodder	3
<i>Cynosurus echinatus</i>	hedgehog dogtail grass	3
<i>Cyperus eragrostis</i>	nut-grass or tall flat-sedge	3
<i>Dactylis glomerata</i>	orchard grass	3
<i>Daucus carota</i>	wild carrot or Queen Anne's lace	3
<i>Deschampsia cespitosa</i> ssp. <i>cespitosa</i>	tufted hair-grass	3
<i>Digitalis purpurea</i>	foxglove	3
<i>Distichlis spicata</i>	saltgrass	3
<i>Eleocharis</i> sp.	spike-rush	3
<i>Epilobium ciliatum</i>	northern willow herb	3
<i>Equisetum arvense</i>	common horsetail	3

Species List
Elk River Wildlife Trail Improvement Project 2006 Surveys, Eureka, California

Scientific Name	Common Name	Presence (1=tree, 2=shrub, 3=herb)
<i>Equisetum hyemale</i> ssp. <i>affine</i>	common scouring rush	3
<i>Erechtites minima</i>	toothed coast fireweed	3
<i>Eriogonum latifolium</i>	beach buckwheat	3
<i>Eschscholzia californica</i>	California poppy	3
<i>Festuca arundinacea</i>	tall fescue	3
<i>Festuca rubra</i>	red fescue	3
<i>Foeniculum vulgare</i>	fennel	3
<i>Fragaria vesca</i>	wood strawberry	3
<i>Fuschia</i> sp.	ornamental fuschia	3
<i>Galium</i> sp.	bedstraw	3
<i>Geranium dissectum</i>	cut-leaved geranium	3
<i>Geranium molle</i>	dovefoot geranium	3
<i>Geranium</i> sp.	geranium	3
<i>Gnaphalium</i> sp.	cudweed	3
<i>Grindelia stricta</i>	gumweed	3
<i>Hedera helix</i>	English ivy	3
<i>Heracleum lanatum</i>	cow parsnip	3
<i>Holcus lanatus</i>	common velvet grass	3
<i>Hordeum jubatum</i>	foxtail barley	3
<i>Hypericum perforatum</i>	Klamath weed or common St. John's-wort	3
<i>Hypochaeris radicata</i>	hairy cat's-ear	3
<i>Iris douglasiana</i>	Douglas iris	3
<i>Jaumea carnosa</i>	fleshy jaumea	3
<i>Juncus balticus</i>	Baltic rush	3
<i>Juncus bolanderi</i>	Bolander's rush	3
<i>Juncus bufonius</i>	common toad rush	3
<i>Juncus effusus</i>	common rush	3
<i>Juncus ensifolius</i>	dagger-leaf rush	3
<i>Juncus leseurii</i>	salt grass	3
<i>Juncus patens</i>	spreading rush	3
<i>Lathyrus latifolius</i>	everlasting pea	3
<i>Lathyrus</i> sp.	pea	3
<i>Lemna</i> sp.	duckweed	3
<i>Lessingia filaginifolia</i>	beach aster	3
<i>Leucanthemum vulgare</i>	ox-eye daisy	3
<i>Leymus mollis</i>	American dunegrass	3
<i>Linum bienne</i>	western blue flax	3
<i>Lolium perenne</i>	perennial ryegrass	3

Species List Elk River Wildlife Trail Improvement Project 2006 Surveys, Eureka, California		
Scientific Name	Common Name	Presence (1=tree, 2=shrub, 3=herb)
<i>Lolium multiflorum</i>	Italian ryegrass	3
<i>Lonicera hispidula</i> var. <i>vacillans</i>	hairy honeysuckle	3
<i>Lotus corniculatus</i>	birdfoot trefoil	3
<i>Lotus micranthus</i>	rose-flowered lotus	3
<i>Lupinus bicolor</i>	miniature lupine	3
<i>Lysichiton americanum</i>	skunk cabbage	3
<i>Melilotus officinalis</i>	yellow sweet clover	3
<i>Mentha pulegium</i>	pennyroyal	3
<i>Montia parvifolia</i>	streambank spring beauty	3
<i>Navarretia squarrosa</i>	skunkweed	3
<i>Oenanthe sarmentosa</i>	Pacific water-parsley	3
<i>Parentucellia viscosa</i>	yellow parentucellia	3
<i>Petasites frigidis</i> var. <i>palmatus</i>	western coltsfoot	3
<i>Phalaris arundinacea</i>	reed canary grass	3
<i>Plantago lanceolata</i>	English plantain	3
<i>Plantago major</i>	common plantain	3
<i>Poa</i> sp.	bluegrass	3
<i>Polygonum arenastrum</i>	beach knotweed	3
<i>Polypogon monspeliensis</i>	rabbitfoot grass or annual beard grass	3
<i>Polystichum munitum</i>	sword fern	3
<i>Potentilla anserina</i>	silverweed	3
<i>Prunella vulgaris</i>	self-heal	3
<i>Pteridium aquilinum</i> var. <i>pubescens</i>	western bracken fern	3
<i>Ranunculus occidentalis</i>	western buttercup	3
<i>Ranunculus repens</i>	creeping buttercup	3
<i>Raphanus sativus</i>	wild radish	3
<i>Rorippa nasturtium-aquaticum</i>	water cress	3
<i>Rubus ursinus</i>	Pacific bramble or California blackberry	3
<i>Rumex acetosella</i>	sheep sorrel	3
<i>Rumex crispus</i>	curly dock	3
<i>Rumex salicifolius</i>	willow dock	3
<i>Salicornia virginica</i>	pickleweed	3
<i>Scirpus americanus</i>	three-square bulrush	3
<i>Scirpus cernuus</i>	low club-rush	3
<i>Scirpus microcarpus</i>	small-flowered bulrush	3
<i>Scrophularia californica</i>	coast figwort	3
<i>Senecio vulgaris</i>	common butterweed	3
<i>Solidago spathulata</i>	dune goldenrod	3

Species List Elk River Wildlife Trail Improvement Project 2006 Surveys, Eureka, California		
Scientific Name	Common Name	Presence (1=tree, 2=shrub, 3=herb)
<i>Sonchus asper</i> ssp. <i>asper</i>	prickly sow thistle	3
<i>Spartina densiflora</i>	cordgrass	3
<i>Spergularia macrotheca</i>	sandspurry	3
<i>Stachys ajugoides</i>	hedge nettle	3
<i>Stachys chamissonis</i>	Chamisso's hedge nettle	3
<i>Tanacetum camphoratum</i>	dune tansy	3
<i>Trifolium pratense</i>	red clover	3
<i>Trifolium repens</i>	white clover	3
<i>Trifolium wormskoldii</i>	springbank clover	3
<i>Triglochin maritima</i>	seaside arrow-grass	3
<i>Typha latifolia</i>	broadleaf cattail	3
<i>Urtica dioica</i> ssp. <i>holosericea</i>	stinging nettle	3
<i>Verbascum thapsis</i>	woolly mullein	3
<i>Veronica americana</i>	American brooklime	3
<i>Vicia americana</i> var. <i>americana</i>	American vetch	3
<i>Vicia hirsuta</i>	hairy vetch	3
<i>Vinca major</i>	greater periwinkle	3