Natural Resources Assessment

Connor Creek Erosion Control Project
Grays Harbor County

PACIFIC
INTERNATIONAL
ENGINEERING PLLC

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Appendix A. Wetland Data Sheets

1. Introduction

Connor Creek is located in Grays Harbor County (GHC) between Ocean City and the City of Copalis. On February 12, 2001, Pacific International Engineering^{PLLC} (PI Engineering) staff biologists visited Connor Creek to delineate the wetland and assess the values of the associated habitats within the study area.

Before conducting the field evaluation, the *National Wetland Inventory* (NWI) was consulted. The NWI identified the site as Estuarine Intertidal Flat/Regularly Flooded (E2FLN) and Estuarine Intertidal Beach/Bar/Irregularly Flooded (E2BBP). The Soil Survey the GHC area was also reviewed for the possible listing of hydric soils in the area. The Soil Survey listed the local soils as beaches (sand not able to support vegetation).

2. Methodology

2.1 Wetland Delineation Methods

To perform the wetland delineation, the 1997 *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997*)* was used. This state manual is a revised version of the U.S. Army Corps of Engineers (Corps) Wetlands Delineation Manual (Corps 1987). The methodology in this manual recognizes that the three parameters of hydrology, wetland soils, and wetland plants are generally found in wetlands and that these parameters are important in the establishment and maintenance of wetland communities. The methodology evaluates each of the three parameters to determine if a wetland is present and establishes wetland boundaries. The wetland parameters are defined as:

Hydrophytic Vegetation - The U.S. Fish and Wildlife Service (USFWS) (Reed 1993) has established a rating system that has been applied to commonly occurring plant species on the basis of their frequency of occurrence in wetlands. Species indicator status expresses the range in which plants may occur in wetlands and non-wetlands (uplands). Under this system, vegetation is considered hydrophytic when there is an indicator status of facultative (FAC), facultative wetland (FACW), or obligate (OBL) wetland (Table 1). Modifiers are used with the plant indicator categories to specifically define the frequency of occurrence. A positive (+) sign indicates that plants are more frequently found in wetlands than the category indicates, whereas a negative (-) sign indicates that plants are less frequently found in wetlands than the indicator signifies. A status of FAC- does not meet the hydrophytic plant community criterion. The hydrophytic vegetation criterion for wetland determination is met when 50 percent or more of the dominant plant species are FAC or wetter.

Table 1. USFWS Plant Indicator Status

Plant Indicator Status Category	Indicator Status Abbreviation	Definition (Probability of Occurrence)
Obligate Upland	UPL	Occur rarely in wetlands (less than 99 percent) and almost always in uplands (greater than 99 percent)
Facultative Upland	FACU	Occur rarely in wetlands (less than 99 percent) and almost always in uplands (greater than 99 percent)
Facultative	FAC	Equal likelihood in uplands and wetlands (33 to 67 percent)
Facultative Wetland	FACW	Occur sometimes in wetlands (1 to less than 33 percent), but more likely in uplands (greater than 67 to 99 percent)
Obligate Wetland	OBL	Occur rarely in uplands (less than 99 percent) and almost always in wetlands (greater than 99 percent)
Not Listed	NL	Not listed in USFWS *National List of Plant Species that Occur in Wetlands*

Hydrology - Evidence of permanent or periodic inundation, or soil saturation to within 12 inches of the surface for one week or more during the growing season (soil temperatures above 41 deg.) meets the hydrology criterion. Stained leaves, soil surficial cracking or water-borne litter are secondary indicators of wetland hydrology.

Hydric soils - Soils that are saturated, flooded, or ponded enough during the growing season to develop anaerobic conditions in the upper soil horizons are considered hydric soils. Visible indicators include high organic content, low soil chroma (Munsell matrix chroma of 2 with mottles or less than 2 without mottles (Kollmorgen 1994)), or gleying.

The presence of dominant hydrophytic vegetation was used to delineate the boundary between wetland and upland areas (Table 2). The boundary was frequently confirmed by checking the soil color and organic content to verify presence of hydric soils.

Table 2 List of plant species identified at Connor Creek

Common Name	Scientific Name	Indicator Status
European beachgrass	*Ammophila arenaria*	FACU
Bighead sedge	*Carex macrocephala var. macrocephala*	FAC-
Slough sedge	Carex obnupta	OBL
Soft rush	*Juncus effusus*	FACW+
Sickleleaf rush	*Juncus falcatus var. sitchensis*	FACW-
Mud rush	*Juncus gerardii var. gerardii*	FACW+
Water-parsley	*Oenanthe sarmentosa*	OBL
Ditch-grass	*Ruppia maritime*	OBL
Sitka alder	*Alnus viridis ssp. sinuate*	FACW
Cattails	*Typha latifolia*	OBL
Pacific bayberry	*Myrica gale*	OBL
Wax Myrtle	*Myrica californica*	NI
Hookers Willow	*Salix hookeriana*	FACW-

2.2 Habitat Survey Methods

Habitat surveys began at the mouth of Connor Creek, located 500 ft north of Benner Rd. Stream cross sectional transects were conducted every 1,000 ft, unless a change in habitat type was identified; at which point a new transect would be measured. Stream width (bankfull and wetted), depth (average and max), substrate material, and bank condition were measured using the methods described in the U.S. Forest Service *Stream Inventory Handbook* (USFS 1999) and were recorded at each transect. Photos were also taken looking downstream at each stream cross section transect.

3. Results

3.1 Wetland Delineation Results

3.1.1 Wetland A

Wetland A is located west of the Surfcrest Condominiums at the south end of the Study Area (Figure A) and includes side channels and saturated lower elevation areas several hundred feet from the channel. The wetland is located between the first and second dune system. The total surveyed size of wetland A is 3.95 acres and it is classified as a Palustrine emergent shrub-scrub, regularly flooded tidal freshwater wetland system.

Vegetation - The vegetation community is a shrub-scrub, emergent, and aquatic bed layered system. The shrub-scrub component is comprised of Sitka alder, Hookers willow, and sweetgale. The herbaceous layer is comprised of slough sedge and soft rush. The aquatic bed layer consists of water-parsley and ditch-grass.

Soils - Soils are beach sand saturated within the first few inches of the surface. The soil colors are gleyed 4/10Y with a sulfidic odor from the surface to 16 inches. The first few inches contain a high organic content. Iron concretions are present in deeper soils.

Hydrology - Hydrology is supported by ground water flow into Connor Creek and by the rising and falling water levels of Connor Creek. The hydrology patterns are comprised of both small depressional areas and side channels that flow several hundred feet away from the main channel. A high water table, as well as flow from the stream, hydrologically support the side channels.

3.1.2 Wetland B

Wetland B is located northwest of the Surfcrest Condominiums and north of Wetland A on the left bank of Connor Creek (Figure A). Wetland B encompasses .34 acres and is classified as a Palustrine emergent, regularly flooded tidal freshwater wetland system.

Vegetation - The hydrophytic vegetation is an emergent and aquatic bed layered system. The herbaceous layer consists of slough sedge and soft rush. The aquatic bed layer consists of water-parsley and ditch-grass. There are a few individual species of shrub-scrub, such as Hookers willow and sweetgale, but the shrub-scrub layer does not

cover enough square feet of the wetland to be considered a separate class.

Soils - The soils in Wetland B are beach sand, hydric and saturated within 2 inches of the surface. Soil colors are gleyed 4/10Y with a sulfidic odor from the surface to 16 inches. The first few inches are littered with a high organic content, with concretions present in deeper soils.

Hydrology - Hydrology is supported by ground water flow into Connor Creek and by the rising and falling water levels of Connor Creek. The wetlands function as riverine flow-through wetlands, and are directly influenced by the water levels of Connor Creek.

3.1.3 Wetland C

Wetland C is located on the west bank of Connor Creek and north of Wetland B (Figure A). This wetland encompasses .45 acres and is classified as a Palustrine emergent shrub-scrub, regularly flooded tidal freshwater wetland system.

Vegetation - The riparian vegetation community is a shrub-scrub, emergent, and aquatic bed layered system. The shrub-scrub is comprised of Sitka alder, Hookers willow, and sweetgale. The herbaceous layer consists of slough sedge, soft rush, and cattails. The aquatic bed layer consists of water-parsley and ditch-grass. There are small patches of dune grass established on dunes within the wetland.

Soils - Wetland soils are beach sand and are saturated to the surface. The soil colors are gleyed 4/10Y with a sulfidic odor from the surface to 16 inches. The first few inches are littered with a high organic content while deeper soils contain magnesium or iron concretions. There are some soils developing organic streaking within the wetland. In addition, there are gleyed soils in surrounding areas and developing signs of organic streaking within the wetland.

Hydrology - Hydrology is supported by ground water flow into Connor Creek and by the rising and falling water levels of Connor Creek. There is a small depressional riverine impounding wetland located west of Wetland C. This riverine impounding wetland has a depressional bowl shape, but is influenced by Connor Creek floodwaters. This small wetland was flagged as wetland C (a), but is considered a part of Wetland C due to its hydraulic connection.

3.1.4 Wetland D

Wetland D is located west of Connor Creek and north of Wetland C (Figure A). This wetland is a Palustrine emergent shrub-scrub, regularly flooded tidal freshwater wetland system and encompasses 2.27 acres.

Vegetation - Wetland vegetation is a shrub-scrub, emergent, and aquatic bed-layered system. The shrub-scrub layer is comprised of Sitka alder, Hookers willow, and sweetgale, with some wax myrtle dispersed throughout the wetland. The herbaceous layer is comprised of slough sedge, soft rush, and cattails. The aquatic bed layer consists of water-parsley and ditch-grass.

Soils - All soils consisted of beach sand, however, the direct connection to the water table, the floodwaters of Connor Creek, and the deposition of decomposed organic materials have developed a somewhat hydric sand layer. Soils are a saturated sandy gleyed 4/10Y with a sulfidic odor from the surface to 16 inches. The first few inches are littered with a high organic content, with magnesium or iron concretions present in deeper soils.

Hydrology - Wetland hydrology is supported by ground water flow into Connor Creek and by the rising and falling water levels of Connor Creek. There is another small depressional riverine impounding wetland west of Wetland D, flagged as Wetland D (a).

3.1.5 Wetland E

This wetland is located on the east side of Connor Creek opposite from wetlands B and C (Figure A). Wetland E consists of several small riparian wetlands scattered along the east shoreline of Connor Creek. Wetland E is a Palustrine emergent shrub-scrub, regularly flooded tidal freshwater wetland system.

Vegetation - The vegetation is comprised of a dense layer of slough sedge with small patches of cattails, Sitka alder, and Hookers willow.

Soils - Wetland soils are inundated beach sand. The soil colors are gleyed 4/10Y with a sulfidic odor from the surface to 16 inches. The first few inches have a high organic content and the rest of the soils show signs of magnesium or iron concretions.

Hydrology - Hydrology is supported by ground water flow into Connor Creek and by the rising and falling water levels of Connor Creek. The wetlands function as riverine flow-through wetlands, and are directly influenced by the water levels of Connor Creek.

3.2 Habitat Survey Results

Connor Creek, from the mouth upstream to 5,276 ft, consisted primarily of glide habitat. Channel width ranged from 33 ft to 76 ft for the first 4,000 ft, then increased to 249 ft at 5,276 ft. Channel substrate type was sand with no spawning gravel identified throughout the entire length. Average wetted depth was 1.4 ft with a maximum depth of 3.8 ft. The left bank substrate was sand with a slope of near zero, and no vegetation was observed. The right bank was sand with an approximately 90-degree slope and active erosion. Right bank vegetation consisted of 100 percent beachgrass (*Ammophila arenaria*) coverage. At 3,000 ft, organic material was starting to accumulate in small pockets within the channel. *Corophium sp*., three-spined stickleback (*Gasteroteus aculeatus*), and sculpin (*Cottidae sp*.) were observed at approximately 3,000 ft.

At 5,276 ft, bank characteristics changed noticeably. The left bank slope increased, ranging between 2 and 5 deg., in association with the beach dune. Beachgrass was the dominant vegetation with about 40 percent coverage. The right bank became more stable with a slope of approximately 40 deg., and few signs of active erosion. Beachgrass was the dominant vegetation on the right bank, with close to 100 percent coverage. Vegetation was beginning to grow along both banks of the creek and in the channel. The amount of organic material present in the channel also increased dramatically, as well as channel depth and width. Several areas of lower elevation were present in the dunes on the left bank, indicating tidal breaching of the dunes.

From 5,276 ft to 9,276 ft (the upstream end of the stream survey), the creek habitat increased in complexity. Small off-channel pools were present and aquatic vegetation and organic material presence in the channel increased further upstream. Small wetlands were observed at 6,969 ft and 8,216 ft on the left bank. At 8,636 ft, another wetland began on the left bank and continued to the end of the stream survey. Wetted channel width increased and ranged from 110 ft to 350 ft, with depths ranging from 1.8 ft to greater than 4 ft. The left bank consisted of sand, with slopes ranging from 2 to 5 deg. to the top of the beach dunes. The right bank was also sand with slopes ranging from 5 to 70 deg., with few signs of active erosion. Beachgrass was the dominant vegetation on both banks with coverage greater than

90 percent. Sculpin and three-spined sticklebacks were the only fish species observed in the channel at the upstream end of the survey. Other animals observed in this area included frogs (*Rana sp*.), beaver (*Castor canadensis*), mallard ducks (*Anas platyrhynchos*), great blue herons (*Ardea herodias*), Barrow's goldeneye (*Bucephala islandica*), belted kingfisher (*Ceryle alcyon*), wrens (*Troglodytidae sp*.) and other song birds.

4. Summary

Based on previous and recent observations, the riparian wetland area is growing in size and riparian vegetation is becoming established along the Connor Creek channel. The increased channel length may be reducing saltwater influx to the wetland, providing suitable habitat for salmon, amphibians, waterfowl, and small mammals. Five wetland areas were identified and delineated around the south end of the study area. These wetlands were in early stages of development.

Within the southern portions of the Connor Creek channel, habitat complexity is starting to develop with increased organic matter and invertebrate populations. Due to the instability of the system, it is difficult to project channel habitat development in the future.

5. References

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FIGURE A

CONNOR CREEK WETLAND DELINEATION

APPENDIX A

WETLAND DATA SHEETS