Final Prospectus
for the
Long Beach
Wetland Mitigation Bank
in
Pacific County, Washington

Prepared for:
Mitigation Banking Review Team

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The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.

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INTRODUCTION

SITE LOCATION

The proposed 72.95-acre wetland mitigation bank is located on the Long Beach Peninsula in Pacific County, Section 28, Township 11 North, Range 11 West of the Willamette Meridian. Figure 1 shows the project location and proposed service area, and Figure 2 shows local topography. The site can be accessed by traveling north from Long Beach on Ocean Beach Highway (SR 103) and turning east onto 148th Place.

The proposed mitigation bank consists of two parcels totaling 82.00 acres (Parcel Numbers 74049908000 and 74049901000); however, a total of 9.05 acres along the perimeter of the parcels is reserved as preservation areas for other projects on the peninsula requiring wetland mitigation (see Figure 3). These areas are not proposed as part of the mitigation bank, but they will function as a 100-foot buffer to the proposed 72.95-acre mitigation bank.

OWNERSHIP AND LEGAL RESTRICTIONS

The property is owned by LBMB, LLC (Long Beach Mitigation Bank). There are no liens on the property; however, there is a county storm-drain easement that is 30 feet wide and extends into the property 190 feet.

A report was obtained from Environmental Data Resources, Inc. (EDR 2007) to help assess potential environmental-risk information on or adjacent to the site. Twenty-seven federal and nineteen state and local databases were searched for potential hazards such as Superfund sites, hazardous waste, solid-waste facilities, leaking underground-storage tanks, clandestine drug labs, inactive dry cleaners, etc. No sites were listed on these databases within standard search radii used for Phase I Environmental Assessments.

MITIGATION BANK DESIGNERS

Francis Naglich, MES, is a wetland biologist and president of ELS. Tim Haderly is an ecologist and vice-president of ELS. Mr. Naglich and Mr. Haderly have 20 and 18 years experience, respectively, in managing watershed, stream, and wetland projects in Washington and Oregon.

Francis served on the state wetland rating form team and proposed the specific wetland rating system for interdunal wetlands. ELS has worked on numerous wetland mitigation projects on the Long Beach Peninsula and has obtained permits for two large properties with preservation tracts for wetland mitigation (Peninsula Sanitation and Cranguyma Cranberry Farm). He has also obtained permits for wetland preservation tracts at Trendwest Resorts, Codega Cranberry Farm, Staudenraus Cranberry Farm, CranMac Cranberry Farm, and the Naglich property (single family). ELS also investigated Seastrand Bog as a preservation site for wetland mitigation associated with the Links at Half Moon Bay golf course and was the consultant for the Grayland Beach State Park improvements and mitigation.

LANDSCAPE POSITION AND GEOMORPHOLOGY

The Pacific Ocean is approximately one mile to the west of the proposed mitigation-bank site. Willapa Bay, an estuary, is approximately two miles to the east. The Long Beach Peninsula likely formed as a consequence of climate warming after the last ice age. Retreating glaciers caused the ocean to rise about 200 feet, forming new bars and beaches. The peninsula began as a bay-mouth bar formed from Columbia River sand which now extends northward 28 miles from the mouth of the river. As the peninsula widened, successive numbers of dune ridges and swales formed from blowing sand. At the same time land was accreting to the west, vegetation stabilized the older ridges and swales.

Dune systems are a rare environment in Washington; the Long Beach Peninsula represents approximately half the coastal dune area of the state. The peninsula has the following characteristics atypical of most dune systems (City of Long Beach *Dune Management Report*, 2000):

- Significant localized accretion (over 20 feet per year in the 1970s and over 30 feet per year in the 1980s)
- Wetlands with varying degrees of maturity
- A mix of private and public ownership
- A resort-area setting along with rural areas, cranberry bogs, and small forested tracts
- Recreation and tourist uses that are a significant part of the local economy

The introduction of European dunegrass to the area in the 1930s has significantly stabilized the dunes, which when coupled with the increased land mass, low swales, high annual precipitation (80 inches per year), and a high groundwater level, has created a deflation plain with interdunal wetlands. In the City of Long Beach, wetlands are estimated to comprise about 15 percent of the dunal system (City of Long Beach *Dune Management Report*, 2000). Many interdunal wetlands in the area are transitioning either to upland or wetland, depending on short- and long-term trends in precipitation.

LAND USE IN VICINITY

On the Long Beach Peninsula, human activities are primarily located in upland areas. Recreation, communities, towns, and tourism are more common along the beaches, and residential and agricultural areas are generally located on dune ridges. Wetland areas on the peninsula have been used for cranberry farms, shown as brown areas on the NWI map in Figure 4 (USFWS 2007). A high density of cranberry farms is located approximately one mile south along Cranberry Road. The proposed mitigation bank is bordered on the north, east, and south by vacant wetland areas, with the exception of one single-family residence to the south. A small residential area consisting of approximately fifteen homes is located on the northern portion of the western property line. A gravel road extends along the western property line to within about 100 feet of the southwestern property corner.

The proposed mitigation bank has been formerly used for timber production and is zoned as Agricultural. The property has been selectively logged within the last 20 years. There are no structures, driveways, roads, or recreational trails onsite. Access roads lead from SR 103 to the small residential area adjacent to the western site boundary, and a gravel road

extends from the residential area south along the western boundary. There has been illegal garbage dumping along the gravel road that includes appliances, televisions, camper tops, and vehicle bodies.

Other Mitigation Banks on the Long Beach Peninsula

Other mitigation banks on the Long Beach Peninsula include the McHugh Demonstration Mitigation Bank located on Willapa Bay near the mouth of Albers Slough. This bank was an estuarine-wetland restoration project that was established as a demonstration wetland bank, and most of the credits have been sold for county public works projects. Washington State Department of Transportation owns another area of approximately 43 acres of diked, high salt marsh near Albers Slough, but no activity has occurred at this site.

Another mitigation site south of Seaview preserves high-quality wetlands for multiple projects. This site has been used only on a case-by-case basis and is not a formally designated bank.

SITE SELECTION

Proposed Service Area

The proposed service area for this wetland mitigation bank includes projects with wetland impacts on the Long Beach Peninsula that either have no outlet or that drain to the Willapa Bay or Pacific Ocean (see Figure 1). Sites in the Columbia River watershed will not be included.

Rationale for Site Selection

The proposed 72.95-acre mitigation-bank is located on two parcels and meets all the criteria listed above. It is part of a mature interdunal wetland and will be used to mitigate impacts to interdunal wetlands on the Long Beach peninsula. This site has the potential for timber harvest of mature onsite trees and has the potential for conversion to residential development or cranberry farming (it is zoned Agricultural). If the property was re-zoned for a residential use with a 5-acre minimum, up to 16 homes could be constructed along the western boundary of the site where there is a mosaic of uplands and wetlands and an existing gravel access road that abuts the western side of the parcel. Residential areas could impact the wetland by increasing impervious surfaces, pesticide use, septic-tank effluent, increased noise and light, and increased presence of humans, pets, and livestock. Figure 5 shows aerial photographs from 1943 and 2007 that show residential growth in the area.

The onsite wetland is in a relatively natural state and does not need extensive restoration. There is opportunity for 7.2 acres of enhancement in the wetland/upland mosaic area (see Figure 3). The site has been logged in the last 15 years, but there are still large, mature trees onsite too large for most mills to process (see Photoplates); however, there are also many smaller trees within the mosaic area that are ready for harvesting. Timber values in this area increase 3 to 4 percent each year.

The onsite wetland is part of a extensive wetland swale (greater than 15 miles long) that includes Loomis Lake, which is about one mile north of the site. The wetland is also connected to both the Pacific Ocean and Willapa Bay through surface-water features that include wetlands, streams, and ditches.

The Pacific County Comprehensive Plan (1998) projected 6,007 new residents in Pacific County between 1996 and 2016. The projected land needed for this growth is 5,118 acres, which is 48 percent of the vacant buildable land. The increased demand for residential development on the peninsula will lead to the increased potential for impacting critical areas and their buffers.

SITE SELECTION METHOD

The focus of this proposed wetland-mitigation bank is to provide mitigation for projects within the service area that impact interdunal, depressional wetlands in areas where onsite mitigation is discouraged by the Washington Department of Ecology and the U.S. Army Corps of Engineers because of inadequate onsite acreage and inadequate buffer widths to provide wetland protection. There are many "piano-key lots" on the peninsula that cannot be used for development in compliance with local land-use designations without impacting wetlands or wetland buffers. Onsite mitigation within these lots usually leaves poor options for wetland creation or enhancement. The potential for improving wetland functions in these situations is low because of the high building density, which leads to a high level of human presence. Additionally, buffers on small lots usually cross property boundaries; neighboring landowners are not typically aware of the presence of wetlands on neighboring properties, let alone observing their associated buffers. This situation leads to many inadvertent and unmitigated wetland and buffer impacts.

Instead of providing onsite mitigation on small lots with little chance of improving wetland function or protection, there are existing high-quality wetlands that are in danger of impacts from residential development, cranberry farming, or timber harvest. A mitigation bank that preserves high-quality wetlands provides an overall increase of wetland functions within the service area. Therefore, the following criteria were used for mitigation-bank site selection to provide legal protection for preserving existing high-quality wetlands:

- One contiguous piece of land over 40 acres in size.
- Depressional HGM classification
- Is in the Pacific Ocean or Willapa Bay watersheds, or is part of the large, central wetland swale in the center of the peninsula.
- Category I wetland or the potential for restoring or enhancing to Category I within 10 years.
- Potential for onsite areas to be harvested for timber or to be converted to residential development or cranberry farming.
- Large percentage of wetland area within property boundaries.
- Connections to large, relatively undisturbed, wetland or upland areas.

APPLICATION OF MITIGATION-BANK LOCATION GUIDELINES

The proposed mitigation bank received a high score compared to surrounding areas using the *Guidance on Locating Mitigation Banks Using a Landscape-Based Approach*

(Mitigation Bank Review Team 2007). The high score was received for the following reasons: it has a high percentage of area with wetlands/floodplains/lakes, relatively low amounts of human alteration, and a high score of relative importance. Using the guidance matrix, these characteristics make it suitable for wetland protection.

Characteristics of the selected mitigation bank were evaluated using the site-selection checklist (Appendix J) in *Wetland Mitigation in Washington State – Part 2, Version 1* (WDOE 2006). Results showed that the proposed site meets applicable checklist criteria.

LAND-USE COMPATIBILITY

The proposed mitigation bank is within Pacific County jurisdiction. The site is not encumbered by legal constraints, which may conflict with placing land under long-term protection through a deed restriction. Additionally, the bank design is not located where surrounding land uses could limit the bank design or wetland functions (utilities, historic districts, etc.). The proposed bank has not been designated as "agricultural land of long-term significance" or "agricultural land of local importance" (Pacific County Comprehensive Plan 1998).

The bank can achieve the following local-planning goals: preserve and protect wetlands to prevent their continued loss and degradation; prioritize preservation of resources over public access, recreation, and development whenever a conflict exists (Pacific County Shoreline Master Program 2000); and wetlands should be protected because they provide important functions which add to the quality of life in Pacific County (Pacific County Comprehensive Plan 1998). The Dune Management Plan (2000) for the City of Long Beach states that offsite mitigation sites be located within high-quality wetlands on the Long Beach Peninsula.

The proposed mitigation-bank functions are expected to have the following positive effects on the surrounding environment: provides 72.95 acres of undeveloped wetland and upland wildlife habitat, improves water-quality of stormwater entering the site from adjacent land uses, provides flood-storage capacity, and maintains high groundwater levels.

There are currently no other approved mitigation banks in the county (other than the McHugh Demonstration Bank discussed above). A wetland mitigation project for impacts on a small lot in the City of Long Beach jurisdiction received Water Quality Certification from Washington Department of Ecology on August 8, 2007 for 5 acres of offsite mitigation (preservation) at the proposed mitigation-bank site.

DESCRIPTION OF THE WETLAND

The proposed mitigation-bank site is part of an extensive wetland extending in a narrow, 15-mile-long swale in the center of the Long Beach Peninsula that connects to large areas of wetlands south and east of the City of Long Beach and is connected by surface water and wetlands to both the Pacific Ocean and Willapa Bay (see Figure 4). This swale (depressional wetland) ranges from several hundred feet wide to about one-half mile wide and includes Loomis Lake, located north of the site, which is connected to the Pacific

Ocean by a maintained outlet canal. The wetland swale is approximately 20 to 30 feet above mean sea level.

Although the large wetland system has been disconnected from other natural habitats by roads and human activity, and its buffers have been reduced in many areas, the wetland provides important local and regional functions. It provides high levels of water-quality functions, because it receives water from agricultural and residential areas. It also functions as a groundwater recharge area; the average precipitation of 80 inches per year recharges freshwater in the aquifer, preventing salt-water intrusion from Willapa Bay and the Pacific Ocean.

The wetland provides moderate hydrologic functions because it has constricted outlets and can store a large amount of water during wet periods. Wildlife-habitat functions in this extensive wetland system are very high. Numerous hydroperiods and vegetation classes create many wildlife-habitat niches, and the size of the wetland creates areas for large numbers of species and individuals. There are also opportunities for species to move between wetland areas and between wetlands and uplands, because there are still many corridors and connections between these areas that are uninterrupted by human land uses.

FUNCTIONAL ASSESSMENT OF THE WETLAND

Functions for the large 15-mile-long wetland swale connected to Loomis Lake were assessed using the *Western Washington Wetland Rating Form* (Hruby 2004). The rating system is based on the functions of water quality, hydrology, and wildlife habitat.

The wetland is a Category I, depressional wetland (scoring a total of 92 points out of 100); it provides a very high level of water-quality functions (30 points), high hydrologic functions (28 points), and a very high level of wildlife-habitat function (34 points). It also qualifies as a Category I wetland because it is listed as a Natural Heritage Wetland by Washington Department of Natural Resources (WDNR 2007b), and it has areas of mature forest.

Water Quality (Removing nutrients, sediment, metals, and toxic organic compounds)

The wetland has a high score for water-quality functions (30 points). It has intermittently-flowing surface outlets, areas of organic and clay soils, and there is persistent vegetation throughout 95 percent of its area. It has the opportunity to improve water quality because it receives runoff from roads and areas of residential and agricultural land use.

Hydrology (Reducing peak flows, decreasing downstream erosion, recharging groundwater)

The primary hydrologic source for the wetland is the seasonally-high water table. The wetland has a high score for hydrologic function (28 points). It has an intermittently flowing surface outlet, there is ponding up to 3 feet in depth, and the wetland's watershed is less than 10 times the area of the wetland (see Figure 7). The wetland does not have an opportunity to reduce flooding because it does not drain to a stream that has flooding problems.

Wildlife Habitat (General, invertebrates, amphibians, fish, birds, mammals)
Habitat suitability for wildlife in the wetland is high (34 points) because there are five vegetative classes (aquatic bed, emergent, scrub/shrub, forested, and forested areas with more than 3 strata). There are five hydroperiods (most are shown on Figure 8) including permanently inundated, seasonally inundated, occasionally inundated, saturated, and lake-fringe wetland in Loomis Lake). There is high plant-species richness, and there are high interspersions of vegetative classes.

Special habitat features include downed logs, standing snags, overhanging vegetation, beaver activity, and at least ¼ acre of thin-stemmed persistent vegetation in seasonally inundated areas. Greater than 50 percent of the buffer is relatively undisturbed for a distance of 330 feet. There are undisturbed connections to wetlands and uplands at least 150 feet wide, with at least 30 percent cover of shrubs that connect undisturbed wetlands and uplands of more than 250 acres. There are also more than three wetlands within ½ mile with relatively undisturbed connections. The Loomis Lake outlet channel has riparian habitat and there is more than 1 acre of mature forest in and near the wetland. There may be bogs within the wetland, because Seastrand mucky peat soil series is mapped within wetland areas.

WETLAND BUFFERS
Within the large wetland swale, approximately one-half the circumference of the wetland buffer within 330 feet of the wetland is undisturbed. The remaining areas are either used for agriculture, residential areas, or are within the City of Long Beach.

Existing and pending preservation tracts are shown on the perimeter of the proposed mitigation bank. They are not proposed as part of the mitigation bank but will function as a 100-foot buffer to the proposed 72.95-acre mitigation bank.

WATER QUALITY
Water-quality data at the preservation site and in the large wetland system is not available; however, the wetland adjacent to the preservation site receives water from roads, agriculture, and residential areas. Water quality is not expected to change significantly as a result of mitigation-bank restoration or enhancement activities.

OTHER AQUATIC RESOURCES ON OR ADJACENT TO THE WETLAND
The Pacific Ocean is approximately 1 mile to the west of the mitigation site, and Willapa Bay, an estuary, is approximately 2 miles to the east. Three, long, wetland swales are located to the east of the preservation wetland, separated by stabilized dune ridges. These swales are not directly connected to the proposed mitigation-bank site; however the three swales are connected by surface water, ditches, and wetlands to Willapa Bay.

DESCRIPTION OF MITIGATION BANK
A wetland delineation has not been performed at the proposed mitigation-bank site; however, Ecological Land Services, Inc. (ELS) personnel made multiple site visits from

March to mid August in 2007 and in April 2008 for reconnaissance purposes. The following discussions reflect conditions within the proposed mitigation-bank boundaries.

WATER REGIME

The primary hydrologic source for the large wetland swale is a shallow groundwater table. The 2007 aerial photograph in Figure 7 shows the wide range of hydroperiods provided by this area of the wetland. The wetland system has permanent, seasonal, and occasional inundation and some areas that are only saturated. Based on recent aerial photographs, the NWI map, USGS topography maps, and local knowledge, we estimate the following percentages of hydroperiods within the proposed mitigation bank: 5 percent permanent inundation, 46 percent seasonal inundation, 8 percent occasional inundation, 10 percent saturated, and 31 percent upland.

SOILS

Soils within the proposed mitigation bank are shown on Figure 6 and are mapped in the United States Department of Agriculture's Natural Resources Conservation Service internet site (NRCS 2007) as Netarts fine sand, 3 to 12 percent slopes (#92); Seastrand mucky peat, (#132); Westport fine sand, 3 to 10 percent slopes (#153); and Yaquina loamy fine sand (#162). Seastrand mucky peat and Yaquina loamy fine sand are listed as hydric soils by the State of Washington (NRCS 2007).

Netarts fine sand (#92) is very deep, well-drained soil on old, stabilized, sand dunes. Native woody vegetation is typically conifers. Seastrand mucky peat soils (#132) are very deep, very poorly drained soils in depressional areas between sand dunes, and the drainage has been altered by ditching. This is an organic soil formed in decomposed plant remains deposited over sand. Native vegetation is mainly conifers, rushes, and sedges.

Westport fine sand (#153) is very deep, excessively-drained soil on long, narrow, stabilized sand dunes. Native vegetation is a thin layer of grass, moss, leaves, and needles. Yaquina loamy fine sand (#162) is very deep, somewhat-poorly drained soil in depressional areas between stabilized sand dunes. Native vegetation is primarily red alder, with some conifers.

VEGETATION

A botanical survey has not been completed for the project site. *Washington Natural Heritage Program* information (WDNR 2007b) shows there are documented occurrences of rare plants within the same section as the proposed mitigation bank, but there is no documentation of rare plants within site boundaries.

A map of Cowardin vegetation classes within the proposed mitigation bank is shown on Figure 8. Estimates of vegetation classes within the mitigation bank are as follows: 6 percent aquatic bed, 20 percent emergent, 15 percent scrub/shrub, and 10 percent forest. Forested areas have multiple strata including trees, sub-canopy, shrubs, herbaceous plants, and mosses/groundcovers.

Dominant wetland vegetation in the preservation site includes forested, scrub-scrub, emergent, and aquatic-bed species. Forested areas are dominated by Sitka spruce (*Picea sitchensis*, FAC), and red alder (*Alnus rubra*, FAC). Scrub-shrub areas are dominated by spirea (*Spirea douglasii*, FACW), Nootka rose (*Rosa nutkana*, FAC), salmonberry (*Rubus spectabilis*, FAC+), and Hooker willow (*Salix hookeriana*, FACW). Areas of emergent vegetation are generally dominated by slough sedge (*Carex obnupta*, FACW), and aquatic-bed vegetation is dominated by spatter dock, also known as yellow pond-lily (*Nuphar luteum ssp. polysepalum*, OBL).

The following bog plants have been identified in areas of Seastrand mucky peat soils: bog cranberry (*Vaccinium oxycoccus*, OBL), bog Labrador tea (*Ledum groenlandicum*, OBL), western bog laurel (*Kalmia microphylla ssp. occidentalis*, FACW+), brown-stemmed peat moss (*Sphagnum lindbergii*, NI), and small red peat moss (*Sphagnum capillifolium*, NI).

Vegetation observed in upland areas in the western portion of the mitigation site consists of Douglas fir (*Pseudotsuga menziesii*, FACU), western hemlock (*Tsuga heterophylla*, FACU), Sitka spruce, red alder, evergreen huckleberry (*Vaccinium ovatum*, UPL), cascara (*Rhamnus purshiana*, FAC-), red huckleberry (*Vaccinium parvifolium*, FACU), red elderberry (*Sambucus racemosa*, FACU), thimbleberry (*Rubus parviflorus*, FAC-), salal (*Gaultheria shallon*, FACU), false lily-of-the-valley (*Maianthemum dilatatum*, FAC), deer fern (*Blechnum spicant*, FAC+), trailing blackberry (*Rubus ursinus*, FACU), and sword fern (*Polystichum munitum* - FACU).

FAUNA

The following wildlife may be present at the preservation site and within the wetland system: black-tailed deer, elk, coyotes, black bear, mink, beaver, muskrat, nutria, birds of prey, waterfowl, passerine birds, songbirds, amphibians, small reptiles, small mammals, and insects.

On August 15, 2007, ELS observed signs of the following species: black bear (scat and evidence of digging); beaver (dam in wetland); moles (soil mounds); chipmunk (cone-seeds eaten); banana slug (observed specimen); swallowtail butterfly (observed specimen); osprey (heard calls); Steller's jay (heard calls); grouse (observed specimen); golden or bald eagle (observed very large bird in flight without the markings of mature or juvenile bald eagles - bones and feathers were found at the base of a tree with a large nest).

The WDNR stream-typing map (WDNR 2007a) shows that the large pond on the preservation site and the two other ponds on the preservation tract are fish bearing. It is not known at this time which fish species are living within these ponds. The Washington Department of Fish and Wildlife (WDFW) internet site, SalmonScape, does not identify salmonid species within site boundaries; however, it does show that winter steelhead and fall chum are present in the lower reaches of Tarlatt Slough, and it shows coho are present in Tarlatt Slough up to Breaker Lake and Briscoe Lake, which are less than 2 miles south of the site. These lakes are part of the long wetland swale that includes the proposed mitigation-bank site.

WETLAND/UPLAND MOSAIC

The western portion of the site along the gravel road has a mosaic of wetlands and uplands. Small upland areas are interspersed with pocket wetlands and shallow, saturated swales connected to the large, onsite, wetland. Upland hummocks occur throughout the wetland areas.

VICINITY WATER-SUPPLY WELLS

Approximately 50 water-supply wells were identified in federal and state databases within a one-mile radius; none of the wells were identified as public water-supply wells. Eight wells are within a one-half mile radius, and none are within a one-quarter mile radius. No state or federal hydrogeological data points were identified within a one-mile radius.

CULTURAL RESOURCES

There are no known cultural resources on the proposed mitigation-bank site. Preservation and enhancement will be implemented as part of the mitigation objectives, but wetland creation is not necessary, so no ground-disturbing activities other than plant installation are anticipated as a result of this project.

OVERVIEW OF PROPOSED PLAN

MITIGATION GOAL AND OBJECTIVES

Mitigation Bank Goal

Provide a wetland mitigation bank for impacts to depressional wetlands within the service area by protecting a portion of the Category I wetland from the following future development impacts: removing garbage; and enhancing 7.2 acres of wetland-mosaic area with native vegetation.

Mitigation Bank Objectives

To achieve mitigation goal, the following objectives will be met:

Objective 1: Provide long-term, legally-binding protection to a portion of a Category I wetland.

Objective 2: Install wetland/no-trespassing signs..

Objective 3: Remove garbage dumped onto the property.

Objective 4: Enhance approximately 7.2 acres of wetland-mosaic area shown in site plan with native trees and shrubs.

SITE CONSTRAINTS

Constraints of the site include the following characteristics: the wetland continues offsite to the north, east, and south, so only a portion of the wetland will be preserved; and the wetland and its contributing watershed have many owners, so land uses outside property boundaries are outside the applicant's control.

Possible Effects from Surrounding Properties

Surrounding land use is primarily small- and large-lot, single-family residential uses with some cranberry farms and logging. Much of the land is unimproved due to the presence of wetlands. Potential effects to the mitigation bank from these activities include additional pollution from typical residential, agricultural, and post-logging runoff. In addition, the change in land uses on surrounding properties could cause a loss of connectivity between the mitigation bank and surrounding wetlands and uplands.

Possible Effects to Surrounding Properties

Planned activities for the mitigation bank will have little or no impact to surrounding properties. On-site activities will not alter wetland hydrology by grading or filling. The mitigation bank will concentrate on preserving high-quality wetland functions and enhancing the wetland mosaic area with native trees and shrubs.

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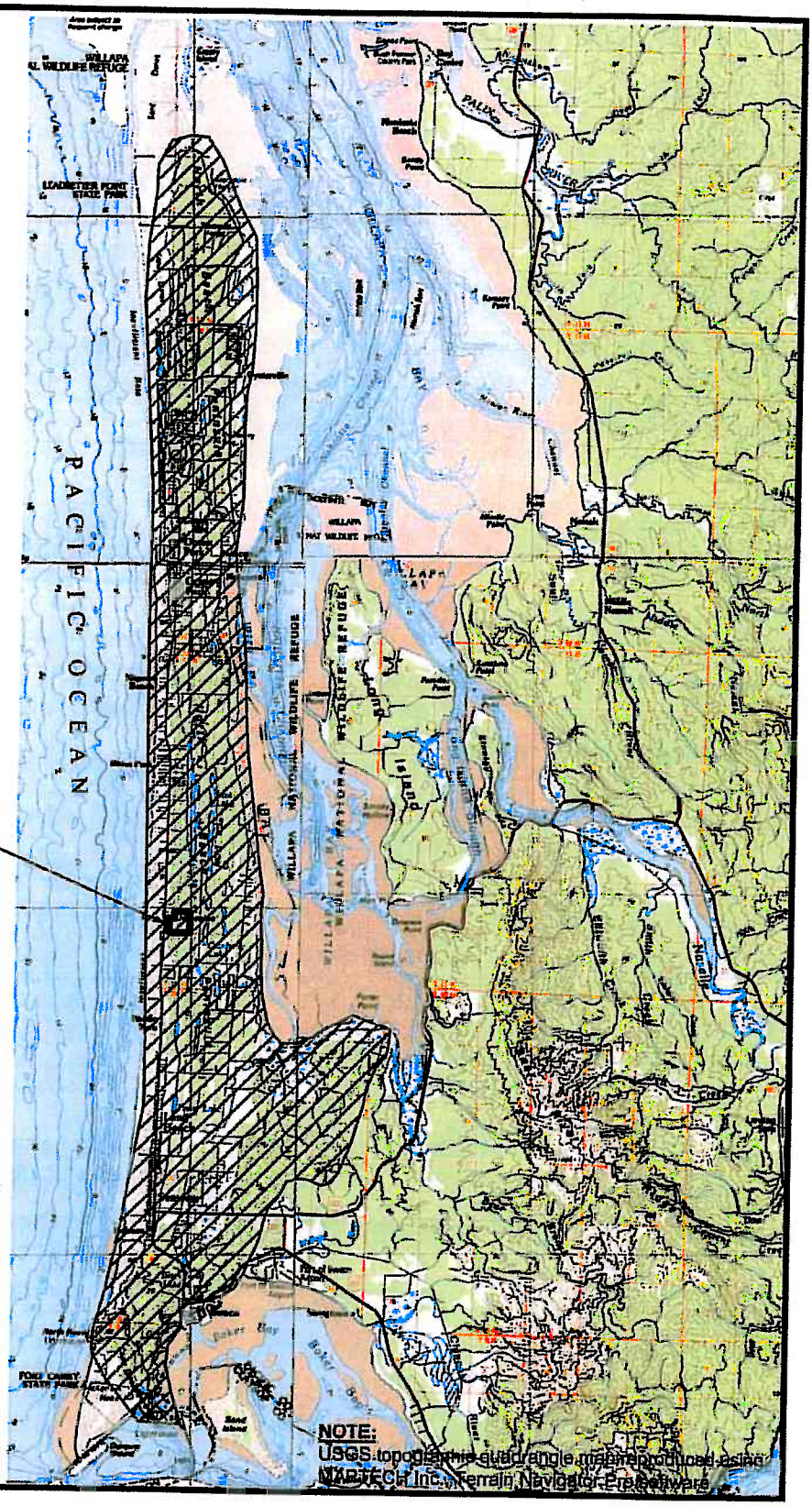

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Figure 1
VICINITY MAP AND SERVICE AREA MAP
Proposal for Long Beach Wetland Mitigation Bank
LBMB, LLC
Pacific County, Washington
Section 28, Township 11N, Range 11W, W.M.

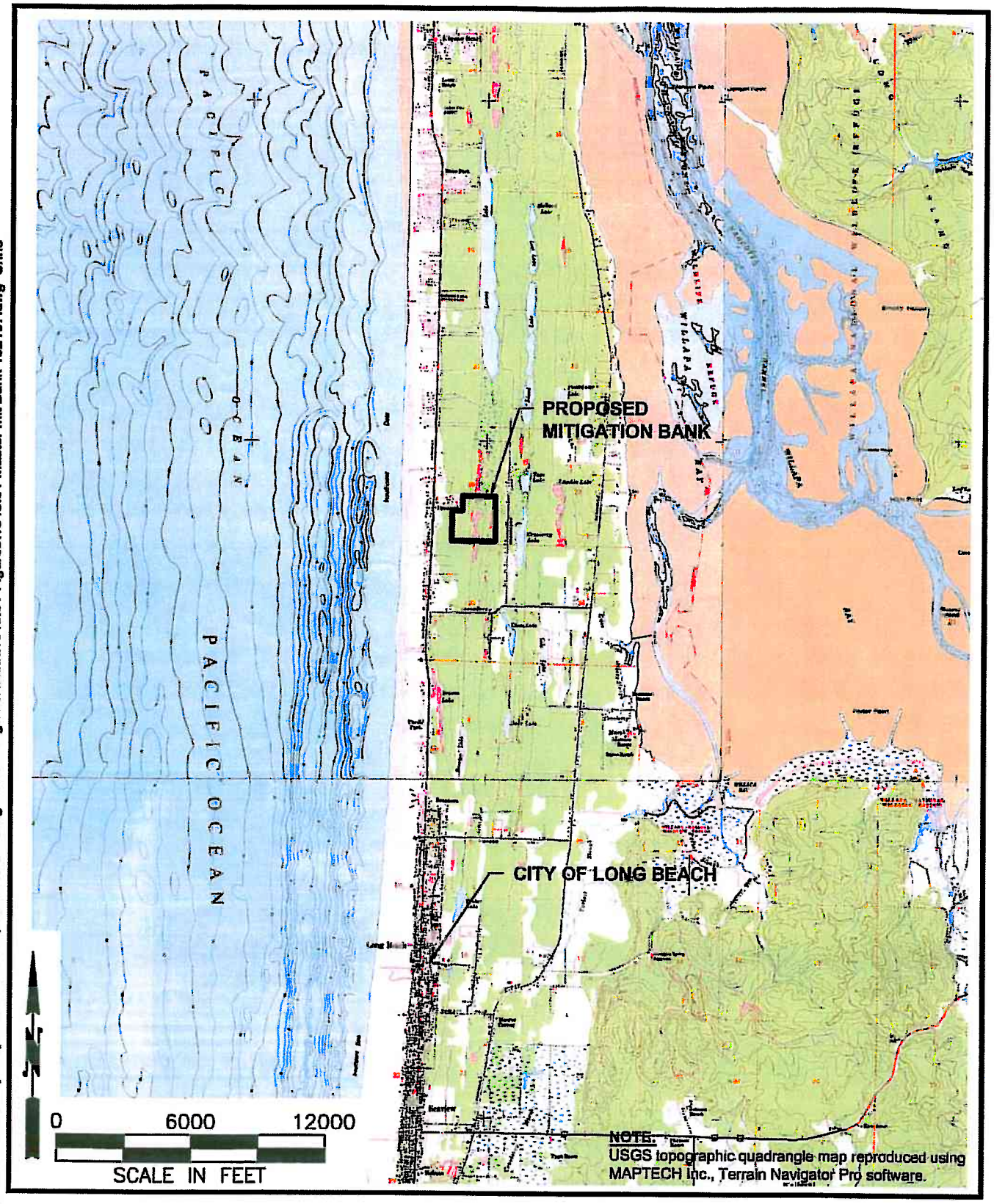

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Figure 2
TOPOGRAPHIC MAP
Proposal for Long Beach Wetland Mitigation Bank
LBMB, LLC
Pacific County, Washington
Section 28, Township 11N, Range 11W, W.M.

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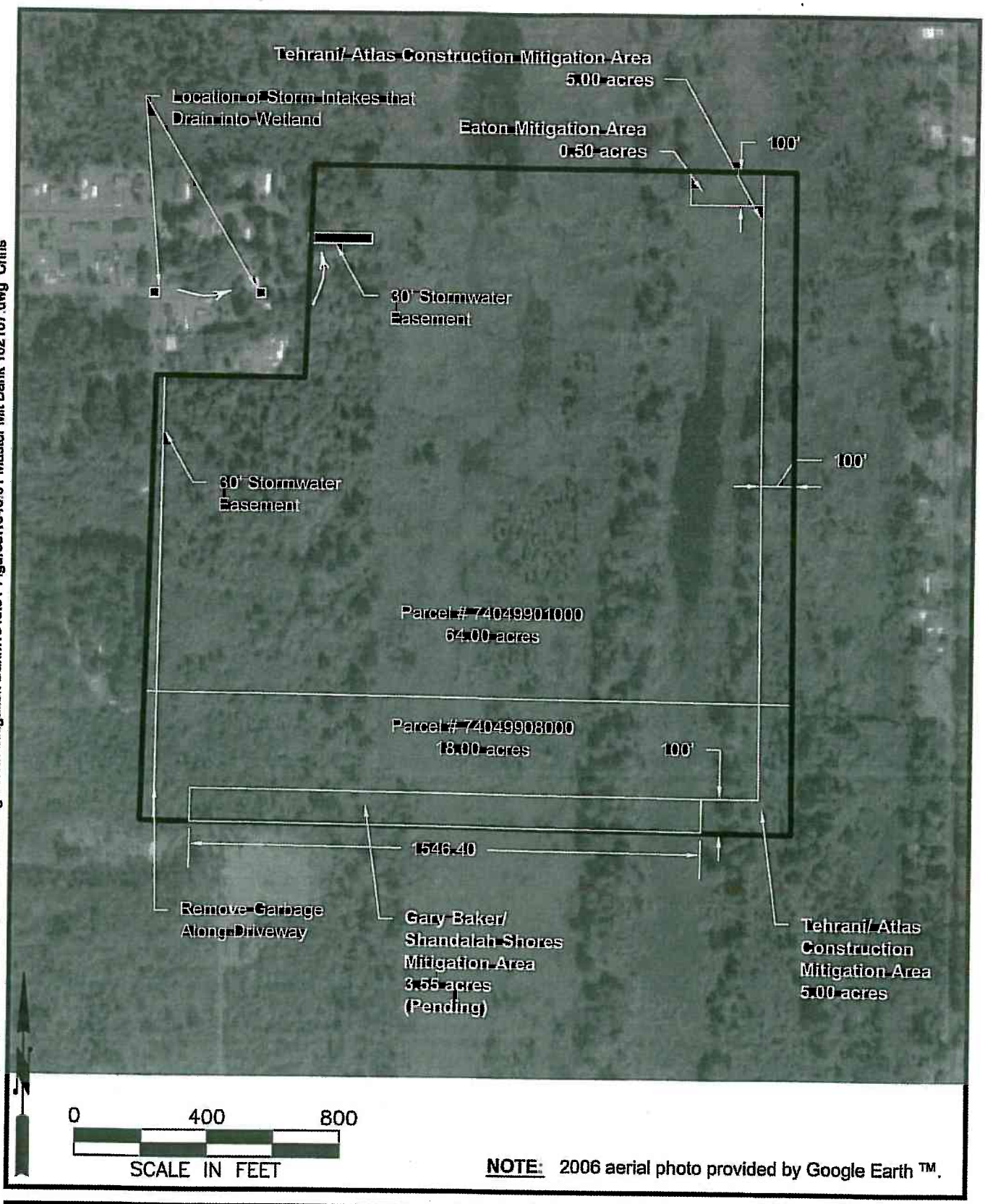

NOTE: 2006 aerial photo provided by Google Earth ™.

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Figure 3
PROPOSED MITIGATION BANK SITE PLAN
Proposal for Long Beach Wetland Mitigation Bank
LBMB, LLC
Pacific County, Washington
Section 28, Township 11N, Range 11W, W.M.

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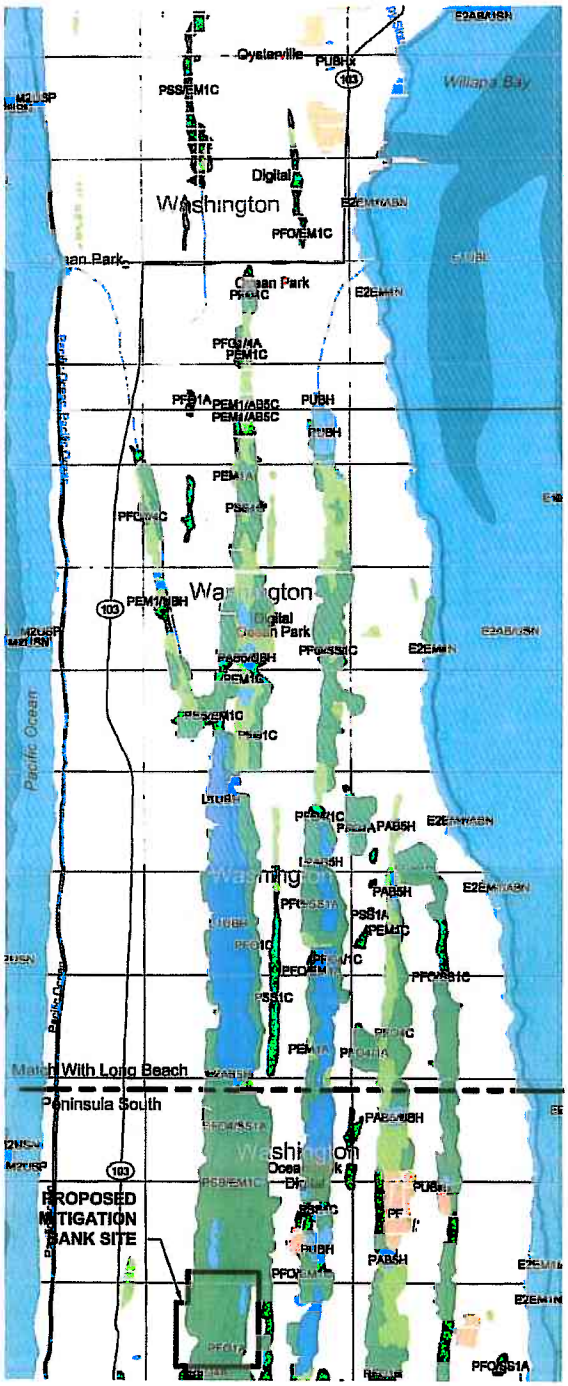
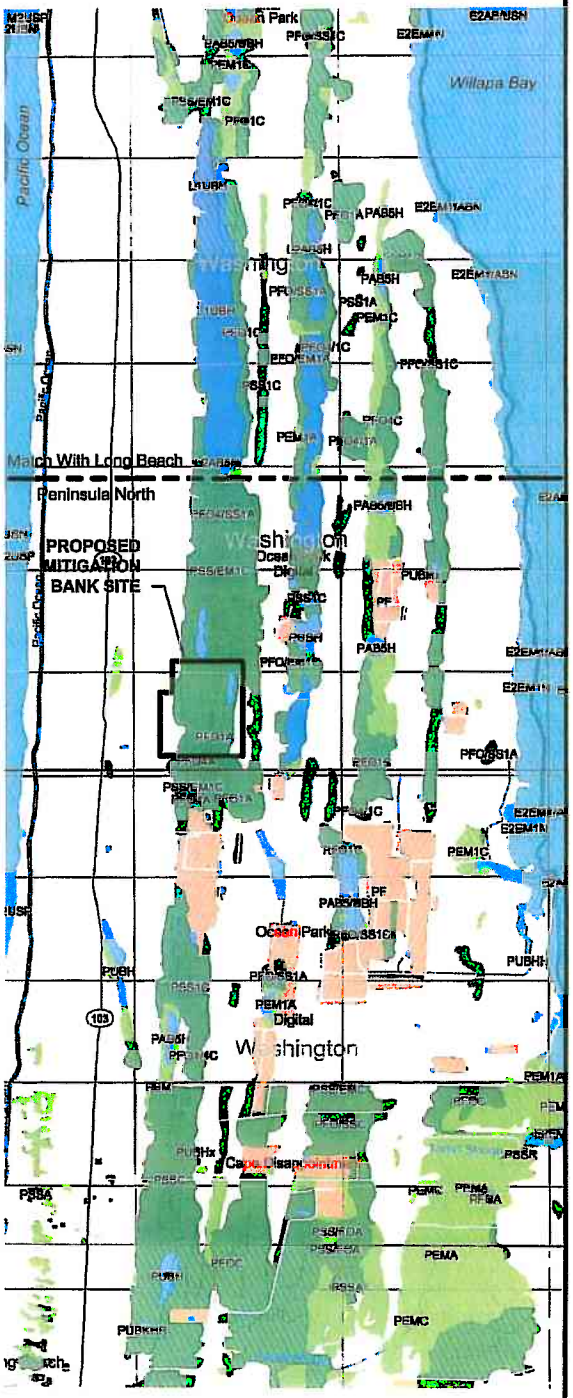
LONG BEACH PENINSULA NORTH



LONG BEACH PENINSULA SOUTH



LEGEND:

- Lake
- Freshwater Pond
- Forested or Scrub-shrub Wetlands
- Emergent Wetlands
- Cranberry Farms

NOTES:

1. Map provided on-line by US Fish & Wildlife Service at web address: *http://www.wetlandsfws.er.usgs.gov/NWI/index.html*
2. Map not to scale.

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Figure 4
NWI MAP OF LONG BEACH PENINSULA
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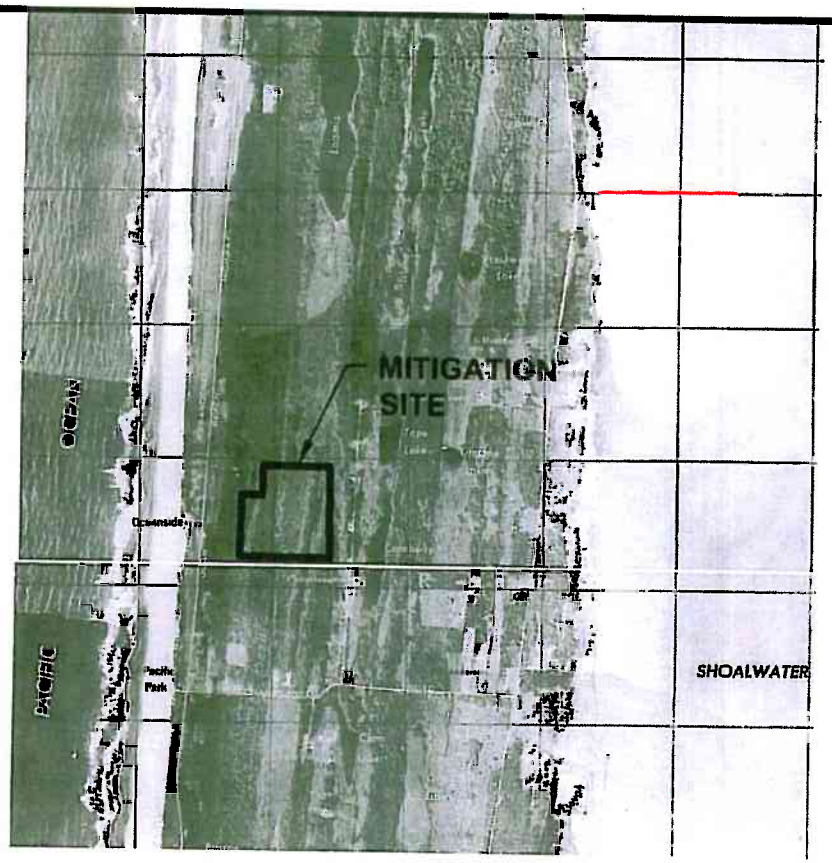

1943 Aerial

2006 Aerial

0 4000 8000

SCALE IN FEET

NOTES:

1. 2006 aerial provided by Google Earth ™, 2007.
2. 1943 aerial provided by the Army Map Service.

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Figure 5
1943 AND 2006 AERIAL PHOTOGRAPHS
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92 - Netarts fine sand, 3-12% slopes. Not hydric.
132 - Seastrand mucky peat. Hydric.
162 - Yaquina loamy fine sand. Hydric.
169 - Water. Hydric.

0 500 1000
SCALE IN FEET

NOTE: Map provided on-line by NRCS at web address: *www.wa.nrcs.usda.gov/pnw_soil/wa_reports.html*

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Figure 6
SOIL SURVEY MAP
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0 400 800

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NOTE: 2006 aerial photo provided by Google Earth ™.

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Figure 7
ESTIMATED HYDROPERIODS
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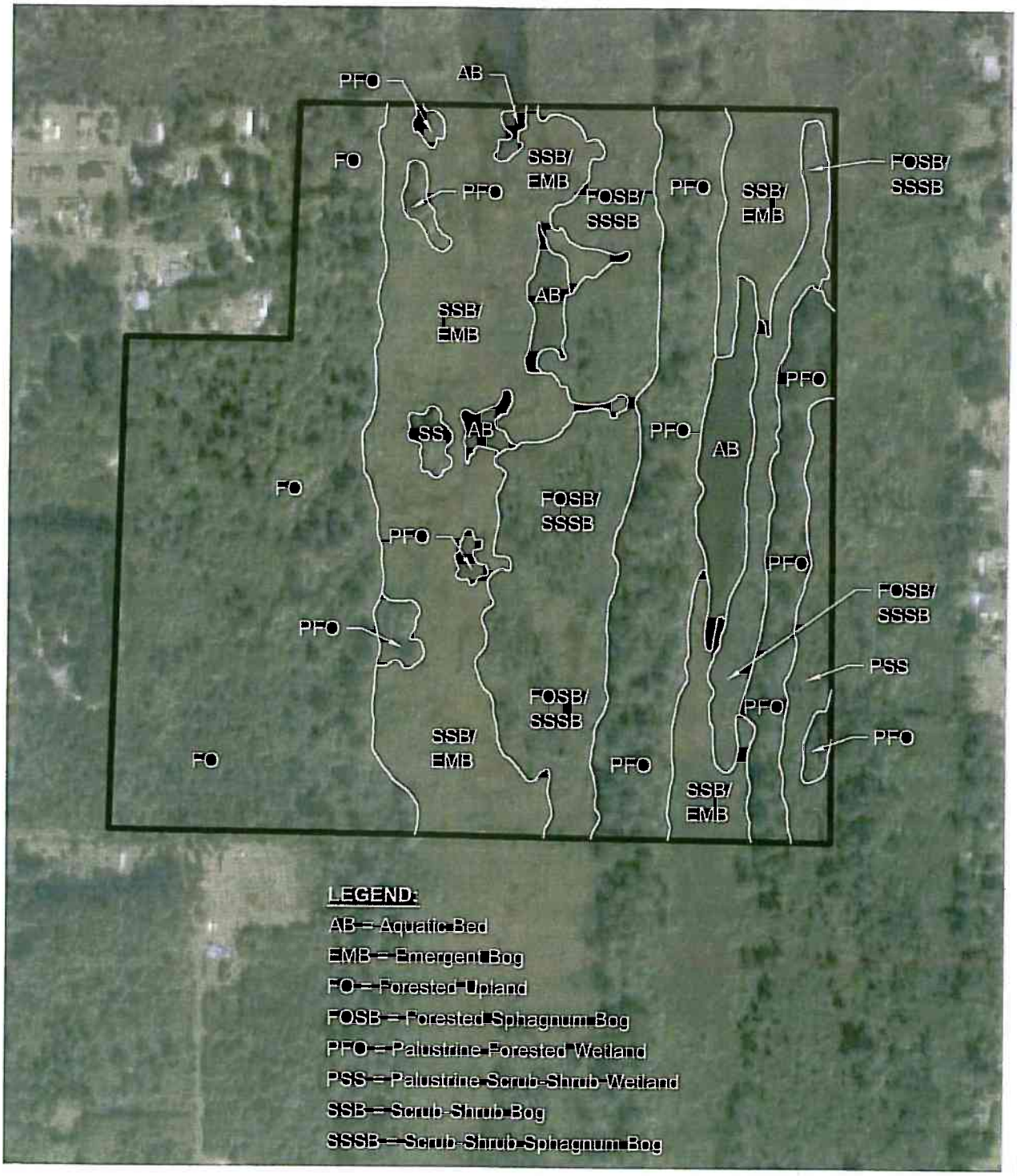

NOTE: 2006 aerial photo provided by Google Earth ™.

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Figure 8
COWARDIN VEGETATIVE CLASSES
Proposal for Long Beach Wetland Mitigation Bank
LBMB, LLC
Pacific County, Washington
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Photo 1.
Looking north at proposed Long Beach Mitigation Bank wetland.

Photo 2.
Emergent, scrub-shrub, and forested areas of the wetland.
View is to the southeast.

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Photoplate 1
SITE PHOTOS
Proposal for Long Beach Wetland Mitigation Bank
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Photo 3.
Upland habitat island.

Photo 4.
Example of mature spruce trees present in the wetland/upland mosaic in the western portion of the proposed mitigation bank.

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Photoplate 2
SITE PHOTOS
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Photo 5.
Typical habitat in wetland/upland mosaic.

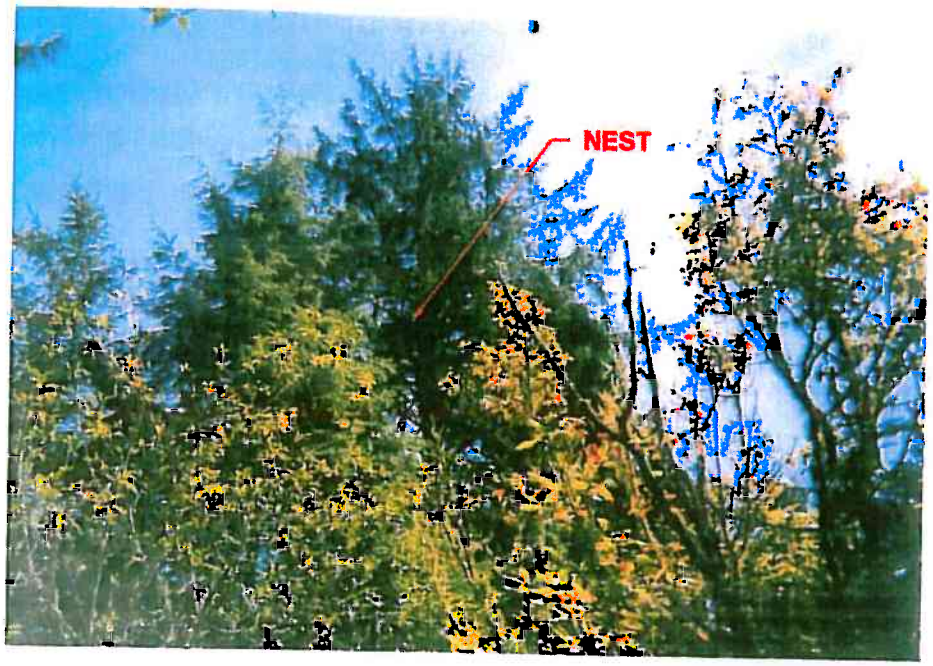

Photo 6.
Location of large bird-of-prey nest in western portion of the site.

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Photoplate 3
SITE PHOTOS
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Photo 7.
Open areas totaling over 7.2 acres can be enhanced with native trees and shrubs.

Photo 8.
Forested carpet in upland areas includes false lily-of-the-valley (Maianthemum dilatatum) and clubmoss (Lycopodium clavatum).

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Photoplate 4
SITE PHOTOS
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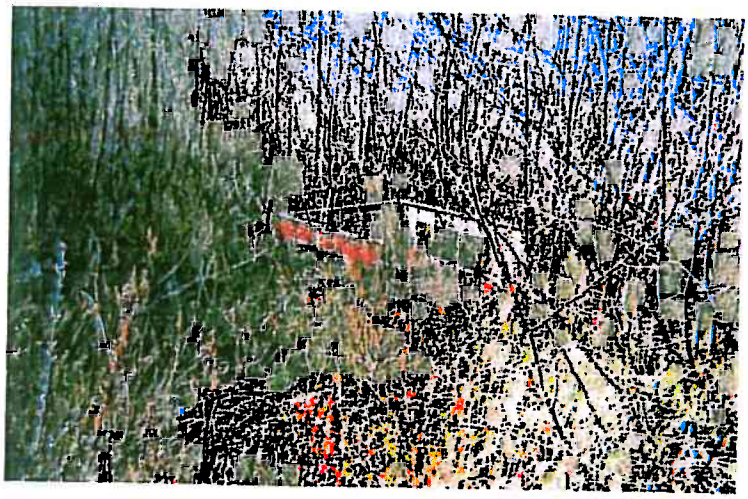
Photo 9.
Example of garbage along the western portion of the property that will be removed.

Photo 10.
Example of garbage along the western portion of the property that will be removed.

Photo 11.
Example of garbage along the western portion of the property that will be removed.



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Photoplate 5
SITE PHOTOS
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Photo 12

Panoramic view to the southwest of forested, shrub, and emergent bog wetland in background and aquatic bed wetland in foreground.

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Photoplate 6
SITE PHOTOS
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LBMB, LLC
Pacific County, Washington
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Photo 13

Scrub-shrub sphagnum bog wetland habitat. Species include bog cranberry, bog Labrador tea, and bog laurel. Tree species occurring on hummocks adjacent to bogs include shore pine, Sitka spruce, and western hemlock.

Photo 14

Sphagnum mosses and coastal reindeer lichen in bog wetland area.

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Photoplate 7
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