EDMONDS CROSSING

Connecting ferries, bus & rail

Chapter 3 Affected Environment

3.1 Introduction

This chapter describes the existing environmental setting of the project area and identifies resources or issues that could be affected by the Edmonds Crossing project. The project area is generally located near the downtown area of the City of Edmonds; immediately to the south of the project area on the bluff overlooking the Edmonds "bowl" is the Town of Woodway. Land uses within the project area are a mix of commercial establishments, the now-closed UNOCAL bulk fuel terminal, the Port of Edmonds Marina, scattered park land along the waterfront, and pockets of residential units north of Main Street, along Railroad Avenue, east of SR 104, and in Woodway. The Edmonds Marsh comprises a considerable amount of acreage in the center of the project area.

The existing conditions presented in this section, along with the impacts analysis in Chapter 4, are based on a series of technical discipline reports, which are referenced in the bibliography (Appendix D) and incorporated into this EIS by reference. Copies of these reports and accompanying material are available for review at WSDOT's Northwest Regional office in Seattle (15700 Dayton Avenue North, 206/440-4548), and Federal Highway Administration (FHWA) (711 South Capitol Way, Suite 501, Olympia, Washington, 98501, 360/753-9480) and the City of Edmonds, Community Services Department (121 Fifth Avenue North, Edmonds, Washington 425/775-7724).

3.2 Biological and Physical Environment

3.2.1 Air Quality

Climate

The Puget Sound region has a relatively mild climate. The Olympic Mountains buffer the area from the weather that arrives from the Pacific Ocean. The summer months are characterized by moderate temperatures and light and variable winds, which tend to blow from the north. Summer weather is often dominated by persistent high-pressure cells, resulting in stagnant air conditions. This weather pattern can contribute to the formation of photochemical smog, as indicated by increased ozone (O_3) concentrations downwind from the urban centers during the summer months.

Storm fronts pass through the area frequently during the spring and fall and occasionally during the winter. Southerly winds dominate during these storm conditions. Winter weather can also produce stable or stagnant conditions that coincide with temperature inversions. The average precipitation is 30 to 40 inches per year.

Air Pollutants

The United States Environmental Protection Agency (EPA) has set standards for allowable concentrations for several "criteria" pollutants. These pollutants are nitrogen oxides (NO_x), sulfur dioxide (SO_x), carbon monoxide (CO), O_3, particulate matter less than 10 microns in diameter (PM_{10}), and lead. Primary standards are designed to protect health, while secondary standards are set to protect public welfare and include vegetation, soils, and wildlife. Within the State of Washington, the Department of Ecology (Ecology) and the regional air quality agencies have established ambient air quality standards for criteria pollutants and have been granted authority by the EPA to issue certain air quality-related permits. The regional agency with jurisdiction over air quality in the proposed project area is the Puget Sound Clean Air Agency (PSCAA). Table 3-1 shows the federal, state, and regional ambient air standards.

Ecology and PSCAA operate monitoring stations in the Puget Sound region to measure the ambient air concentrations of criteria pollutants. Geographic areas where pollutant levels exceed these standards are designated as "nonattainment areas" for that pollutant. Attainment status for CO and O_3 was regained in November 1996, which means the area is subject to a maintenance plan for 10 years to ensure continued compliance with the standards. The project area is designated to be in attainment with ambient air quality standards for all criteria pollutants (PM_{10}, SO_2, CO, O_3, and NO_2).

The project area primarily consists of small businesses and residential and apartment dwellings. The primary source of air pollution in the area is vehicle emissions, with CO emitted in the greatest quantities.

Carbon Monoxide

Carbon monoxide is a colorless, odorless gas commonly formed from incomplete combustion of fossil fuels. Health effects from overexposure include reduced oxygen transport capacity of the blood as well as effects to lung and brain function. CO emissions from vehicle traffic represent a long-term air quality concern in the Puget Sound area. Concentrations of CO are generally highest during the winter because vehicle engines operate less efficiently in cold weather, producing higher emissions, and because stable atmospheric conditions tend to keep pollutants near the ground. The highest ambient CO concentrations occur near congested roadways and intersections. Edmonds is included in the Puget Sound area, which has recently been redesignated as in attainment for CO. In conjunction with this redesignation, EPA has approved a maintenance plan designed to keep the area in attainment.

The Edmonds area consists primarily of low-rise residential/commercial areas with no tall buildings that could trap vehicle CO emissions within street canyons. In addition, estimated street traffic counts and traffic congestion in the area are not as high as those seen in downtown Tacoma or Seattle. However, the presence of traffic queues at the ferry toll booth and the existing pattern of vehicles traveling through the downtown area to get to the ferry may result in short-term periods of high vehicle emissions and elevated CO concentrations. There are no monitoring data

available to determine how CO concentrations currently compare to the ambient standards.

Table 3-1
Ambient Air Quality Standards

Pollutant	EPA (primary)	EPA (secondary)	Washington State	Puget Sound Region
CO				
8-hour average	9.5 ppm	--	9.5 ppm	9 ppm
1-hour average	35 ppm	35 ppm	35 ppm	35 ppm
PM_{10}				
Annual arithmetic mean	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$
24-hour average	150 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$
TSP				
Annual geometric mean	--	--	60 $\mu g/m^3$	60 $\mu g/m^3$
24-hour average	--	--	150 $\mu g/m^3$	150 $\mu g/m^3$
O_3				
1-hour average	0.12 ppm	0.12 ppm	0.12 ppm	0.12 ppm
SO_2				
Annual average	0.03 ppm	--	0.02 ppm	0.02 ppm
30-day average	--	--	--	0.04 ppm[a]
24-hour average	0.14 ppm	--	0.10 ppm	0.10 ppm[a]
3-hour average	--	0.50 ppm	--	--
1-hour average[b]	--	--	0.25 ppm	0.25 ppm
1-hour average	--	--	0.40 ppm	0.40 ppm[a]
5-minute average[c]	--	--	--	1.00 ppm
Lead				
Calendar quarter average	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	--	1.5 $\mu g/m^3$
NO_2				
Annual average	0.05 ppm	0.05 ppm	0.05 ppm	0.05 ppm

Note: Annual, quarterly, and 30-day standards are never to be exceeded. Shorter-term standards are not to be exceeded more than once per year, unless noted otherwise.

[a] *Never to be exceeded.*
[b] *Not to be exceeded more than twice in 7 days.*
[c] *Not to be exceeded more than once in 8 hours.*

-	*No standard set.*
CO	*carbon monoxide*
NO_2	*nitrogen dioxide*
O_3	*ozone*
PM_{10}	*particular matter less than 10 microns in diameter*
ppm	*parts per million*
SO_2	*sulfur dioxide*
$\mu g/m^3$	*micrograms per meters squared*

Ambient air is currently not monitored for CO at any traffic intersections in the affected area. The closest ambient air CO monitoring station is located approximately 4 miles from the project in Lynnwood, which has measured CO

concentrations well below the 1-hour and 8-hour standards since the monitor was installed in 1998.

Particulate Matter

Health concerns over PM_{10} and, in particular PM with a diameter of less than 1 micron, relate the potential for damage to the lungs and respiratory tract. The Edmonds area is currently in attainment of the total suspended particulates (TSP) and PM_{10} standards. PM_{10} concentrations were also monitored in Lynnwood from 1994 to 1999, during which time no exceedances of the annual or 24-hour PM_{10} standards were measured. No monitoring of O_3, SO_2, or NO_x is currently performed near the project site.

3.2.2 Noise

Noise levels in this report are stated as hourly equivalent sound pressure levels (L_{eq}) in terms of decibels (dB) on the A-weighting scale (dBA). Noise levels stated in terms of dBA approximate the response of the human ear by filtering out some of the noise in the low- and high-frequency ranges that the ear does not detect well.

Existing dominant noise sources in the project area include vehicular traffic on SR104 and other local roadways, occasional ferry horns, and intermittent train movements on the Burlington Northern Santa Fe Railroad tracks. Existing noise levels were measured at eight sites within the project area (designated M1 through M8 in Figure 3-1). Measurement procedures complied with the American National Standards Institute (ANSI) S1.13-1971(R 1986) and *Measurement of Highway-Related Noise* (U.S. Department of Transportation [USDOT], 1996).

Measured noise levels in the project area ranged from 43 dBA-L_{eq} to 59 dBA-L_{eq} during daytime hours. All measured noise levels are below the FHWA noise abatement criteria for Category B land use, which includes residences, parks, schools, churches, motels, picnic areas, recreation areas, playgrounds, and other noise-sensitive uses. For the purpose of this analysis, project noise is defined as the noise generated by vehicular traffic and ferry operations; increased rail traffic is considered independent because it will occur with or without the project. The monitoring results are contained in the noise discipline report appendix, on file with WSDOT and FHWA.

Vehicular Traffic Noise

Vehicular traffic noise levels were estimated in the project area by using the FHWA Traffic Noise Model (TNM), Version 2.0. TNM uses data on traffic volumes, vehicle mix, speed, vehicle noise emission levels, roadway geometry, and terrain data to predict traffic-generated noise levels at chosen receiver locations.

There were 13 receiver locations selected for use in predicting noise levels in the project area. The receiver locations are identified in Figure 3-1 as Receivers 1 through 13.

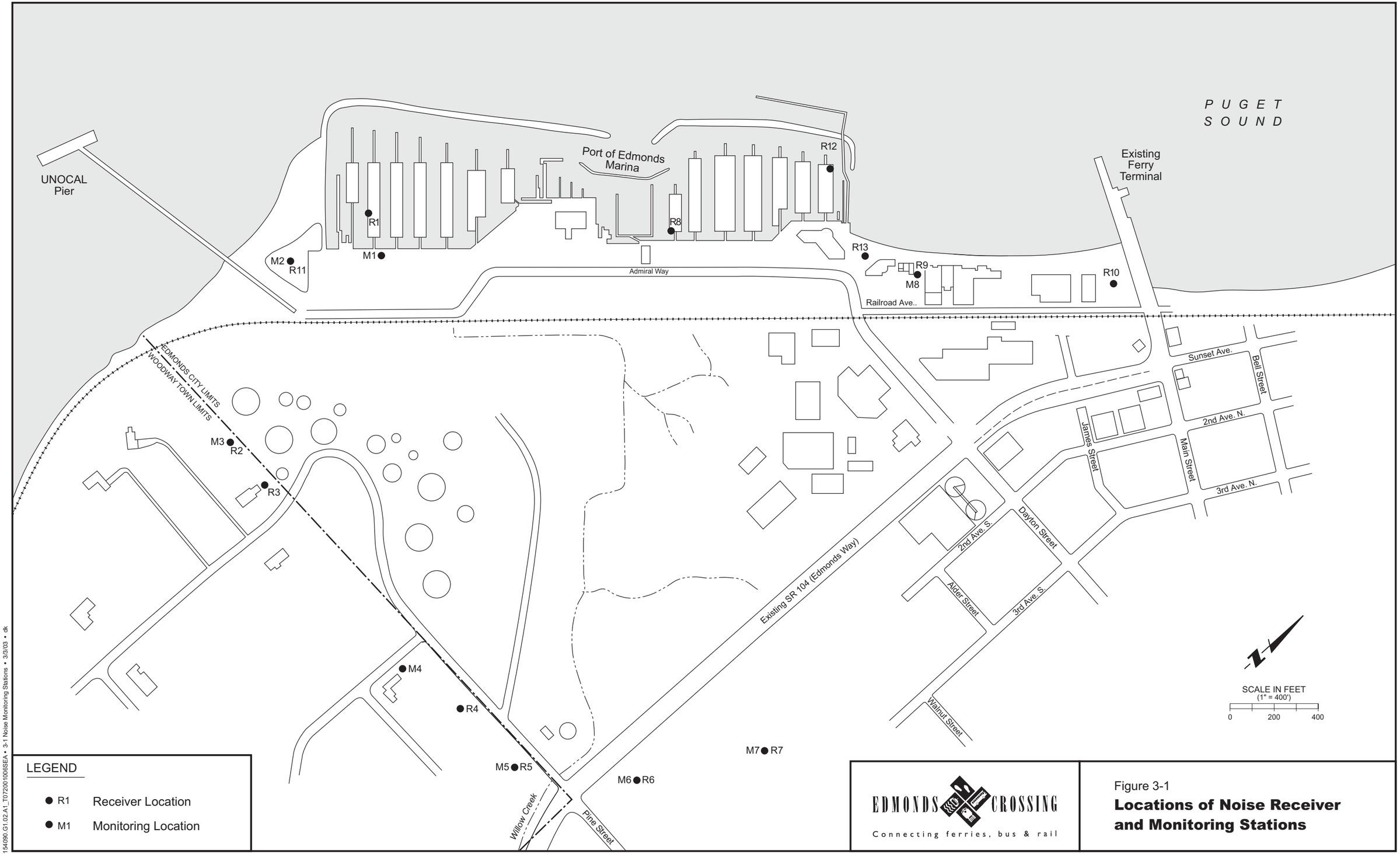

Figure 3-1

Locations of Noise Receiver and Monitoring Stations

154090.G1.02.A1_T072001006SEA • 3-1 Noise Monitoring Stations • 3/3/03 • dk

It should be noted that three of the receiver locations (1, 8, and 12) are representative of live-aboard boats in the Port of Edmonds Marina. Port regulations limit the total number of possible live-aboard boats to 20; no live-aboard boats are allowed in the southernmost two docks in the marina. Currently, there are only a few live-aboard boats in the marina. Receivers 1 and 12 represent potential live-aboard slips closest to the two build alternative sites; receiver 8 represents a potential midpoint location between the build alternative sites.

Ferry Noise

Maximum noise levels associated with the operation of the Edmonds/Kingston ferry range from approximately 55 to 65 dBA at 100 feet. The measured L_{eq} noise level at such distances during launching and docking was 60 dBA. The ferry horn is sounded during ferry arrivals and departures and is required for safe operations. The ferry horn can be heard throughout the project area; however, as a maritime safety rule not subject to noise restrictions, ferry horn blasts have not been quantified in this analysis. Currently, there are approximately 28 departures and 28 arrivals per day. The actual number and times of ferry runs vary depending on the season.

Ambient Noise Levels

Table 3-2 shows the total ambient noise levels (vehicular traffic and other background noise sources, except trains) under existing conditions, along with FHWA noise criteria. The data shown in this table are based on the results of existing on-site background noise level measurements and calculations of traffic noise levels, at locations in the vicinity of existing roadways, based on existing (2002) peak-hour traffic data. No receiver locations currently exceed the FHWA noise abatement criteria.

Table 3-2
Existing Ambient Noise Levels and Noise Abatement Criteria (dBA-L_{eq})

Receiver Location	Land Use Type	FHWA Peak-Hour Impact Criterion	Existing Ambient Noise Level (2002-2003)
1/M1	Marina/live-aboard	67	51
2/M3	Residential	67	43
3/M3	Residential	67	43
4/M4	Residential	67	48
5/M5	Residential	67	52
6/M6	Park/recreational	67	53
7/M7	Residential	67	52
8	Marina/live-aboard	67	54
9/M8	Residential	67	57
10	Park/recreational	67	59
11/M2	Park/recreational	67	51
12	Marina/live-aboard	67	54
13	Park/recreational	67	57

Note: Noise levels do not include noise from intermittent train passbys through the area.

dBA decibels (dB) on the A-weighting scale
L_{eq} hourly equivalent sound pressure levels

Railroad Noise

Currently, there are approximately 35 trains per day passing through Edmonds. Existing railroad noise levels were measured during a train pass-by. The noise level during a train pass-by was 87 dBA at 100 feet from the tracks. The train horn is sounded as a train approaches a grade crossing and is required for safe operations. Typical train horn noise levels range from 95 to 100 dBA at approximately 100 feet from a crossing. The train horn can be heard throughout the project area.

3.2.3 Energy

Because this project consists of a multimodal terminal rather than a single roadway, the project area has been defined to include the total area analyzed within the recently updated City of Edmonds traffic forecasting model. The City's model is based on, and incorporates, regional growth forecasts adopted by the Puget Sound Regional Council (PSRC) for two forecast years: 2008 and 2022. Traffic growth to the 2030 design year was estimated by extrapolating the 2022 forecasts. For more detailed information regarding the traffic forecasting model, see the transportation discipline report (CH2M HILL, 2002). In 2002, it is estimated that there were about 138 million vehicle miles of travel (VMT) throughout the City of Edmonds. This figure corresponds to about 5.8 million gallons of fuel consumption. Edmonds is also served by the WSF system and by Amtrak, intermodal, and freight rail service on a single main rail track.

3.2.4 Geology and Soils

Topography and Setting

The project area is located along the shoreline of Puget Sound in Edmonds, Washington. The site is relatively flat, except for a hill at the southern end. Steep slopes extend along the north and west of the hillside. Elevations onshore range from 0 mean sea level (MSL) at the shoreline to about 180 feet MSL on top of the hill. Elevations offshore range to about -50 feet MSL at the end of the ferry pier proposed under either build alternative.

The slopes associated with the hillside generally range from about 15 to 40 percent, with several areas greater than 40 percent. Offshore slopes range from about 20 to 33 percent, with some areas locally steeper at the proposed pier for Modified Alternative 2. Slopes range to about 15 percent at the Alternative 3 pier location.

Soils

Soils mapped in the project area (United States Department of Agriculture-Soil Conservation Service [USDA-SCS], 1983) are shown in Figure 3-2. The mapping focuses on surficial soils, typically within the upper 3 to 5 feet of the subsurface profile. Most of the project area is mapped as Urban Land, which is composed of fill material or has been developed. Soil units mapped in the area include Alderwood Gravelly Sandy Loam, Everett Gravelly Sandy Loam, Kitsap Silt Loam, and Mukilteo Muck.

PUGET SOUND

UNOCAL Pier

Port of Edmonds Marina

Existing Ferry Terminal

Admiral Way

Railroad Ave.

EDMONDS CITY LIMITS

WOODWAY TOWN LIMITS

Ur

AuE

KpB

AeD

Mk

AgC

EgA

KpA

2nd Ave. W.

James Street

Main Street

Bell Street

3rd Ave. N.

2nd Ave. S.

Dayton Street

3rd Ave. S.

Alder Street

Walnut Street

Existing SR 104 (Edmonds Way)

Pine Street

Note: Boundaries and locations of soil features are approximate.
Source: U.S. Soil Conservation Service, 1983.

LEGEND

AgC	Alderwood Gravelly Sandy Loam 15 - 25% Slopes	KpA	Kitsap Silt Loam 0 - 8% Slopes
AeD	Alderwood - Everett Gravelly Sandy Loam 25 - 70% Slopes	KpB	Kitsap Silt Loam 8 - 25% Slopes
AuE	Alderwood - Urban Land Complex 2 - 8% Slopes	Mk	Mukilteo Muck
EgA	Everett Gravelly Sandy Loam 0 - 8% Slopes	Ur	Urban Land

SCALE IN FEET
(1" = 400')
0 200 400

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Figure 3-2
Soils of the Project Area

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The Alderwood soil unit includes glacial till. Erosion hazard of this soil is moderate on slopes between 15 and 25 percent, and high for steeper slopes. Soils belonging to the Everett unit include glacial outwash and are underlain by very gravelly sand. The erosion hazard is moderate on steeper slopes (greater than 25 percent). The Kitsap unit includes soil formed in the bottom of a lake. The erosion hazard of this soil is slight on flat slopes (less than 8 percent) and moderate on steeper slopes (between 8 and 25 percent). These soils may become unstable under wet or saturated conditions. Mukilteo Muck formed in lower areas with very flat slopes (less than 1 percent). These soils generally occur where wetlands are found within the project area (see Section 3.2.7, Wetlands). Information on contaminants in soils is located in Section 3.3.7, Hazardous Waste, of this chapter.

Geology

The project area is located in the Puget Sound Lowland in western Washington and occupies an area of about 400 square miles. The Lowland is a major low-lying area that extends northward between the Olympic Mountains to the west and the Cascade Range to the east. Glacial and non-glacial deposits (up to about 3,700 feet in thickness) lie above the surface of the Puget Sound Lowland. Surface geology in the project area is shown in Figure 3-3 and includes modified land, marsh deposits, Vashon drift, and preglacial deposits (Minard, 1983). Geologic units encountered in the project vicinity are described below.

Modified Land (ml)

Within the project area, modified land occurs along the shoreline and extends across the lower yard of the UNOCAL property and Harbor Square south of Dayton Street. Modified land also extends across some areas of the hillside in the southern portion of the project. Modified land generally consists of areas that have been filled. The fill material varies widely and consists of silty sand, clean sand, gravelly sand, clayey silt, and sandy silt.

Littoral Drift

These coastal drift deposits consist of loose materials that are transported by waves and currents along the shoreline. The Washington Coastal Zone Atlas (Ecology, 1979) has identified fine-grained materials that have gathered in the coastal area between the UNOCAL pier and the marina and between the marina and the existing ferry terminal. These soils generally consist of fine gravel, sand, and mud. Sand occurs in the vicinity of Point Edwards and extends southward. These deposits do not appear on the geologic map by Minard (1983).

Marsh Deposits (Qm)

Marsh deposits occur in the Edmonds Marsh, which is located north of the existing UNOCAL property and south of Harbor Square. Marsh deposits include fine-grained, organic-rich tidal or deltaic deposits, and appear to have developed partially as a result of fill placed along the shoreline between the marsh area and Puget Sound. The marsh likely lies above deposits of soft silt and organic soils of

variable thickness. Developed areas around the margins of the marsh may be underlain by soft silt or organic soil deposits underlying fill soils.

Older Littoral Drift

These deposits have been identified in some of the offshore drilling explorations reviewed for this EIS and generally occur above fill deposits. The littoral drift consists of sand, gravel, and shell fragments (Hong West & Associates [HWA], 1990; Hong Consulting Engineers, Inc. [HCE], 1985; Dames and Moore, 1972). These deposits do not appear on the geologic map by Minard (1983).

Vashon Till (Qvt)

Vashon glacial till is mapped in the southern portion of the site on the hillside. Glacial till materials typically consist of a mixture of sand, silt, and gravel and is very dense and therefore often difficult to excavate. Till has been identified in some of the drilling explorations in the vicinity of the marina and existing ferry pier. At these locations, the till lies below the older littoral drift deposits.

Vashon Advance Outwash (Qva)

Advance outwash is mapped on the hillside under the till. These deposits generally consist of dense sands with gravel. Advance outwash deposits appear to lie below older littoral drift deposits in the vicinity of the existing Point Edwards pier.

Transitional Beds (Qtb)

Transitional beds are mapped on the hillside and portions of the slope below the outwash deposits. These glacial and nonglacial deposits are dense or hard and consist of clay, silt, and fine-grained sand.

Whidbey Formation (Qw)

Below the transitional beds are deposits of the Whidbey formation, which consist of dense sands. It appears that the Whidbey Formation extends from the hill slope east to City Park and north beyond the existing ferry terminal. However, fill materials and tidal flat or marsh sediments may lie above the Whidbey Formation across much of the project area.

Site Seismicity

The project area lies within Seismic Zone 3 as defined in the Uniform Building Code (UBC, 1997). Zone 3 includes the Puget Sound region and represents an area of high seismic risk. Seismic activity (or earthquake activity) in the region is a result of collisions between two plates within the earth's crust: the Juan de Fuca plate and the North American plate. Geophysical investigations suggest that earthquakes may also occur from faults in the bedrock beneath the Puget Sound area. However, few active faults have been identified in the Puget Sound region as a result of the significant depth to bedrock that occurs in this area. No known active faults are mapped in the project area.

PUGET SOUND

UNOCAL Pier

Port of Edmonds Marina

Existing Ferry Terminal

Admiral Way

Railroad Ave.

ml

Qva

Qtb

Qvt

Qw

Qm

Qm

Qw

Existing SR 104 (Edmonds Way)

Willow Creek

Pine Street

James Street

2nd Ave. W.

Main Street

Bell Street

3rd Ave. W.

Dayton Street

2nd Ave. S.

3rd Ave. S.

Alder Street

Walnut Street

SCALE IN FEET
(1" = 400')
0 200 400

Note: Boundaries and locations of soil features are approximate.
Source: Minard, 1983.

LEGEND

ml	Modified Land	Qva	Vashon Advance Outwash
Qm	Marsh Deposits	Qtb	Transitional Beds
Qvt	Vashon Till	Qw	Whidbey Formation

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Figure 3-3
Geology of the Project Area

154090.G1.02.A1_T072001006SEA • 3-3 Geology of the Project Area • 3/3/03 • dk

The nearest active fault to the project area is the South Whidbey Island Fault Zone, located approximately 7 or more miles north of the project area, along the southern edge of Whidbey Island (Gower *et al*, 1985).

Structural Geology Features

Recent studies indicate there may be a possible geologic or structural feature west of the project area, referred to as the Kingston Arch. An "arch" is a structural feature that differs from a fault in that it indicates bending or folding rather that actual earth slippage or movement. The Kingston Arch has been located and mapped using geophysical techniques that locate the top of bedrock. It appears to be domes or arched in this area. The axis of the arch or dome dips to the east and has been mapped as being located under Puget Sound between Edmonds and Kingston with the trendlline of the Kingston Arch about 3,700 feet off-shore. Brocher *et al* (2001) suggests that this geologic feature may still be in the process of bending or folding, but notes that available data does not indicate the presence of shallow crustal faults.

Sensitive Areas

The Snohomish County *Geologic Hazard Maps* indicate that portions of the south end of the project include moderate and high landslide hazard areas (Figure 3-4). These areas are also considered to have moderate to high erosion hazard (GeoEngineers, 1991).

Mapped landslide deposits occur along the shoreline to the south and north of the project area (GeoEngineers, 1991). Some of these areas include transitional beds (Minard, 1983), which have been mapped along the hillside of the project area, as shown in Figure 3-4.

As mentioned above, the general project area is located within a seismic hazard area, defined as areas where there is a severe risk of earthquake damage as a result of seismically induced liquefaction. Liquefaction occurs when loose, saturated, and relatively sandy soil deposits temporarily lose their strength as a result of earthquake shaking. Primary factors controlling the development of liquefaction include the strength and time duration of strong ground motion, characteristics of subsurface soil, in-place soil conditions, and depth to groundwater. Potential effects of soil liquefaction include temporary loss of the soil's ability to support vertical loads and resist horizontal forces, liquefaction-induced settlement, and spreading of the near-surface soils. Although no seismic hazard areas are mapped in the specific project area, a review of the available subsurface information suggests that liquefaction is possible within portions of the project area. These areas generally include the low-lying portions of the project area where looser granular fill deposits occur and may extend offshore where fill materials and littoral drift deposits also occur. Onshore, these areas will likely be shown as modified land in Figure 3-3.

Borrow Sources

Six commercial gravel pits are located within about 20 miles of the project area: Rinker Sand and Gravel (formerly associated Sand and Gravel) and Cadman in

Everett; Northwest Sand and Gravel (Formerly Maltby Resources) in Maltby; Cadman and Eastside in Monroe; and Rinker in Granite Falls. Three additional borrow pits are located between 20 and 50 miles from the site: Glacier Northwest (formerly Lone Star Northwest) in Dupont, Tacoma Sand and Gravel in Tacoma, and Northwest Sand and Gravel (formerly Lloyd's Enterprises) in Federal Way. Each of these eight borrow sites individually or in combination could supply more than one million cubic yards of gravel borrow material. Both Rinker's pit in Everett and Glacier Northwest's pit in Steilacoom are nearly used up and may not be in operation at the time of construction (Gulick, 1995). However, Glacier Northwest also barges in material from Dupont and stockpiles it at their yards in Kenmore and Everett.

3.2.5 Waterways and Hydrological Systems

Marine Hydrology

Figures 3-5 and 3-6 show prevailing wind and wave directions at the two proposed alternative sites and the existing ferry pier. Current directions are shown for Point Edwards. The wind speed, wave heights, and currents are all more pronounced at Point Edwards compared to the existing ferry pier or Mid-Waterfront. Tide elevations and coastal flooding stillwater elevations are essentially the same at each site. Propeller scour will take place at each of the alternative sites and has been an ongoing process at the existing ferry pier.

The Puget Sound area is subject to strong winds, especially from October through April when major low-pressure centers from the Pacific Ocean approach the Washington coast from the southwest. Rapidly moving cold fronts or occluded fronts often sweep ahead of the low-pressure centers, creating strong south-to-north pressure gradients (i.e., large drops in barometric pressure over distance) and subsequent gale (34 to 47 miles per hour [mph]) to storm-force (48 mph and higher) southerly winds. Major storms in the Puget Sound area, such as the Columbus Day storm (October 12, 1962), the Hood Canal storm (February 13, 1979), and the Friday the 13th storm (November 13 and 14, 1981) were associated with deep low-pressure systems with central pressures of 958 millibars (mb), 968 mb, and 954 mb, respectively (Lilly, 1983). Wind gusts in the Columbus Day storm were measured at 100 mph at the Renton airport. Winds exceeding 100 mph caused the destruction of the Hood Canal Bridge in 1979. These types of storms create the highest winds of long duration from a southerly direction in Puget Sound. More typical, however, are the lesser winds associated with weaker depressions affecting Western Washington.

Another major wind producer is the arctic-air outbreak that occurs in winter when a strong high-pressure system settles over the southern part of British Columbia, and a low-pressure system approaches the Washington coast. Cold winds blow from the northeast out of the Fraser River Valley of British Columbia into northern Puget Sound and continuing into southern Puget Sound as northerly winds. The December 28, 1990, outbreak was the strongest arctic-air outbreak in 34 years (1957 to 1990) in Puget Sound. Winds of 32 to 42 mph (345 to 008°True) persisted for 7 hours at West Point.

PUGET SOUND

UNOCAL Pier

Port of Edmonds Marina

Existing Ferry Terminal

Admiral Way

Railroad Ave.

EDMONDS CITY LIMITS

WOODWAY TOWN LIMITS

James Street

2nd Ave. N.

Main Street

Bell Street

3rd Ave. N.

Daylon Street

2nd Ave. S.

3rd Ave. S.

Existing SR 104 (Edmonds Way)

Alder Street

Walnut Street

Willow Creek

Pine Street

SCALE IN FEET
(1" = 400')

0 200 400

Note: Boundaries and locations of soil features are approximate.
Source: GeoEngineers, Inc., 1991.

LEGEND

- High Landslide Hazard Area
- Moderate Landslide Hazard Area

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Figure 3-4
Landslide Hazard Areas

154090.G1.02.A1_T07200106SEA • 3-4 Landslide Hazard Areas • 3/3/03 • dk

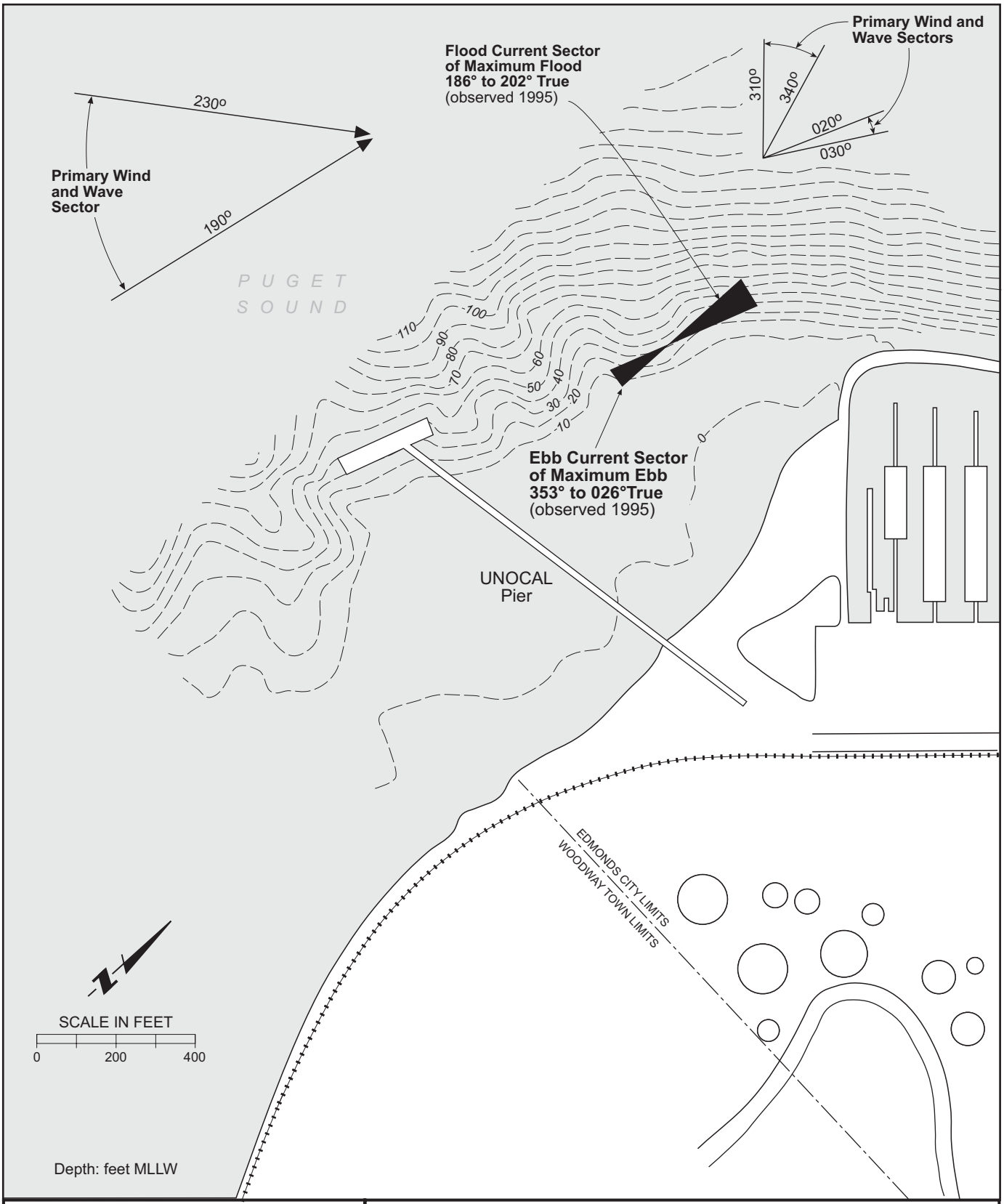

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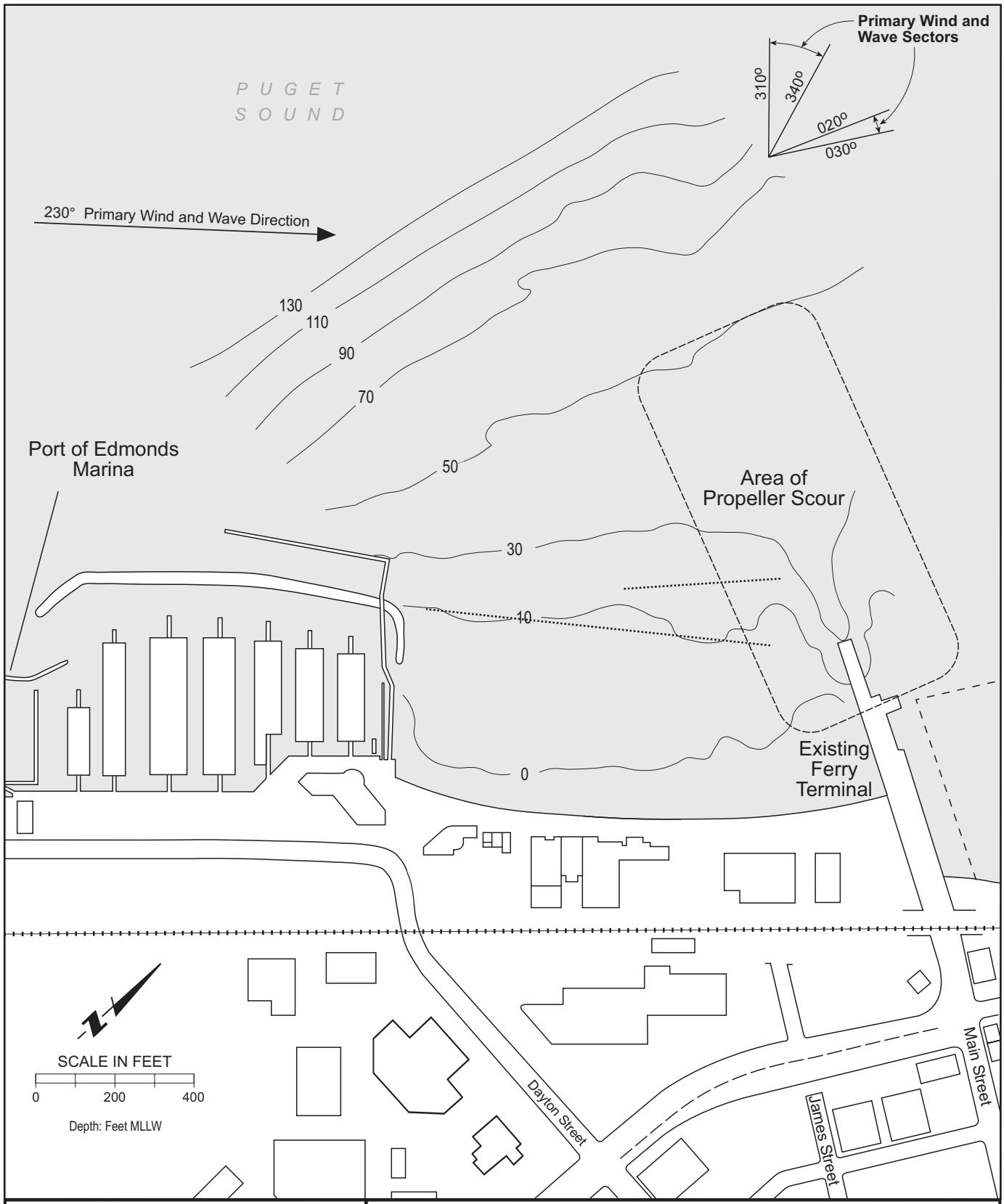
Figure 3-5

Wind, Wave, and Current Direction Near the UNOCAL Pier

154090.G1.02.A1_T07200106SEA • 3-5 Wind, Wave, Current at Pt. Edwards • 3/3/03 • dk



154090.G1.02.A1_T072001006SEA • 3-6 Wind, Wave, Current Near Exist. Ferry Terminal • 3/3/03 • dk

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Figure 3-6

Wind, Wave, and Current Directions Near the Existing Ferry Terminal Site

Strong northwesterly winds (sometimes gale force) also occur, blowing out of Admiralty Inlet toward Edmonds. These winds are associated with strong west-to-east pressure gradients in the Strait of Juan de Fuca, particularly following the passage of a weather front through the Strait in which higher pressure builds behind the front, while lower pressure remains over Puget Sound.

Unusually strong thunderstorms can produce gusts exceeding 50 mph, but these types of events are relatively rare in the Edmonds area. Sea breezes and convergence zones also create winds, but seldom to gale force.

In all cases, the terrain in the Puget Sound area creates localized wind phenomena, such as wind channeling, sheltering, and formation of meso-scale pressure patterns that affect the wind speed and direction experienced at a given location. For example, Point Edwards is exposed to the full impact of southerly and northwest to north-northeast winds and to accelerated wind speeds because of the nearby terrain. Mid-Waterfront and the existing ferry pier, on the other hand, are less exposed to southerly storms, but are fully exposed to northwest and north-northeast winds. The present study addresses the occurrence of winds from the important directions, but does not address individual storm events. Return-period winds and waves (i.e., 2-, 5-, 10-, 25-, 50-, and 100-years) are shown in the waterways and hydrologic systems discipline report.

Existing Ferry Terminal

Conditions at the existing ferry terminal are almost identical to those at the proposed Mid-Waterfront site. Apparent propeller-scour patterns (Figure 3-6) indicate that propeller-induced currents are sufficient to transport seabed material away, preventing the return of eelgrass to the area offshore from the terminal. Part of the channel near the pier was formed by dredging to achieve the depths necessary to operate a ferry close to shore. The areal extent of the apparent scouring is probably in equilibrium with the natural environment. Seasonal changes, if any, are not known.

Point Edwards Site

Located offshore from Point Edwards, this site is exposed to the strong winds and currents common to open areas of Puget Sound. Nearby steep, high terrain accelerates the wind in a localized area around Point Edwards. South-quadrant winds (winds from 135°True to 225°True) associated with storms passing through Puget Sound are approximately 55 percent higher than would be expected at the Mid-Waterfront or existing ferry pier locations, which are sheltered by Point Edwards. North-quadrant winds (winds from 315°True to 045°True) are approximately 15 percent higher at the Point Edwards site than at the other two locations (see waterways and hydrologic systems discipline report).

As a result of the exposed location, significant wave heights from the south quadrant are estimated to be approximately 85 percent higher than those at either Mid-Waterfront or the existing ferry pier. Measurement of wave heights just south of the UNOCAL pier in 1995 confirmed that the wave heights at the site are not created by the accelerated wind speeds, but are the result of a lower-speed wind

blowing over Puget Sound. The long southerly fetch allows much larger waves to develop for a given wind speed. From the north quadrant, however, wind wave heights are similar at all three locations, because all are exposed directly to winds from the northwest to northeast.

Table 3-3 shows the frequency of occurrence of waves at the Point Edwards site, based on additional analysis of winds and waves. It is readily apparent that only certain wind directions are important for creating waves of concern at this site.

Table 3-3
Modified Point Edwards Site Percent Frequency of Significant Wave Height[a]

Significant Wave Height (feet)	Wind Direction (ºTrue)											
	020	030	190	200	210	220	230	310	320	330	340	TOTAL
1.00 to 1.99						0.081	0.028					0.108
2.00 to 2.99	0.13	0.051	1.25	0.57	0.20	0.034	0.011	0.18	0.44	0.36	0.068	3.285
3.00 to 3.99	0.009		0.78	0.28	0.094	0.014	0.0043	0.033	0.081	0.068	0.033	1.392
4.00 to 4.99			0.48	0.17	0.048	0.0036	0.00071	0.011	0.030	0.024	0.0050	0.773
5.00 to 5.99			0.086	0.034	0.0043	0.0014		0.0014	0.0043	0.0029		0.134
6.00 to 6.99			0.013	0.0043					0.00071			0.018
7.00 to 7.99			0.0014	0.0014								0.003
8.00 to 8.99				0.00071								0.001
TOTAL	0.138	0.051	2.608	1.053	0.346	0.133	0.044	0.221	0.555	0.459	0.106	5.713

[a]*Table is based on wind speeds greater than or equal to 15 knots; wind speeds less than 15 knots are not important for wave generation.*

Years of wind data used in analysis = 16 year (1984 to 1998 and 2000); data for 1999 not used due to questionable values in data base from NOAA.
Winds from 040ºT to 180ºT are over land or shallow water and are not a concern for wave generation.
Winds from 350ºT to 010ºT are not associated with waves of concern.
Winds 240ºT to 300ºT are not associated with sustained wind speeds 15 knots or greater for wave generation.

Table 3-3 shows that wind waves of importance are limited to those from 190°True to 230°True, 310°True to 340°True and 020°True to 030°True. Significant waves with heights of 1 foot and higher may be expected, on average, 5.713 percent of the time from these directions. A floating breakwater would be used to reduce or eliminate the high waves from 190°True to 230°True so that the wave climate would be very similar to that at the existing ferry terminal. Exposure to waves from the west-northwest to northeast would be virtually the same at the Point Edwards, Mid-Waterfront, and existing ferry terminal sites.

Currents at the southwest corner of the Edmonds Marina have not been measured, but are expected to be similar in speed to those that were measured near the UNOCAL pier. Flood surface currents would likely be oriented more or less with the seabed contours, and flow toward the southwest. Ebb currents would likely flow toward the northeast. The floating breakwater to be placed southwest of Slip 1 would likely interrupt the surface ebb tidal flow, resulting in weak ebb surface currents at all three ferry slips.

Surface currents at the site are much stronger than those predicted in the tidal current tables from National Oceanic and Atmospheric Association (NOAA) for the current station nearest Edmonds. The predicted currents are for a location 1.9 nautical miles west-northwest of the UNOCAL pier, near the center of Puget Sound. Orientation of seabed contours and the steep bottom slope accelerate the currents and also alter their direction.

Maximum ebb currents of 0.83 to 0.99 knot and maximum flood currents of 0.76 to 1.00 knot were measured. Ebb currents exceeding 1.3 knots and flood currents exceeding 1.1 knots, however, are likely at Point Edwards (see waterways and hydrologic systems discipline report). Maximum ebb current direction is 014°True (±15°) and flood is 194°True (±35°).

Mid-Waterfront Site

This location is sheltered from the extreme effects of south-quadrant wind storms, but is fully exposed to north-quadrant winds. South-quadrant storm winds are estimated to be approximately 35 percent less in strength than at the Point Edwards site.

The wind waves at this location from south-quadrant strong winds are considerably less than those at the Point Edwards site and would be only slightly higher than those at the existing ferry pier, because the site lies in the windward lee of Point Edwards and shoreline. High waves from a southerly storm wind over Puget Sound would fan out because of shoaling and refraction offshore from the southwest end of the Port of Edmonds Marina, but these refracted waves will diminish rapidly in size as they progress toward Mid-Waterfront. North-quadrant waves would be very nearly the same as those at Point Edwards.

Currents at this location were not measured, and there are no predicted currents in the NOAA tables. Possession Sound to the northeast of Edmonds has light and variable currents. Currents at the Mid-Waterfront site are expected to be similar to those at the existing ferry pier and would not be a factor of much concern for operating vessels.

Surface Water Resources

Drainage Configuration

The area under study surrounds the 23-acre Edmonds Marsh, formerly known as the Union Oil marsh, on the south, west, and north (Figure 3-7). Edmonds Marsh receives drainage from Willow Creek to the southeast, from Shellabarger Creek to the east, and from immediately surrounding properties. The marsh is bordered on its northwest side by the BNSFRR tracks. Properties on the west side of the tracks drain into Puget Sound, either directly or through side connections into the Willow Creek culvert or other stormwater conveyances.

Runoff from the upper portion of the Willow Creek basin, including much of SR 104, is collected in an enclosed drainage system referred to as the “Edmonds Way Drain” in Figure 3-7. At its lower end, this storm drain passes through the

existing UNOCAL property and discharges into Puget Sound through a 72-inch-diameter culvert with an outfall located about 850 feet north of the UNOCAL pier. This conveyance system does not collect runoff from the existing UNOCAL property, and it bypasses Edmonds Marsh altogether. The area drained by this system approximates 945 acres. The Edmonds Way drain has surcharged under severe storm conditions in the vicinity of Admiral Way along the waterfront, resulting in the lifting of manhole lids and street ponding. Computer modeling of stormwater runoff characteristics indicates that surcharging occurs downstream from the intersection of Edmonds Way and Pine Street during a 10-year storm event (R.W. Beck and Associates, 1991).

Edmonds Marsh drains southwest to the channelized extension of Willow Creek that runs along the northern and western periphery of the existing UNOCAL lower yard. On the northwest side of the existing UNOCAL lower yard, the Willow Creek channel turns northwest to run through culverts under the BNSFRR tracks. On the east side of the tracks there is a tide gate that is kept open in summer (April to October) and closed the remainder of the year to prevent flooding of areas adjacent to the marsh (R.W. Beck and Associates, 1991; Fiene, pers. comm., 1995). When the tide gate is open, it allows reconversion of the marsh to a saltwater habitat. The existing culvert nearest the outlet of the marsh that is associated with this tide gate has an invert elevation that lies above the outlet channel bottom and therefore impounds water to a shallow depth upstream of it. That impoundment causes shallow water ponding in much of the marsh at all times. Much of the marsh lies at an elevation of +8 to +9 feet MLLW datum. Salt marshes throughout Puget Sound typically do not retain water at low tide in this upper intertidal elevation range.

When the tide gate is open, the Willow Creek/Edmonds Marsh drainage system is continuously subject to tidal influence. Downstream of the BNSFRR tracks, Willow Creek flows through a single 48-inch-diameter culvert, approximately 1,275 feet long, that extends to the Puget Sound shoreline several hundred feet south of the southern breakwater of the Port of Edmonds Marina. Nearshore drift has periodically clogged the culvert outlet with sand and gravel, restricting outflow (R.W. Beck and Associates, 1991). The area contributing drainage to this Willow Creek culvert is about 900 acres, including Willow and Shellabarger Creeks, the existing UNOCAL property, Edmonds Marsh, and areas immediately adjacent to Edmonds Marsh.

The area southwest of Edmonds Marsh is included on the existing UNOCAL property. The stormwater collection and treatment system that was used on the 27-acre property includes a series of catch basins connected by underground concrete pipes that served the upper and lower yards (EMCON, 1994). Much of that system remains in place although the UNOCAL facility is no longer operating and site demolition and clean-up is underway. The following discussion explains how this system operated in the past. During normal precipitation events, all of the catch basins drained into a duplex sump, and the collected stormwater was pumped into an oil/water separator in the lower yard. Any recoverable oil was skimmed from the oil/water separator, and the treated stormwater was pumped into detention basin 2 (formerly called a skimmer pond). Flows were discharged from detention basin 2 into Willow Creek, in the ditch section adjacent to the BNSFRR tracks, via National Pollutant Discharge Elimination System (NPDES)-permitted outfall 002. If this

Edmonds Way Drain
(72-inch)

Willow Creek Drain
(48-inch)

UNOCAL
Pier

Port of Edmonds
Marina

P U G E T
S O U N D

Dayton St. Drain
(24-inch)

Existing
Ferry
Terminal

Admiral Way

BNSFRR

Railroad Ave.

Tide Gate

54-inch Pipe

Oil/Water
Separator

LOWER
YARD

Detention
Pond No. 2

Detention
Pond No. 1

UNOCAL PROPERTY

HARBOR
SQUARE

DAYTON
STREET
BASIN

Bell Street

2nd Ave. N.

James Street

Main Street

3rd Ave. N.

EDMONDS CITY LIMITS
WOODWAY TOWN LIMITS

Willow Creek

EDMONDS
MARSH

Wastewater
Treatment
Plant

2nd Ave. S.

Dayton Street

Existing SR 104 (Edmonds Way)

Alder Street

3rd Ave. S.

WILLOW CREEK/
SHELLABARGER CREEK
BASIN

Shellabarger Creek

Walnut Street

Deer Creek
Fish Hatchery

Edmonds Way Drain

Pine Street

SCALE IN FEET
(1" = 400')
0 200 400

LEGEND

Basin Boundary

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-7
Drainage Features in the Waterfront Area

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treatment system exceeded capacity, stormwater was routed from detention basin 2 into the larger detention basin 1 through a spillway. Detention basin 1 does not have an outlet. Therefore, after high flow conditions subsided, stormwater was pumped from detention basin 1 back through the oil/water separator and eventually into Willow Creek.

During very high tides and heavy rainfall events, stormwater was discharged directly from the oil/water separator into Willow Creek via NPDES-permitted outfall 001 (EMCON, 1994).

In addition to flows from Willow and Shellabarger Creeks, Edmonds Marsh receives local drainage inputs from SR 104, the southern portion of the Harbor Square development, part of the existing UNOCAL access road, and the eastern side of the BNSFRR right-of-way where it borders the marsh. Much of this drainage is conveyed into the marsh by piped systems, and some of it occurs as overland flow.

Northeasterly of Edmonds Marsh, storm drainage from the northern two-thirds of the Harbor Square development, as well as from most of the property west of 2nd Avenue South between Dayton Street and Main Street, is collected in an enclosed system, then is conveyed along Dayton Street in a 24-inch-diameter line. This storm drain discharges into Puget Sound off Olympic Beach Park on the northeastern side of the Port of Edmonds Marina. The area drained by this system is approximately 40 acres.

Existing Land Cover

Commercial and office development associated with a high percentage of impervious surface coverage is the primary land use in downtown Edmonds on the northwest and northeast sides of Edmonds Marsh. The existing UNOCAL property southwest of the marsh is an industrial development, and its lower yard is primarily a flat, compacted gravel surface with scattered structures. Edmonds Marsh and the upland area along the south edge of the marsh are undeveloped, except for the existing UNOCAL access road and the Deer Creek Fish Hatchery located just northwest of the intersection of the existing UNOCAL access road with SR 104.

Groundwater Resources

Groundwater occurrence, groundwater flow direction and gradient, local water supply wells, and infiltration potential and aquifer vulnerability in the project vicinity are discussed in this section. Hazardous waste has been identified or is suspected within some locations of the proposed project alternatives. Contaminated groundwater also has been identified or is suspected at some locations of the proposed project alternatives. (See Section 3.3.7, Hazardous Waste, for more information.)

Groundwater Occurrence and Flow Direction

Available groundwater monitoring data within the project area has focused on two general locations at the existing UNOCAL property, the lower yard and the upper yard. The lower yard is a relatively level area at the northern base of the Point

Edwards bluff and includes modified land or fill material underlain by the Whidbey Formation, which is composed of compacted sand and gravel. The upper yard, located on the steeply sloping bluff, is predominantly underlain by transitional beds, which are a mixture of sedimentary deposits of clay, silt, and fine sand.

The shallowest saturated groundwater zone that is continuous across the existing UNOCAL property is located within the Whidbey Formation; this is a minor regional source of groundwater in the project vicinity. The water table surface is at generally the same level as the contact between the transitional beds and the Whidbey Formation. Isolated perched groundwater zones are locally encountered within the transitional beds in the existing UNOCAL upper yard and are laterally discontinuous and surrounded by unsaturated soils. The predominant groundwater flow direction in the project area is toward the northwest or toward Puget Sound. Local variations typically follow the slope of the ground surface.

Local Water Supply Wells

Two water supply wells are located in the immediate project vicinity, one used by the Deer Creek Fish Hatchery and the other by the City of Edmonds wastewater treatment plant (WWTP).

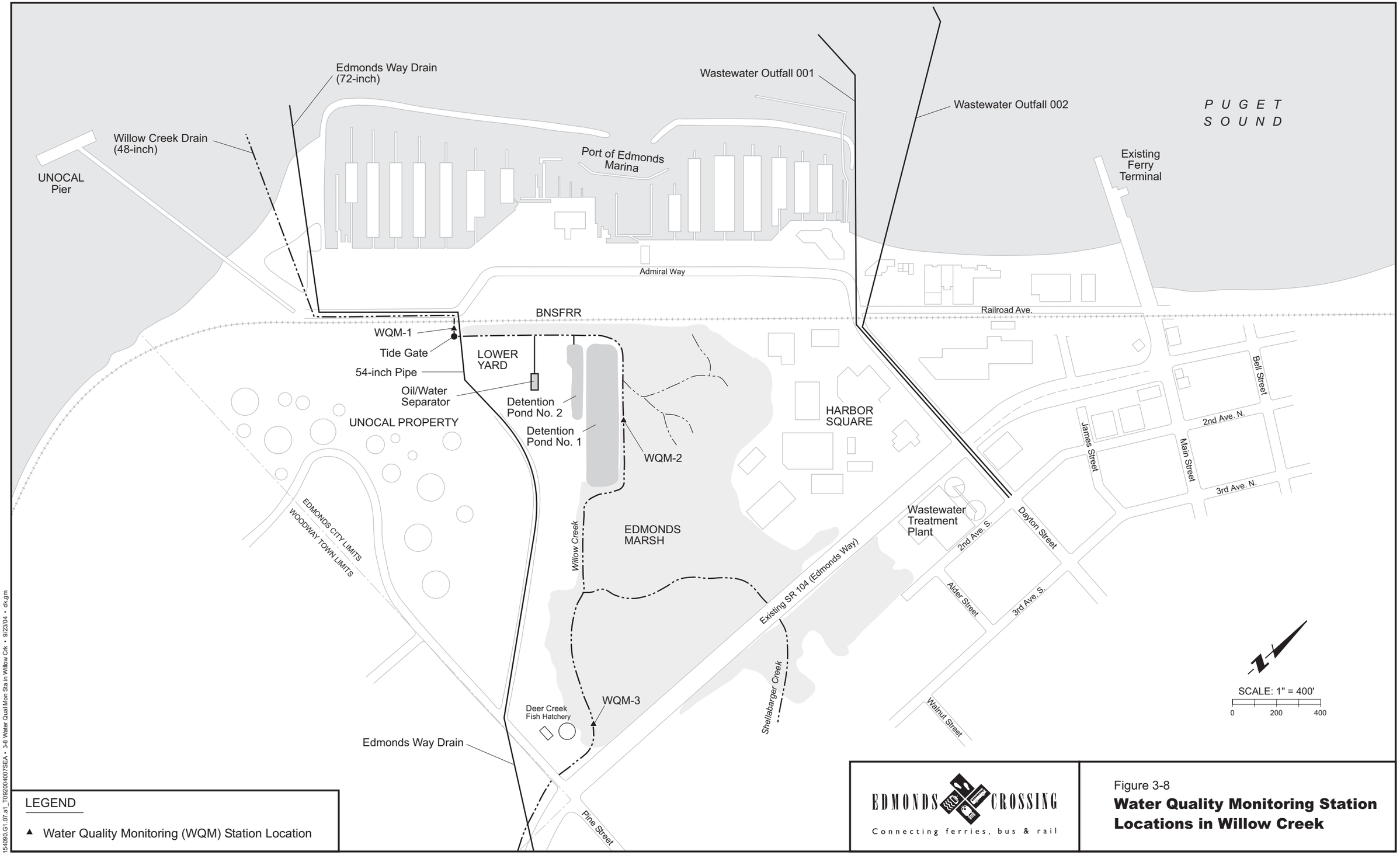
Infiltration Potential and Aquifer Vulnerability

The advance outwash deposits that exist immediately east and south of the project site are critical for aquifer recharge (Economics and Engineering Services, Inc. [EES], 1991). This characterization is based on the relatively high recharge potential exhibited by the shallow geologic materials encountered around the project area. No single groundwater source has been identified in the project vicinity (EES, 1991).

3.2.6 Water Quality

Surface Water Resources

The main surface water drainage features in the project area include Willow Creek, Shellabarger Creek, and Edmonds Marsh, which all discharge to the marine shoreline via a drainage ditch and a culvert (see Figure 3-8). Tides in Puget Sound affect flows from the ditch and culvert, and thus affect flows exiting Edmonds Marsh. In addition, two stormwater systems drain the surrounding upland area and discharge to the marine shoreline within the project area. The general flow patterns in these surface water systems are discussed in Section 3.2.5, Waterways and Hydrological Systems. The following paragraphs present a discussion of available water quality information for these surface waters, as well as inferred water quality characteristics. A discussion of contaminants known or suspected in soils and other media that could impact surface water quality is located in Section 3.3.7, Hazardous Waste, of this chapter.



LEGEND

▲ Water Quality Monitoring (WQM) Station Location

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-8
Water Quality Monitoring Station Locations in Willow Creek

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Willow Creek

Willow Creek originates approximately 1.5 miles southeast of the marine shoreline near 6th Avenue South and Elm Street. The stream flows northwest through a moderately incised ravine that is surrounded by residential and commercial development, then underneath Pine Street near SR 104 and past the Deer Creek Fish Hatchery before flowing into Edmonds Marsh.

Previous studies have provided a general characterization of degraded water quality in Willow Creek based on the size of the creek, the land uses within its watershed, and knowledge of water quality in similar streams (University of Washington, 1990). Willow Creek is unclassified and drains to a Class AA water body (i.e., Puget Sound offshore of the city); therefore, it is rated as Class AA according to the Washington Administrative Code (WAC) 173-201A.

Because no Willow Creek water quality data are available from literature sources, on-site monitoring was conducted for this project to provide an indication of the relative water quality of the stream. Figure 3-8 shows the locations of the monitoring stations used. Samples of creek water were obtained on June 17, and July 17, 1996, for laboratory analysis of pollutant concentrations. Although this sampling plan was limited to a short period of time and involved a small number of water quality samples, the resulting data provide a general indication of typical water quality conditions in the project area.

In general, pollutant levels in Willow Creek did not exceed state criteria for Class AA waters, and the overall water quality was similar to the water quality found in other creeks in the Puget Sound metropolitan area. However, pH levels and dissolved oxygen levels measured at all stations could potentially harm aquatic biota. The low pH values measured in Willow Creek may be the result of natural soil and geologic factors in the watershed. The low dissolved oxygen concentrations measured in the creek in the vicinity of Edmonds Marsh could be attributable to oxygen depletion in the warm and shallow waters of the marsh.

Pollutant transport into the creek with stormwater could be a substantial problem, as evidenced by data collected at station WQM-3 near the Deer Creek Fish Hatchery (Figure 3-8). Elevated concentrations of nutrients, suspended solids, fecal coliform bacteria, and metals were all recorded during storm flow sampling at this station. Water temperatures in excess of the state criteria for Class AA waters were also recorded at the station adjacent to the west edge of the UNOCAL site (Station WQM-1 in Figure 3-8) because of the open area of Willow Creek created by the Edmonds Marsh and ditch just upstream from the sampling station. Water quality in the farthest downstream reaches of Willow Creek is strongly influenced by tidal influxes of saltwater.

Shellabarger Creek

Shellabarger Creek originates approximately 1 mile southeast of Edmonds Marsh near 8th Avenue South and Elm Street. The stream flows northwest through a broad ravine that is surrounded by residential development. Shellabarger Creek then flows into a palustrine emergent (PEM) wetland (freshwater marsh) south of the WWTP.

Shellabarger Creek is culverted underneath SR 104 and flows into the quiescent waters of Edmonds Marsh from the east.

No Shellabarger Creek water quality data are available from literature sources. As with Willow Creek, Shellabarger Creek is rated as a Class AA stream because it drains to Class AA Puget Sound waters and is otherwise unclassified according to the state (WAC 173-201A, 1992). Water quality characteristics are assumed to be similar to Willow Creek.

Edmonds Marsh

Sediment transport from development in the upper watersheds of Willow and Shellabarger Creeks is likely contributing metals, nutrients, and sediment to this wetland. Drainage from developed areas surrounding the marsh, including SR 104, part of Harbor Square, and the UNOCAL access road, is probably contributing the same types of pollutants to the marsh. Because water quality data on Edmonds Marsh are not available from literature sources, limited on-site monitoring was conducted for this project in the Willow Creek channel draining the marsh to provide an indication of relative water quality within the marsh. These data (detailed in the water quality discipline report and briefly discussed above) indicate that Edmonds Marsh has generally acceptable water quality, although dissolved oxygen levels are low. This finding is not surprising, because the marsh has a large, shallow area of open water that is susceptible to warming and stagnation, which can deplete the dissolved oxygen in the water.

Puget Sound Shoreline

Puget Sound is designated as a Class AA water body offshore of Edmonds. Characteristic uses of the water body include fish and shellfish rearing, spawning, and harvesting; wildlife habitat; commerce and navigation; and general recreation and aesthetic enjoyment (WAC 173-201A, 1992).

No water quality data specific to the Edmonds shoreline area were found in the course of this study. However, the King County Department of Natural Resources, Water and Land Resources Division monitors water quality in the vicinity of Richmond Beach within a few miles of the project site. Richmond Beach receives runoff from upland development similar to Edmonds. The King County data reflect ambient water quality, with minimal effects from a nearby combined sewer overflow outfall (King County DNR, 2001). Occasional exceedances of the state water quality standards for peak fecal coliform bacteria concentrations occur in the vicinity of 194th and 198th streets offshore of Richmond Beach, in the intertidal zone (King County DNR, 2001). Compared to many other areas of Puget Sound, the frequency and severity of these fecal coliform bacteria exceedances are low. High levels of fecal coliform bacteria can adversely affect shellfish populations, resulting in human health effects if the shellfish are consumed. All other monitored parameters meet state water quality standards, if such standards are established. Hydrocarbons and phthalates have been detected in samples near the shoreline of Richmond Beach, but there are no established standards for maximum acceptable concentrations of those pollutants in Puget Sound.

Municipal Conveyance Facilities

The two primary drainage systems in the Willow Creek basin are the Edmonds Way (SR 104) trunk storm drain and the Willow Creek storm drain (R.W. Beck and Associates, 1991) (Figure 3-8). Both of these storm drain systems pass through the project area and discharge urban runoff pollutants to Puget Sound between the UNOCAL pier and the Port of Edmonds Marina. No data are available that characterize the water quality of discharges from these storm drain systems.

The Edmonds WWTP discharges secondary-treated effluent to Puget Sound through two pipelines, one 24 inches in diameter and the other 36 inches in diameter**.** The treatment plant is located on Dayton Street east of SR 104, and the pipelines run along Dayton Street to the waterfront. The locations of the two outfalls are shown in Figure 3-8. The design flow through these two pipelines is approximately 11.8 million gallons per day (Ecology, 1992a). The treatment plant discharges certainly affect Puget Sound water quality in the localized area of the outfalls, but water quality data specific to this location are not available.

Stormwater Treatment and Detention Facilities

Currently, there are no publicly owned stormwater treatment and detention facilities in the project vicinity. City regulations require that new developments and redevelopments implement storm drainage controls to mitigate downstream water quality and flooding impacts. Detention basins 1 and 2 and an oil/water separator were previously used to treat discharges from the UNOCAL property (see Figure 3-8). Although these facilities were intended to treat flows containing a substantial proportion of industrial wastewater, they probably currently provide some treatment of stormwater runoff from portions of the existing UNOCAL property.

Contaminated Areas in the Project Vicinity

Soil and groundwater contamination exists or potentially exists in several places within the project vicinity. These areas include portions of the existing UNOCAL property, the BNSFRR tracks, the former Dayton Depot that currently is covered by the Harbor Square development, and marine sediments offshore of industrial areas. Contamination in these areas is a major concern for water quality in Willow Creek, Edmonds Marsh, and Puget Sound because of the potential for contaminant migration via stormwater runoff, groundwater seepage, sediment disturbance, and soil erosion.

The existing UNOCAL property had 10 reported spills between 1950 and 1990 that contaminated soil and groundwater with fuel oil, gasoline, emulsified asphalt, diesel, and aviation gasoline (EMCON, 1994). Documented contamination in the lower yard includes at least four main plumes of floating petroleum product in groundwater and extensive soil contamination (EMCON, 1995). Definition of the nature and extent of this contamination is ongoing while the site clean-up proceeds.

A sanitary wastewater discharge system is also located in the existing UNOCAL lower yard, consisting of three separate septic tanks and drain lines connected to the

office buildings (Emcon Northwest, 1994). Partially treated effluents from this system are also present in shallow groundwater beneath the site. Therefore, it is probable that sewage-related pollutants such as nutrients and fecal coliform bacteria are present, in addition to the petroleum product contamination in the soils and groundwater of the existing UNOCAL property. Similarly, it is likely that stormwater runoff from the existing UNOCAL property is mildly contaminated, and the treatment facilities through which it flows are only partially effective at removing pollutants before the discharges enter Willow Creek.

Contamination on the BNSFRR property in the project area has occurred as a result of a train derailment (spilling diesel fuel), a leaking underground storage tank (LUST), and creosote leaching from railroad ties.

The Dayton Depot was operated by UNOCAL from 1924 to the 1940s on the site where the Harbor Square development currently exists (Landau Associates 1992). This facility received gasoline, kerosene, and diesel via railcars for storage in aboveground tanks, while awaiting subsequent shipping off site by tanker truck (EMCON Northwest, 1994). In 1989, soil and groundwater contamination was discovered underneath the Harbor Square complex; this is possibly from past spills at the Dayton Depot (Landau Associates, 1991). A Phase II investigation by Landau Associates (1991) indicates that total petroleum hydrocarbon (TPH) levels in soil underneath the Harbor Square development exceed Ecology's Method A Model Toxics Control Act (MTCA) limits.

Additional information on soil and groundwater contamination in the project vicinity is contained in Section 3.3.7, Hazardous Waste.

Groundwater Resources

Information from groundwater well logs and literature sources indicates that groundwater lies near the surface (1 foot to 5 feet deep) in the project area. It appears that the surface water level in Edmonds Marsh represents the groundwater table underneath the surrounding waterfront area.

Water quality data from groundwater monitoring wells (MWs) installed on the existing UNOCAL property indicate that contamination of local groundwater resources is extensive. As mentioned above, floating product is present on the groundwater table beneath the lower yard area on the existing UNOCAL property. Water quality data are not available for other groundwater wells (past or present) in the project vicinity, nor is there any indication whether groundwater contamination on the existing UNOCAL property has migrated into Edmonds Marsh.

3.2.7 Wetlands

This section discusses the results of the field reconnaissance and wetland delineations within the project area, including wetland vegetation, soil, and hydrology. Wetland areas within the project area were classified according to the U.S. Fish and Wildlife Service (USFWS) wetland classification system (Cowardin *et al*, 1979). Wildlife and fish use in the wetlands is discussed in Section 3.2.8, Vegetation, Fish, and Wildlife.

Three wetlands were identified within the project area: (1) Edmonds Marsh, (2) a freshwater marsh on the east side of SR 104 that was part of Edmonds Marsh before construction of the highway, and (3) the existing UNOCAL wetland at the existing detention pond 1. Two riparian corridors were also identified within the project area: a narrow riparian corridor associated with Shellabarger Creek at the north end of Edmonds City Park, and the Willow Creek riparian corridor, which runs through the Deer Creek Fish Hatchery. Table 3-4 shows the approximate wetland size, wetland classification, wetland rating, and primary wetland functions.

Table 3-4
Wetlands Within the Project Area

Wetland	Approximate Size (acres)	USFWS Classification[a]	Wetland Rating[b]	Primary Functions[c]
Edmonds Marsh	23.0	PEM, PFO	Category I	Flood storage and desynchronization sediment trapping, nutrient removal, water quality improvement, wildlife habitat, fish habitat, passive recreation
Freshwater marsh on east side of SR 104	3.7	PEM, PSS	Category II	Flood storage and desynchronization, sediment trapping, nutrient removal, water quality improvement, limited biological support
Detention Pond 1	2.3	PEM	Category III	Flood storage and desynchronization, sediment trapping

[a]*Classification according to Cowardin, et al. (1979): PEM = Palustrine emergent; PSS = Palustrine scrub-shrub; PFO = Palustrine forested.*
[b]*Rating according to City of Edmonds Critical Areas Ordinance No. 2874 (City of Edmonds, 1992)*
[c]*Functional assessment according to Reppert, et al, (1979).*

Edmonds Marsh

Edmonds Marsh is a 23-acre marsh located near the waterfront in downtown Edmonds. It is bounded by SR 104 on the east, the Harbor Square commercial development on the north, the BNSFRR tracks and the Port of Edmonds on the west, and the existing UNOCAL property and the Deer Creek Fish Hatchery on the south (see Figure 3-9). The marsh was deeded to the City of Edmonds in 1981, and was established by the City as a Wildlife Habitat and Natural Resource Sanctuary at that time (Ohlde, pers. comm., 1995). Historically, the marsh was an approximately 40-acre, tidally influenced, estuarine system. Progressive filling of the marsh over time reduced the marsh to its present size. A tide gate was installed in 1962 during

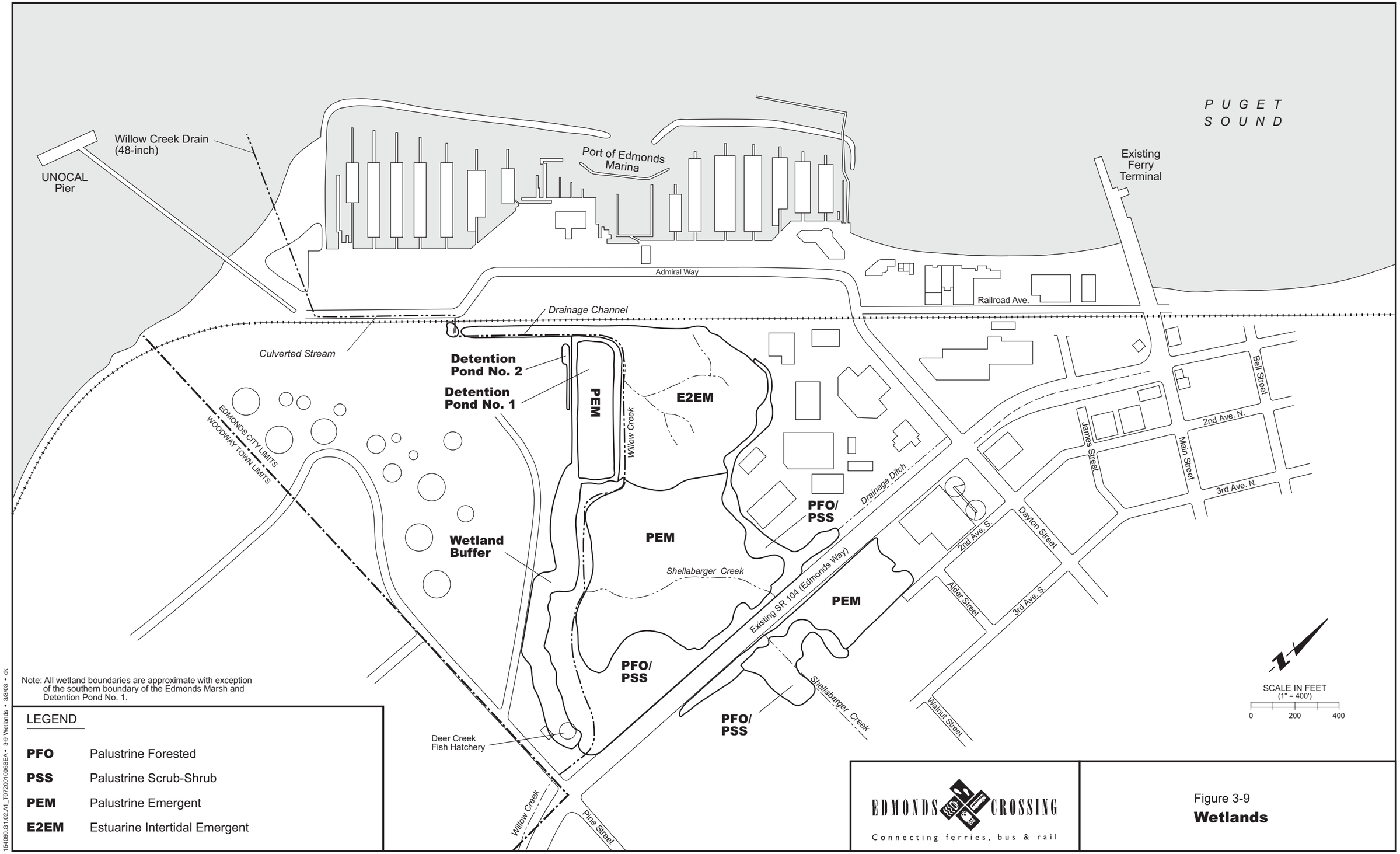
the development of the Port of Edmonds Marina to prevent localized flooding during storm periods (Watershed Co., 1987). This gate provided a barrier to saltwater entering the marsh. As a result, the original salt marsh vegetation changed to freshwater wetland vegetation (cattails) as the saltwater influence declined and freshwater inflow from Willow and Shellabarger Creeks became predominant. In 1984, the City of Edmonds received a Coastal Zone Management grant through Ecology to study public access improvement to the Edmonds waterfront area.

A habitat evaluation of the marsh under this grant recommended the reestablishment of tidal influence within the marsh to restore its historical saltmarsh plant community and to increase habitat diversity (Watershed Co., 1987). Subsequent to this study, the City of Edmonds Parks and Recreation Division permanently opened the tide gate in the culvert at the marsh outlet in May 1989 (Ohlde, pers. comm., 1995).

The marsh consists of several wetland classifications: (1) seasonally flooded, PEM wetland within the eastern portion (2) estuarine intertidal emergent (E2EM) marsh within the western section; and (3) seasonally flooded palustrine forested and scrub-shrub wetland (PFO/PSS) within the northern and southeastern sections. The PEM (freshwater) section of the marsh is dominated by cattails, with associated purple loosestrife and hard-stem bulrush. The western, estuarine section of the marsh is dominated by American three-square, fleshy jaumea, and Pacific silverweed, with associated salt marsh bulrush, saltgrass, and soft rush. Invasive species, such as Himalayan blackberry, Japanese knotweed, and Scot's broom, are found along the northwestern marsh border.

The PFO/PSS component of the marsh is largest in the southeastern section, adjacent to the Deer Creek Fish Hatchery and the existing UNOCAL property. This component is associated with the marsh and Willow Creek, which enters the marsh north of the intersection of Pine Street and SR 104 on the southeast side of the hatchery (see Figure 3-10). The dominant plant species in the overstory include red alder, black cottonwood, and Scouler's Willow, with associated western red cedar, bigleaf maple, and Douglas fir. Salmonberry is the dominant species in the shrub layer. The herb layer is dominated by lady fern, creeping buttercup, and reed canarygrass. Associate species include pig-a-back, skunk cabbage, fringecup, and lady fern. Several large dead trees used as perches by various bird species occur in this area. The forested component in the northern section of the marsh is dominated by willow species.

The Mukilteo Muck soil series has been mapped in the Edmonds Marsh (Debose and Klungland, 1983). Mukilteo Muck is a deep, poorly drained soil formed in organic material derived from sedges. It is found in depressional areas and is considered a hydric soil. Soils sampled in the marsh are predominantly very dark, silty muck, and fit the profile for Mukilteo Muck. The Alderwood and Everett Gravelly Sandy Loam soil series have been mapped within the forested area on the south side of the marsh and adjacent to the Deer Creek Fish Hatchery. Alderwood soil is mapped on till plains, terraces, and outwash plains. Everett Gravelly Sandy Loam is a very deep, somewhat excessively drained soil found on terraces and outwash plains (see Section 3.2.4, Geology and Soils). Soils observed in the forested area were black silty loam with organic material.



Note: All wetland boundaries are approximate with exception of the southern boundary of the Edmonds Marsh and Detention Pond No. 1.

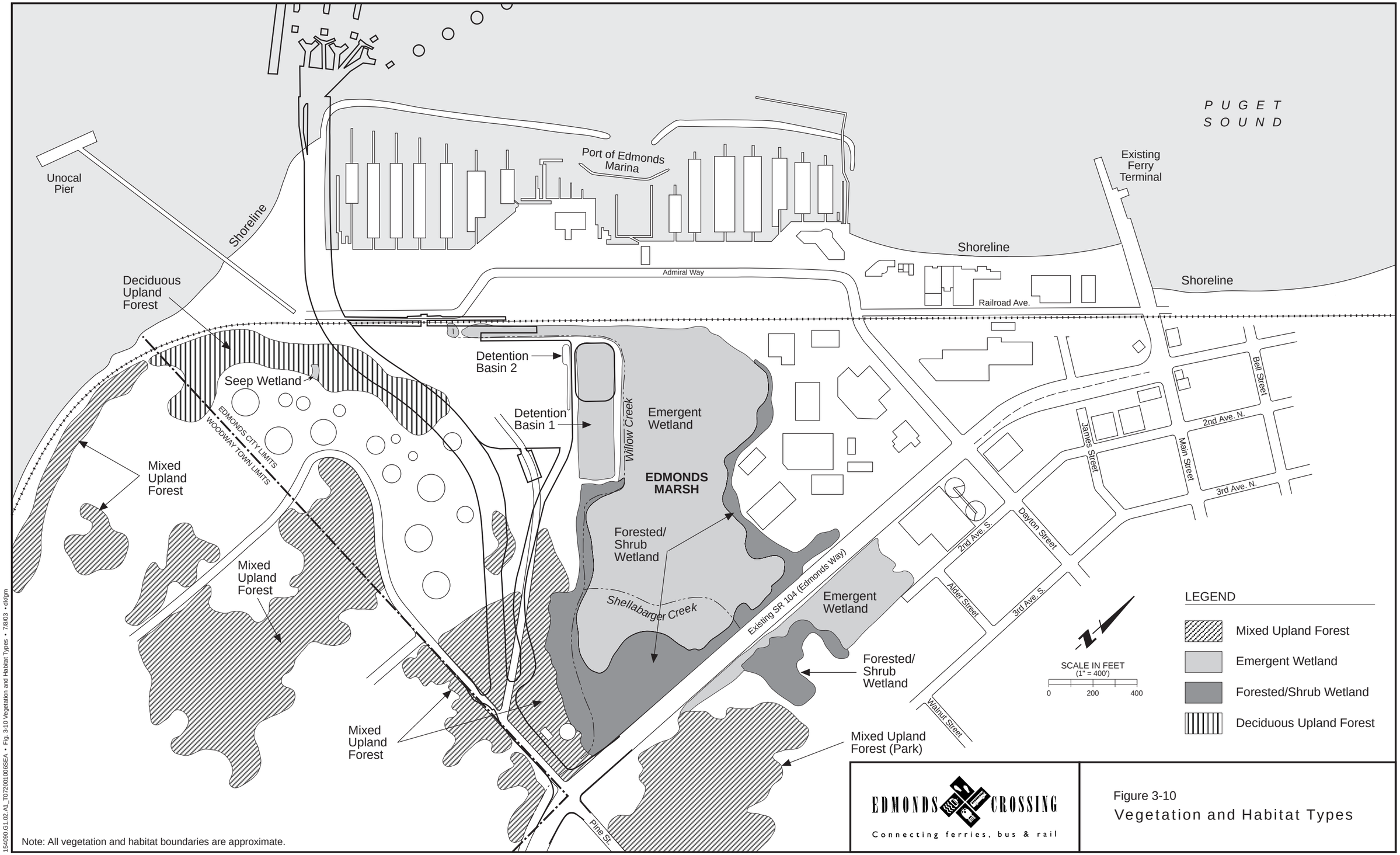
LEGEND

PFO	Palustrine Forested
PSS	Palustrine Scrub-Shrub
PEM	Palustrine Emergent
E2EM	Estuarine Intertidal Emergent

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-9
Wetlands

154090.G1.02.A1_T07200106SEA • 3-9 Wetlands • 3/3/03 • dk



Note: All vegetation and habitat boundaries are approximate.

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-10
Vegetation and Habitat Types

154090.G1.02.AI_T07200106SEA • Fig. 3-10 Vegetation and Habitat Types • 7/8/03 • dk/grn

The marsh receives fresh water from Willow Creek, which flows from upland areas to the south and east, and from Shellabarger Creek, which enters the marsh through a culvert under SR 104 approximately 800 feet north of Willow Creek. Shellabarger Creek flows southwest in a natural channel to a confluence with Willow Creek in the southeastern section of the marsh, just west of the Deer Creek Fish Hatchery. At the confluence, the combined creeks then flow west to the southwestern corner of the site in an excavated channel that continues south along the BNSFRR right-of-way.

Willow Creek, which historically meandered through the marsh, was relocated to its current channel in the 1950s, at the time of the construction of detention pond 1 on the existing UNOCAL property. The channel is culverted under the railroad tracks, emerges into the open for a short distance within the Port of Edmonds parking area, and continues west in a 48-inch-diameter culvert, discharging into Puget Sound at Marina Beach Park.

Because of its large size and dense emergent vegetation, the wetland provides high flood storage and desynchronization, sediment trapping, nutrient removal, and water quality improvement functions. The emergent forested and shrub components provide a diversity of wildlife habitat.

Edmonds Marsh has been rated by the City of Edmonds as a Category I (high-quality) wetland, based on its uniqueness, large size, and habitat for a state monitor species (great blue heron). It is designated by the City as a Wildlife Sanctuary on its Environmentally Sensitive Areas map and is designated as a Priority Habitat in the Washington State Department of Fish and Wildlife (WDFW) Priority Habitat and Species database. Wetlands are rated by the City according to their relative kinds and degrees of functions and values, with Category I wetlands being the most valuable and Category III being the least (City of Edmonds, 1992). Disturbances to Category I wetlands are rarely permitted. When filling or other disturbances to wetlands must occur, compensation for impacts to Category I wetlands is made on an areal replacement ratio of 6:1 (replaced: impacted). Wetland buffer areas for Category I wetlands are typically 100 feet. If alteration of wetlands or other critical areas is identified, the City may require a detailed compensatory mitigation plan.

Detention Pond 1–Existing UNOCAL Property

The existing UNOCAL property is the focus of a remedial investigation (RI) under an agreement with Ecology (EMCON Northwest, Inc., 1994). The investigation is evaluating petroleum contamination of soils and groundwater at the site and is expected to result in finalization of the RI and issuance of a supplemental RI/Feasibility Study (FS) by the fall of 2003 and full clean-up by 2005. As part of the site investigation, a wetland delineation was conducted at the existing UNOCAL facility in January 1995 (Adolfson Associates, 1995).

Detention pond 1 is a 2.3-acre wetland located within a detention basin in the northern corner of the existing UNOCAL property. Detention pond 1 was created in 1952 to collect stormwater runoff from the site (EMCON Northwest, Inc., 1994). This area was originally a small pond, with adjacent pasture and marshland. The dominant plant species in the detention pond are common cattail, spreading

bentgrass, purple loosestrife, and American threesquare. Associate species include common velvetgrass, redtop, and invasive species such as Himalayan blackberry, purple loosestrife, and Scot's broom. Purple loosestrife is a state-designated noxious emergent plant.

The Urban Land soil unit has been mapped throughout this area of the site (Debose and Klungland, 1983). This designation is given to soils that have been extensively modified by grading and filling to the point that the original soil units cannot be identified. A Phase I site assessment report completed by GeoEngineers (1986) indicates that the lower yard of the existing UNOCAL property, including the detention pond, was originally a tidal marsh, and that up to 11 feet of fill material were placed on the lower yard to support UNOCAL facilities. Soil observed in the detention pond ranged from dark brown over very dark grayish brown loamy sand with infrequent mottles, to black above very dark grayish brown sandy muck. Present soil profiles represent disturbed conditions.

Detention pond 1 currently functions as a stormwater detention pond during high rainfall events. Historically, water levels in detention pond 1 have fluctuated considerably. Detention pond 2, a polyvinyl chloride (PVC)-lined basin just south of detention pond 1, receives water discharged from the facility's oil/water separator. Detention pond 2 discharges through an outfall to the drainage channel along the western edge of the facility and, eventually, into Puget Sound. During high rainfall events, overflows from detention pond 2 may occasionally enter detention pond 1 through a spillway.

Because of its small size, lack of vegetative diversity, and disturbed condition, detention pond 1 is expected to provide limited nutrient removal, water quality improvement, and biological support functions. It is expected to provide moderate flood storage and desynchronization and sediment trapping functions, which was its intended purpose.

Detention pond 1 would likely receive a Category III rating according to the City of Edmonds, because of its small size, disturbed condition, limited vegetative diversity, and apparent lack of a hydrologic connection to the Edmonds Marsh. Limited stormwater management use is allowed by the City of Edmonds in the outer 25 percent of the buffers of Category III wetlands. When filling or other disturbances to wetlands must occur, compensation for impacts to Category III wetlands is made on an areal replacement ratio of 1.25:1. Wetland buffer widths for Category III wetlands are typically 25 feet. The Corps, which has jurisdiction over the detention pond, has issued a statement that impacts to the pond would not require a Section 404 permit as long as the pond is used for stormwater detention, as is proposed (see letter in Appendix A).

Riparian Corridors

Riparian corridors include those vegetated areas adjacent to a stream or river that are seasonally or occasionally flooded. Riparian corridors provide food, shade, and other habitat components for a variety of fish, amphibian, mammal, and bird species. Two riparian corridors were identified within the project area: a narrow riparian corridor associated with Shellabarger Creek at the north end of City Park,

and the Willow Creek riparian corridor, which runs east of the Deer Creek Fish Hatchery.

Shellabarger Creek

The Shellabarger Creek riparian corridor at the northwestern end of City Park is a shallow braided corridor within a forested area. Channel width in this area ranges from 1 to 2 feet, stream depth ranges from 3 to 6 inches, and bottom substrate is composed of silt and muck. Stream characteristics are discussed in greater detail in Section 3.2.8, Vegetation, Fisheries, and Wildlife. Vegetation along the creek includes willows, red alder, and some western red cedar in the overstory, with curly dock, skunk cabbage, and Robert's geranium in the herb layer.

Willow Creek

Within the project vicinity, Willow Creek flows from a low-density residential area in the Town of Woodway just south of the project area and above the existing UNOCAL property. The creek is culverted under Pine Street near its intersection with SR 104, and flows past the Deer Creek Fish Hatchery to Edmonds Marsh. The Willow Creek riparian corridor south of Pine Street and through the Deer Creek Fish Hatchery is a narrow, shaded corridor with gently sloping banks. Stream characteristics are discussed in greater detail in Section 3.2.8, Vegetation, Fisheries, and Wildlife. Vegetation along the creek includes western red cedar, red alder, bigleaf maple, and Douglas fir in the overstory; salmonberry, Indian plum, salal, and Oregon grape in the shrub layer; and sword and lady fern, pig-a-back, bentgrass, reed canarygrass, and mannagrass in the herb layer.

3.2.8 Vegetation, Fish, and Wildlife

Vegetation

Five different vegetation communities have been identified within the Edmonds Crossing project area (see Figure 3-10). The following sections describe the dominant plant communities located within the project area. A review of the Washington State Department of Natural Resources (DNR) Natural Heritage Information System indicated that there are no records of important natural features, rare plants, high-quality native wetlands, or high-quality native plant communities within the project area (DNR, 1996). A detailed list of all species identified on site, with common and scientific names, is provided in the vegetation, fish, and wildlife discipline report. This list of plant species represents the species actually observed on site during 8 days of field observation in 1995 and is not all-inclusive.

Emergent Wetland

Emergent wetlands within the project area include portions of Edmonds Marsh and adjacent wetlands located on the existing UNOCAL property (approximately 27 acres). The eastern portion of the wetland is a freshwater system. The western portion is tidally influenced and considered a salt marsh.

Dominant vegetation in the western, brackish area includes salt grass, seacoast bulrush and Pacific silverweed, with brass buttons as a common associate. Cattail and purple loosestrife dominate the eastern freshwater portion of the marsh. Associated species within the freshwater marsh include common velvet grass, water parsley, climbing nightshade, and redtop.

Forested/Shrub Wetland

Forested and shrub wetland vegetation dominates a portion of Edmonds Marsh wetland complex (approximately 11 acres). This community is located north of Pine Street and both east and west of SR 104. The forest canopy layer is dominated by red alder, bigleaf maple, and Scouler's willow. Himalayan blackberry, beaked hazelnut, salmonberry, and red elderberry predominate in the shrub layer. Herbaceous species include reed canary grass and horsetail. Additional hydrophytic species include skunk cabbage, fringecup, and creeping buttercup. Numerous dead trees are present in the canopy and midstory.

Shoreline

Dominant species above the high-water mark consist of dune wildrye, white sweet-clover, and Puget Sound gumweed, with ocean spray, English plantain and Scot's broom dominating the higher shoreline areas and along the marina breakwater.

Upland Forest

Upland forest within the project area is typically a mixed deciduous/coniferous forest association, composed of approximately 37 acres. In addition, a small area of deciduous upland forest (5 acres) exists on the west-facing slope of the existing UNOCAL property, where the tank farm is located. Dominant species include bigleaf maple, grand fir, western red cedar, Douglas fir, and red alder. Dominant understory vegetation consists of red elderberry, ocean spray, Himalayan blackberry, stinging nettle, and horsetail. City Park, located north of Pine Street and east of SR 104, is predominantly vegetated with a mixed-forest community. Douglas and grand fir dominate the tree layer, with lesser amounts of red alder and bigleaf maple, and landscaped elements beneath. In the western portion of the project area, a narrow band of forest 150 to 400 feet wide lies along the bluff below the storage tanks. The dominant trees consist of red alder, bigleaf maple, and bitter cherry; no conifers are present in this area.

Urban

Urbanized landscapes are common throughout the project area. Urban habitat is typified by impervious surfaces, maintained lawns, and landscape plantings. Pioneer or weedy species occupy areas adjacent to roadways, parking areas and rights-of-way (for example, along SR 104, Harbor Place Business Park, and the lower yard of the existing UNOCAL property). Scot's broom, Himalayan blackberry, thimbleberry and ocean spray dominate a dry shrub community bordering the BNSFRR tracks south of Marina Beach Park. Herbaceous species in the understory consist of dune wildrye, yarrow, and English plantain.

Fisheries

Marine Environment–Nearshore

For the purposes of this EIS, the nearshore environment is defined as shoreline areas in less than 80 feet of water, which corresponds to the lower limit of the photic zone. This area includes intertidal and shallow subtidal habitats, which are some of the most productive marine areas and are particularly important for early rearing of many species such as Dungeness crab and various salmonid species. Juvenile Dungeness crabs live intertidally and shallow subtidally for about 1 year before moving into deeper waters. Juvenile salmon, particularly pink (*O. gorbuscha*), chum (*O. keta*), and fall chinook (*O. tshawytscha*) salmon feed on planktonic and benthic (bottom dwelling) organisms in very shallow waters during the first spring and summer. Forage species, including Pacific herring (*Clupea pallasi*), sand lance (*Ammodytes hexapterus*), rock sole (*Lepidopsetta bilineata*), and surf smelt (*Hypomesus pretiosus*) are expected to be present along the Edmonds shoreline.

Nearshore marine habitat information in the project area is largely based on field surveys conducted specifically for this project. Key features of the project area's aquatic resources are depicted in Figure 3-11.

The nearshore marine areas within the project area were divided into two units corresponding to the two build alternatives: the north and south survey areas. Both areas are similar in character, having mostly sand and mixed sand substrates, as well as a rocky shoreline directly adjacent to them (the Edmonds Marina breakwater).

Existing Ferry Terminal Area

The nearshore area between the existing ferry terminal and the Port of Edmonds Marina is mostly sand. There are areas of artificial reef materials and rock at depths of -15 to -90 feet mean lower low water (MLLW) and some mixed sand/gravel at +5 to -15 feet MLLW. The marina breakwater consists of large rock riprap. A public fishing pier built on concrete piles extends out beyond the breakwater. There is a band of sand/shell substrate at the base of the breakwater.

The area near the existing ferry terminal and Dayton Street has expansive macroalgae and eelgrass beds (Figure 3-12). Macroalgae, including *Laminaria* and *Nereocystis*, are nearly continuous from the -5-foot contour to the -60-foot MLLW contour. The area directly offshore of and including the docking area of the existing ferry terminal is conspicuously devoid of macroalgae, probably as a result of propeller-induced turbulence. Eelgrass beds are continuous from the marina to the ferry pier and from the ferry pier north through the underwater park and beyond. Depths range from about -2.0 feet to -20 feet MLLW. The total area depicted for eelgrass in Figure 3-12 is 4.0 acres. The green algae, *Ulva lactuca*, and the red algae, *Gracilaria sjoestedtii*, are also common. Eelgrass is conspicuously absent directly offshore of the ferry terminal. Due to the fact that eelgrass beds are present adjacent to ferry operations on both sides, it is apparent that eelgrass was once present offshore and under the terminal.

Fish species observed at the existing ferry terminal include species characteristic of both rocky and sand habitats. Sandy areas support mostly flatfish species such as English sole (*Parophrys vetulus*) and C-O sole (*Pleuronichthys coenosus*). Rocky habitats are present in the dredge/scour trough at the ferry slip and at the artificial reefs on either side of the terminal. Rocky habitats were found to contain typical assemblage including lingcod (*Ophiodon elongatus*), various rockfish (*Sebastes* spp.), perch (*Embiotocidae* spp.), cabezon (*Scorpaenichthys marmoratus*), and other species. For more detail, please refer to the vegetation, fish, and wildlife discipline report.

Geoduck clams are expected to be found in the project area (Ecology, 1987). A major geoduck bed extends from Mukilteo south to the Port of Edmonds Marina entrance. Juvenile Dungeness crabs are found throughout the area. Juvenile Dungeness crabs were found to be most abundant just to the north of the marina in the lower intertidal/shallow subtidal zone in eelgrass beds. Adult Dungeness crabs extend down the eastern Puget Sound shoreline throughout the project area but are most abundant in areas adjacent to eelgrass beds on sand substrates. Hardshell clams are found throughout the project area, primarily in mixed sand/gravel substrates.

Existing UNOCAL Pier Area

The nearshore area just south in the vicinity of the UNOCAL pier includes a broad shallow bench to the south that is intertidal to about two-thirds of the distance out to the end of the UNOCAL pier. Water depths drop off rapidly at that point (at about -10 feet MLLW). The intertidal area is mostly mixed gravel and small gravel, with some scattered areas of cobble and rocks. Some areas of medium sand are also present. Shallow subtidal areas are mostly sand with areas of mixed sand/gravel, sand/shell, and rock from the 8-foot contour and higher. The Edmonds Way stormwater drainage outfall (between the UNOCAL pier and the marina breakwater) is supported and surrounded by riprap materials.

Habitat in the vicinity of the southeast corner of the Edmonds Marina breakwater is similar to that described for the UNOCAL pier, at least offshore of the zero tide elevation (MLLW). The marina breakwater is composed of large riprap boulders. Substrates are composed of sand, mixed sand and gravel and shell fragments at depths between 0.0 and -10.0 feet MLLW at the foot of the breakwater. Further offshore, substrates are composed of medium to fine sand. These habitats are utilized by flatfish and sculpins for the most part.

Eelgrass beds are small, patchy, and sparse in the vicinity of the UNOCAL pier (Figure 3-13). No eelgrass is present within 100 yards of the footprint of the Modified Alternative 2 (Point Edwards Site) pier alignment. Macroalgae, primarily *Ulva* and *Entermorpha*, are abundant in large patches adjacent to the UNOCAL pier on both sides, including the footprint of the Modified Point Edwards pier alignment (Figure 3-13).

Southern Study Area
Edmonds Way Drain (72-inch)
Willow Creek Drain (48-inch)
Unocal Pier
Sport Fishing Pier
Salmon Net Pen
Port of Edmonds Marina
Admiral Way
Artificial Reef (Tires)
Wastewater Outfall 001
Wastewater Outfall 002
Northern Study Area
P U G E T S O U N D
Existing Ferry Terminal
Brackett's Landing
Edmonds Underwater Park
Dayton St. Drain (24-inch)
Railroad Ave.
EDMONDS CITY LIMITS
WOODWAY TOWN LIMITS
Channelized Very Exposed Very Poor Habitat
Salt Marsh
Channelized Mostly Shaded Poor Habitat
Willow Creek
Freshwater Wetlands
Area of Braided Channel
Good Habitat
Culvert (partial block)
Weir (partial block)
Fair Habitat
Pine Street
Existing SR 104 (Edmonds Way)
Shellabarger Creek
Bell Street
James Street
2nd Ave. S.
Main Street
3rd Ave. S.
Dayton Street
2nd Ave. S.
Alder Street
3rd Ave. S.
Walnut Street
SCALE IN FEET
(1" = 400')
0
200
400

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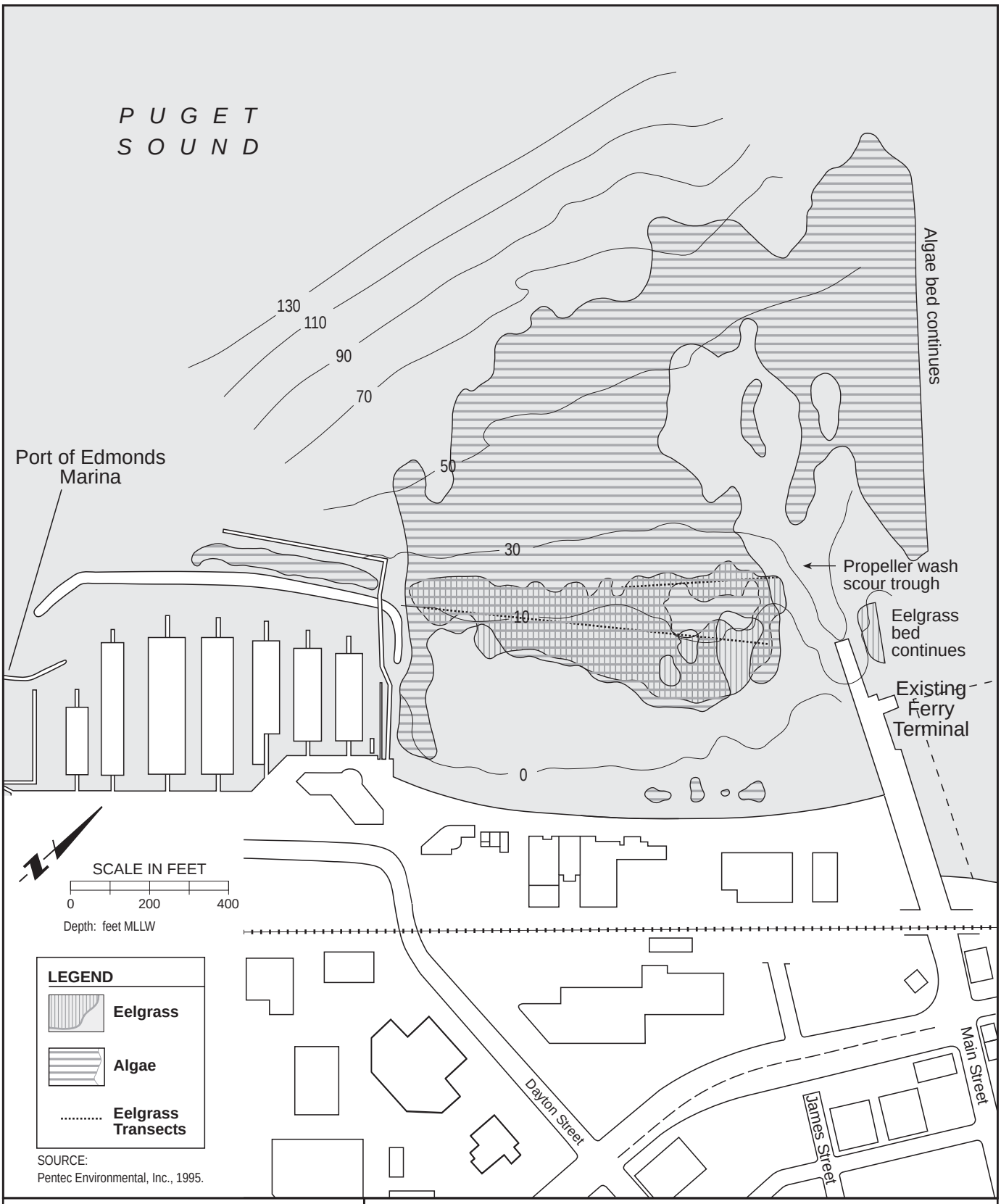
EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-11
Fisheries Features

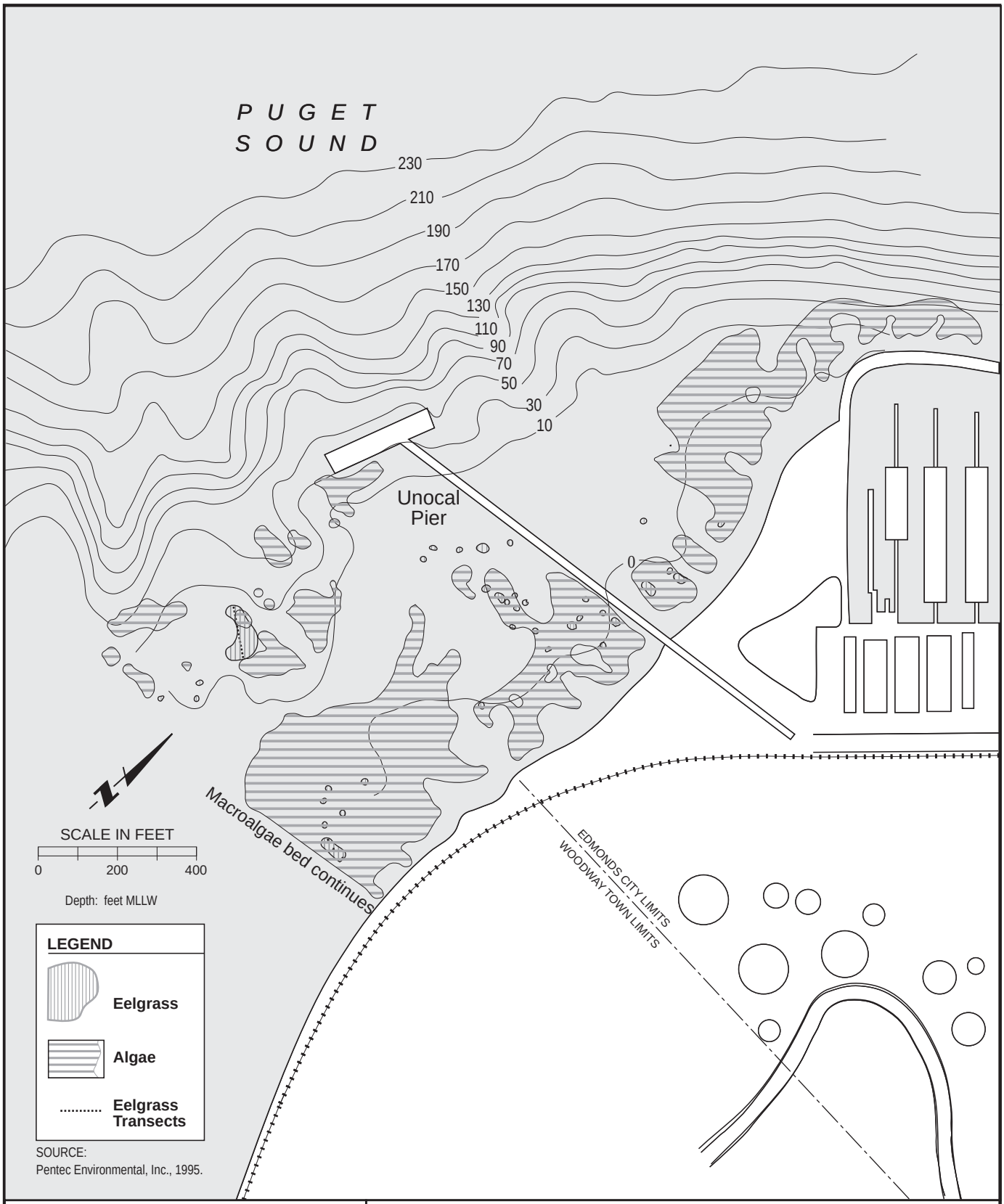


EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 3-12

Distribution of Macroalgae and Eelgrass Near the Existing Ferry Terminal Site



EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 3-13

Distribution of Macroalgae and Eelgrass Near the UNOCAL Pier

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Geoduck clams were found in low densities in the area as a whole (<0.1/square yard), but were relatively abundant in a few restricted areas such as between the UNOCAL pier and the marina breakwater (2.6/square meter). Juvenile Dungeness crabs appear to be less abundant in areas adjacent to the UNOCAL pier compared with the existing ferry pier area. However, such a judgment cannot be made definitely because of the low numbers actually observed. A large proportion of the observed adult crabs was found under the UNOCAL pier. Ten to fifteen crabs were found buried in the sand at about -10 feet MLLW. Most had soft shells, indicating that they had just molted. Hardshell clams are abundant in the intertidal and shallow subtidal areas surrounding the UNOCAL pier.

Marina Breakwater and Other Rocky Areas

Edmonds Marina breakwater riprap, the stormwater outfalls, pier pilings, and artificial reefs all provide hard substrates that support similar biota. Vegetation on these substrates consists of abundant macroalgae dominated by rockweed (*Fucus distichus*), with ribbon and bull kelp in shallower depths. Below about -25 feet MLLW, only sparse red algae were present on these substrata.

These hard substrata support an abundant encrusting fauna and associated finfish assemblage. Much of these fauna have been described by Walton (1979) and Hueckel (1980). The ling cod is a species of concern for the WDFW because of declining numbers. Several individuals were seen near the tire reef adjacent to the sport fishing pier. Previous studies indicate that ling cod use the artificial reef for spawning (Kyte, pers. comm., 1995).

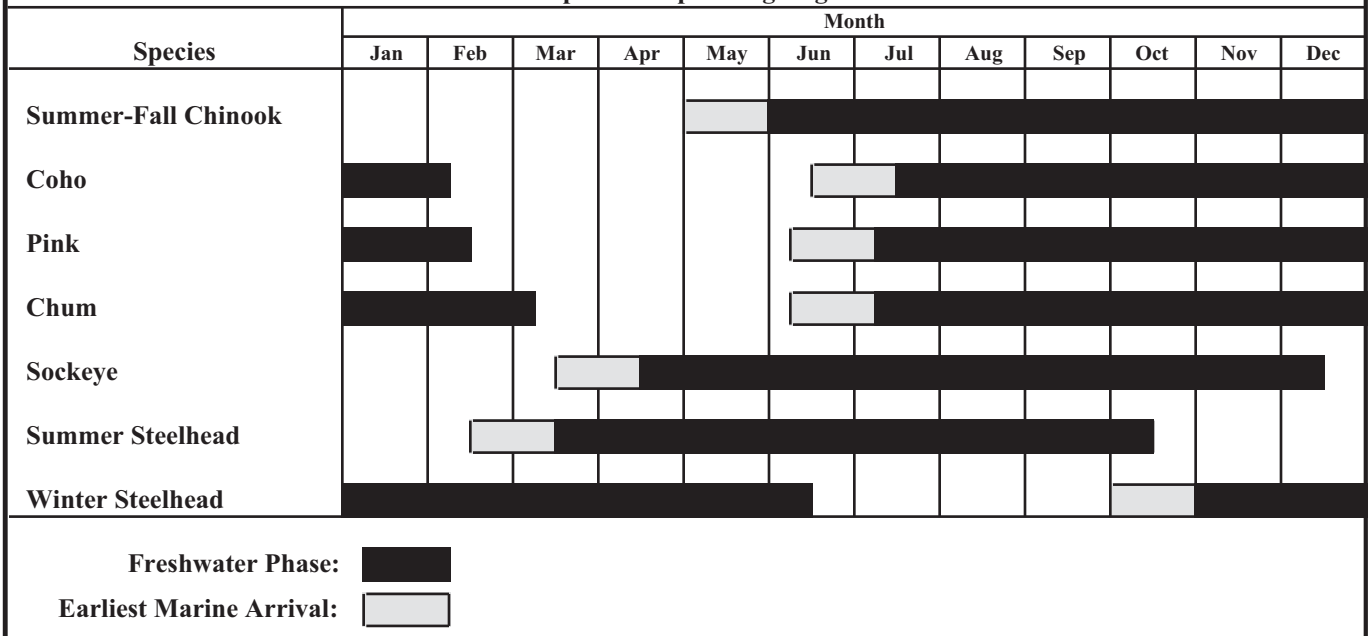
Invertebrates are diverse and abundant in the hard substrata. Additional species present on the tire reef, pier pilings, breakwater riprap, and outfall structures included large tube worms and several species of hydroids, anemones, tunicates, mollusks, starfish, small shrimp, and other crustaceans.

Glacial till found within the existing ferry slip scour hole supports biota different from those seen on other hard substrata. This difference probably reflects both the nature of the substratum and exposure to extreme ferry propeller wash turbulence.

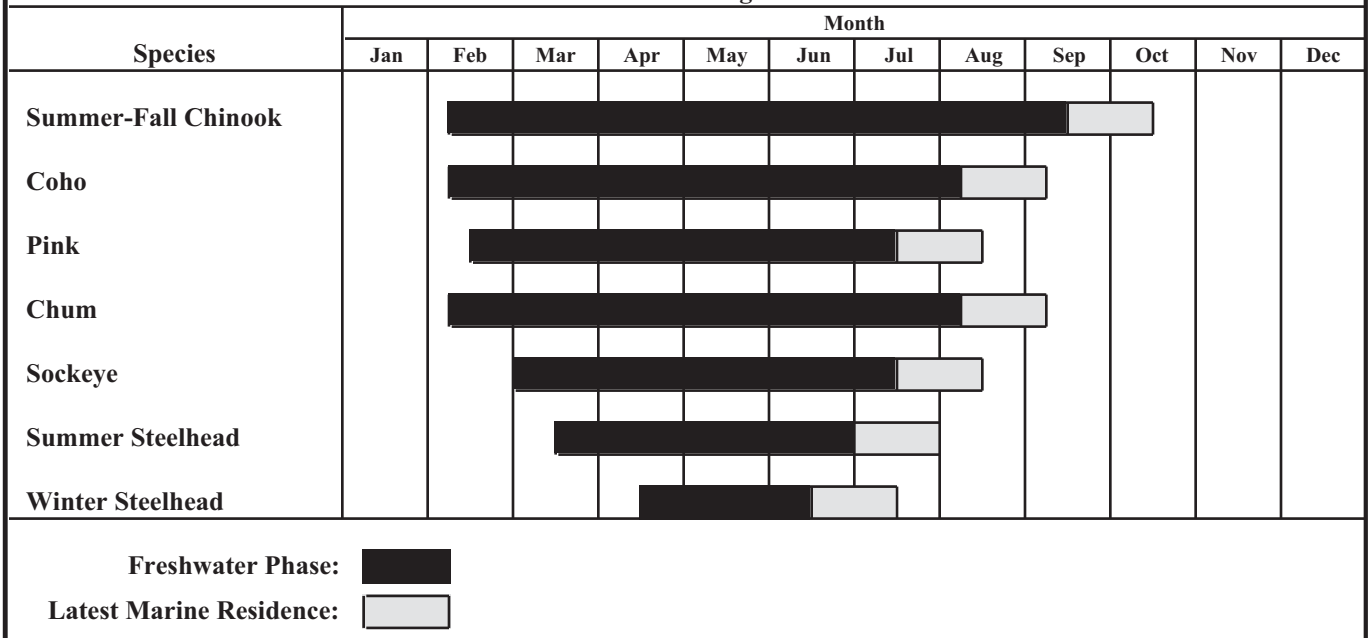
Juvenile Salmonids

As juveniles, salmonid species reside for varying lengths of time in shallow waters along shorelines in Puget Sound. Species that are relatively large when they smolt and enter saltwater, such as steelhead, and coho, move offshore quickly. Species that are relatively small at seawater entry, such as pink, chum and chinook salmon, stay close to shore and move offshore as they grow larger. They migrate along shorelines in central Puget Sound, moving north towards the open sea as they grow (Figure 3-14). During this time, they are vulnerable to nearshore activities, construction impacts, and conditions resulting from altered shorelines. Adult and juvenile sea-run cutthroat trout and bull trout are also seasonal residents of the nearshore area.

Adult Upstream Spawning Migration



Juvenile Out-Migration



SOURCE: WDF, 1975.

Encompasses all stocks south of the Skagit River (inclusive).

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-14

Salmon and Steelhead Migration in Southern and Central Puget Sound

A temporal depiction of juvenile salmonid nearshore migration is shown in Figure 3-14. Juvenile salmonids can be expected in nearshore marine waters as soon as their freshwater migration begins. Pink and chum salmon move directly into marine waters following emergence from spawning gravels in spring. Spawning areas for these species are usually low in river systems, so river migrations are usually short. Chinook usually take more time to move into nearshore areas and can be found into July. A few remain as late as September, October, and even November.

Seasonal timing of juvenile salmonid occurrence in the Edmonds area was inferred from beach seining results in adjacent shorelines (Parametrix, 1985).

Marine Environment–Offshore

The Puget Sound waters offshore of the project area are host to a variety of fish and invertebrate species. By far, the most important fish species commercially, recreationally, and biologically are the salmonids, including chinook, coho, pink, chum, and sockeye salmon (*O. nerka*); steelhead (*O. mykiss*), and sea-run cutthroat trout.

Salmonid Resources

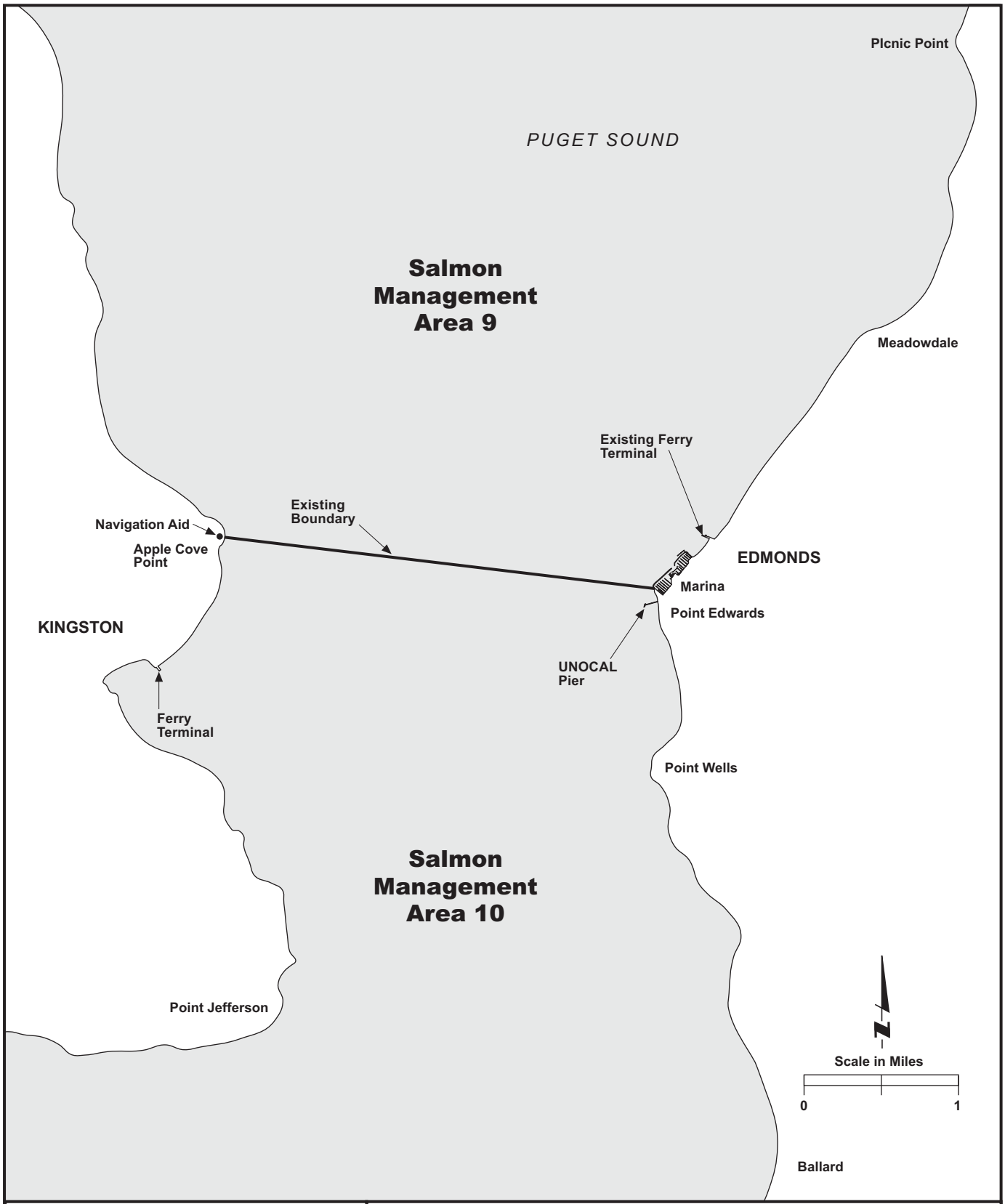
Salmon stocks that may be present in the project area for variable lengths of time includes runs originating from the Skagit and Stillaguamish, but mostly from the Snohomish, Cedar, Green, Puyallup, Nisqually, and Deschutes rivers and smaller drainages in central and southern Puget Sound. The timing of the migrations of adult salmon of various species and various stocks through the central Puget Sound and their residence duration in the Edmonds vicinity is not precisely known. However, salmon generally arrive about 2 weeks to 1 month before entering natal rivers (Figure 3-14).

The size of salmon runs through Salmon Management Areas 9 and 10 (Figure 3-15) can be estimated by adding the current run sizes of the contributing rivers. The approximate run size range of each species is given in Table 3-5.

Table 3-5
Salmon and Steelhead Runs Into Area Rivers

	Minimum Run	Maximum Run
Chinook	23,571	97,558
Coho	20,247	178,566
Chum	61,334	762,200
Pink	200,300	1,295,300
Sockeye	79,747	404,816
Steelhead	9,874	33,339

Source: WDFW et al., 1992.



EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 3-15

Salmon Management Areas

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Freshwater Environment

The freshwater environment in the project area consists of two small perennial streams (Willow Creek and Shellabarger Creek) and a wetland (Edmonds Marsh). The marsh, a complex of salt marsh and freshwater wetland, is described in Section 3.2.7, Wetlands.

Willow Creek is a small perennial suburban stream in the southern portion of the project area. It is a second-order stream with a DNR stream classification of "F" (perennial with salmonids) below Pine Street. The stream is perennial without salmonids above Pine Street (the culvert is a passage block). Base flow statistics are not available, but seasonal low flow is probably on the order of about 0.1 to 0.5 cubic feet per second at the mouth. Observed flow on June 28, 1995, was about 1.5 cubic feet per second.

Willow Creek originates in a residential area in the vicinity of Elm Street and Sixth Avenue at an elevation of about 260 feet. It flows roughly west under SR 104, northwest into Edmonds Marsh, then southwest around the existing UNOCAL detention pond and into a long culvert that discharges onto the beach at Marina Beach Park, adjacent to the UNOCAL pier (Figure 3-11). The culvert is 48 inches in diameter with a very gradual slope. There are conflicting reports as to how long the culvert is; available maps indicate that it is about 1,275 feet long. The culvert runs under the park and portions of the marina parking lot.

Willow Creek is known to contain coho salmon, resident, and sea-run cutthroat trout and, historically, chum salmon (Stay, pers. comm., 1995). Electrofishing efforts on June 28, 1995, confirmed utilization by coho salmon and cutthroat trout. Other fish species observed include sculpins (*Cottus* sp.), and three-spined stickleback (*Gasterosteous aculeatus*).

Deer Creek Fish Hatchery is a small rearing and outplanting facility operated by the Laebugton Chapter of Trout Unlimited since 1986, under the direction of WDFW. Hatchery production (mostly from WDFW Issaquah Creek Hatchery eggs) is entirely coho salmon. Fish are reared to smolt stage and are outplanted into several north Lake Washington tributaries, including Swamp Creek and North Creek in King and Snohomish counties. No fish are intentionally released into Willow Creek. Total annual production is about 120,000 fish.

In addition to hatchery production, Trout Unlimited operates a delayed-release coho program. Coho smelts are obtained from either the WDFW Snohomish or Skagit hatcheries and held in a net pen for 3 to 4 months for imprinting purposes in June or July. The net pen is located next to the public fishing pier (Figure 3-11).

Although the hatchery program was not begun with the goal of adult returns to the hatchery, a run has become established. The average annual return of coho to Willow Creek is about 20 to 40 fish (Haldeman, pers. comm., 2003). Although there is a small reach of suitable spawning and rearing habitat adjacent to the hatchery (less than 100 yards) the primary source of this run is thought to be from the net pen-reared fish. Willow Creek is the only creek in the vicinity of the net pen. The successful returns to the hatchery means adult salmon will traverse the long outlet

culvert and can negotiate the braided marsh reach, at least under high-flow conditions. Spawning activity was observed in the vicinity of the hatchery.

Chum salmon are known to occasionally stray into Willow Creek, presumably from chum enhancement projects in nearby watersheds such as Pipers Creek (Stay, pers. comm., 1995).

During a very low tide (-1.3 feet MLLW), Willow Creek runs across mixed sand and gravel for about 200 feet in a featureless channel about 8 feet wide and 2 inches deep (Figure 3-16). At the time of the habitat survey (June 1995), the flow rate was about 1.5 cubic feet per second and water was clear. At high tide, the concrete culvert outlet is submerged. The pipe is reported to be partially to mostly blocked by sand and gravel at times (as was the case during the field reconnaissance). Upstream of the culvert, intertidal marine life indicates a strong tidal influence. The creek is a channelized ditch for several hundred yards along the western and northern borders of the existing UNOCAL detention pond. The bottom is exclusively muck and the water is uniformly shallow, warm, and exposed. Habitat for salmonids in this reach is very poor.

Upstream, the creek is bordered first by cattails, then by a combination of cattails, willows, and alder. The channel is a uniform, channelized, sand-bottomed ditch without many features for about one-half the distance from the east end of the existing UNOCAL detention pond to the hatchery. Most of the remaining half of this distance is a channel braided through cattails and flooded thickets of alder, willow, and blackberries. Water velocities are slow. Shellabarger Creek joins Willow Creek in the middle of this reach. Pools are scarce, but slow velocities and heavy cover probably offer some rearing potential for juvenile salmonids.

Fair to good spawning and rearing habitat is present in the 240-foot-long reach adjacent to Deer Creek Fish Hatchery. Abundant spawning gravels and pools provide the only good habitat in the creek. Abundant salmonid juveniles (mostly coho) were observed here. A weir at the hatchery (approximately 30 inches high) impounds water for the intake, creating a large, deep pool. The weir is a migratory block when in place, but is removed in the winter (Haldeman, pers. comm., 1995). The culvert at Pine Street appears to be a partial or complete blockage to migrating salmonids due to velocity; the culvert has a slope of 5.6 percent.

Habitat for salmonids above Pine Street for about 1/4 mile below SR 104 is poor to fair for rearing because of a lack of pools. The channel in this reach is almost all high-gradient riffle with a substrate of gravels and cobbles embedded with about 30 percent sand. Shading is good from 4- to 10-inch-diameter alders. Several partial blockages are present in the reach below SR 104: two debris jams; and an 2.7-foot-high waterfall. Gradient is moderate (about 3 to 4 percent) in this reach. Some spawning habitat is available for coho during the higher water conditions present in December, when most spawning takes place. Overall, Willow Creek provides very little usable salmonid habitat.

Willow Creek Outfall

Willow Creek in intertidal reach. Edmonds Way stormwater outfall at far right.

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Figure 3-16

Photos of Willow Creek Outfall and Intertidal Area Adjacent to the UNOCAL Pier

Shellabarger Creek

Shellabarger Creek originates in a residential area in the vicinity of Eighth Avenue and Elm Street at an elevation of about 200 feet. The creek runs northwest, then west for about 1.0 mile, and merges with Willow Creek in a braided, poorly defined reach channel in the southeast corner of Edmonds Marsh, approximately represented in Figure 3-11.

Above the marsh, Shellabarger Creek is confined in a shallow ravine by constructed embankments and riprap materials in a moderately to well-vegetated green belt between apartment complexes. In places, lawns extend down to the channel. The stream is mostly well-shaded by overhanging blackberries, salmonberries, ferns, alders, and maples. Channel morphology is mostly riffle and run with perhaps 10 percent pools. Gradient is about 3 to 4 percent. An adequate amount of gravel deposits is present relative to available pool habitat and is thus not limiting. A few 3- to 6-inch trout were seen during the site visit. Habitat quality is fair.

Wildlife

Wildlife use of an area depends on the complexity of the vegetative community, the plant species present, and the proximity of other habitat types used by the wildlife species.

Five onshore habitat types have been described within the immediate project vicinity (Figure 3-10). A list of wildlife species that use the habitat types available within the project area is included in the vegetation, fish, and wildlife discipline report. Appendixes B, D, and E of this discipline report list common and scientific names of vertebrate wildlife species that were observed, directly or indirectly (i.e., vocalizations, tracks, scat). In addition, the list contains species that are known to use similar sites in the Puget Sound region (Hunn, 1982; Wahl and Paulson, 1991; King County, 1991; Kozloff, 1976; Leonard *et al*, 1993; Ingles, 1965; Burt and Grossenheider, 1976; Matthews, 1988; Pojar and McKinnon, 1994; Opperman, Thompson, and Murphy, pers. comms., 1995). A number of these species are likely to be present within the project area, but remain unobserved through nocturnal habits, avoidance of humans, and camouflage (e.g., opossum, deer mouse, northwest salamander, screech owl). Others noted on the list are possibly, though not likely, present (e.g. striped skunk, porcupine, hoary bat, northern red-legged frog). A list prepared by a noted member of the Seattle Audubon Society is included in the vegetation, fish, and wildlife discipline report.

Emergent Wetland Habitat

The emergent habitat available within the project area, in particular Edmonds Marsh, is used by a number of wildlife species. This habitat comprises approximately 27 acres within the project area. Project staff observed 17 species of birds during field visits in May and June 1995 and June 1996, including bald eagle, red-tailed hawk, great blue heron, Virginia rail, mallard, gadwall, and 13 species of passerines. Several species of bats are expected to use the marsh for feeding, the most common being the little brown myotis and big brown bat (Odegaard, pers. comm., 1995). Raccoon tracks were observed in spring 1995, and river otter, coyote,

beaver, and muskrat are known to use the site (Opperman and Murphy, pers. comm., 1995). Amphibian and reptile species, including Pacific chorus frog and northwestern garter snake, are expected to use this habitat, although none were observed during field visits.

Forested/Shrub Wetland Habitat

Forested and shrub wetland habitat, comprising approximately 11 acres within the project area, is associated with Edmonds Marsh and Shellabarger and Willow creeks. This habitat type is particularly productive for wildlife; many upland forest species will forage or water in this habitat, in addition to species that spend the majority of their time there. A Douglas squirrel was observed in this habitat in spring of 1995. In addition, raccoon, river otter, coyote, beaver, and mountain beaver are expected to use this habitat (Opperman, pers. comm., 1995). Little brown myotis and big brown bat are expected to feed above shrub habitats in Puget Sound (Odegaard, pers. comm., 1995).

There were 16 species of passerine birds recorded in this habitat during site visits. Dead trees provide nesting habitat for violet-green swallows and tree swallows and perches for swallows, fly-catchers, hummingbirds, and others. Migrants such as warblers, flycatchers, and tanagers use both wetland forest and shrub habitats for foraging (Seattle Department of Parks and Recreation, 1994). Numerous other birds use this habitat for mid-migration feeding and resting (Martin-Yanny, 1992). Raptors, including bald eagle, might perch or forage in this habitat.

Shoreline Habitat

The shoreline habitat above the high-water mark is typified by open sand and gravel areas, with scattered grasses, herbs, and small shrubs along the landward edge. Bird species observed in May and June 1995, and June 1996, in the shoreline area included red-tailed hawk, bald eagle, great-blue heron, killdeer, several species of passerine birds, and four species of gulls and terns. Waterfowl species observed from the shore in the nearshore project area included double-crested cormorant, pigeon guillemot, surf scoter, western grebe, and white-winged scoter. Other species of waterfowl are expected to use the nearshore habitat throughout the year.

A long-tailed weasel was observed in the shoreline habitat south of the UNOCAL pier. Mammals that are known to use the nearshore habitats within the project area are mink, river otter, California sea lion (WDFW, 1995), and harbor seal (Opperman, pers. comm., 1995). California sea lion haulouts are listed as a priority habitat by WDFW (1995). The nearest sea lion haul-out is located at Race Rock near Victoria, British Columbia (Norberg, pers. comm., 2003).

Upland Forest Habitat

Upland forest, composed of 42 acres within the project area, provides potential nesting and foraging habitat for a variety of species of birds and mammals. Forest edges provide nesting sites for species such as song sparrow, bushtit, and rufous-sided towhee. Dead trees, or snags, within this habitat provide perches for bald eagle, red-tailed hawk, western wood pewee, and great blue heron. Snags also

provide foraging opportunities for downy and hairy woodpecker and nesting habitat for swallow, black-capped chickadee, European starlings, and woodpecker. Migrants such as Wilson's warbler, orange-crowned warbler, and western tanager use both forest edge and interior habitats for foraging and nesting, and others use this habitat as a mid-migration resting and foraging stop (Martin-Yanny, 1992; Brown, 1985).

Up to 11 great blue herons were observed using snags and living trees for daytime roosting north of the existing UNOCAL access road in January 1995. As many as 17 herons have been observed in this location in the past (Murphy, pers. comm., 1995).

Great blue herons built nests in trees located south of the Edmonds Marsh in 1997 (Thompson, pers. comm., 1998). UNOCAL personnel and birding recreationalists indicate that six nests were active in 1997 and three nests were active in 1998. The nest sites have not been active since that time (Thompson, pers.comm., 2003).

Pileated woodpecker holes were observed in this area in May 1995. Pileated woodpecker is a Washington State priority species. Douglas squirrel, raccoon, river otter, coyote, beaver, and mountain beaver are mammal species expected to use this habitat within the project area (Opperman, pers. comm., 1995). Amphibians and reptiles using forested habitats in the Puget Sound region include rubber boa, northern alligator lizard, ensatina, and Pacific tree frog (Penland, 1992).

Urban

Urban habitat, typified by impervious surfaces, landscape plantings, lawn, and disturbed sites, is used by a number of urban-adapted native and introduced bird and mammal species. Observed species include American robin, crow, European starling, house sparrow, barn swallow, and black-capped chickadee. Black rat, eastern gray squirrel, raccoon, Virginia opossum, and house mouse are also common in urban environments. Little brown myotis and big brown bat are expected to feed in urban areas in Puget Sound (Odegaard, pers. comm., 1995), although none were observed during the field visit.

Threatened and Endangered Species

In February 2003, USFWS provided a list of federal endangered or the threatened species, and identified marbled murrelet (*Brachyramphos marmoratus marmoratus*) occurrence within the project area as well as bald eagle (*Haliaeetus leucocephalus*) and bull trout (discussed under “Fisheries” above) (see Appendix A).

Marbled murrelets are found from the Aleutian Islands of Alaska south to central California. In Washington, marbled murrelets are year-round residents on coastal waters. They feed primarily on small fish and crustaceans from saltwater within 1.2 miles of the shore. The nesting period extends from April 1 to September 15. There are no known marbled murrelet nests within the project vicinity, and no typical murrelet nesting habitat is present in the project vicinity. Marbled murrelets have been observed in summer and winter foraging in waters off the site (Stein, pers. comm., 1996).

The occurrence of bald eagles within Snohomish County has been documented since presettlement times. Eagle populations decreased within the region as a result of hunting (legal until the 1940s) and the widespread use of dichlorodiphenyltrichloroethene (DDT) (banned in 1972). Bald eagle numbers have been increasing in recent years. Bald eagles are primarily fish-eaters, although they will feed on waterfowl and carrion (Stokes, 1989; Matthews, 1988). No bald eagle nests are known within the project area or within 1/2 mile of the project area (WDFW, 2003).

In a letter dated November 4, 1998, the National Marine Fisheries Service (NMFS) identified humpback whale, Steller sea lion, and leatherback sea turtle as federal threatened or endangered marine mammal or reptile species possibly occurring in the vicinity of the project. All of these species were addressed in the Biological Assessment (BA). A priority habitat and species/natural heritage program database search (2003) did not identify any additional Washington State threatened or endangered species.

In March 1999, following publication of the Draft EIS, NMFS announced the listing of Puget Sound chinook and Hood Canal summer-run chum salmon as "threatened" under the Endangered Species Act (ESA) (NMFS, 1998). Puget Sound chinook smolts originating from the Green, Duwamish, Lake Washington systems, and to a lesser extent from the Snohomish and Puyallup systems, can be expected to pass through the project area during their migration out to the open ocean. Coastal Puget Sound bull trout were also listed under the ESA in November 1999. Puget Sound chinook and coastal Puget Sound bull trout are addressed in a BA for this project.

One of the comments made on the *Draft Environmental Impact Statement for SR 104, Edmond Crossing* indicated that the discussion of ESA-protected species needed to cover summer-run Hood Canal chum salmon. Summer-run Hood Canal chum salmon were not included in the BA because it is extremely unlikely these fish would be present in the action area. Hood Canal chum fry would have to swim across Puget Sound in the opposite direction of their normal out-migratory pattern to be present in the vicinity of Edmonds.

Through consultation with WSDOT, the authorized ESA-compliance reviewer of this document, the salmonid action area was set as the marine area encompassing a 1/2-mile radius around the construction zone. The freshwater action area includes the reach of Willow Creek below SR 104. Kingston and central Puget Sound have been excluded from the action area because the project does not affect these areas. The action area for birds were set at a 1.0 mile radius around the construction area.

3.3 Built Environment

3.3.1 Land Use

The Edmonds Crossing project area encompasses parts of two jurisdictions: the City of Edmonds and the Town of Woodway. For this land use analysis, the project area was defined as the general area encompassed by Puget Sound to the west, Bell Street to the north, 3rd Avenue to the east, and northwest Woodway to the south.

Existing and future land uses within the project area for these two jurisdictions are described in further detail below.

City of Edmonds

Existing Land Use

Overall, approximately 95 percent of the City of Edmonds is developed. The majority of the City's land use base is developed with single-family residences. Single-family and multifamily residential units make up approximately 59 percent of the City's total area. Commercial activity is concentrated in the downtown/waterfront area (which encompasses the project area) and along the SR 99 corridor.

Existing project area land use in the City of Edmonds consists primarily of waterfront-oriented facilities and commercial businesses. Land use along the western portion of the project area is dominated by Port of Edmonds facilities. The Port contains a 1,000-slip marina (both covered and open slips on approximately 11 acres) and other waterfront-related uses such as boat launch facilities, guest moorage, dry boat storage, pressure-washing area, 50-ton travelift, and a marine fuel dock. The Port's property is also occupied by approximately 80 businesses including a variety of shops, offices, restaurants, and businesses (City of Edmonds, 2001).

Three detached single-family residences are located along the west side of Railroad Avenue near its intersection with Dayton Street; these units are non-conforming uses within a commercially designated zoning district (Commercial Waterfront). Other waterfront land uses north of the Port include multifamily residential (Ebb Tide and Reef Apartment complexes); the South County Senior Center; office, retail, and restaurant establishments; Brackett's Landing Park South; and the existing Edmonds ferry terminal located at the western terminus of Main Street. This terminal was constructed in the early 1950s.

A commercial development referred to as Harbor Square is located in the central portion of the project area on land owned by the Port of Edmonds. Harbor Square is bordered by the Edmonds Marsh to the south, BNSFRR to the west, Dayton Street to the north, and SR 104 to the east, and consists of five low-rise (i.e., one- to two-story) buildings that contain primarily office and retail uses. Other uses in this commercial development include the Harbor Inn Motel and Harbor Square Athletic and Tennis Clubs. North of Harbor Square across Dayton Street is another commercial building (the old Safeway complex) that includes a variety of retail and business services, as well as three restaurant/food establishments. The Edmonds rail passenger station is located adjacent to and west of this commercial development.

In the central portion of the project area between SR 104 and the BNSFRR right-of-way lies a large 23-acre wetland (referred to as Edmonds Marsh), which includes interpretive trails. In addition to this large passive natural area, there are numerous other parks and recreational facilities in the project area, including four local waterfront parks: Brackett's Landing North, Brackett's Landing South, Olympic Beach Park and Fishing Pier, and Marina Beach Park.

A large inactive tank farm used as part of UNOCAL's operations formerly occupied the Point Edwards bluff in the southern portion of the project area. The storage tanks were removed in 2001 and clean-up of the upper yard was completed in October 2003. Interim clean-up of the lower yard is expected to resume in summer 2003 and be completed by 2005 (UNOCAL, 2003). At least four administrative and industrial buildings remain in the lower yard. In addition, an unused pier located adjacent to and south of Marina Beach Park extends over water for approximately 900 feet.

Existing land use east of SR 104 and south of Main Street includes the City's WWTP at Dayton Street between SR 104 and 2nd Avenue South, and mixed-use commercial and multifamily residential development. Land use north of Main Street along Sunset Avenue consists of commercial businesses and single-family residences. Three restaurants are located around the intersection of Main Street and Sunset Avenue. A combination of commercial and multifamily residential developments extend east of 2nd Avenue South into downtown Edmonds.

City of Edmonds zoning designations for the project area are shown in Figure 3-17. Current regulations governing zoning districts and general zoning requirements are embodied in Titles 16 and 17, respectively, of the Edmonds Community Development Code.

The Master Plan Hillside Mixed Use (MP) zone encompasses the UNOCAL property. The MP1 zone covers UNOCAL's upper yard and the MP2 zone covers the lower yard. The purposes of the MP1 and MP2 zone are the same and include the general purposes for business and commercial zones as well as the following:

- To reserve an area where potential exists for planned development that provides new tax revenue
- To reserve an area where a mix of land uses can take advantage of site conditions and water views
- To promote a mix of residential, commercial, and other uses consistent with the City's comprehensive plan and Downtown Waterfront Plan
- To encourage visual access to the water from public spaces within the development

The uses permitted in the MP1 zone are multifamily residential, office, hotels or motels, restaurants, local public facilities, mixed-use development for any use permitted in the zone, secondary service and retail uses, conference and/or performing arts center, day care, and neighborhood parks or open space. All of the aforementioned uses are permitted in the MP2 zone except residential uses is prohibited on the ground floor. Other permitted uses in the MP2 zone include neighborhood-oriented retail and services, a multimodal transportation center, and educational facilities. A master plan is required before development will be permitted to commence.

The Commercial Waterfront District extends north from the Town of Woodway/ City of Edmonds border to the existing ferry terminal and encompasses the waterfront property west of the BNSFRR, including the Port of Edmonds. The primary purpose of the Commercial Waterfront (CW) zone is to reserve areas for water-dependent and water-related uses and uses that will attract pedestrians to the waterfront. Other purposes are to protect and enhance the natural features of the waterfront, to encourage public use of the waterfront, and to ensure physical and visual access to the waterfront for the public. Primary permitted uses within this zone include marine-oriented services, retail uses that are either marine-oriented or pedestrian-oriented, public marine-oriented parks, recreational facilities, bus stop shelters, and offices.

The Harbor Square commercial development is currently zoned General Commercial (CG^2); however, this zoning designation was established through the contract rezone process. As part of the contract rezone process, limitations affecting maximum building height, land uses, and other standards are placed on future development at Harbor Square.

The portion of the project area generally located north of Dayton Street and east of Railroad Avenue is within a Community Business (BC) zone. The general purpose of the BC zone is to reserve areas for retail stores, offices, and service and amusement establishments that offer goods and services to the entire community. Multiple dwelling units are permitted as a secondary use to business uses within this zone. Permitted uses include retail stores, offices and service uses, new automobile sales and service, dry cleaning and laundry plants, bus stop shelters, and community open air markets conducted as an outdoor operation.

The Edmonds Marsh is located within an Open Space (OS) zoning district. Olympic Beach Park, Brackett's Landing North, City Park, and the City's WWTP and former public works building (on 2nd Avenue South) are located within a Public Use zone. A single-family residential zone (RS-6) is located on both sides of Sunset Avenue north of Main Street. Various densities of multifamily residential zones are located north and south of downtown.

Future Development

Growth Management Act. The State of Washington's Growth Management Act (GMA) requires certain jurisdictions to develop and adopt comprehensive plans. Mandatory elements of these plans are land use, housing, capital facilities, utilities, and transportation. The comprehensive plans must identify infrastructure standards that must be present (or developed concurrently) for approval of proposed developments. Improvements, or strategies for them, must be in place at the time of proposed development, or funding must already be allocated to complete the infrastructure improvements or strategies within 6 years. The GMA also requires that once the comprehensive plans (or updates of existing plans) are adopted, the jurisdiction must also adopt and enforce ordinances reflecting the comprehensive plans. In most cases, these ordinances will also include zoning provisions. In response to GMA requirements, the City of Edmonds adopted an updated comprehensive plan in April 2001. Relevant aspects of the plan are described briefly below.

Outer Harbor Line

UNOCAL Pier

South Marina

Port of Edmonds Marina

North Marina

PUGET SOUND

Existing Ferry Terminal

CW

P

CW

P

Admiral Way

Railroad Ave.

RS-6

RM-2.4

RM-3

RM-1.5

2nd Ave. N.

James Street

Main Street

BC

3rd Ave. N.

Bell Street

EDMONDS CITY LIMITS / WOODWAY TOWN LIMITS

MP2

MP1

R-87

CG

OS

2nd Ave. S.

BN

P

Alder Street

Dayton Street

Existing SR 104 (Edmonds Way)

3rd Ave. S.

RM-2.4

RM-1.5

Walnut Street

R-43

P

Willow Creek

Pine Street

SCALE IN FEET
(1" = 400')
0 200 400

LEGEND

City of Edmonds

BC	Community Business
RS-6	Single-Family
RM-1.5	Multifamily
RM-2.4	Multifamily
RM-3	Multifamily
CW	Commercial Waterfront
CG	General Commercial
BN	Neighborhood Business
P	Public Use
OS	Open Space
MP1/2	Master Plan Hillside Mixed Use

Town of Woodway

R-43	Residence Zone
R-87	Residence Zone

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-17
Zoning

154090.G1.02.A1_T07200100SEA • 3-17 Zoning • 7/7/03 • dk/gm

City of Edmonds Comprehensive Plan. Future development in the City is guided by the *City of Edmonds Comprehensive Plan* and zoning code and map. The City of Edmonds is strategically planning for future development in two areas: the downtown/waterfront and medical/ Highway 99 activity centers. The downtown/waterfront activity center, which encompasses the proposed project area, would be the primary focus for future commercial, governmental, and cultural activities, with a substantial projected growth in employment.

The *Edmonds Downtown/Waterfront Plan* was adopted in June 1995 as part of the City's updated comprehensive plan. One of the key elements of this plan is relocation of the existing ferry terminal and development of a new multimodal rail/ferry/auto/bus transportation center at the Point Edwards site. According to this plan, the project would help to integrate the downtown core with the waterfront, improve shoreline pedestrian access and traffic circulation, and encourage mixed-use development (City of Edmonds, 1994).

Comprehensive plan land use designations for the project area are shown in Figure 3-18. The downtown/waterfront area north of the Port is designated for mixed-use commercial activity. The Port's property, Edmonds Marsh, and UNOCAL property site are designated for Master Plan Development. Master plan developments are defined as areas dominated by a special set of circumstances that allow for coordinated, planned development that can be phased over time. Specific projects that are being considered for future development consistent with the City's comprehensive plan, Downtown/Waterfront Plan, and master plan developments are briefly described later in this section.

City of Edmonds Shoreline Master Program. The City's Shoreline Master Program (Chapter 23.10 of the Edmonds Community Development Code), adopted in July 2000, provides special land use development standards for areas lying along the Puget Sound coastline between the outer harbor line and 200 feet landward of the mean higher high water (MHHW) mark. Following the guidance of the Washington State Shoreline Management Act of 1971, the master program is designed to address the use, protection, restoration, and preservation of shoreline areas as "valuable and fragile resources." It contains both general goals and specific regulations for several designated types of "shoreline environments," each of which is considered suitable for particular types of activities and levels of protection under the program.

Within the Edmonds Crossing project area, there are four different shoreline environments under the shoreline master program. The waterfront area from the Woodway town limit north to the southern edge of the Port Edmonds Marina and between the waterward extensions of Dayton and Main Streets are designated as Urban Mixed Use II, except for a short section along Brackett's Landing South Park, which is in the Conservancy I Saltwater environment. The area between the waterward extension of Dayton Street and the southern boundary of the present Port of Edmonds property (generally the Port of Edmonds Marina area) is designated Urban Mixed Use I. The Urban Mixed Use environments are intended to encourage multiple use of shorelines, which lend to the marina atmosphere of the Edmonds waterfront and which provide for shoreline use and enjoyment by large numbers of people. The Edmonds Marsh, along with the contiguous wetland east of SR 104, is

designated as Natural environment. This designation is intended to protect natural areas with unique or diverse natural characteristics from disruptive activities and to prevent the loss or degradation of the functional value of natural resources. This designation also includes isolated wetlands east of the railroad tracks that are within 200 feet of the ordinary high-water mark of Puget Sound.

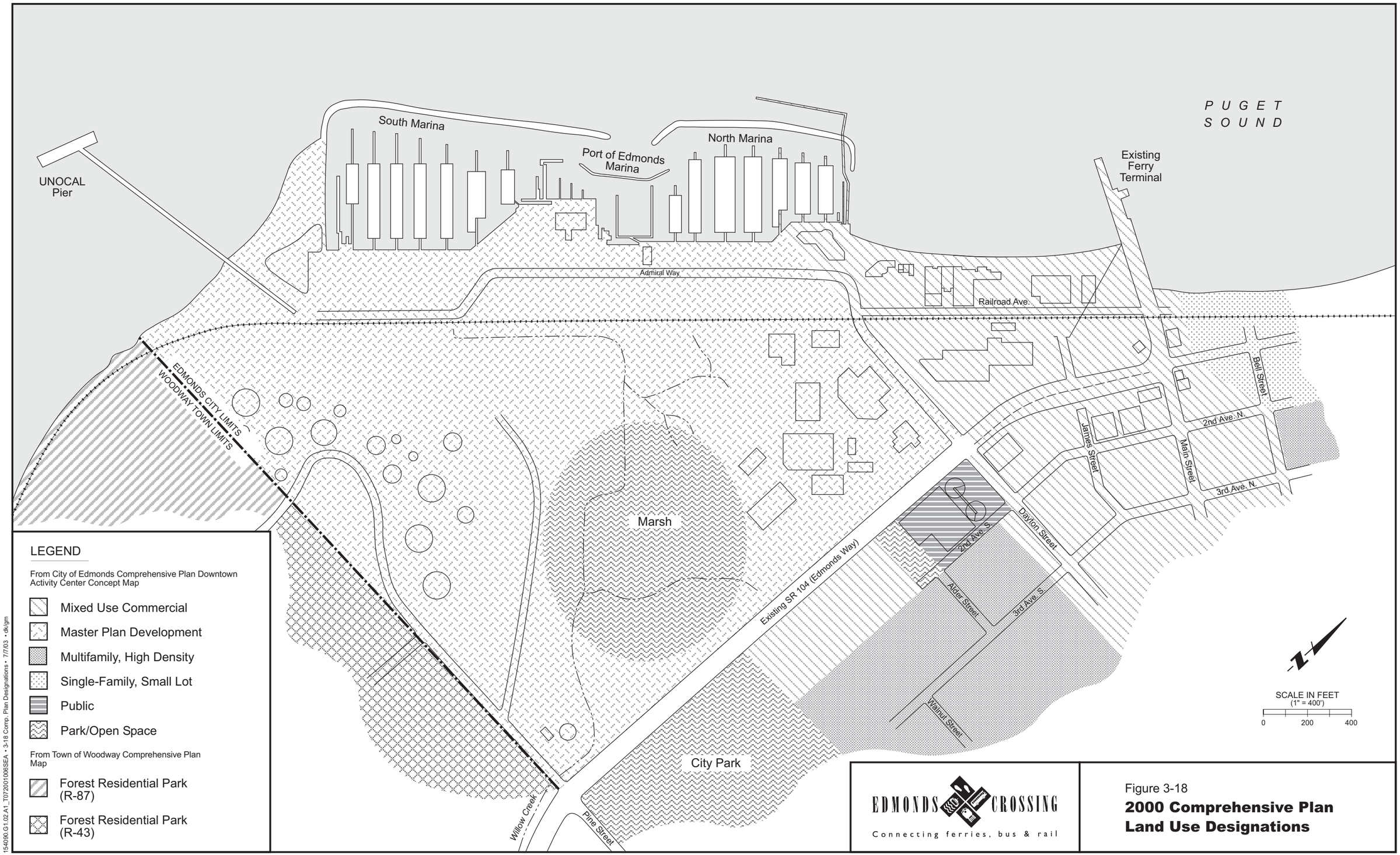
Kitsap County Comprehensive Plan. Kitsap County adopted its revised countywide comprehensive plan in May 1998, and the Growth Management Hearings Board validated the plan in February 1999. Urban growth boundaries for the County's communities including Kingston, have been reduced from previous versions of the plan to encourage compact urban development, efficient land utilization, and cost-effective urban service provision. Urban densities are only allowed in areas served by sewer systems and other urban services. Areas without these services are maintained in large lot zoning, and urban densities are not allowed.

In June 2002, Kitsap County adopted an amended Land Use Plan as part of its comprehensive plan. The Land Use Plan identifies Urban Joint Planning Areas in unincorporated areas adjacent to existing urban growth areas. The Urban Joint Planning Area process addresses the location and amount of land outside of urban growth areas that may be needed to support future growth. The communities involved in the joint planning process are Bremerton and Port Orchard.

Kingston Community Design Study. The study was prepared to "develop a community vision to guide the future development of Kingston, and an urban design plan to implement that vision." The study's recommendations were incorporated within the Kitsap County Comprehensive Plan as the Kingston Community Plan. Goals of the study include protecting environmental quality, building a sense of community, preserving small town character, protecting rural character of open lands, defining Kingston's edges, preventing urban sprawl, integrating land use patterns and circulation systems to be mutually supportive, better managing ferry traffic and downtown parking, and improving public transit. More specific policies are provided for the Urban Growth Area (UGA), Community Transition Areas, and areas outside the UGA.

Existing UNOCAL Property Redevelopment. One of the objectives of the *Edmonds Downtown/Waterfront Plan* is to use the existing UNOCAL property to its best community potential by developing a multimodal transportation center with compatible development on the uplands. The plan provides only general guidelines for new uses to ensure that redevelopment is compatible with its surroundings and the community's overall redevelopment efforts (City of Edmonds, 1994). Preferred uses on the upland portion of this property were not designated in this plan because the property would not have been available for redevelopment for several years.

Clean-up of the lower yard began in 2001 with the removal of contaminated topsoil and underground oil. Once ecology approves a clean-up plan, lower yard clean-up will resume in summer 2003 and is expected to be completed by 2005. Clean-up of the upper yard was completed in October 2003.



EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-18
2000 Comprehensive Plan Land Use Designations

154090.G1.02.A1_T07200106SEA • 3-18 Comp. Plan Designations • 7/7/03 • dk/gm

The City of Edmonds has recently adopted Ordinance No. 3402, which includes a new MP – Master Plan Hillside Mixed-Use Zone. A private developer, Triad Development, has begun construction of an upscale, multifamily condominium project within the upper yard.

Edmonds Marsh Wildlife Sanctuary Development. Donated to the City of Edmonds by UNOCAL, Edmonds Marsh has been designated by the City as a wildlife sanctuary. The property is the remnant of a formerly extensive salt marsh, and is being managed to allow the reestablishment of salt marsh vegetation and habitat after a period of being closed to tidal influence. The City has developed two plans for conservation and development of the marsh: the *Interpretive Plan for Union Oil Marsh and Goodhope Pond*, which includes concepts for an interpretive trail system on the Edmonds Marsh perimeter; and the *Feasibility Study, Willow Creek/Union Oil Marsh Enhancement Plan,* which evaluates alternative methods of restoring and enhancing habitat for fish and wildlife. Portions of the trail system proposed in the interpretive plan have been constructed. None of the alternatives proposed would preclude implementation of the plans for the marsh.

Port of Edmonds Strategic Plan and Master Plan. The Port of Edmonds is a port district that encompasses the Town of Woodway, a substantial portion of the City of Edmonds, and portions of unincorporated Snohomish County. Within the project area, the Port owns or operates a number of facilities along the Edmonds waterfront, including the marina and a variety of businesses (see "Existing Land Use" section, above). The Port has a master plan that guides the development of its property and facilities; when adopted by the City of Edmonds, the plan also becomes part of the City's comprehensive plan.

In May 2001, the Port Commissioners approved a new *Port of Edmonds Master Plan, which* was adopted as part of the City's 2001 comprehensive plan. The plan calls for renovating or replacing a number of Port facilities, including the Port office, Anthony's Restaurant, and the Edmonds Yacht Club. Independent parties have shown interest in relocating onto Port property, including an interactive fine arts center proposed by the Fine Arts Center of Edmonds to be located just west of Admiral Way. The *2001 master plan* contains a number of proposed projects that could affect the Edmonds Crossing project. Other new or modified planned land uses include construction of a stacked boat loft west of Admiral Way at the south end of the Port's property, an expanded south marina, more parking and landscaping, and a defined entrance area located east at Admiral Way and Railroad Avenue. In addition to the master plan, the Port prepared and adopted a strategic plan with a new mission statement (Port of Edmonds, 2001). The purpose of the *2001 Port of Edmonds Strategic Plan* is to guide short-term and long-term activities at the marina and other port properties. The 2001 strategic plan states the Port's continue support for planning for the Edmonds Crossing project.

Town of Woodway

Existing Land Use

Approximately 80 percent of the Town of Woodway is developed with residential land uses, ranging from large multiacre estates to medium-density subdivisions.

There is no commercial development in the town, and industrial use is limited to industrial products storage. The Town Hall, Woodway's only institutional land use, is located in a suburban residential area.

The northwestern corner of Woodway is located adjacent to and south of the former UNOCAL tank farm in the southern portion of the project area. This portion of the town is developed as single-family residences. The Woodway Park sewage lift station serving these residences is located in the southwest corner of the Pine Street/SR 104 intersection.

Future Development

In response to GMA requirements, the Town of Woodway adopted an updated comprehensive plan in 2000. The plan emphasizes preservation of the established nature and character of Woodway's single-family residential neighborhoods. Anticipated new development or redevelopment is limited to suitable vacant or underdeveloped sites scattered throughout the town. A 60.8-acre parcel located in the southeast corner of Woodway, previously used for petroleum storage, has been rezoned Urban Restricted. This area, known as Woodway Highlands, has been redeveloped with 94 residences (Town of Woodway, 2000).

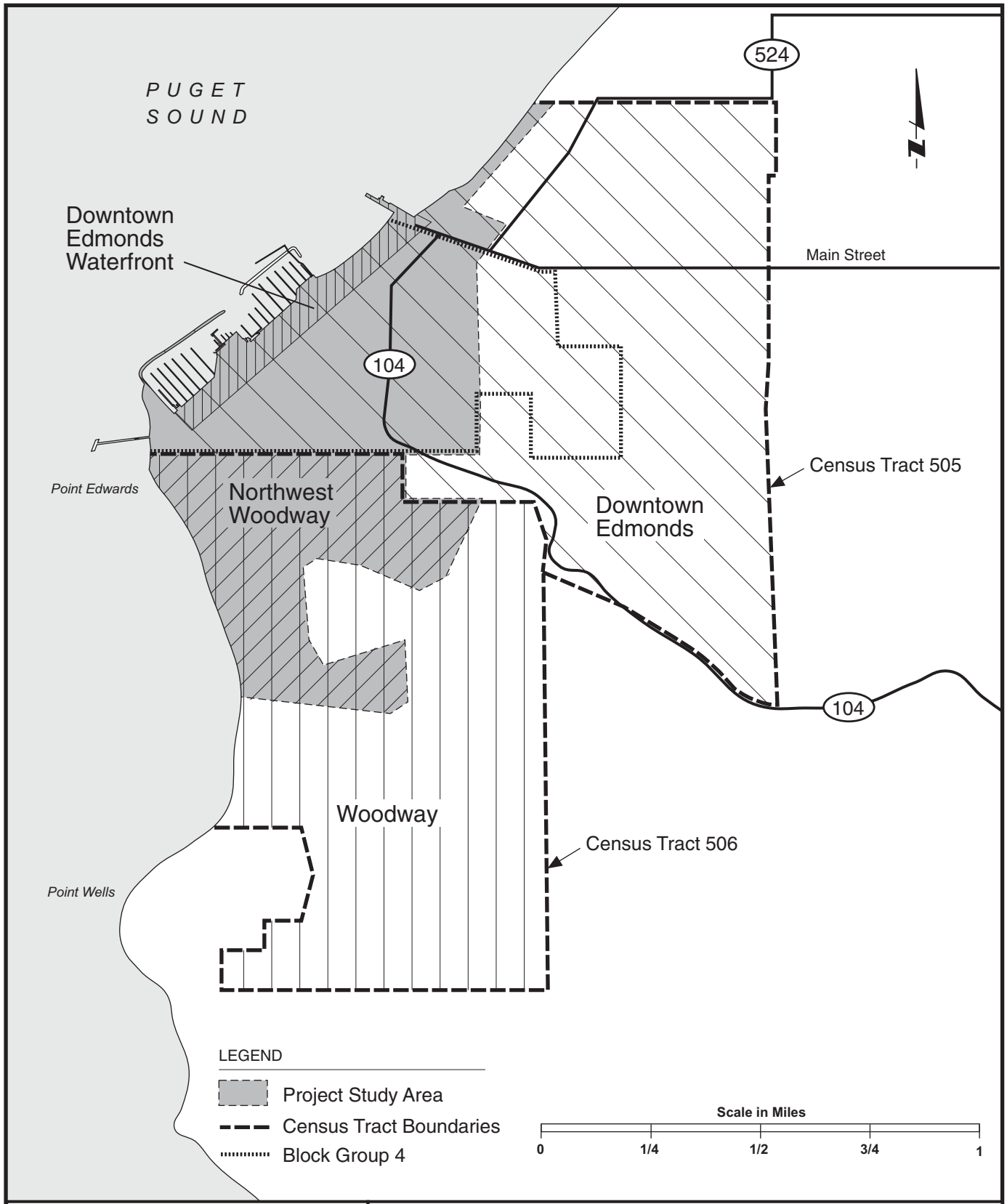
Zoning Designations

Consistent with its comprehensive plan, the Town of Woodway zoning plan designates the southern portion of the Edmonds Crossing project area as Forested Residential Park (FRP) (see Figure 3-18). The FRP R-43 Residence Zone allows for one single-family dwelling unit on a minimum of 1 acre). The FRP R-87 Residence Zone provides for a single-family dwelling unit on a minimum of 2 acres.

3.3.2 Relocation

Demographic Characteristics

The Edmonds Crossing project area comprises two jurisdictions: the City of Edmonds and the Town of Woodway. As shown in Figure 3-19, the project area was defined as the general area encompassed by Puget Sound to the west, Bell Street to the north, 3rd Avenue to the east, and the Northwest Woodway neighborhood to the south (the southern boundary of the Northwest Woodway neighborhood is approximately 236th Street SW).



EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 3-19

Project Study Area and Census Tracts

The two project area neighborhoods affected by the Edmonds Crossing project are the Edmonds downtown/waterfront and Northwest Woodway neighborhoods. The delineation of these two neighborhoods was based on their relationship to the street system, common use of public facilities, and demographic characteristics. The Edmonds downtown/waterfront neighborhood would be the only neighborhood directly affected by residential and business displacements caused by the Edmonds Crossing project (see Figure 3-19). Available housing and demographic characteristics for this neighborhood are briefly summarized below and have been described in greater detail in Section 3.3.3, Social.

According to the 2000 U. S. census, the percentage of owner-occupied housing in the Edmonds downtown/waterfront neighborhood was lower than either regional (i.e., county) or local (i.e., downtown, project area) levels. Demographically, this neighborhood's population in 2000 was more racially homogenous than Snohomish County, Edmonds downtown area, or the project area as a whole, with a 100 percent Euro-American population. Most notable was the percentage of residents over the age of 65, which was more than eight times the percentage countywide.

Business Characteristics

The project area supports a wide variety of commercial businesses. Businesses located along the waterfront in the Edmonds downtown/waterfront neighborhood include water-related uses (e.g., boat storage, boat moorage, and boat repair), as well as restaurants, retail shops, and offices. Similar commercial development is located along Dayton Street. These businesses serve local residents and attract visitors from surrounding communities. Administrative, office, and technical services are provided at the existing UNOCAL property in the southern portion of this neighborhood.

In 1990, the City had an estimated 9,263 jobs; of this total, 38 percent consisted of jobs in finance, insurance, real estate, and services, while retail trade and government accounted for 27 and 23 percent of total jobs, respectively. The remaining 12 percent of jobs was in manufacturing (5 percent); wholesale trade, transportation, communications, and utilities (4 percent); and education (3 percent). According to a historic population growth rate of one percent per year, total citywide employment is projected to increase by 3,000 and reach 12,263 jobs by the year 2012 (City of Edmonds, April 2001).

With the exception of certain Port of Edmonds facilities (e.g., marinas, boat launcher, fueling pier), the types of businesses found in the Edmonds downtown/ waterfront neighborhood (e.g., office, retail, and food services) do not have difficult locational requirements, such as large tracts of land or proximity to water sources. The current and future availability of commercial property in the project area is addressed below in the discussion of mitigation measures.

3.3.3 Social

Community Cohesion

The Edmonds Crossing project area comprises two jurisdictions: the City of Edmonds and the Town of Woodway. For this social analysis, the project area was defined as the general area encompassed by Puget Sound to the west, Bell Street to the north, 3rd Avenue to the east, and Northwest Woodway to the south.

The two project area neighborhoods affected by the Edmonds Crossing project are Edmonds downtown/waterfront and Northwest Woodway (see Figure 3-20). The identification of these two neighborhoods was based upon their relationship to the street system, common use of public facilities, and demographic characteristics, as well as on local jurisdiction boundaries.

Figure 3-20 shows the general location of these two project area neighborhoods, as well as the location of public facilities. Table 3-6 provides the latest available information on regional and local income characteristics. The housing and demographic characteristics of Snohomish County, downtown Edmonds, the Town of Woodway, and project area neighborhoods (as reflected in census block, block group, and tract data) are summarized in Table 3-7 and are described in more detail below. The Environmental Justice Analysis indicates that there are low-income and minority populations within the study area that are protected by Executive Order 12898 on Environmental Justice (see Appendix G).

Table 3-6
Regional and Local Income Characteristics[a]

	Snohomish County	City of Edmonds	Town of Woodway	Downtown Edmonds[b]	Census Tract 505, Block Group 4[c]
Median Household Income ($)	53,060	53,522	101,633	50,000	35,341
Per Capita Income ($)	23,417	30,076	51,613	37,204	41,253
Persons Below Poverty Level (percent)	6.9	4.6	2.4	3.6	8.7
Families Below Poverty Level (percent)	4.9	2.6	0.7	2.5	6.5

[a]2000 Census of Population and Housing; these files record income characteristics for the last complete calendar year before the census was conducted.
[b]Downtown Edmonds is represented by Census Tract 505.00, which is defined by Town of Woodway border, Elm Street, and Paradise Lane to the south, Puget Sound to the west, Caspers Street to the north, and 9th Avenue to the east.
[c]Block Group 4 within Census Tract 505.00 is generally defined by Town of Woodway border to the south, Puget Sound to the west, Main Street to the north, and 3rd Avenue to the east.

Downtown Edmonds

Downtown Edmonds is the portion of the City that encompasses the Edmonds Crossing project area. For the purposes of this analysis, Downtown Edmonds is defined as Census Block 505.00 (see Figure 3-20).

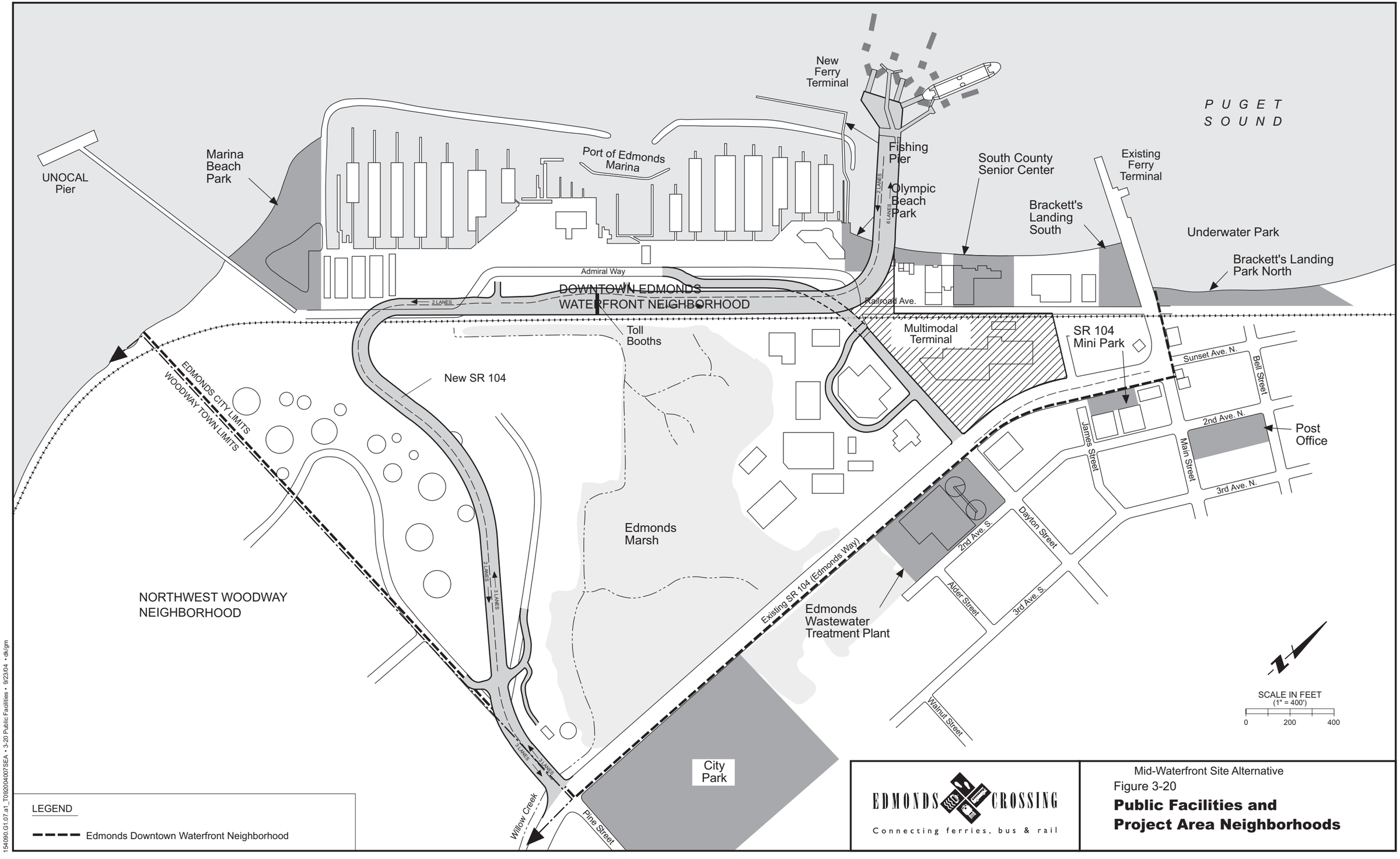
At the time of the 2000 census, downtown Edmonds contained 6,246 people in 3,207 households. The average value of owner-occupied housing in downtown Edmonds ($275,400) was higher than Snohomish County as a whole ($196,500); however, the median rent ($788) was closer to the Snohomish County median rent ($766). Demographically, the downtown Edmonds population was less racially diverse than Snohomish County, with less than one-half the percentage of minorities than countywide (Table 3-7). The percentage of residents over the age of 65 in downtown Edmonds, nearly 33 percent, was substantially higher compared to the County's average of less than 10 percent. As shown in Table 3-6, per-capita income is higher and the percentage of persons below the poverty level is lower than for Edmonds as a whole or for Snohomish County.

Table 3-7
2000 Regional and Local Housing and Demographic Characteristics

	Snohomish County	City of Edmonds	Downtown Edmonds[a]	Town of Woodway	Edmonds Crossing Project Area[b]	Downtown Edmonds Waterfront[c]	Northwest Woodway[d]
Households							
Owner-occupied (percent)[f]	67.8	68.1	67.0	96.1	63.5	55.1	96.3
Median value (percent)[e]	196,500	238,200	275,400	592,300	245,000[e]	N/A	N/A
Renter-occupied (percent)	32.2	31.9	33.0	3.9	36.5	44.8	3.7
Median rent (percent) per month[e]	766	779	788	875	728[e]	N/A	N/A
Average number of persons per household	2.65	2.32	1.92	2.76	1.8	1.35	3.0
Population							
Total population	606,024	39,515	6,246	936	713	31	244
Minority (percent)	14.4	12.3	5.6	5.9	6.9	0	7.4
Over 65 (percent)	9.1	16.7	32.9	19.8	38.7	77.4	13.1
Disabled (percent)	2.8	7.7	5.5	5.5	10.0[e]	N/A	N/A

Note: N/A = This category of data is not available at the Census Block level. Datum is not reported for Block Group because of overlaps with other geographic areas. For example, Northwest Woodway is in Block Group 1 within Census Tract 506.00. This census tract includes only this one block group so data reported for the Town of Woodway and Northwest Woodway would be the same.

[a]Census Tract 505.00.
[b]Blocks 1002,1003,1005, and 1006 within Census Tract 506.00 and Blocks 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, 4014, 4015, 4016, 4017, 4018, 4029, 4030, 5004, 5005, 5006, and 5024 within Census Tract 505.00.
[c]Blocks 4010, 4011, and 4012 within Census Tract 505.00.
[d]Blocks 1002,1003,1005, and 1006 within Census Tract 506.00
[e]This category of data is not available at the Census Block level. Datum reported is for Block Group 4 in Census Tract 505.00.
[f]Disabled persons were identified as persons having a work disability and/or mobility and/or self-care limitation that had lasted for more than 6 months, which has limited their work opportunities and/or ability to go outside the home alone and/or their ability to meet their personal needs.



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Mid-Waterfront Site Alternative

Figure 3-20

Public Facilities and Project Area Neighborhoods

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Edmonds Downtown/Waterfront

The Edmonds downtown/waterfront neighborhood is defined as the area bordered by Puget Sound to the west, Main Street to the north, SR 104 to the east, and the City of Edmonds/Town of Woodway border to the south. This neighborhood is composed primarily of commercial and marine-oriented businesses (e.g., boat storage, marinas) populated with a few high-density residential apartment/ condominium complexes along the waterfront. The primary social/community service facility in the vicinity is the South County Senior Center; no churches are located in the area.

Because this neighborhood supports a mixture of commercial, residential, and recreational land uses, it is less socially cohesive than more traditional neighborhood groupings, such as residential subdivisions.

In 2000, the median value of owner-occupied housing in the Edmonds downtown/ waterfront neighborhood[1] was higher than the median recorded for Snohomish County and lower than the downtown Edmonds median. The percentage of owner-occupied housing in this neighborhood was similar to regional (county) or local (downtown, project area) levels. The median rent for this neighborhood ($728) was lower than both regional and local median rents. Per-capita income and percentage of persons below the poverty level are higher than the County and the City as a whole (Table 3-6).

Town of Woodway

The Town of Woodway in 2000 had 936 residents in 336 households. Unlike Edmonds, which contains commercial development along the SR 99 corridor and in the downtown and waterfront areas, Woodway is a contained residential community secluded from dense urban development.

Woodway is substantially more affluent compared to the county and downtown Edmonds. Median household and per-capita income (Table 3-7) are substantially higher than the Snohomish County median, and the percentage of individuals and families below the poverty level is correspondingly low. At the time of the 2000 census, the median owner-occupied housing value in this community was $592,300, more than three times the median value reported for Snohomish County. Rents in Woodway were also substantially higher compared to both the county and downtown Edmonds but not to the same degree as home values. At the time of the 2000 census, Woodway was more racially homogenous than Snohomish County (94.1 percent white compared to 85.6 percent). The percentage of residents over 65 years old was twice that of the county, but considerably lower compared to downtown Edmonds.

[1] Median home value, median rent, and income characteristics reported for the Edmonds downtown/waterfront are based on data form Census Tract 505, Block Group 4, because these data are not available on the census block level.

Northwest Woodway

This small residential neighborhood, located in the northwest corner of the Town of Woodway, consists of low-density, single-family homes and a few rental units.

Bordered on the west by Puget Sound, on the north by the City of Edmonds/Town of Woodway border, and on the east and south by similar low-density residential development, this neighborhood is internally cohesive. The Town of Woodway, which provides the broader context for this neighborhood, is an isolated residential enclave surrounded by more intensive urban development.

In 2000, the percentage of owner-occupied homes in this neighborhood (96.3 percent) was greater than either regional or local levels. Though income statistics are not calculated at the block level, the statistics for Woodway as a whole suggest that this area is also considerably more affluent than Edmonds or Snohomish County. With a white population of approximately 92.6 percent, this neighborhood's racial makeup was less diverse than the county's population (85.6 percent). The percentage of residents over 65 was considerably lower compared to both downtown Edmonds and the project area, but slightly higher than the county.

Regional and Community Growth

Local and Regional Population

Table 3-8 shows historical and projected population characteristics for the City of Edmonds and Town of Woodway, as well as historic population trends for Snohomish County. Population within the City of Edmonds has grown rapidly over the last decade. Between 1980 and 1990, population within the City increased 11 percent, or approximately 1 percent per year. Between1990 and 2000, population within the City increased 28.5 percent, or approximately 2.9 percent per year, primarily due to annexation of existing developed neighborhoods. In comparison, population within Snohomish County during the past decade has increased at an average rate of approximately 3 percent per year. The Town of Woodway has grown from a 1958 population of approximately 400 to a year 2000 population of 936. Between 1990 and 2000, population within the Town of Woodbury increased 2.4 percent or less than 0.3 percent per year.

Table 3-8
Local Population Growth

Jurisdiction	Historical Population				Growth Target[a]	
	1958	1980	1990	2000	2010	2012
Edmonds	--	27,679	30,743	39,515	--	36,930
Woodway	400	832	914	936	--	1,245
Snohomish County	--	337,720	465,642	606,024	719,914	--

[a]*"Growth Target" refers to population forecasts used by cities to accommodate for a fair share of regional growth, developed by the City of Edmonds in coordination with PSRC.*

Sources: City of Edmonds, 2001; Town of Woodway, 2000; State of Washington, 2001; U.S. Census 2000

Population Growth Characteristics

As part of the GMA requirements, the City of Edmonds worked with the PSRC to develop population forecasts used to accommodate its fair share of regional growth. As a result of this planning process, it was determined that the city's share of the regional population by the year 2012 will be approximately 36,930. At the time of the 2000 census, the Edmonds 2012 growth target had been exceeded by approximately 2,500 people. Implementation of the GMA will facilitate concentration of population and employment growth into areas already developed or identified for development within urban growth boundaries. In the project area and vicinity, the City of Edmonds expects to increase residential population primarily through infill within existing single-family neighborhoods (both new single-family and accessory dwelling units) as well as with new multifamily development in the area referred to as the downtown/waterfront activity center. The 2001 *Edmonds Comprehensive Plan* includes a new *Downtown Activity Center Concept Map,* which redesignates multifamily-medium density areas to multifamily-high density areas. In addition, the *Concept Map* only allows for small-lot, single-family homes within the downtown center.

Snohomish County population projections predict that Woodway may grow to a population of 1,245 by the year 2010 (Town of Woodway, 2000). Future residential growth would occur on available vacant or underdeveloped land zoned for residential development.

Recreation

A wide range of recreational opportunities are available for residents and visitors to the City of Edmonds. Parks, recreation facilities, and open space provide both passive and active recreational opportunities, including jogging, bicycling, walking, fishing, and boating.

The Edmonds Crossing project area contains several parks and recreational facilities whose operation could be directly or indirectly affected by the proposed project. These facilities and the anticipated impacts on them are discussed in detail in Chapter 6, Section 4(f). Brief descriptions of local parks and recreational facilities follow; these facilities are shown in Figure 3-20.

Natural Open Space Areas

Edmonds Marsh

The Edmonds Marsh is a large 23-acre wetland located in the central portion of the project area bounded by SR 104 on the east, the Harbor Square commercial development on the north, BNSFRR right-of-way on the west, and existing UNOCAL property and the Deer Creek Fish Hatchery on the south. Access to this wetland is off Dayton Street, behind the Harbor Square development. A partial interpretative trail is located along the northern boundary of the marsh. Similar trails are planned for the eastern and southern portions of the marsh near the hatchery and along SR 104. The *2001 Parks, Recreation, and Open Space Plan* recommends acquisition of the hatchery for use as the Beach Ranger Program interpretive center.

Regional Waterfront Parks

Brackett's Landing North and South

Brackett's Landing North is an approximately 4.5-acre waterfront park located immediately north of the existing ferry terminal. This site contains approximately 1,500 linear feet of shoreline. Facilities provided at this site include a public restroom, a small interpretive area, beach access, an observation jetty, waterfront walkway, showers for scuba divers, and public parking. Brackett's Landing South, approximately 2.0 acres in size, is immediately south of the ferry terminal. This area is a passive recreational area offering waterfront access, walkways, and picnicing.

Underwater Park

The City's 22.5-acre Underwater Park is a regional park located adjacent to and north of the existing Edmonds ferry pier and adjacent to Brackett's Landing North. The park, which attracts divers and snorkelers from all over the nation, was established in 1970 and was the first designated underwater park on the west coast. Recreational features of this park include a sunken 300-foot dry dock, a sunken 94-foot tug, underwater gardens and trails, and rest floats.

Olympic Beach Park and Fishing Pier

Olympic Beach Park, located adjacent to and north of the Port of Edmonds Marina, is a 4.3-acre waterfront park; most of this waterfront acreage is tidelands, with a small amount of uplands. Access to the park is via Admiral Way. Facilities provided in the upland area include an open lawn area, picnic area, restrooms, and waterfront stairs. A fishing pier providing overwater access extends approximately 500 feet into Puget Sound; facilities on the pier include benches, a restroom/interpretive building, and fish-cleaning areas.

Marina Beach Park

Marina Beach Park, located immediately south of the Port of Edmonds on the north side of the UNOCAL pier, is a 4.5-acre developed waterfront park. In December 2001, the City purchased the park site from UNOCAL. Vehicle access to this park is via Admiral Way; the Port of Edmonds also provides pedestrian access from the north. Facilities provided at this park include a large open picnic area, children's playground, portable restrooms, beach volleyball court, car-top boat launch area, and two small parking lots (total capacity of 47 vehicles). On the south side of the UNOCAL pier, additional undeveloped shoreline and open space can be publicly accessed via a BNSFRR easement trail.

Community Parks–City Park

City Park is a 14.5-acre community park located adjacent to and east of SR 104 and is bordered by 3rd Avenue South on the east, Pine Street on the south, and a new housing development on the north. Recreational facilities and activities provided at City Park include two public restrooms, picnic and open lawn areas, a

baseball/softball field, two children's playgrounds, horseshoe pits, a wading pool, three picnic shelters, and parking areas.

Special Use Areas

The Port of Edmonds Marina is a 46-acre facility located on the central waterfront of Edmonds, directly south of Olympic Beach Park, north of Marina Beach Park, and west of the Edmonds Marsh. The Port's mission is to stimulate the economy of the Port District and enhance the quality of life for District residents by providing excellent waterfront infrastructure. Among its stated objectives is to "provide recreational opportunities through enhanced public access to Port facilities, including shoreline, wetlands, and marina."

The primary recreational opportunities offered at the marina are those related to pleasure boating. These include approximately 730 wet moorage slips, 300 dry storage spaces, boat launch facilities, guest moorage, and associated support services. The marina also offers public access to the shoreline, including a waterfront boardwalk.

SR 104 Mini Park

The SR 104 mini park is approximately 0.3 acre and is located east of the existing ferry holding lanes on SR 104 between James and Main Streets. This site was donated by WSDOT when improvements to the ferry holding lane were made. This neighborhood park is designated for passive recreational use. Existing facilities include a lawn area and public area, and a restroom. It serves as a resting place for ferry patrons. *The 2001 Parks, Recreation, and Open Space Plan* envisions the park eventually becoming a "Brackett's Landing East."

Recreational Fishing

Sport fishers in the central Puget Sound area primarily fish for coho and blackmouth (immature chinook) and, to a lesser degree, chum and pink salmon. The fishery intensifies considerably in fall months when runs of mature fish return from the open ocean to spawn in local rivers and streams. Sport fishing activity in the vicinity of Edmonds occurs up and down the eastern Puget Sound shoreline, but is concentrated off Point Edwards, the Edmonds to Mukilteo shoreline, just north of the existing ferry terminal, Jefferson Head, and Possession Point (DNR, 1977; Haw and Buckley, 1973; Ecology, 1980; Evergreen Guide, 1989). Sport fishing pressure in these areas is very intense because of the proximity to the Seattle metropolitan area.

The central Puget Sound bottom fish sport fishery was once quite extensive because of the proximity to Seattle. Historically, the most important species numerically were various rockfish, various flatfish, Pacific cod, sablefish (*Anoplopoma fimbria*), and walleye pollock, in that order. In the past two decades, however, Pacific cod and walleye pollock have all but disappeared. Rockfish and lingcod numbers are severely depressed because of heavy fishing pressure, the ease of capture, and their relatively slow reproductive rate. The depression of many bottom-fish stocks

coupled with highly restrictive fishing regulations has resulted in low fishing pressure in the last 10 years.

Services

Public Services

Schools

The project area is served by Edmonds School District No. 15. The district operates 27 elementary/K-8 schools, 4 middle schools, and 5 high schools; however, no educational facilities are located within the Edmonds Crossing project area. Students living in the project area are served by Sherwood Elementary School in Edmonds, College Place Middle School in Lynnwood, and Edmonds-Woodway High School in Edmonds (Cook, pers. comm., 2003; Edmonds School District, 2003). School buses transport students living in the Northwest Woodway neighborhood to these schools via Pine Street and other neighborhood roads. School bus routes within the Edmonds downtown/waterfront neighborhood vary each year according to the location of students' residences.

Social Institutions

The South County Senior Center is a private, non-profit organization. The center provides multipurpose services (e.g., social activities, food bank) to approximately 4,000 members over the age of 55. It accommodates between 200 and 300 members per day, Monday through Friday, and is rented on weekends for receptions and other activities.

Police Protection

Police protection within the Edmonds portion of the project area, including the Port of Edmonds, is provided by the City of Edmonds Police Department. The department provides 24-hour service, 365 days per year. The Edmonds Police Department has mutual aid agreements with Snohomish County and neighboring jurisdictions for additional police assistance, if required (City of Edmonds, 1995). The Town of Woodway is policed by a force of off-duty officers from adjoining communities.

Fire Protection and Other Emergency Medical Services

Fire protection and emergency medical services within both the City of Edmonds and Town of Woodway are provided by the Edmonds Fire Department. The City of Edmonds has mutual aid agreements with all neighboring jurisdictions, including Lynnwood, Mountlake Terrace, and Snohomish County Fire District No. 1. These fire districts work cooperatively to enhance fire protection and related emergency services. The Edmonds Fire Department operates and maintains three fire stations (Fire Station Nos. 16, 17, and 20). The fire station closest to the project area is No. 17, and it is located at 250 5th Avenue North. The average response time by the Edmonds Fire Department is approximately 5 minutes for emergency calls and 7 minutes for all other calls.

The Edmonds Fire Department does not own a boat with fire-fighting capabilities. To date, fires at the existing ferry terminal have been handled by the department's fire trucks. The fire trucks have accessed fires by maneuvering along the holding and/or exit lanes.

Solid Waste

Snohomish County provides solid waste management services in the Edmonds Crossing project area. All of Snohomish County's solid waste is currently disposed of at the Hidden Valley Landfill, a private landfill in Klickitat County. This landfill has approximately 30 to 50 years of capacity. According to the county's comprehensive solid waste management plan, the county's current recycling objective is elimination of 50 percent of the total waste volume by the year 2000.

Other Governmental Institutions and Services

The Port of Edmonds, located along the waterfront south of Dayton Street, contains a large 1,000-slip marina and other waterfront-related uses such as boat launch facilities, guest moorage, dry boat storage, and a marine fuel dock. The Port's property is also occupied by approximately 80 businesses including a variety of shops, offices, and restaurants (see Section 3.3.1, Land Use).

Religious/Cultural Institutions

No churches or cultural institutions are located within the neighborhoods potentially affected by the proposed project.

Utilities

Water

The City of Edmonds provides domestic and fire protection water in the Edmonds portion of the project area, and the Olympic View Water & Sewer District services the Town of Woodway. Water supply facilities in the project area consist primarily of water mains and hydrants. The City of Edmonds distributes water through a gravity-fed network of mains ranging in diameter from 6 to 12 inches. City water mains in the project area are located along Dayton Street, Railroad Avenue, Admiral Way, and Pine Street. In addition, an 8-inch-diameter City of Edmonds water main traverses the western portion of the existing UNOCAL property, crosses the BNSFRR right-of-way, and extends west into Marina Beach Park.

Sanitary Sewer

Sanitary sewer service in the northern portion of the project area is provided by the City of Edmonds. Major facilities within this area include the Edmonds WWTP, located on Dayton Street between 1st and 2nd Avenues, and a number of sewer trunk lines. Trunk lines in this area include an 8-inch-diameter sewer along Dayton Street and Admiral Way, and two 36-inch-diameter sewer outfalls that enter Puget Sound north of the Port of Edmonds breakwater. These two outfalls extend approximately 1,200 feet into the water to a depth of about 60 feet below MLLW.

The Olympic View Water & Sewer District provides sanitary sewer service to Woodway residents in the southern portion of the project area. Wastewater treatment in this area is provided by the City of Edmonds under a contractual agreement dating from 1983. This portion of Woodway discharges to the Edmonds WWTP via the Woodway Park Estates lift station located in the southwest corner of the Pine Street/SR 104 intersection. A 4-inch-diameter PVC force main conveys the lift station discharge eastward along Pine Street to the Edmonds sewer system at 2nd Avenue South (Town of Woodway, 1994).

The existing UNOCAL property is serviced by a private septic system, which is a series of leach fields (Kellar, pers. comm., 1995). UNOCAL representatives expect that these fields will be removed during remedial clean-up of the UNOCAL lower yard (Kellar, pers. comm., 2003).

Storm Drainage

The project area's storm drainage system consists of a network of pipes, streams, wetlands, detention systems, and ditches. The City operates and maintains a 24-inch-diameter storm drain along Dayton Street that terminates in a 30-inch-diameter outfall into Puget Sound located south of the City's sewer outfalls. A City storm drain line also extends along Pine Street, west of SR 104, and then travels parallel to Unoco Road. A second, 24-inch-diameter City stormwater outfall is located at Marina Beach Park.

WSDOT owns and maintains a 54-inch-diameter pipe (referred to as the Edmonds Way trunk storm drain) that drains runoff from SR 104. This trunk line discharges into Puget Sound from a 72-inch-diameter outfall at Marina Beach Park.

Willow Creek is a natural drainage system within the project area that flows into the Edmonds Marsh and is drained by an approximate 1,300-foot-long, 48-inch-diameter pipe; this pipe also discharges into Puget Sound from an outfall at Marina Beach Park (City of Edmonds, 1995). An approximate 3.2-acre wetland/detention pond located adjacent to and south of the Edmonds Marsh functions as a stormwater collection pond for the existing UNOCAL property; this system discharges to a ditch that parallels the BNSFRR right-of-way before draining into the City's 48-inch-diameter storm pipe.

Electrical Power

Snohomish County Public Utility District (PUD) No. 1 provides electrical power to the project area. PUD No. 1 operates and maintains a network of underground and overhead transmission and distribution facilities, including power lines, substations, and switching stations. Overhead facilities in the project area (i.e., poles, transmission lines) are located parallel to and within the BNSFRR right-of-way and along Pine Street west of SR 104. A number of underground electrical conductors are located along Admiral Way, on Port property between Admiral Way and the BNSFRR right-of-way, and across Dayton Street and Pine Street. No substations are located within the project area.

Natural Gas

Puget Sound Energy supplies natural gas to the project area through a system of stations, mains, and distribution lines running throughout its service area. A 4-inch-diameter trunk line follows Dayton Street across the BNSFRR right-of-way and then travels along Admiral Way to the southern portion of the project area. A gas line also extends north of Dayton Street along Railroad Avenue.

Other

Other underground utilities located in the project area include Verizon Communications facilities, cable television lines provided by Comcast, and subsurface marine communication cables. GTE telephone conduits, one television cable, and two marine communication cables cross Dayton Street within the BNSFRR right-of-way. A GTE telephone conduit also extends along the lengths of Dayton Street and Admiral Way. A television cable follows Pine Street in the southern portion of the project area. An underground telephone cable lies in an east-west direction through the SR 104/Pine Street intersection and extends for approximately 500 feet west of SR 104 along the south side of Pine Street before emerging aboveground and continuing along the remaining length of Pine Street. Aerial telephone cables also extend along portions of the BNSFRR right-of-way.

Pedestrians and Bicyclists

The *City of Edmonds Bikeway and Walkway Plan* (City of Edmonds, 1992) identifies existing and proposed walkways within the project area. The walkway plan indicates that existing or planned designated walkways are located along Dayton Street between Railroad Avenue and 3rd Avenue South, Sunset Avenue north of Main Street, and 3rd Avenue South between Dayton Street and the Woodway city limits south of SR 104. The plan recommends that the existing walkway along the west side of Railroad Avenue between Main and Dayton Streets be relocated to Edmonds Way because the narrow width, adjacent uses, driveways, and truck activity make this walkway somewhat unpleasant to use. None of the walkways is marked using guide signs; from a user's perspective, the walkways are simply a collection of existing sideways with no continuous routes or marked destinations. The plan recommends a number of additional walkways along project area arterials, including the following:

- Edmonds Way between Main and Dayton Streets (the walkway relocated from Railroad Avenue, as noted above)
- Admiral Way south from Dayton Street to Point Edwards (this would be designated as a scenic walkway)
- Realigned SR 104 between the existing SR 104/Pine Street intersection and the new Point Edwards ferry terminal (this would be a combined walkway/bikeway along the north side of the roadway)

Key aspects of the pedestrian and bicycle system serving the existing Edmonds ferry terminal, the train station, and the waterfront area include the following:

- Access to the ferry terminal near Railroad Avenue is difficult during ferry loading and unloading periods.

- Pedestrian access to the train station and ferry patron parking lot is generally unchannelized through a parking lot.

- The at-grade railroad crossing disrupts pedestrian and bicycle circulation.

The last two deficiencies have been addressed as part of interim improvements that were made to the existing ferry terminal.

3.3.4 Economics

All three project alternatives are located in or near the downtown/waterfront area. Most available economic data are collected and reported for the City of Edmonds as a whole. However, because the downtown area is one of the City's primary commercial centers, the citywide data provide some insight into the trends and condition of the local economy.

Population

During the past 12 years, the City of Edmonds' population has experienced some marginal growth. Between 1990 and 2002, the population increased from 30,743 to 39,460, an average annual increase of approximately 2 percent. Annexations accounted for the majority of this growth. During this period, Edmonds annexed 1.5 square miles containing 3,491 housing units and 7,739 residents. Adjusting for these annexations, the City's population increased by 978 residents during this 12 year period, or an average annual increase of 0.3 percent. During this same period the population for Snohomish County increased from 465,628 to 628,000, or an annual average increase of 2.5 percent.

During the previous decade, the City's population increased from 27,679 in 1980 to the 1990 level mentioned above, or an annual increase of approximately 1 percent. The effect of annexations were less and accounted for approximately 13 percent of the growth during this period.

Census data indicate that in 2000 the population of the City of Edmonds was slightly older and more affluent than the county population as a whole. In Edmonds, the median age was 42 years, and the per capita income was $30,076, compared to 35 years and $23,417, respectively, in the county.

Employment

The City's employment base has increased since 1990 but at a slower rate than the resident population. According to the PSRC data, in 1990 there were 9,263 jobs located in the City of Edmonds. By 2000, employment levels had increased to 10,038, representing an average annual growth rate of approximately 0.8 percent. This rate of growth is substantially lower than what was experienced in the previous decade when employment increased from 7,071 to 9,263, or an average of 2.7 percent per year.

The relationship between local population and employment is a good indicator of a community's general socioeconomic character and can be summarized in a ratio that measures the number of local jobs per 100 residents. The closer this ratio gets to 0, the more an area is primarily residential in nature. The 2000 ratio for the entire Puget Sound metropolitan area (King, Kitsap, Pierce, and Snohomish Counties) was approximately 53 jobs per 100 residents. This is the best measure of the balance point between jobs and residents. Communities with ratios lower than the regional figure will tend to be more residential, while areas with ratios higher than 53 will tend to serve as employment centers.

The job-to-population ratio in Edmonds was 30:100 in 1990 and 25:100 in 2000. The ratio indicates that the City is still primarily a residential community, where many residents travel outside the area for work. Similarly, the Snohomish County balance between jobs and population was 36:100 in 1990 and 36:100 in 2000.

In the last decade, the county has maintained a consistent jobs/housing balance while the City's job/housing mix has become less balanced. In fact, the City's job/housing balance returned to its 1980 level after showing improvement during the 1980s.

Local Tax Base

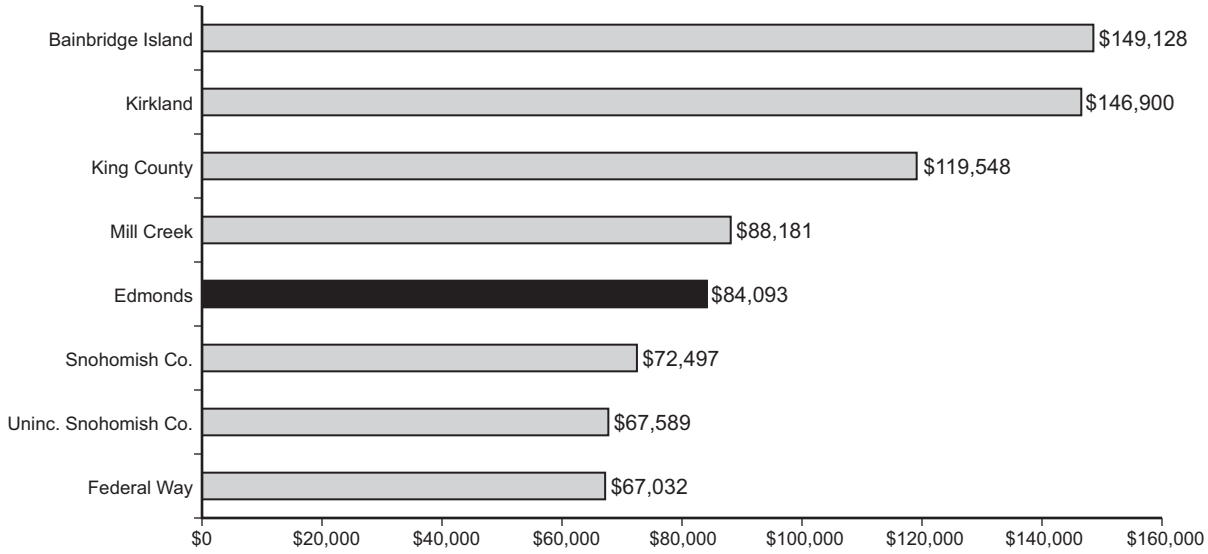
The primary components of the local tax base are the assessed value of property and taxable retail sales. The efficiency of these tax sources substantially affects the City's ability to fund the service needs of the community.

Assessed Value of Real Property

Local property taxes provide the largest single revenue source for the City of Edmonds. In 2001, regular property taxes accounted for approximately 32 percent of total revenues received by the City's general fund. Property taxes are based on the assessed valuation of property within a jurisdiction. A good measure of this source to support a local community's service needs can be seen in the total assessed value of property on a per-capita basis.

Figure 3-21 compares the per capita assessed value of property in the City of Edmonds with a sample of communities with similar demographics, the unincorporated areas of Snohomish County, and Snohomish and King Counties as a whole.

The City of Edmonds property tax base provides substantially greater financial capacity when compared with unincorporated Snohomish County and the county as a whole, suggesting that the City is relatively more affluent than the county. Therefore, to generate the same amount of tax revenues per capita, Edmonds could tax at a lower rate than would be possible in other parts of Snohomish County. However, the per-capita property tax base in Edmonds is comparatively smaller than that of other relatively prosperous communities such as Bainbridge Island and Kirkland.



Source: Assessor's offices in King, Kitsap, and Snohomish Counties; Washington State Office of Financial Management, Forecast Division.

EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 3-21

2002 Per Capita Assessed Value

Taxable Retail Sales

Sales tax receipts are the second largest revenue source for the City of Edmonds. In 2001 retail sales tax revenues represented approximately 20 percent of total general fund revenues. Communities with a high level of retail sales activity can generate a substantial amount of local revenues from this source. This provides a mechanism to import tax dollars from neighboring communities and reduce the tax burden of the local resident population. The per-capita taxable retail sales figures indicate how effective the sales tax is in generating revenue for a particular community, as presented in Figure 3-22.

The City of Edmonds' per-capita retail sales is about average when compared to similar cities. However, when compared to the per capita retail sales for Snohomish and King Counties as a whole, it appears that residents are spending a substantial amount of their retail dollars in other communities. A substantial reduction in the vitality of the local retail community resulting from the development of the proposed project could lead to fewer retail businesses, which would reduce the per-capita sales tax base and would place a greater burden on the property tax to provide for local service needs.

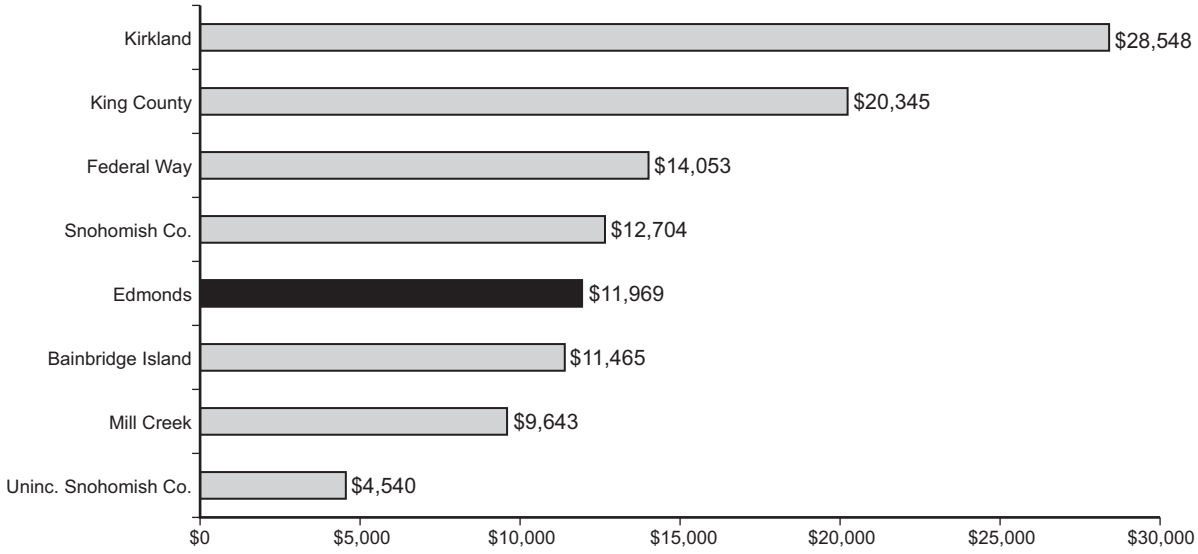
Downtown/Waterfront District

The City of Edmonds covers 4,800 acres of land, 95 percent of which is already developed. As stated in the EIS for the City's comprehensive plan, the majority of the City's land is developed for residential use (58 percent); most of this residential development is single-family detached housing. There are several large clusters of multifamily development located within and adjacent to the downtown area. Commercial and industrial development occupies 7 percent of the City's total land base. The two principal commercial districts in the City are the downtown/waterfront area and the SR 99 corridor. Other, smaller, commercial centers include the Five Corners and Westgate areas. Of the remaining land within the City, 12 percent is being used for institutional purposes (schools, parks, or government buildings), 18 percent for public right-of-way, and 5 percent is vacant.

Increasing vacancy and lease rates have recently been cited as problems in the downtown/waterfront area, but this assertion is contradicted by local real estate sources, which indicate that downtown vacancies and lease rates have remained relatively constant over time. Parking availability and competition from regional malls and businesses along the SR 99 corridor have also been identified as problems.

Relationship Between Local Economy and the Ferry Terminal

For the purposes of this analysis, the most important economic factor in downtown Edmonds is the relationship between the ferry terminal, its associated traffic, and the local economy. Documenting the elements of this relationship is difficult because reliable and consistent data about downtown business activity are not readily available. In addition, the ferry terminal is just one of many important variables affecting the downtown/waterfront district, so segregating the effects of



Source: Washington State Department of Revenue;
Washington State Office of Financial Management, Forecast Division.

EDMONDS CROSSING

Connecting ferries, bus & rail

Figure 3-22

2001 Per Capita Sales Tax Base

154090.G1.02.A1_T072001006SEA • 3-22 2001 per capita sales tax base • 7/7/03 • dk/gm

one or the other is difficult. Most economic data sources consider the City of Edmonds as a whole and do not segregate the different commercial districts.

In February of 1995, the Edmonds Ferry Terminal was closed for reconstruction and only passenger service was available between Edmonds and Kingston. Total ferry ridership on the Edmonds-Kingston route during that month was 50,229, an 80 percent decrease over ridership in February 1994. This period of limited ferry service and reduced ridership provides an opportunity to isolate some of the influence of the ferry terminal on downtown business activity (because the perceived economic stimulus, ferry traffic, stopped during this month). While none of the alternatives under review would involve shutting down the automobile ferry service, this analysis might provide a sense of the influence of the facility on local businesses and an order of magnitude for its overall significance as a local generator of economic activity.

The only available objective measure of local business activity is the regular and consistent collection of sales and use taxes. These revenues fluctuate with changes in retail sales. One of the more critical ways in which ferry traffic contributes to the local economy is through visitors spending money in shops and restaurants. Table 3-9 compares the sales and use tax collections in Edmonds for the first quarters of 1993, 1994, and 1995.

Table 3-9
City of Edmonds Sales and Use Tax Distributions

	January Activity[a]	February Activity[a]	Percent Change (January to February)	March Activity[a]	Percent Change (February to March)
1993	$225,072	$171,855	-24 percent	$186,074	8.3 percent
1994	$200,077	$179,961	-10 percent	$196,254	9.1 percent
1995	$221,616	$215,498	-2.8 percent	$220,411	2.3 percent
Percent Change					
1993 to 1994	-11.1	4.7	---	5.5	---
1994 to 1995	10.8	19.7	---	12.3	---

[a]*Tax revenue distributions occurring in March, April, and May for sales and use tax activity occurring in January, February, and March.*

Source: State of Washington Department of Revenue, Research Division.

Based on typical seasonal variation, February is often a slower month for retail sales. In each of the 3 years, tax revenues generated from retail sales activity in Edmonds declined from January to February, then increased again in March. Each year, however, the size of the February drop has been less. In February of 1995, when there was no automobile service at the terminal, sales were approximately 20 percent higher than in the previous year, suggesting that the limited service at the ferry terminal did not negatively impact the City's retail sales and may even have contributed to increased sales.

Other sources of local business information were also analyzed in an effort to support or refute the implications of the previous analysis. Two surveys were conducted that provide information regarding the relationship between ferry traffic and downtown business activity. In 1992, as part of the *Edmonds Downtown/ Waterfront Plan*, 442 businesses in the downtown/waterfront area were surveyed to assess the degree to which ferry operations contributed to or inconvenienced them. Responses to this survey indicated that, on average, 4.5 percent of business activity in the downtown/waterfront area was related to the ferry terminal and associated traffic. Overall, of the 209 businesses responding to the survey, only 23 (11 percent) stated that the ferry was important to their business.

The Edmonds Chamber of Commerce conducted a survey in February 1995; it explicitly targeted impacts resulting from reduced ferry terminal activity. This survey reported that retail businesses generally felt the greatest impact from the auto ferry closure. This anecdotal information is not necessarily incompatible with the sales tax analysis findings, because the survey does not address the volume of reported lost sales. It is possible that the cumulative impact of the losses in the immediate area were more than offset by strength in other parts of the City.

From this evaluation, it appears that the ferry terminal is not a major direct catalyst for economic activity when measured on a citywide basis. The terminal and its associated traffic have been identified as important sources of business income for several individual businesses in the downtown/waterfront core, mostly retail and restaurant establishments. However, these affected businesses appear to be a relative minority of the total businesses in the proximate area. The project alternatives considered in this analysis involve relocation of the facility, so it can reasonably be expected that impacts will be less than those experienced during the temporary auto ferry closure.

3.3.5 Cultural Resources

The Point Edwards and Mid-Waterfront alternative sites are located in a potentially sensitive zone where buried archaeological sites may be present.

Project Setting

The steep headlands that characterize the shoreline north of Seattle terminate abruptly at Point Edwards. Just north of Point Edwards is a gently sloping topographic break that accommodates flat sandy beaches, an intertidal wetland/marsh, and a series of low benches or terraces that step back away from the shoreline to the east. Willow Creek, a permanent stream, drains into the wetland/marsh before it reaches the Sound. In spite of extensive alterations to the local setting as a result of urbanization, portions of the wetland/marsh and some unchannelized segments of Willow Creek survive. Stretches of sandy beach that might have been more extensive in the late 19th century have been eliminated by modern improvements. Except for the intertidal wetland/marsh, before European settlement the Edmonds area was dominated by species of the Western Hemlock Vegetational Zone (Franklin and Dyrness, 1973).

The project area has several habitats in proximity: open salt water, rocky shore, sandy shore, fresh water, wet coniferous forest, broadleaf forest, riparian woodland, and intertidal wetland/marsh. The Edmonds waterfront area is partly a sandy shore/shellfish habitat that today supports a variety of molluscs. Edible crabs are found just offshore. Land mammals were once present in some numbers. Sea mammals in the area include, among others, harbor seal and harbor porpoise.

Numerous post-glacial processes have had the potential for affecting the patterns of human subsistence and settlement and for affecting the archaeological evidence of those activities. The Puget glacial lobe was estimated to be up to 3,000 feet thick (Galster and Laprade, 1991). As it receded, broad isostatic rebound occurred, raising some surfaces as much as 300 feet. Extensive sediment deposition began in stream valleys, lakes, and inlets, forming alluvial surfaces. Sea level, as much as 200 feet below that of today, began to rise (Thorson, 1980). Active shoreline erosion and slope failures began.

About 1,000 years ago, a large earthquake occurred in the region. Evidence around Puget Sound includes surface subsidence, uplifted terraces, turbidity deposits in lake sediments, tsunami deposits, and rock avalanches (Atwater and Moore, 1992; Bucknam, *et al*, 1992; Karlin and Abella, 1992; and Schuster, *et al*, 1992). Larson and Lewarch (1994) report that the West Point landform, approximately 10 miles south of Edmonds, subsided approximately 3 feet as a result of this earthquake.

Several natural geomorphologic processes, either singly or working in tandem, may be responsible for obscuring archaeological deposits that might be present in the project area. These processes, such as alluvial deposition, sea level adjustment, erosion and slope failures, earthquake subsidence, and tsunami deposits, may have contributed to site archaeological burial or submersion below present sea level.

Cultural Context

Previous Archaeological Investigations

A records search conducted at the Office of Archaeology and Historic Preservation (OAHP) in Olympia revealed a complete absence of recorded prehistoric archaeological sites in the immediate vicinity of Edmonds. Miss and Campbell (1991) report only 117 recorded prehistoric sites in Snohomish County as of November 1991, and the nearest recorded prehistoric archaeological sites are located well to the north, about halfway between Edmonds and Everett. In contrast, large numbers of prehistoric sites have been recorded throughout King County–mostly as a result of federal- or state-mandated reconnaissance surveys associated with project development. The closest recorded prehistoric sites in King County are located at West Point, approximately 10 miles south of Edmonds.

The *Draft Environmental Impact Statement for the City of Edmonds Comprehensive Plan* includes among its goals for archaeological preservation a recommendation for "general identification of archaeological sites [that] would include, but not be limited to: Old Indian Cemetery (vicinity of 9th and Dayton), and Indian encampment sites in the vicinity of Union Oil Dock" (City of Edmonds, 1995). The OAHP has no site records on file for either site.

A useful review of previous archaeological work has been presented by Larson and Lewarch (1994). A number of sites have been recorded near the historic mouth of the Duwamish River. While approximately 17 miles south of Edmonds, the environmental setting has strong similarities to Edmonds where Willow Creek drains into the Sound. A shell midden site on the east edge of the West Seattle peninsula is located in a former cove or embayment along the former shoreline of Elliott Bay and would have overlooked a large expanse of tidal mudflats at the mouth of the Duwamish River. The site was used for shellfish gathering/ processing and fishing campsites on a beach surface that was exposed by an earthquake along the Seattle Fault approximately 1,000 years before present (B.P.).

A recent survey of shoreline along the Port Madison Indian Reservation resulted in the discovery of 15 archaeological sites. Other sites below contemporary sea level may be buried in the bays and marshes of the area's inlets. In addition to documenting a long history of land use in the area, the Port Madison study also shows a dense distribution of sites along the shoreline. One might expect a similar density in the Edmonds area prior to urbanization and extensive land modification. The Willow Creek wetland in the project area may represent a former bay or marsh inlet that may have been filled by rising sea levels or localized subsidence caused by large earthquakes. The Port Madison study suggests that sites may also be found buried in what may once have been a former bay/inlet/ marsh in the project area.

The West Point site complex noted above is located in a sandspit that juts from the mainland to the west. While not directly comparable, West Point shares many geomorphologic similarities to Point Edwards. Both are located on the eastern shore of Puget Sound, have freshwater streams discharging into the Sound, have areas of sandy beach and associated salt marsh environments, and have associated steep bluffs and ravines. Rising sea levels and earthquake subsidence served to cover archaeological deposits at West Point, and the same might have occurred at Edmonds. Not only does the Edmonds area share many physical similarities to West Point, but the enthnographic and cultural setting of the two areas is similar.

Ethnography

Edmonds lies within lands and waters once controlled by the Suquamish Indians (Wessen and Stilson, 1987). At the time of historic contact, there was a large population in southern Puget Sound consisting of eight closely related tribal groupings: Twana-Skokomish, Nisqually, Puyallup, Duwamish, Suquamish, Skykomish, Snoqualmie, and Muckleshoot—all of whom spoke Coast Salish languages (Wessen and Stilson, 1987).

These peoples were skilled fishermen, hunters, and plant collectors who employed a settlement and subsistence system marked by a central base or winter village and a cycle of movements to smaller, more informal, settlements at different times of the year to exploit locally available resources. The winter village was a focal point of social and ceremonial life (Wessen and Stilson, 1987).

Living along the Sound, the Suquamish had direct access to intertidal and marine resources, and their principal settlements were located adjacent to or on modern saltwater beaches. The Edmonds waterfront area, with its generally flat beach and

adjacent intertidal estuary/wetland marsh, is a spot that would have been most favorable for the location of one or more prehistoric or proto-historic Suquamish settlements.

Suquamish subsistence patterns along the western shores of Puget Sound are similar to those reported for the nearby Duwamish who inhabited the Seattle waterfront area. According to Larson and Lewarch (1994), the Duwamish and their neighbors [Suquamish] practiced a seasonal round that consisted of spring, summer, and fall migrations to fishing grounds, berry and root patches, and shellfishing areas, with retirement to a sedentary lifestyle in the winter longhouses. The fall fisheries were crucial to their subsistence because they provided dried or smoked food for the winter months.

Historic Setting

The founding of Edmonds is tied to the timber industry. George Brackett, widely credited as the founder of Edmonds, first became aware of the area while canoeing along the shore looking for timber to harvest. The popular story has Brackett being blown ashore by a storm in 1870. He noted that the area was an ideal town site. One of the prime factors in his analysis was that this was one of the few sites in the area where the land sloped gently to the shore. In most areas of this part of the Sound, the shoreline has steep bluffs.

Brackett returned in 1872 and bought 147 acres that were originally taken as a preemption claim in 1866. In 1876, Brackett moved his logging operation to present-day Edmonds and built a house. The town grew slowly. In 1884, the town was platted and granted a post office, and a school district was established. In 1889, Brackett opened the first sawmill. Edmonds was incorporated in 1890, and the Great Northern Railroad reached the town the following year. At the same time, the wharf originally built by Brackett was extended, making it accessible to the steamers plying the Sound. The availability of reliable transportation by both water and rail stimulated the timber industry in Edmonds and by 1895, four shingle mills and a lumber mill were in operation along the waterfront.

The production of cedar shingles was the principal industry in Edmonds during the first half of the 20th century. The cedar that grew on the surrounding hills provided an abundant supply of raw material for the mills that lined the waterfront. By 1951, the local supply of cedar was depleted, and the last of the Edmonds shingle mills closed.

Between 1890 and 1950, industrial facilities along the Edmonds waterfront changed frequently. A 1909 Sanborn fire insurance map shows nine shingle mills, a sawmill, an excelsior manufactory, and a bolt factory along the waterfront. The map also shows a saltwater pond south of Dayton Street between the railroad tracks and the Sound. The next available Sanborn map, prepared in 1926, shows two drying kilns that were present in 1909; all of the other buildings along the waterfront had changed. The only company that retained its 1909 name was A. M. Yost and Sons, although their operation had changed from a sawmill to a lumber yard. The saltwater pond was no longer present. These frequent changes to the waterfront resulted from several factors. Without a breakwater, mills were often damaged by

high water from winter storms. Fire was also common, with numerous reports of damage or destruction of the wooden mill buildings. A third factor was economics. The waterfront industries primarily produced building materials (shingles and lumber), so they were highly susceptible to economic trends.

The Edmonds area is historically important for oil product storage facilities. In 1911, Standard Oil Company of California established a storage tank farm at Point Wells, about 2 miles south of Edmonds. Shell Oil also developed a tank farm at Point Wells at about the same time. In 1922, UNOCAL established a tank facility at Point Edwards. In 1924, UNOCAL located a substation on Dayton Street just east of the railroad tracks. In May 1951, the company opened an asphalt refinery at the Point Edwards location.

The 1950s marked the beginning of a shift away from industrial use along the waterfront, when the first restaurant was opened there. In 1962, the first small boat harbor was opened. Expanded twice since then, it now has several hundred slips. Several stretches of beach south of the current ferry dock have been developed as public parks.

Redevelopment of the waterfront resulted in the removal of all of the industrial development from the historic (pre-1945) period in the project area except the UNOCAL tank facility. A 1941 aerial photograph of the area (included in the hazardous waste discipline report) shows most of the tanks, the pier, and a pipeline from the tanks to the pier in their current locations. A steel pony truss bridge is incorporated in the structure that carries the pipeline over the railroad tracks and may be historic. The buildings at the facility appear to date to the 1960s.

Findings

The project area contains no prehistoric or historic archaeological sites that are currently listed on, nominated to, or determined eligible for the National Register of Historic Places.

A prehistoric archaeological site was discovered on May 3, 1995, during the field reconnaissance along the small access road to the Deer Creek Fish Hatchery. The site was named the Deer Creek Hatchery Shell Scatter and was designated as site 45-SN-310 by OAHP. It is located about 50 feet or more north of the present access road, northwest of the hatchery building and stock pond.

This site is probably not eligible for inclusion in the National Register of Historic Places, and no further investigative work was conducted because the site would not be directly affected by either of the build alternatives. A site record form for 45-SN-310 is on file with OAHP in Olympia.

No other archaeological sites were detected during the surface reconnaissance. The Old Indian Cemetery purported to be in the vicinity of 9th Avenue and Dayton Street lies outside the project area. Native Indian encampment sites purported to be present in the vicinity of the UNOCAL pier (City of Edmonds, 1995) could not be located.

Surface visibility in the project area is generally poor as a result of modern development. Large areas of both sites proposed under the build alternatives are covered with imported fill, pavement, and modern commercial structures and industrial facilities. Nevertheless, most of the project area is considered to be a high-probability area for the presence of archaeological sites.

The UNOCAL facility, established in 1923 at the southern end of the project area, is the only standing property that dates from the historic period (pre-1945). Many of the tanks and the pony truss bridge carrying the pipeline to the pier over the railroad tracks are historic. A 1944 aerial photograph shows 13 tanks at the facility, the pier, and the pipeline. The UNOCAL facility ceased operation in the early 1990s. The property is associated with several historically important trends (development of the West Coast petroleum industry, development of petroleum tank technology, and development of the City of Edmonds) but did not play a substantial role in any of them. Since its establishment, the facility underwent continuing maintenance, expansion, and modifications. Many historic elements have been lost and many modern elements have been added. The facility (including the pony truss bridge) lacks both historic significance and historic integrity. It is not eligible for listing in the National Register of Historic Places.

While no remains were identified during the project survey, there is potential for historic archaeological remains in the portion of the Mid-Waterfront alternative site west of the railroad tracks. The section of proposed roadway that parallels the tracks has a moderate probability of containing historic archaeological remains because of its proximity to shingle mill locations. However, the mills were generally closer to the beach than where the new road would be constructed. The section of new roadway that would turn northwest toward the proposed ferry terminal would cross the site of the Yost sawmill and residences (shown on 1926 and 1932 Sanborn maps), which has a high probability of containing historic archaeological remains.

Conclusions

The Point Edwards and Mid-Waterfront sites are located within archaeologically sensitive areas. Although a limited subsurface presence/absence testing program conducted in late 1995 in accessible portions of the Point Edwards and Mid-Waterfront areas resulted in negative findings, it is still possible that buried prehistoric Native American occupation sites are present somewhere within the two build alternatives. The Mid-Waterfront site has a moderate to high potential for containing buried historic archaeological sites because this was the area of the former cedar shake mills. Twentieth century demolition of these early industrial facilities may have sealed subsurface features and artifact-bearing refuse deposits. The Point Edwards site, which is much less congruent with the location of much of the former historic waterfront, has a lower probability of containing historic archaeological sites. Neither build alternative is any more or less likely to have prehistoric archaeological sites present.

3.3.6 Tribal Fishing

Fishing the waters of Puget Sound for migrating salmon and other important fish and shellfish species was the most important subsistence activity of the prehistoric

peoples ancestral to the modern day tribes noted in Table 3-10. To past and present Indian people, fishing is an integral part of their culture. Tribal groups view the world and the environment in a much more holistic fashion than non-Indians; it is commonly known that salmon fishing played a central role in the whole constellation of prehistoric and historic Indian culture in the vicinity of the project.

There are a number of Puget Sound Treaty Tribes that are reorganized as sovereign governing powers with fishing rights at all "usual and accustomed grounds and stations" in Puget Sound and the Strait of Juan de Fuca. These areas are where members of a tribe customarily fished from time to time at and before treaty times, whether or not other tribes then also fished in the same waters. Tribes have commercial fishing rights for salmon in their usual and accustomed fishing areas and also have the legal right to harvest shellfish and bottom fish from the same areas.

Management of tribal and commercial fishing is a joint effort of WDFW and the treaty tribes. Recognized tribes participating in the management of Central Puget Sound fisheries are shown in Table 3-10.

Table 3-10
Tribes Participating in Central Puget Sound Fisheries

Tribe	Usual and Accustomed Fishing Area (WDFW Salmon Management Area)	
	9	10
Lummi	X	X
Suquamish	X	X
Swinomish	X	
Tulalip	X	X

In accordance with the Boldt decision (*Washington State vs. United States, 1975*), tribal fishers have the right to 50 percent of the harvestable surplus salmon and steelhead in the waters passing through or originating in areas designated as their usual and accustomed fishing grounds. In addition to commercial fishing, these tribes also harvest fish in these usual and accustomed areas for ceremonial and subsistence purposes. Fishing quotas and fishing open dates are negotiated from year to year, based on return projections calculated by tribal and WDFW harvest management biologists. Usually, each fishery (e.g., coho, chum) is split so that state and tribal fishers fish on different, sometimes alternate, days. During the past decade, because of poor salmon returns in the same years, the number of fishing days has dwindled to as few as three days each for the state and tribal fisheries in Salmon Management Area 10. The coho season extends from roughly mid-September to early October. The chum season extends from October through November.

The project area lies on the boundary between SMAs 9 and 10. The actual landmarks from which the line extends is from Point Edwards (the southwest corner of the Port of Edmonds Marina breakwater) across to Apple Cove Point (Figure 3-15). SMA 9 has been closed for many years to non-recreational fishers because north-central and southern Puget Sound salmon stocks are still mixed in this area and separation is desired for the protection of certain stocks. SMA 10 is open for varying lengths of time each year for salmon harvest.

Because SMA 9 is usually closed to non-recreational salmon fishing, the first opportunity to intercept salmon inside of Admiralty Inlet is the boundary between SMAs 9 and 10. Point Edwards appears to concentrate salmon to a greater extent than any other area along the SMA 9/10 line. There is a tendency for non-recreational fishers to crowd up next to the SMA 10 line because the best fishing is there. Fishing farther to the south means that a fisher will catch fewer fish (Hayes, pers. comm., 1994). Even so, fishers generally space themselves approximately 1,800 feet apart down the shoreline as far as Golden Gardens Park in Seattle (Sheldon, pers. comm., 1995).

The following was average annual tribal catch for SMA 10, by species, for the 11-year period 1992 to 2002.

- Chinook: 7,875
- Coho: 88,666
- Chum: 22,269
- Sockeye: 2,872
- Pink: 1,186

The state fishery is basically the same as the tribal fishery, except that it includes a limited number of commercial boats and occurs on different days. The state fishery includes a larger number of purse seiners. The state fishery, like the tribal fishery, is focused on Point Edwards and the SMA 9/10 line. The following was the average annual state catch in SMA 10 for the period 1992 to 2002.

- Chinook: 1,079
- Coho: 6,438
- Chum: 14,906
- Sockeye: 1,178
- Pink: 58

In accordance with the “Rafeedie” decision (*United States vs. Washington 1994*), tribal fishers have 50 percent of the shellfish and nonsalmon fish resources within their usual and accustomed fishing areas. As with salmon fisheries, resources such as Dungeness crab, spot shrimp, geoduck clams, and sea cucumbers are comanaged by the tribes and WDFW.

Although Dungeness crabs are present in the project area at unknown densities, they are not apparently present in sufficient quantities to attract commercial harvest at this time. Tribal crab fishing is, however, conducted to the north of the existing ferry terminal and other areas throughout Puget Sound.

Geoduck clams were surveyed along transects between the existing UNOCAL pier and the proposed ferry terminal location. The average density was 2.2 geoduck clams per square yard, which is a fairly high density. However, the biologists conducting the survey reported that the area covered may not be representative due to the shoreline morphology. The Picnic Point geoduck commercial harvest tract (06000), which extends from the vicinity of Picnic Point south to a point directly offshore of the middle of the Edmonds Marina, had an estimated density of 0.4 clams per square yard.

There is a relatively new commercial fishery for spot shrimp (*Pandalus platyceros*). Tribal fishers fish for spot shrimp up and down the shoreline from Point Edwards to a point well north of the existing ferry terminal using baited shrimp pots. Tribal fishers are currently allocated 4,000 pounds of catch. The extent of this resource is not well known and the exploitation rate may be increased in the future if data indicate that this is warranted. Tribal fishing effort currently consists of three to five boats, most of which have been from the Suquamish Tribe. The tribal fishery is typically about five to six days long, starting April 1.

3.3.7 Hazardous Waste

This section summarizes land use information regarding those properties with potential environmental concerns. The information includes brief descriptions of the properties within each alternative that would be directly affected or are immediately adjacent to the alternative sites. Properties that are of concern or that have potential environmental concerns are identified in Figure 3-23.

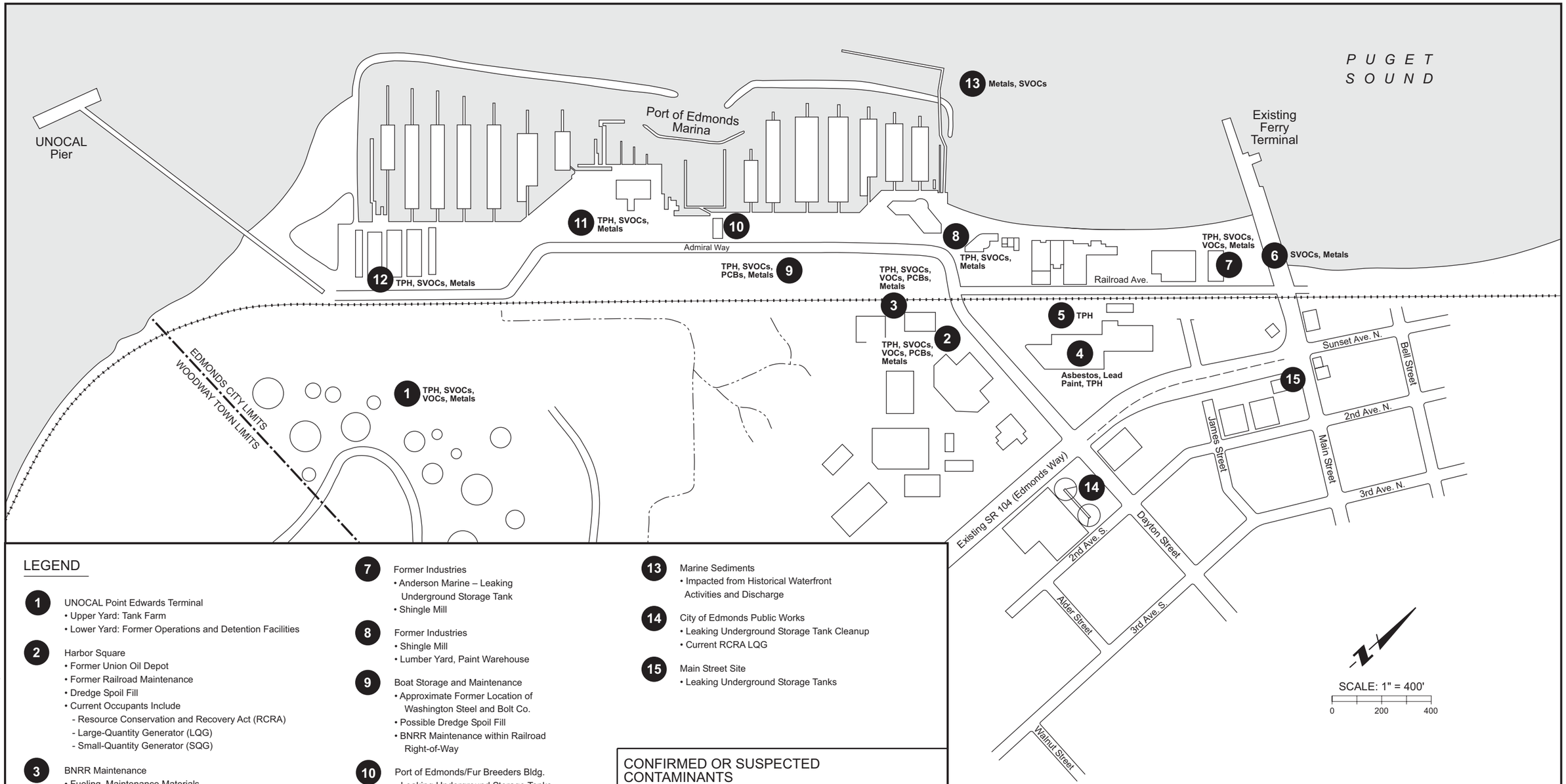
Alternative 1: No Action

The WSF ferry terminal location has been in maritime use since at least 1909 according to available Sanborn maps. Prior to the dock installation and operation by the ferry system, the site was called the City Dock. The 1909 Sanborn maps indicate that it was used to receive freight. According to the federal and state environmental agency databases[2] reviewed, the WSF ferry terminal is a Resource Conservation and Recovery Act (RCRA) small-quantity generator of hazardous waste (less than 2.2 pounds of acute hazardous waste or 220 pounds of other hazardous waste per month).

The areas north and south of the ferry terminal have had industrial uses in the past dating back to at least 1909. The primary industries in the immediate vicinity were shingle mills. The shingle mill south of the dock is noted as destroyed by fire in the 1926 Sanborn map. The 1955 aerial photograph and later photographs suggest that the area south of the terminal was used as a boatyard.

An abandoned and fenced commercial marine facility (Anderson Marine), located south of the ferry terminal, was observed during the site visit on June 2, 1995.

[2]The databases reviewed for preparation of this Final EIS include the EPA National Priority List, Resource Conservation Recovery Information System, Comprehensive Environmental Response, Compensation, and Liability Information System, Corrective Action Report, Emergency Response Notification System, Facility Index System, and Toxic Substance Control Act; the USDOT Hazardous Material Information Reporting System; and the Washington Department of Ecology (DOE) Leaking Storage Tanks Site List, Confirmed and Suspected Contaminated Sites List, Statewide Underground Storage Tank Site Report, and Solid Waste Facilities Handbook.



LEGEND

1 UNOCAL Point Edwards Terminal
- Upper Yard: Tank Farm
- Lower Yard: Former Operations and Detention Facilities

2 Harbor Square
- Former Union Oil Depot
- Former Railroad Maintenance
- Dredge Spoil Fill
- Current Occupants Include
  - Resource Conservation and Recovery Act (RCRA)
  - Large-Quantity Generator (LQG)
  - Small-Quantity Generator (SQG)

3 BNRR Maintenance
- Fueling, Maintenance Materials

4 Sunset Avenue Complex

5 Former BNRR Fuel Tank

6 WSF Pier
- Current RCRA SQG
- Former Freight Operations

7 Former Industries
- Anderson Marine – Leaking Underground Storage Tank
- Shingle Mill

8 Former Industries
- Shingle Mill
- Lumber Yard, Paint Warehouse

9 Boat Storage and Maintenance
- Approximate Former Location of Washington Steel and Bolt Co.
- Possible Dredge Spoil Fill
- BNRR Maintenance within Railroad Right-of-Way

10 Port of Edmonds/Fur Breeders Bldg.
- Leaking Underground Storage Tanks

11 Port of Edmonds Underground Storage Tanks (new)
- Possible Dredge Spoil Fill
- Marine Fueling Facility

12 Former Area of Willow Creek/UNOCAL / Port of Edmonds Dry Storage Water Discharge
- Water Discharge
- Possible Dredge Spoil Fill
- TPH Contamination Detected in Soil and Groundwater

13 Marine Sediments
- Impacted from Historical Waterfront Activities and Discharge

14 City of Edmonds Public Works
- Leaking Underground Storage Tank Cleanup
- Current RCRA LQG

15 Main Street Site
- Leaking Underground Storage Tanks

CONFIRMED OR SUSPECTED CONTAMINANTS

TPH – Total Petroleum Hydrocarbons

VOCs – Volatile Organic Compounds

SVOCs – Semivolatile Organic Compounds (including Polynuclear Aromatic Hydrocarbons)

PCBs – Polychlorinated Biphenyls

Metals

Asbestos

Lead Paint

EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-23
Properties of Potential Environmental Concern

154090.G1.02.A1_T07200100SEA • 3-23 Prop. of Potential Env. Concern • 7/7/03 • dk/gm

Types of operations and property conditions of the marine facility are not known. Two LUSTs are listed in the database reviewed for the Anderson marine site. These are categorized as "reasonably predictable sites" in accordance with FHWA terminology (FHWA, 1997).

Within a 1/4-mile distance east of the ferry terminal, the environmental agency databases reviewed indicated a LUST site (FHWA "reasonably predictable site") and a RCRA small-quantity generator of hazardous waste.

A potential for contaminated sediments in the vicinity of the ferry terminal exists because of the duration of industrial use in the area. Possible contaminants include semivolatile organic compounds, including polycyclic aromatic hydrocarbons (PAHs); polychlorinated biphenyls (PCBs); and metals, including organotin and mercury from ship repair (painting and grit blasting).

Modified Alternative 2 (Preferred Alternative): Point Edwards Site

The UNOCAL Point Edwards facility was constructed and put in operation in the early 1920s. The site is approximately 44 acres (EMCON, 1994; 1995; 1996a). The facility was used as a bulk fuel terminal for storage and distribution of fuel from approximately 1923 until 1991 and would be categorized as a "substantially contaminated site" using FHWA terminology (FHWA, 1997). The 15-acre upper yard was used as a tank farm, and the 29-acre lower yard was used for other operations including dock operations, railcar unloading, truck loading, laboratory operations, warehousing, and other facility maintenance and support activities. In addition, an asphalt refinery, constructed in about 1953 and dismantled around 1980 (EMCON, 1995), operated in the lower yard. A total of 10 underground storage tanks (USTs) were located at the facility. According to EMCON (1994, 1995), six of the USTs have been removed, one in 1990 and five in late 1994. Two detention basins are located in the lower yard along with two oil/water separators. Surface water runoff from the site was once directed to the detention basins and discharged to a tidal basin that empties to Puget Sound. Discharge from this area was easily observed in early aerial photographs. In the 1960s, when the Port of Edmonds Marina was constructed, the discharge stream was covered and rerouted through culverts.

A number of petroleum product releases to the environment have been reported for the facility, including nine spills recorded between 1954 and 1990. According to EMCON (1994), the spills ranged from a few gallons to 80,000 gallons and involved fuel oils, heavy fuel oils, gasolines, off-specification emulsified asphalt, and diesel. Other minor releases have occurred on land, but have not entered water. EMCON (1994) reports that periodic product releases have occurred within the tank farm, loading facilities, and piping systems, but complete records of these events are not available. EMCON (1994) also provides information on a diesel release to Puget Sound that occurred from a 1971 derailment on the BNSFRR tracks immediately south of the UNOCAL pier approach trestle, and a spill of asphalt cutter stock to the Sound in 1990 from the Chevron facility 1 mile south of Point Edwards.

According to the environmental agency databases[3] reviewed, the site is reported to be on EPA and Ecology contaminated sites lists, as an UST and LUST site, and as a RCRA large-quantity generator of hazardous waste. Ecology and UNOCAL have entered into an Agreed Order for conducting the site RI and FS under MTCA. Before entering into the Agreed Order, a number of voluntary site investigations and environmental clean-ups were conducted at the site. An RI was conducted by UNOCAL in compliance with the Agreed Order with Ecology. The RI was conducted between October 1994 and August 1996. Additional quarterly and annual groundwater monitoring and product recovery has continued through 2002 (Brearley, pers. comm., 2003). According to the Ecology Site Manager, the current schedule is to finalize the RI and issue a supplemental RI/FS by the fall of 2003. These documents will be released for public comment at that time (South, pers. comm., 2003).

The draft RI Report (EMCON, 1996a) reports that the RI field investigations included 31 surface soil samples, 120 shallow soil borings, installation of 39 additional MWs and 9 piezometers, 17 basin sediment/soil samples, 3 test pits, and 4 test trenches. Four quarters of groundwater samples were collected, seven monthly rounds of water levels were measured, one round of surface water and stormwater samples were collected, and aquifer characterization tests were performed. Sample results are compiled in the draft RI report (EMCON, 1996a). Additional data from groundwater monitoring conducted since 1996 has been submitted to Ecology.

According to the draft RI report, the primary environmental impacts at the existing UNOCAL property include free product on the groundwater table, related petroleum hydrocarbon chemicals in subsurface soil and groundwater, and paint/sand blast grit-related metals in the surface soil. Free product has been found in six plumes in the lower yard: the railroad spur plume, truck loading rack plume, asphalt plant plume, RW-2 plume, office plume, and Detention Basin No. 1 plume. These plumes are the result of releases during former UNOCAL operations. Recovered product results indicate that the free product consists of gasoline-range, diesel-range, and oil-range hydrocarbons. Field observations made during the RI have been interpreted by EMCON (1996a) to indicate that much of the free product may be heavier-end hydrocarbons. Based on product thickness measurements over the last 10 years, product migration rates are estimated by EMCON (1996a) at less than 6 feet per year.

Groundwater at the existing UNOCAL property generally flows to the northwest toward Puget Sound. The groundwater table is present within 4 to 8 feet below the ground surface in most areas. Petroleum hydrocarbon constituents dissolved in groundwater were primarily found near free product plumes and in areas with free-phase product trapped in the vadose zone near the water table. These chemicals were found at or above MTCA clean-up levels for TPH and benzene, ethylbenzene, toluene, or total xylenes (BETX) in site shallow wells (EMCON, 1996a). Except for zinc, metals concentrations in groundwater were generally low, with the highest concentrations found in isolated locations around the terminal. Zinc was the most frequently detected metal in groundwater, with the highest concentrations found in

[3]See footnote 2.

wells along the perimeter of the site. Non-BETX volatile organic compounds were not found in groundwater at the terminal (EMCON, 1996a).

EMCON reports that high concentrations of petroleum hydrocarbons in soil were primarily found near free product plumes and in areas with free-phase product trapped in the vadose zone. High concentrations of petroleum hydrocarbons were also found in the material within Detention Basin No. 1. Elevated metals concentrations were found in surface soil in areas of sand-blast grit and paint chips that occur under pipe runs and manifolds, in isolated grit piles, and in certain tank basins. Leachable metals concentrations were low, indicating that leaching of metals from surface soil is not likely. Additionally, metals were not found in substantial concentrations in subsurface soil.

Petroleum-related chemicals were detected in on-site stormwater, primarily from the lower yard. Non-BETX volatile organic compounds, and oil and grease were not found in stormwater. Similarly, these constituents were also not detected in surface water in the drainage ditch and tidal basin adjacent to the site, nor were TPHs in the gas, diesel, or oil ranges. The highest metals concentrations, and elevated PAH concentrations, were found in surface water upgradient of the site. Biotoxicity testing results for sediments collected in the drainage ditch along the existing UNOCAL property boundaries exceeded clean-up screening level criteria at five of 15 sample locations. No discernible pattern was identified by EMCON (1996a) that would point to a single sediment toxicity source. However, the draft RI report concluded that the potential was low for toxic effects further downgradient from the upland tidal basin in the drainage ditch. No sampling and analysis of offshore marine sediments was performed for the RI.

Since the draft RI was submitted, UNOCAL has begun interim clean-up actions at the site under the supervision of Ecology. The following clean-up actions have occurred or are ongoing:

- **Lower yard interim remedial action 2001-2003.** Free petroleum product and associated petroleum-contaminated soil were removed from four areas of the lower yard east of Willow Creek/drainage ditch and shipped off site for thermal treatment. The excavations extended vertically to between 6.5 and 10.5 feet below grade and extended laterally until product-saturated soil was not observed in the excavation side walls (or until structural concerns made it prudent to cease excavation). Additionally, the excavation was kept open for several weeks to allow for removal of floating product from the groundwater surface. This work was performed primarily between August 28 and November 7, 2001. A final interim action as-built report was submitted to Ecology in November 2002 (Maul Foster &Alongi, November 30, 2002). According to UNOCAL, no free product has been observed in monitoring wells in the area since the action was completed (Brearley, pers. comm., 2003). A second lower yard interim remedial action was completed in December 2003 that included excavation of contaminated materials from Detention Basin No. 1 and the southwest lower yard. The excavated materials were transported and disposed of at an offsite landfill (Brearley, pers. comm., 2004; South, pers. comm., 2004).

- **Upper yard remedial action 2002-2003.** Excavation of petroleum-contaminated soils in the upper yard (former tank farm area) was conducted in 2002-2003. An estimated total of 94,650 tons of petroleum-contaminated soils were excavated and sent offsite to a thermal treatment facility, approximately 23,700 tons of petroleum- and metal-contaminated soils were sent offsite for disposal, and additional debris and materials were sent offsite for disposal or recycling (Maul, Foster, & Alongi, 2003). Ecology confirmed the completion of the upper yard clean-up in October 2003 (South, October 2003).

The FS for clean-up alternatives for contaminated soils and groundwater at the existing UNOCAL property has not been completed. A draft FS report was submitted to Ecology in 2004, but the agency was notified that the document is to be replaced with a revised version. Ecology is deferring review of the FS until receipt of the revised document (South, pers. comm., 2004).

Contaminated media at concentrations above MTCA clean-up levels remain at the existing UNOCAL property and, depending on the clean-up options selected for the site, contaminated media above clean-up levels may remain on site after the clean-up has been conducted. At this time, Ecology does not know the specific clean-up options that will be used for final clean-up at the existing UNOCAL property. Clean-up may range from total removal and/or treatment of all contamination above MTCA clean-up levels to monitoring and institutional controls, such as deed restrictions, depending on the type of contamination at the site, future intended use of the site, location, and other factors. Clean-up at sites typically falls somewhere between these two ends of the spectrum, resulting in some contaminated media being remediated, access restrictions, or land restrictions and long-term maintenance and monitoring to ensure protection of human health and the environment. The Clean-Up Action Plan for final clean-up of the site is currently scheduled for 2004 and completing the final clean-up by 2005 (South, pers. comm., 2003).

If all contamination is removed from the existing UNOCAL property and/or treated to clean-up standards during site clean-up, the clean-up standards will be met, and no further clean-up of contaminated media related to the former UNOCAL operation would be necessary during construction and long-term operation and maintenance of the Edmonds Crossing facility. If the site does not meet all of the clean-up standards, then UNOCAL and/or the property's new owners or operators will be required to conduct long-term operation and maintenance and monitoring to ensure protection of human health and the environment. Restoration and/or additional clean-up actions may also be required by UNOCAL and/or the property's new owners or operators if construction or the operation and maintenance of the Edmonds Crossing facility results in the disturbance or modification to previously completed clean-up actions.

Environmental clean-ups that have occurred to date at the existing UNOCAL property include removal of USTs and soil excavations conducted in late 1994, and removal of 3,264 linear feet of asbestos-containing pipe insulation in 1983. Oil in 20 site transformers was analyzed in 1984 and was determined to have less than 50 ppm PCBs. The transformers were labeled with non-PCB tags. Free product recovery from groundwater in the lower yard was initiated in 1987. The lower yard interim action to remove free product from groundwater and petroleum-

contaminated from four areas was completed in 2002. Contaminated materials from Detention Basin No. 1 and the southwest lower yard were excavated and disposed of offsite during an interim action completed in December 2003. Clean-up of the upper yard was completed and certified by Ecology in a 2003 interim action.

Studies were conducted at the Point Edwards site, west of the BNSFRR right-of-way, including the Marina Beach Park and subtidal areas in the vicinity of the UNOCAL pier and the two stormwater outfalls (CH2M HILL, 2000a and 2000b) and the Port of Edmonds South Marina dry storage area (Landau, 1998). These areas are outside of the UNOCAL MTCA site as entered in the Agreed Order between the Ecology and UNOCAL.

Soil and groundwater samples were collected from six boring locations at Marina Beach Park (CH2M HILL, 2000a). Soil samples were analyzed for TPH as gasoline, diesel, and heavy oil, and metals. TPH as heavy oil was detected in three soil samples. Two of these samples were collected immediately below asphalt paving and may have contained asphalt. The TPH concentrations detected in all three soil samples were substantially below MTCA Method A clean-up levels for unrestricted land use and as such do not represent a threat to human health or the environment. Groundwater samples collected from the boreholes were analyzed for TPH as gasoline, diesel, and heavy oil, and volatile organic compounds. These contaminants were not detected in groundwater (CH2M HILL, 2000a).

A subsurface investigation at the Port of Edmonds's South Marina, north of Marina Beach Park, confirmed the presence of TPH in soil and groundwater (Landau, 1998). Maximum soil concentrations of diesel-range TPH reported was 17,000 milligrams per kilogram (mg/kg); maximum soil concentrations of heavy-oil range TPH was 20,000 mg/kg. Reported groundwater concentrations ranged from less than method detection limits (0.25 milligrams per liter [mg/L]) to 13.0 mg/L diesel-range TPH. The source of the petroleum hydrocarbons was not established. According to information at Ecology's Hazardous Site List, the site has been ranked "5" (lowest potential threat to human health and the environment) and is awaiting remedial action (Ecology, February 2003).

A sediment investigation was conducted at the Point Edwards site in accordance with a sampling and analysis plan approved by Ecology (CH2M HILL, 2000d). Sediment samples were collected from 15 stations offshore of Marina Beach Park between the inner and outer harbor lines and in the DNR lease areas (CH2M HILL, 2000c). Sample stations included five in the vicinity of the Willow Creek drain and Edmonds Way drain located south of the Port of Edmonds breakwater. Replicate samples were collected from 2 of these stations for a total of 17 samples. Three samples were collected at a site in Carr Inlet designated by the Ecology as a reference sediment site. Sediment samples were collected and analyzed for conventional parameters (ammonia, total solids, sulfides, total organic carbon, and grain size), semivolatile organic compounds, PAHs, and PCBs. The chemical analytical results showed compliance with the Washington State Sediment Quality Standards (SQS) [WAC 173-204-320], and as such the marine sediments were found to be uncontaminated (CH2M HILL, 2000d). The Ecology has agreed that the sediments are not contaminated (Turvey, 2000).

Alternative 3: Mid-Waterfront Site

The discussion in the previous section regarding the UNOCAL facility also applies to the Mid-Waterfront site, because the realignment for SR 104 for Alternative 3 would also cross the facility. Other areas impacted by the alternative rights-of-way and sites, including the areas west of the BNSFRR tracks, the area near Dayton Street, and the offshore area north of the Port of Edmonds Marina, are discussed below.

The area west of the railroad tracks between Point Edwards and Dayton Street has been used historically by various industries, wood shingle mills, a steel and bolt manufacturing facility, a lumberyard with a paint and oil warehouse, and a boat maintenance facility. Most of these industrial facilities had docks or piers. In addition, various residences were located here. Possible onshore or offshore contaminants that could have resulted from operation, storage, and maintenance activities at these facilities include petroleum products, semivolatile organic compounds (including PAHs), volatile organic compounds, and metals. Ecology's sediment database indicates that sediments in the vicinity of the proposed pier under this alternative have concentrations of PAHs elevated above Puget Sound Marine Sediment Clean-Up Screening Levels (WAC) 173-204-520 (including fluorene, indeno (1,2,3-cd) pyrene, and phenanthrene), Washington Sediment Management Standards).

Since the 1960s, the area has been dominated by the Port of Edmonds Marina. It is possible that substantial dredging was required to create the w. It is not known where all dredge spoils were disposed of. Landau & Associates (1992) report that some of the dredge spoils were used as fill at the Harbor Square business park. According to Port of Edmonds staff, the marina was last dredged about 1987. The sediments were transported to an upland site for a parking lot project. Other dredging was done in the early 1960s and early 1970s. All dredging was conducted in conjunction with construction projects; no maintenance dredging was performed. Sediment testing data are not available (Toskey, pers. comm., 1995). According to historical aerial photographs, surface water discharge from the existing UNOCAL property previously entered Puget Sound within the area now used by the marina. As such, it is possible that the dredged sediments may have been contaminated from boat maintenance and repair operations, as well as possible industrial discharges from adjacent sites (e.g., UNOCAL).

According to the environmental agency database[4] search, the Port of Edmonds has had USTs removed. It was observed during the site visit on June 2, 1995, that the old USTs had been replaced with new tanks. The tanks are located close to the water near the marina fuel dock. The agency database also indicates that one or more leaking USTs have been reported and that clean-up of soil and groundwater was initiated in 1995. This site is classified as a “reasonable predictable site” using FHWA terminology (FHWA, 1997). In addition, the database search indicated that the Port is a RCRA small-quantity generator of hazardous waste.

[4]See footnote 2.

According to staff at the Port of Edmonds, two Northwest Farm Food Co-op tanks were acquired by the Port and were replaced, along with two tanks previously owned by the Port, in June 1995. Three 12,000-gallon USTs were installed as replacements for the four older tanks. The exact location of these tanks was not identified during the database search (Howard, pers. comm., 1995). In addition to fueling activities at the marina, some boat maintenance activities appear to take place in the upland storage areas immediately west of the BNSFRR right-of-way. At least one boat was observed being prepared for painting during the site visit on June 2, 1995.

A subsurface investigation conducted to collect geotechnical information for design of a dry stacked storage area of the south marina of the Port of Edmonds detected petroleum in soils. The Port of Edmonds initiated a focused environmental investigation to confirm the presence of petroleum in the subsurface and to help determine the origin of the petroleum. Background information in the investigation report stated that the south marina site was filled in 1962 using dredged sediments from what is now the marina basin (Landau, 1998). During the investigation, nine stratoprobes were advanced to approximately 13 feet below ground surface in the vicinity of the geotechnical borings that originally indicated contamination. Soil samples were collected from each probe location and a total of four groundwater samples were collected. Concentrations of TPH in soils exceeded MTCA Method A clean-up levels at five probe locations (P-1, P-2, P-5, P-7, and P-8) with concentrations detected up to 17,000 mg/kg TPH as diesel and 20,000 mg/kg TPH as oil. Groundwater samples were reported to contain concentrations at or above MTCA Method A clean-up (1 milligram per liter) at two probe locations (P-2 and P-5). The report recommended additional investigation to assess the presence of other petroleum constituents and to further evaluate the source(s) of contamination.

UNOCAL was contacted regarding the potential that the Edmonds Bulk Terminal may have been the source of the contamination. UNOCAL responded by installing a single MW (MW-301) in the right-of-way area immediately north of Shellabarger Creek (Brearley, pers. com., 2000). The purpose of the well was to evaluate whether the backfill and storm drain might have presented a preferred path of flow for petroleum hydrocarbons from the UNOCAL property onto the Port's property. It is not clear from the report whether the well was installed in the backfill of the Shellabarger/Willow Creek culvert (48-inch diameter) or in the backfill of the Edmonds Way storm drain (72-inch diameter). Testing of soils and groundwater collected from MW-301 did not reveal the presence of contamination. Other commercial facilities exist adjacent to the rights-of way, including restaurants, retail, and professional offices. Some private residences were also observed. It is not known whether these structures have any heating oil USTs or any building materials with asbestos-containing materials or lead-based paint (LBP).

BNSFRR maintains a railroad maintenance area within the railroad right-of-way immediately south of the Dayton Street crossing. According to historical aerial photographs, it appears that this maintenance area has been in existence since at least the late 1940s. Landau & Associates (1992) report that the Great Northern Railroad established service through Edmonds in 1891 and, sometime thereafter, established a section house to support maintenance along a section of track. During the site visit on June 2, 1995, a maintenance building, a diesel aboveground storage

tank, a flammable gas tank (propane), and several 55-gallon drums of what appeared to be lubricating oils were observed. The drums were outside and directly on the ground. They were corroded, and one had visible oil leakage on the top. Stained soils were also observed in the area. Currently, there is a railroad spur to the west of the tracks where rail cars were stored. Historically, as evidenced from aerial photographs, there was also a rail spur on the east side of the tracks under what is now the Harbor Square business park. Potential contaminants in this area could include petroleum products, semivolatile organic compounds, volatile organic compounds, PCBs, and metals. Insufficient information is available to classify the site as "reasonably predictable" or "substantially contaminated" in accordance with FHWA terminology (FHWA, 1997).

The Harbor Square business park is located south of Dayton Street and immediately west of the railroad right-of-way. Historically, the property was used as a UNOCAL fuel depot. According to EMCON (1994), the property was purchased by UNOCAL in 1920. Sanborn maps for the years 1926 and 1932 indicate that the UNOCAL fuel depot was in operation. Landau & Associates (1992) reports that oil tanks and an oil storage warehouse were on the property at least until 1955. EMCON (1994) reports that UNOCAL leased the Dayton Street depot to General American Transportation Corporation for 10 years beginning in 1948. Confirmed land uses are not available for the period between the mid 1950s and the late 1970s, but according to Landau & Associates (1992), the Harbor Square area was used by the City of Edmonds for "dumping," parking, and by City maintenance crews for storage; and by the NORSOL Company to store crab pots. Insufficient information is available to classify the site in accordance with FHWA terminology, but Ecology has given the site the lowest ranking of concern of threat to human health or the environment. As mentioned above, a railroad spur was located on the property east of the railroad maintenance facility. Landau & Associates (1992) reports that previously unfilled portions of the marsh in the Harbor Square area were filled with sands and silts dredged from the Port of Edmonds Marina basin. The Harbor Square business park was constructed in the 1980s. Current occupants include a print shop, an oil spill response warehouse, and a marine engine sales and repair business. The agency database search indicated that one occupant, RNC & A Marine, Inc., is a RCRA large-quantity generator of hazardous waste (greater than 2.2 pounds of acutely hazardous waste or greater than 220 pounds of other hazardous waste per month).

The Harbor Square site is currently on Ecology's Confirmed and Suspected Contaminated Sites List, but is not ranked in terms of risk to human health and the environment. Studies performed by Landau & Associates (1992) found petroleum contamination at concentrations substantially above state regulatory clean-up standards. (Concentrations up to 110,000 mg/kg TPH by Method 418.1 were reported.) Groundwater samples collected during one event did not detect petroleum or volatile organic compound contamination above regulatory clean-up levels. A conceptual agreement regarding clean-up at the site has been reached by the Port of Edmonds and UNOCAL. Currently, the Port of Edmonds continues to monitor the site and plans appropriate remedial action in the future (Toskey, pers. comm., 1997).

The Amtrak passenger rail station is located north of Dayton Street. A MW was observed in the area during the June 2, 1995, site visit. Information on the site was obtained from a followup call to the telephone number labeled on the adjacent waste

drums. A leaking UST owned by BNSFRR was removed in 1990. The tank was a 2,000-gallon diesel tank located approximately 700 feet north of the Harbor Square area (EMCON, 1994). The UST site is classified as "reasonably predictable" using the FHWA classification system (FHWA, 1997). According to BNSFRR, the groundwater tested from the MW is below state clean-up levels. The agency database indicates that one or more leaking USTs were reported in 1990 and that clean-up of soil and groundwater was initiated.

The old Safeway shopping center, located north of Dayton Street and east of the railroad right-of-way, was built in the mid-1960s. It is possible that asbestos-containing materials and LBP may be present in the structures. The property manager was contacted, but was not willing to discuss conditions of the property (Dykes, pers. comm., 1995). It is not known whether any USTs for heating oil or other fuel are located on the property. A City emergency generator and sewer maintenance equipment were observed adjacent to the shopping center in a parking area to the west. The equipment was located on pavement and appeared to be in good condition.

The agency database search indicated that within 1/4 mile east of the Mid-Waterfront site, a leaking UST clean-up was performed at the City of Edmonds Public Works site (FHWA "reasonably predictable"). The same address (200 Dayton Street) is also listed in the database as a RCRA large-quantity generator (greater than 2.2 pounds of acute hazardous waste or 220 pounds of other hazardous waste per month).

3.3.8 Visual Quality

Existing Visual Environment

The project area is part of a small basin framed by Puget Sound and surrounding hills and bluffs. The Edmonds basin was considered as the prime landscape unit when assessing the project's visual impacts. The project area is bordered by downtown Edmonds, which rises on a gentle slope to the east, Point Edwards bluff on the south, Puget Sound on the west, and the residential area to the north of downtown Edmonds.

The project area has views to the west of important regional water and landforms (e.g., Puget Sound, Kitsap Peninsula, the Olympic Mountains). These views are primarily available from along the shoreline and from portions of the Edmonds basin's eastern slope. Waterward views from the project area are partially obstructed by existing vegetation and development.

Visual Resources

The project area contains landscape districts formed by existing landforms and landcover: Woodway; Point Edwards; Edmonds Marsh; south, central, and north waterfront; central commercial area; downtown Edmonds business park; residential; mixed use; and City Park. The boundaries of these districts are identified in Figure 3-24. Each district has distinct visual resources that are briefly described below. Figure 3-24 also identifies eight key view locations for the two build

alternatives. Photographs of existing conditions for these key views are presented in Chapter 4.

The following discussion of the landscape districts is given to describe each area and provide context. The assessment of visual quality is of the district and not of the views from the district.

Woodway

The Town of Woodway can be characterized as a contained, secluded, wooded residential community surrounded by more dense urban development. Much of the existing aesthetic and natural character of the town depends on its relatively low development densities. Residential development in northwest Woodway is located on minimum 1- and 2-acre single-family lots, and is heavily vegetated. Woodway residences located along the Point Edwards bluff have unobstructed, panoramic views to the west of Puget Sound, but are screened from existing development to the north by dense vegetation.

Point Edwards

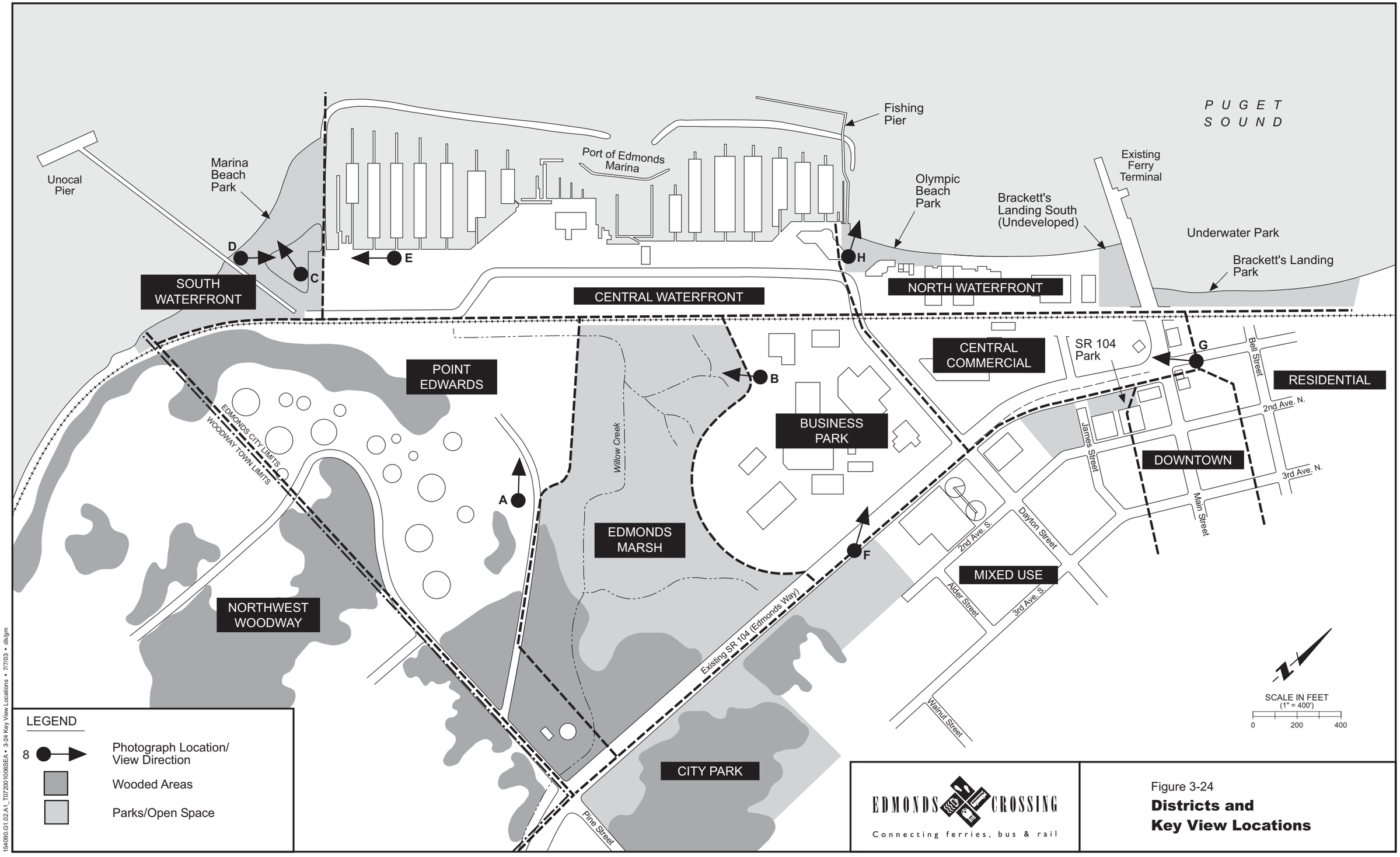
The Point Edwards district is divided into two distinct landscape sub-units: the uplands and the lower yard. Site topography ranges from approximately sea level within the lower yard to about 160 feet above MSL at the top of the uplands. The uplands are moderately forested with deciduous trees. This bluff contributes to the project area's physical sense of enclosure. The bluff is visible from throughout the project area and is identified as an existing "visual landmark" in the *Edmonds Downtown/Waterfront Plan* (City of Edmonds, 1994) (discussed in Section 3.3.1, Land Use). UNOCAL tanks were removed from the hillside in 2001 and an upscale multifamily condominium project is being developed on part of the hillside. The Point Edwards lower yard is a paved flat area located at the foot of the uplands. This area is currently occupied with scattered, low-rise buildings and ancillary facilities (e.g., pipe racks), although it has low visibility from off-site locations.

Edmonds Marsh

Edmonds Marsh is a large 23-acre wetland located in the central portion of the project area. The marsh is a unique visual resource because it is the largest parcel of natural, undeveloped open space within the project area. Interpretative overlooks and a trail system are located along the northern boundary of the marsh. The Point Edwards uplands rise quickly to the south and create a strong sense of enclosure around the southern edge of the marsh. Views toward the water from the marsh are screened by adjacent development (e.g., boat storage racks, low-rise buildings, etc.). Surrounding development detracts from the visual quality of this district.

South Waterfront

The south waterfront is dominated by Marina Beach Park and the UNOCAL pier. The park is flat open space vegetated with lawn and a few small trees on the far side away from the water. The park has a sandy beach. South of the pier, the park is



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EDMONDS CROSSING
Connecting ferries, bus & rail

Figure 3-24
Districts and Key View Locations

undeveloped beach and open space. There are excellent views of Puget Sound and the Olympic Mountains from the south waterfront.

The UNOCAL pier is long and low with vertical and diagonal support piles underneath. It obstructs views of the water, but is low enough that from most vantage points so that only the light standards on top of the pier interfere with mountain views. The pier contains fuel pipelines, small buildings, and is fenced to prevent access. The visual quality of this unit is degraded only by the industrial character and inaccessibility of the pier.

Central Waterfront

The central waterfront includes the Port of Edmonds Marina and the area landward behind it. It also is a flat area with the only vegetation consisting of limited street trees and parking lot plantings. Overwater features include the Olympic Beach Fishing Pier and Marina, which dominates the waterside. The metal boat sheds and rock breakwater obstruct water and mountain views. The boats and waterfront activity of the marina area attract visitors and is visually interesting, thus partially offsetting the negative aspect of obstructing views. The landside development includes surface parking, a few commercial buildings, storage warehouses, and a large dry stack boat storage area.

North Waterfront

The north waterfront is characterized by an intermingling of shoreline parks, low-rise commercial and residential buildings, vacant open space, surface parking, and the existing ferry terminal. The topography is flat. There are open and unobstructed vistas of the water and mountains beyond only along the shoreline because of the existing buildings and development.

Olympic Beach Park is largely an open lawn area and Brackett's Landing Park North is a landscaped parking lot, beach, and rock jetty. Brackett's Landing Park South, located immediately south of the ferry pier, is landscaped and provides waterfront bicycle trails and pedestrian walkways. Expansive views of the water and lands beyond are available from all three parks. The built environment within the waterfront district generally detracts from the visual environment because it intrudes into the water, is indistinct and lacks coherence, and obstructs views to the west. The existing ferry terminal and pier is one of the elements that intrudes into the water and obstructs views from along the waterfront. The terminal has an overall horizontal line and form with vertical pilings underneath the pier. Its surface supports the existing terminal building, ticket booth, and vertical tower structure at the end of the pier.

Central Commercial District

The central commercial district is a flat area characterized by low-rise commercial buildings, surface parking, railroad tracks, ferry holding area, and intermittent landscaping. The one-story buildings are architecturally inconsistent and unexceptional. There are some water views near the existing ferry terminal.

Business Park

The business park is a flat area characterized by two-story office buildings and parking for the Harbor Square complex. All the buildings have a similar architecture style that is clean, but undistinguished. The development is well landscaped.

Downtown Edmonds

Downtown Edmonds rises away from the water on a gentle slope. This district is distinguished by its low-rise (one- to four-story), small-scale buildings, contiguous storefronts adjacent to sidewalks, and narrow streets. The Main Street commercial area is enhanced by street trees and other pedestrian streetscape design elements. Main Street provides views of Puget Sound and the existing ferry terminal to the west. Ferry loading traffic and SR 104 visually separates the downtown from the waterfront.

Residential District

The residential area is north of the downtown commercial area and also slopes gradually away from the water. The area consists primarily of single-family residences, but also includes some two- to three-story multifamily developments. The area has a coherent development pattern in terms of small lot sizes and character of the housing. There are views of the water and mountains to the west from residences on Sunset Avenue and the multifamily buildings.

Mixed-Use District

This area is a low-rise, mixed commercial, multifamily, and single-family district. It also rises, more steeply to the east, away from the water. The mix of uses results in a diverse, but less coherent, architectural character. The south end of this district includes the Edmonds water treatment plant, which has a unique, but interesting, architecture. Views of the water and mountains are best from the east-west roads and taller structures.

City Park

City Park is located along SR 104 and along the south end of the mixed-use district. It is characterized by mature trees, open lawn, and play areas. The topography gently slopes away from SR 104. The park has few clear views into or from the active areas.

Viewers

This discussion of viewers takes into account their sensitivity to the visual environment, primarily a function of viewer activity and awareness, and exposure, which is defined by viewer location, quantity, and duration. The principal views of the project area are from the various landscape districts, SR 104, and from Puget Sound. Broken views of the area are also available from the surrounding higher ground.

Recreationists, including pedestrians and bicyclists, are one of the most sensitive viewer groups within the project area viewshed. Marina Beach Park, Olympic Beach Park, and Brackett's Landing Park North and South are popular waterfront destinations for recreationists (see Figure 3-24). These parks have panoramic views of Puget Sound, the Olympic Mountains, and other lands to the west. Users of the Olympic Beach Fishing Pier and waterfront walkways are also included in this viewer group. The third area frequented by recreational users is the Edmonds Marsh boardwalk and interpretative trail, which are used primarily for observing wildlife. In general, users of these parks and other waterfront areas would be highly sensitive to changes in the existing natural areas, waterfront landscape, and to views of the water and mountains. These viewers have a slow speed and are exposed to the views for the duration of their visits.

Local residents are also sensitive viewers. Woodway contains eight to ten residences located along Point Edwards bluff with views of the UNOCAL pier. Residents located on Railroad Avenue and North Sunset Avenue have views of the Edmonds shoreline. Residents located in the mixed-use district, depending on their location, have no view or clear-to-partial views of most of the project area. Most views from the mixed-use district are partially screened and the site is in the viewer's middleground. Those residences nearest to and with clear views of the project area would be sensitive to changes in the project area's visual environment. Residents have the longest duration of exposure of all the viewer groups.

Motorists, tourists, out-of-town visitors and ferry passengers traveling to and through Edmonds and the project area are another group of sensitive viewers. Most of this group enter the area via SR 104 or the ferry terminal, which are gateways to the City of Edmonds. Compared to the other viewer groups, motorists and ferry passengers represent the largest number of viewers in the project area. In 2000, the average number of daily passengers using the Edmonds ferry terminal was approximately 13,000. Passengers have panoramic views of Puget Sound and the project area. About 595 and 450 vehicles travel northbound and southbound, respectively, along SR 104 through the project area in the weekday p.m. peak hour. Views of the project area for northbound motorists begin approximately alongside Edmonds Marsh. Southbound motorists see the project area as they leave the ferry terminal and downtown. Travelers on SR 104 and the ferry would have a moderately high sensitivity to changes in the visual quality of the project area because their views are temporary and for a short duration. Ferry passengers in vehicles that queue along SR 104 have few opportunities for views to Puget Sound and the waterfront because the development in the central commercial and business park districts block their view. Only during peak travel periods are views from SR104, as it descends into the project area, available for any duration..

Roadside Classification

WSDOT has classified SR 104 as urban as it passes through the downtown Edmonds and central commercial areas and as semi-urban as it passes through the business park, mixed use, Edmonds Marsh, and City Park areas of the city. The roadside classifications are used to guide management of the state highway's roadsides during planning, design, construction, and maintenance.