



# North Central Puget Sound Geographic Response Plan (NCPS GRP)



**Before you print this document:**

All chapters and appendices in this plan are provided in “portrait” page orientation format with the exception of the response matrices in Chapter 4 and the economic resources at risk listing in Appendix 6A. Pages 4-12 through 4-22 (Adobe pp. 32-42) and 6A-1 through 6A-9 (Adobe pp. 70-78) of this document are in “landscape” page orientation format.

# Spill Response Contact Sheet

## Required Notifications for Oil Spills & Hazardous Substance Releases

<b>Federal Notification - National Response Center</b>	<b>(800) 424-8802*</b>
<b>State Notification - Washington Emergency Management Division</b>	<b>(800) 258-5990*</b>

### - Other Contact Numbers -

U.S. Coast Guard	
<b>Sector Puget Sound</b>	
- Emergency	<b>(206) 217-6001*</b>
- Watchstander	<b>(206) 217-6002*</b>
- Incident Management Division	(206) 217-6214
- Port & Waterways Safety	(206) 217-6042
<b>Pacific Strike Team</b>	(415) 883-3311

U.S. Environmental Protection Agency	
<b>Region 10 - Spill Response</b>	
	<b>(206) 553-1263*</b>
<b>Washington Ops Office</b>	(360) 753-9083
<b>RCRA/CERCLA Hotline</b>	<b>(800) 424-9346*</b>

National Oceanic Atmospheric Administration	
<b>Scientific Support Coordinator</b>	(206) 526-6829
<b>Weather</b>	(206) 526-6087

Canadian	
<b>Marine Emergency Ops/Vessel Traffic</b>	(604) 666-6011
<b>Environmental Protection</b>	(604) 664-9100

Department of Interior	
<b>Regional Environmental Officer</b>	(503) 326-2494

US Navy	
<b>Naval Station Everett</b>	(425) 304-3202
<b>NAS Whidbey Island</b>	(360) 257-5641

Other Federal Agencies	
<b>U.S. Fish &amp; Wildlife Service (pager)</b>	<b>(360) 534-9313*</b>
<b>U.S. Army Corps of Engineers - District</b>	(206) 764-3400

Pipeline Companies, & Railroads	
<b>BP Olympic Pipeline</b>	<b>(425) 235-7736</b>
<b>BNSF Railway</b>	<b>(800) 832-5452*</b>

Washington State	
<b>Dept of Ecology</b>	
- Headquarters (Lacey)	(360) 407-6000
- NW Regional Office (Bellevue)	(425) 649-7000
- Bellingham	(360) 715-5200
- SW Regional Office (Lacey)	(360) 407-6300
<b>Dept of Fish and Wildlife</b>	
- Emergency HPA Assistance	<b>(360) 902-2200</b>
- Marine Office (La Conner, WA)	(360) 466-4245
<b>Dept of Health (Shellfish)</b>	
- After normal business hours	(360) 236-3330
	(360) 789-8962
<b>Dept Archaeology &amp; Historic Preservation</b>	(360) 586-3065
<b>Dept of Transportation</b>	(360) 705-7000

Response Contractors (OSRO & PRC)	
<b>NRC Environmental Services / NRC</b>	<b>(800) 337-7455*</b>
<b>Marine Spill Response Corporation</b>	<b>(425) 252-1300*</b>
<b>Global Diving and Salvage</b>	<b>(206) 623-0621*</b>

Tribal Contacts	
<b>Lummi Nation</b>	(360) 384-2298
<b>Northwest Indian Fisheries Commission</b>	(360) 438-1180
<b>Stillaguamish Tribe of Indians</b>	(360) 652-7362
<b>Suquamish Tribe</b>	(360) 598-3311
<b>Swinomish Indian Tribal Community</b>	(360) 466-3163
<b>The Tulalip Tribes</b>	(360) 651-4000

State Patrol	
<b>State office</b>	(509) 891-6839
<b>District 7 (Marysville, WA)</b>	(360) 654-1204

Local Government	
<b>Island County</b>	(360) 678-5111
<b>Skagit County</b>	(360) 419-3303
<b>Snohomish County</b>	(425) 388-3411
<b>City of Everett</b>	(425) 257-7965
<b>City of Marysville</b>	(360) 363-8300
<b>City of Mukilteo</b>	(425) 775-4545
<b>City of Oak Harbor</b>	(360) 279-4500
<b>City of Stanwood</b>	(425) 388-5290

\* Contact Numbers staffed 24-hour/day

# Record of Changes

Date	Change Number	Summary of Changes	Name of Person Making Change
5/12/1994	N/A	Original Release	N/A
1/31/1995	NCPS-001	Replacement of document - includes new chapters and revised Chapter 4 based on field verification	N/A
3/1/2003	NCPS-002	Update of Chapter 4 using GIS based maps, and new priority tables based on trajectory modeling	Dale Davis (Ecology)
12/3/2012	NCPS-003	Update/Rewrite of Chapter 1, 2, 5, 6, & 7 and Response Contact Sheet. Area Maps in Chapter 3 moved to Chapter 4. Area & Sector Map boundaries in Chapter 4 redrawn to eliminate conflicts with other GRP areas. Response strategies in Chapter 4 were not updated.	Kris Grinnell Harry Chichester (Ecology)
7/12/2013	NCPS-004	Updated logistical resource information in Chapter 7 (fire departments & marinas/ports).	Harry Chichester (Ecology)

# North Central Puget Sound Geographic Response Plan

## Purpose and Use of this Plan

This Geographic Response Plan is meant to aid the response community during the initial phase of an oil spill incident; the period from when a spill occurs to the time a Unified Command is established. This plan constitutes the federal and state on-scene coordinators' orders during the initial phase of an oil spill response. The plan prioritizes response strategies based on where a spill might originate and the proximity to sensitive natural, cultural, and economic resources in the area. By using this document it is hoped that immediate and proper action can be taken to minimize oil's impact on these sensitive resources.

**Response Strategy Selection:** The bulk of this plan is contained in Chapter 4. It provides maps and information on GRP response strategies and the order they should be implemented based on potential spill origin points and their proximity to sensitive resources. After a spill occurs, the response strategies provided in Chapter 4 should be implemented as soon as possible. Unless circumstances unique to a particular spill dictate otherwise, the priority tables in Chapter 4 should be used. The movement of oil and the time it takes to mobilize response resources to deploy GRP strategies must always be considered when setting strategy implementation priorities.

**“Control and containment at the source will always be a higher priority than GRP strategy implementation”** If in the responder's best judgment spill control and containment at the source is not feasible, then the priorities laid out in Chapter 4 take precedence. It is important to note that spill response strategies rely on the spill trajectory. A booming strategy listed as a high priority would not necessarily be implemented if the spill trajectory and booming location did not warrant action in that area. However, the priority tables should be followed until spill trajectory information becomes available. Modifications to any of the priority tables published in Chapter 4 must be approved by the Unified Command. The strategies discussed in this plan have been designed for use with persistent oils and may not be suitable for other petroleum products or

hazardous substances. For hazardous substance spills, refer to the [Northwest Area Contingency Plan, Chapter 7000](#).

**Resources at Risk:** Chapter 6 of this plan provides information on sensitive resources at risk in the area that may be injured if impacted by oil. The implementation of certain strategies may be delayed if flight restrictions are associated with a particular resource until the required trustee consultation has been provided. Information in the chapter regarding flight restrictions should be followed before moving to implement any strategy requiring the use of aircraft.

**Information in Other Chapters of the Plan:** Chapter 1 provides an introduction and outlines the process used to develop the plan. Chapter 2 describes the physical features, hydrology, climate and winds, and tides and currents in the GRP area. An oil spill risk assessment is also provided in Chapter 2. Chapter 5 provides information on shoreline types and oil spill countermeasures. Finally, Chapter 7 provides information needed to support logistics during the initial phase of a response.

Chapter 1	Introduction
Chapter 2	Site Description
Chapter 3	Reserved
Chapter 4	Response Strategies & Priorities
Chapter 5	Shoreline Countermeasures
Chapter 6	Resources at Risk
Chapter 7	Logistical Information
Appendix A	Protection Techniques
Appendix B	GRP Contributors
Appendix C	GRP Comments, Corrections, Suggestions

**Standardized Response Language:** In order to avoid confusion in response terminology, this plan uses standard National Interagency Incident Management System, Incident Command System (NIIMS ICS) terminology.

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# North Central Puget Sound Geographic Response Plan

## Chapter 1 – Introduction

Geographic Response Plans (GRPs) are planning documents with operational tactics intended to help the response community avoid the initial confusion that sometimes accompanies the onset of an oil spill incident. This document serves as the federal and state on-scene-coordinators orders during the initial phase of a spill response for North Central Puget Sound. This plan has been approved by the United States Coast Guard and the Washington State Department of Ecology Spills Program. Changes to this document are expected as more testing is conducted through drills, site visits, and actual use in spill situations. We value your input and hope that you'll submit comments on how the plan might be improved. Please submit comments online at <http://www.rrt10nwac.com/Comment>. Comments may also be emailed to [GRPs@ecy.wa.gov](mailto:GRPs@ecy.wa.gov) or submitted via U.S. Mail using the information provided in Appendix "C" of this document.

GRPs have been developed for the marine and inland waters of Washington, Oregon, and Idaho. They are prepared through the efforts and cooperation of the Washington Department of Ecology, Washington Department of Fish and Wildlife, Oregon Department of Environmental Quality, Idaho State Emergency Response Commission, U.S. Coast Guard, U.S. Environmental Protection Agency, other state and federal agencies, tribal and local governments, response organizations, emergency responders, and local communities. GRPs are developed through meetings and workshops with federal, state, and local oil spill emergency response experts, response contractors, tribal representatives, industry, local communities, local governments, environmental organizations, ports, and pilots. Participants identify resources that may be at risk of injury from spills, develop oil spill response strategies to reduce injury to those resources, prioritize resources and provide information needed to support logistics during a spill response.

After compiling information on sensitive resources in the area, site visits are conducted to gather data and determine if spill response strategies near those resources should be added, modified, or deleted. In this, the anticipated effectiveness of existing strategies is reviewed,

modifications made as determined necessary, potentially unsafe or ineffective strategies removed, and new strategies added to the plan. Unfortunately, the dynamics of marine and inland water environments and the limitations of response technology make the development of strategies for all resource locations impracticable. A draft plan is produced after site visits are completed. Comments from stakeholders and the public on the draft plan are provided and incorporated into a final version of the GRP. A responsiveness summary is generated for all public comments received but not incorporated into the final version of the updated GRP.

The North Central Puget Sound GRP covers roughly 373 square miles of Puget Sound. The planning area extends from Elliot Point in Mukilteo in the south (near the Mukilteo-Clinton ferry route) north to Similk Bay and the Swinomish Channel (south of the SR20 Bridge). It includes waters west of Deception Pass from the southern portion of Burrows Bay (near Biz Point) to Joseph Whidbey State Park (south of Rocky Point). Marine waters east of Whidbey Island to the mainland coast of Washington State, including Deception Pass, Saratoga Passage, Skagit Bay, Possession Sound and Port Susan are covered by this plan. The North Central Puget Sound GRP is bordered by the San Juan Islands / North Puget Sound GRP to the North and Northwest; the Strait of Juan de Fuca GRP to the West; WRIA 7 GRP to the Southeast; and the Admiralty Inlet / Hood Canal GRP to the South and Southwest. The cities and towns of Everett, Marysville, Mukilteo, Oak Harbor, Stanwood, Coupeville, La Conner, and Langley are located within this geographic area, as well as portions of Island, Skagit, and Snohomish Counties.

An area site description that includes information on physical features, hydrology, climate and winds, tides and currents, and an area risk assessment are provided in Chapter 2 of this plan. Oil spill response strategy descriptions, response priorities, and strategy maps are in Chapter 4. Chapter 5 provides information on shoreline countermeasures. Information on natural, cultural, and economic resources at risk from oil spills and information on flight restriction zones, hazing, oiled wildlife, and the pre-cleaning of shorelines is in Chapter 6. Chapter 7 provides information on logistics and identifies resources in the area that might be available to support the initial phase of an oil spill response.

# North Central Puget Sound Geographic Response Plan

## Chapter 2 – Site Description

### 2.1 - Chapter Introduction

This chapter provides a description of the area's physical features, hydrology, climate and winds, and tides and currents. An oil spill risk assessment for North Central Puget Sound is also provided in this chapter.

### 2.2 - Physical Features

North Central Puget Sound is a diverse area. It includes many different types of shorelines, from large marshes on the mainland to wave cut platforms on Whidbey Island. Much of the land in the area is rural, rural residential, or conservancy. Seven state parks and dozens of boat ramps and marinas can be found throughout the region. Everett is an active port city located in the Southeastern part of the GRP. It has an extensive waterfront, populated by wood processing facilities, marinas, parks, and vessel repair facilities. Outside of Everett, local economies are based primarily on natural resource use and tourism. Aquaculture, commercial fishing, and recreational fishing are active and important industries throughout the region. The U.S. Navy maintains two bases in the area; Naval Station Everett (in Everett) on Port Gardner Bay and Naval Air Station Whidbey Island at the north end of Whidbey Island near Oak Harbor.

The North Central Puget Sound GRP area contains marine and estuarine waters that are biologically rich and sensitive. A wide diversity of shoreline and marine habitats (estuaries, rocks, reefs, and islands) and abundant food resources contribute to making the area home to a wide range of fish and wildlife. The region has nesting colonies for caspian terns and glaucous-winged gulls; a number of marine mammal haulouts and breeding sites; and rearing and feeding habitat for a large variety of marine and anadromous fish. Shallow intertidal bays at the mouths of the Stillaguamish and Snohomish Rivers and in Similk Bay are home to vast numbers

of bird species. The marsh and tidal flats of the Skagit River Delta are particularly rich and diverse. This GRP area is home to many species of marine mammals, including seasonal resident killer whales and gray whales. Refer to Chapter 6 for more detailed resource information.

## 2.3 - Hydrology

The North Central Puget Sound GRP area consists of marine waters east of Whidbey Island to the mainland, including Deception Pass, the waters surrounding Camano Island, and the shallow waters between Fidalgo and Whidbey Islands. The waters of Rosario Strait, west of Whidbey Island, from the southern portion of Burrows Bay (near Biz Point) south beyond Rocky Point (to Joseph Whidbey State Park) are also included. Penn Cove, Skagit Bay, Similk Bay, Swinomish Channel, Saratoga Pass, Holmes Harbor, Port Susan, and Possession Sound all reside within the geographic boundaries of this plan.

The largest sources of fresh surface water from the mainland include the Snohomish River, North and South Forks of the Skagit River, and the Stillaguamish River. The Snohomish River accounts for about 30 percent of the freshwater discharge to Whidbey Basin. The Skagit and Stillaguamish Rivers both supply freshwater recharge to Port Susan. Main sources of groundwater recharge in the area reside in Whidbey and Camano Islands sole source aquifers. Surface water runoff during spring and fall winter rain events also contribute to freshwater recharge.

The Skagit River is the largest freshwater supply to the North Central Puget Sound. This two layer system of buoyant freshwater over a saltwater lens in the basin interiors creates a relatively balanced mixing zone inside the North Central Puget Sound GRP. Water salinity in this area stays relatively constant with the exception of declining salinity values in Skagit Bay at the Skagit River confluence during spring snow melt. This condition of lower salinity levels is generally short in duration, roughly 2 months.

Portions of Water Resource Inventory Areas Lower Skagit (WRIA 3), Stillaguamish (WRIA 5), Island (WRIA 6), and Snohomish (WRIA 7) Watersheds fall within the geographic boundaries of this plan.

**2.3.1 - Lower Skagit (WRIA 3):** The Lower Skagit Watershed is situated in the Northern part of Puget Sound east of the San Juan Islands and comprises the western part of Skagit County and small portions of Snohomish and Whatcom Counties. Fidalgo, Guemes, Cypress and other smaller offshore islands are also included in the WRIA 3

watershed. In addition to the Skagit River and its delta, the watershed includes Lake Samish, the Samish River, and various smaller streams that are tributary to the Skagit River such as Fisher, Carpenter, Jones, and Day Creeks. Yearly precipitation ranges from as little as 15-20 inches in the coastal area to over 70 inches in the Cultus Mountains. Most of this precipitation arrives during the winter months when water demands are the lowest, and only a fraction becomes available for human and economic uses. During the summer irrigation season, the snowpack is gone and there is little rain. Low stream flows are dependent on groundwater inflow.

**2.3.2 - Stillaguamish (WRIA 5):** The Stillaguamish Watershed is situated in the central part of Puget Sound and comprises the northwestern part of Snohomish County and the South central part of Skagit County. On its west side it is bounded by Puget Sound and its east side includes portions of the Cascade Mountain range. This watershed is sparsely populated. The watershed includes the Stillaguamish River and its two forks which originate in the Cascade Mountains. The watershed also includes various smaller streams such as Jim, Pilchuck, and Canyon creeks. Yearly precipitation ranges from 30-35 inches in the coastal area to over 150 inches in the Cascades Mountains. Most of this precipitation arrives during the winter months when water demands are the lowest, and only a fraction becomes available for human and economic uses. During the summer, the snowpack is gone and there is little rain so low stream flows are dependent on groundwater inflow.

**2.3.3 - Island (WRIA 6):** The Island Watershed consists of Whidbey and Camano Islands along with several smaller islands. The northern part of Whidbey Island has the largest population density of the area with the city of Oak Harbor and the Naval Air Station. The rest of the islands mainly consist of low density rural development. There are no major rivers in the watershed, and much of the water available for economic use comes from groundwater, which is recharged exclusively from precipitation. The northern and central part of Whidbey Island is situated in the rain shadow of the Olympic Mountains and therefore the watershed has a high variability of rainfall, from 18 inches at Coupeville to 42 inches at Goss Lake. Most of this precipitation arrives during the winter months when water demands are the lowest, and only a fraction becomes available for human and economic uses. The Island watershed does not benefit from snow pack so during the summer when there is little rain naturally, low stream flows are dependent on groundwater inflow.

**2.3.4 - Snohomish (WRIA 7):** The Snohomish Watershed comprises the northeastern portion of King County and south central Snohomish County, including the city of

Everett and its adjacent suburban areas. On its west side it is bounded by Puget Sound and its east side includes portions of the Cascade Mountain range. This watershed has significant urban development in its western portion and large areas of agricultural development along the Snohomish River and some of its tributaries. The watershed includes the Snohomish River and its major tributaries; the Snoqualmie and Skykomish Rivers which originate in the Cascade Mountains. The watershed includes various smaller streams such as Pilchuck, Sultan, Raging, and Tolt Rivers. The South Fork of the Tolt River provides about 30% of the drinking water for the greater Seattle area. Average precipitation ranges from 30-35 inches per year in the coastal areas to over 180 inches in some parts of the mountains. Most of this precipitation arrives during the winter months when water demands are the lowest, and only a fraction becomes available for human and economic uses. During the summer, the snowpack is gone; there is little rain so low stream flows are dependent on groundwater inflow.

## **2.4 - Climate & Winds**

The seasonal climate of the North Central Puget Sound area includes mild summer temperatures with highs in the mid 70's (F) and winter lows in the mid 30's (F). Annual precipitation is highest in December; average annual rainfall in Everett is 35.49" with December's average being 4.99". Snowfall is variable, with most accumulation occurring in January; average annual snowfalls range from 2.5" to 3.4". Prevailing winds are generally south in the fall and winter, and north in the summer. Wind speeds range from 5.8 mph to 7.9 mph in December through April, and 3.6 mph to 6.7 mph in May through November. Whidbey Island affects the prevailing winds near Oak Harbor, which are generally southeast in winter and fall and west in the summer; average annual wind speeds for Oak Harbor range from 8.0 mph to 8.6 mph. High winds are typically greatest in November through January. Wind gusts can occasionally reach 50 mph or greater. The visibility in the North Central Puget Sound is generally moderate to good, with occasional conditions of poor visibility in the morning and at night. Dense fog occurs with less regularity than in coastal regions, due to the sheltered nature of the area.

## **2.5 - Tides and Currents**

Currents in North Central Puget Sound are generally weak and variable due to the protective nature of the landmass that surrounds the basin interior. The north end of Whidbey Island at Deception Pass is the exception; currents can be very strong in this area.

- Deception Pass  
Tidal Range: 12.2ft to -3.9ft (average high and low tidal ranges)  
Current: -8.0 knots on ebb & 8.0 knots during flood.
- Skagit Bay and Saratoga Passage  
Tidal Range: 13.6ft to -3.5ft  
Current: -2.2 knots on ebb and 2.9 knots during flood
- Possession Sound and Port Susan  
Tidal Range: 13.6ft to -3.5ft (average high and low tidal ranges)  
Current. -2.2 knots on ebb and 2.9 knots during a flood

Currents in Saratoga Passage generally flow in a southerly direction and tend to be weak and variable, sometimes slightly moderate in more narrow areas south of Penn Cove between Camano and Whidbey Islands. Currents in Port Susan usually flow in a southerly direction towards Possession Sound. They tend to be weak and variable, but can be influenced by the discharge flow of the Stillaguamish and Snohomish Rivers. Increased surface currents in Hat Slough (South of Stanwood, WA) may be present, but are typically dependent on the flow of the Stillaguamish River.

Tides in this system are diurnal. Tides and currents vary with seasonal runoff and lunar cycles in localized areas. Spill responders should consult tide and current tables for particular locations of interest.

## 2.6 - Risk Assessment

North Central Puget Sound is plentiful in natural, cultural, and economic resources, all at risk of injury from oil spills. Potential risks to these resources include large commercial vessels, naval vessels, ferries, tank barges, pipelines, road and rail systems, and other concerns. This section briefly discusses these risks in the North Central Puget Sound GRP area.

Large Commercial Vessel Traffic: As many as one-hundred large commercial vessels arrive to the Port of Everett each year. These vessels typically carry large amounts of heavy and blended fuel oils and other petroleum products, raising the potential for sensitive resources to be impacted if an oil spill incident were to occur.

Washington State Ferries: Two Issaquah class ferries cross between Clinton and Mukilteo over thirty-five times a day; more than seventy transits combined. Ferries are

refueled at the dock via tank truck. Potential risks include spills during bunkering, hydraulic failures, unintentional waste oil discharges, and vessel operation incidents. Issaquah class ferries use diesel fuel for propulsion and can carry as many as 124 vehicles.

Barge Transits: Naval Air Station Oak Harbor receives fuel shipments by barge. Vessels at Naval Station Everett occasionally receive fuel oil from barges while moored. Oil spill risks from tank barges include accidents or emergencies occurring during transit and incidents occurring during the transfer of fuel from the barge to a naval vessel or facility.

Pipelines: Large quantities of fuel from refineries in Northern Washington are transported through pipelines to population centers farther south. Pipelines in the region are typically located inshore, away from the marine environment, but pose a risk to North Central Puget Sound at points where they cross under and over rivers, creeks, and ditches that drain into Puget Sound.

Road and Rail: Road, rail, and other land-based transportation systems present an oil spill risk to North Central Puget Sound where they run adjacent to the shoreline or cross over rivers, creeks, and ditches that drain into Puget Sound. Train locomotives typically hold several thousand gallons of diesel fuel plus large quantities of lube and motor oils. Loaded train tank cars can contain tens of thousands of gallons of crude oil or other petroleum products. Commercial truck traffic on highways and roadways can contain hundreds to thousands of gallons of fuel and oil, especially fully loaded tank trucks.

Other Potential Risks: Incidents involving marinas or vessels moored at marinas, including fishing, excursion, and recreational boat refueling incidents; boat or vessel groundings, allisions, or collisions; and land-based spills impacting sensitive resources on or near shore.

## 2.7 – References

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# **North Central Puget Sound Geographic Response Plan**

## **Chapter 3 – (Reserved)**

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# North Central Puget Sound Geographic Response Plan

## Chapter 4 – Response Strategies & Priorities

### 4.1. Chapter Introduction

This chapter details the specific response strategies and resources to protect as outlined by the participants of the GRP workshop for the North Central Puget Sound area. It describes the strategies determined for each area and the prioritization of those strategies.

### Maps & Matrices

The maps in this chapter provide information on the specific location of booming strategies. They are designed to help the responder visualize response strategies. Details of each booming strategy are listed in corresponding matrix tables. Each matrix indicates the exact location, intent and implementation of the strategy indicated on the map. The “Status” column describes whether the strategy has been visited or tested in the field, and the date of the visit/test. Shoreline photographs for the area are available on the internet through Washington’s Coastal Atlas at <https://fortress.wa.gov/ecy/coastalatlus/tools/ShorePhotos.aspx>.

### Major Protection Techniques

All response strategies fall into one of three major techniques that may be utilized either individually or in combination.

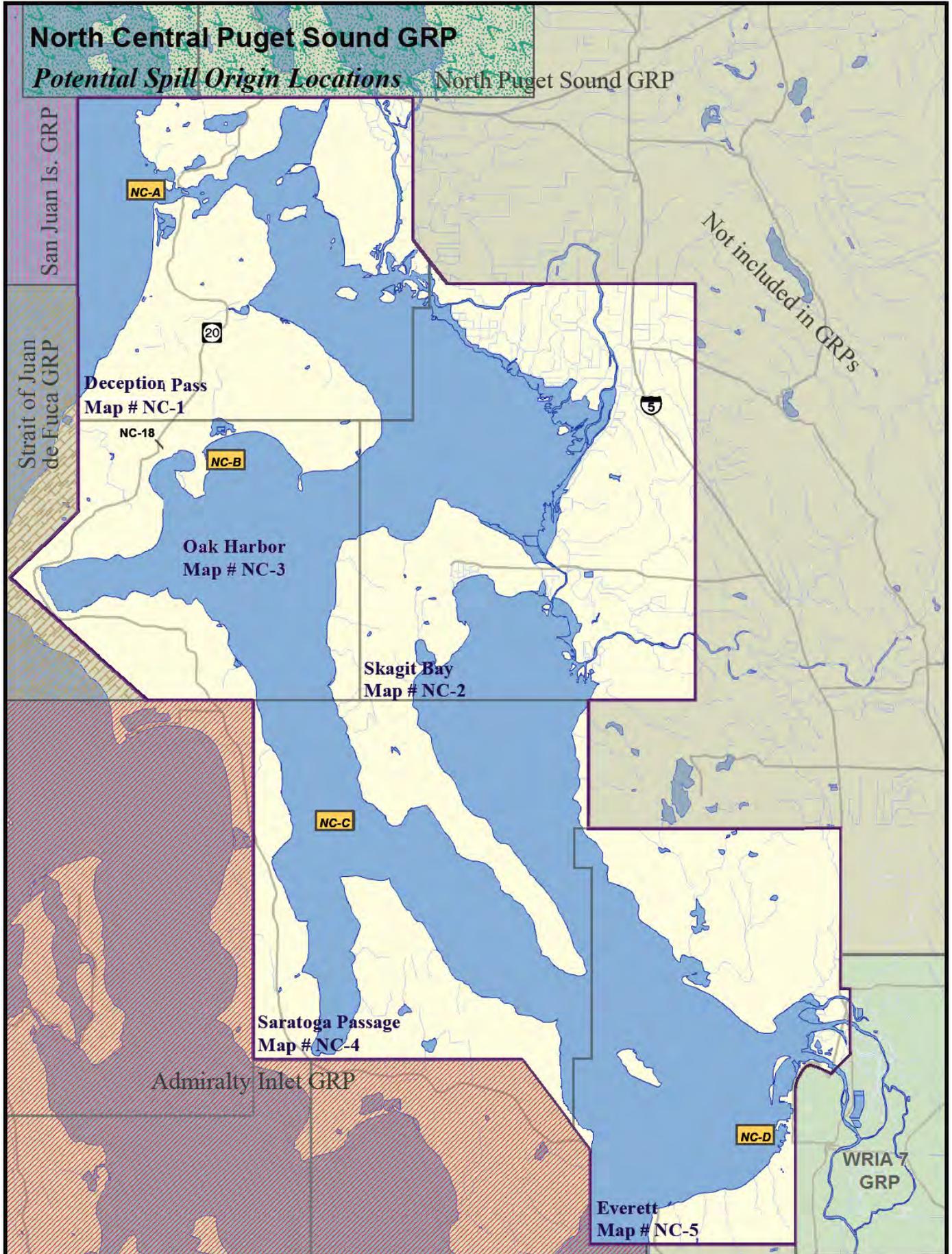
**Dispersants:** Washington State Policy currently does not allow use of dispersants in this area. Certain chemicals break up slicks on the water. Dispersants can decrease the severity of a spill by speeding the dissipation of certain oil types. Their use will require approval of the Unified Command. Dispersants will only be used in offshore situations under certain conditions, until further determinations are made by the Area Committee and published in the Area Contingency Plan.

**In Situ Burning:** Approval to burn in this area is unlikely due to the proximity of population to a potential burn site. Burning requires the authorization of the Unified Command, who determine conformance of a request to burn with the guidelines set forth in the Area Plan. This option is preferable to allowing a slick to reach the shore provided that population areas are not exposed to excessive smoke. Under the right atmospheric conditions, a burn can be safely conducted in relative close proximity to human population. This method works on many types of oil, and requires special equipment including a fire boom and igniters.

**Mechanical Recovery and Protection Strategies:** If a spill is too close to shore to use In Situ burning or dispersants, then skimming and collection and diversion booming can be used to help recover spilled oil from the water. Deflection and exclusion booming can be used to help keep oil away from sensitive resources at risk of injury from spilled oil. Skimming strategies are not provided in this plan, but should be considered during any response. Skimming is often the primary means of recovering oil and protecting sensitive resources when booming in an area is unsafe or not feasible. Additional information on Protection Techniques can be found in Appendix A of this plan.

**Priorities:** The strategy priority tables provided in Section 4.2 of this chapter were developed using specific locations where spills are likely to occur. Trajectory modeling was used for each of these "Potential Spill Origins" to identify sensitive resources that would likely be impacted within the initial hours of the spill. A booming strategy priority table was developed for each of the "Potential Spill Origins" based on the sensitivity of resources nearby, feasibility, and other factors. Booming strategies should be deployed following the priority table for the "Potential Spill Origin" closest to the actual spill origin. The area map in Section 4.2 of this chapter shows the locations of all Potential Oil Spill Origins in North Central Puget Sound. Response strategies listed in the priority tables are explained in the response strategy matrices (Section 4.4).

**Control and containment at the source is the number one priority of any response.** If control and containment of the spill at the source is delayed or not feasible, then the strategies presented in this chapter should be deployed as quickly as possible, following the appropriate priority table in Section 4.2 for the potential oil spill origin point nearest the source of the spill.



### 4.2.2 – Response Strategy Priority Tables

Table 4-1

<b>NC-A (Deception Pass)</b>			
<b>Implementation Priority</b>	<b>Strategy Number</b>	<b>Sector Map Page Number</b>	<b>Matrices Page Number</b>
1	NC-1	4-7	4-12
2	NC-2	4-7	4-12
3	NC-3	4-7	4-13
4	NC-4	4-7	4-13
5	NC-11	4-7	4-16
6	NC-5	4-7	4-13
7	NC-10	4-7	4-16
8	NC-12	4-7	4-16

Table 4-2

<b>NC-B (Naval Air Station Whidbey Island, Crescent Harbor)</b>			
<b>Implementation Priority</b>	<b>Strategy Number</b>	<b>Sector Map Page Number</b>	<b>Matrices Page Number</b>
1	NC-18	4-9	4-19
2	NC-17	4-9	4-18

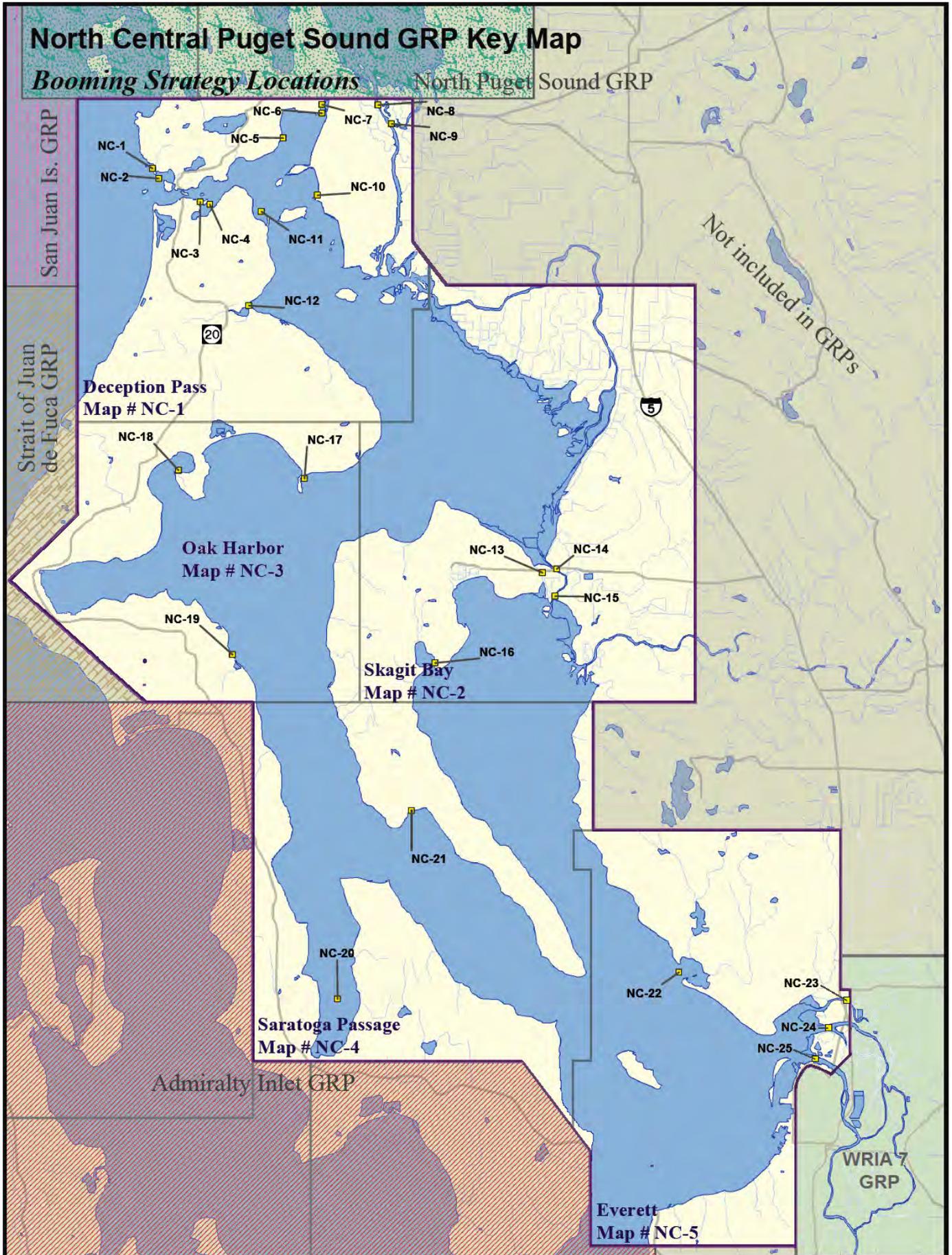
**4.2.2 – Response Strategy Priority Tables** (continued)

**Table 4-3**

<b>NC-C (Saratoga Passage, mouth of Holmes Harbor)</b>			
<b>Implementation Priority</b>	<b>Strategy Number</b>	<b>Sector Map Page Number</b>	<b>Matrices Page Number</b>
1	NC-21	4-10	4-20
2	NC-20	4-10	4-20
3	NC-19	4-9	4-19

**Table 4-4**

<b>NC-D (Everett Harbor, Navy Homeport)</b>			
<b>Implementation Priority</b>	<b>Strategy Number</b>	<b>Sector Map Page Number</b>	<b>Matrices Page Number</b>
1	NC-25	4-11	4-22
2	NC-24	4-11	4-21
3	NC-23	4-11	4-21
4	NC-22	4-11	4-21
5	NC-21	4-10	4-20
6	NC-19	4-9	4-19



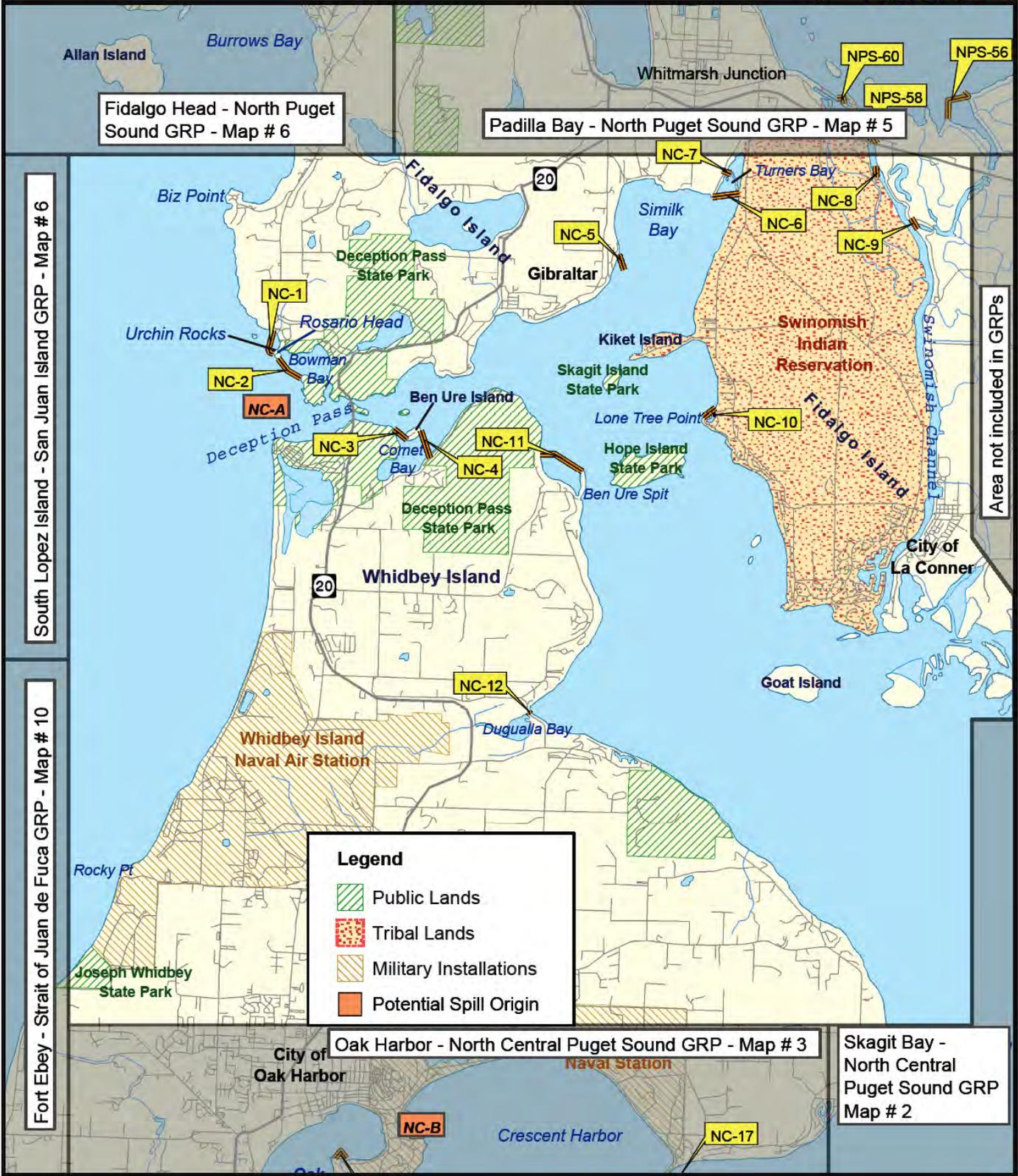
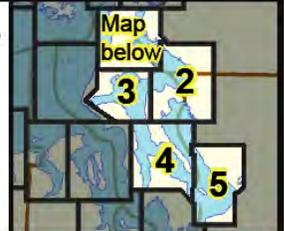
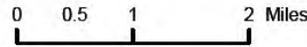
**DECEPTION PASS**

*Proposed Booming Strategies*

**North Central Puget Sound GRP**

**MAP # 1**

March, 2003



**Legend**

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

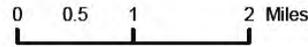
# SKAGIT BAY

## North Central Puget Sound GRP

### Proposed Booming Strategies

### MAP # 2

March, 2003



Deception Pass - North Central Puget Sound GRP - Map # 1

Area not included in GRPs

Area not included in GRPs

Oak Harbor - North Central Puget Sound GRP - Map # 3

Saratoga Passage - North Central Puget Sound GRP - Map # 4

Area not included in GRPs

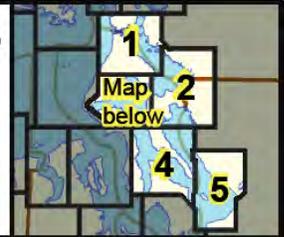
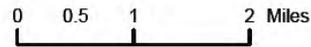
# OAK HARBOR

## Proposed Booming Strategies

March, 2003

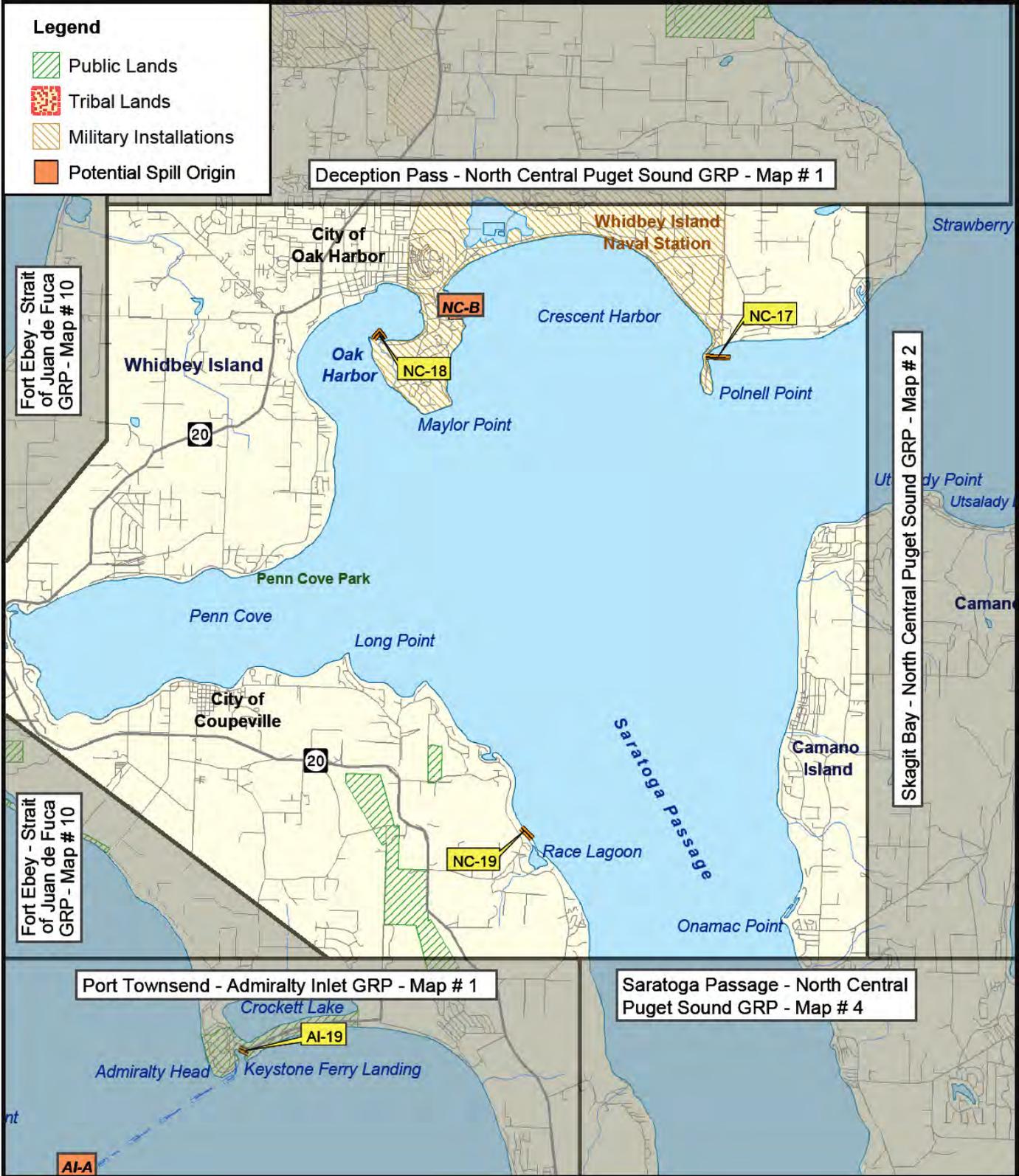
### North Central Puget Sound GRP

#### MAP # 3



#### Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin



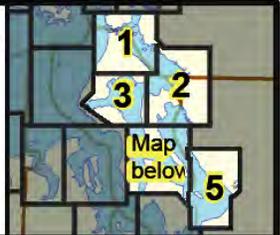
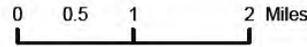
**SARATOGA PASSAGE**

*Proposed Booming Strategies*

March, 2003

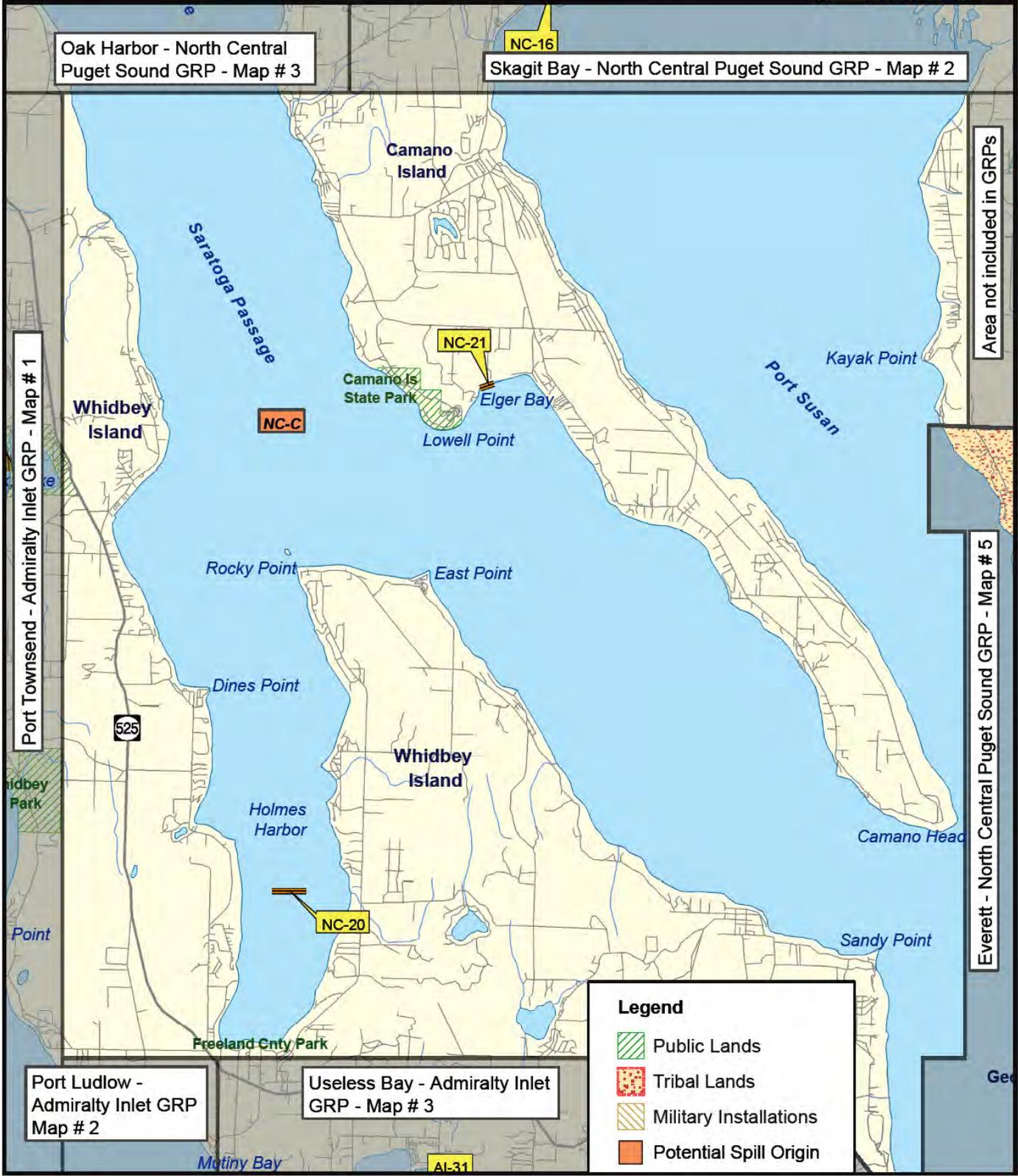
**North Central Puget Sound GRP**

**MAP # 4**



Oak Harbor - North Central Puget Sound GRP - Map # 3

Skagit Bay - North Central Puget Sound GRP - Map # 2



Port Townsend - Admiralty Inlet GRP - Map # 1

Area not included in GRPs

Everett - North Central Puget Sound GRP - Map # 5

Port Ludlow - Admiralty Inlet GRP Map # 2

Useless Bay - Admiralty Inlet GRP - Map # 3

**Legend**

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

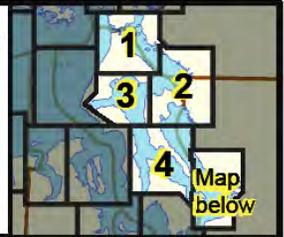
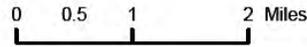
EVERETT

Proposed Booming Strategies

March, 2003

North Central Puget Sound GRP

MAP # 5



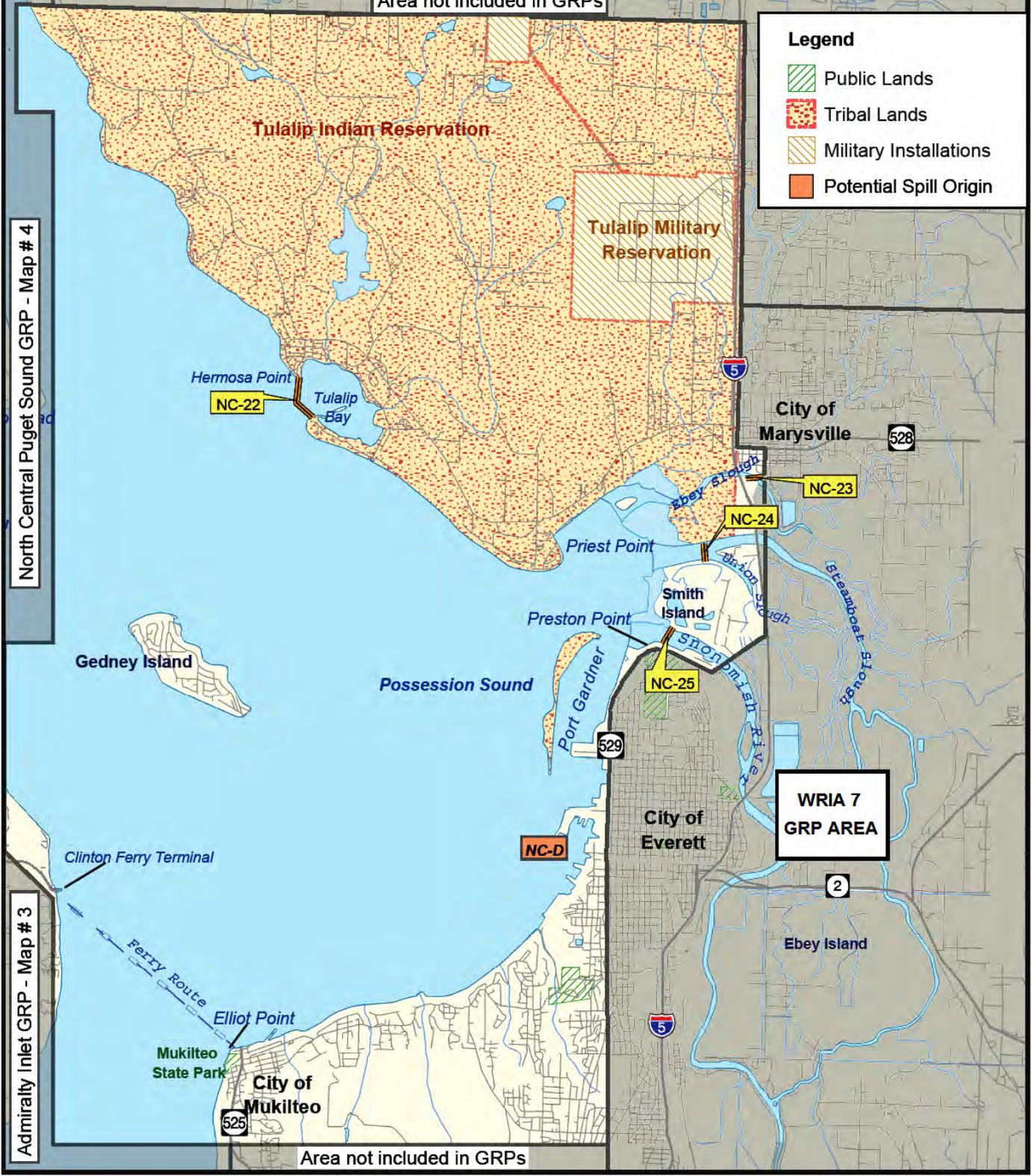
Area not included in GRPs

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

North Central Puget Sound GRP - Map # 4

Admiralty Inlet GRP - Map # 3



Area not included in GRPs

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-1	Urchin Rocks (NW of Bowman Bay and Deception Pass)	<a href="http://N48.41716667">N48.41716667</a> <a href="http://W122.6655833">W122.6655833</a>	Exclusion  Keep oil off Urchin Rocks and out of the tide pools on the north shore of Rosario Head.	1900'	Stage from the Bowman Bay boat ramp parking lot, the Deception Pass State Park, or Anacortes.	By boat from the ramp in Bowman Bay, or from Anacortes. Vehicle access from Highway 20 to Rosario Road.	Deploy boom from Rosario Beach, out to and around Urchin Rocks, and back to the west side of Rosario Head to protect the tide pools on the north shore of Rosario Head. This area is exposed to southerly and westerly weather, fall back and protect as much of Urchin Rocks and the tide pools as possible if the strategy cannot be deployed as described. Rosario Beach is a low priority for this strategy.	Created 9/01	Protect the tide pools on Rosario Head, rocky shoreline, and kelp beds; seabird concentrations, and sensitive nesting species.
NC-2	Bowman Bay and Sharpe Cove (NW of Deception Pass)	<a href="http://N48.41366667">N48.41366667</a> <a href="http://W122.6594167">W122.6594167</a>	Exclusion  Keep oil out of the bay and cove.	1900'	Stage from the Bowman Bay boat ramp parking lot, the Deception Pass State Park, or Anacortes.	By boat from the ramp in Bowman Bay, or from Anacortes. Vehicle access from Highway 20 to Rosario Road.	Deploy boom in a chevron configuration across the entrance to the bay and the cove from the south side of Rosario Head to the northwest corner of Reservation Head. Run the boom between Gull Rocks and Coffin Rocks. This area is exposed to southerly and westerly weather, fall back and protect as much of the bay and cove as possible if the strategy cannot be deployed as described.	Field Test 5/00	Protect rocky shoreline and kelp beds, seabird concentrations, and sensitive nesting species.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-3	Cornet Bay - West entrance (West shore to Ben Ure Island, north end of Whidbey Island)	<a href="#">N48.4035</a> <a href="#">W122.6313333</a>	Exclusion  Keep oil out of the bay.	1000'	Stage from the Cornet Bay boat ramp parking lot, the Deception Pass State Park, or Anacortes.	By boat from the ramp in Cornet Bay, or from Anacortes. Vehicle access from Highway 20 to Cornet Bay Road.	Deploy boom across the west entrance to the bay from the west shore to the dock on the west end of Ben Ure Island.		State Park recreational resources.
NC-4	Cornet Bay - East entrance (Ben Ure Island to the east shore, north end of Whidbey Island)	<a href="#">N48.40233333</a> <a href="#">W122.625</a>	Exclusion/ Collection  Keep oil out of the bay.	1400'	Stage from the Cornet Bay boat ramp parking lot, the Deception Pass State Park, or Anacortes.	By boat from the ramp in Cornet Bay, or from Anacortes. Vehicle access from Highway 20 to Cornet Bay Road.	Deploy boom across the east entrance to the bay from the east end of Ben Ure Island to the pier at the Cornet Bay boat ramp for collection with a vac truck at the boat ramp.		State Park recreational resources.
NC-5	Gibraltar (West side of Similk Bay)	<a href="#">N48.42975</a> <a href="#">W122.57975</a>	Collection  Keep oil out of Similk Bay.	1000'	Stage from the Deception Pass State Park, Cornet Bay, or Anacortes.	By boat from the ramp in Cornet Bay, or from Anacortes. Vehicle access from Highway 20 to Gibraltar Road.	Deploy boom at an angle to the south from the beach at Gibraltar to collect oil moving along the shoreline from Deception Pass.	Modified 9/01	Dungeness crab, large waterfowl concentration, eagle nests, high productivity area.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-6	Turner Bay - Outer Strategy (NE corner of Similk Bay)	<a href="#">N48.44525</a> <a href="#">W122.5504167</a>	Exclusion Keep oil out of the bay.	1700'	Stage from the road on the west shore, the Swinomish Channel boat ramp parking lot (under Highway 20), or Anacortes.	By boat from the ramp in Cornet Bay, or from Anacortes. Vehicle access from Highway 20 to Reservation Road.	Deploy boom across the outer entrance to the bay from the point on the west shore to the base of the sand spit on the east shore. May be difficult to deploy at low tide, much of the area becomes a mud flat. Deploy NC-7 first at low tide.		
NC-7	Turner Bay - Inner Strategy (NE corner of Similk Bay)	<a href="#">N48.44916667</a> <a href="#">W122.55033333</a>	Exclusion Keep oil out of the bay.	300'	Stage from the road on the west shore, the Swinomish Channel boat ramp parking lot (under Highway 20), or Anacortes.	By boat from the ramp in Cornet Bay, or from Anacortes. Vehicle access from Highway 20 to Reservation Road.	Deploy boom across the inner entrance to the bay from the tip of the sand spit on the east shore to the beach on the west shore. Deploy before NC-6 at low tide.	Created 9/01	

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-8	Pocket on west side of Swinomish Channel (previously NPS-59)	<a href="#">N48.44891667</a> <a href="#">W122.5135</a>	Deflection/ Collection  Keep oil from moving into the Swinomish Channel.	500'	Stage at the Swinomish Channel boat ramp parking lot (under Hiwy 20).	By boat from the Swinomish Channel ramp. Vehicle access from I-5 to Highway 20, go west and exit at the Swinomish Casino, turn back east to a dike road on the west side of the channel. Vac truck access from the dike road.	Deploy 500' of boom at the small pocket on the west shore of the channel south of the Highway 20 bridge to deflect the oil into a natural collection area.		Wetland habitat; waterfowl and shorebirds.
NC-9	Swinomish Channel (East side, connection to Higgins Slough and the south end of Telegraph Slough)	<a href="#">N48.44125</a> <a href="#">W122.5039167</a>	Exclusion  Keep oil out of the entrance to the sloughs.	400'	Stage from the dike road on the east shore of the Swinomish Channel, the Swinomish Channel boat ramp parking lot (under Highway 20), or Anacortes.	By boat from the Swinomish Channel boat ramp, or from Anacortes. Vehicle access from Highway 20 to the east dike road.	Deploy boom across the entrance to the sloughs to protect the tidal marsh at the entrance. Connection to the sloughs is through culverts or tide gates inside the marsh area.	Modified 9/01	Waterfowl concentrations.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-10	Lone Tree Point (Tosi Pt.) Lagoon (NE of Hope Island and south of Kiket Island)	<a href="#">N48.40808333</a> <a href="#">W122.55275</a>	Exclusion  Keep oil out of the lagoon.	100'	Stage from the beach near the lagoon, or from Anacortes.	By boat from the ramp in Cornet Bay, or from Anacortes. Vehicle access from Highway 20 to Reservation Road to Sneeoosh Road to private road.	Deploy boom across the entrance to the lagoon. Extreme high tides may flood the lagoon from the south side.	Created 9/01	Waterfowl concentrations.
NC-11	Ben Ure Spit (NE corner of Whidbey Island)	<a href="#">N48.40041667</a> <a href="#">W122.5895833</a>	Exclusion  Keep oil out of the embayment behind the spit.	3000'	Stage from the Cornet Bay boat ramp parking lot, the Deception Pass State Park, or Anacortes.	By boat from the ramp in Cornet Bay, or from Anacortes. Vehicle access from Highway 20 to Troxell Road.	Deploy boom in a chevron configuration, with 2000' of boom to the northwest from the tip of the spit for one leg, and then 1000' directly west to the shoreline for the other leg.	Field Test 5/00	Eelgrass beds, herring, sand lance, and surf smelt spawning, hardshell clams, shorebird concentrations
NC-12	Dugualla Bay (NE side of Whidbey Island)	<a href="#">N48.35691667</a> <a href="#">W122.5969167</a>	Exclusion  Keep oil out of the inner bay.	100'	Stage from the road at the site.	Vehicle access from Highway 20 to Dugualla Bay Road to site.	Deploy boom in front of the culvert/tide gate. Closing the tide gate or blocking the culvert with boards, sandbags, etc. would be more effective.		Fisheries and waterfowl concentrations.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-13	Davis Slough (at Highway 532 bridge)	<a href="#">N48.23941667</a> <a href="#">W122.3940833</a>	Exclusion/ Collection  Keep oil from moving through the slough.	400'	Stage from parking areas on either side of the bridge, the parking lot at the Camano Island State Park boat ramp, or Everett.	Vehicle access from I5 to Highway 532 to parking areas on each side of the bridge over the slough.	Deploy boom across the slough south of the bridge at Highway 532. Angle the boom to collect oil from the east side, depending on the direction the oil is coming from.		Tidal marshes, waterfowl concentrations, and sensitive nesting species.
NC-14	West Pass (at Highway 532 bridge)	<a href="#">N48.24025</a> <a href="#">W122.3835833</a>	Exclusion/ Collection  Keep oil from moving through the pass.	400'	Stage from the road and shore on either side under the bridge, the parking lot at the Camano Island State Park boat ramp, or Everett.	By boat from the Camano Island State Park boat ramp, or Everett. Vehicle access from I5 to Highway 532 to Stanwood, roads to the shore on each side of the bridge.	Deploy boom across the pass under the bridge at Highway 532. Angle the boom to collect oil from either side, depending on the direction the oil is coming from.	Created 9/01	Waterfowl concentrations and sensitive nesting species.
NC-15	South Pass (North end of Port Susan, connection to Skagit Bay)	<a href="#">N48.22825</a> <a href="#">W122.3845</a>	Exclusion/ Collection  Keep oil from moving through the pass.	500'	Stage from the road on the west shore, the parking lot at the Camano Island State Park boat ramp, or Everett.	By boat from the Camano Island State Park boat ramp, or Everett. Vehicle access from I5 to Highway 532 to Stanwood, take first road south after the bridge over the pass.	Deploy boom across the entrance to South Pass at a narrow spot between the dike on each side. Angle the boom to collect oil from the road on the west side, depending on the direction the oil is coming from.		Waterfowl concentrations and sensitive nesting species.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-16	Triangle Cove (East side of Camano Island)	<a href="#">N48.196083333</a> <a href="#">W122.4645</a>	Exclusion/ Collection  Keep oil out of the cove.	800'	Stage from Barnum Road or the private road out to the end of the sand spit, or from Everett.	By boat from Everett. Vehicle access from I5 to Highway 532 to East Camano Drive to Barnum Road.	Deploy boom from Barnum Point to the tip of the sand spit at the entrance to the cove, and then back to the east shore at an angle to the northeast for collection from Barnum Road. Tidal currents through the entrance can be strong, but the double boom configuration should slow the oil enough for collection at the second boom.	Created 9/01	Tidal marshes, waterfowl concentrations, and sensitive nesting species.
NC-17	Polnell Point (East side of Crescent Harbor, east side of Whidbey Island)	<a href="#">N48.27758333</a> <a href="#">W122.5594444</a>	Collection  Prevent oil from moving down Saratoga Passage.	1500'	Stage from the road to Polnell Point, or from the Oak Harbor Marina.	By boat from the Oak Harbor Marina, or Everett. Vehicle access from Highway 20 to Torpedo Road to Midway Road. Access to the point is through a locked gate, contact the Whidbey Island Naval Air Station at 360-2574330 for entry.	Deploy boom from the beach on the south end of the sand spit leading to Polnell Point to the northeast to collect oil moving along the beach from the east.	Modified 9/01	Sensitive nesting species, waterfowl concentrations, other Saratoga Passage resources.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-18	Maylor's Marsh (South side of Oak Harbor, east side of Whidbey Island)	<a href="#">N48.280537</a> <a href="#">W122.642827</a>	Exclusion  Keep oil out of marsh.	600'	Stage from the Oak Harbor Marina, or Everett.	By boat from the Oak Harbor Marina, or Everett. Vehicle access from Highway 20 to Pioneer Way to West Coral Sea Ave. to Cascade Drive. Site is on the Naval Seaplane Base, contact the Whidbey Island Naval Air Station at 360-2574330 for entry.	Deploy boom in a chevron configuration from the beach at the entrance to Maylor's Marsh. Tidal currents through the entrance of the marsh can be very strong. Anchor chevron apex far enough off shore so oil is not entrained under the boom by tidal currents.	Field Test 4/03	Marsh habitat, sensitive nesting species, waterfowl concentrations.
NC-19	Race Lagoon (East side of Whidbey Island, just south of Penn Cove)	<a href="#">N48.199292</a> <a href="#">W122.604053</a>	Exclusion  Keep oil out of the Lagoon.	200'	Stage from the Oak Harbor Marina, or Everett.	By boat from the Oak Harbor Marina, or Everett. Vehicle access from Highway 20 to Harrington Road through private property at the beach.	Deploy boom across the entrance to the lagoon.	Created 9/01	Waterfowl concentrations.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-20	Holmes Harbor (Southeast side of Whidbey Island) - General strategy for the entire harbor.	<a href="#">N48.058333333</a> <a href="#">W122.5333333</a>	Exclusion/ Deflection/ Collection  Protect beaches throughout the harbor.	3000'	Stage from the Freeland County Park (ISL0095), or Everett.	By boat from the ramp at the Freeland County Park, or Everett. Vehicle access from the Mukilteo Ferry to Highway 525 to Freeland, or from Anacortes on Highway 20 to Highway 525.	Based on trajectories, deploy boom to protect as much of the shoreline in the harbor as possible that is expected to be impacted. All beaches in the harbor have high resource value.		All beaches in the area are baitfish spawning habitat.
NC-21	Elger Bay (SW side of Camano Island)	<a href="#">N48.1295</a> <a href="#">W122.477</a>	Exclusion  Keep oil out of the tidal marsh behind the sand spit.	300'	Stage from the parking lot at the Camano Island State Park boat ramp, or Everett.	By boat from the Camano Island State Park boat ramp, or Everett. Vehicle access from I5 to Highway 532 to East Camano Drive to Elger Bay Road.	Deploy boom across the entrance to the tidal marsh.	Modified 9/01	Tidal marshes, waterfowl concentrations, and sensitive nesting species.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-22	Tulalip Bay (Just north of Everett)	<a href="#">N48.058166667</a> <a href="#">W122.2929167</a>	Exclusion  Keep oil out of the bay.	3000'	Stage from the marina in Tulalip Bay, or from Everett.	By boat from the marina in Tulalip Bay, or Everett. Vehicle access from I-5 to Tulalip Road.	Deploy boom in a chevron configuration from the tip of Hermosa Point south to the opposite point northwest of Mission Beach. In poor weather, move the boom inside to protect the bay south of the sand spit across the middle of the bay, running the boom from the end of the sand spit to the shoreline on the east side of the bay.		Seabird and waterfowl concentrations, sensitive nesting species, and fish resources.
NC-23	Ebey Slough (above I-5, between Everett and Marysville)	<a href="#">N48.04675</a> <a href="#">W122.1796667</a>	Exclusion/ Collection  Keep oil out of the slough.	500'	Stage off Highway 529 on the northwest side of the bridge, or from Everett.	By boat from Everett. Vehicle access from I5 to Highway 529.	Deploy boom across the slough downstream from the Highway 529 bridge, from the south shore angled north and east to the north shore near the bridge for collection.		Seabird and waterfowl concentrations, sensitive nesting species.
NC-24	Steamboat and Union Sloughs (at confluence, between Everett and Marysville)	<a href="#">N48.034166667</a> <a href="#">W122.1914667</a>	Exclusion  Keep oil out of the sloughs.	1200'	Stage off Highway 529 at the west tip of Spencer Island, or from Everett.	By boat from Everett. Vehicle access from I5 to Highway 529.	Deploy boom west of the confluence of the two sloughs.		Seabird and waterfowl concentrations, sensitive nesting species.

Strategy	Location	Position	Strategy Type & Objective	Boom Length	Staging Area	Site Access	Strategy Implementation	Status	Resources at Risk
NC-25	Snohomish River (at mouth in Everett)	<a href="#">N48.02</a> <a href="#">W122.20375</a>	Exclusion  Keep oil out of the mouth of the river.	1400'	Stage from Preston Point, or Everett.	By boat from Everett. Vehicle access from I5 to Highway 529 South to West Marine View Drive.	Deploy boom across the river mouth from Preston Point across the river to Smith Island.		Seabird and waterfowl concentrations, sensitive nesting species.

# North Central Puget Sound Geographic Response Plan

## Chapter 5 – Shoreline Countermeasures

### 5.1 - Chapter Introduction

Shoreline countermeasure processes continue to evolve, reflecting increasingly efficient treatment techniques. Response organizations and agencies must identify shorelines requiring treatment, establish treatment priorities, monitor the effectiveness and impacts of treatment, and resolve problems as the treatment progresses.

This chapter serves as a tool for countermeasure contingency planning and implementation for shorelines within the North Central Puget Sound GRP area. It contains shoreline-type maps, and oil countermeasure matrices for very light oils, light oils, medium oils, and heavy oils. The shoreline type for a specific area can be compared to the matrix for the particular oil spilled to determine (generally) what response cleanup actions are appropriate. The Northwest Area Shoreline Countermeasures Manual and Matrices (NWACP - Section 9640) provides detailed information on shoreline countermeasures and should be consulted during any oil spill response.

### 5.2 - Oil Countermeasure Matrices

Appendix 5A contains oil countermeasure matrices for very light oils, light oils, medium oils, and heavy oils. Each matrix provides general guidance on the removal of oil from shoreline substrates. They must be used in conjunction with the Northwest Area Shoreline Countermeasures Manual and Matrices (NWACP - Section 9640) plus field observations and scientific advice. The countermeasures listed in the matrices are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques. The Federal On-Scene Coordinator (FOSC), or the state OSC operating with the FOSC's authorization, has the responsibility and authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, shoreline type, and the presence of sensitive resources.

### 5.3 - Shoreline Type Maps and Photographs

Shoreline type maps for North Central Puget Sound are contained in Appendix 5B. The shoreline type for a specific location can be compared to the matrices in Appendix 5A for the particular oil spilled to determine (generally) what response cleanup actions are appropriate. A list of shoreline codes and types is provided below. Additional information on shoreline type classifications can be found in the [Shoreline Assessment Job Aid](#) and in Environmental Sensitivity Index (ESI) Maps. Both are available on the National Oceanographic and Atmospheric Administration's website at <http://archive.orr.noaa.gov>.

#### Shoreline Codes and Types:

- 1** - Exposed rock shores and vertical, hard man-made structures
- 2** - Exposed wave-cut platforms
- 3** - Fine to medium grained sand beaches and steep
- 4** - Course grained sand beaches
- 5** - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
- 6A** - Gravel beaches - pebbles to cobble
- 6B** - Gravel beaches - cobbles to boulders
- 6C** - Exposed rip rap
- 7** - Exposed tidal flat
- 8A** - Sheltered vertical rock shores and vertical, hard man-made structures (seawalls, docks)
- 8B** - Sheltered rubble slope
- 9A** - Sheltered sand and mud flats
- 9B** - Sheltered vegetated low bank
- 10** - Marshes

**Shoreline Countermeasures Matrices: Table 5A-1**

# Very Light Oils

**Jet fuels, Gasoline**

- Highly volatile (should all evaporate within 1-2 days)
- High concentration of toxic (soluble) compounds
- Localized, severe impacts to water column and shoreline resources
- Duration of impact is a function of the resource recovery rate
- No dispersion necessary

**Shoreline Type Codes**

- 1** - Exposed rock shores and vertical, hard man-made structures
- 2** - Exposed wave-cut platforms
- 3** - Fine to medium grained sand beaches and steep
- 4** - Course grained sand beaches
- 5** - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
- 6A** - Gravel beaches - pebbles to cobble
- 6B** - Gravel beaches - cobbles to boulders

- 6C** - Exposed rip rap
- 7** - Exposed tidal flat
- 8A** - Sheltered vertical rock shores and vertical, hard man-made structures (seawalls, docks)
- 8B** - Sheltered rubble slope
- 9A** - Sheltered sand and mud flats
- 9B** - Sheltered vegetated low bank
- 10** - Marshes

Countermeasures for <b>Very Light Oils</b>														
Shoreline Type →	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
<b>CONVENTIONAL METHODS</b>														
No action	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Manual removal of oil														
Passive collection of oil			C	C	C	C	C	C						
Oiled debris removal	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal														
Ambient water flooding (deluge)														C
Ambient water flush <50 psi														
Ambient water flush <100 psi														
Warm water flush <90°F														
Hot water flush >90°F														
Vacuum removal of oil														
Sediment reworking			C	C	C	C								
Sediment Removal - cleaning - replacement														
Cutting oiled vegetation														
<b>ALTERNATIVE METHODS*</b>														
In-situ burning on shore														
Chemical stabilization, protection, or cleaning														
Nutrient enhancement														
Microbial addition														

**R = Recommend** (May be Preferred Alternative)

**C = Conditional** (Refer to NW Shoreline Countermeasures Manual – [NWACP Section 9640](#))

**Items not marked** “R” or “C” are not applicable or not generally recommended

Labels marked \* Required to follow approved process defined in [National Contingency Plan](#) and [NW Area Contingency Plan](#)

Permit Requirements: See [NWACP Section 9320](#) - Northwest Area Permit and Consultation Guide

*This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual in the NW Area Contingency Plan plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC), or the state OSC operating with the FOSC’s authorization, has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, shoreline type, and the presence of sensitive resources.*

**Shoreline Countermeasures Matrices: Table 5A-2**

# Light Oils

**Diesel, No. 2 Fuel Oils,  
Light Crude Oils**

- Moderately volatile; will leave residue (up to 1/3 of spilled amount)
- Moderate concentrations of toxic (soluble) compounds
- Long-term contamination of intertidal resources possible
- Potential for subtidal impacts (dissolution, mixing, sorption onto suspended sediments)
- No dispersion necessary
- Cleanup can be very effective

**Shoreline Type Codes**

- 1 - Exposed rock shores and vertical, hard man-made structures
- 2 - Exposed wave-cut platforms
- 3 - Fine to medium grained sand beaches and steep
- 4 - Course grained sand beaches
- 5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
- 6A - Gravel beaches - pebbles to cobble
- 6B - Gravel beaches - cobbles to boulders

- 6C - Exposed rip rap
- 7 - Exposed tidal flat
- 8A - Sheltered vertical rock shores and vertical, hard man-made structures (seawalls, docks)
- 8B - Sheltered rubble slope
- 9A - Sheltered sand and mud flats
- 9B - Sheltered vegetated low bank
- 10 - Marshes

Countermeasures for <u>Light Oils</u>														
Shoreline Type →	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
<b>CONVENTIONAL METHODS</b>														
No action	R	R	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil			C	C	C	C	C	C		R	R		C	
Passive collection of oil	C	R	R	R	R	R	R	R	C	R	R	C	R	R
Oiled debris removal	C	C	R	R	R	R	R	R	C	R	R	C	C	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C								
Ambient water flooding (deluge)			C	C	C	R	R	R			C			C
Ambient water flush <50 psi		C			C	C	C	C		R	C			C
Ambient water flush <100 psi														
Warm water flush <90°F														
Hot water flush >90°F														
Vacuum removal of oil							C	C						C
Sediment reworking			C	C	C	C								
Sediment Removal - cleaning - replacement			C	C	C									
Cutting oiled vegetation							C	C		C	C		C	C
<b>ALTERNATIVE METHODS*</b>														
In-situ burning on shore														
Chemical stabilization, protection, or cleaning														
Nutrient enhancement			C	C	C	C	C	C						C
Microbial addition														

**R = Recommend** (May be Preferred Alternative)

**C = Conditional** (Refer to NW Shoreline Countermeasures Manual – [NWACP Section 9640](#))

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**Shoreline Countermeasures Matrices: Table 5A-3**

# Medium Oils

## Most Crude Oils & Some Heavily Weathered Light Crude Oils

- About 1/3 will evaporate within 24 hours
- Maximum water-soluble fraction is 10-100 parts per million (ppm)
- Oil contamination of intertidal areas can be severe and long-term
- Impact to waterfowl and fur-bearing mammals can be severe
- Chemical dispersion is an option within 1-2 days
- Cleanup most effective if conducted quickly

**Shoreline Type Codes**

- 1** - Exposed rock shores and vertical, hard man-made structures
- 2** - Exposed wave-cut platforms
- 3** - Fine to medium grained sand beaches and steep
- 4** - Course grained sand beaches
- 5** - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
- 6A** - Gravel beaches - pebbles to cobble
- 6B** - Gravel beaches - cobbles to boulders

- 6C** - Exposed rip rap
- 7** - Exposed tidal flat
- 8A** - Sheltered vertical rock shores and vertical, hard man-made structures (seawalls, docks)
- 8B** - Sheltered rubble slope
- 9A** - Sheltered sand and mud flats
- 9B** - Sheltered vegetated low bank
- 10** - Marshes

Countermeasures for <u>Medium Oils</u>														
Shoreline Type →	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
<b>CONVENTIONAL METHODS</b>														
No action	C	C	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil	C	R	R	R	R	C	C	C		R	R		C	C
Passive collection of oil	R	R	R	R	R	R	R	R	C	R	R	R	R	R
Oiled debris removal	C	R	R	R	R	R	R	R	C	R	R	C	R	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C							C	
Ambient water flooding (deluge)			C	C	C	R	R	R		R	R		C	C
Ambient water flush <50 psi	C	C			C	R	C	R		R	R		C	C
Ambient water flush <100 psi	C	C					C	C		C				
Warm water flush <90°F	C						C	C		C				
Hot water flush >90°F	C									C				
Vacuum removal of oil	C	C	R	R		C	R	R		C	C		C	C
Sediment reworking			C	C	C	C								
Sediment Removal - cleaning - replacement			C	C	C	C		C			C			
Cutting oiled vegetation							C	C		C	C		C	C
<b>ALTERNATIVE METHODS*</b>														
In-situ burning on shore														
Chemical stabilization, protection, or cleaning														
Nutrient enhancement			C	C	C	C	C	C			C			C
Microbial addition														

**R = Recommend** (May be Preferred Alternative)

**C = Conditional** (Refer to NW Shoreline Countermeasures Manual – [NWACP Section 9640](#))

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**Shoreline Countermeasures Matrices: Table 5A-4**

# Heavy Oils

**Crude Oils, Intermediate Fuel Oils, Bunker C, Heavily Weathered Medium Crude Oils**

- Heavy oils with little or no evaporation or dissolution
- Water-soluble fraction likely to be <10 ppm
- Heavy contamination of intertidal areas likely
- Severe impacts to waterfowl and fur-bearing mammals (coating and ingestion)
- Long-term contamination to sediments possible
- Weathers very slowly
- Dispersion seldom effective
- Shoreline cleanup difficult under all conditions

**Shoreline Type Codes**

- |  |  |
|--|--|
| 1 - Exposed rock shores and vertical, hard man-made structures   | 6C - Exposed rip rap   |
| 2 - Exposed wave-cut platforms   | 7 - Exposed tidal flat   |
| 3 - Fine to medium grained sand beaches and steep  | 8A - Sheltered vertical rock shores and vertical, hard man-made structures (seawalls, docks) |
| 4 - Course grained sand beaches  | 8B - Sheltered rubble slope  |
| 5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material | 9A - Sheltered sand and mud flats  |
| 6A - Gravel beaches - pebbles to cobble  | 9B - Sheltered vegetated low bank  |
| 6B - Gravel beaches - cobbles to boulders  | 10 - Marshes   |

Countermeasures for <u>Medium Oils</u>														
Shoreline Type →	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
<b>CONVENTIONAL METHODS</b>														
No action	C	C	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil	C	R	R	R	R	C	C	C		R	R		C	C
Passive collection of oil	R	R	R	R	R	R	R	R	C	R	R	R	R	R
Oiled debris removal	C	R	R	R	R	R	R	R	C	R	R	C	R	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C							C	
Ambient water flooding (deluge)			C	C	C	R	R	R		R	R		C	C
Ambient water flush <50 psi	C	C			C	R	C	R		R	R		C	C
Ambient water flush <100 psi	C	C					C	C		C				
Warm water flush <90°F	C						C	C		C				
Hot water flush >90°F	C									C				
Vacuum removal of oil	C	C	R	R		C	R	R		C	C		C	C
Sediment reworking			C	C	C	C								
Sediment Removal - cleaning - replacement			C	C	C	C		C			C			
Cutting oiled vegetation							C	C		C	C		C	C
<b>ALTERNATIVE METHODS*</b>														
In-situ burning on shore														
Chemical stabilization, protection, or cleaning														
Nutrient enhancement			C	C	C	C	C	C			C			C
Microbial addition														

**R = Recommend** (May be Preferred Alternative)

**C = Conditional** (Refer to NW Shoreline Countermeasures Manual – [NWACP Section 9640](#))

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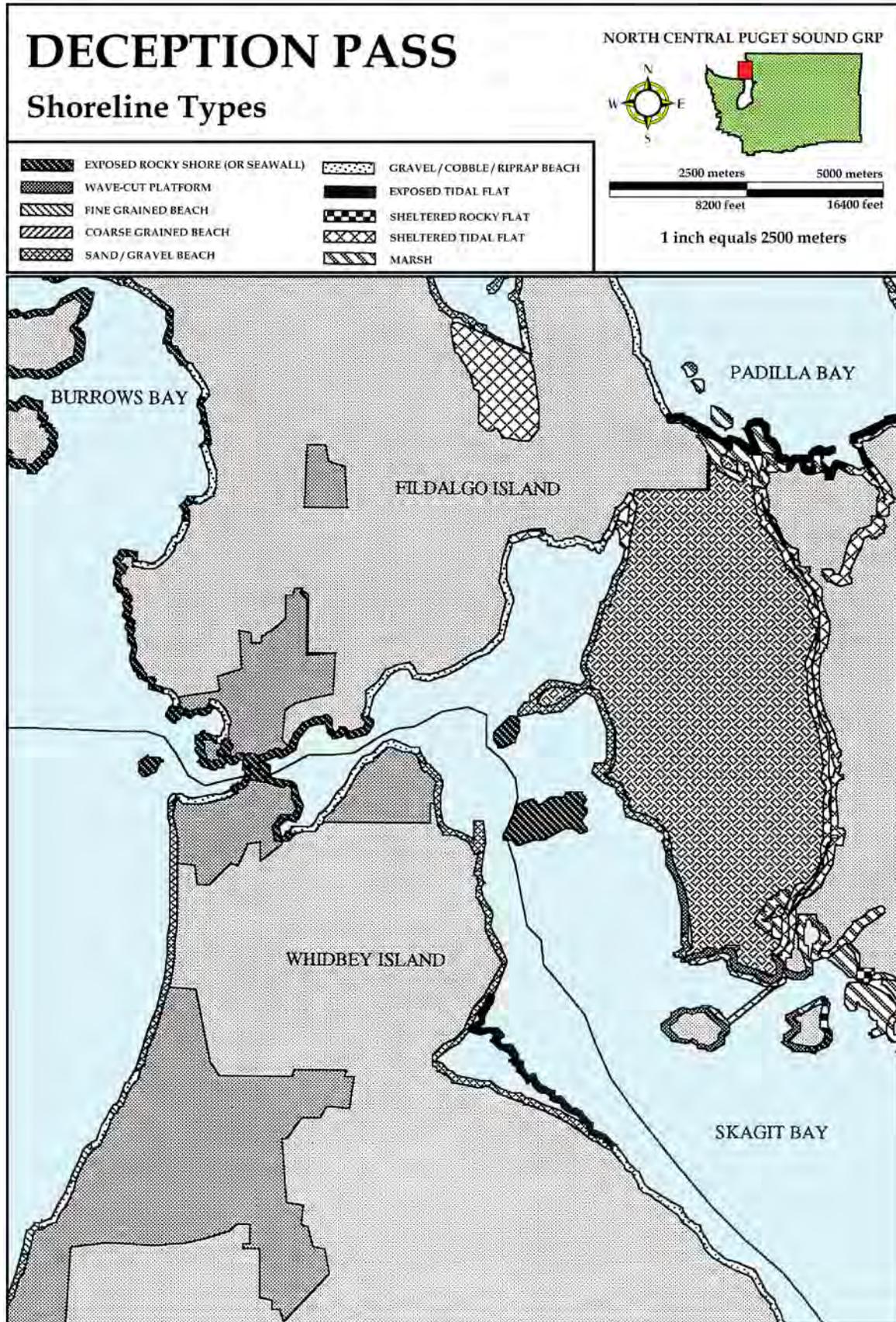
*This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire [Shoreline Countermeasures Manual](#) in the NW Area Contingency Plan plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC), or the state OSC operating with the FOSC’s authorization, has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, shoreline type, and the presence of sensitive resources.*

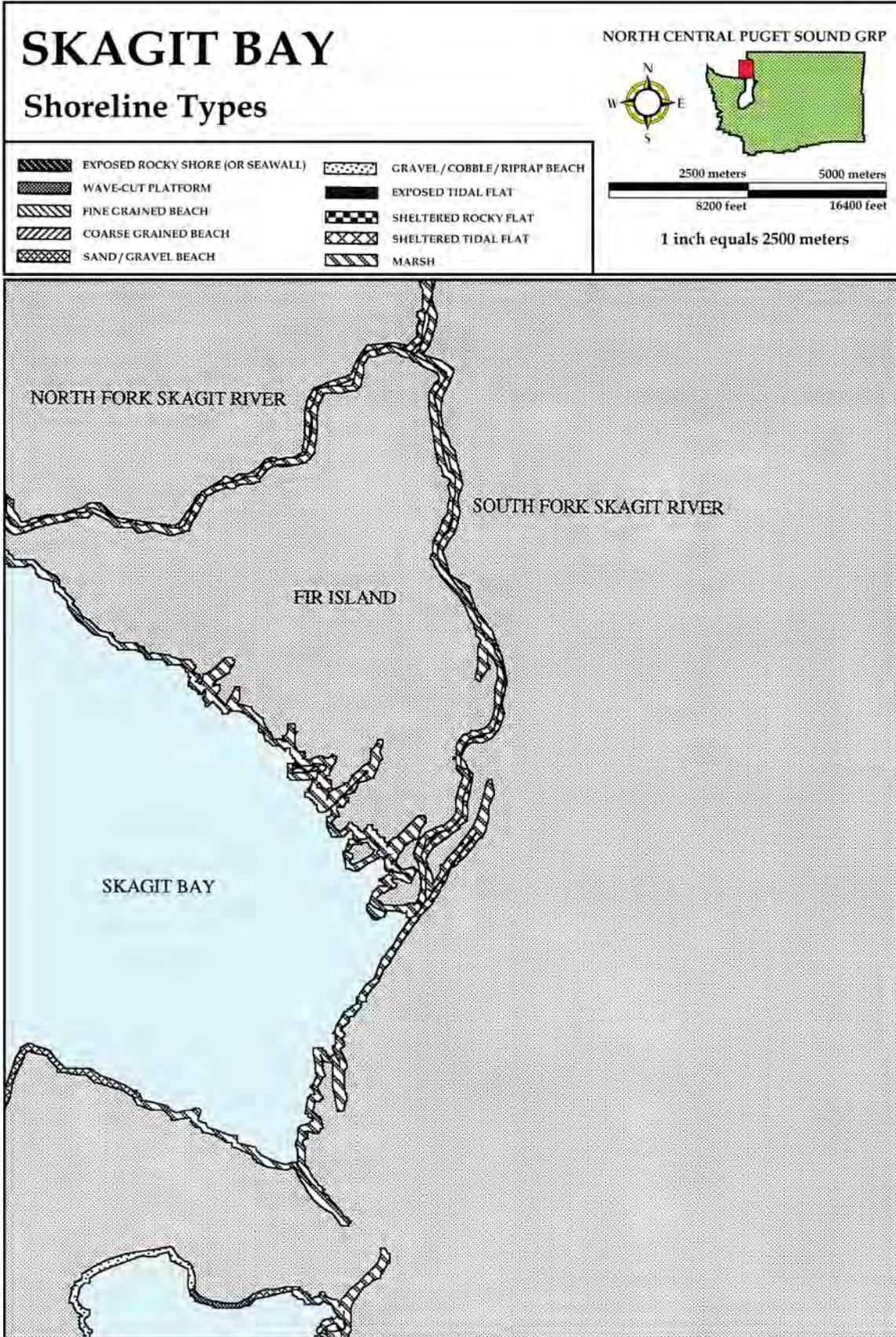
# North Central Puget Sound Geographic Response Plan

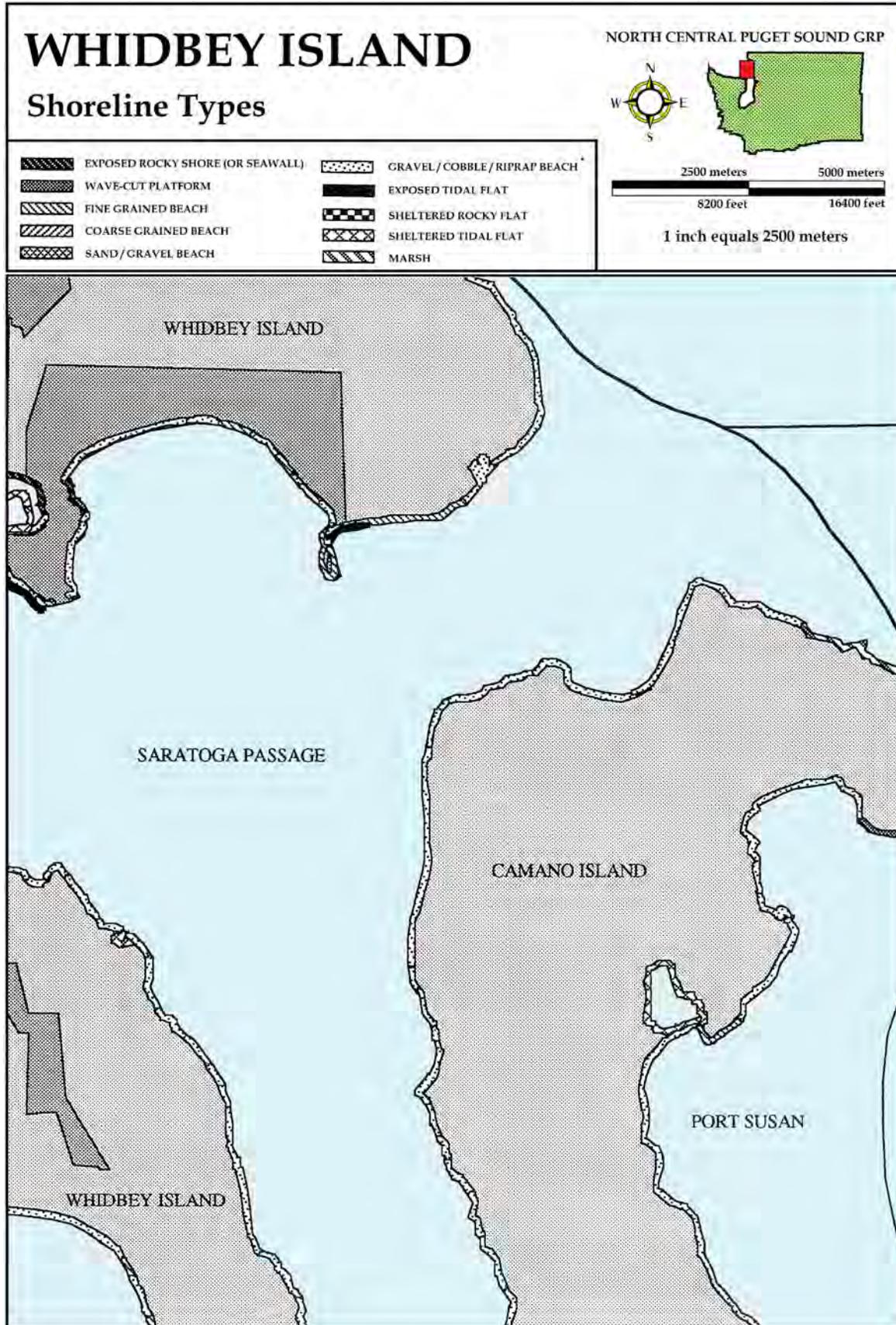
## Appendix 5B – Shoreline Maps

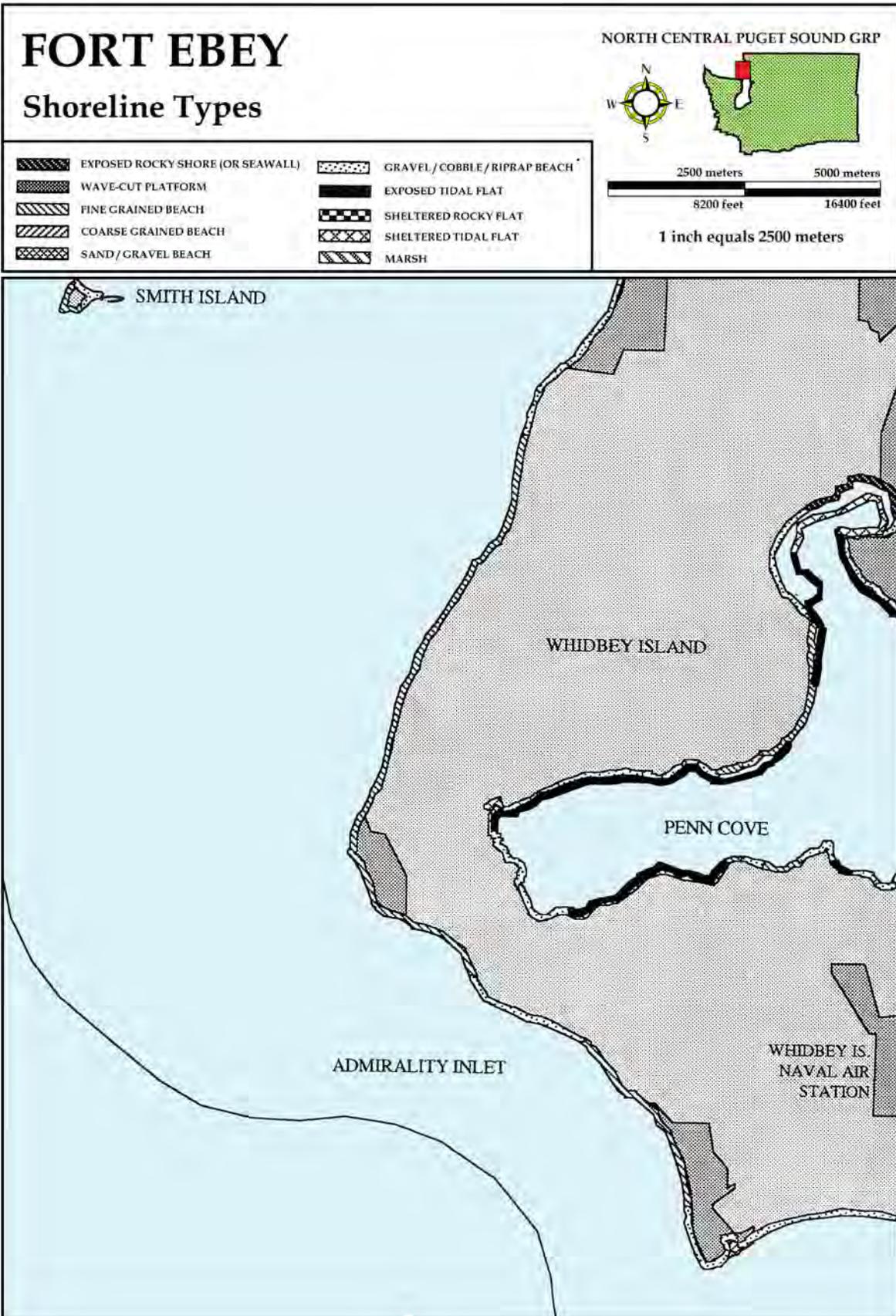
Maps of shoreline types are provided for the following areas:

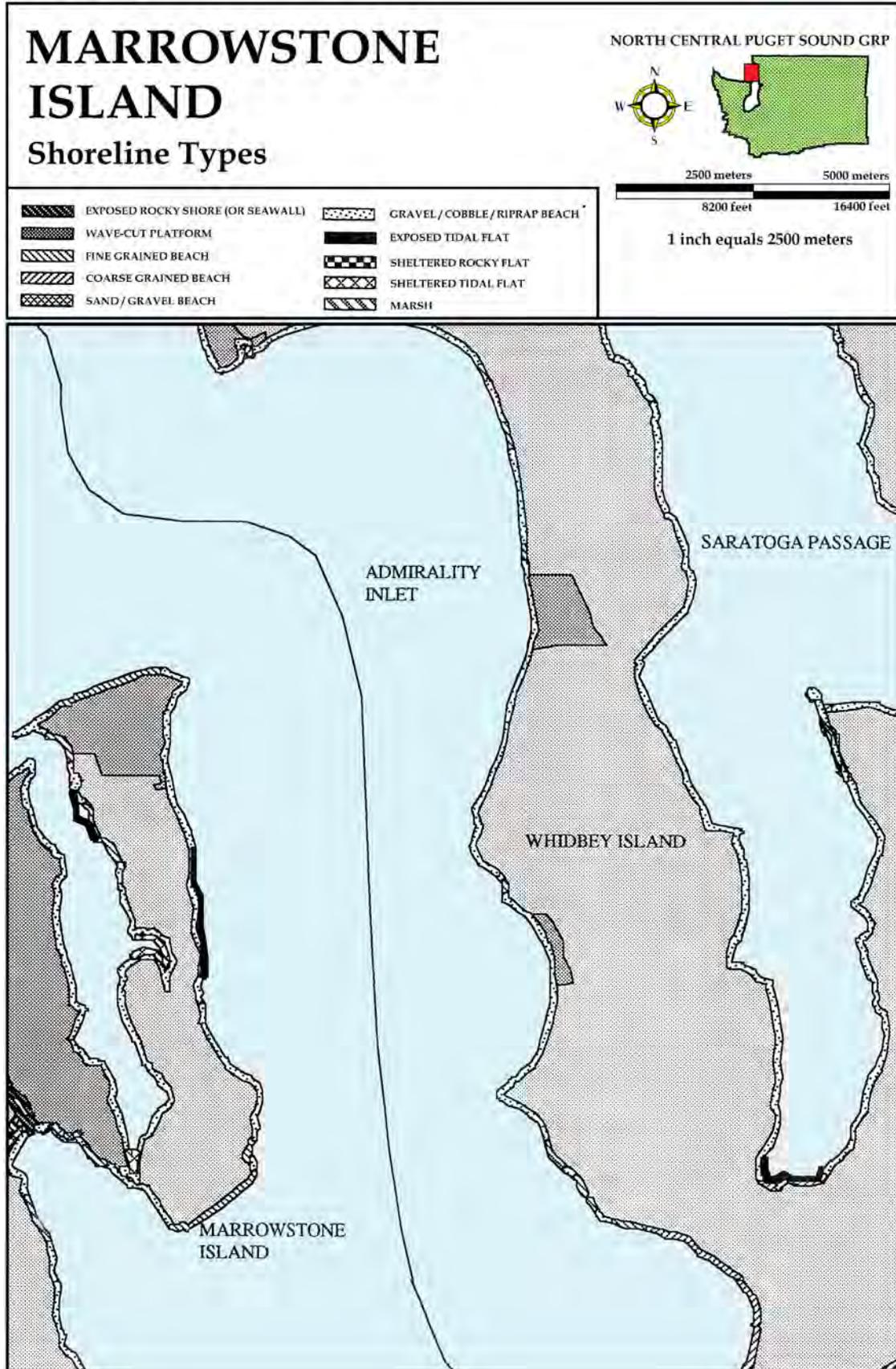
- Deception Pass
- Skagit Bay
- Whidbey Island
- Fort Ebey
- Marrowstone Island
- Camano Island
- Everett
- Mukilteo

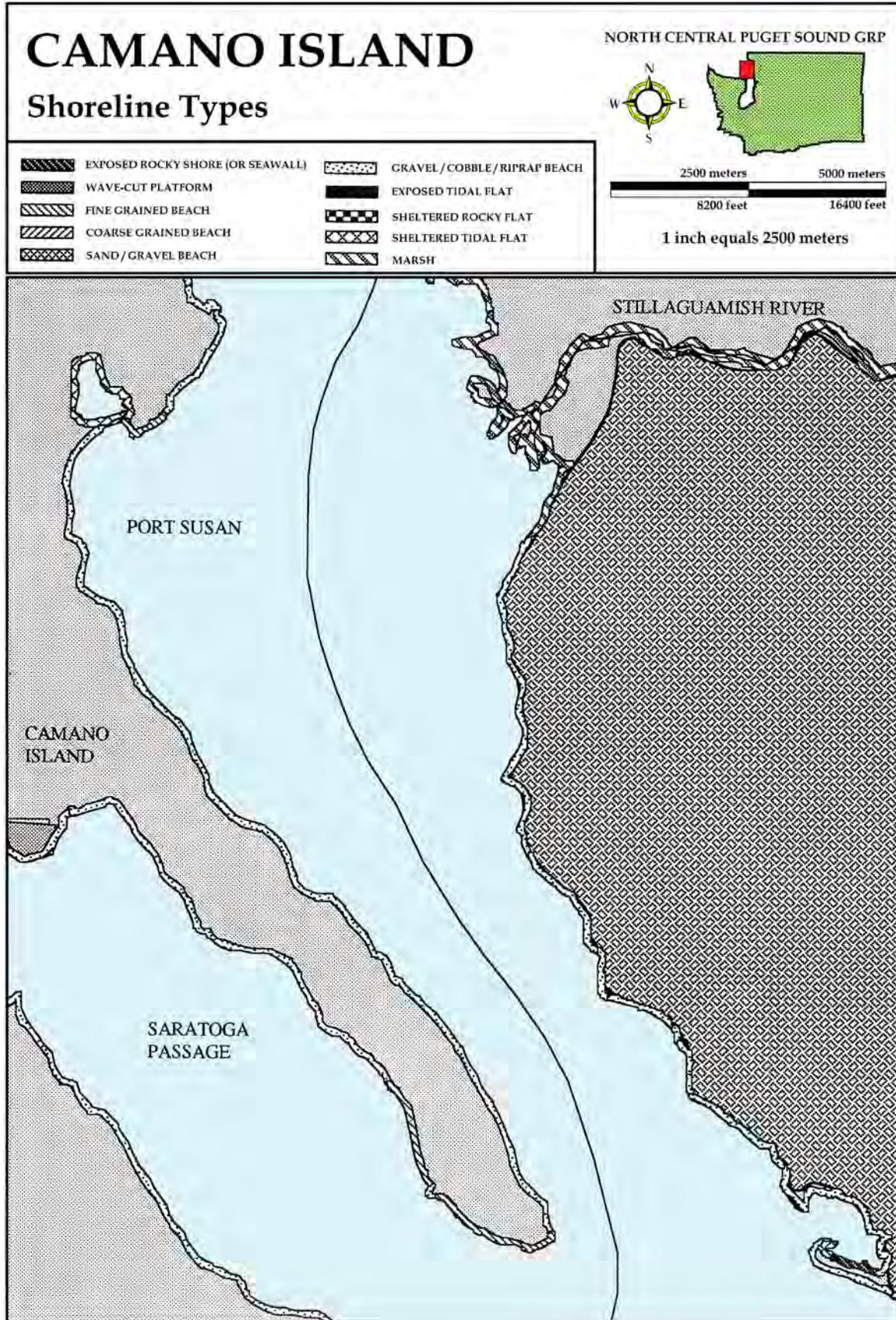


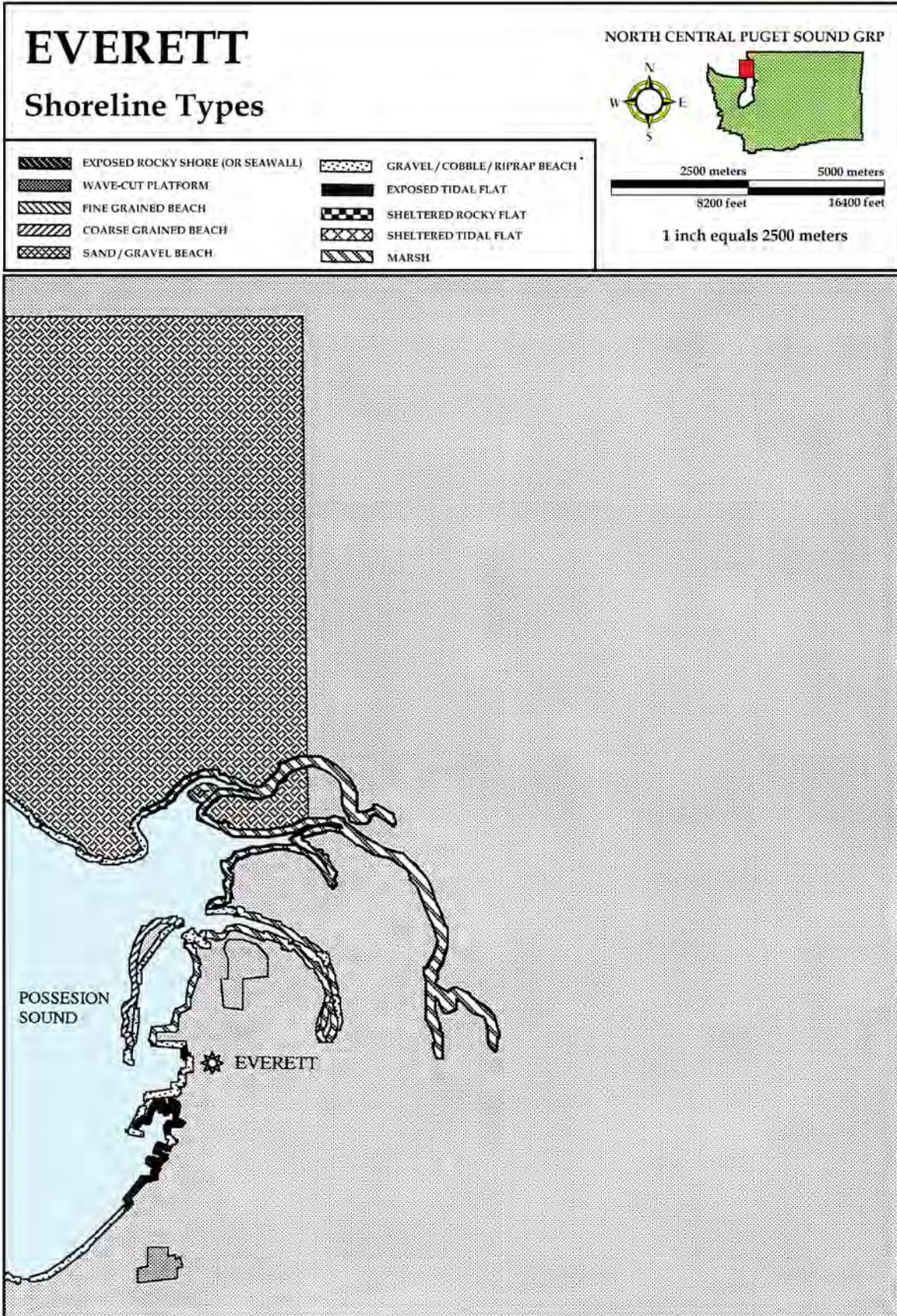


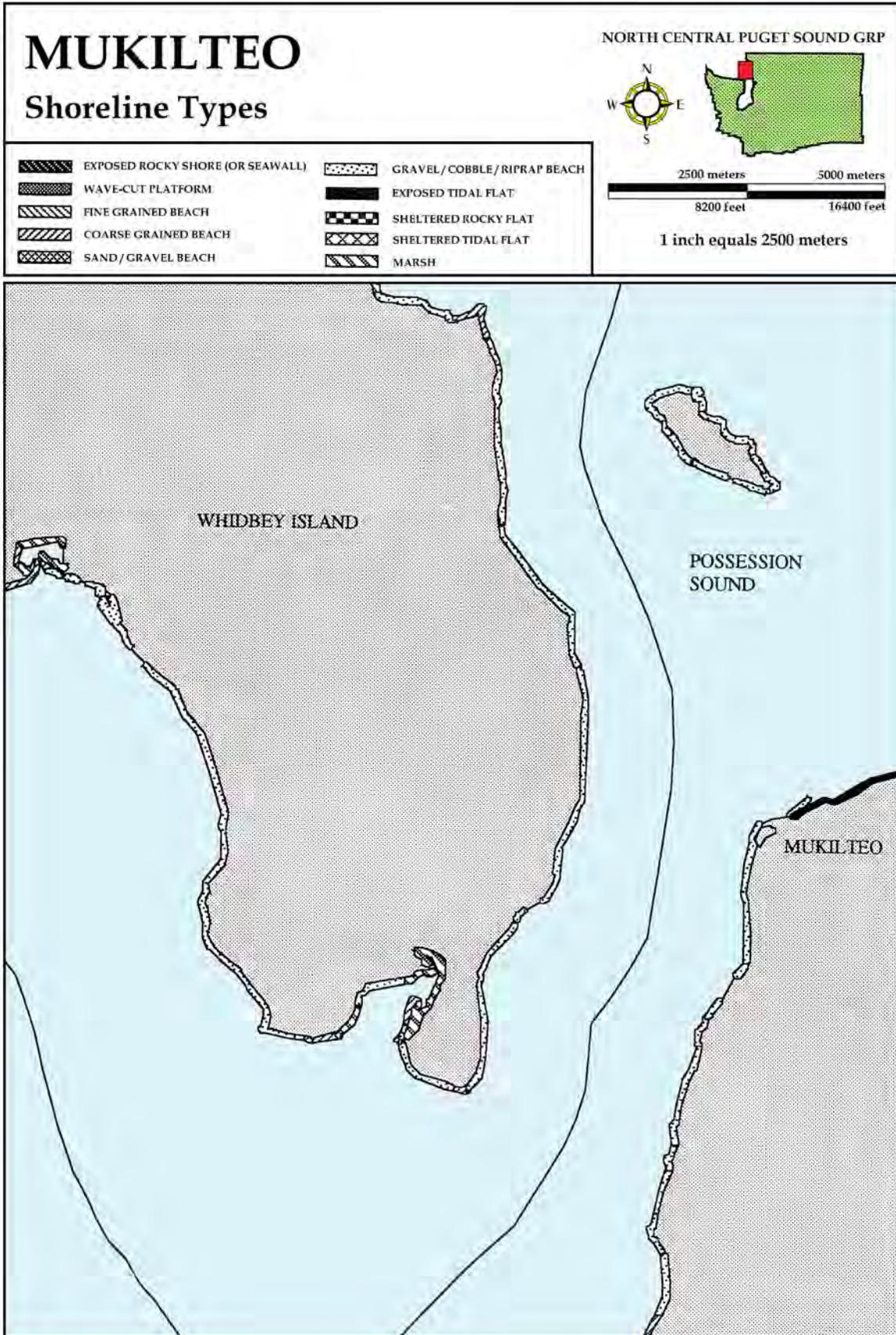












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# North Central Puget Sound Geographic Response Plan

## Chapter 6 – Resources at Risk

### 6.1 – Chapter Introduction

The information presented in this chapter provides a summary of natural, cultural, and economic resources at risk, and gives general information on other related topics of importance for the North Central Puget Sound Geographic Response Plan (GRP) area. The information is not comprehensive, but is meant to give response managers and first responders enough detail to cover the initial phase of an oil spill; the period from when a spill occurs until an Environmental Unit (EU) is established in the Planning Section of a Unified Command. During an incident, detailed information regarding natural, cultural, and economic resources at risk will be provided by the EU. Specific resource concerns related to areas that already have designated protection strategies may be found in the “Resources Protected” column of the matrices for individual strategies in Chapter 4.

The information provided in this chapter is intended for use in:

- Providing resource-at-risk “context” to responders and clean-up personnel in the initial stages of a response.
- Briefing ICS personnel that may be unfamiliar with the general natural resource concerns related to the GRP area.
- Providing background information for personnel involved in media presentations and public outreach associated with a spill incident.

### 6.2 – Natural Resources at Risk Summary

Sensitive species that may occur, at some time of year, within this area include the following federal and/or state listed species. The following designations apply:

- Federal Endangered (FE)
- Federal Threatened (FT)
- Federal Candidate (FC)

- Federal Species of Concern (FCo)
- State Endangered (SE)
- State Threatened (ST)
- State Candidate (SC)
- State Sensitive (SS)

**Birds:** Marbled Murrelet [FT/ST], Bald Eagle [FCo/SS], Peregrine Falcon [FCo/SS], Common Murre [SC], Western Grebe [SC], Brant's Cormorant [SC], Common Loon [SS]

**Mammals:** Southern Resident Killer Whale [FE/SE], Steller sea lion [FT/ST]

**Fish:** Puget Sound Chinook salmon [FT/SC], Puget Sound Steelhead [FT], Puget Sound coho [FCo], Bull Trout [FT/SC], Black rockfish [SC], Broccaccio rockfish [FE/SC], Brown rockfish [FCo/SC], Canary rockfish [FT/SC], Copper rockfish [FCo/SC], Green striped rockfish [SC], Quillback rockfish [FCo/SC], Red stripe rockfish [SC], Tiger rockfish [SC], Widow rockfish [SC], Yelloweye rockfish [FT/SC], Yellowtail rockfish [SC], Pacific Cod [FCo], Pacific Hake [FCo/SC], Walleye Pollock [FCo/SC], Pacific Herring [FCo/SC]

### 6.1.1 - General Resource Concerns

#### 6.1.1a Habitats:

- **Rivers and streams** of this region provide abundant habitat for spawning salmonids. The extensive *sloughs and river deltas* of the Skagit, Stillaguamish and Snohomish Rivers provide a variety of key habitats for fish, shellfish, waterfowl, harbor seals, and other species.
- **Shallow intertidal and subtidal habitats** in bays throughout the region are rearing areas for juvenile salmon, Dungeness crab, hardshell clams and other fish and shellfish. These habitats are also often important feeding areas for waterfowl, shorebirds, and herons and are also used as low tide haulouts by harbor seals.
- **Eelgrass beds** occur extensively throughout the region, with the largest occurring in Skagit Bay, Similk Bay, Holmes Harbor, Port Susan and Port Gardner. These habitats provide critical nursery areas for fish and shellfish as well as important spawning habitat for herring and feeding areas for waterfowl. The scattered *kelp beds* in the northern portions of the region perform a similar ecological function.

- **Salt marshes** occur in sheltered areas throughout the region and in association with the larger river deltas. These habitats support a diverse array of fish and wildlife species.

#### 6.1.1b Fish & Shellfish:

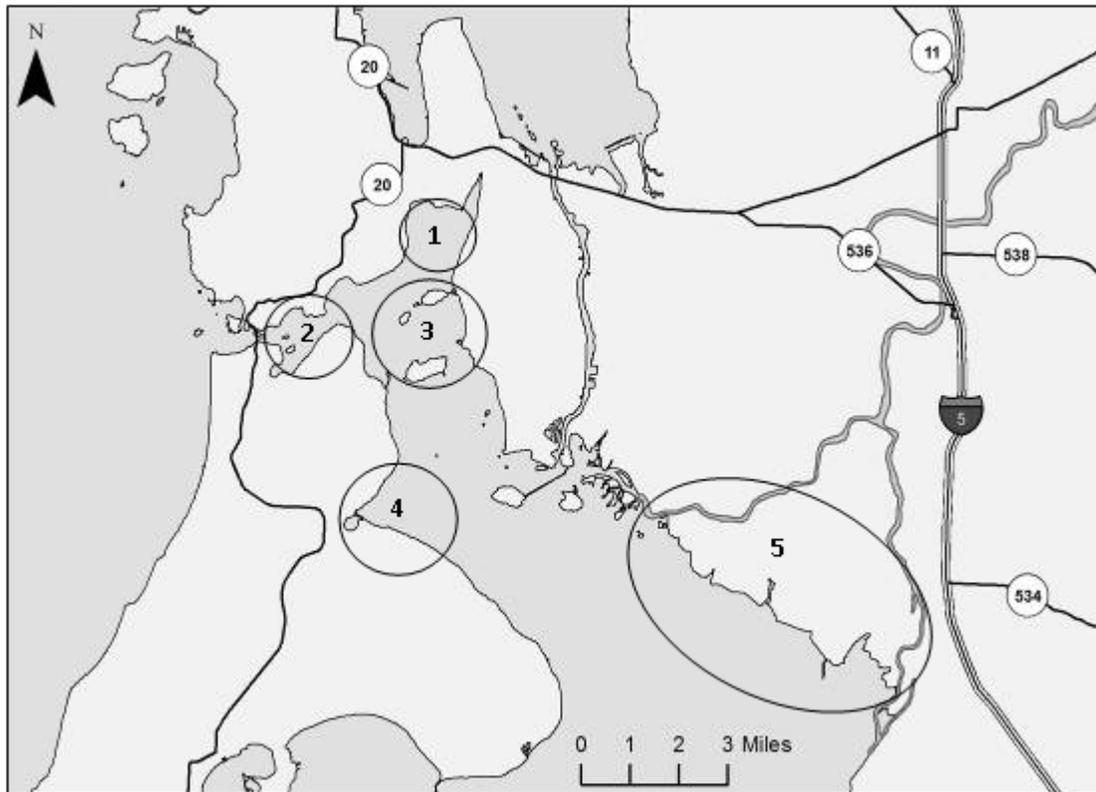
- All of Washington's **salmonid** species occur in this region, with most spawning occurring in the Skagit, Snohomish and Stillaguamish river systems.
- **Forage fish** spawning occurs extensively throughout the region. Major **herring** spawning areas occur in Tulalip Bay, Port Susan, Holmes Harbor and northern Skagit Bay. **Surf smelt and sandlance** spawning occurs on intertidal gravel beaches throughout the region.
- **Shellfish**, including Dungeness crab, hardshell clams and shrimp are widely distributed throughout the entire region.

#### 6.1.1c Wildlife:

- **Bald eagles** and **Great Blue Herons** nest throughout the region and are present year-round. **Peregrine Falcons** and **Osprey** also nest in this region, with especially high nesting concentrations of Osprey at the mouth of the Snohomish River. All of these species routinely forage in intertidal and nearshore waters.
- Concentrations of **migratory and wintering waterfowl** within this region may exceed 100,000 birds during peak periods, with southern Skagit Bay, Port Susan and the Snohomish River estuary supporting the largest concentrations. Port Susan supports the largest **migratory and wintering shorebird** concentrations in Washington.
- Apart from the gull and tern nesting on Jetty Island in Everett, **seabird nesting** in this region is primarily characterized by small, widely scattered nesting sites. **Marbled Murrelets** occur throughout the region, especially in Saratoga Pass, southern Port Susan and in the vicinity of Deception Pass.
- **Harbor seal** haulouts are scattered throughout the region with the largest concentrations occurring off the mouths of the rivers. Small numbers of **gray whales** are commonly found in Saratoga Passage and Port Susan from spring through late fall. **Southern Resident Killer Whales** occasionally range into Possession Sound off Everett.

### 6.1.2 – Specific Geographic Areas of Concern: (Includes sensitive locations in adjoining GRP areas)

#### 6.1.2a - Northern Section:

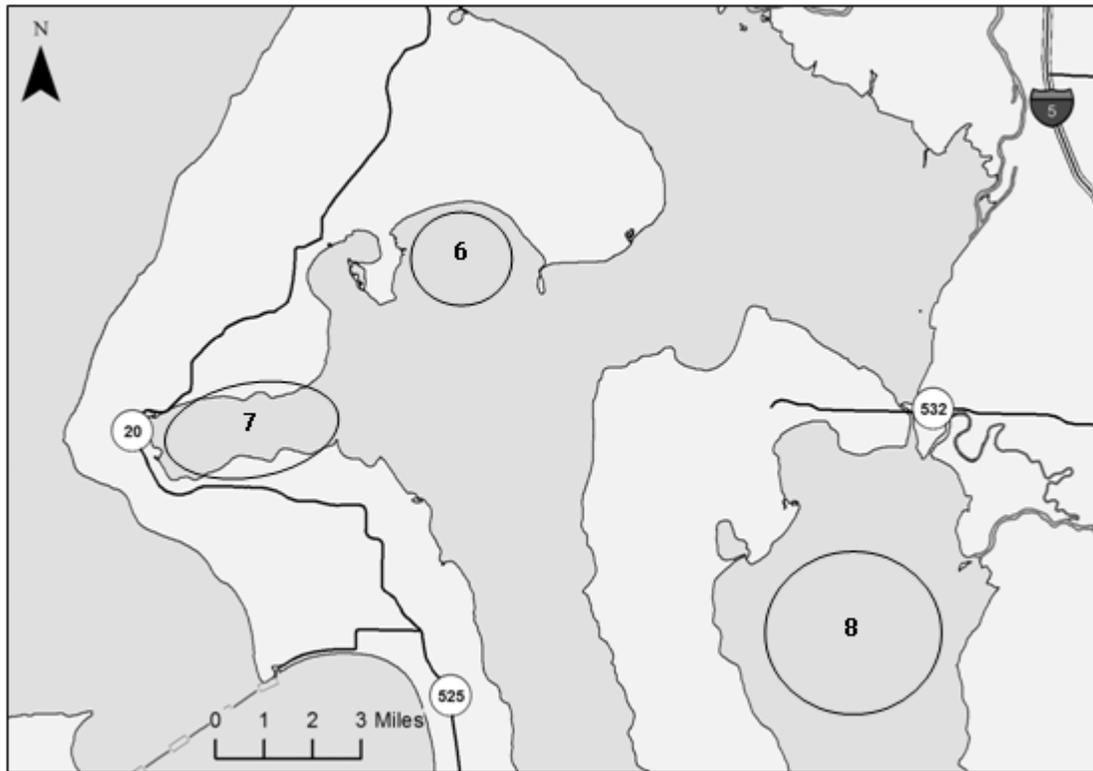


**Figure 6-1:** Areas of concern within the northern portion of North Central Puget Sound

- 1) **Similk Bay:** Extensive eelgrass, intertidal mudflat, salt marsh and forage fish beach spawning habitats. Salmonid spawning and rearing habitats. Herring, sandlance and surf smelt spawning. Dungeness crab and hardshell clams. Major waterfowl concentration area (fall through spring). Resident Bald Eagles. Harbor seal haul-out area. Tribal lands and resources.
- 2) **Deception Pass:** Eelgrass and kelp habitat. Dungeness crab and hardshell clams. Small concentrations of marine birds, including Marbled Murrelets. Nesting eagles and other birds of prey. Deception Pass State Park.
- 3) **Hope and Kiket Islands:** Eelgrass and kelp habitats. Surf smelt spawning beaches. Nesting eagles and other birds of prey. Hope Island and Skagit Island State Parks.
- 4) **Dugalla Bay:** Eelgrass, saltmarsh and intertidal mudflat habitats. Salmonid spawning and rearing habitat. Spawning habitat for herring, surf smelt and

- sandlance. Hardshell clams and Dungeness crab. Seasonal waterfowl concentrations.
- 5) **Skagit River Delta:** Extensive slough, salt marsh and slough habitats. Major salmonid spawning and rearing habitat. Very large wintering concentrations of waterfowl and raptors.

#### 6.1.2b - Central Section:

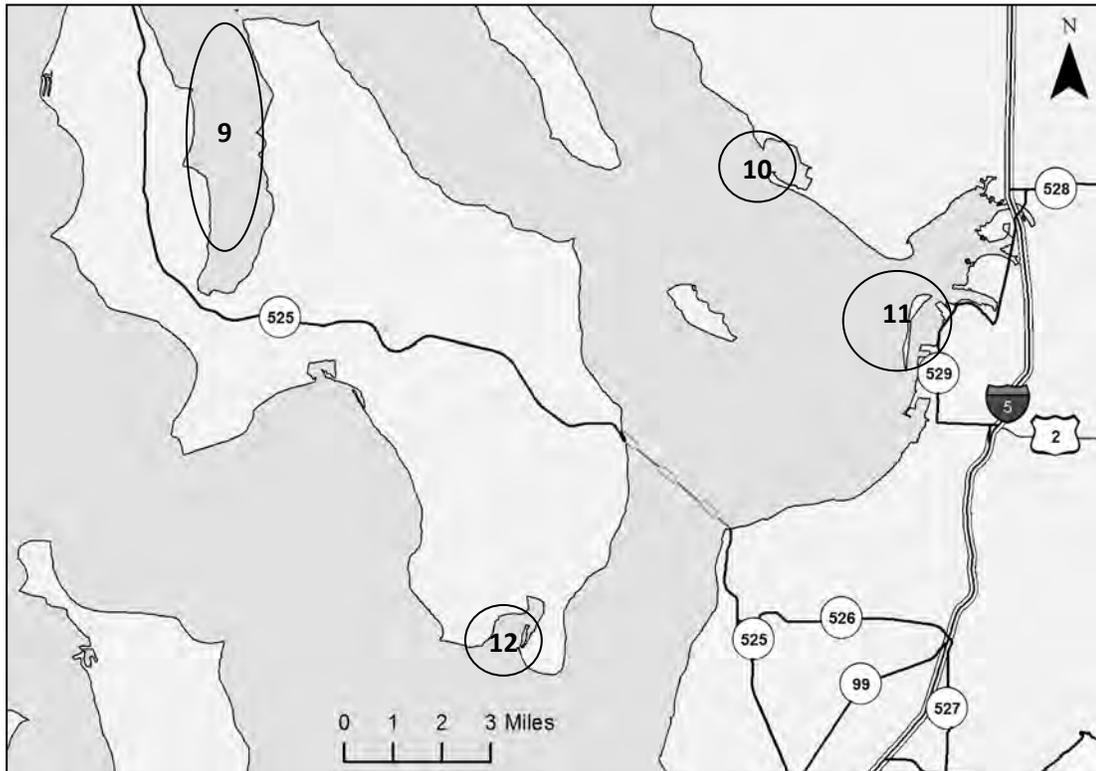


**Figure 6-2:** Areas of concern within the central portion of North Central Puget Sound

- 6) **Crescent Harbor:** Eelgrass and forage fish beach spawning habitats. Hardshell clams. Seasonal waterfowl concentrations.
- 7) **Penn Cove:** Extensive surf smelt and sandlance spawning. Hardshell clams and mussel beds. Waterfowl concentrations (fall through spring).
- 8) **Port Susan (north of Kayak Point):** Extensive eelgrass, intertidal mudflat, and salt marsh habitats. Major salmonid spawning and rearing habitat. Herring, sandlance and surf smelt spawning. Dungeness crab. Intertidal mudflats in north end of bay support largest shorebird concentration area in Puget Sound, major concentrations

of wintering waterfowl and several harbor seal haulouts. Gray whale feeding area (spring through fall). Tribal lands and resources.

### 6.1.2c - Southern Section:



**Figure 6-3:** Areas of concern within the southern portion of North Central Puget Sound

- 9) **Holmes Harbor:** Extensive eelgrass beds. Herring, sandlance and surf smelt spawning. Geoducks and shrimp.
- 10) **Tulalip Bay:** Eelgrass, saltmarsh and intertidal mudflat habitats. Salmonid spawning and rearing habitat. Spawning habitat for herring and sandlance. Dungeness crab. Seasonal waterfowl concentrations. Tribal lands and resources.
- 11) **Port Gardner/Snohomish River Delta:** Eelgrass, saltmarsh and intertidal mudflat habitats. Dungeness crab. Large seasonal waterfowl concentrations. Nesting concentrations of Osprey. Tribal lands and resources.
- 12) **Cultus Bay:** Eelgrass, saltmarsh and intertidal mudflat habitats. Significant seasonal concentrations of waterfowl and shorebirds. Foraging area for resident nesting eagles and herons.

## 6.2 – Cultural Resources at Risk Summary

Culturally sensitive sites are present within the North Central Puget Sound GRP area. Due to the sensitive nature of this information, details regarding the location and type of cultural resources present are not included in this document. Information on Cultural and Historic Preservation provided in NWACP Section 4313 must be considered and should be followed during a response. Washington Department of Archaeology and Historic Preservation (WDAHP) may assign a person to monitor cleanup operations, or provide a list of professional archeologists that can be contracted to monitor response activities.

Information on the location of culturally sensitive sites is maintained by WDAHP and made available to Washington Department of Ecology for oil spill preparedness and response planning. After the unified command is established, information related to specific archeological concerns will be coordinated through the Environmental Unit.

**6.2.1 - Discovery of Human Skeletal Remains:** Any human remains, burial sites, or burial-related materials that are discovered during a spill response must be treated with respect at all times.

- All work must be stopped immediately and the Incident Commander and Cultural Resource Specialist notified if any person monitoring work activities or involved in spill response believes that human skeletal remains have been discovered.
- The Incident Commander is responsible for taking appropriate steps to protect the discovery. The immediate area of discovery should be flagged. Vehicles and equipment must not be permitted to traverse the discovery site. In no case should further disturbance be performed prior to consultation with WDAHP. Exposed human remains should not be left unattended.
- The Incident Commander (or representative) must immediately report the discovery to WDAHP, local law enforcement (with jurisdiction), and the local coroner (with jurisdiction). The coroner (or medical examiner) will determine whether the discovery site is a crime scene or human burial.
- If the remains are determined to be non-Native American, or connected with criminal activity, local law enforcement will take charge of the discovery site and remains.

- If the remains are determined to be Native American not related to a crime scene, an archaeologist from the appropriate tribe, state archaeologist, and Incident Commander will confer on a treatment plan for the remains.

**6.2.2 - Procedures for the Discovery of Cultural Resources:** All work must be stopped immediately. The Incident Commander and Cultural Resource Specialist must be notified immediately if any person monitoring work activities or involved in a spill response believes that they have encountered cultural resources. The area covered by the work stoppage must be adequate enough to provide for the security, protection, and integrity of the material or artifact(s) discovered.

Prehistoric Cultural Resources:

*(May include but not limited to any of the following items)*

- Lithic debitage (stone chips and other tool-making byproducts)
- Flaked or ground stone tools
- Exotic rock, minerals, or quarries
- Concentrations of organically stained sediments, charcoal, or ash
- Fire-modified rock
- Rock alignments or rock structures
- Bone (burned, modified, or in association with other bone, artifacts, or features)
- Shell or shell fragments
- Petroglyphs and pictographs
- Fish weirs and traps
- Culturally modified trees
- Physical locations or features (traditional cultural properties)

Historic cultural material:

*(May include any of the following items over 50 years old)*

- Bottles, or other glass
- Cans
- Ceramics
- Milled wood, brick, concrete, metal, or other building material
- Trash dumps
- Homesteads, building remains
- Logging, mining, or railroad features
- Piers, wharves, docks, bridges, dams

If the Department of Archaeology and Historic Preservation (WDAHP) believes that the discovery is a cultural resource, the Incident Commander must take appropriate steps to protect the discovery site:

- The immediate area of the discovery site should be flagged. Vehicles or equipment must not be permitted to enter the discovery site. Work in the immediate area can not resume until treatment of the discovery has been completed.
- The Incident Commander (or representative) must contact WDAHP and arrange for the discovery to be evaluated by a professional archaeologist. The archaeologist will determine whether the discovery is potentially eligible for listing on the National Register of Historic Places. (36 CFR 60.4)
- The professional archaeologist will consult with WDAHP on the eligibility of the discovery for entry into the National Register. If WDAHP determines that the discovery is eligible, they will consult with the Incident Commander to determine an appropriate treatment for the discovery.
- If adverse impacts to an eligible site cannot be avoided, a treatment plan will be developed and implemented.
- NWACP Section 4313 (Cultural and Historic Preservation) must be followed.

The Secretary of the Interior's *Standards for Archaeological Documentation* must be followed; including provisions for research design, reporting, and curation of recovered material and samples. The particular data recovery measures applied to any given historic property will depend on the development of research questions, and the design of excavation strategies to acquire the data needed to answer those questions. Field notes, maps, plans, profiles, and photographs will document the process. The final report will follow style guidelines of the professional archaeological journal *American Antiquity*; it will synthesize the data collected and address the research questions posed.

### **6.3 – Economic Resources at Risk Summary**

Socio-economic sensitive resources are facilities or locations that rely on a body of water to be economically viable. Because of their location, they could be severely impacted if an oil spill were to occur. Economically sensitive resources are separated into three categories: critical infrastructure, water dependent commercial areas, and water dependent recreation areas. A listing of Economic Resources at Risk in the North Central Puget Sound GRP area is available in Appendix 6A of this document.

1. Critical infrastructure: As defined in the Northwest Area Contingency Plan, no critical infrastructure components have been identified in this GRP area.
2. Water Dependent Commercial Areas: Everett is a growing shipping port in North Central Puget Sound. Presently, all of the oceangoing parts for the Boeing 747, 767 and 777 pass through the Port of Everett. The area also supports an extensive aquaculture industry, and commercial fishing to a smaller extent. The shallow bays and salt water marshes of the area are prime habitat for fish and shellfish.

*Maps of commercial shellfish growing areas are available online at the Washington Department of Health's website at <http://www.doh.wa.gov/CommunityandEnvironment/Shellfish/GrowingAreas/AnnualReports.aspx>.*

3. Water Dependent Recreational Areas: Water dependent recreational resources in North Central Puget Sound are plentiful. They draw people to the area and feed local economies through tourism. A moderate to large oil spill in North Central Puget Sound could negatively impact tourism and harm extensive recreational fisheries in the area, including fin and shellfish.

*Maps of recreational shellfish areas are available online at the Washington Department of Health's website at <http://www.doh.wa.gov/CommunityandEnvironment/Shellfish/RecreationalShellfish.aspx>.*

## 6.4 – General information

**6.4.1 Flight restriction zones:** Flight restriction zones may be recommended by the Environmental Unit of the Planning Section in a Unified Command for the purpose of minimizing disturbance that could result in injury to wildlife during an oil spill. By keeping a safe distance or altitude from identified sensitive areas, pilots can minimize the risk of aircraft/ bird collisions, prevent the accidental hazing of wildlife into oiled areas, and avoid causing the abandonment of nests or marine mammal pupping areas. Implementation of Flight Restriction Zones will take place within the Air Operations Branch (Air Ops) of the Operations Section. Environmental Unit staff will work with the Air Ops Branch Director to resolve any potential conflicts with those flight activities that are essential to the spill response effort.

**6.4.2 Hazing:** The Wildlife Hazing Group within the Wildlife Branch of the Operations Section in a Unified Command is responsible for implementing wildlife hazing operations. Wildlife hazing is meant to minimize injuries to wildlife by attempting to keep animals away from spilled oil and cleanup operations. Hazing may include the use of acoustic or visual deterrent devices, boats, aircraft or other situation-appropriate tools. The Wildlife Branch will work in cooperation with appropriate state and federal agencies, as well as with the Environmental Unit in the Planning Section, to evaluate hazing options.

**6.4.3 Oiled wildlife:** Incident personnel should not attempt to approach or capture oiled wildlife as this may be hazardous to both personnel and the affected animals. Any observations of oiled wildlife should be reported to the Wildlife Branch of the Operations Section in a Unified Command.

**6.4.4 Pre-cleaning of shorelines:** “Pre-cleaning” refers to the practice of removing debris (typically organic) from a shoreline prior to it becoming impacted by an oil spill. Before initiating any beach pre-cleaning, the Environmental Unit (EU) of the Planning Section in a Unified Command must be provided with a list of proposed beaches (with location descriptions) being considered for this activity.

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

December2012

## North Central Puget Sound Geographic Response Plan Socio-Economic Resources at Risk

### A. Critical Infrastructure

A1 - Drinking Water Intakes				
Name	Location/Address	Lat/Long	Contact	Phone
No Information				

A2 - Energy/Power Generation Water Intakes (Lock & Dams Included)				
Name	Location/Address	Lat/Long	Contact	Phone
No Information				

A3 - Federal or State Water Projects or Irrigation Channels for Agriculture				
Name	Location/Address	Lat/Long	Contact	Phone
No Information				

### B. Water Dependent Commercial Areas

B1 - Industrial Intakes				
Name	Location/Address	Lat/Long	Contact	Phone
No Information				

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List of Economic Resources at Risk

December 2012

<b>B2 - Agricultural Irrigation Intakes</b>				
<b>Name</b>	<b>Location/Address</b>	<b>Lat/Long</b>	<b>Contact</b>	<b>Phone</b>
No Information				

<b>B3 - Aquaculture</b>				
<b>Name</b>	<b>Location</b>	<b>Company Address</b>	<b>Contact</b>	<b>Phone</b>
Penn Cove Shellfish	Penn Cove	106 Sherman Road Coupeville, WA 98239	Email: <a href="mailto:info@penncoveshellfish.com">info@penncoveshellfish.com</a>	(360) 678-4803
Swinomish Indian Tribal Community	Holmes Harbor, Penn Cove, Saratoga Passage, Similk Bay	11404 Moorage Way La Conner, WA 98257	Web: <a href="http://www.swinomish.org">www.swinomish.org</a>	(360) 446-7200
The Tulalip Tribes	Holmes Harbor, Possession Sound, Saratoga Passage	6406 Marine Drive Tulalip, WA 98271	Web: <a href="http://www.tulaliptribes-nsn.gov">www.tulaliptribes-nsn.gov</a>	(800) 869-8287
Upper Skagit Indian Tribe	Penn Cove, Saratoga Passage, South Skagit Bay	25944 Community Plaza Way Sedro Woolley, WA 98284		(360) 854-7090

<b>B4 - Marinas</b>				
<b>Name</b>	<b>Location/Address</b>	<b>Lat/Long</b>	<b>Contact</b>	<b>Phone</b>
Port of Edmonds	336 Admiral Way Edmonds, WA 98020	<a href="#">N 47.809033 W</a> <a href="#">122.388811</a>	Email: <a href="mailto:info@portofedmonds.org">info@portofedmonds.org</a>	Phone: (425) 775-4588
Port of Everett	1700 W Marine View Drive Everett, WA 98201	<a href="#">N 47.995206 W</a> <a href="#">122.214832</a>	Website: <a href="http://www.portofeverett.com">www.portofeverett.com</a>	Phone: (425) 259-6001

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

December 2012

<b>B4 – Marinas (continued)</b>				
<b>Name</b>	<b>Location/Address</b>	<b>Lat/Long</b>	<b>Contact</b>	<b>Phone</b>
Dagmars Marina	1871 Ross Ave Everett, WA 98201	<a href="#">N 48.014071 W 122.17829</a>	Email: <a href="mailto:dagmarsmarina@clearwire.net">dagmarsmarina@clearwire.net</a> Web: <a href="http://www.dagmarsmarina.com">www.dagmarsmarina.com</a>	Phone: (425) 259-6124
Langley Marina & Boat Launch	228 Wharf St Langley, WA 98260	<a href="#">N 48.038546 W 122.404464</a>	Email: <a href="mailto:harbormaster@portofsouthwhidbey.com">harbormaster@portofsouthwhidbey.com</a>	Phone: (360) 221-1120
Oak Harbor Marina	1401 Catalina Drive Oak Harbor, WA 98277	<a href="#">N 48.286506 W 122.63227</a>	Web: <a href="http://www.oakharbor.org">www.oakharbor.org</a>	Phone: (360) 279-4576
Tulalip Marina	7411 Tulalip Bay Drive Tulalip, WA 98271	<a href="#">N 48.063067 W 122.293711</a>	Web: <a href="http://www.tulaliptribes-nsn.gov">www.tulaliptribes-nsn.gov</a>	Phone: (360) 716-4563

<b>B5 - Commercial Fishing and Shellfish Harvest Areas</b>		
<b>General Area</b>	<b>Location</b> (approximate Lat/Long if available)	<b>Remarks</b>
Entire GRP Area	Dungeness Crab Fishery Region 1 and portions of Regions 2E and 3	<a href="#">Commercial Dungeness Crab Fishery</a>
Entire GRP Area	Area 22A: <a href="#">N 48.408694, W 122.680893</a> Area 23B: <a href="#">N 48.342103, W 122.723465</a> Area 24A: <a href="#">N 48.32156, W 122.485199</a> Area 24B: <a href="#">N 48.141807, W 122.405548</a> Area 24C: <a href="#">N 48.134017, W 122.535324</a> Area 24D: <a href="#">N 48.051464, W 122.528458</a> Area 26AE: <a href="#">N 47.985326, W 122.310104</a>	<a href="#">Commercial fish and shellfish</a> and <a href="#">Commercial Sea Cucumber</a> fisheries
Entire GRP Area	<a href="#">District 6 and District 2</a>	<a href="#">Commercial Sea Urchin</a>

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

December 2012

<b>B5 - Commercial Fishing and Shellfish Harvest Areas (continued)</b>		
<b>General Area</b>	<b>Location (approximate Lat/Long if available)</b>	<b>Remarks</b>
Entire GRP Area	<a href="#">North Puget Sound Region</a> for Commercial Geoduck Fishery	<a href="#">Wild Stock Commercial Geoduck Clam Fishery</a>
Entire GRP Area	Area 6A: <a href="#">N 48.375865, W 122.709732</a> Area 8: <a href="#">N 48.316994, W 122.476959</a> Area 8A: <a href="#">N 48.019324, W 122.312164</a> Area 8D: <a href="#">N 48.060643, W 122.272339</a>	<a href="#">Salmon management and catch reporting areas 6A, 8, 8A, &amp; 8D</a>
Penn Cove	<a href="#">N 48.229704, W 122.695312</a>	Hardshell clams and mussel beds

<b>B6 - Fish Hatcheries (Federal, State, and Private)</b>				
<b>Name</b>	<b>Location/Address</b>	<b>Lat/Long</b>	<b>Contact</b>	<b>Phone</b>
No Information				

<b>B7 - Specially Designated Residential, Commercial, &amp; Industrial Areas</b> (Includes Floating Homes & Live Aboard Marinas)				
<b>Name</b>	<b>Location/Address</b>	<b>Lat/Long</b>	<b>Contact</b>	<b>Phone</b>
Port of Everett	1700 W Marine View Drive Everett, WA 98201	<a href="#">N 47.995206</a> <a href="#">W 122.214832</a>	Web: <a href="http://www.portofeverett.com">www.portofeverett.com</a>	Phone: (425) 259-6001
Oak Harbor Marina	1401 Catalina Drive Oak Harbor, WA 98277	<a href="#">N 48.286506</a> <a href="#">W 122.63227</a>	Web: <a href="http://www.oakharbor.org">www.oakharbor.org</a>	Phone: (360) 279-4576

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

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**C. Water Dependent Recreational Areas**

C1 - Boating Areas		
General Area	Location (approximate Lat/Long if available)	Remarks
Entire GRP Area	North Central Puget Sound	With the exception of waters near naval and port facilities the entire GRP area is available for recreational boating.

C2 – Public Recreation Areas				
Name	Location/Address	Lat/Long	Contact	Phone
Skagit Wildlife Recreation Area	21961 Wylie Road Mt. Vernon, WA 98273	<a href="#">N 48.325755, W122.37658</a>	Belinda Schuster	(360) 445-4441

C3 – Sport Fishing Areas	
Name	General Location/Remarks
Entire GRP Area	Throughout the area Sport fishing occurs seasonally

C4 – Parks & Beaches (National, State, & Local)				
Name	Location/Address	Waterbody (or Area)	Contact	Phone
<a href="#">Cama Beach State Park</a>	1880 S West Camano Drive Camano Island, WA 98282	Camano Island	<a href="mailto:Jeff.Wheeler@parks.wa.gov">Jeff.Wheeler@parks.wa.gov</a>  <a href="mailto:Tom.Riggs@parks.wa.gov">Tom.Riggs@parks.wa.gov</a>	(360) 387-7542 (360) 387-3304 (360) 387-3031
Camano Park	141 E Camano Drive Camano Island	Camano Island		

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

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<b>C4 – Parks &amp; Beaches (Continued)</b> (National, State, & Local)				
<b>Name</b>	<b>Location/Address</b>	<b>Waterbody (or Area)</b>	<b>Contact</b>	<b>Phone</b>
Possession Point State Park	8214 Possession Road Clinton, WA 98236	Clinton	<a href="mailto:Jon.Crimmins@parks.wa.gov">Jon.Crimmins@parks.wa.gov</a>	(360) 678-4519
<a href="#">Camano Island State Park</a>	2269 S. Lowell Point Rd Camano Island, WA 98282	Camano Island	<a href="mailto:Jeff.Wheeler@parks.wa.gov">Jeff.Wheeler@parks.wa.gov</a>  <a href="mailto:Tom.Riggs@parks.wa.gov">Tom.Riggs@parks.wa.gov</a>	(360) 387-7542 (360) 387-3304 (360) 387-3031
Cavalero Beach	1013 Simonsen Place Camano Island	Camano Island		
Elger Bay	South Camano Island	Camano Island		
English Boom	Northern Tip of Camano Island	Camano Island		
Iverson Preserve	3 Iverson Rd Camano Island	Camano Island		
Livingston Bay	Northern Camano Island	Camano Island		
Maple Grove	684 Maple Grove Rd Camano Island	Camano Island		
Tillicum Beach	2947 Tillicum Beach Drive Camano Island	Camano Island		
Utsalady Point	2998 Utsalady Point Rd Camano Island	Camano Island		
Walter G. Hutchinson Park	3227 S. East Camano Drive Camano Island	Camano Island		

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

December 2012

<b>C4 – Parks &amp; Beaches (Continued)</b> (National, State, & Local)				
<b>Name</b>	<b>Location/Address</b>	<b>Waterbody (or Area)</b>	<b>Contact</b>	<b>Phone</b>
Dan Porter Park	7490 Deer Lake Road Clinton, WA 98236	Clinton		
Harborview Park	W Mukilteo Blvd Everett, WA	Everett		
Howarth Park	1127 Olympic Blvd Everett, WA	Everett		(425) 257-8300
10 <sup>th</sup> Street Marine Park	10 <sup>th</sup> Street Everett, WA	Everett		
Jetty Island Park	10 <sup>th</sup> Street Everett, WA  The jetty East of 10 <sup>th</sup> Street Marine Park	Everett		
Freeland Park	East Shoreview Drive Freeland, WA	Freeland		
Greenbank Trails	Greenbank, WA	Greenbank		
Pioneer Park	1200 S 4 <sup>th</sup> St La Conner, WA	La Conner		(360) 466-3125
Phil Simon Park	Wharf Street Langley, WA	Langley		
Seawall Park	First Street Langley, WA	Langley		

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

December 2012

<b>C4 – Parks &amp; Beaches (Continued)</b> (National, State, & Local)				
<b>Name</b>	<b>Location/Address</b>	<b>Waterbody (or Area)</b>	<b>Contact</b>	<b>Phone</b>
Generation Park	Saratoga Rd Langley, WA	Langley		
Saratoga Woods	4228 Saratoga Rd Langley, WA	Langley		
Thomas Hladkey Memorial Park	Anthes Avenue Langley, WA	Langley		
<a href="#">Skagit State Wildlife Recreation Area</a>	Mann Road Mount Vernon, WA	Mount Vernon		
Mukilteo Lighthouse (City of Mukilteo)	609 Front St Mukilteo, WA 98275	Mukilteo		(425) 263-8180
Ala Spit	5050 Geck Rd. Oak Harbor, WA	Oak Harbor		
City Beach Park	Downtown Waterfront Oak Harbor, WA	Oak Harbor		
Cornet Bay Dock	296 Cornet Bay Rd Oak Harbor, WA	Oak Harbor		
Deception Pass State Park	41020 State Route 20 Oak Harbor, WA	Oak Harbor	<a href="#">Jack.Hartt@parks.wa.gov</a>	(360) 675-3767
Mariner's Cove	2200 Mariner Beach Drive Oak Harbor, WA	Oak Harbor		
Monroe Landing	512 Scenic Heights Rd Oak Harbor, WA	Oak Harbor		

**Appendix - 6A (NCPS-GRP)**

List of Economic Resources at Risk

December 2012

<b>C4 – Parks &amp; Beaches (Continued)</b> (National, State, & Local)				
<b>Name</b>	<b>Location/Address</b>	<b>Waterbody (or Area)</b>	<b>Contact</b>	<b>Phone</b>
Hope Island State Park	Only accessible by boat, SW of Deception Pass	Skagit County	<a href="mailto:Jack.Hartt@parks.wa.gov">Jack.Hartt@parks.wa.gov</a>	(360) 675-3767
Skagit Island State Park	Only accessible by boat, W of Deception Pass	Skagit County	<a href="mailto:Jack.Hartt@parks.wa.gov">Jack.Hartt@parks.wa.gov</a>	(360) 675-3767
Kayak Point Park	15610 Marine Drive Stanwood 98292	Stanwood		
Joseph Whidbey State Park	395 North Fort Ebey Rd Coupeville, WA 98239	Whidbey Island		(360) 678-4636
Kettles Trails	Central Whidbey Island	Whidbey Island		

<b>C5 – National Historical Reserve</b>		
<b>General Location</b>	<b>Lat/Long (Approximate Center Point)</b>	<b>Remarks</b>
Whidbey Island, WA	<a href="#">Ebey's Landing National Historical Reserve</a>	17,400 acres surrounding Penn Cove. The town of Coupeville is located within the reserve. See: <a href="http://www.nps.gov/ebla/index.htm">http://www.nps.gov/ebla/index.htm</a> or Call (360) 678-6084

<b>C6 – National River Reach (Designated as Recreational)</b>		
<b>General Location</b>	<b>Lat/Long (Approximate Center Point)</b>	<b>Remarks</b>
No Information		

# North Central Puget Sound

## Geographic Response Plan

### Chapter 7 – Logistics

#### 7.1 Chapter Introduction:

The logistical information contained in this chapter is meant to aid the response community during the initial phase of an oil spill. It may be particularly useful as the initial response transitions into a unified command. The information provided is not and should not be considered the “universe” of everything available to support a response. Additional and more current information may be found in area telephone directories, online resources, newspaper advertisements, and other media sources. The lack of information under certain categories in this chapter does not mean that no logistical resources exist; only that information regarding those resources was not found or verified before updating this chapter. Chapter 5000 of the Northwest Area Contingency Plan (NWACP) also contains valuable logistical information. The NWACP is available online at <http://www.rrt10nwac.com>.

Information on Staging Areas and Boat Launch Locations can be found in Chapter 4 of this plan (see attachments 4B & 4C). Contact information for federal, state, tribal, and local agencies can be found on the “Spill Response Contact Sheet” located near the beginning of this plan. Detailed response resource information can be found on the Western Region Resource List (WRRL). The WRRL is available online at <http://www.wrrl.us>.

We value your comments. To report outdated information, or recommend additional logistical resources, please submit comments using the information provided in Appendix “C” of this plan or online at <http://www.rrt10nwac.com/Comment>.

#### 7.2 List of Logistical Resources:

This chapter contains information on the following logistical resources:

- Aircraft Support - Helicopters & Fixed Wing
- Airports & Air Fields
- Ambulance Services (Air & Ground)
- Boat Cleaning
- Command Posts (Fixed & Mobile)

- Communications
- Cultural Resource Support
- Environmental & Conservation Organizations
- Fire Departments
- Food Services/Catering
- Hospitals & Medical Centers
- Hotels/Motels, Berthing Accommodations
- Marinas, Ports, Docks
- Military Bases/Installations
- Office Equipment Supply & Rental
- Oil Spill Response Contractors
- Outdoor Recreation Groups, Companies, & Organizations
- Park Facilities
- Rental Equipment - Industrial/Commercial
- Response Equipment Cache Locations
- River Guides
- Security Services
- Support Personnel - Local/Emergency
- Transportation
- Tribal Resources
- Wildlife

### 7.3 Logistical Resource Details:

Aircraft Support - Helicopters & Fixed Wing			
City/Location	Name/Information	Address	Contact & Other Information
Darrington	Hi Line Helicopters Inc	47225 Sauk Prairie Rd Darrington, WA 98241	Phone: (360) 436.1302
Everett	Regal Air	10217 31st Ave W # C51 Everett, WA 98204	Phone: (425) 353.9123
Everett	Northway Aviation	10108 32nd Ave West Bldg C-3 Everett, WA 98204	Phone: (425) 742.7003 Email: <a href="mailto:contact@northwayaviation.com">contact@northwayaviation.com</a>
Snohomish	Snohomish Flying Services	9900 Airport Way Snohomish, WA 98296	Phone: (360) 568-1541 Fax: (360) 568-6034 Email: <a href="mailto:snofly1@harveyfield.com">snofly1@harveyfield.com</a>

<b>Airports &amp; Air Fields</b>			
<b>City/Location</b>	<b>Name</b>	<b>Address</b>	<b>Contact &amp; Other Information</b>
Arlington	Arlington Municipal Airport	18204 59 <sup>th</sup> Drive NE Arlington, WA 98223	Phone:(360) 403-3470
Anacortes	Anacortes Airport	100 Commercial Ave Anacortes, WA 98221	Phone: (360) 293-3134
Anacortes	Skyline Seaplane Base Skyline Marine Center	2011 Skyline Way Anacortes, WA 98221	Phone: (360) 293-5134
Camano Island	Camano Island Airfield	1212 Moore Rd Camano Island, WA 98282	Phone:(360) 629-4811
Darrington	Darrington Municipal Airport	Arlington-Darrington Rd Darrington, WA 98241	Phone: (360) 436-1454
Everett	Snohomish County Airport – Paine Field	3220 100th St SW Ste A Everett, WA 98204	Phone: (425) 353-2110
Langley	Whidbey Airpark	S Crawford Road Langley, WA 98260	Phone: (206) 322-2003
Oak Harbor	AJ Eisenburg Airport	1140 Monroe Landing Rd Oak Harbor, WA 98277	Phone: (360) 679-2585
Snohomish	Harvey Airfield	9900 Airport Way Snohomish, WA 98296	Phone:(360) 568-1541

<b>Ambulance Services (Air &amp; Ground)</b>			
<b>City/Location</b>	<b>Company Name</b>	<b>Address</b>	<b>Contact &amp; Other Information</b>
Coupeville	Ambulance Service Whidbey Island	101 N Main St., Coupeville, WA 98239	Phone: (360) 678-5151
Everett	Rural/Metro Ambulance	5810 23 <sup>rd</sup> Drive West, Suite 100 Everett, WA 98203	Phone: (888 ) 991-7555

<b>Boat Cleaning</b>			
City/Location	Name	Address	Contact & Other Information
Edmonds	Port of Edmonds Boat Yard	336 Admiral Way, Edmonds WA 98020	Phone: (425) 775-4588
Everett	Port of Everett Marina	1205 Craftsman Way Everett, WA 98201	Phone: (425) 259-6001

<b>Command Posts (Fixed &amp; Mobile)</b>			
City/Location	Name	Address	Contact & Other Information
No Information			

<b>Communications</b>			
City/Location	Name	Address	Contact & Other Information
No Information			

<b>Cultural Resource Support</b>			
City/Location	Name	Address	Contact & Other Information
Coupeville	Island County Historical Society	908 NW Alexander St. Coupeville, WA 98239	Phone: (360) 678-3310 Web: <a href="http://www.islandhistory.org">www.islandhistory.org</a>
Edmonds	Edmonds-South Snohomish County Historical Society	118 5 <sup>th</sup> Ave N Edmonds, WA 98020	Phone: (425) 774-0900 Email: <a href="mailto:edmondsmuseum118@gmail.com">edmondsmuseum118@gmail.com</a>
Everett	Snohomish County Historical Preservation Commission	3000 Rockefeller MS 411 Everett, WA 98201	Phone: (425) 388-3186 Web: <a href="http://www1.co.snohomish.wa.us">www1.co.snohomish.wa.us</a>
Everett	Everett Maritime Museum	2418 California St. Everett, WA 98201	Phone: (425) 259-2685 <a href="mailto:evtmaritimemuseum@gmail.com">evtmaritimemuseum@gmail.com</a>

<b>Cultural Resource Support</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Olympia	Washington Department of Archaeology & Historic Preservation	1063 S. Capitol Way Suite 106 Olympia, WA 98501	Phone: (360) 586-3065

<b>Environmental &amp; Conservation Organizations</b>			
City/Location	Name	Address	Contact & Other Information
Anacortes	Evergreen Islands	PO Box 223 Anacortes, WA 98221	Phone: (360) 293-8606
Anacortes	Northwest Chinook Recovery	15657 Yokeko Drive Anacortes, WA 98221	Phone: (360) 588-1917 Email: <a href="mailto:nwchinook@wavecable.com">nwchinook@wavecable.com</a>
Coupeville	Island County Marine Resources Committee	101 NE 6 <sup>th</sup> Street Coupeville, WA 98239	Phone: (360) 679-7327 Web: <a href="http://www.islandcountymrc.org">www.islandcountymrc.org</a>
Coupeville	Island County Beach Watchers	PO Box 5000 Coupeville, WA 98239	Phone: (360) 679-7391
Coupeville	Lighthouse Environmental Programs	PO Box 565 Coupeville, WA 98239	Phone: (360) 240-5558 Email: <a href="mailto:lepwashington@gmail.com">lepwashington@gmail.com</a>
Coupeville	Pacific Rim Institute for Environmental Stewardship	180 Parker Rd. Coupeville, WA 98239	Phone: (360) 678-5586 Email: <a href="mailto:mowens@ausable.org">mowens@ausable.org</a>
Everett	Adopt a Stream Foundation	600 128 <sup>th</sup> St. SE Everett, WA 98208	Phone: (425) 316-8592 Email: <a href="mailto:NOSPAMaasf@streamkeeper.org">NOSPAMaasf@streamkeeper.org</a>
Everett	OceanGate Foundation	1111 80 <sup>th</sup> St. SW Everett, WA 98203	Phone: (425) 939-8409 Email: <a href="mailto:Guillermo@oceangatefoundation.org">Guillermo@oceangatefoundation.org</a>
Everett	Salish Sea Habitat	1928 Pucker Avenue Everett, WA 98201	Phone: (425) 259-2685 Email: <a href="mailto:pellegrinisalishseahabitat@gmail.com">pellegrinisalishseahabitat@gmail.com</a>

<b>Environmental &amp; Conservation Organizations</b> (continued)			
<b>City/Location</b>	<b>Name</b>	<b>Address</b>	<b>Contact &amp; Other Information</b>
Everett	Stilly Snohomish Fisheries Enhancement Task Force	PO Box 5006 Everett, WA 98206	Phone: (425) 252-6686 Email: <a href="mailto:salmon@stillysnofish.org">salmon@stillysnofish.org</a>
Freeland	Friends of Freeland	PO Box 861 Freeland, WA 98249	Phone: (360) 331-1224 Web: <a href="http://www.friendsoffreeland.org">www.friendsoffreeland.org</a>
Greenbank	Whidbey Camano Land Trust	765 Wonn Road C-201 Greenbank, WA 98253	Phone: (360) 222-3310 Email: <a href="mailto:info@wclt.org">info@wclt.org</a>
Langley	Whidbey Environmental Action Network	PO Box 53 Langley, WA 98260	Phone: (360) 579-4202 Email: <a href="mailto:wean@whidbey.net">wean@whidbey.net</a>
Langley	Whidbey Watershed Stewards	PO box 617 Langley, WA 98260	Phone: (360) 579-1272 Web: <a href="http://www.whidbeywatersheds.org">www.whidbeywatersheds.org</a>
Marysville	Project SeaWolf Coastal Protection	PO Box 929 Marysville, WA 98270	Phone: (425) 879-4676 Email: <a href="mailto:info@projectseawolf.org">info@projectseawolf.org</a>
Mount Vernon	The Northwest Straits Marine Conservation Foundation	10441 Bayview Edison Road Mount Vernon, WA 98273	Phone: (360) 428-1064 Email: <a href="mailto:price@mwstrats.org">price@mwstrats.org</a>
Mount Vernon	Padilla Bay Foundation	PO Box 1305 Mount Vernon, WA 98273	Phone: (360) 757-3234 Email: <a href="mailto:foundation@padillabay.gov">foundation@padillabay.gov</a>
Mount Vernon	Skagit Fisheries Enhancement Group	PO Box 2497 Mount Vernon, WA 98273	Phone: (360) 336-0172 Web: <a href="http://www.skagitfisheries.org">www.skagitfisheries.org</a>
Oak Harbor	Deception Pass Park Foundation	41020 State Route 20 Oak Harbor, WA 98277	Phone: (360) 675-3767 <a href="mailto:deceptionpassfoundation@gmail.com">deceptionpassfoundation@gmail.com</a>

<b>Environmental &amp; Conservation Organizations</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Seattle	Sierra Club Washington Chapter (Snohomish Group)	180 Nickerson St, Suite 202 Seattle, WA 98109	Phone: (206) 378-0114 Web: <a href="http://cascade.sierraclub.org">cascade.sierraclub.org</a>
Seattle	Pacific Marine Research	PO Box 31137 Seattle, WA 98103	Phone: (206) 361-1919 Email: <a href="mailto:janatpmr@comcast.net">janatpmr@comcast.net</a>
Snohomish	Sustainable Fisheries Foundation	601A Rainier St Snohomish, WA 98290	Phone: (360) 862-1255 Email: <a href="mailto:cleve.stewart@amec.com">cleve.stewart@amec.com</a>
Stanwood	Ducks Unlimited	Stanwood, WA	Email: <a href="mailto:bbolfing@ducks.org">bbolfing@ducks.org</a> Web: <a href="http://www.ducks.org/washington">http://www.ducks.org/washington</a>
Stanwood	Pilchuck Wildlife Services, Inc.	PO Box 625 Stanwood, WA 98292	Phone: (360) 387-8299
Whidbey Island	Central Puget Sound Marine Mammal Stranding Network	Greenbank, WA 98253	Phone: (866) 672-2638 Phone: (360) 661-3739 <a href="http://www.beachwatchers.wsu.edu/island/mmsn">www.beachwatchers.wsu.edu/island/mmsn</a>
Whidbey Island	Orca Network	2403 North Bluff Rd Greenbank, WA 98253	Phone: (866) 672-2638 Phone: (360) 678-3451 Email: <a href="mailto:info@orcانetwork.org">info@orcانetwork.org</a> Web: <a href="http://www.orcanetwork.org">http://www.orcanetwork.org</a>
Whidbey Island	Whidbey Audubon Society	PO Box 1012 Oak Harbor, WA 98277	Phone: (360) 331-4679 Phone: (360) 331-4779 Email: <a href="mailto:cspcoach@aol.com">cspcoach@aol.com</a> Email: <a href="mailto:slb@whidbey.com">slb@whidbey.com</a> Web: <a href="http://whidbeyaudubon.org">http://whidbeyaudubon.org</a>

<b>Fire Departments</b>			
City/Location	Name	Address	Contact & Other Information
Camano Island	Camano Island Fire & Rescue	811 N. Sunrise Blvd Camano Island, WA	Phone: (360) 387-1512
Coupeville	Central Whidbey Island Fire Rescue	Fire Station 53 1164 Race Road Coupeville, WA 98239	Phone: (360) 678-3602 <a href="http://www.cwfire.org">www.cwfire.org</a>

<b>Fire Departments</b> (continued)			
<b>City/Location</b>	<b>Name</b>	<b>Address</b>	<b>Contact &amp; Other Information</b>
Edmonds	Edmonds Fire Department	121 5 <sup>th</sup> Ave Edmonds, WA 98020	Phone: (425) 771-0215
Everett	Everett Fire Department	2811 Oakes Ave Everett, WA 98201	Phone: (425) 257-8100
Freeland	South Whidbey Fire / EMS	5535 Cameron Rd Freeland, WA 98249	Phone: (360) 321-1533
La Conner	La Conner Fire Department	204 Douglas St. La Conner, WA 98257	Phone: (360) 466-3515
Mukilteo	Mukilteo Fire Department	10400 47 <sup>th</sup> Place West Mukilteo, WA 98275	Phone: (425) 348-3591
Oak Harbor	Oak Harbor Fire Department	855 E Whidbey Ave Oak Harbor, WA 98277	Phone: (360) 279-4700
Oak Harbor	North Whidbey Fire & Rescue	2720 Heller Rd Oak Harbor, WA 98277	Phone: (360) 675-1131
Snohomish	Snohomish County Fire Department	1205 SW Lake Roesiger Rd Snohomish, WA 98290	Phone: (360) 568-1954
Stanwood	Stanwood Fire Department	8117 267th St. NW Stanwood, WA 98292	Phone: (360) 629-2184

<b>Food Services/Catering</b>			
<b>City/Location</b>	<b>Name</b>	<b>Address</b>	<b>Contact &amp; Other Information</b>
Coupeville	Serendipity Catering, LLC	PO Box 24 Coupeville, WA 98239	Phone: (360) 678-3807 Email: <a href="mailto:serendipity_catering">@serendipity_catering</a> Email: <a href="mailto:@frontier.com">@frontier.com</a>
Everett	Barry's Catering	1606 Hewitt Ave. Everett, WA 98201	Phone: (425) 252-5036 Email: <a href="mailto:mkbarrycatering@aol.com">mkbarrycatering@aol.com</a>

<b>Food Services/Catering</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Everett	Rose's Classic Catering LLC	3227 Norton Avenue Everett, WA 98201	Phone: (425) 772-2292 Email: <a href="mailto:info@rosesclassiccateringllc.com">info@rosesclassiccateringllc.com</a>
Everett	Red Rock Subs	3514 Broadway Everett, WA 98201	Phone: (425) 252-2786 Email: <a href="mailto:info@redrocksubs.com">info@redrocksubs.com</a>
Everett	Karl's Bakery & Café	2814 Wetmore Avenue Everett, WA 98201	Phone: (425) 252-1774 Email: <a href="mailto:contact@karls-bakery.com">contact@karls-bakery.com</a>
Oak Harbor	BBQ Joint	601 NE Midway Blvd Oak Harbor, WA 98277	Phone: (360) 679-3500 Email: <a href="mailto:thebbqjoint@comcast.net">thebbqjoint@comcast.net</a>

<b>Hospitals &amp; Medical Centers</b>			
City/Location	Facility Name	Address	Contact & Other Information
Arlington	Cascade Valley Hospital	330 S. Stillaguamish Ave Arlington, WA	Phone: (360) 435-2133 Web: <a href="http://www.cascadevalley.org">www.cascadevalley.org</a>
Coupeville	Whidbey General Hospital	101 North Main Street Coupeville, WA 98239-0400	Phone: (360) 678-5151 Phone: (360) 321-5151 Web: <a href="http://www.whidbeygen.com">www.whidbeygen.com</a>
Edmonds	Stevens Hospital	21601 76th Avenue W Edmonds	Phone: (425) 640-4000 Web: <a href="http://www.stevenshealthcare.org">www.stevenshealthcare.org</a>
Everett	Providence General Medical	1321 Colby Everett, WA 98201	Phone: (425) 261-2000 Phone: (425) 261-3000 (ER) Web: <a href="http://www.providence.org">www.providence.org</a>
Oak Harbor	US Naval Hospital	3475 N Saratoga St Oak Harbor, WA 98278	Phone: (360) 257-9500
Stanwood	Stanwood Camano Medical Center	9631 269th St NW Stanwood	Phone: (360) 629-5800

<b>Hotels/Motels, Berthing Accommodations</b>			
City/Location	Facility Name	Address	Contact & Other Information
Everett	Best Inn	1122 Broadway Everett, WA 98201	Phone: (425) 252-8000 Web: <a href="http://www.daysinn.com">www.daysinn.com</a>
Everett	Holiday Inn	3105 Pine St Everett, WA 98201	Phone: (866) 700-1188 Web: <a href="http://www.holidayinn.com">www.holidayinn.com</a>
Everett	Best Western Cascadia Inn	2800 Pacific Ave Everett, WA 98201	Phone: (425) 258-4141 Web: <a href="http://www.bestwestern.com">www.bestwestern.com</a>
Everett	Travelodge Everett City Center	3030 Broadway Everett, WA 98201	Phone: (425) 259-6141 Web: <a href="http://www.travelodge.com">www.travelodge.com</a>
Everett	Inn at Port Gardner	1700 West Marine View Dr Everett, WA 98201	Phone: (425) 252-6779
Oak Harbor	Acorn Motor Inn	31530 State Route 20 Oak Harbor, WA 98277	Phone: (360) 675-6646 Web: <a href="http://www.acornmotorinn.com">www.acornmotorinn.com</a>
Oak Harbor	Queen Ann Motel	450 Southeast Pioneer Way Oak Harbor, WA 98277	Phone: (360) 675-2209 Web: <a href="http://www.queenannmotel.com">www.queenannmotel.com</a>
Oak Harbor	Whidbey Island Navy Lodge	760 E Coral Sea Drive Oak Harbor, WA 98277	Phone: (360) 675-0633 Web: <a href="http://www.navy-lodge.com">www.navy-lodge.com</a>
Oak Harbor	North Whidbey Inn	461 Southeast Midway Blvd Oak Harbor, WA 98277	Phone: (360) 675-5911

<b>Marinas, Ports, Docks</b>			
City/Location	Facility Name	Address	Contact & Other Information
Camano Island	Camano Island State Park Boat Ramp	2269 S Lowell Point Rd Camano Island, WA 98282	Phone: (360) 387-7542 Phone: (360) 387-3304 Phone: (360) 387-3031
Camano Island,	Utsalady Point	2998 Utsalady Pt. Rd. Camano Island, WA	

<b>Marinas, Ports, Docks</b> (continued)			
<b>City/Location</b>	<b>Facility Name</b>	<b>Address</b>	<b>Contact &amp; Other Information</b>
Clinton	Clinton Beach Fishing Pier-Dock	64 South Ferry Dock Rd Clinton, WA 98236	Phone: (360) 331-5494 <a href="mailto:field@portofsouthwhidbey.com">field@portofsouthwhidbey.com</a>
Clinton	Dave Mackie Park Boat Ramp	7490 Maxwellton Rd. Clinton, WA 98236	Phone: N/A
Clinton	Possession Beach Boat Launch	8214 Possession Road Clinton, WA 98236	Phone: (360) 579-2451 <a href="mailto:possessionpt@portofsouthwhidbey.com">possessionpt@portofsouthwhidbey.com</a>
Coupeville	Port of Coupeville Coupeville Wharf and Boating Facility	P.O. Box 577 24 Front Street Coupeville WA 98239	<a href="#">Executive Director</a> : (360) 678-5020 Harbor Master: (360) 678-3625 Web: <a href="http://www.portofcoupeville.org">www.portofcoupeville.org</a>
Everett	10 <sup>th</sup> Street Marina Boat Launch	10 <sup>th</sup> St. & W. Marine View Everett, WA 98201	Phone: (425) 257-8300 Email: <a href="mailto:parks@ci.everett.wa.us">parks@ci.everett.wa.us</a>
Everett	Port of Everett	1700 W Marine View Drive Everett, WA 98201	Phone: (425) 259-6001 Web: <a href="http://www.portofeverett.com">www.portofeverett.com</a>
Freeland	Freeland Park Boat Ramp	East Shoreview Drive Freeland, WA 98249	Phone: N/A
La Conner	Port of Skagit La Conner Marina	613 North 2nd La Conner, WA 98257	Phone: (360) 466-3118
Langley	Langley Marina and Boat Launch	228 Wharf St Langley, WA 98260	Phone: (360) 221-1120 <a href="mailto:harbormaster@portofsouthwhidbey.com">harbormaster@portofsouthwhidbey.com</a>
Mount Vernon	Swinomish Channel Boat Launch (Skagit County Parks)	State Route 20 (under Berentson Bridge)	Phone: (360) 336-9414
Mount Vernon	Blake's Resort Marina & ramp	13739 Rawlins Road Mount Vernon, WA 98273	Phone: (360) 445-6533
Mukilteo	Mukilteo Lighthouse Park Public Boat Launch	609 Front Street Mukilteo, WA 98275	Phone: (425) 263-8180

<b>Marinas, Ports, Docks</b> (continued)			
City/Location	Facility Name	Address	Contact & Other Information
Oak Harbor	Oak Harbor Marina	865 SE Barrington Drive Oak Harbor, WA 98277	Phone: (360) 279-4576
Oak Harbor	Cornet Bay Boat Launch	41020 State Route 20 Oak Harbor, WA 98277	Phone: (360) 675-3767
Stanwood	Kayak Point Park Boat Launch	15610 Marine Drive Stanwood, WA 98292	Phone: (425) 388-6600
Tulalip	Tulalip Marina Launch	Tulalip Bay	Phone: (360) 716-4563

<b>Military Bases / Installations</b>			
City/Location	Installation Name	Nearest Address	Contact & Other Information
Everett	Naval Station Everett	2000 W Marine View Dr Everett, WA 98207-0001	Phone: (425) 304-3000
Oak Harbor	Naval Air Station Whidbey Island		Phone: (360) 257-5641

<b>Office Equipment Supply &amp; Rental</b>			
City/Location	Name	Address	Contact & Other Information
Everett	Everett Office Furniture	2931 Broadway Everett, WA 98201	Phone: (425) 257-3242 <a href="http://www.everettofficefurniture.com">www.everettofficefurniture.com</a>
Everett	Office Interiors and Supplies	2002 Madison Street Everett, WA 98201	Phone: (425) 355-3500 <a href="http://www.officeinteriorsinc.com">www.officeinteriorsinc.com</a>
Everett	Office Depot	10115 Evergreen Way Everett, WA 98201	Phone: (425) 513-0515 <a href="http://www.officedepot.com">www.officedepot.com</a>
Everett	Staples	4920 Evergreen Way S Everett, WA 98201	Phone: (425) 258-2017 <a href="http://www.staples.com">www.staples.com</a>

**Office Equipment Supply & Rental (continued)**

City/Location	Name	Address	Contact & Other Information
Oak Harbor	OfficeMax	775 NE Koetje St. Oak Harbor, WA 98277	Phone: (360) 240-2177 <a href="http://www.officemax.com">www.officemax.com</a>
Oak Harbor	Office Depot	201-a East College Way Oak Harbor, WA 98277	Phone: (360) 416-4979 <a href="http://www.officedepot.com">www.officedepot.com</a>

**Oil Spill Response Contractors**

City/Location	Name	Address	Contact & Other Information
Bellingham	Matrix Service Inc.	3810 Bakerview Spur Bellingham, WA 98226	Phone: (360) 685-2000 Web: <a href="http://www.martixservice.com">www.martixservice.com</a>
Everett	MP Environmental Services, Inc	3400 34 <sup>th</sup> Avenue Everett, WA 98205	Phone: (800) 442-6334 Web: <a href="http://www.mpenviro.com">www.mpenviro.com</a>
Everett	MSRC	Everett, WA	Phone: (425) 252-1300 Phone 2: (800) 645-7745 Web: <a href="http://www.msrg.org">www.msrg.org</a>
Seattle	NRC	Seattle, WA	Phone: (800) 337-7455 Web: <a href="http://www.nrcc.com">www.nrcc.com</a>
Longview	Cowlitz Clean Sweep, Inc	55 International Way Longview, WA 98632	Phone: (888) 423-6316 <a href="http://www.pnecorp.com/ccs.html">www.pnecorp.com/ccs.html</a>
Seattle	Marine Vacuum Services, Inc	1516 South Graham Street Seattle, WA 98124	Phone: (206) 762-0240 Web: <a href="http://www.marinevacuum.com">www.marinevacuum.com</a>
Seattle	Global Diving & Salvage	3840 W Marginal Way SW Seattle, WA 98106	Phone: (206) 623-0621 Web: <a href="http://www.gdiving.com">www.gdiving.com</a>

**Outdoor Recreation Groups, Companies, & Organizations**

City/Location	Name	Address	Contact & Other Information
Coupeville	Island County Beach Watchers	PO Box 5000 Coupeville, WA 98239	Phone: (360) 679-7391

<b>Outdoor Recreation Groups, Companies, &amp; Organizations</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Everett	Everett Mountaineers	PO Box 1848 Everett, WA 98206	<a href="http://www.everettmountaineers.org">www.everettmountaineers.org</a>
Everett	Mosquito Fleet	1724 W Marine View Drive Everett, WA 98201	Phone: (800) 888-2535
Everett	The North Sound Sea Kayaking Association	PO Box 1523 Everett, WA 98206	Phone: (360) 652-5429 <a href="http://www.nsseakayaker.homestead.com">www.nsseakayaker.homestead.com</a>
Langley	Whidbey Island Kayaking Company	201 Wharf Street Langley, WA	Phone: (360) 661-5183 <a href="http://www.whidbeyislandkayaking.com">www.whidbeyislandkayaking.com</a>
Mount Vernon	Skagit Search & Rescue Council	2911 E College Way Mount Vernon, WA 98273	Phone: (360) 428-3250 Email: <a href="mailto:skagitsar@skagitsar.com">skagitsar@skagitsar.com</a>
Mount Vernon	Hole in the Wall Paddling Club	Mount Vernon, WA	<a href="http://www.holeinthewallpaddlingclub.org">www.holeinthewallpaddlingclub.org</a>
Oak Harbor	Northwest Search and Rescue Association	316 SE Pioneer Way #568 Oak Harbor, WA 98277	Phone: (360) 720-2865 Email: <a href="mailto:infor@nwsar.org">infor@nwsar.org</a>
Seattle	Washington Water Trails Association	4649 Sunnyside Ave N #307 Seattle, WA 98103	Phone: (206) 545-9161 Web: <a href="http://www.wwta.org">www.wwta.org</a>

<b>Park Facilities</b>			
City/Location	Name	Address	Contact & Other Information
Camano Island	<a href="#">Cama Beach State Park</a>	1880 S West Camano Drive Camano Island, WA 98282	Phone: (360) 387-7542 Phone: (360) 387-3304 Phone: (360) 387-3031 Email: <a href="mailto:Jeff.Wheeler@parks.wa.gov">Jeff.Wheeler@parks.wa.gov</a> Email: <a href="mailto:Tom.Riggs@parks.wa.gov">Tom.Riggs@parks.wa.gov</a>
Camano Island	Camano Park	141 E Camano Drive Camano Island, WA 98282	

<b>Park Facilities</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Camano Island	<a href="#">Camano Island State Park</a>	2269 S. Lowell Point Rd Camano Island, WA 98282	Phone: (360) 387-7542 Phone: (360) 387-3304 Phone: (360) 387-3031 Email: <a href="mailto:Jeff.Wheeler@parks.wa.gov">Jeff.Wheeler@parks.wa.gov</a> Email: <a href="mailto:Tom.Riggs@parks.wa.gov">Tom.Riggs@parks.wa.gov</a>
Camano Island	Cavalero Beach	1013 Simonson Pl Camano Island, WA 98282	
Camano Island	Elger Bay		South Camano Island
Camano Island	English Boom		Northern Tip of Camano Island
Camano Island	Iverson Preserve	3 Iverson Rd Camano Island, WA	
Camano Island	Livingston Bay		Northern Camano Island
Camano Island	Maple Grove	684 Maple Grove Rd. Camano Island, WA	
Camano Island	Tillicum Beach	2947 Tillicum Beach Dr Camano Island, WA	
Camano Island	Utsalady Point	2998 Utsalady Pt. Rd. Camano Island, WA	
Camano Island	Walter G. Hutchinson Park	3227 S. East Camano Dr Camano Island, WA	
Clinton	Dan Porter Park	7490 Deer Lake Road Clinton, WA 98236	
Clinton	Possession Point State Park	8214 Possession Road Clinton, WA	Phone: (360) 678-4519 Email: <a href="mailto:Jon.Crimmins@parks.wa.gov">Jon.Crimmins@parks.wa.gov</a>
Everett	Harborview Park	W Mukilteo Blvd Everett, WA	
Everett	Howarth Park	1127 Olympic Blvd Everett, WA	Phone: (425) 257-8300
Everett	10th Street Marine Park	10th St. Everett, WA	

<b>Park Facilities</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Everett	Jetty Island Park	The jetty East of 10th Street Marine Park Everett, WA	
Freeland	Freeland Park	East Shoreview Dr Freeland, WA	
Greenbank	Greenbank Trails	Greenbank, WA	
La Conner	Pioneer Park	1200 S 4th St La Conner, WA	Phone: (360) 466-3125
Langley	Phil Simon Park	Wharf Street Langley, WA	
Langley	Seawall Park	First Street Langley, WA	
Langley	Generation Park	Saratoga Rd Langley, WA	
Langley	Saratoga Woods	4228 Saratoga Rd. Langley, WA	
Langley	Thomas Hladkey Memorial Park	Anthes Avenue Langley, WA	
Mount Vernon	Skagit State Wildlife Recreation Area	Mann Rd. Mount Vernon, WA	
Mukilteo	Mukilteo Lighthouse (City of Mukilteo)	609 Front St Mukilteo, WA 98275	Phone: (425) 263-8180
Oak harbor	Ala Spit	5050 Geck Rd. Oak Harbor, WA	
Oak Harbor	City Beach Park	Downtown Waterfront Oak Harbor, WA	
Oak harbor	Cornet Bay Dock	296 Cornet Bay Rd Oak Harbor, WA	
Oak Harbor	Deception Pass State Park	41020 State Route 20 Oak Harbor, WA	Phone: (360) 675-3767 Email: <a href="mailto:Jack.Hartt@parks.wa.gov">Jack.Hartt@parks.wa.gov</a>

<b>Park Facilities</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Oak Harbor	Mariner's Cove	2200 Mariner Beach Drive Oak Harbor, WA	
Oak Harbor	Monroe Landing	512 Scenic Heights Rd. Oak Harbor, WA	
Skagit County	Hope Island State Park	Only accessible by boat, SW of Deception Pass	Phone: (360) 675-3767 Email: <a href="mailto:Jack.Hartt@parks.wa.gov">Jack.Hartt@parks.wa.gov</a>
Skagit County	Skagit Island State Park	Only accessible by boat, W of Deception Pass	Phone: (360) 675-3767 Email: <a href="mailto:Jack.Hartt@parks.wa.gov">Jack.Hartt@parks.wa.gov</a>
Stanwood	Kayak Point Park	15610 Marine Drive Stanwood, WA 98292	
Whidbey Island	Joseph Whidbey State Park	395 North Fort Ebey Rd Coupeville, WA 98239	(360) 678-4636
Whidbey Island	Kettles Trails	Central Whidbey Island	

<b>Rental Equipment - Industrial/Commercial</b>			
City/Location	Name	Address	Contact & Other Information
Anacortes	Island Rentals and Supply	2615 Commercial Ave Anacortes, WA 98221	Phone: (360) 293-3161 <a href="http://www.islandrentalandsupply.com">www.islandrentalandsupply.com</a>
Everett	Total Rental	9217 Evergreen Way Everett, WA 98204	Phone: (425) 353-4102 Web: totalrental1.com
Everett	Hertz Equipment Rental	3516 McDougall Ave Everett, WA 98201	Phone: (425) 303-6900 Web: <a href="http://www.hertzequip.com">www.hertzequip.com</a>
Everett	RSC Equipment Rental	2810 Highland Avenue Everett, WA 98201	Phone: (425) 259-6108 Web: rscrental.com

<b>Rental Equipment - Industrial/Commercial</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Marysville	Ace Equipment Rentals	14904 Smokey Pt Blvd. Marysville, WA 98271	Phone: (360) 568-3900 Web: <a href="http://www.aceequipmentrentals.com">www.aceequipmentrentals.com</a>
Oak Harbor	Double R Rentals	1751 NE Goldie St. #B1 Oak Harbor, WA 98277	Phone: (360) 679-2288 Web: <a href="http://www.doublerrental.com">www.doublerrental.com</a>
Oak Harbor	Jet City Equipment	33345 SR 20 Oak Harbor, WA 98277	Phone: (360) 675-4441 Web: <a href="http://www.jetcityequipment.com">www.jetcityequipment.com</a>

<b>Response Equipment Cache Locations</b>			
City/Location	Equipment	Address	Contact & Other Information
Anacortes	Boom Trailer 800ft 20" Boom	1019 Q Ave Anacortes, WA 98221	Cap Sante Boat Haven (360) 293-0694
Everett	Boom Trailer 1600ft 20" Boom (2x800ft)	1200 13th St. Everett, WA 98201	Port of Everett Marina (425) 259-3164
La Conner	Boom Trailer 1200ft 20" Boom	17353 Reservation Rd, La Conner, WA 98257	Swinomish Tribal Police (360) 466-7237
Marysville	Boom Trailer 800ft 20" Boom	7720 Waterworks Rd., Tulalip, WA 98271	Tulalip Police Department (425) 508-1565
Oak Harbor	400ft 20" Boom	2720 Heller Road, Oak Harbor, WA 98277	North Whidbey Fire & Rescue (360) 675-1131
Oak Harbor	Boom Trailer 800ft 20" Boom	855 E. Whidbey Ave., Oak Harbor, WA 98277	Oak Harbor Fire Department (360) 279-4700

<b>River Guides</b>			
City/Location	Name	Address	Contact & Other Information
No Information			

<b>Security Services</b>			
City/Location	Name	Address	Contact & Other Information
Everett	Whatcom Security Agency	1902 120 <sup>th</sup> PL SE Suite 203 Everett, WA 98208	Phone: (425) 316-8700 Web: <a href="http://www.whatcomsecurity.com">www.whatcomsecurity.com</a>
Nationwide	National Security Services, LLC	Nationwide	Phone: (888) 386-4068 Web: <a href="http://www.GuardsToGo.com">www.GuardsToGo.com</a>
Mount Vernon	Transworld Security Services	1725 East Blackburn Rd Mount Vernon, WA 98274	Phone: (360) 542-4016 <a href="mailto:info-us@transworldsecurity.com">info-us@transworldsecurity.com</a>

<b>Support Personnel - Local/Emergency</b>			
City/Location	Name	Address	Contact & Other Information
Anacortes	Anacortes City Hall	904 6 <sup>th</sup> St. Anacortes, WA 98221	Phone: (360) 299-1950 Email: <a href="mailto:coa.mayor@cityanacortes.org">coa.mayor@cityanacortes.org</a>
Anacortes	Anacortes City Police	1218 24 <sup>th</sup> St. Anacortes, WA 98221	Phone: (360) 293-4684
Coupeville	Island County DEM	Po Box 5000 Coupeville, WA 98239	Phone: (360) 679-7370 Email: <a href="mailto:dem@co.island.wa.us">dem@co.island.wa.us</a>
Coupeville	Island County Sheriff	1 NE 7 <sup>th</sup> St. Coupeville, WA 98239	Phone: (360) 678-4422 <a href="http://www.islandcounty.net/sheriff">www.islandcounty.net/sheriff</a>
Edmonds	Edmonds Police Department	250 5 <sup>th</sup> Ave. N Edmonds, WA 98020	Phone: (425) 771-0200
Everett	Everett City Hall	3002 Wetmore Everett, WA 98201	Phone: (425) 257-8700 Web: <a href="http://www.ci.everett.wa.us">www.ci.everett.wa.us</a>
Everett	Everett City Police	3002 Wetmore Everett, WA 98201	Phone: (425) 257-8400 Email: <a href="mailto:police@ci.everett.wa.us">police@ci.everett.wa.us</a>

<b>Support Personnel - Local/Emergency</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Everett	Snohomish County DEM	3509 109th St. SW Everett, WA 98204	Phone: (425) 388-5060
Everett	Snohomish County Sheriff	3000 Rockefeller Ave. Everett, WA 98201	Phone: (425) 388-3411 Web: <a href="http://sheriff.snoco.org">sheriff.snoco.org</a>
Mount Vernon	Skagit County DEM	2911 E. College Way Suite B Mount Vernon, WA 98273	Phone: (360) 428-3250 Email: <a href="mailto:dem@co.skagit.wa.us">dem@co.skagit.wa.us</a>
Mount Vernon	Skagit County Sheriff	600 South Third St. Mount Vernon, WA 98273	Phone: (360) 336-9450 Email: <a href="mailto:sheriff@co.skagit.wa.us">sheriff@co.skagit.wa.us</a>
Oak Harbor	Oak Harbor Police	860 SE Barrington Drive Oak Harbor, WA 98277	Phone: (360) 279-4600 Email: <a href="mailto:ohpd42@oakharbor.org">ohpd42@oakharbor.org</a>

<b>Transportation</b>			
City/Location	Name	Address	Contact & Other Information
Anacortes	Paraclete Charter Service	2201 Skyline Way Anacortes, WA 98221	Phone: (360) 293-5920
Everett	Lucky Taxi	Everett, WA	Phone: (425) 317-1111
Everett	Farwest Taxi	Everett, WA	Phone: (425) 609-3030 Email: <a href="mailto:tamirak@gmail.com">tamirak@gmail.com</a>
Everett	American Checker Taxi	2803 Maple St Everett, WA 98201	Phone: (425) 259-3333
Everett	Nelson Petroleum	1125 80 <sup>th</sup> St. SW Everett, WA 98203	Phone: (800) 562-9882 Web: <a href="http://www.nelsonpetroleum.com">www.nelsonpetroleum.com</a>
Renton	Shuttle Express	800 SW 16th St. Renton, WA 98057	Phone: (425) 981-7000 Email: <a href="mailto:sales@shuttleexpress.net">sales@shuttleexpress.net</a> Web: <a href="http://www.shuttleexpress.com">www.shuttleexpress.com</a>

<b>Transportation</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Seattle	First Student Charters	2001 W Garfield Street Seattle, WA 98119	Phone: (206) 957-2039
Snohomish	Chinook Charter Services	721 Avenue D, #207 Snohomish, WA 98290	Phone: (425) 259-3262 Email: <a href="mailto:bob@chinookbus.com">bob@chinookbus.com</a> Web: <a href="http://www.chinoobus.com">www.chinoobus.com</a>

<b>Tribal Resources</b>			
City/Location	Name	Address	Contact & Other Information
Arlington	Stillaguamish Tribe of Indians	3310 Smokey Point Dr Arlington, WA 98223	Phone: (360) 652-7362 Web: <a href="http://www.stillaguamish.com">www.stillaguamish.com</a>
Bellingham	Lummi Nation	2616 Kwina Road Bellingham WA 98226	Phone: (360) 384-2298 Web: <a href="http://www.lummi-nsn.gov">www.lummi-nsn.gov</a>
Darrington	Sauk-Suiattle Indian Tribe	5318 Chief Brown Lane Darrington, WA 98241	Phone: (360) 436-1031 Web: <a href="http://www.sauk-suiattle.com">www.sauk-suiattle.com</a>
La Conner	Swinomish Indian Tribal Community	11404 Moorage Way La Conner, WA 98257	Phone: (360) 466-3163 Web: <a href="http://www.swinomish.org">www.swinomish.org</a>
Olympia	Northwest Indian Fisheries Commission	6730 Martin Way E Olympia, WA 98516	Phone: (360) 438-1180 Web: <a href="http://nwifc.org">http://nwifc.org</a>
Sedro Woolley	Upper Skagit Tribe	25944 Community Plaza Way Sedro Woolley, WA 98284	Phone: (360) 854-7090
Suquamish	Suquamish Tribe	18490 Suquamish Way Suquamish, WA 98392	Phone: (360) 598-3311 Web: <a href="http://www.suquamish.nsn.us">www.suquamish.nsn.us</a>
Tulalip	The Tulalip Tribes	6406 Marine Drive Tulalip, WA 98271	Phone: (360) 651-4000 Web: <a href="http://www.tulaliptribes-nsn.gov">www.tulaliptribes-nsn.gov</a>

<b>Tribal Resources</b> (continued)			
City/Location	Name	Address	Contact & Other Information
Sedro Woolley	Upper Skagit Tribe	25944 Community Plaza Way Sedro Woolley, WA 98284	Phone: (360) 854-7090

<b>Wildlife</b>			
City/Location	Name	Address	Contact & Other Information
Anacortes	Focus Wildlife	P.O. Box 944 Anacortes, WA 98221	Phone: (800) 578-3048 Web: <a href="http://www.focuswildlife.net">www.focuswildlife.net</a>
Friday Harbor	Islands' Oil Spill Association (IOSA)	P.O. Box 2316 Friday Harbor, WA 98250	Phone: (360) 378-5322 Web: <a href="http://iosaonline.org">http://iosaonline.org</a>
Astoria, OR	International Bird Rescue	1526 Franklin Avenue Astoria, OR 97103	Phone: (888) 447-1743 Web: <a href="http://www.bird-rescue.org">www.bird-rescue.org</a>
Davis, CA	Oiled Wildlife Care Network	UC Davis Wildlife Health Center TB 128 Old Davis Road Davis, CA 95616	Phone: (530) 752-4167 Email: <a href="mailto:owcn@ucdavis.edu">owcn@ucdavis.edu</a> Web: <a href="http://www.vetmed.ucdavis.edu/owcn">www.vetmed.ucdavis.edu/owcn</a>
Newark, DE	Tri-State Bird Rescue	110 Possum Hollow Rd Newark, Delaware 19711	Phone: (302) 737-9562 Web: <a href="http://www.tristatebird.org">www.tristatebird.org</a>

# Appendix A

## Protection Techniques

**Table A-1: Summary of Protection Techniques for Onshore Areas**

Protection Technique	Description	Minimum Logistical Requirements	Limitations
Beach Berms	A berm is constructed along the top of the mid-intertidal zone from sediments excavated along the downgradient side. The berm should be covered with plastic or geo-textile sheeting to minimize wave erosion.	<ul style="list-style-type: none"> <li>· Bulldozer/Motor Grader (1)</li> <li>· Equipment Operators (1)</li> <li>· Support Personnel/Workers (1)</li> <li>· Plastic or Geotextile Sheeting</li> </ul>	<ul style="list-style-type: none"> <li>· High Wave Energy</li> <li>· Large Tidal Range</li> <li>· Strong Along Shore Currents</li> </ul>
Geotextiles	A roll of geotextile, plastic sheeting, or other impermeable material is spread along the bottom of the supra-tidal zone & fastened to the underlying logs or stakes placed in the ground.	<ul style="list-style-type: none"> <li>· Support Personnel/Workers (5)</li> <li>· Stakes &amp; Tie-Down Cord</li> <li>· Plastic/Geotextiles (3 meter width rolls)</li> </ul>	<ul style="list-style-type: none"> <li>· Low Sloped shoreline</li> <li>· High spring tides</li> <li>· Large storms</li> </ul>
Sorbent Barriers	A barrier is constructed by installing two parallel lines of stakes across a channel, fastening wire mesh to the stakes & filling the space between with loose sorbents.	<p><u>Per 30 Meters of Barrier:</u></p> <ul style="list-style-type: none"> <li>· Support Personnel/Workers (2)</li> <li>· Wire mesh (70 meters x 2 meters)</li> <li>· Sorbents (30 square meters)</li> <li>· Stakes (20)</li> <li>· Fasteners, Support Lines, Stakes</li> </ul>	<ul style="list-style-type: none"> <li>· Waves &gt; 25 cm (~ 9.8")</li> <li>· Currents &gt; 0.5 m/s (~ 1.6ft/s, ~1kt)</li> <li>· Tidal range &gt; 2 meters (~ 6.5ft)</li> </ul>
Inlet Dams	A dam is constructed across the channel using local soil or beach sediments to exclude oil from entering channel	<ul style="list-style-type: none"> <li>· Loader (1)</li> <li>· Equipment Operators (1)</li> <li>· Support Personnel/Workers (1+)</li> <li>· Shovels (1 for each worker)</li> </ul>	<ul style="list-style-type: none"> <li>· Waves &gt; 25 cm (~ 9.8")</li> <li>· Tidal range exceeding dam height</li> <li>· Freshwater Outflow</li> </ul>

Source: R. Miller, Clean Sound Cooperative

**Table A-2: Summary of Protection Techniques for Nearshore Areas**

Protection Technique	Description	Minimum Logistical Requirements	Limitations
Containment Booming	Boom is deployed in a "U" shape in front of the oncoming slick. The ends of the booms are anchored by work boats or drogues. The oil is contained within the "U" & prevented from reaching the shore.	<u>For 150 Meters Slick:</u> <ul style="list-style-type: none"> <li>· Work Boats (2)</li> <li>· Boom - 280 meters (~918ft)</li> <li>· Personnel/Boat Operators (2)</li> <li>· Personnel/Boat Crew (2)</li> <li>· Personnel/Boom Tenders (4)</li> <li>· Tow lines, drogues, connectors</li> </ul>	<ul style="list-style-type: none"> <li>· High winds</li> <li>· Swells &gt; 2 meters (~6.5ft)</li> <li>· Breaking Waves &gt; 50 cm (~19.6")</li> <li>· Currents &gt; 1.0 m/s (~ 3.3ft/s, ~2kts)</li> </ul>
Exclusion Booming	Boom is deployed across or around sensitive areas & anchored in place. Approaching oil is deflected or contained by boom.	<u>Per 300 meters of Boom:</u> <ul style="list-style-type: none"> <li>· Work Boat (1)</li> <li>· Boom - 300 meters (~984ft)</li> <li>· Personnel/Boat Operators (1)</li> <li>· Personnel/Boat Crew (1)</li> <li>· Personnel/Boom Tenders (3)</li> <li>· Anchors (6)</li> <li>· Anchor Lines, Buoys, etc.</li> </ul>	<ul style="list-style-type: none"> <li>· Currents &gt; 0.5 m/s (~ 1.6ft/s, ~1kt)</li> <li>· Breaking waves &gt; 50 cm (~19.6")</li> <li>· Water depth &gt; 20 meters (~65ft)</li> </ul>
Deflection Booming	Boom is deployed from the shoreline away from the approaching slick & anchored or held in place with a work boat. Oil is deflected away from shoreline.	<u>Single Boom</u> (0.75 m/s knot current) (~2.5ft/s) <ul style="list-style-type: none"> <li>· Work Boat (1)</li> <li>· Boom - 60 meters (~197ft)</li> <li>· Personnel/Boat Operators (1)</li> <li>· Personnel/Boat Crew (1)</li> <li>· Personnel/Boom Tenders (3)</li> <li>· Anchors (3)</li> <li>· Anchor Lines, Buoys, Recovery Unit</li> </ul>	<ul style="list-style-type: none"> <li>· Currents &gt; 1.0 m/s (~ 3.3ft/s, ~2kts)</li> <li>· Breaking waves &gt; 50 cm (~19.6")</li> </ul>
Diversion Booming	Boom is deployed from the shoreline at an angle towards the approaching slick & anchored or held in place with a work boat. Oil is diverted towards the shoreline for recovery.	<u>Single Boom</u> (0.75 m/s knot current) (~2.5ft/s) <ul style="list-style-type: none"> <li>· Work Boat (1)</li> <li>· Boom - 60 meters (~197ft)</li> <li>· Personnel/Boat Operators (1)</li> <li>· Personnel/Boat Crew (1)</li> <li>· Personnel/Boom Tenders (3)</li> <li>· Anchors (3)</li> <li>· Anchor Lines, Buoys, Recovery Unit</li> </ul>	<ul style="list-style-type: none"> <li>· Currents &gt; 1.0 m/s (~ 3.3ft/s, ~2kts)</li> <li>· Breaking waves &gt; 50 cm (~19.6")</li> </ul>

**Table A-2: Summary of Protection Techniques for Nearshore Areas (cont.)**

Protection Technique	Description	Minimum Logistical Requirements	Limitations
Skimming	Self-propelled skimmers work back & forth along the leading edge of a windrow to recover the oil. Booms may be deployed from the front of a skimmer in a "V" configuration to increase sweep width. Portable skimmers are placed within containment booms in the area of heaviest oil concentration.	<p><u>Self-propelled</u> (None)</p> <p><u>Towed</u></p> <ul style="list-style-type: none"> <li>· Boom - 200 meters (~656ft)</li> <li>· Work Boats (2)</li> <li>· Personnel/Boat Operators (2)</li> <li>· Personnel/Boat Crew (2)</li> <li>· Personnel/Boom Tenders (4)</li> <li>· Tow Lines, Bridles, Connectors</li> </ul> <p><u>Portable</u></p> <ul style="list-style-type: none"> <li>· Hoses - 30 meters discharge (~98ft)</li> <li>· Oil Storage - 2000 liters (~528 gal)</li> </ul>	<ul style="list-style-type: none"> <li>· High winds</li> <li>· Swells &gt; 2 m (~6.5ft)</li> <li>· Currents &gt; 1.0 m/s (~ 3.3ft/s, ~2kts)</li> <li>· Breaking waves &gt; 50 cm (~19.6")</li> </ul>

Source: R. Miller, Clean Sound Cooperative

**Table A-3: Summary of Protection Techniques for Harbors & Bays**

Where water depth is usually greater than typical boom skirt depth

Description	Tactics
Use river techniques in specific areas. Current speed dependent. Vessel traffic dependent.	Single diversion boom Current < 2 knots use boom skirt of 12 inches if no waves. Current > 2 knots use boom skirt of 6 inches or less if no waves
Currents over 2 knots	Cascade boom • Use short skirts, short boom lengths and sufficient overlap
Currents less than 2 knots and area is large	Encircling
Sufficient room to maneuver	Skimmers
Special conditions	Air and water jets
Isolated areas	Sorbents and pom-poms

Source: "Oil Spill Response in Fast Currents: A Field Guide." US Coast Guard, October 2001

**Table A-4: Summary of Protection Techniques for Rivers & Canals (Non-Tidal)**

Where water depth is greater than typical boom skirt depth and there may be tidal influence, but current always flows in the same direction.

Description	Tactics
Current speed dependent Vessel traffic dependant	Single diversion boom Current < 2 knots: Use boom skirt of 12 inches Current > 2 knots: Use boom skirt of 6 inches or less
Currents over 2 knots	Cascading diversion boom Use short skirts, short boom lengths and sufficient overlap
Collection areas available on both sides	Chevron booms Open for vessel traffic Closed if no traffic
Currents less than 2 knots and river is wide	Single diversion boom Exclusion boom for sensitive areas Encircle and divert to collection area
Sufficient room to maneuver	Skimmers for collection
No vessels available	Boom vane, Flow diverters
Special conditions	Air and water jets
Isolated areas	Sorbents and pom-poms

Source: "Oil Spill Response in Fast Currents: A Field Guide." US Coast Guard, October 2001.

**Table A-5: Summary of Protection Techniques for small Streams, Creeks, & Culverts**

Where water depth is less than boom skirt depth.

Description	Tactics
Dependent upon flow rate	Single diversion for volume greater than about 10 cubic ft/sec
Block for low volume flow	Sealing (Fill, Dams, Weirs)
Design for volume	Overflow / underflow dams
Low flow	Sorbents and pom-poms

Source: "Oil Spill Response in Fast Currents: A Field Guide." US Coast Guard, October 2001.

**Table A-6: Fast Water Booming Techniques  
Current Chip Log and Maximum Boom Deflection Angle**

The table uses the time for floating debris to drift 100 feet. This is accurately determined by anchoring a line with two floating buoy markers attached at a spacing 100 feet apart. Floating

debris is then thrown into the water approximately 20 feet upstream of the first buoy marker. Determine the time it takes the debris to transit the distance between the two marker buoys in seconds. This assumes that the minimum escape velocity under a boom perpendicular to the current (90 degrees) is 1.2 feet per second. The table provides an estimate of the length of boom required for deflecting oil at a specified angle for a 110-foot profile (perpendicular length) to the current. It also provides an estimate of the number of anchors or shoreline tiebacks required for that length of boom assuming anchor points are required every 50 feet.

Time to Drift 100 Feet (seconds)	Velocity (ft/sec)	Max. Boom Deflection Angle (degrees)	Boom for 100 Foot Profile to Current (feet)	Anchors if Placed Every 50 Feet (number)
6	16.7	4.0	1,429	30
8	12.5	5.4	1,071	22
10	10.0	6.7	857	18
12	8.3	8.0	714	15
14	7.1	9.4	612	13
17	5.9	11.4	504	11
20	5.0	13.5	429	10
24	4.2	16.3	357	8
30	3.3	20.5	286	7
40	2.5	27.8	214	5
60	1.7	44.4	143	4
>86	<1.2	90.0	100	3

(1 Knot = 1.16 mile/hr, 6,080 ft/hr, or 1.7 ft/sec)

**Table A-7: Current Drag Force on One-Foot Boom Profile to Current**

The major force exerted on a boom is caused by the water drag on the skirt. Wave forces can increase the drag factor by two to three times depending upon the wave height, period, and loading dynamics. Wind force is less than current and waves, but is also a factor. In high current situations, drag is sometimes increased by water piling up on the boom, causing some submergence and increased drag forces, often resulting in mooring failure. In this situation, the 100-foot section of 4 X 6 diversion boom (4-inch floatation and 6-inch draft) should take the hydrodynamic load. A replacement section 50 feet long can withstand the reduced forces with submerging. The effects of current velocity and boom draft on boom drag force can be seen in the table. Drag increases with draft in a linear fashion, while current increased drag more dramatically (to the square of the velocity).

Velocity (ft/sec)	Boom Drag Force (pounds)			
	Draft 0.5 Feet	Draft 1.0 Feet	Draft 1.5 Feet	Draft 2.0 Feet
0.8	0.7	1.3	2.0	2.7
1.7	2.7	5.3	8.0	10.7
2.5	6.0	12.0	18.0	24.0
3.4	10.7	21.3	32.0	42.6
4.2	16.7	33.3	50.0	66.6
5.1	24.0	48.0	72.0	95.9
5.9	32.6	65.3	97.9	130.6
6.8	42.6	85.3	127.9	170.6
7.6	54.0	107.9	161.9	215.9
8.4	66.6	133.3	199.9	266.5
9.3	80.6	161.2	241.8	322.5
10.1	95.9	191.9	287.8	383.8
11.0	112.6	225.2	337.8	450.4
11.8	130.6	261.2	391.8	522.3
12.7	149.9	299.8	449.7	599.6
13.5	170.6	341.1	511.7	682.2

**Table A-8: Approximate Safe Working Loads/Tensile Strength of New Rope**

Rope Diameter (inches)	Manila No. 1 (3 strand) (pounds)	Nylon (3-strand) (pounds)	Polyester (3-strand) (pounds)
5/16	200 / 1,000	500 / 2,500	500 / 2,500
3/8	270 / 1,350	700 / 3,500	700 / 3,500
7/16		1,140 / 5,700	
1/2	530 / 2,650	1,250 / 6,250	1,200 / 6,000
5/8	880 / 4,400	2,100 / 10,500	1,950 / 9,750
3/4	1,080 / 5,400	2,750 / 5,400	2,300 / 11,500

Towing load can be significant when a boom is anchored on one end and pulled against the current. Boats must have sufficient horsepower and be properly rigged to tow. Lines must be

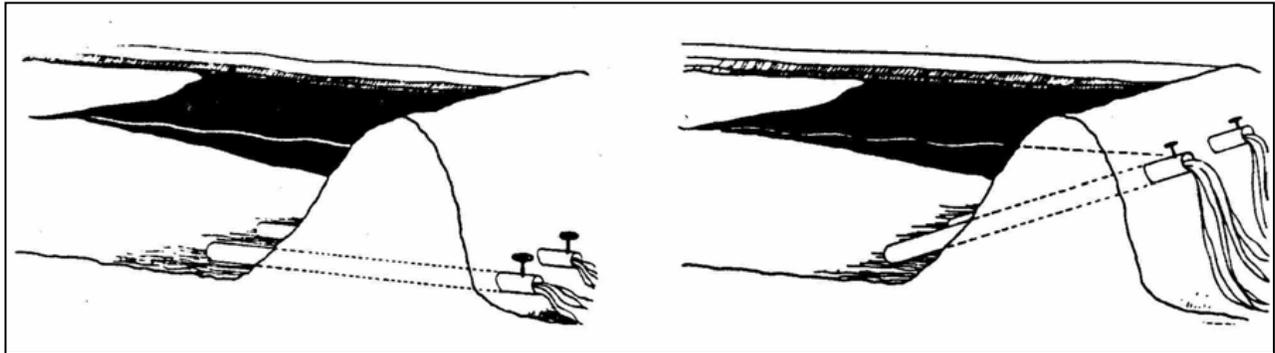
capable of withstanding the forces and the boom must have a tension member capable of high loads. If the boom is extended behind the tow boat and pulled free in the current, there is only the frictional drag along the boom. Because this drag is a function of the boat speed, proper motor size becomes a function of boom size and length, boat size, and water velocity. Although free towing drag is low, when one end of the boom is anchored to the shore, a small boat may be incapable of positioning the boom because of the high current drag exerted on the boom. The boom must be able to withstand the forces. The tension member must not become detached from the boom due to differential expansion.

Attempting to moor a boom in a straight line across a current (90 degrees) is not recommended. The result is a sag in the boom that will trap free floating oil at a point inaccessible to the shore. In swift currents, the resulting forces on moorings can cause large lines of break and present possible safety hazards. The current can be so swift that the boom may dip and become completely or partially submerged. If this happens, the boom's position should be adjusted. The total force on the mooring points will be a combination of the forces caused by current, wind, and waves.

Boom positioning is an important point. The first step is to decide where the boom should be located. It is likely that the boom will be placed on an angle to the current; therefore, the prime concern becomes the location of the upstream end. If the selected upstream location is inaccessible, a spot further upstream can be used for access and the boat and boom allowed to drift to the selected mooring site. The boom can be secured to trees, stakes, anchors, or other solid objects. Do not attach boom to vehicles of any type or size.

### **Figure A-1: Underflow Dams**

Dams can be built in shallow rivers, culverts, and inlets using hand tools or heavy machinery, as available. Pipes are used to form an underflow dam to allow water passage out while oil stays behind, as seen in first figure below. The inlet of the pipe is cut at an angle to permit a larger entrance area for the water in order to reduce the inlet velocities and the possibility of oil drawdown due to formation of vortices. Caution should be taken to prevent whirlpools from forming and pulling the oil down. Face the cut pipe opening down (or insert a 90 degree angle) to help eliminate this. This technique is effective for water bodies less than two feet deep where flow volume can be accommodated by pipe flow. This method can also be used in deep, narrow culverts.



Earth underflow dam (DOWCAR 1997).



Sandbag underflow dam

Figure A-2: Culvert block

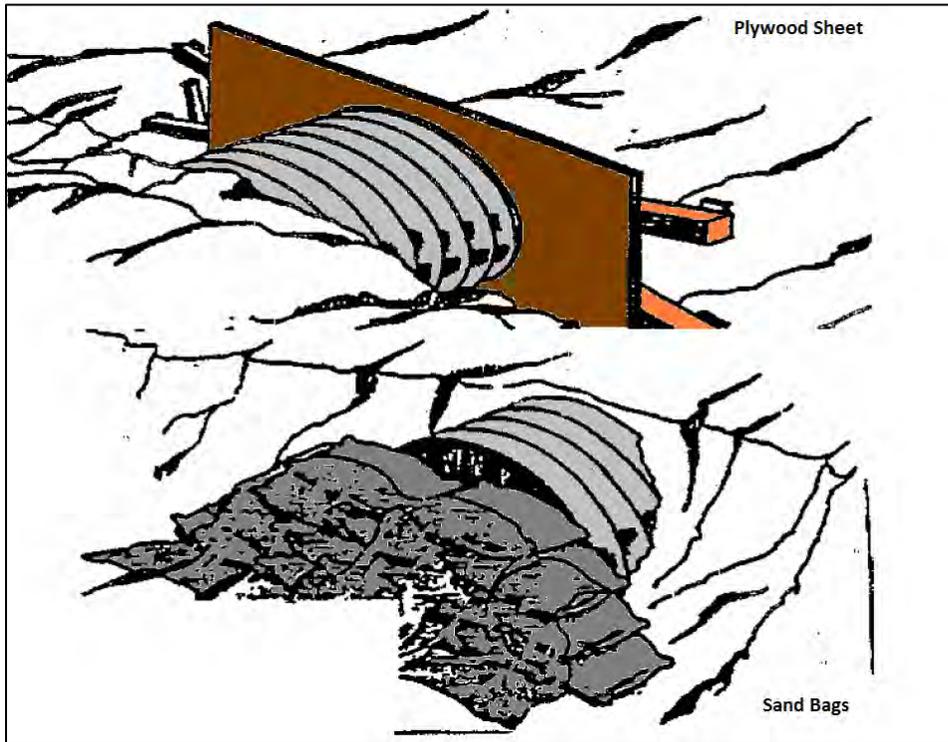
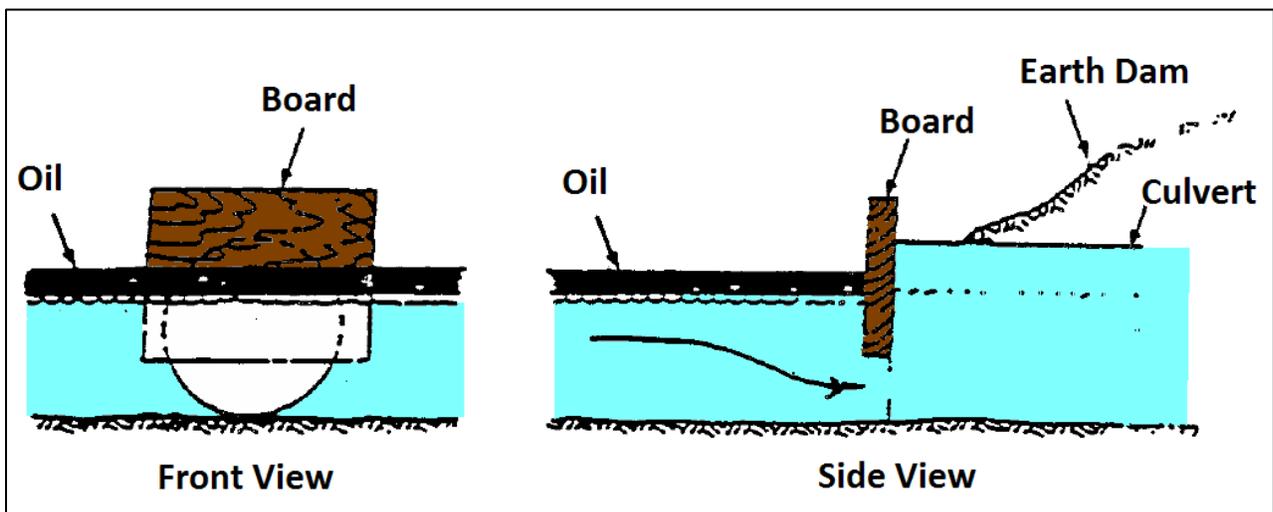


Figure A-3: Culvert weir



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## Appendix B

### North Central Puget Sound Geographic Response Plan

#### Original Contributors

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Harry Hutchins

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Scott Paper

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Shell Oil Company

Gary Putnam

# Appendix C

## Geographic Response Plan

### Comments, Corrections, or Suggestions

We value your input and hope that you'll submit comments on how this plan might be improved. If you have any questions or comments, suggestions for improvement, or find errors in this document please submit comments online at <http://www.rrt10nwac.com/Comment>, email them to us at [GRPs@ecy.wa.gov](mailto:GRPs@ecy.wa.gov), or forward them via U.S. Mail to the following agencies:

United States Coast Guard  
Sector Puget Sound  
Incident Management Division  
1519 Alaskan Way S., Bldg. 1  
Seattle, WA 98134-1192

Washington State Department of Ecology  
Spill Prevention, Preparedness, and Response (GRPs)  
P.O. Box 47600  
Olympia, WA 98504-7600  
(360) 407-7202

The form on the following page of this attachment can be used to submit comments by mail. Contact information is requested so that we can give you a call if more information or comment clarification is needed.

Please use the GRP Field Report Form for providing information on GRP strategy field visits or the testing of response strategies. The form is available online at <http://www.ecy.wa.gov/programs/spills/preparedness/GRP/Form-GRPFieldReport.pdf>. Additional information on Geographic Response Plans is available at <http://www.rrt10nwac.com/GRP>.

# GRP Comment Form

**Mail Completed Form to:**

United States Coast Guard  
Sector Puget Sound  
Incident Management Division  
1519 Alaskan Way S., Bldg. 1  
Seattle, WA 98134-1192

Washington State Department of Ecology  
Spills Program (GRPs)  
P.O. Box 47600  
Olympia, WA 98504-7600

Today's Date: \_\_\_\_\_

Your Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company/Agency: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

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GRP Page Number: \_\_\_\_\_ Section or Paragraph: \_\_\_\_\_

Comment(s): \_\_\_\_\_

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