



Winter 2017

Environmental impact assessment: Cherry Point Aquatic Reserve addition

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Environmental Impact Assessment:

Cherry Point Aquatic Reserve Addition

ESCI 493 – Spring 2017
Western Washington University
Huxley College of the Environment



Environmental Impact Assessment
Huxley College of the Environment

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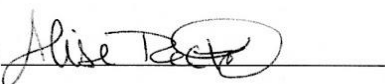
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Brandon Nichols

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Neha Malhan

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Alise Rector

Date 3/13/17

Dear Concerned Citizen,

The following document details the potential environmental effects associated with incorporating a 45-acre cutout into the existing Cherry Point Aquatic Reserve outside of Bellingham, Washington. This document – an Environmental Impact Assessment (EIA) for the proposed addition – was prepared as a requirement for a capstone Environmental Studies course under the supervision of Dr. Leo Bodensteiner. The EIA complies with the procedures outlined in the State Environmental Policy Act (SEPA) (WAC 197-11) and can serve as an informational tool for students, researchers, and community members.

The Cherry Point Aquatic Reserve is a roughly 227-acre cutout that is publicly owned and managed by the Washington State Department of Natural Resources (DNR). In September 2016, the Lummi Nation asked the Department to consider adding 45 acres to the reserve that had been previously set aside for the proposed Gateway Pacific Terminal Project (GPT). This EIA examines the environmental impacts of the Lummi Nation's proposal as well as the impacts of "alternative" and "no action" proposals.

The goal of this EIA is to describe the potential impacts and mitigation techniques relevant to the three proposals in order to identify a recommended course of action. Comments and suggestions for improvement are welcomed. Thank you for your interest in this Environmental Impact Assessment and the Cherry Point Aquatic Reserve.

Sincerely,

Patrick Eckroth, Rose Howe, Neha Malhan, Brandon Nichols, and Alise Rector
Cherry Point Aquatic Reserve Environmental Impact Assessment Team
Western Washington University



Environmental Impact Assessment: Cherry Point Aquatic Reserve Addition

Bellingham, WA

Prepared for:

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Environmental Science 493
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DISCLAIMER

This report represents a class project that was carried out by students of Western Washington University, Huxley College of the Environment. It has not been undertaken at the request of any persons representing local governments or private individuals, nor does it necessarily represent the opinion or position of individuals from government or the private sector.

Fact Sheet

Project Title

Environmental Impact Assessment: Cherry Point Aquatic Reserve Addition

Description of Project

The goal of this project is to identify how adding a 45-acre cutout to the Cherry Point Aquatic Reserve will impact the local environment. The impacts of two other potential proposals - an alternative and a no action proposal - are also examined. This report will describe all major environmental impacts associated with each of the three different actions. The recommended or preferred action will be determined by analyzing the cumulative impacts from each action. Ultimately, this document can serve as a tool for policymakers as well as students, researchers, and the public.

Legal description of location

The proposed site lies within the existing Cherry Point Aquatic Reserve. It is a 45-acre cutout that is considered ideal for the industrial development of a deepwater shipping port because it has a distinct bathymetry that will require no additional dredging, as natural depths of approximately 70 feet are met within a few hundred meters of the shoreline. The reserve itself stretches from the northern edge of the Lummi Reservation to Point Whitehorn, just south of Birch Bay. It is located in the Strait of Georgia.

Proposer

Huxley College of the Environment, Environmental Impact Assessment, Winter 2017

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Permits

Department of Natural Resources

State Commissioner of Public Lands

Lummi Nation and Nooksack Indian Tribe Permissions

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Neha Malhan: Cover Page, Title Page, Fact Sheet, Editing, Animals, & Transportation

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Acknowledgments

We will like to thank the following people for their contributions and guidance:

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- Patrick Kennedy, Bellingham REI Market Coordinator, REI

Issue Date

March 13th, 2017

Public Hearing

3:15 PM; Thursday, March 9, 2017
REI Conference Room
400 36th St.
Bellingham, WA 98225

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Glossary of Technical Terms

Adjacent: lying near, close, or contiguous; adjoining; neighboring

Acceptable Source Impact Levels: administrative screening levels for project assessment; based on estimates for possible risk of the additional incidence of cancer in a population from increased exposure to a given contaminant

Autotroph: an organism capable of making nutritive organic molecules from inorganic sources via photosynthesis

Ballast Water: fresh or salt water, sometimes containing sediments, held in tanks and cargo holds of ships to increase stability and maneuverability during transit

Bathymetry: the measurement of depth of water in oceans, seas, or lakes

Bioaccumulation: refers to the accumulation of substances, such as pesticides or other organic chemicals, in an organism

Biomagnification: a process in which chemical substances become more concentrated at each higher trophic level. Chemical substances that biomagnify tend to be difficult to remove from animal and plant tissues

Carbon Monoxide (CO): a colorless, odorless gas emitted from fossil fuel combustion that can be harmful when inhaled in large amounts

Cetacean: referring to the taxonomic order *Cetacea* which includes whales, porpoises and dolphins

Crude Oil: unrefined petroleum oil

Diesel Particulate Matter (DPM): potentially toxic fine particulate matter generated by the combustion of diesel fuels that results directly from emissions as well as through atmospheric mixing

Dredging: the removal of bed material using machinery other than hand-held tools (WAC 220-110-020)

Emissions: the production and discharge of something, especially gas or radiation

Erosion: the process of eroding or being eroded by wind, water, or other natural agents

Feeder Bluffs: an eroding coastal bluff that delivers a significant volume of sediment to a beach over an extended period of time (Washington Department of Ecology 2014)

Groundwater discharge area: the zone in which groundwater leaves the ground either as a spring or into a water body

Haul-out: behavior associated with pinnipeds temporarily leaving the water between periods of feeding. Required for the performance of activities such as resting, mating and rearing young

Herbaceous: a plant that has leaves and stems that die down at the end of the growing season to the soil level. They have no persistent woody stem above ground. Herbaceous plants may be annuals, biennials or perennials

Infiltration: the process by which water on the ground surface enters the soil

Maritime: an adjective that describes objects or activities related to the sea

Nitrogen Oxides (NO_x): Nitrogen oxides represent a group of harmful gases that are composed of nitrogen and oxygen, including Nitrogen Dioxide (NO₂), Nitric Oxide (NO), and other less prominent gases. NO₂ is the most prominent of these pollutants and is therefore used as an indicator for the larger NO_x category under the NAAQS established in the CAA

Particulate matter: complex mixture of extremely small solid particles and liquid droplets that become suspended in air and water; can include particles such as dust, dirt, soot, and smoke as well as toxic air pollutants

Petroleum Oil: a liquid mixture of hydrocarbons that is present in certain rock strata and can be extracted and refined to produce fuels including gasoline, kerosene, and diesel oil

Pinniped: referring to the taxonomic suborder *Pinnipedia*. Includes families *Phocidae* (seals), *Otaridae* (sea lions) and *Odobenidae* (walrus). Animals in this group have fin-like flippers

Riparian: the interface between land and a river or stream

Salmonid: any fish of the family *Salmonidae*, which includes the salmon, trout, grayling, and whitefish

Sulfur Dioxide (SO₂): Sulfur Dioxide is a colorless, corrosive and toxic gas that is regulated under the NAAQS and used as an indicator for the larger group of harmful Sulfur Oxides (SO_x) that are produced by burning fuels containing sulfur and other industrial process

Surface water: all lakes, rivers, ponds, wetlands, streams, inland waters, salt waters and all other surface water and surface water courses within the jurisdiction of the state of Washington (WAC 173- 350-100)

Topography: a field of planetary science comprising the study of surface shape and features of the Earth and other observable astronomical objects including planets, moons, and asteroids. It is also the description of such surface shapes and features

Toxic Air Pollutants: components of air pollution that are known or suspected to be toxic and directly harmful to human health based on their chemistry and potential to cause cancer or other detrimental health effects

Treaty of Point Elliott (1855): Signed on January 22, 1855 at Point Elliott (near Mukilteo, Washington) created a Government-to-Government relationship between the United States and the Native Tribes of Washington including: the Dwamish, Suquamish, Sk-kahl-mish, Sam-ahmish, Smalh-kamish, Skopeahmish, St-kah-mish, Snoqualmoo, Skai-wha-mish, N'Quentl-ma-mish, Sk-tah-le-jum, Stoluck-wha-mish, Sno-ho-mish, Skagit, Kik-i-allus, Swin-a-mish, Squin-ah-mish, Sah-ku-mehu, Noo-wha-ha, Nook-wa-chahmish, Mee-see-qua-guilch, and Cho-bah-ah-bish. The United States Senate ratified the Point Elliott Treaty in 1859. The Point Elliott Treaty guaranteed hunting and fishing rights and reservations to all Tribes represented by the Native signers. In return for the reservation and other benefits promised in the treaty by the United States government, the Duwamish Tribe exchanged over 54,000 acres of their homeland. Today those 54,000 acres include the cities of Seattle, Renton, Tukwila, Bellevue, and Mercer Island, and much of King County

Tropospheric: occurring in the lowest layer of the Earth's atmosphere, where nearly all weather and moisture occurs

Vegetation: a general term for the plant life of a region; it refers to the ground cover provided by plants. It is a general term, without specific reference to particular taxa, life forms, structure, spatial extent, or any other specific botanical or geographic characteristics

Washington Natural Heritage Program: the WNHP manages site-specific and species/ecosystem specific information on priority species and ecosystems; those that are rare or have very limited distribution

Water Column: the vertical expanse of water lying between the surface of a body of water and the floor directly below it, excluding the actual surface and the floor

Wetlands (Palustrine and forested shrub wetlands): those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of

vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (WAC 173-22-030)

Acronyms and Abbreviations

ASIL: Acceptable Source Impact Level

BPA: Bonneville Power Administration

BP: British Petroleum

CPEARMP: Cherry Point Environmental Aquatic Reserve Management Plan

DNR: Washington State Department of Natural Resource

DPM: Diesel Particulate Matter

DPS: Distinct Population Segment

EIA: Environmental Impact Assessment

ESA: Endangered Species Act

ESU: Evolutionary Significant Act

GPT: Gateway Pacific Terminal

kV: kilovolt

MESA: Marine EcoSystems Analysis

MMPA: Marine Mammal Protection Act

MWh: MegaWatt-hour

NAAQS: National Ambient Air Quality Standards

NMFS: National Marine Fisheries Service

NOAA: National Oceanic and Atmospheric Administration

NWCAA: Northwest Clean Air Agency

OFM: Washington State Office of Financial Management

PSE: Puget Sound Energy

RCW: Revised Code of Washington

SAV: Subaquatic Vegetation

SEPA: State Environmental Protection Act

SRKW: Southern Resident Killer Whale

TAC: Technical Advisory Committee

TAPs: Toxic Air Pollutants

TRT: Technical Recovery Team

UGA: Urban Growth Area

EPA: Environmental Protection Agency

USFWS: U.S. Fish and Wildlife Service

WAC: Washington Administrative Code

WDFW: Washington Department of Fish and Wildlife

WRIA: Water Resource Inventory Area

1. Executive Summary

1.1 Purpose

The purpose of this Environmental Impact Assessment (EIA) is to identify how adding a 45-acre cutout to the Cherry Point Aquatic Reserve will impact the local environment. The impacts of two other potential proposals - an alternative and a no action proposal - are also examined. The goal of this EIA is to describe all major environmental impacts associated with each of the three different actions. The recommended or preferred action will be determined by the analysis in this EIA. Ultimately, this document can serve as a tool for policymakers as well as students, researchers, and the public.

1.2 Site Description

The proposed site lies within the existing Cherry Point Aquatic Reserve in Whatcom County, Washington. It is a 45-acre cutout that is considered ideal for the industrial development of a deepwater shipping port because it has a distinct bathymetry that will require no additional dredging, as natural depths of approximately 70 feet are met within several hundred feet of the shoreline. The reserve itself stretches from the northern edge of the Lummi Reservation to Point Whitehorn, just south of Birch Bay. It is located in the Strait of Georgia.

The shoreline consists of mostly flat upland with coarse sand, large cobble, and gravel beaches. Bluffs line the shoreline and are used to feed the development of the beaches. As they are eroded away, sediment is carried along the shoreline and deposited giving the local beaches their distinctive rough, cobbled look.

1.3 Description of Proposed Action and Alternatives

Proposed Action

The current 227-acre Cherry Point Aquatic Reserve does not include the 45-acre cutout located directly south of the British Petroleum (BP) Refinery pier (Figure 1). The proposed action will place that 45-acre cutout into the aquatic reserve and under the current Cherry Point Aquatic Reserve Management Plan. This will place it under management of the Department of Natural Resources (DNR).

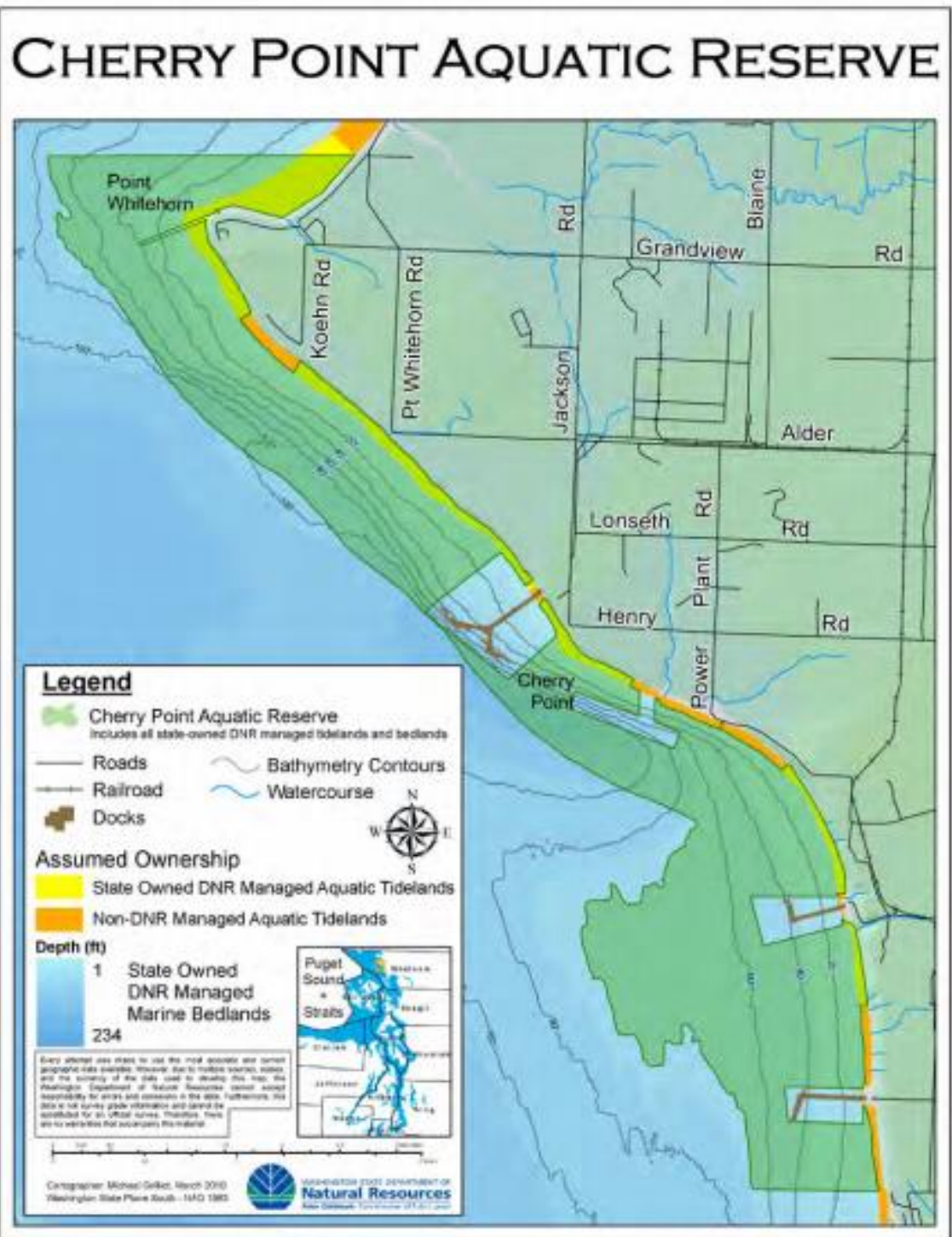


Figure 1. Map of current Cherry Point Aquatic Reserve boundaries including cutouts.

Alternative Action

The alternative action plan will place the 45-acre cutout into the aquatic reserve but with increased protections that are not included in the original management plan. The restrictions will prohibit non-tribal entities from fishing and recreating within the site. By only allowing tribal entities to fish and recreate in the cutout, the alternative action plan accomplishes both the original goal of the proposed action and further protects the environment.

No Action Alternative

Under no action alternative, the 45-acre cutout will not be included in the Cherry Point Aquatic Reserve. This plan leaves the cutout vulnerable to future development such as the Gateway Pacific Terminal (GPT) as it was intended for previously. The cutout will be without the protections granted to the aquatic reserve surrounding it.

1.4 Permits and Approvals

The proposed action of expanding the boundaries of the Cherry Point Aquatic Reserve to include the 45-acre cutout will require permits and approvals by the DNR and the Lummi Nation. RCW 79.68.060 provides the Washington DNR with the authority to “identify and withdraw from conflicting use at such times and for such periods as it shall determine appropriate, limited acreage of public lands under their jurisdiction.” Additionally, RCW 79.90.460(3) allows DNR to consider the natural values such as wildlife habitat, natural area preserve, representative ecosystem, or spawning areas in issuing any initial lease or authorizing any changes in use of state-owned aquatic lands. Due to the delegation of this authority by the state legislature, DNR and the State Commissioner of Public Lands will have the primary responsibility for approval of this reserve boundary expansion. In addition, since this Cherry Point shoreline area is included in the Lummi Nation’s legally adjudicated usual and accustomed fishing and gathering grounds, support from their tribal government will be necessary to ensure federal treaties and statutes are not illegally abrogated.

1.5 Decision Matrix

This matrix shows a quantitate tally between negative and positive impacts involved with three possible actions for the 45-acre cutout. The final sum will be considered while choosing the outcome of this environmental impact assessment.

+ = Positive Impact - = Negative Impact 0 = No Significant Impact

<i>Natural Environment</i>	Proposed Action	Alternative Action	No Action
Earth			
Soils	0	0	-
Topography	0	0	-
Erosion	0	0	-
Air			
Air Quality	0	0	-
Water			
Surface Water	0	0	-
Runoff/Absorption	0	0	-
Plants & Animals			
Habitat/Diversity	+	+	-
Unique Species	+	+	-
Migration Routes	+	+	-
Energy & Natural Resources	0	0	-

<i>Built Environment</i>	Proposed Action	Alternative Action	No Action
Land & Shoreline Use			
Existing Land Use	+	-	0
Aesthetics	+	+	-
Recreation	0	+	-
Historical & Cultural Preservation	+	+	-
Transportation			
Waterborne Traffic	0	+	-
Movement/Circulation of Goods	0	0	-
Utilities	0	0	0
Total	6	6	-15

1.6 Recommendation

After assessing all of the probable impacts to the natural and built environments as addressed in this report, our team of environmental specialists has found the proposed action to be the best course of action for Whatcom County. In this alternative, the 45-acre cutout will be added to the existing reserve and regulated under the current management plan by the Department of Natural Resources. As summarized in section 1.5, Decision Matrix, the proposed and alternative action plans have the most positive impact on the environment. The Alternative Action plan will place the 45-acre parcel under a distinct management scheme from the rest of the 227-acre reserve and therefore impact existing resources and personnel. The proposed action plan is the best option as it is favorable to have a consistent management plan throughout the entire reserve and positive environmental impact.

1.7 Introduction to Elements of the Environment

Presented below is the core of the environmental assessment for the Cherry Point Aquatic Reserve addition based on the Elements of the Environment as stated in the State Environmental Policy Act (WAC 197-11). The following two sections – Elements of the Natural Environment and Elements of the Built Environment – contain information and analyses about potential impacts of the three possible actions. The elements of the natural and built environment to be reviewed are listed under WAC 197.11.444. Some elements were excluded from review following meetings with Dr. Leo Bodensteiner, the assessment team, and other parties associated with preparing this document. The unassessed elements were considered either not directly applicable to the site or not significantly harmful to the environment.

Overall, the elements of the Natural Environment section includes all major categories of natural elements: Earth, Air, Water, Planets and Animals, and Energy and Natural Resources. However, select subsections within each category were excluded from review by this EIA. Most of the subsections excluded from review were dismissed due to the non-project nature of the proposed and alternative actions. No construction or development is planned under these two proposals; the two actions are primarily just legal boundary changes. Thus, the subsections for “geology”, “unique physical features”, “odor”, “climate”, “flood”, “groundwater movement/quantity/quality”, and “public water supplies” were not included in the EIA analysis because there were no expected environmental impacts to these subsections under the boundary extensions proposed by either the proposed or alternative actions. Two subsections, “conservations and renewable resources” and “scenic resources”, were also excluded from review under Energy and Natural Resources. The impacts to these areas are addressed in Aesthetics section of the EIA. Table 2, found in the appendix, displays what Elements of the Natural Environment subsections have been included and excluded from EIA review.

For the elements of the Built Environment, all of Environmental Health was excluded (Noise, Risk of Explosion, Releases or Potential releases to the environment affecting public health such as toxic or hazardous materials), parts of Land and Shoreline use (Housing, Light and Glare, and Agricultural crops), parts of Transportation (Transportation Systems, Vehicular Traffic, Parking, and Traffic Hazards), and parts of Public Services and Utilities (Fire, Police, Schools, Parks or other recreational facilities, Maintenance, Communication, Sewer or Solid Waste, and other Governmental Services or Utilities). Housing was not included because there is no housing within a one-mile radius of the proposed site. Light and glare will have no significant impact on the proposed site. Agricultural crops were excluded because the land is not used for agriculture but for heavy industry. The Transportation elements section was excluded because this area is unaffected by Transportation Systems, Vehicular Traffic, Parking or Traffic Hazards. The addition to the reserve also does not increase the necessity for Public Services and Utilities such as Fire, Police, Schools, Parks or other recreational facilities, Maintenance, Communication, Sewer or Solid Waste, and other Government services and Utilities. Thus, the following sections contain information about the impacts most likely to affect the environment of Cherry Point.

2. Elements of the Natural Environment

2.1 Earth

Existing Conditions

The 45-acre cutout is located within the existing Cherry Point Aquatic Reserve boundaries, which extend northward to Point Whitehorn and Birch Bay and southward to the northern border of Lummi Indian Nation Reservation (Figure 2). The reserve lies within the Strait of Georgia, a basin characterized by its complex glacial history. The most recent glacial ice sheets advanced between 15,000 and 13,000 years ago. The ice sheet that extended over this region is known as the "Vashon Advance". The presence of the Vashon Advance is reflected today in the steep bathymetric gradient located directly offshore of Cherry Point which was created by sub-glacial meltwater and ice sheet scour. The slope just offshore of the 45-acre site is steep, reaching depths of over 70 feet within a few hundred yards. The Vashon Advance brought with it loads of sediment and debris that were later deposited as the glacier melted. Large bluffs began to take their current form around 5,000 years ago, as the earth's crust rebounded and stabilized from the pressure of the ice sheet.

The upper portion of the beach is made up of various sized boulders mixed with cobble, gravel and sand. The low tide terrace is typically composed of mixed fine-grained sediments and sand. The sublittoral zone, extending 200 meters offshore from the low-tide line, is generally depositional with some sand, fine-grained

sediments, silt and mud. The main source of sediment to the site is material eroded from large feeder bluffs located to the north at Point Whitehorn and Birch Bay. Sand and gravel is carried from eroding feeder bluffs via the Cherry Point drift cell. The Cherry Point drift cell is one of three littoral drift cells located within or in the near vicinity of the Cherry Point Aquatic Reserve (Figure 3). This drift cell affects as much as 54 percent of the Cherry Point shore reach. While much of the marine shoreline is characterized as unstable slope, broad storm berms comprised mainly of pebble and sand, along with eelgrass root systems, provide some buffer to wave erosion (Cherry Point Aquatic Reserve Management Plan, 2010).

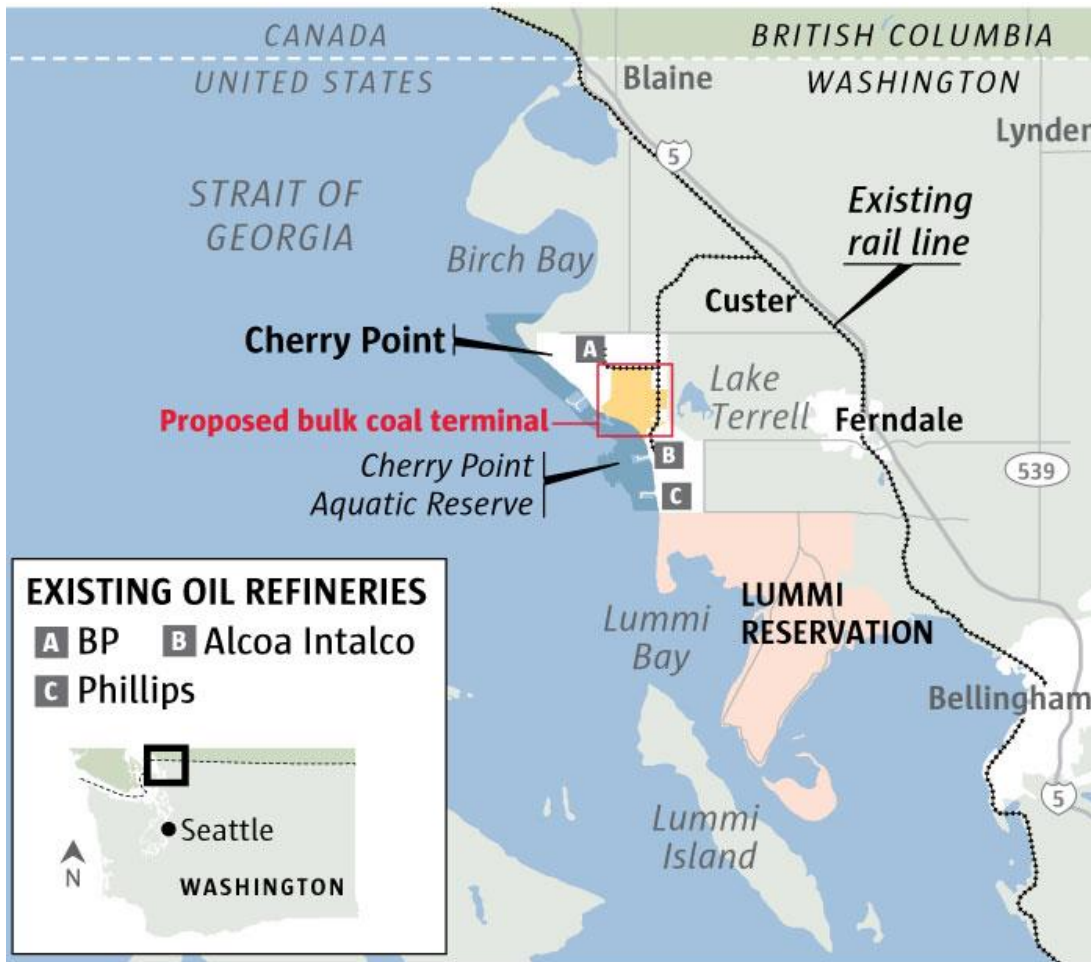
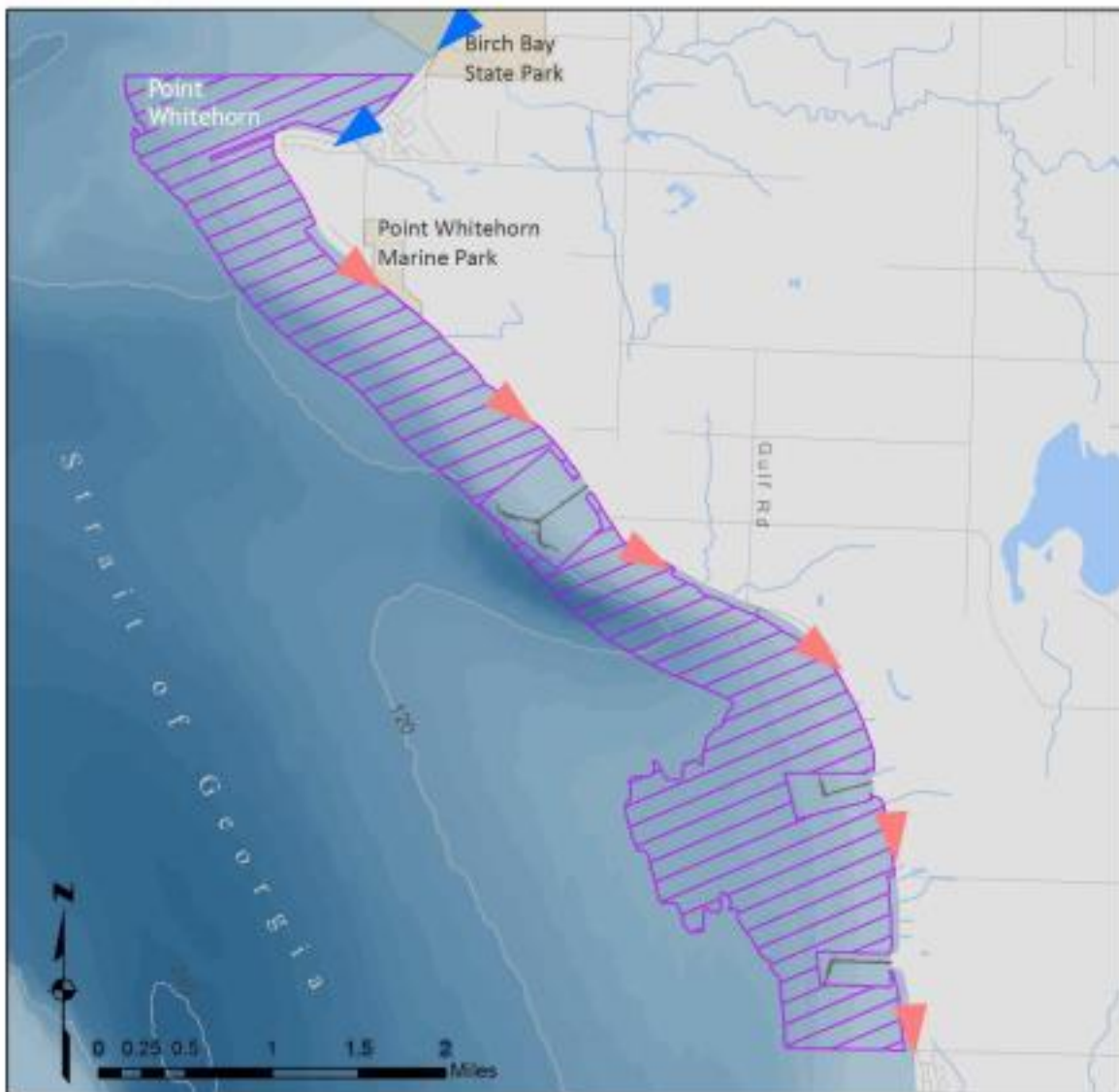


Figure 2. Map of the Strait of Georgia with key landmarks including major cities, existing oil refineries, the Cherry Point Aquatic Reserve and the Lummi Reservation.

Cherry Point Aquatic Reserve

Drift Cells



Cherry Point Aquatic Reserve

Drift Cells

Left to right

Right to left

County Roads

State & County Parks

Depth Contour (ft)

Watercourse



Created by J Kilgo 12/5/16

Every attempt was made to use the most accurate and current geographic data available. However, due to multiple sources, scales, and the currency of the data used to develop this map, the Washington Department of Natural Resources cannot accept responsibility for errors and omissions in the data. Furthermore, this data is not survey grade information and cannot be substituted for an official survey. Therefore, there are no warranties that accompany this material.

Data sources: Dept. of Ecology (drift cells, OMR recorder trends monitoring, WSDOT tracks, WDFW (depth contours), State Map, Kennerly & P. Current bathymetry and topography of Puget Sound, Washington State University of Washington (<http://ocean.washington.edu/data/puget-sound/>)

Figure 3. Location and direction of drift cells within the Cherry Point Aquatic Reserve.

Proposed Action

Impacts

The current reserve management plan does not prohibit commercial and recreational fishing, including the harvest of shellfish. Shellfish harvesting is one concern regarding beach stability, as some recreational shellfish harvesters neglect or forget to refill holes after digging, despite Washington State Department of Fish and Wildlife (WDFW) regulations mandating harvesters to do so. The displaced sediment is rarely restored by natural tidal and wave action, leaving beach and intertidal habitats altered. This loosened soil can increase the future rate of erosion. While degradation of the shoreline through human activities is a possibility under the current management plan, the integrity of the topography and soil of the site will be protected from future development for heavy industrial use. The proposed action is likely to have a positive impact on the topography and soil of the region by protecting it from heavy industrial use, but it could have even more of a positive impact if human activity was further restricted.

Mitigation

One way to mitigate negative impact from recreational shellfish harvesting is through public education and outreach. For example, the WDFW could place informational signs along the beach that state the benefits of simple, mindful actions such as refilling holes dug for shellfish.

Alternative Action

Impacts

The alternative action prohibits recreational activities including shell fishing (excluding tribal entities). This will cause no increased rate of local human-caused erosion. Erosion will occur at natural rates. Under the alternative action, these aspects of the Earth element are likely to experience positive impacts.

Mitigation

No mitigation is necessary for the alternative action plan.

No Action

Impacts

The no action alternative leaves the possibility of industrial expansion, as the area is zoned for heavy industrial use. One project, the Gateway Pacific Terminal (GPT), was already proposed to be sited here in part due to the unique underwater terrain.

The 70-foot drop off is enticing as a deep-water port, as it will require no additional dredging. The construction and subsequent use of this 45-acre site for heavy industrial use could include excavation into and grading of land surfaces which will likely have adverse effects on topography and soil. Additionally, as much of the marine shoreline is characterized as unstable slope, construction will likely increase erosion and could possibly even induce landslides. The no action alternative is likely to cause significant negative environmental impact to topography, soils and erosion.

Mitigation

Incidences of landslides and bluff erosion in the Pacific Northwest occur most frequently during winter months as the result of heavy precipitation (Johannessen & MacLennan, 2007). Limiting construction to Spring-Fall months could help reduce the potential of these events.

2.2 Air

Existing Conditions

In recent years, the air in Whatcom County was determined to be some of the cleanest in the nation in terms of tropospheric ozone and particulate matter concentrations (NWCAA, 2016) and was in attainment for all air quality criteria pollutants for nearly all of 2016. The Cherry Point area currently experiences reduced air quality due to existing high-impact industrial facilities in the region as well as frequent railway traffic, local vehicular traffic, and emissions associated with residential developments in the area. The air pollution associated with these different activities includes sulfur dioxide (SO₂), nitrogen oxides (NO_x) and other ozone precursors, carbon monoxide (CO), particulate matter, and potential toxic air pollutants (TAPs) such as diesel engine exhaust particulate matter (ENVIRON Intl. Corp., 2014).

Sulfur Dioxide (SO₂)

Sulfur Dioxide (SO₂) is a colorless, corrosive gas that contributes to acid rain and is emitted by the burning of sulfur-containing fuels such as coal and oil and some industrial processes such as smelting. The main sources of SO₂ in the Cherry Point region are point sources of air pollution including the two oil refineries and the aluminum smelting facility. In addition to these industrial facilities, diesel engines in train locomotives, trucks, and marine vessels act as nonpoint sources that contribute to background concentrations of SO₂ in the area. Point sources of SO₂ are regulated by the Environmental Protection Agency under the National Ambient Air Quality Standards (NAAQS) and Washington State Department of Ecology through its Air Operating Permit system. Area SO₂ concentrations have been monitored in the Bellingham area as well as at the BP Cherry Point refinery facility and have been far below the standards established by the NAAQS in recent history. Specifically,

background concentrations of SO₂ at the BP Cherry Point refinery represent approximately 53% of the 1-hour average NAAQ standard of 0.225 ppm (ENVIRON Intl. Corp., 2014).

Nitrogen Oxides (NO_x)

Nitrogen Oxides (NO_x), including nitric oxide (NO) and nitrogen dioxide (NO₂), contribute to the formation of acid rain, smog, and tropospheric ozone and are emitted by the combustion of fuels at high temperatures. The sources of NO_x in the area are based on fuel combustion from transportation emissions, such as marine vessels, rail locomotives, as well as trucks and other vehicles. NO_x is emitted by nonpoint sources in this area and tends to disperse throughout the region due to atmospheric conditions. Because of this, NO_x concentrations are monitored on a regional basis, with monitoring locations in La Conner, Washington and Langley, British Columbia. NO_x and ozone concentrations in the Puget Sound region have historically been designated as nonattainment under the NAAQS, meaning the concentrations for these pollutants have exceeded the federal standard and required a maintenance plan in the past. In addition, NO_x and ozone concentrations in the Puget Sound region have exceeded the 8-hour NAAQ standard in recent years, providing potential for nonattainment status in future years (ENVIRON Intl. Corp., 2014).

Carbon Monoxide (CO)

Carbon Monoxide (CO) is a product of incomplete combustion that has short-term, localized negative impacts to the environment and human health. In the Cherry Point area, CO is primarily generated by burning fuels for transportation and residential space heating services. Because of the short-term and local characteristics of CO emissions, CO concentrations tend to diminish within a short distance of their source. In Cherry Point and Washington State as a whole, CO concentrations have not been in violation of ambient air quality standards for several years (ENVIRON Intl. Corp., 2014).

Coarse and Fine Particulate Matter

Particulate matter air pollution can be produced by industrial activities, fuel combustion, ground disturbance, and other sources and can present significant environmental and human health risks through inhalation and the disposition of harmful chemicals. Particulate matter can be categorized as coarse (10 micrometers in particle diameter) or fine (2.5 micrometers in particle diameter) with finer particulate matter posing more substantial health risks due to its ability to be more easily and deeply inhaled and embedded during respiration. The closest monitoring location for particulate matter is in the City of Bellingham, where fine particulate matter concentrations have reached approximately 50% of the 24-hour and annual NAAQ standards (ENVIRON Intl. Corp., 2014).

Toxic Air Pollutants (TAPs)

Fuel combustion is known or suspected to emit several different Toxic Air Pollutants (TAPs) that can be directly harmful to humans and the environment but are not regulated under NAAQS or other health-protecting pollution standards. Diesel engine exhaust particulate matter (DPM) represents a TAP of particular importance to the Cherry Point region due to the current level of diesel-fueled trains, marine vessels, and trucks traveling through the region (ENVIRON Intl. Corp., 2014). These DPM emissions can include toxic and even carcinogenic pollutants such as benzene, formaldehyde, polycyclic aromatic hydrocarbons (PAHs), metals, and other trace elements (US EPA, 2017; OSHA). The Northwest Clean Air Agency (NWCAA) and Washington State Department of Ecology have developed Acceptable Source Impact Levels (ASILs), which represent negligible risk, for TAPs based on the cancer risks involved with this form of air pollution. Emissions of TAPs are difficult to monitor due to their nonpoint sources and the different compounds present in the exhausts of different diesel engines. Because of this, the EPA has provided median statewide DPM exposure estimates, which anticipate exposure in Washington State to be approximately 75 times greater than the ASIL for DPM emissions.

Proposed Action

Impacts

The proposed action of incorporating this 45-acre area into the Cherry Point Aquatic Reserve will have no impacts on air quality. Since no construction or additional emissions will result from this action, the air quality in the Cherry Point region and other parts of Whatcom County will continue to comply with or exceed air-quality standards.

Mitigation

No air quality mitigation measures will be necessary under the proposed action due to the lack of air quality impacts associated with including this area under the Cherry Point Aquatic Reserve Management Plan.

Alternative Action

Impacts

Under the alternative action, the 45-acre area of the proposed GPT site will be incorporated into the Cherry Point Aquatic Reserve with additional restrictions to non-tribal use of the incorporated area, and no terminal will be developed on the site. Therefore, no activities will occur that will have an impact on local and regional air quality.

Mitigation

No air quality mitigation measures will be necessary under the no action alternative due to the lack of air quality impacts associated with maintaining the existing conditions of the Cherry Point area.

No Action Alternative

Impacts

Under the no action alternative, the site will remain open for high-impact industrial development, such as the GPT, which will be expected to have impacts to local and regional air quality due to the construction and operations of the facility at Cherry Point. The development of this terminal will require modification of the BNSF Custer Spur that supports the Cherry Point industrial area in order to support increased rail traffic. In addition, developing this terminal will include constructing a large overwater structure with facilities on the adjacent shoreline that will cover hundreds of acres on Cherry Point. Construction will require the use of heavy trucks, excavators, graders, work vessels, and pile drivers as well as smaller equipment such as generators, pumps, and compressors (ENVIRON Intl. Corp., 2014). This construction and modification will create short-term local and regional air pollution in the form of dust and other particulate matter from the required land disturbance as well as additional SO₂, NO_x, ozone precipitates, and CO emissions from operating construction vehicles and machinery. In terms of the operation of this terminal, the area will see consistent increases in train, marine vessel, and vehicle traffic during the loading and offloading of goods. The increased train traffic is also likely to have impacts on local vehicle traffic by augmenting congestion around railway crossings. The combination of increased vehicle idling and increased train and marine vessel traffic will have more consistent, long-term negative impacts on air quality in the region due to increased emissions of CO, SO₂, NO_x, DPM, and other particulate matter. In addition, the fossil fuel combustion associated with this vehicle traffic and the operations of the terminal itself will contribute to overall greenhouse gas emission from the area. The projected concentrations of criteria pollutant emissions from the operation of this terminal when added to the existing background concentrations do not exceed the NAAQ standards. However, several of these pollutants, such as particulate matter and NO_x, are projected to significantly increase in concentration to a level just below the ambient standards (Table 1). Because of this, and the margin of error associated with emissions modeling, taking no action is likely to impact air quality by resulting in emissions of several criteria pollutants in excess of federal standards (ENVIRON Intl. Corp., 2014).

Mitigation

The impacts to air quality resulting from the construction of this terminal could be mitigated by applying water to the construction area and leaving vegetation in place to suppress dust and other particulate matter released from land disturbance.

To further mitigate the negative air quality impacts from this alternative, diesel emissions can be reduced through maintaining, repairing, or replacing diesel engines to increase vehicle fuel efficiency (US FHWA, 2014). In addition, the impacts of these diesel emissions can be mitigated by utilizing less emission-intensive alternative fuels such as biodiesels or other fuels with lower sulfur and toxicant contents. Then, impacts from increased idling can be mitigated by constructing railway over or underpasses to minimize railway traffic impacts on vehicle traffic congestion in the area. However, due to existing fuel and engine technologies, the majority of the air quality impacts from this project cannot be mitigated without reducing the transportation required of the project.

Table 1. GPT Modeling Results for Criteria Pollutant Maximum Concentrations ($\mu\text{g}/\text{m}^3$).

Criteria Air Pollutant	Avg. Time	B/G Conc. ^(a)	Project Related Concentration ^{(b), (c)}	Project Plus B/G	Ambient Standard ^(d)
PM ₁₀	Annual	12.0	25.2	37.2	50
	24-Hour	29.0	100.3	129.3	150
PM _{2.5}	Annual	6.0	3.8	9.8	12
	24-Hour	15.8	12.6	28.3	35
SO ₂	Annual	14.2	0.06	14.3	52
	24-Hour	36.7	1.1	37.8	262
	3-Hour	14.1	6.2	20.3	1,310
	1-Hour	89.0	5.9	94.9	196
NO ₂	Annual	11.8	25.5	37.3	100
	1-Hour	52.3	126.7 ^(e)	179.0	188

^(a) Background concentrations based on measured levels. See [Table 2](#) (page 13).

^(b) Reported pollutant concentrations are those occurring at the maximum impact location for each pollutant. Concentrations at all other locations are less than those reported here.

^(c) Note that all of the short-term concentrations are based on modeling that considered maximum hourly activity during every hour of the 5-year meteorological data set, which is not a possible actual level of activity. These results are therefore intentionally skewed to represent very conservative conditions. Note that consistent with EPA guidance, the annual modeling results are based on 5-year averages from the 5-year meteorological data set instead of 3-year as per the NAAQSs.

^(d) All ambient concentrations are expressed in terms of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$); [Table 1](#) (page 11) which presents only the ambient air quality standards, includes some concentrations reported in parts per million (ppm).

^(e) The air quality modeling for *off-site* trains assumed locomotives would be comprised according the EPA default fleet mix in 2019, except that all engines with emissions characteristics less than Tier 2+ were replaced with Tier 2+. This same assumption was *not* applied to on-site trains, and with the elimination of older locomotives from the system NO₂ concentrations from on-site activities would be even lower than indicated here.

2.3 Water

Existing Conditions

Surface

The proposed reserve addition site is directly adjacent to the Strait of Georgia. To the east of the reserve is Lake Terrell, a 500-acre manmade lake that includes a stream, Terrell stream, flowing into Birch Bay to the north of the reserve. Lake Terrell is about 2 miles to the east of the proposed reserve addition site. The proposed reserve lies within the Strait of Georgia watershed but Lake Terrell is not an included aspect of the proposition. Around the site are freshwater emergent wetlands and freshwater forested/shrub wetlands shown in Figure 4.

Runoff

There will be minimal runoff directly into the reserve from the proposed site. There is currently no runoff of waste materials into the water and the site does not alter drainage patterns.

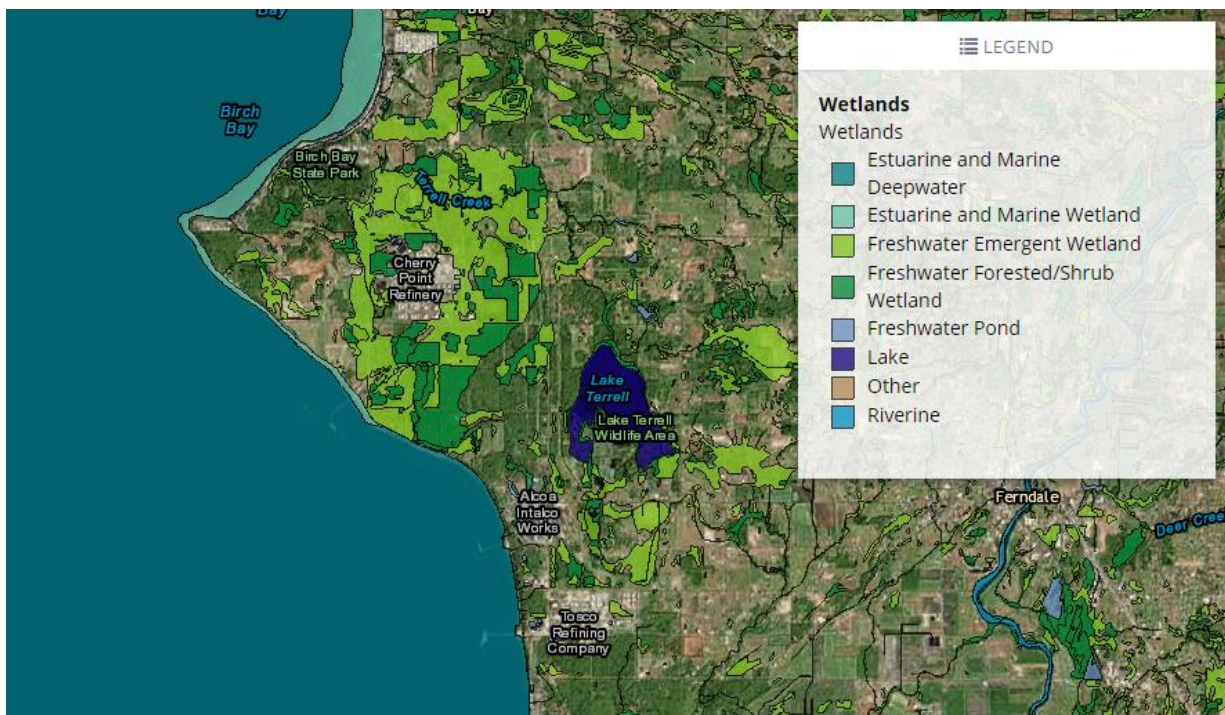


Figure 4. Map of wetlands.

Proposed Action

Impacts

Water quality will not be affected by the addition to the current reserve. It will have further protections under the current management plan than it does now. Along with more protection of water quality for the 45-acre cutout, there will be no development of cable or pipeline installations or saltwater intake structures. Other proposed uses will not be permitted by DNR unless otherwise stated in the management plan. This is all in accordance with the 2010 Cherry Point Reserve Management plan revised in 2017. Since there is no development on the shoreline of the reserve, there will be no increased runoff of waste materials. (Cherry Point Management Plan, 2010)

Mitigation

No mitigation efforts are necessary to avoid detrimental impacts to water quality or for increased waste material runoff.

Alternative Action

Impacts

The alternative action accomplishes much of the same as the proposed action as it places the proposed reserve under the current management plan but with more protections. These increased protections will not change the amount of runoff to the reserve. There will be no additional impacts from the alternative action.

Mitigation

No mitigation efforts are necessary to avoid detrimental impacts to water quality or for increased waste material runoff because the alternative action causes no new impacts.

No Action

Impacts

While there is no current development planned for this specific cutout, without additional protections such as adding it to the reserve, the possibility of development by heavy industry or similar development will significantly impact water quality and runoff. Development of the land for heavy impact industry will create more man-made impermeable surfaces, which will increase runoff. The runoff from heavy impact industry will decrease water quality and adversely affect the local populations such as the Pacific herring and local eelgrass populations. If the cutout were developed for a deep-water port, increased boat traffic will further

decrease water quality. This brings about possibility of future water contamination through the possibility of spills or leaks. While there are currently no impacts, development of the land may lead to future impacts to local population and water quality.

Mitigation

Mitigation efforts are needed to prevent degradation of water quality of the Cherry Point Aquatic Reserve from future development. Under current management plans, development is possibly putting water quality from runoff at risk. This can be avoided by having stringent water protection actions put into place. Any development of the area must be offset with actions from the developer. These actions may include: monitoring of local water quality, enhancing local water quality, and stringent precautions to avoid contamination or degradation of local water quality. These actions are only necessary if heavy impact industry is developed in this deep-water port. Further studies will be necessary to assess the impacts on local water quality if development takes place.

2.4 Plants and Animals

Existing Conditions - Plant Species

Submerged aquatic vegetation (SAV) is abundant in the marine nearshore environment of the Cherry Point Aquatic Reserve. SAV includes species of eelgrass and attached macroalgae. Eelgrass beds of both native and nonnative species (*Zostera marina* and *Z. japonica*, respectively) are found within the Cherry Point Aquatic Reserve. Eelgrass beds are continuous along the sand bars in southern Birch Bay and along Point Whitehorn. South of Point Whitehorn until Neptune Beach, eelgrass beds are interspersed with a diverse algal community. The sandbars of the 45-acre cutout are one of the few locations south of Birch Bay where eelgrass beds are continuous (Figure 5). The macroalgae community is dominated by bladed kelps such as *Laminaria saccharina* and *Costaria cosata*, large filamentous brown algae such as a few *Demarestia spp.*, and a variety of red foliose and filamentous algae. *Sargassum muticum* is a non-native brown algae that can be found in the intertidal zone mixed with eelgrass along 94 percent of the reserve.

SAV is an important component of nearshore primary production rates. SAV also provides rearing and foraging habitat for many commercially, culturally and ecologically significant aquatic species. The roots and rhizomes of eelgrass also help anchor sediments, providing shoreline stabilization and protection from wave and current-driven erosion. The Technical Advisory Committee (TAC), an independent group of scientists assigned to evaluate the Cherry Point site in 2003, unanimously recommended incorporating the 45-acre cutout into the reserve, citing that Pacific herring spawning in the area is a unique biological feature of the Puget Sound and that the steep gradient, sediment makeup and SAV of the intertidal habitat are

important for maintaining high marine biodiversity (Cherry Point Aquatic Reserve Management Plan, 2010).

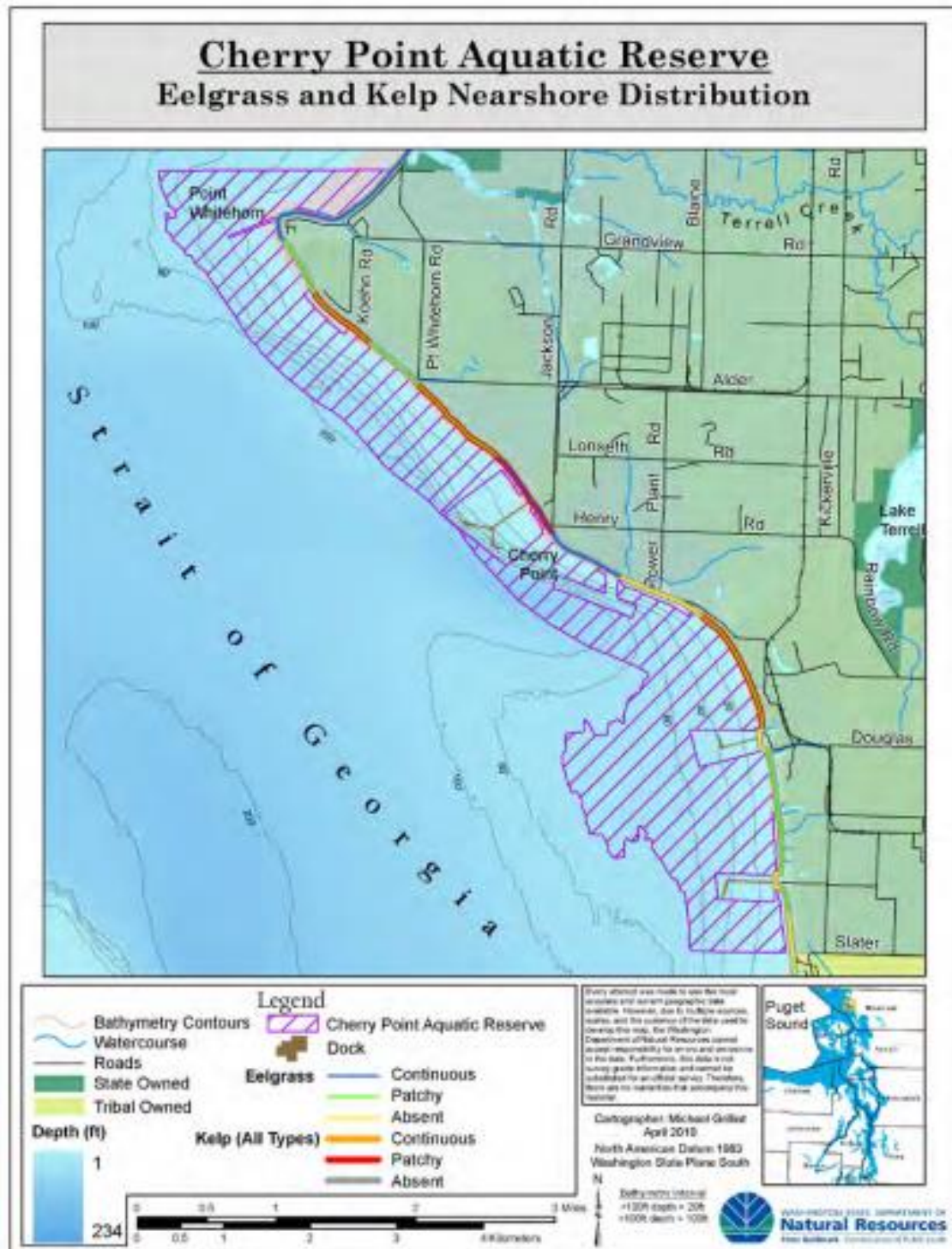


Figure 5. Distribution and abundance of nearshore eelgrass and kelp.

Proposed Action

Impacts

The primary focus of the Cherry Point Aquatic Reserve is to protect, enhance and restore habitats used by the wide diversity of aquatic marine life found in the region. The protection of SAV, namely eelgrass and macroalgae, falls within this wider goal as these aquatic organisms provide both rearing and forage habitat for other important species. The site in question contains continuous eelgrass beds that will be protected from the potential of severely invasive human activity, particularly heavy industrial use, if incorporated into the larger reserve under the current conditions of the Cherry Point Aquatic Reserve Management Plan. Light human influence through permitted recreational activities could still cause minor disturbance to SAV. The primary concern here is damage to or uprooting of vegetation from both trampling feet and boat motors. The proposed action is likely to have a positive impact on the SAV of the region by protecting it from heavy industrial use, but it could have even more of a positive impact if human activity was further restricted.

Mitigation

Education and outreach to inform the public about the fragile nature of aquatic ecosystems are preventative actions that could mitigate negative human impacts to SAV.

Alternative Action

Impacts

The alternative action plan will both incorporate the 45-acre cutout into the larger Cherry Point Aquatic Reserve protecting SAV from degradation via heavy industrial use, and add restrictions on recreational activities. This alternative will minimize the amount of foot traffic passing over sensitive SAV. Under the alternative action, SAV will be positively impacted.

Mitigation

No mitigation actions are necessary under the alternative action plan.

No Action

Impacts

The no action alternative will leave this 45-acre cutout under its current zoning of heavy industrial use, making it open to development for GPT or other comparable uses. The distinct bathymetry and water depths of over 70 feet just off shore of the

site provide incentive for the construction of a large vessel port. Construction and subsequent industrial uses could have a variety of adverse impacts on SAV. Overhead structures such as piers or docks could shade aquatic vegetation, reducing the light available for photosynthetic processes. Anchors of large ships could damage SAV and displace the roots and rhizomes of eelgrass beds. An increase in impervious surface will reduce filtration and amplify runoff, leading to higher concentrations of pollutants in the nearshore marine environment for plants to absorb. Any combination of these processes could contribute to the loss of riparian vegetation. Degradation of these habitats is especially threatening to the animal species that depend on them and will have rippling effects throughout the food web of the Cherry Point Aquatic Reserve. The no action alternative is likely to cause significant negative environmental impact to SAV.

Mitigation

Grading and minimum height requirements should be implemented for overhead structures to reduce shading impacts on SAV. Regulatory mechanisms and enforcement should be put in place for erosion and waste control, including requirements mandating the proper disposal of discarded building materials, chemicals, litter, and concrete truck washout. Heavily impacted SAV should be compensated a comparable habitat within a reasonable distance of the proposal site by transplanting individuals taken from healthy donor beds or seedlings reared under laboratory conditions (Fonseca et al., 1998).

Existing Conditions - Animals

Forage Fish

Four species of forage fish can be found within the Cherry Point Aquatic Reserve including Pacific herring (*Clupea pallasii*), surf smelt (*Hypomesus pretiosus*), Pacific sand lance (*Ammodytes hexapterus*) and northern anchovy (*Engraulis mordax*).

Pacific Herring (Clupea pallasii)

Pacific herring that occur at Cherry Point are a migratory species that annually use this site as pre-spawning and spawning habitat. Pre-spawning habitat is generally located near spawning grounds and serves the purpose of holding adults three to four weeks prior to spawning. Pacific herring populations at Cherry Point spawn from early April through early June. Eggs are deposited on intertidal and shallow subtidal vegetation, particularly native eelgrass and the following genera of marine algae, *Gracilaria*, *Laminaria*, *Saccharina*, *Sargassum* and *Botryglossum*. Pacific herring are central to the local food web, acting as a predator to copepods and larval fish and as prey for a variety of fish, including salmon, birds and marine mammals (Cherry Point Aquatic Management Plan, 2010).

The Pacific Herring at Cherry Point are physically, physiologically, ecologically and behaviorally distinct from other Pacific Herring populations. In the past, Cherry Point was the spawning grounds for the largest herring population of the Puget Sound and Strait of Juan de Fuca (Cherry Point Aquatic Reserve Management Plan, 2010). Since then, Pacific herring have experienced significant population declines. Stocks declined from 15,000 tons in the 1970s to less than 1,000 tons in 2000, with no signs of recovery (Figure 7). Harvest on this stock has been restricted since 1996 (WDFW, 2012). Pacific Herring was a former Endangered Species Act (ESA) candidate species but in 2014 it was determined that the listing was not warranted (NOAA, 2014). Pacific herring are a state candidate species, meaning they are under review for status of State Endangered, Threatened or Sensitive (WDFW, 2017).

Pacific herring are considered a species that indicate the overall health and function of the nearshore and intertidal ecosystem at Cherry Point. They face a large number of risks including drastic reduction in population size, spawning area, habitat, hatching viability, and recovery potential as well as increased population isolation. The security of herring stocks in the Puget Sound relies heavily on the protection of their spawning habitat.

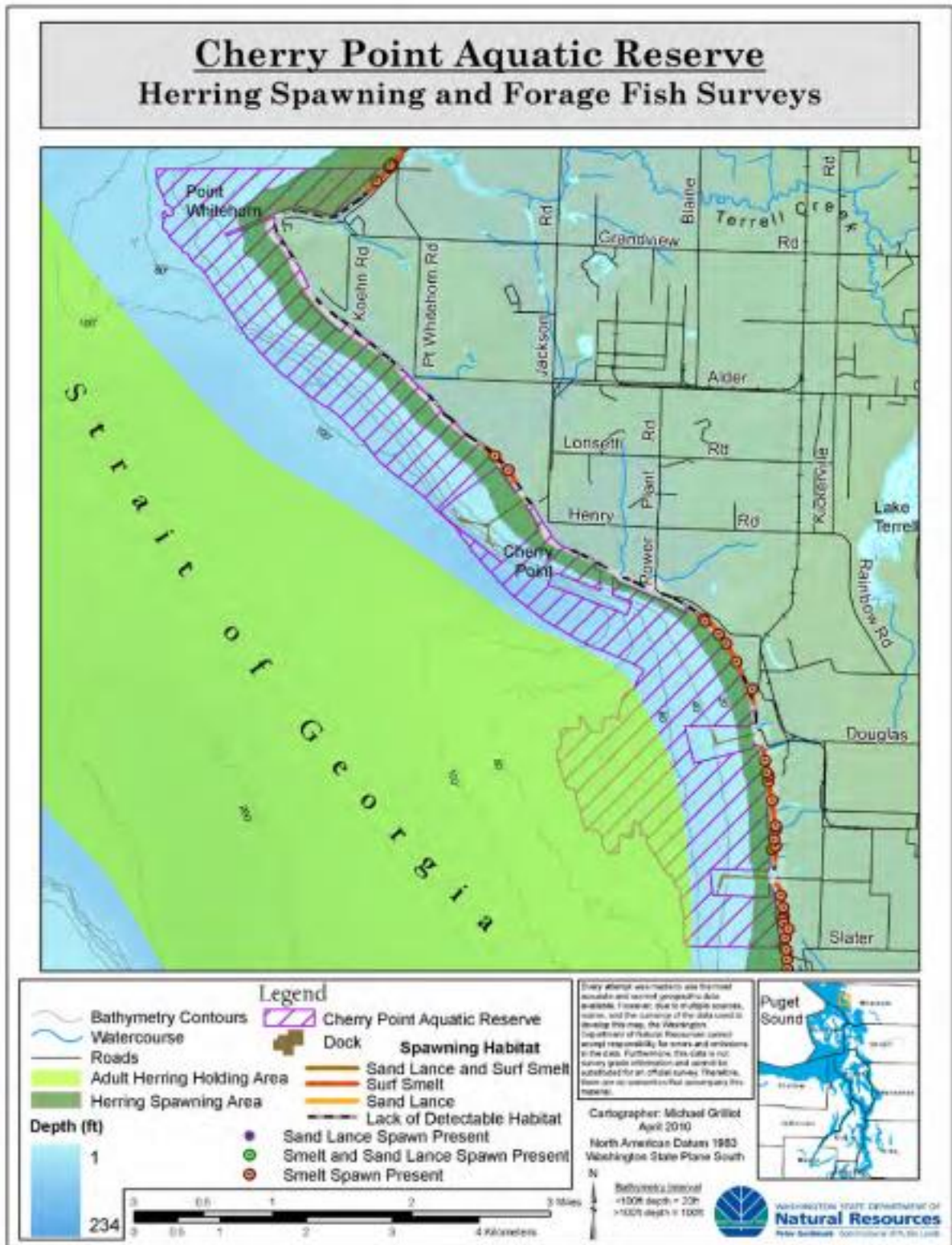


Figure 6. Distribution of forage fish spawning habitat and holding area.

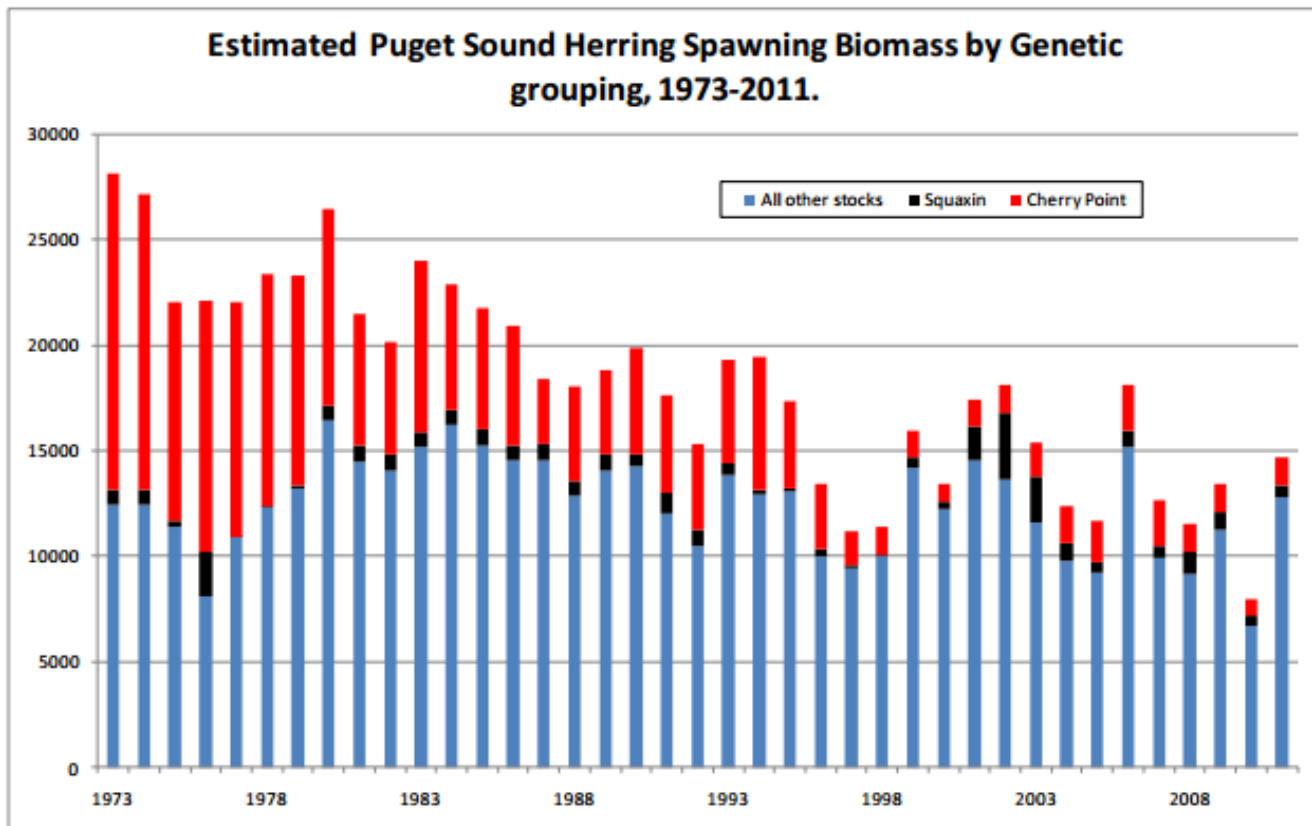


Figure 7. Estimated herring spawning biomass from 1973 to 2011.

Groundfish

The main species of groundfish that make use of the site are Dover sole (*Solea solea*), English sole (*Parophrys vetulus*), rock soles (*Lepidopsetta bilineata*), starry flounder (*Platyichthys stellatus*), Pacific sanddabs (*Citharichthys sordidus*), and speckled sanddabs (*C. stigmaeus*). Adult butter sole (*Isopsetta isolepsis*) and lingcod (*Ophiodon elongates*) have also been spotted on occasion (Cherry Point Aquatic Reserve Management Plan 2010). Many groundfish species spend juvenile stages of life feeding and hiding in SAV habitats. Groundfish spend the majority of their adult lives on or near the bottom of the water column.

Salmonids

Salmonids, fish of the family Salmonidae, have designated habitats for listed species including Chinook (*Onchorynchus tshawytscha*), coastal cutthroat trout (*O. clarki clarki*), steelhead (*O. mykiss*), native char (*Salvelinus confluentus*), pink salmon (*O. gorbuscha*), Dolly Varden (*Salvelinus malma*), chum (*O. keta*), coho (*O. kisutch*), and juvenile sockeye (*O. nerka*) all of which are dependent on kelp and eelgrass beds for shelter as they mature and migrate. Mature salmon are used for native ceremonial purposes as well as commercial and subsistence and are also a key player in the

food chain. Bull trout, listed in the Whatcom County Water Resource Inventory Area (WRIA) 1 Salmon Recovery Plan as well as the critical habitat list and endangered list according to U.S. Fish and Wildlife Service (USFWS), forage on salmonid eggs amongst other smaller fish populations including herring. The Cherry Point Aquatic Reserve is a designated critical habitat for native bull trout which also feed on smaller fish. The Puget Sound evolutionary significant unit deemed Cherry Point a site of significance for Chinook salmon, listed as a federally threatened species and considered to be essential by the Technical Recovery Team (TRT) for recovery efforts. Chinook are also a main prey for Southern Resident Killer Whales (Cherry Point Environmental Aquatic Reserve Management Plan, 2010).

Birds

Considered one in 18 significant areas for bird habitats in the Puget Sound Straits, Cherry Point was deemed to have the highest bird densities with more than 13,000 birds per square mile estimated by Marine EcoSystems Analysis (MESA). Studies have shown a recent density decline of 79.1% in a study done by Western Washington University in conjunction with MESA. Both eelgrass beds and shallow bay characteristics have been important for diving and surface-feeding birds and should be considered when developing management actions. Bird species that rely on Cherry Point Aquatic Reserve habitats that are classified as Endangered, Threatened, or Sensitive by the state of Washington include: marbled murrelet (*Brachyramphus marmoratus*), common loon (*Gavia immer*), double-crested cormorant (*Phalacrocorax auritus*), brandt's cormorant (*Phalacrocorax penicillatus*), pelagic cormorant (*Phalacrocorax pelagicus*), bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), common murre (*Uria aalge*), surf scoter (*Melanitta perspicillata*), great blue heron (*Ardea herodias*), western grebe (*Aechmophorus occidentalis*), osprey (*Pandion haliaetus*), cavity nesting ducks, and subspecies of these listed birds (Cherry Point Environmental Aquatic Reserve Management Plan, 2010).

Mammals

The marine mammals that are assumed to utilize the area and resources within the Cherry Point Aquatic Reserve are based off their presence in the southeast Strait of Georgia. Species include the harbor seal (*Phoca vitulina*), stellar sea lion (*Eumetopias jubatus*), California sea lion (*Zalophus californianus*), pacific harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), southern resident killer whale (SRKW) (*Orca orcinus*), gray whale (*Eschrichtius robustus*), and humpback whale (*Megaptera novaeangliae*). All marine mammals are protected under the Marine Mammal Protection Act (MMPA, 1974).

The harbor seal is considered the most common and frequently sighted pinniped in Washington waters. The harbor seal, Stellar sea lion and California sea lion can be found in shallow areas of estuaries and rivers as well as a variety of "haul-out locations" including intertidal sand bars, rocks and beaches. Harbor seals frequently

utilize the shore south of Point Whitehorn for hauling-out and pupping. As opportunistic feeders, the diet of these species varies depending on prey availability. They generally feed in shallow waters on a variety of fish and cephalopods. In Washington State, harbor seals are classified as “state monitored”. Among other marine mammals, Stellar sea lions are classified as “state-threatened” (WDFW, 2017). The Stellar sea lion Western Distinct Population Segment (DPS) is listed as Federally Endangered under the ESA.

Harbor porpoises were considered a common and frequently sighted cetacean in Washington inland waters in the 1940s, after which their numbers experienced serious decline through the 1970s. Since then, the harbor porpoise population has increased but they are still a state candidate species (WDFW, 2017). The Dall’s porpoise remains year round in the Puget Sound. They are classified as “state-monitored” (WDFW, 2017). These cetaceans most frequently feed on a variety of fish and cephalopods.

The SRKW often follow the runs of Chinook salmon, their preferred prey, which pass through the Cherry Point Aquatic Reserve. Other salmonids and non-salmonids, including Pacific herring, contribute to the SRKW diet. The density and reproductive rates of these long-living individuals has serious impacts on their ability to recover from any decline in population. Killer whales have been listed as a state endangered species since 2004 (Wiles, 2016). The SRKW DPS has been listed as Federally Endangered under the ESA since 2005 (NOAA, 2017). The recovery plan for the SRKW lists prey availability, environmental contaminants and effects from vessels and sound as their primary threats (NOAA, 2016).

Puget Sound is a seasonal feeding area for a small group of gray whales belonging to the Eastern North Pacific stock. This stock was delisted from ESA Endangered status in 1994 (NOAA, 2017). They have been considered a state sensitive species in Washington since 1997 (WDFW, 2012). Humpback whales are listed as Endangered at both the state and Federal level, as commercial whaling has depleted populations historically found in Washington inland waters (WDFW, 2012; NOAA, 2017). Humpback whales are also listed as “depleted” under the MMPA (NOAA, 2017).

Invertebrates, Bivalves, and Malacostracans

Based off substrate type and water-level zones Cherry Point provides many different habitats for species such as barnacles (*Balanus glandula*, *Chthamalus dalli*), snails (*Nucella lamellosa*, *Littorina scutulata*), chitons (*Mopalia muscosa*), limpets (*Collisella strigatella*), mussels (*Mytilus edulis*), seastars (*Leptasterias hexactis*, *Pisaster ochraceus*, *Evasterias trocheli*), red rock crabs (*Cancer productus*), small shore crabs (*Hemigrapsus spp.*), polychaete worms (*Nereis spp.*, *Neanthes spp.*), shrimp families (*Crangonidae* and *Hippolytidaef*), annelid worms (capitellid polychaetes and oligochaetes), burrowing anemones (*Anthopleura artemisia*), amphipods, cockles (*Clinocardium nuttallii*), native littleneck clams (*Protothaca staminea*), butter clams (*Saxidomus giganteus*), sea pen (*Ptilosarcus guernei*),

nudibranchs, Dungeness crabs (*Cancer magister*), tanner crabs (*Chinocetes spp.*), sea cucumber (*Eupentacta pseudoquinquesemita*), small crangonid shrimp, and geoduck clams (*Panope abrupta*). Dungeness crabs in particular serve importance as both predator and prey in the Cherry Point food chain; as larvae they provide food for fish and as predators feed in the benthic food web. They also serve importance for the Lummi Tribe recreationally and commercially as do shellfish, which Cherry Point also harbors an important habitat for (Cherry Point Environmental Aquatic Reserve Management Plan, 2010).

Proposed Action

Impacts

The incorporation of the 45-acre cutout into Cherry Point Aquatic Reserve will mean that those 45 acres will be areas with continual environmental baseline monitoring, extending the protections of ecological diversity to be all encompassing. Light human influence through permitted recreational activities such as boating and fishing could still cause minor disturbances to these animals and their habitats.

Mitigation

Education and outreach to inform the public about the fragile nature of the organismal habitats harbored by aquatic ecosystems are two forms of preventative action that could mitigate negative human impacts.

Alternative Action

Impacts

By further restricting this 45-acre cutout from any non-tribal recreation or fishing, minor human disturbances could be limited to merely being able to walk this area without having authority to recreate or ensue in commercial aquaculture.

Mitigation

Having an area with greater restriction than the other acres included in the aquatic reserve could serve as the basis for a study to educate the public and tribes about the impacts of recreation and fishing in areas that contain animals that are Endangered, Threatened, or Sensitive by comparing those areas with and without extra protections.

No Action

Impacts

The no action alternative will leave this 45-acre cutout under its current zoning of heavy industrial use, leaving it open for GPT or other comparable uses. The likely conversion of the 45-acre to a deepwater port will put the region under the environmental stress of heavy construction and subsequent industrial use. Impacts on aquatic plant species from the no action alternative will necessarily affect the animal species that rely on SAV as critical habitat, spawning and feeding grounds. Artificial light and noise pollution could potentially impact fish species and their predators, leading to changes in spawning behavior, migratory patterns and abnormal congregations of these groups of animals. Environmental contaminants from increased impervious surface runoff, ballast water and waste discharges, fuel spills, material spills and activities associated with overwater structures could adversely impact aquatic animal species, particularly higher-level predators through the process of biomagnification, a process in which chemical substances become more concentrated at each higher trophic level. Chemical substances that biomagnify tend to be difficult to remove from animal and plant tissues (NOAA, 2017). Equipment and marine vessels may disperse and promote invasion by nonnative species, resulting in displacement of key native species and alteration of the trophic web.

Mitigation

Mitigation measures will be required if future development is to take place on the site. Critical spawning and foraging eelgrass habitat could be compensated through transplanting individuals taken from healthy donor beds or seedlings reared under laboratory conditions (Fonseca et al., 1998). Other mitigation strategies may include implementing stringent precautions to avoid contamination and degradation of local water quality, implementing measures to increase the efficiency of diesel engines and therefore decrease fuel consumption, and flushing and refilling ballast tanks with water from the open ocean away from the site.

2.5 Energy and Natural Resources

Existing Conditions

Within the project area there is currently no consumption of energy or natural resources. In the vicinity of the project area, existing energy resources primarily include electricity, natural gas, and different petroleum products such as gasoline, diesel fuel, and lubricating oils. These are currently produced and consumed in the area due to nearby petroleum refineries and electricity generation facilities at Cherry Point (EFSEC, 2003).

Electricity

Electricity is currently provided to the region through Puget Sound Energy (PSE) and the Bonneville Power Administration (BPA) and is generated onsite near BP's

Cherry Point Refinery (Figure 8). These generation facilities include the PSE Point Whitehorn Power Generation Plant, a 147-megawatt (MW) capacity simple-cycle natural gas peaker plant (PSE, 2010), and the BP Cherry Point Cogeneration Project, a 720-MW capacity combined cycle natural gas peaker plant installed to provide reliable electricity and steam to the BP Oil Refinery operation and provide excess capacity to the BPA (US DOE, 2004).

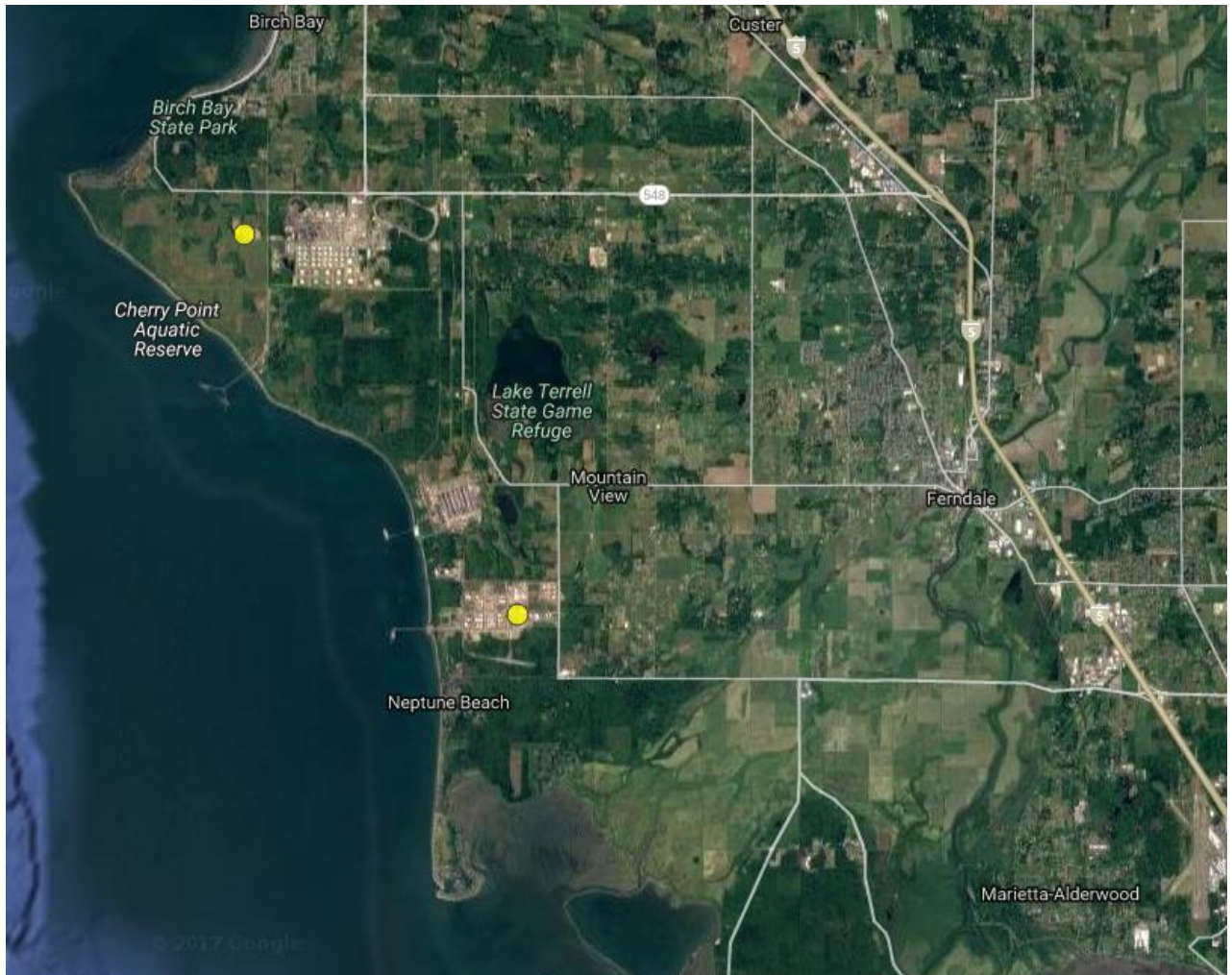


Figure 8. Natural Gas-Fired Electricity Generators at Cherry Point.

Natural Gas

Natural gas is currently provided to Washington State from Canada and the Rocky Mountain region via pipelines. Natural gas may be supplied internationally by the Duke Energy, Inc. pipeline that travels from BC across the border at Sumas, Washington or the Alberta Natural Gas Pipeline (TransCanada pipeline) that travels from Alberta to Washington through BC. Additionally, some natural gas in Washington State is supplied via interstate pipelines such as the Northwest Pipeline operated by the Williams Company and the Gas Transmission, Northwest (GTN) Pipeline operated by PG&E National Energy Group (EFSEC, 2003). These pipelines

then feed into natural gas pipeline networks serving Whatcom County (Figure 9) including the Ferndale Pipeline System, Cascade Natural Gas Corp. pipelines, the Williams Gas Pipeline, the Olympic Pipe Line Co., the BP Cherry Point pipeline, the Sumas Co Generation Co., LP pipeline, and the Terasen Pipeline (UTC, 2006).

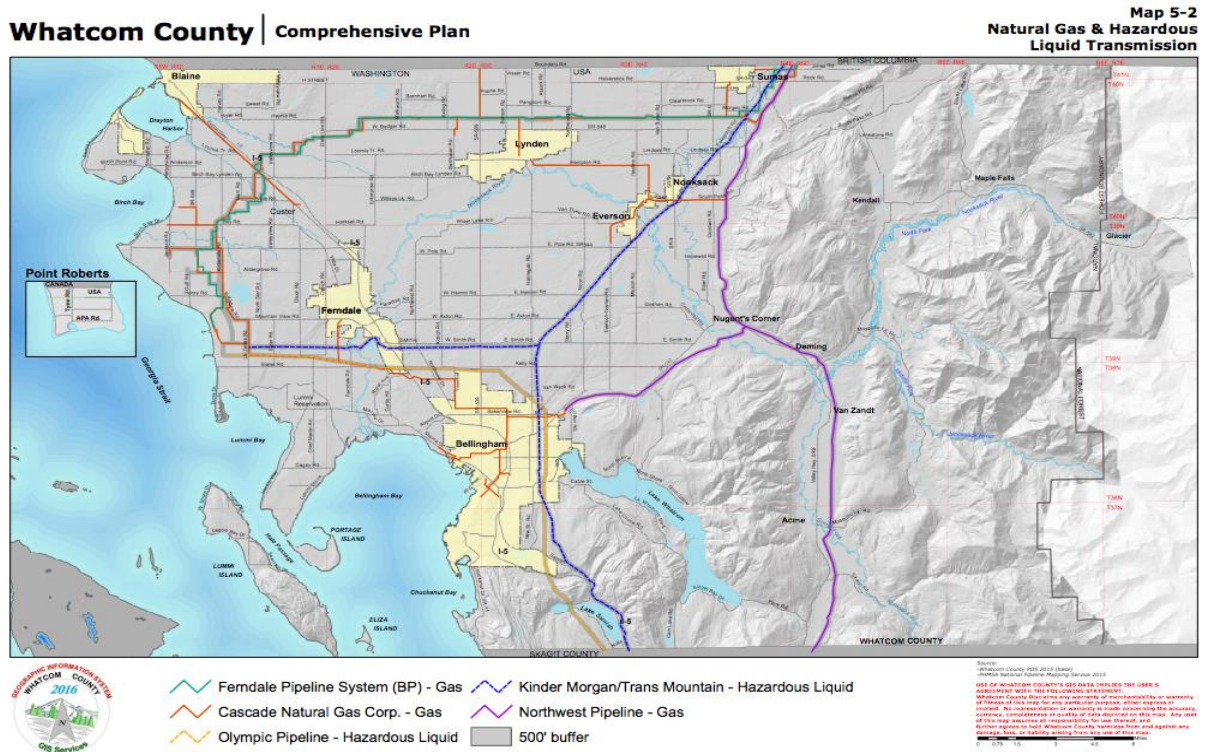


Figure 9. Whatcom County Natural Gas and Hazardous Liquid Pipelines.

Petroleum

Petroleum products are currently refined and transported in the vicinity of the proposed project area. The BP Cherry Point Refinery and Phillips 66 Refinery both import crude petroleum from the Midwest US and Canada through pipelines, rail transportation, and occasionally delivery by marine vessel and then distill and refine the petroleum to create usable products such as diesel, gasoline, aircraft fuels, lubricants, petrochemicals, and asphalt components (EFSEC, 2003).

Proposed Action

Impacts

Under the proposed action, this portion of Cherry Point will be incorporated into the Cherry Point Aquatic Reserve, and therefore there will be no impacts to energy or natural resources. Because incorporating this area into the Reserve Management Plan will prevent the construction of an overwater structure such as an export

terminal, the proposed action will not increase consumption of energy and natural resources and may prevent increased consumption.

Mitigation

Because there are no negative impacts to energy or natural resources under the proposed action, no mitigation measures are necessary.

Alternative Action

Impacts

Under the alternative action, this portion of Cherry Point will be incorporated into the Cherry Point Aquatic Reserve and non-tribal activities will be further restricted in the specific project area. Because incorporating this area into the reserve Management Plan will prevent the construction of an overwater structure such as an export terminal, the proposed action will not increase consumption of energy and natural resources and may prevent increased consumption. Therefore there will be no impacts to energy or natural resources under this alternative.

Mitigation

Because there are no negative impacts to energy or natural resources under the alternative action, no mitigation measures are necessary.

No Action Alternative

Impacts

Under the no action alternative, the construction of a multimodal export terminal and supporting facilities will be allowed pending future permits. The construction and operations of this terminal will increase the consumption of energy and natural resources in the Cherry Point area by increasing electricity, diesel fuel, and gasoline use. During the construction of the terminal and supporting facilities, there will be a temporary increase in the consumption of energy and natural resources in the area. This will include diesel and gasoline consumption to transport construction materials to the site as well as propane, diesel, gasoline, and electricity consumption to operate construction equipment. Then, to transport goods to and from the terminal for export to other countries, this will require increased diesel-fueled rail and marine vessel transportation in the area. Finally, to operate the terminal itself, including offloading, conveyor systems, and ship loading, will require an increase in electricity consumption on site (ENVIRON Intl. Corp., 2014). Overall, the long-term increase in energy consumption from this project will represent an increase in demand for electricity of approximately 25 MWh for a maximum sized terminal that exports coal as well as other goods (PIT, 2011). If coal were not a component of this terminal's operations, it will be expected to have a much less significant increase in electricity demand due to the lack of need for mitigation systems to account for coal

pollution. This alternative will also have significant short-term increases in energy and natural resource consumption during the construction of the facility. Regardless of the goods transported through this terminal, the impacts to energy and natural resources from this alternative will be significant due to required increases in electricity generation and diesel fuel consumption on a long-term basis.

Mitigation

The potential impacts to energy and natural resources from this alternative are largely unavoidable because the construction and operation of a terminal will require large quantities of electricity, diesel, and other energy sources regardless of efficiency measures and other conservation efforts. However, some of this energy consumption could be decreased through efforts similar to those to mitigate air quality impacts. By repairing, maintaining, and replacing diesel engines in locomotives and marine vessels to increase their efficiency, transportation fuel consumption can be decreased. Furthermore, by ensuring the terminal is constructed with the most efficient technologies possible, such as those for lighting, conveyor systems, space heating and cooling, and insulation, the electricity consumption of this facility can be reduced. This will still result in increased energy and natural resources consumption but may reduce it enough to prevent the need to construct additional electricity generation capacity. The total increase in transportation fuels and electricity consumption related to this alternative with mitigation will still represent significant impacts to overall energy consumption.

3. Elements of the Built Environment

3.1 Land and Shoreline Use

Existing Conditions

Existing Zoning and Management

The shoreline and aquatic area within the existing boundaries of the Cherry Point Aquatic Reserve are labeled as the “Cherry Point Management Unit” on the Whatcom County Shoreline Master Program map (Figure 10). The combined area shown on the map is managed and governed by the Whatcom County Shoreline Management Program (SMP) under WCC 23.100.170. Parts of the reserve shoreline are owned privately or state-owned, managed by the Department of Natural Resources (DNR, 2010). The reserve’s northern boundaries border land zoned for residential and rural use; however, most land adjacent to the Cherry Point Aquatic Reserve is zoned as a High Impact Industrial Urban Growth Area and managed under WCC 20.74. Figure 11, shown below, displays the zoning for the land bordering the reserve (DNR, 2010).

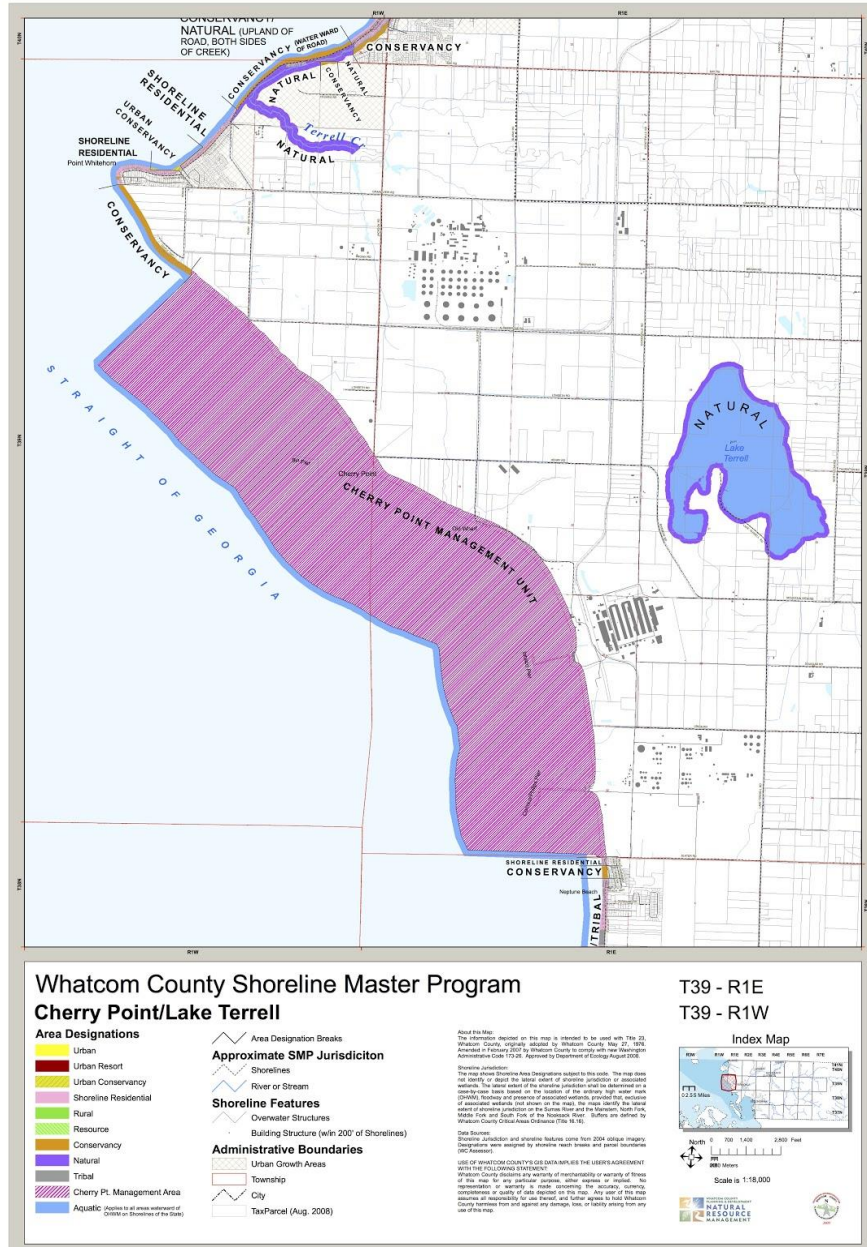


Figure 10. Cherry Point Management Unit according to the Whatcom County Shoreline Master Program.

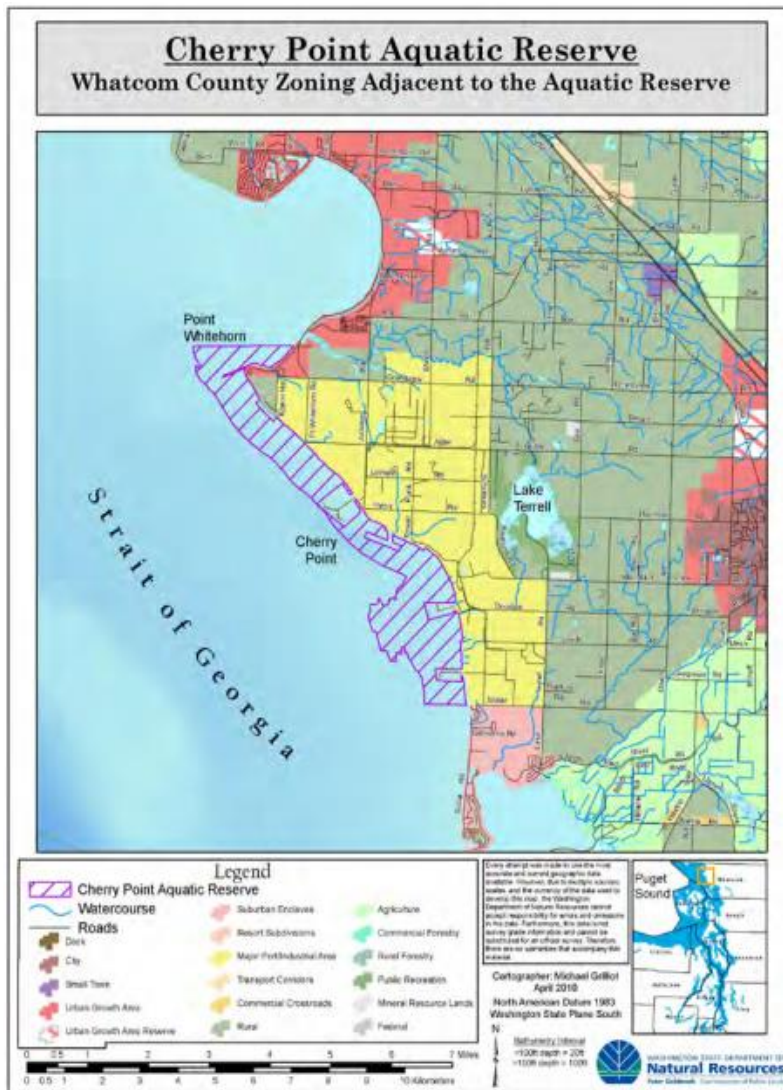


Figure 11. Land Use Zoning for Cherry Point area.

Existing Uses

Uses within the existing Cherry Point Aquatic Reserve boundaries include three commercial piers, multiple discharge outfalls from the heavy industrial facilities nearby, and sewage discharge outfalls for the Birch Bay Water and Sewer District and the Lummi Reservation. The commercial piers in the reserve have water-dependent uses, such as loading aluminum and petroleum products refined nearby. Additionally, non-tribal fisheries and tribes use offshore areas. Tribes harvest fish and crabs for commercial, ceremonial, and subsistence purposes (“Environmental Checklist”, 2010). The reserve also allows low-impact recreational opportunities such as beach walking and shellfish harvesting.

Estimated Population

The population of Whatcom County increased by approximately 4% between 2010 and 2015 and was 209,790 in 2015 (OFM, 2015). According to the most recent management plan for the reserve, the county's continuing population increases are expected to result in a transition away from undeveloped space to more residential, commercial, and industrial use. However, due to current zoning, development adjacent and within the reserve's cut-out areas will be industrial.

Proposed Action

Impacts

Including the 45-acre cutout in the Cherry Point Aquatic Reserve will not create any additional land and shoreline use impacts. Currently, the area within the 45-acre cutout has fewer use restrictions than the surrounding area since it is not included in the reserve area. The area outside of the 45-acre boundaries is already managed under the Cherry Point Environmental Aquatic Reserve Plan. Thus, adding the 45-acre cutout to the other, publicly-owned 227 acres would make land use, shoreline use, and management consistent across the entire Cherry Point area. The proposed action could reduce the potential for adverse environmental impact by placing the 45 acres under a specified management scheme, instead of leaving the area open to development. Ultimately, the proposed action will make the reserve's management uniform and positively impact environment because it will result in low-impact land and water use as well as eliminate the potential for detrimental future development.

Mitigation

The proposed action does not result in any negative land or shoreline use impacts that require mitigation.

Alternative Action

Impacts

The alternative action would place additional land and shoreline use restrictions on the 45-acre cutout area. The cutout would be included within the reserve; however, it would be managed under a more stringent management scheme that reduces non-tribal access to this specified section of the reserve. No additional adverse environmental impacts are expected under the alternative action. Restricting access could assist the recovery of shellfish beds, eelgrass habitat, and herring populations. However, the alternative action could impact management and enforcement. Creating and enforcing a different management plan for the 45-acre area could strain the existing resources available for management of the whole reserve. Overall, however, the alternative action results in a net positive environmental impact because it further limits human use of the shoreline and aquatic area.

Mitigation

No mitigation for environmental impacts is necessary since additional adverse land or shoreline use impacts are not expected. To reduce the increased burden on management, a few shortcuts could be made during the design and implementation of the new management plan for the 45 acres. The same management plan for the Cherry Point Aquatic Reserve could be used, with a few addenda for the extra protections. More on-the-ground patrols by Department of Natural Resources staff could be replaced by signs or posting about the additional restrictions in the area. These solutions may not be more effective but are less financially burdensome.

No Action

Impacts

Under the no action proposal, the 45-acre area is not included in the Cherry Point Aquatic Reserve and the cutout's existing land and shoreline use remains the same. Currently, there are no outstanding proposals to develop the 45-acre area; however, the development status of the acreage could change. Leaving the cutout area outside of the reserve boundaries means the 45 acres could be developed in a way that has negative impacts on the environment, if the proposed development is permitted after an environmental review. The no action alternative leaves the 45-acre area open for development, which could result in positive or negative impacts to land and shoreline use.

Mitigation

There is no current need for mitigation under the no action proposal. If the 45-acre parcel is developed or industrialized, mitigation of adverse environmental impacts may be required. Further environmental review or assessment of the proposed development would reveal the mitigation techniques necessary to limit harm to land or shoreline use.

3.2 Aesthetics

Existing Conditions

Whatcom County is renowned for its scenery, recreational opportunities, and emphasis on quality of life. The reserve borders Birch Bay State Park and offers panoramic views of the Cascade Mountains, Lummi Island, and the Canadian Gulf Islands. The rocky beaches near the reserve are a great place to see tide pools, starfish, and other small marine life (Ayers, 2012). The Cherry Point area embodies many of the natural marine aesthetics cherished by locals and visitors.

Proposed Action

Impacts

No structures or other projects that could potentially degrade the aesthetic value of the area are included in the proposed action. However, the building of structures is not restricted under the reserve's current management plan. The plan states that the construction of new piers or the modification of existing overwater structures is required to follow best practices (Cherry Point Aquatic Reserve Management Plan, 2010). The reserve's management plan also states that construction of new, over-water recreational structures is unlikely due to the extreme weather conditions present at Cherry Point. Ultimately, the structures that will impact the views and aesthetics of the area are possible but unlikely.

Mitigation

Currently, no development is planned and so no adverse impacts to the area's aesthetics are expected. Thus, no mitigation measures are currently necessary but may become necessary if there is a proposal for a structure that blocks views or impacts scenic wildlife. Environmental review and assessment of the proposed development would identify what mitigation techniques should be utilized.

Alternative Action

Impacts

Adverse impacts to aesthetics or the environment will be unlikely under the alternative action. The alternative action would not allow non-tribal individuals or groups to construct structures on land or over water. Adding the 45-acre cutout to the reserve will protect the shoreline, wildlife, and scenic view. No impacts to aesthetics are expected.

Mitigation

Mitigation measures are unnecessary under the alternative action. The construction of piers or over-water structures that could impact aesthetics is prohibited under this action.

No Action

Impacts

Under the no action alternative, the development of overwater structures as well as associated structures on land will be allowed. It is possible that no development will occur in the 45-acre area in the near future, with no impact to the area's aesthetics. However, due to the area's zoning as an industrial urban growth area, future

development is expected if the 45-acre cutout is not included in the reserve. The construction of overwater structures could adversely impact the area's valued marine aesthetics, from small marine life and colorful pebbles to views of the surrounding mountains and islands. The structures or piers will be additional sources of light and noise pollution. Overall, the environment will be negatively impacted development permitted under the no action proposal.

Mitigation

Steps could be taken to reduce the impact that construction of any piers, docks, or overwater structures has on views by placing restrictions on the size of the structure. Other restrictions on the structure's design could be instituted to reduce the negative impacts on aesthetics. To effectively mitigate adverse impacts, these restrictions on the structure's size and design will need to be implemented before development occurs.

3.3 Recreation

Existing Conditions

At Cherry Point, some of the most common public recreational activities include boating, fishing, shellfish harvesting, swimming, and beach walking. Tribal members and members of the public are currently allowed to recreationally harvest crabs and shellfish at Cherry Point. No overwater recreational structures or docks exist within the Cherry Point Aquatic Reserve. No beach fires or dogs are allowed under the reserve's current management plan.

Proposed Action

Impacts

Including the 45-acre cutout into the reserve boundaries will limit recreational activities to those allowed under the reserve's management plan. Many of the permissible forms of recreation impact the environment in varying degrees.

Beach fires are not allowed according to the reserve's management plan. To enforce this rule, the DNR relies on the WDFW ("Environmental Checklist", 2010). Beach fires negatively impact the environment by threatening riparian zones and reducing the amount of driftwood found on the beach, which is an important component of the beach's habitat (Cherry Point Aquatic Reserve Management Plan, 2010). Driftwood is known to potentially act as an "ecosystem engineer" that initiates the formation of hummocks and reduces saltation of wind-blown sand particles (Duggen et al., 2010). Unattended beach fires also pose a threat to surrounding habitat.

Dogs are also not allowed under the reserve's current management plan. Dogs and human activities can disturb birds, marine mammals, fish, and other marine life. Recreational vessels such as boats and jet skis also have the potential of striking marine life, such as diving birds or seals. Both dogs and humans are also responsible for negatively impacting aquatic and surface vegetation. Trampling of aquatic vegetation can impair the growth of beneficial sea grass and algae (Cherry Point Aquatic Reserve Management Plan, 2010).

Improper recreational shellfish digging additionally harms the reserve's marine ecosystem. Refilling holes after digging for shellfish is required by the WDFW; however, a small number of recreational shellfish harvesters do not refill their holes, and this affects the distribution and topography of boulder and cobble substrates. According to the reserve's management plan: "The mounded material dug from the hole is not typically restored by tidal and wave action, resulting in permanent alteration to the beach and intertidal habitat" (2010). Area scientists believe improper refilling of shellfish harvest holes significantly impacts the reproduction of other shellfish as well as Pacific herring (Kyte, 2007). Greater public access to the reserve could amplify the effects of all the aforementioned negative recreational impacts.

Mitigation

Public education and outreach about the sensitivity of the Cherry Point ecosystem can reduce impacts from recreation. Having a public outreach campaign about responsible shellfish harvesting techniques and posted information and signage about the negative effects of unfilled holes could reduce improper harvesting practices. Additional signage about the adverse impact of dogs and beach fires on the marine habitat could mitigate some of recreation's negative effects on the Cherry Point environment.

Alternative Action

Impacts

The alternative action will further restrict public recreational access to the 45-acre cutout beyond what is already restricted in the existing reserve management plan. The alternative action strictly prohibits non-tribal public access and recreational use of the 45-acre parcel. Although the general public will not be allowed to recreate in this particular section of the reserve, tribal members will be permitted to continue using the area for recreation. Thus, tribal recreational activities could have adverse impacts similar to the impacts described under the proposed action. Reduced access will not eliminate the negative impacts but it will reduce the intensity of the impact.

Mitigation

Similar mitigation techniques as those described in the proposed action should be utilized. Increased education and signage about the negative effects of dogs, beach fires, and improper shellfish harvesting could reduce the impact of recreation on the reserve.

No Action

Impacts

Under the no action proposal, recreational activities with negative environmental impacts will be allowed within the 45-acre parcel. Beach fires, dogs, and improper shellfish harvesting will be permissible and will continue to adversely affect the Cherry Point environment. By not including the 45 acres in the reserve, new docks or other hardened, overwater recreational structures could be built more easily. New structures, if large enough, could impact currents and disturb the marine habitats during construction. The current management plan notes that construction of a new overwater recreational structure is unlikely given the area's rough weather conditions (Cherry Point Aquatic Reserve Management Plan, 2010). However, the management plan's hypothesis does not rule out the possibility of development, given that other piers have been built and maintained along the Cherry Point shoreline. Overall, allowing recreational activities and the potential construction of a new recreational overwater structure in the 45-acre cutout will negatively influence the surrounding environment.

Mitigation

Techniques for mitigation similar to those described in the proposed and alternative action would be beneficial. Increased education and signage about the negative effects of dogs, beach fires, and improper shellfish harvesting could reduce the impact of recreation on the reserve and its surrounding area, which includes the 45-acre cutout. An environmental review before the construction of a large overwater recreational structure can also help mitigate environmental degradation.

3.4 Historical and Cultural Preservation

Existing Conditions

The proposed 45-acre cutout was proposed by the Lummi Business Council because it contains a historic and culturally sensitive site to local tribes. Lummi Nation, pictured in figure 12, is located just to the south of the proposed site.



Figure 12. Map of Lummi Nation Reservation.

Proposed Action

Impact

With the addition to the aquatic reserve, the areas of historical and cultural significance will be protected. The treaty rights established in the Point Elliott Treaty allow continued use of the water for fishing and harvesting which conforms with the historical uses of the area. Along with fishing and harvesting of shellfish by Lummi Nation members, the management plan allows public commercial and recreational harvesting of fisheries (Cherry Point Aquatic Reserve Management Plan, 2010).

The site was once home to Federally recognized tribes including the Lummi. As a result, is considered to be highly archaeologically sensitive. With the addition of the reserve, future development of the land by heavy impact industry is not possible, thereby protecting the archaeological site of the Lummi.

Mitigation

No mitigation efforts are needed to further preserve areas of cultural and historical significance as the new reserve accomplishes this.

Alternative Action

Impacts

The alternative management plan will allow continued use of the land by local tribes such as the Lummi and the Nooksack but will restrict public use of the area for harvesting of fish. This alternative action management plan accommodates the treaty rights allowing for continued harvesting of fish.

Mitigation

No mitigation efforts are necessary, as the impacts do not negatively impact the historic importance of the site.

No Action

Impacts

Allowing the current management plan, established in 2010 for the aquatic reserve, to stay in force will risk future development of this 45-acre cutout because the current management plan does not include the 45-acre cutout. Development of the area will be detrimental to the preservation of the area for previously indicated Lummi and Nooksack tribes under Impacts of Alternative Action.

Mitigation

Mitigation efforts to avoid negative impacts to Lummi Tribe's sensitive archaeological sites may include continual consultation with Lummi tribe about archaeological sensitivity. As planned future development occurs, representatives from Lummi Nation should be included in the planning process. Continual consultation will mean having a representative from Lummi Nation on the team of the developers. Any development that occurs should be first approved by this representative and not damage archaeologically sensitive sites.

3.5 Transportation

Existing Conditions

Aspects of transportation that apply to the Cherry Point site are predominantly related to waterborne and rail traffic as well as the movement and circulation of

good. There are some roadways on the uplands used by the refineries and visitors that pose relations to possible transportation effects such as increased pollutants in runoff as they are designated as Urban Growth Areas (UGA) zones according to the Whatcom County Comprehensive Plan. These consist of The Cherry Point UGA and the Birch Bay UGA.

An average of 234,000 barrels of oil are processed daily by the BP refinery at Cherry Point. This is greater than half of all crude and refined petroleum products in Washington state, all of which are loaded and unloaded here as well as products from the Alcoa-Intalco aluminum facility. The result is high volume of large-vessel traffic. There are already three existing pier operations at Cherry Point due to deep-water capacity as a result of favorable bathymetry. The U.S. Coast Guard manages vessel activity and pollution reports. There is a deep-water access currently present for shipping purposes as well as rail access used by the BP refinery located at Cherry Point. Vessel traffic is projected to increase within the next 10-20 years and with it the subsequent concern for risk of spills, discharges, fugitive dust and noise impacts, wildlife strike, and ballast water invasive species introduction. Boating is a popular public recreational activity at Cherry Point, as well as disturbances due to commercial aquaculture and indirect Canadian maritime sources (Cherry Point Aquatic Reserve Management Plan, 2010).

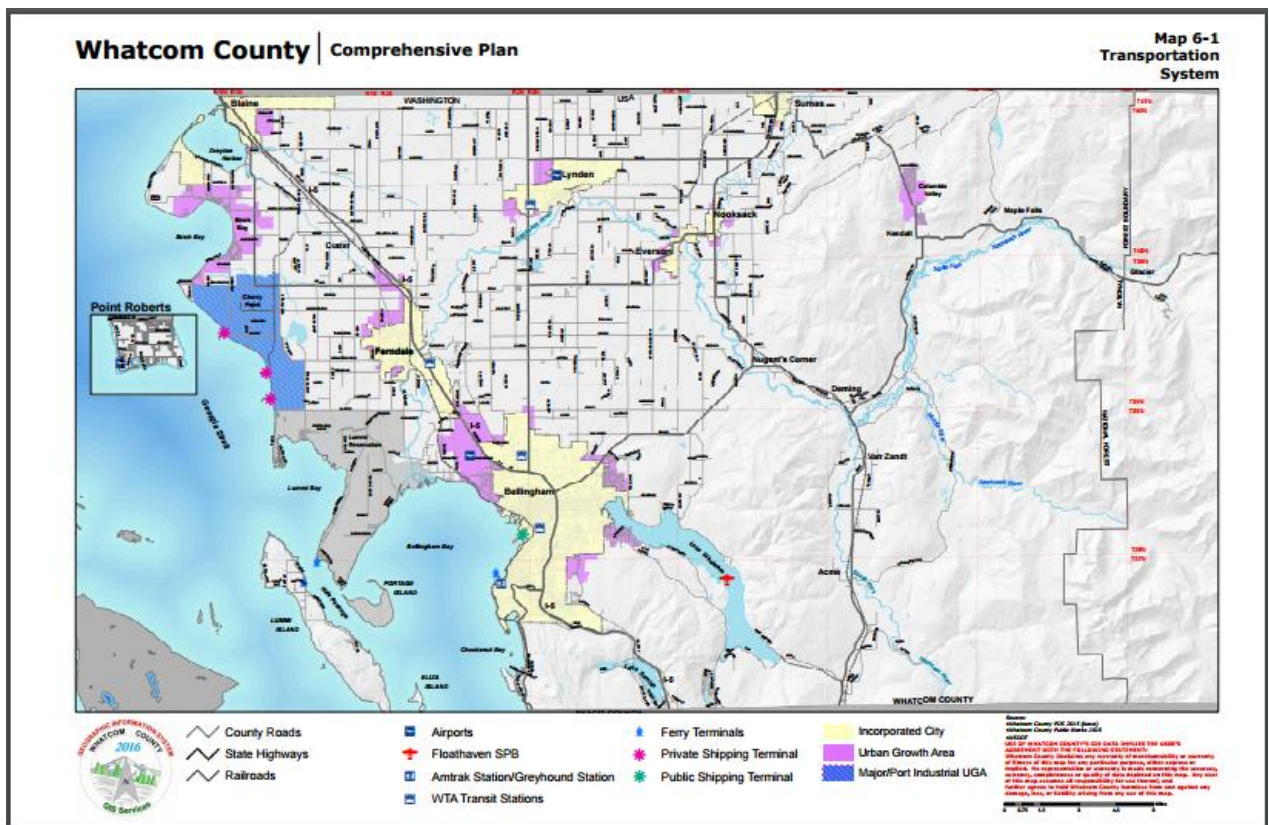


Figure 13. Map of Whatcom County Transportation Systems.

Proposed Action

Impacts

Integrating the 45-acre cutout into the Cherry Point Aquatic Reserve will not impose any additional transportation impacts as it does not entail any construction, added infrastructure, or increased traffic. There will be no added incentive for the public to travel to this area or have it be managed differently than the existing reserve.

Mitigation

No transportation mitigation will be required from Whatcom County in regards to this action as the proposed action does not result in any impact.

Alternative Action

Impacts

The 45-acre cutout under the alternative action will also be deemed an addition to the existing boundaries of the current Cherry Point Aquatic Reserve but with the added stipulation that it may be restricted from non-tribal practices such as recreation or commercial aquaculture. It will be assumed that there will be no significant impacts because of these added restrictions, where there could end up being successively positive consequences.

Mitigation

No transportation mitigation measures will be necessary under this alternative action as it does not result in any impacts.

No Action Alternative

Impacts

Under the no action alternative, the 45-acre cutout will remain undesignated as aquatic reserve land. Therefore, it will be open to industrial use as this is what the area is currently zoned for. This could result in the need for greater infrastructure, an increase in traffic, and incentive for more recreation. Because of the deep water close to shore, this area is desirable to develop as a new large-vessel port. Construction and the ensuing industrial use could have several negative impacts associated with vehicular traffic during construction efforts as well as greater waterborne traffic, increases in risk of spills, discharges, fugitive dust and noise, wildlife strike, and introduction of ballast water invasive species which is an identified problem in Cherry Point waters and remains to be a big concern.

Mitigation

No mitigation will be needed should the land remain as it is, with no plans proposed for the foreseeable future. Mitigation measures that Whatcom County will need to take in order to reduce the significant impacts should the acreage undergo construction and see an increase in traffic could include many actions. Monitoring of ballast water exchange, treatment, and discharges coming through with vessels is one way to mitigate. Construction of a site-specific plan for protections including the enforcement of sewage discharges such as ESHB1186, a Washington state oil spill program enacted in 2011, from vessels with approved oil spill contingency plans in place is another way to mitigate.

3.6 Utilities

Existing Conditions

The area of Cherry Point involved in this proposal is zoned for heavy industrial use and currently has three industrial facilities operating in the surrounding area. Because of these existing industrial facilities, the area of focus in this proposal already has access to a sufficient supply of energy and non-potable water for industrial use (PIT, Inc., 2011). Energy is currently supplied to this area by the Bonneville Power Administration (BPA) through a transmission system (Figure 14) located near the proposed site as well as several natural gas companies with pipelines (Figure 9) traveling through the area (PIT, Inc., 2011). Water is supplied to this industrial area through Whatcom Public Utility District No. 1 (Figure 15), which provides non-potable water for refinery and smelting processes nearby (PIT, Inc., 2011; Whatcom PUD, 2016). The site of the proposed terminal does not include ready access to wastewater management systems, drinking water, or communication infrastructure and will therefore require expansion of existing services or development of independent infrastructure to fulfill project utility requirements.

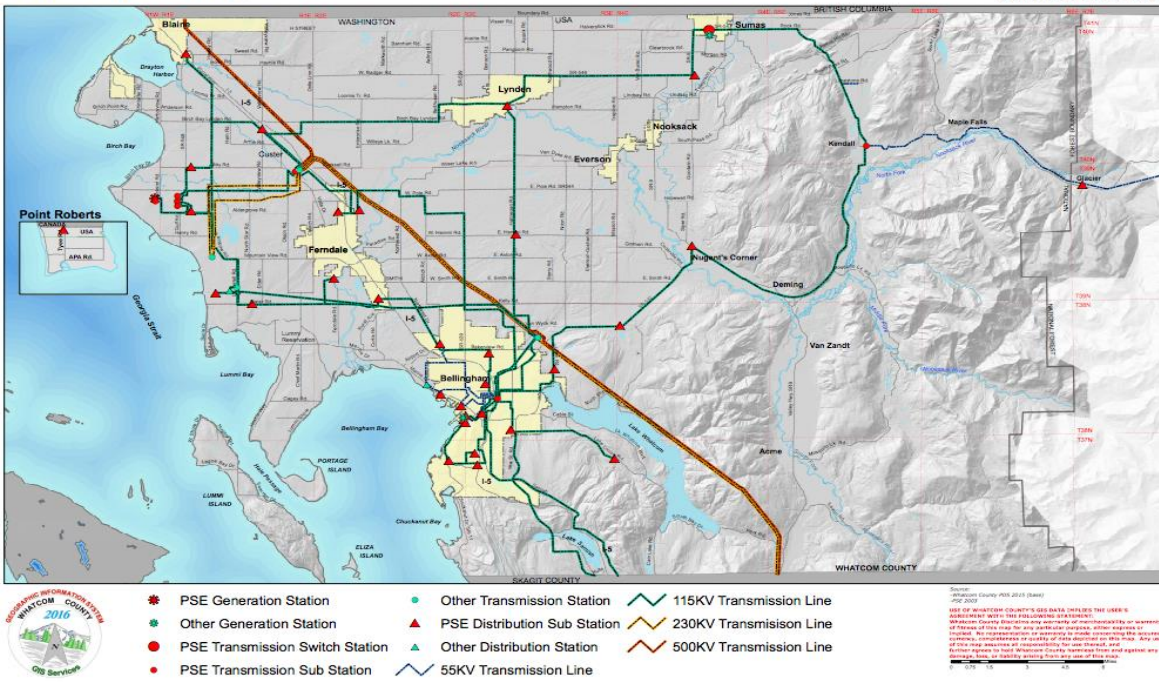


Figure 14. Whatcom County Power Electricity Generation and Transmission.

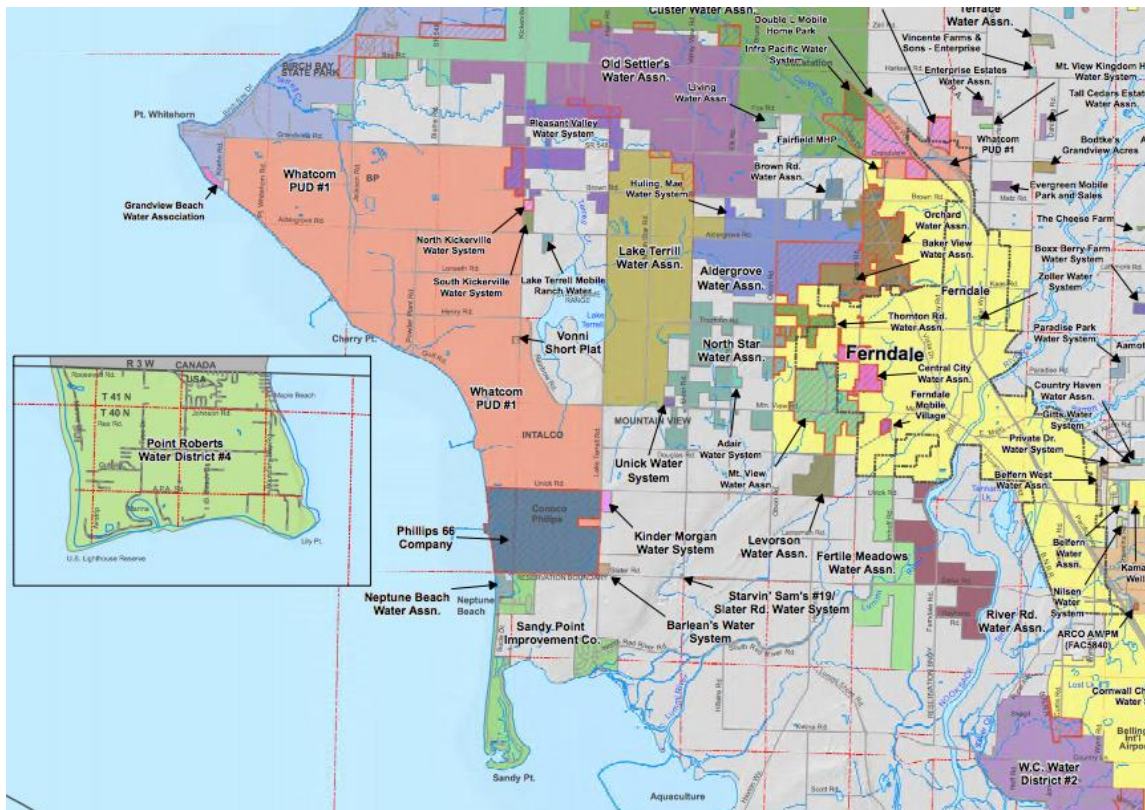


Figure 15. Water Service Utility Areas.

Proposed Action

Impacts

The proposed action will involve no construction and will not require access or connection to any utilities. Therefore, the proposed action will have no impacts on utilities.

Mitigation

Since the proposed action requires no utility connection and therefore has no impacts on utilities, no mitigation measures will be necessary.

Alternative Action

Impacts

Under the alternative action, the 45-acre cutout of the proposed GPT site will be incorporated into the Cherry Point Aquatic Reserve, and no terminal will be developed on the site. Therefore, it can be assumed that there will be no need for utility connections at the site and no impacts to utilities.

Mitigation

Since the alternative action requires no utility connection and therefore has no impacts on utilities, no mitigation measures will be necessary.

No Action Alternative

Impacts

The no action alternative will allow the construction of a multimodal export terminal and supporting facilities. Therefore, this will require access and connection to a sufficient electricity supply and industrial water supply, as well as wastewater management systems and communications infrastructure (PIT, Inc., 2011). Since the Cherry Point industrial area is already served with electricity and water supplies, this alternative will have minimal impacts on area electricity and water utilities. This will require construction of interconnections between these available utilities and the new terminal facilities--including a new dedicated 115 kV power line to connect the terminal to the Bonneville Power Administration's nearby transmission system and a new 12-inch underground water pipe to connect the terminal to the existing Whatcom PUD industrial water main (PIT, Inc., 2011). The terminal will not require connection to natural gas and therefore will have no impact to natural gas utilities (PIT, Inc., 2011). This terminal will also require a wastewater management system, which will be achieved through installation of on-site wastewater treatment systems. Because this service will be provided on site, it will not have impacts for

local wastewater treatment utilities such as the Birch Bay Water and Sewer District. However, the developer will contract with this utility to provide sewer services for the terminal. This will increase the quantity of waste handled by this sewer district and will be achieved through constructing an underground pipe to connect the terminal's wastewater to the nearby sewer access serving the BP Cherry Point refinery facilities (Whatcom Planning Commission 2017). Operating this multimodal export terminal will also require constructing communications infrastructure onsite to provide communications control between all areas of terminal operations, allow communication with incoming trains and marine vessels, and provide terminal security. This will include constructing a central communication and operations facility onsite, laying fiber optic cables between terminal components, and connecting to a land-based telephone network (PIT, Inc., 2011). This communication infrastructure will not have impacts to utilities other than providing access to landline telephone service. This service could be provided through a variety of commercial landline services and will not have significant impacts to this provider other than through providing the initial connection and ongoing maintenance services.

Mitigation

Operating this export terminal will not require utilities to increase their service capacities or construct more infrastructure and therefore it is not likely that the construction of this terminal will significantly impact utilities serving the area. Because the terminal developer will provide the onsite infrastructure to either provide their own services or connect to local utilities, any impacts should be minimal, and mitigation measures are not necessary.

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Appendix

Figures

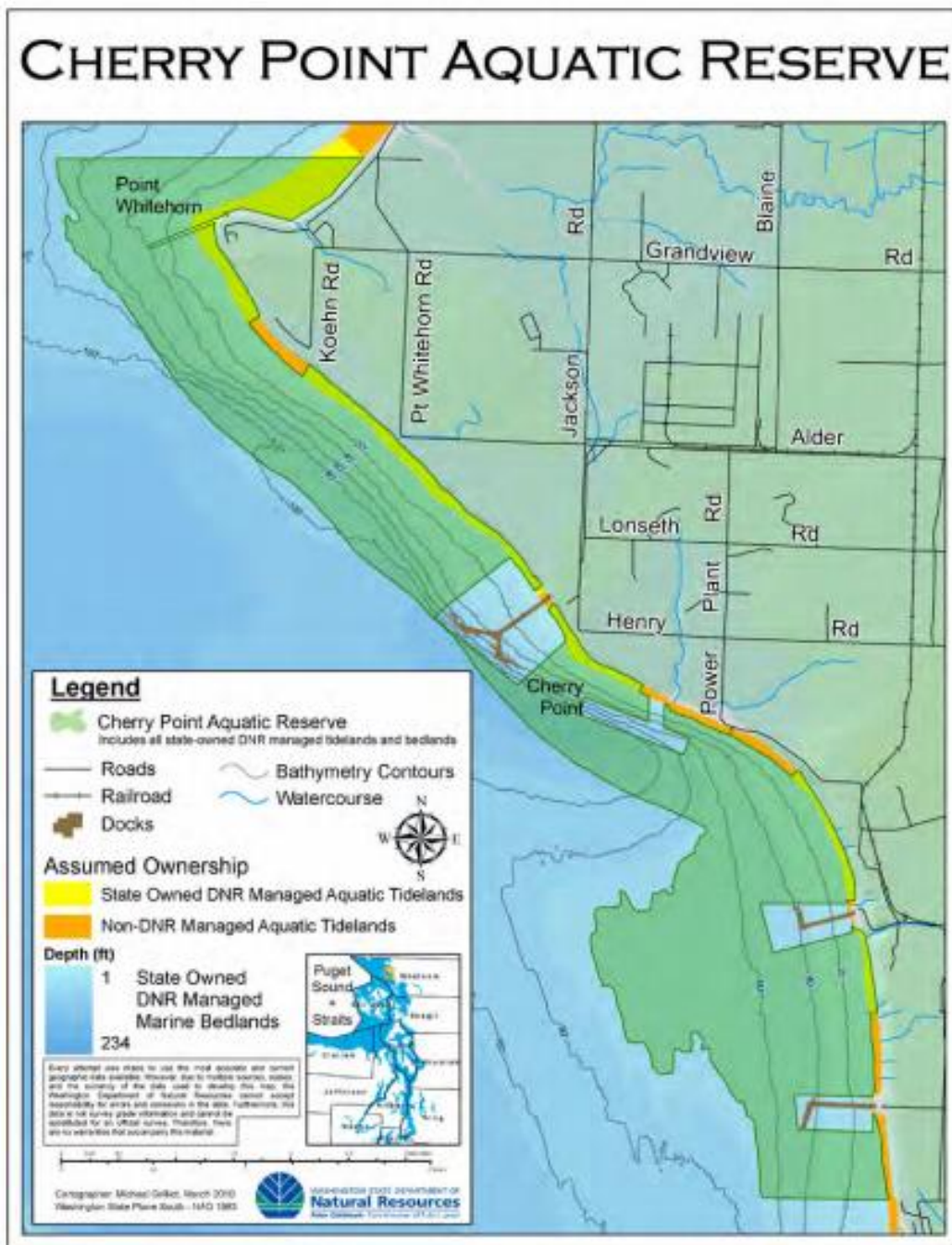


Figure 1.

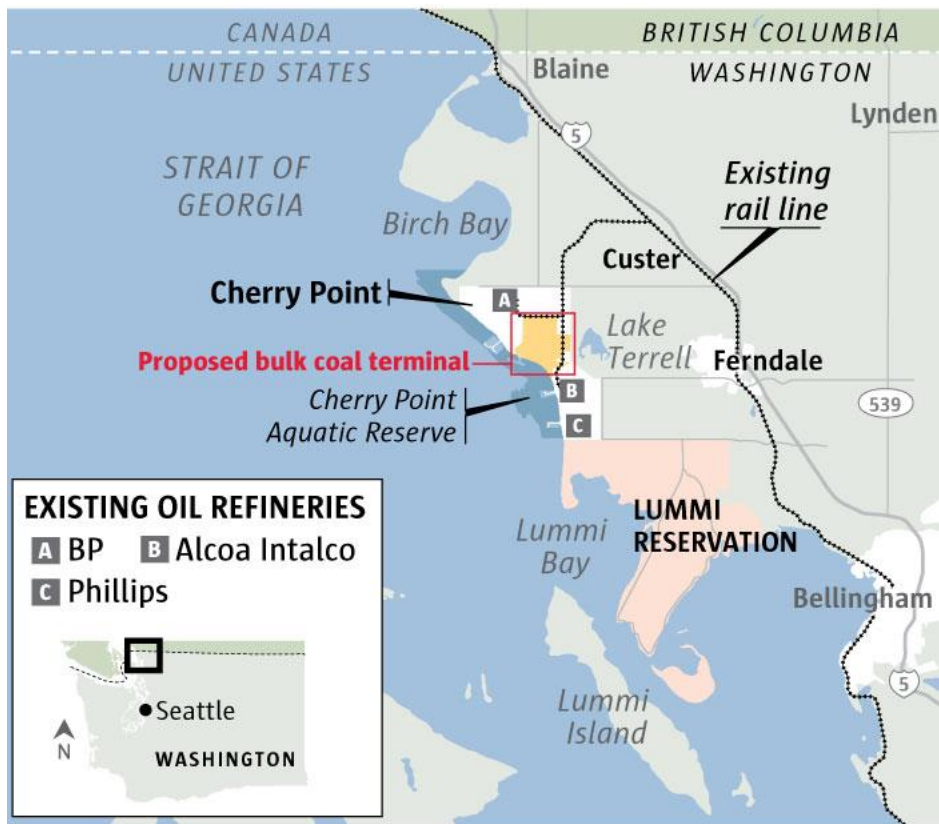
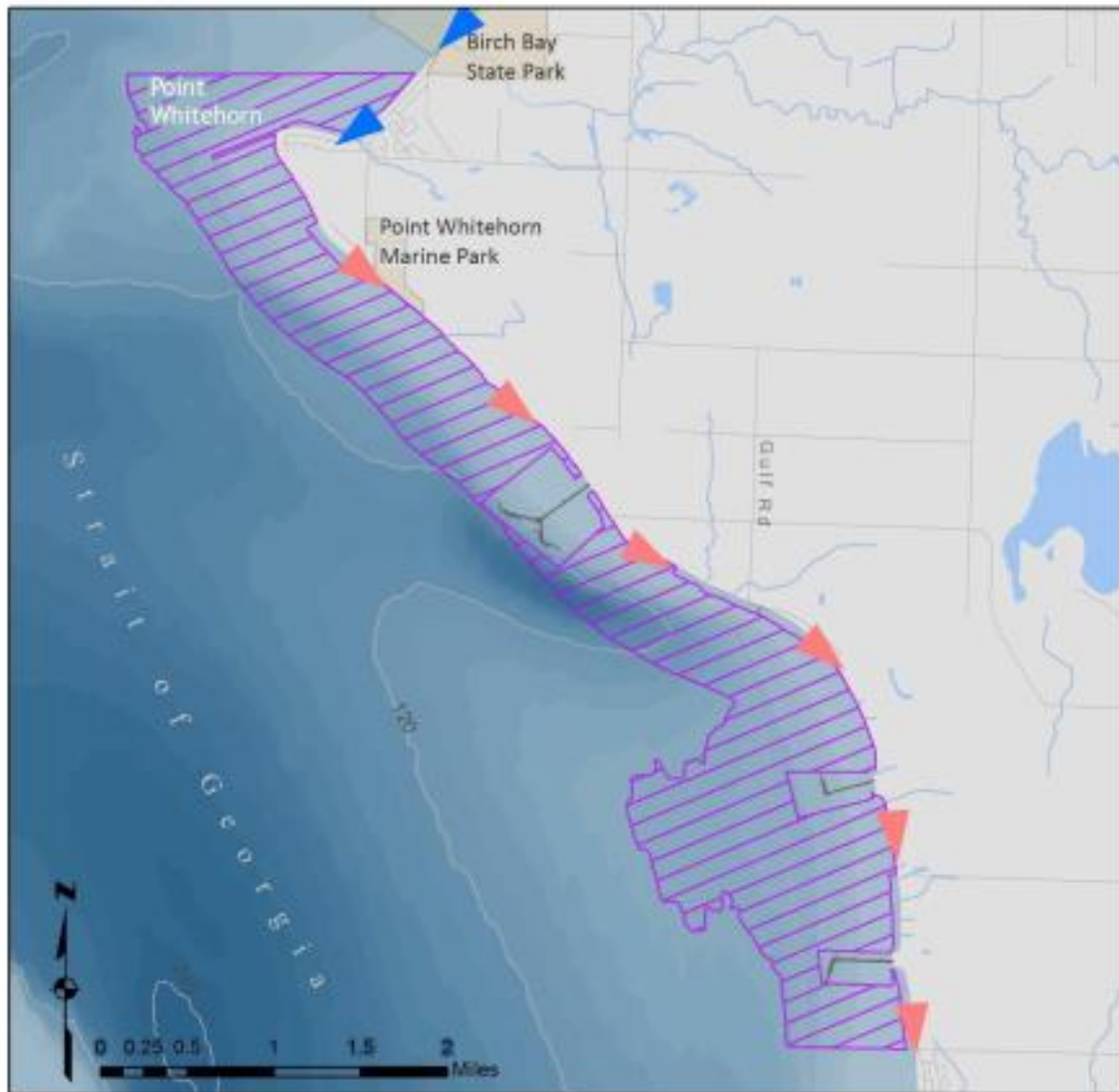


Figure 2.

Cherry Point Aquatic Reserve

Drift Cells



- Cherry Point Aquatic Reserve
- Drift Cells**
 - Left to right
 - Right to left
- County Roads
- State & County Parks
- Depth Contour (ft)
- Watercourse



Created by J Kilgo 12/5/16

Every attempt was made to use the most accurate and current geographic data available. However, due to multiple sources, scales, and the currency of the data used to develop this map, the Washington Department of Natural Resources cannot accept responsibility for errors and omissions in the data. Furthermore, this data is not survey grade information and cannot be substituted for an official survey. Therefore, there are no warranties that accompany this material.

Data sources: Dept. of Ecology drift cells; CH2M Hill acoustic bathymetry; WSDOT roads; WDFW depth soundings; Base Map: Forrester & P. Contoured bathymetry and topography of Puget Sound, Washington State, University of Washington (<http://ocean.washington.edu/batho/topobaths/>)

Figure 3.

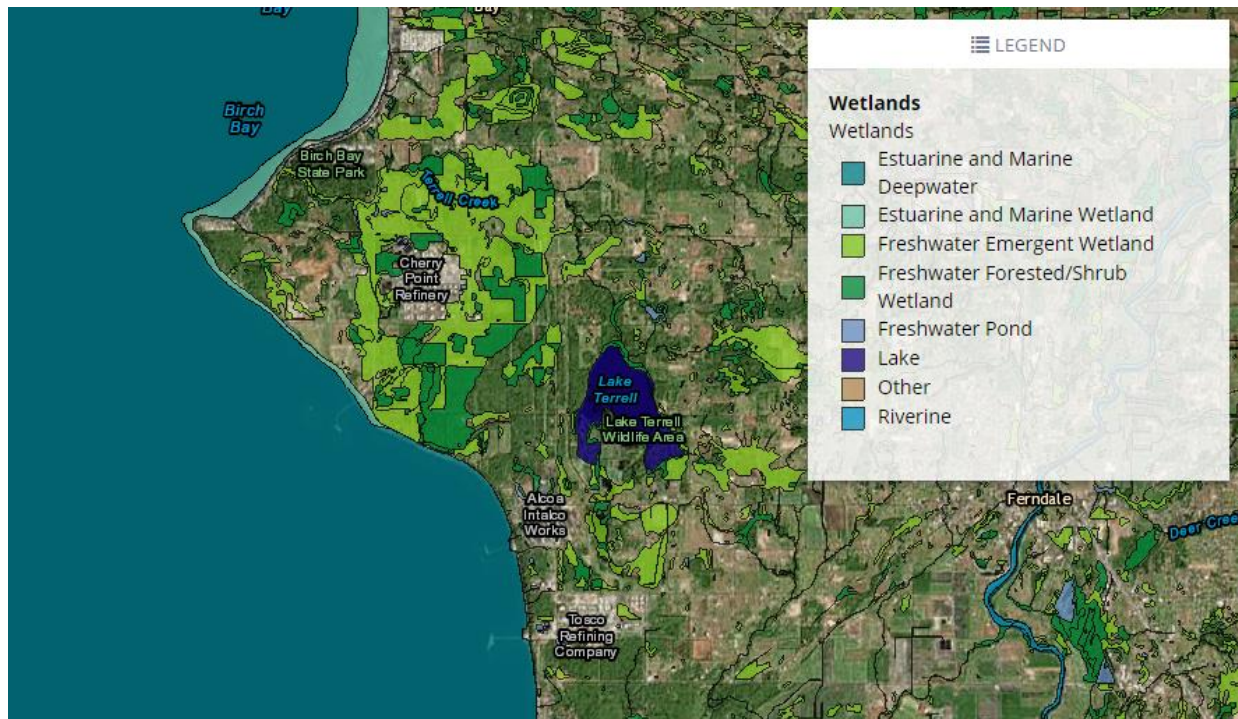


Figure 4.

Cherry Point Aquatic Reserve Eelgrass and Kelp Nearshore Distribution

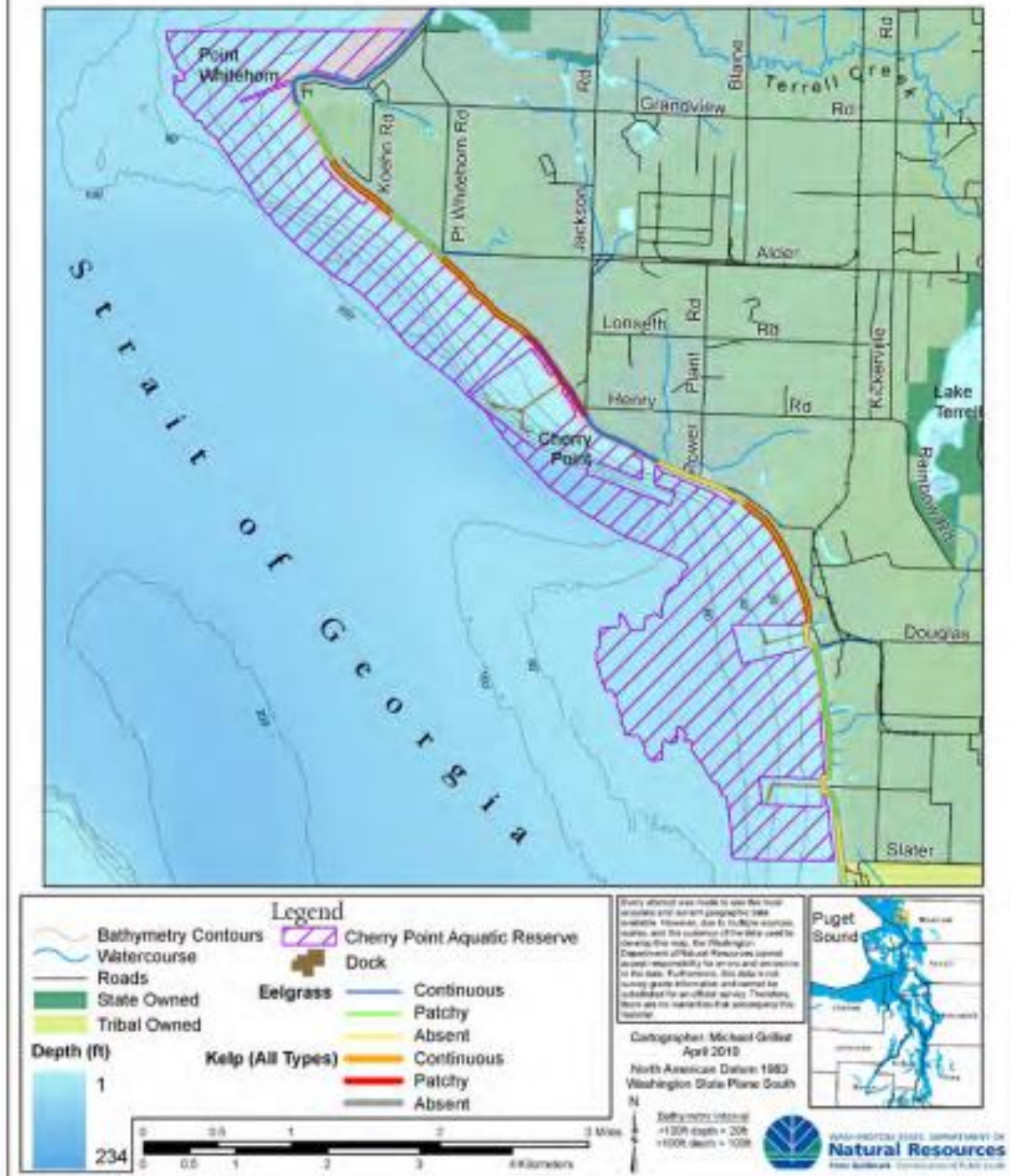


Figure 5.

Cherry Point Aquatic Reserve Herring Spawning and Forage Fish Surveys

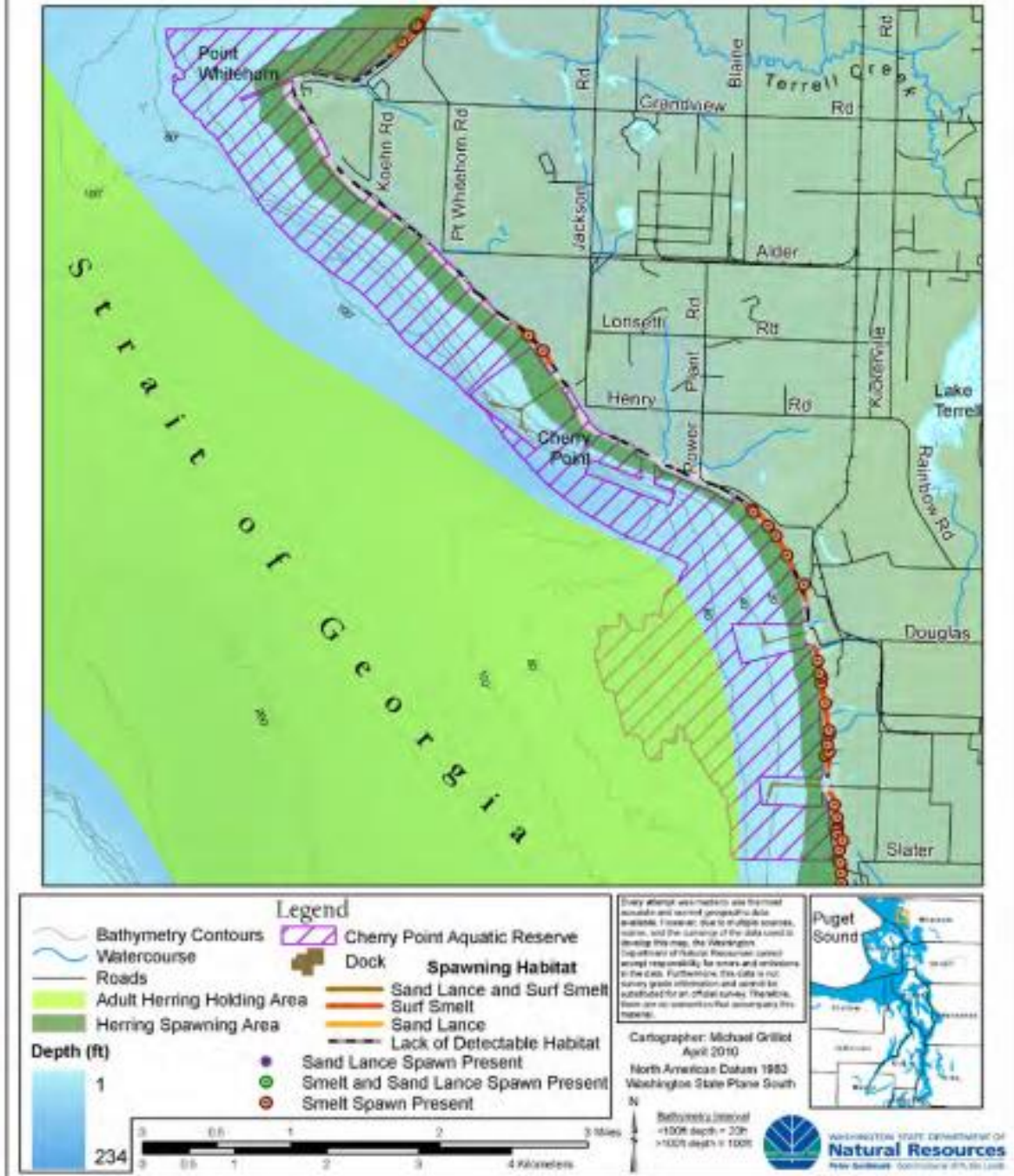


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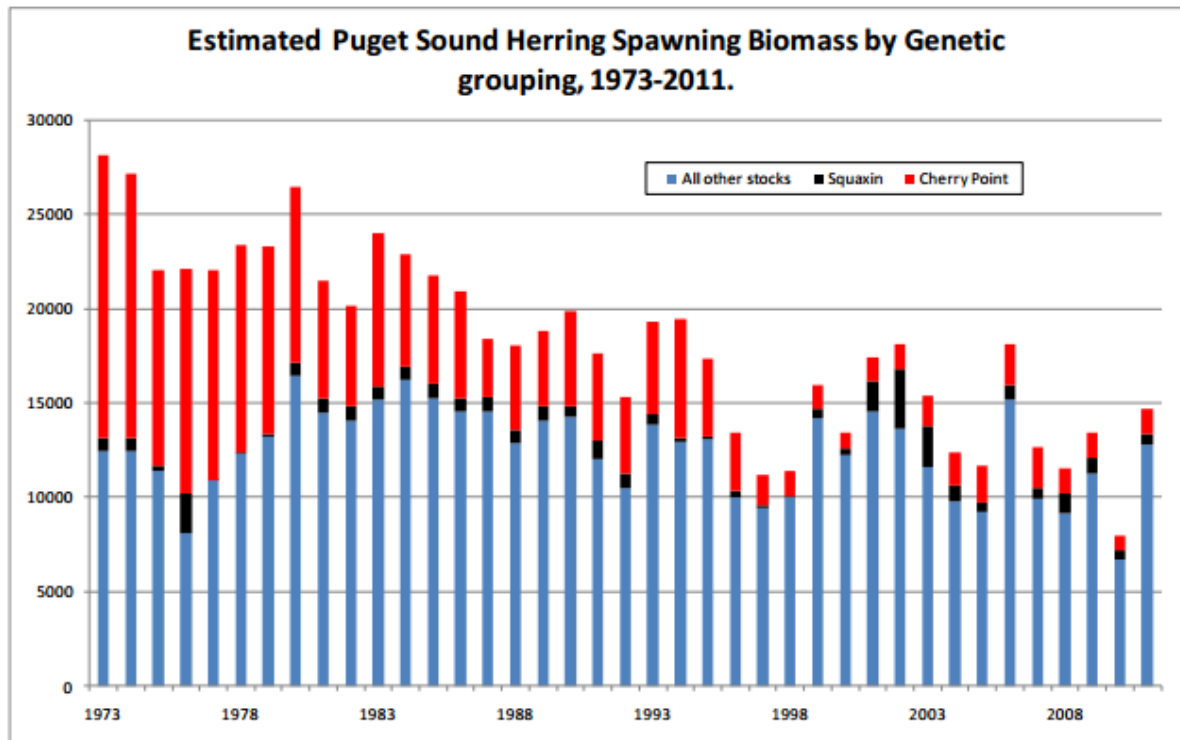


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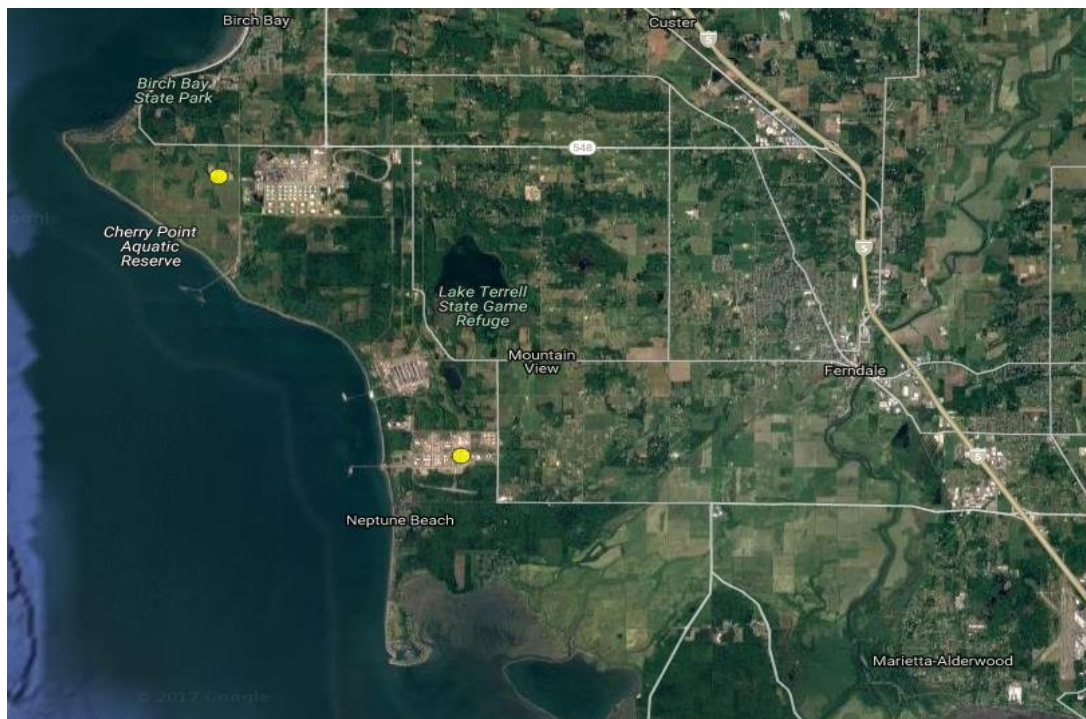
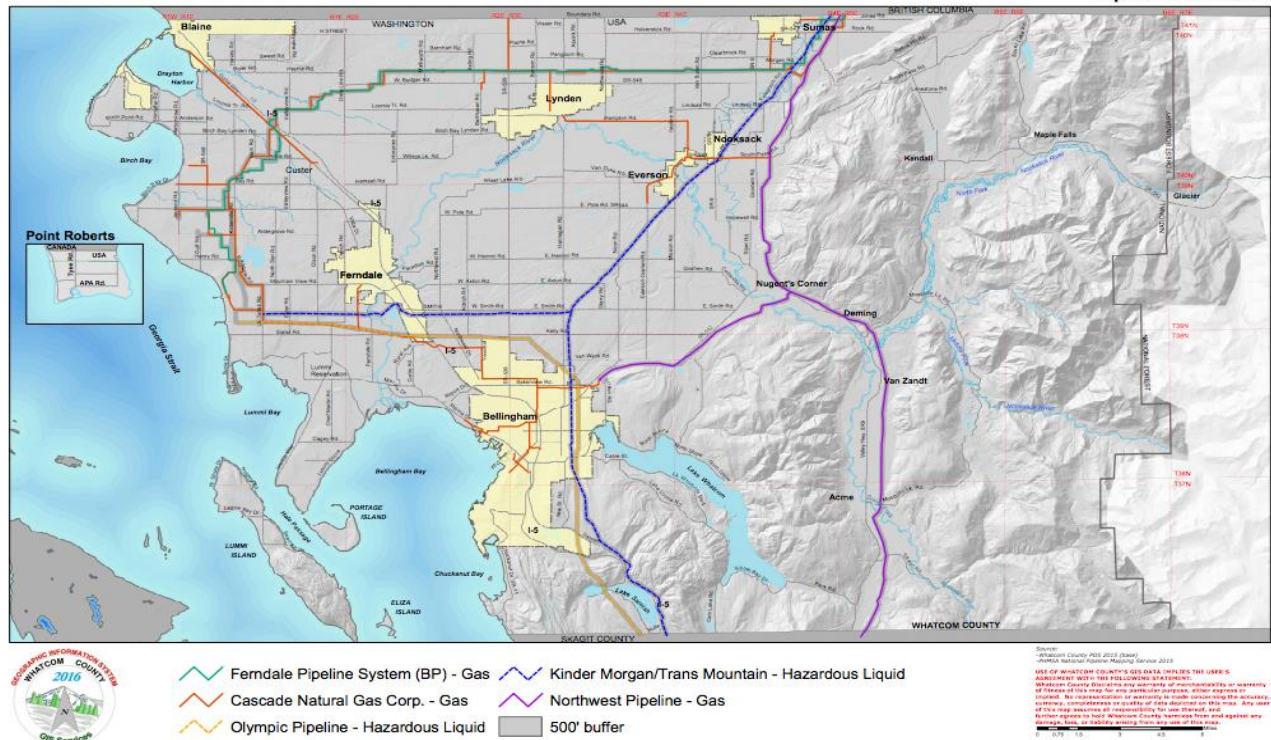


Figure 8.



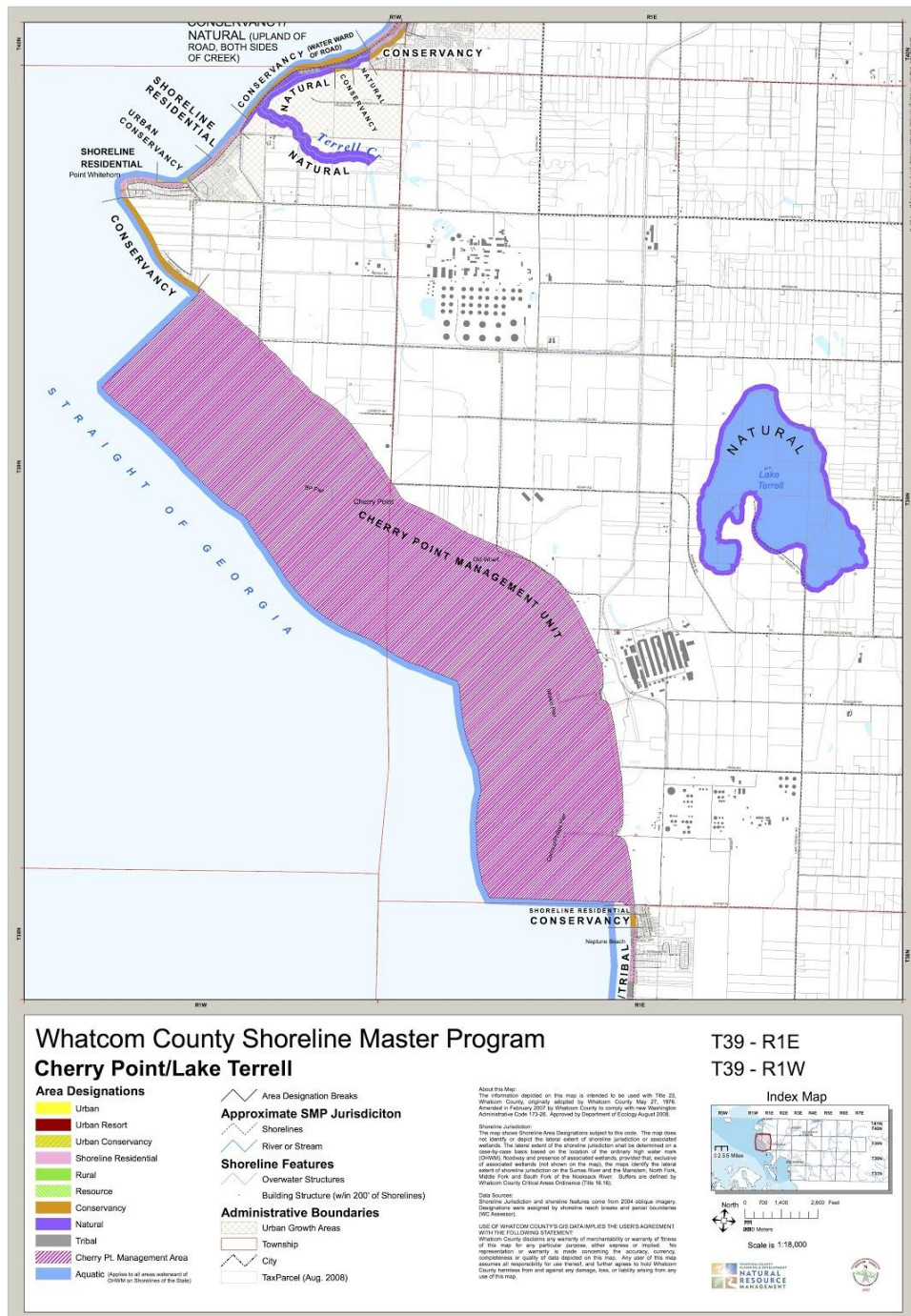


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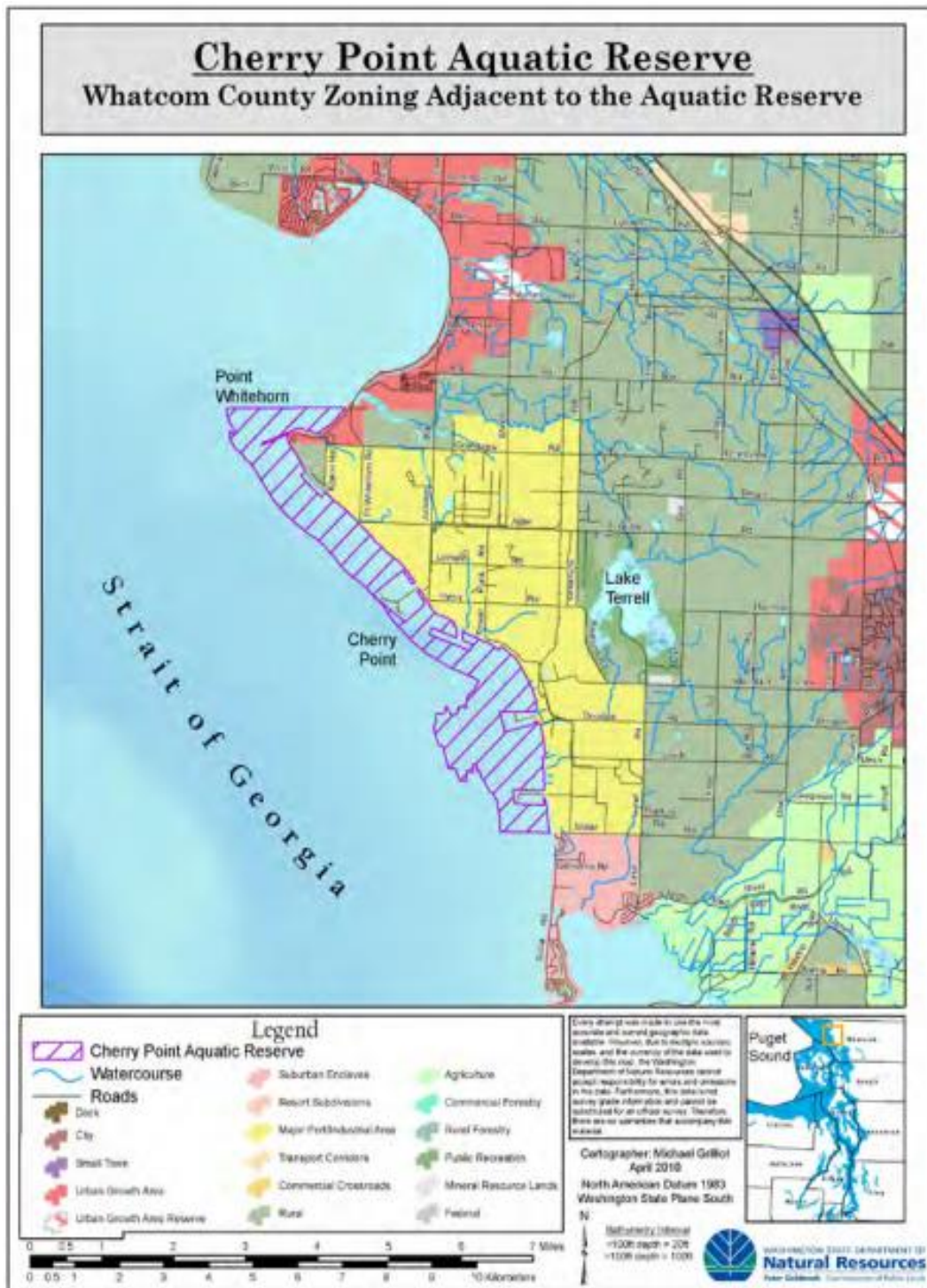


Figure 11.



Figure 12.

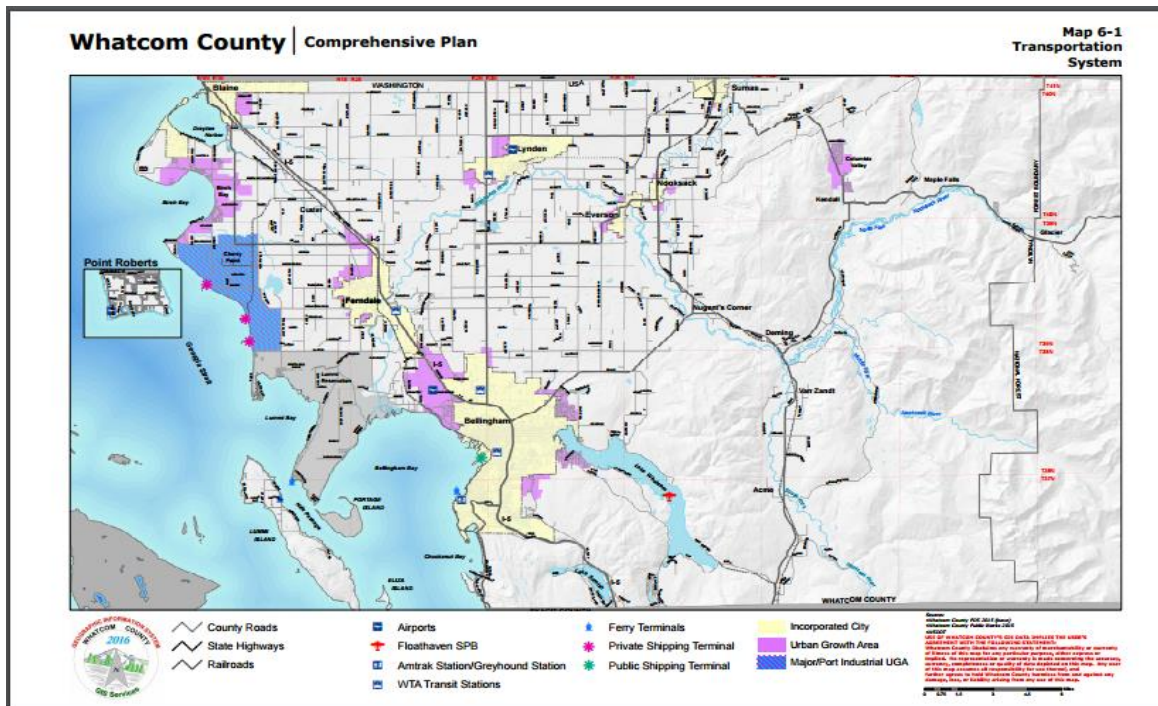


Figure 13.

Point Roberts

Legend:

- ★ PSE Generation Station
- Other Generation Station
- ▲ PSE Distribution Sub Station
- ▲ Other Distribution Station
- PSE Transmission Switch Station
- PSE Transmission Sub Station
- 115KV Transmission Line
- 230KV Transmission Line
- 500KV Transmission Line
- 55KV Transmission Line

Geographic Information System
WHATCOM COUNTY
2016
GIS Services

Source: Whatcom County GIS 2016 (Data)
 100% OF WHATCOM COUNTY'S GIS DATA INCLUDES THE USER'S
 ADDRESS/PROPERTY MAPS. THE FOLLOWING INFORMATION IS PROVIDED FOR YOUR INFORMATION ONLY. IT IS NOT A GUARANTEE OF ACCURACY OR COMPLETENESS OF DATA. ANY USE OF THIS MAP IS AT THE USER'S RISK. THE USER AGREES TO HOLD THE COUNTY HARMLESS FROM ANY AND ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES, INCLUDING REASONABLE ATTORNEY'S FEES, ARISING OUT OF OR RESULTING FROM ANY USE OF THIS MAP.

The map illustrates the complex network of water distribution systems and associations in the Puget Sound area. Key features include:

- Color-Coded Regions:**
 - North Puget (Blue):** Includes areas like Whatcom PUD #1, Vonnli Short Plat, and Ferndale.
 - Whatcom PUD #1 (Orange):** A large central region covering areas like North Kickerville, Lake Terril, and Vonnli Short Plat.
 - Vonnli Short Plat (Purple):** A region to the west of Whatcom PUD #1, including areas like North Kickerville and Lake Terril.
 - Ferndale (Yellow):** A region to the east of Whatcom PUD #1, including areas like North Star, Adair, and Leverson.
- Water Systems and Associations:**
 - Whatcom PUD #1:** The central water utility, serving a large portion of the region.
 - Vonnli Short Plat:** A water system serving the western part of the region.
 - Ferndale:** A water system serving the eastern part of the region.
 - Local Water Associations:** Numerous smaller associations are shown, such as Grandview Beach Water Association, North Kickerville Water System, Lake Terril Water Ass'n, and Vonnli Short Plat.
- Geographical Features:**
 - Coastline:** The map shows the coastline of the Puget Sound, with various islands and peninsulas.
 - Water Bodies:** The map includes labels for various water bodies, such as the Strait of Juan de Fuca, the Puget Sound, and the Strait of Georgia.
- Inset Map:**
 - Point Roberts Water District #4:** An inset map shows the location of Point Roberts Water District #4 within the larger Puget Sound region.

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Tables

Table 1. GPT Modeling Results for Criteria Pollutant Maximum Concentrations ($\mu\text{g}/\text{m}^3$) (ENVIRON Intl. Corp 2014).

Criteria Air Pollutant	Avg. Time	B/G Conc. ^(a)	Project Related Concentration ^{(b), (c)}	Project Plus B/G	Ambient Standard ^(d)
PM ₁₀	Annual	12.0	25.2	37.2	50
	24-Hour	29.0	100.3	129.3	150
PM _{2.5}	Annual	6.0	3.8	9.8	12
	24-Hour	15.8	12.6	28.3	35
SO ₂	Annual	14.2	0.06	14.3	52
	24-Hour	36.7	1.1	37.8	262
	3-Hour	14.1	6.2	20.3	1,310
	1-Hour	89.0	5.9	94.9	196
NO ₂	Annual	11.8	25.5	37.3	100
	1-Hour	52.3	126.7 ^(e)	179.0	188

^(a) Background concentrations based on measured levels. See [Table 2](#) (page 13).

^(b) Reported pollutant concentrations are those occurring at the maximum impact location for each pollutant. Concentrations at all other locations are less than those reported here.

^(c) Note that all of the short-term concentrations are based on modeling that considered maximum hourly activity during every hour of the 5-year meteorological data set, which is not a possible actual level of activity. These results are therefore intentionally skewed to represent very conservative conditions. Note that consistent with EPA guidance, the annual modeling results are based on 5-year averages from the 5-year meteorological data set instead of 3-year as per the NAAQSs.

^(d) All ambient concentrations are expressed in terms of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$); [Table 1](#) (page 11) which presents only the ambient air quality standards, includes some concentrations reported in parts per million (ppm).

^(e) The air quality modeling for *off-site* trains assumed locomotives would be comprised according the EPA default fleet mix in 2019, except that all engines with emissions characteristics less than Tier 2+ were replaced with Tier 2+. This same assumption was *not* applied to on-site trains, and with the elimination of older locomotives from the system NO₂ concentrations from on-site activities would be even lower than indicated here.