



Winter 2011

Boulevard Park shoreline improvements project:environmental impact assessment

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Boulevard Park Shoreline Improvements Project



**Environmental Impact Assessment
Winter 2011**

**Western Washington University
Huxley College of the Environment**

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Environmental Impact Assessment
Huxley College of the Environment

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Date: _____ 3.6.2011 _____

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Dear Concerned Citizens,

This Environmental Impact Assessment (EIA) was completed in accordance with Washington State SEPA rules as a group project supervised by Dr. Leo Bodensteiner for credit at Western Washington University. The project investigated and assessed by this group is the proposed plan to remove fill, riprap, and sod from the shoreline at Boulevard Park and replace this with sloping gravel and sand beaches and rock groins. The purpose of this project is to protect the shoreline from erosion due to wave action by increasing the slope of the shore and replacing soil and fill with gravel. Potential environmental impacts from the proposed action are discussed along with those of two alternatives.

The conclusion of this group, based on cumulative impacts to elements of the environment, is that the proposed action is preferred over the alternative action of installing bulkheads on the shoreline or the no-action alternative.

This EIA is intended to be informative for the general public and a resource in planning and discussing the future of the Boulevard Park shoreline. Our group's selection should be adequately supported in this document.

Sincerely,

Boulevard Beach EIA Team

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Greg Kornelis

Travis Mabee

Caitlin Switaj

Greg Coulter

Boulevard Park Shoreline Improvements Project

Environmental Impact Assessment

Environmental Science 436
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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

Title

Boulevard Park Shoreline Improvements Project

Description of Project

The purpose of the Boulevard Park Shoreline Improvements Project is to remove fill, riprap, and sod from the shoreline along Boulevard Park and replace this hardened shoreline with sloping gravel, sand beaches, and rock groins. Ultimately, this alteration of the shoreline will hinder erosion, improve habitat, improve public access to the bay, and decrease the impact of storm surges.

Legal Description of Location

The Boulevard Park shoreline improvements project is located at the Township 37, Range 2, Section 1, NW quarter section of the City of Bellingham, Washington (City of Bellingham 1996). Boulevard Park is situated on the eastern shore of Bellingham bay. The Park is owned and maintained by the City of Bellingham.

Proposer

The City of Bellingham

Lead Agency

The City of Bellingham

Permits

- JARPA (Joint Aquatic Resource Permit Application) documentation for the implementation of this project is required. The JARPA application pertains to the following approvals and permits:
 - *Hydraulic Permit Approval (HPA)*

Purpose: The Washington Department of Fish and Wildlife requires projects, which use, divert, obstruct, or change the natural flow or bed of any freshwater or saltwater of the state to obtain an HPA.
 - *Section 10 Permit*

Purpose: The U.S. Army Corps of Engineers requires a Section 10 permit when a project involves any work in, over, or under navigable waters of the United States.
 - *Section 404 Permit*

Purpose: The U.S. Army Corp of Engineers requires a Section 404 permit when a project involves the discharge of dredged or fill material into the waters of the United States.

- *401 Water Quality Certification*

Purpose: After receiving a Section 404 permit, a 401 Water Quality Certification must be obtained from the Department of Ecology, which ensures that the project will comply with state water quality standards.

- *Coastal Zone Management Certification (CZM)*

Purpose: A CZM Certification is required when a project engages in activities, which affect coastal resources that involve federal activities, federal licenses or permits, and federal assistance programs. A CZM is issued by the Department of Ecology.

- Shoreline Management Act Documentation

- Shoreline Substantial Permit

Purpose: In order to comply with the Shoreline Management Act, a permit must be issued by the City of Bellingham to allow development on shorelines.

- Department of Natural Resources (DNR) Documentation

- *Aquatic Land Leases*

Purpose: Aquatic land leases are required for the leasing of any state-owned aquatic areas and are obtained through the DNR.

*The Boulevard Park Shoreline Improvements Project will *possibly* require all of the preceding permits. Since this project is in its early design phase, additional information may prove more (or less) permits are required for the implementation of this project.

Contributors

Greg Coulter – *Lead Editor, Earth, Public Services*

Sara De Sitter – *Energy and Natural Resources, Environmental Health*

Greg Kornelis – *Water, Land and Shoreline Use*

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We would like to thank the following individuals for their help in compiling this Environmental Impact Assessment:

Leo Bodensteiner – *Professor, Huxley College of the Environment, Western Washington University*

Dave Engebretson – *Professor, Huxley College of the Environment, Western Washington University*

Gina Gobo Austin – *Park Project Engineer, City of Bellingham*

Mary O’Herron – *Site Manager South State St. Manufactured Gas Plant, Washington State Department of Ecology*

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March 9th, 2011 at 7:00 PM

Fairhaven Pavilion

107 Chuckanut DR

Bellingham, WA 98225

Glossary of Technical Terms, Acronyms, and Abbreviations

Air Quality Index (AQI): A number used by government agencies to characterize the quality of the air at a given location.

Anadromous: Fish which migrate from saltwater to freshwater to spawn. They may spend all or only part of their adult life in saltwater. Chinook salmon and bull trout are anadromous fish (Fish and Wildlife Service 2010).

Anthropogenic: Forces on the environment caused by humans.

Arctic Air: A type of air mass characterized by cold dry air, generally developed in winter over arctic surfaces of ice and snow (NW Weather.net).

Average Daily Traffic Volume (ADTV): Average daily traffic volume is measured by dividing the number of vehicles that pass by a particular point over a specific period of time by the number of hours in that specific time frame and by multiplying the quotient by 24 hours. This method of traffic counting is used by most jurisdictions in Whatcom County (WCOG 2007).

Aquitard - Bedrock of low permeability along an aquifer.

Arterial Road: An arterial road is a high-capacity urban road (WCOG 2007).

Beach Armoring: The process of protecting shorelines from wave action by placing different obstructions such as beaches, riprap, reefs, and bulkheads to dissipate or reduce wave action and erosion on a shoreline.

Beach Deposition: Material deposited by wave action near the shore of a body of water, typically composed of sand and various types of sediment.

Bedrock: The original consolidated rock underlying the surface of the earth.

Below Ground Surface (BGS): A measure of the depth below the surface of the ground often used in reference to the depth of bedrock or differing soil layers.

Biomagnification: The increase of the concentration of a substance in organisms of higher trophic levels accumulated by feeding on contaminated organisms.

Bulkhead: A retaining wall built by man to control beach erosion.

Burlington Northern Santa Fe Railway (BNSF): A railway system covering the United States and parts of Canada.

Carbon monoxide (CO): A colorless, tasteless, odorless gas, which in large concentrations can cause illness, brain damage, or death. CO gas is generated from the burning of fossil fuels, wood, or natural gas without enough oxygen for complete combustion to take place (US EPA 2011).

Chuckanut Formation: Sandstone formations of the Eocene age deposited from 54 million years ago (ma) to 34 ma. This is the stone comprising the majority of the bedrock in the area around Bellingham.

City of Bellingham (COB): Referring to the government and various agencies of the City of Bellingham.

Class A area: Locations which humans occupy and where they sleep. This includes residential areas, recreational, and entertainment areas.

Concrete Groin: A concrete structure used to provide structure for the side of a beach and prevent currents along a shoreline from eroding and carrying material away from the shoreline.

Creosote: An oily liquid mainly used as a wood preservative and antiseptic. It is a product of the distillation of coal and wood tar, has a burning taste, and strong odor.

Cyanide compounds: Any chemical compound containing a triple bonded carbon and nitrogen group ($C\equiv N$).

Decibel: A unit based on powers of ten, and gives a relative measure of sound intensity.

Eelgrass Band: An eelgrass band is sub-tidal community that generally occurs below mean tide and offers habitat and refuge for various aquatic animals (Grisham 2011).

Turion: A bud that separates from the mother plant and stays dormant until the following spring; these are used to measure eelgrass density.

Endangered Species Act: The Endangered Species Act was established in 1973. Intended to conserve both threatened and endangered plants and animals as well as their habitats through

prohibiting their “taking” and ensuring that any approved action will not jeopardize their continued existence (Melious 2011).

Critical Habitat Designation: Section 4 of the Endangered Species Act requires the designation of habitat that is critical for the survival of a particular threatened or endangered species using the best scientific data available, taking into consideration the economic impact of the designation (Melious 2011).

Threatened Species: A species that is likely to become endangered within the foreseeable future in a significant portion or all of its range (Melious 2011).

Endangered Species: A species that is likely to become extinct in a significant portion or all of its range (Melious 2011).

Environmental Protection Agency (EPA): An agency of the federal government of the United States, charged with protecting human health and the environment through writing and enforcing regulations based on laws passed by Congress (US EPA 2011).

Erosion: Erosion is the gradual process of weathering and deteriorating of materials on the Earth’s surface.

Gulf of Alaska cold front: An area defined by cold dry air moving south from the Gulf of Alaska. These fronts are generally generators of harsh winter storms.

Hardpan: A term used to describe a thick or dense layer of soil (Seattle P-1).

High Pressure Sodium (HPS): A common form of outdoor lighting which produces a warm white light.

Hydrologic Forces: Forces related to the movement and distribution of water on and below the surface of the earth, often associated with erosion.

Lead (Pb): A metal found naturally in the environment as well as in manufactured products. The primary sources of lead emissions have historically come from motor vehicles and industrial sources (US EPA 2011).

Marine Park Shoreline Restoration Project: Analogous to the Boulevard Park Shoreline Improvements Project. Completed by early 2005, this project entailed removal of riprap along Marine Park’s shoreline and construction of a gravel beach in its place (Reid Middleton 2009).

Mean Lower Low Water (MLLW): The average of the lowest tidal levels for each day.

Model Toxics Control Act (MTCA): RCW 70.105D. Regulates notification, enforcement, and cleanup of hazardous substances.

National Ambient Air Quality Standards (NAAQS): Standards established by the United States Environmental Protection Agency under authority of the Clean Air Act that apply for outdoor air throughout the country (US EPA 2011).

National Marine Fisheries Service (NMFS): The federal agency responsible for protecting marine species (Olsen 2006).

Nitrogen dioxide (NO₂): One of a group of highly reactive gasses known as nitrogen oxides. NO₂ forms from emissions of cars, trucks and buses, power plants, and off-road equipment. Contributing to the formation of ground level ozone and particulate matter, NO₂ is linked to adverse effects on the respiratory systems (US EPA 2011).

Noise: Any unwanted sound.

Non-potable: Water unsuitable for drinking due to possible adverse health effects.

Nooksack Region: The region defined by the Nooksack River, which is located in the Northwest part of Washington State and empties into Bellingham Bay (Quinn 2005).

Northwest Clean Air Agency (NWCAA): One of seven agencies responsible for ensuring compliance with federal, state, and local air quality regulations in Whatcom County (NWCAA 2005).

Noxious Odor: An unpleasant smell that may affect the wellbeing or daily activities those exposed.

Ocean Substrate: The sediment comprising the seafloor of the ocean.

Ozone (O₃): A gas that occurs both in Earth's upper atmosphere and at ground level. Depending on the location of O₃, it can be beneficial or detrimental to human health. Ground level ozone is a pollutant that is poses a significant health risk, particularly to people with asthma. It also damages crops, trees, and other vegetation, and is the main ingredient of urban smog (US EPA 2011).

Particulate Matter (PM): Also known as particle pollution, particulate matter is comprised of extremely small particles and liquid droplets. A number of components make can make up PM such as acids, organic chemicals, metals, and dust particles. PM10 and PM2.5 relate to the size in micrometers of the particles, which may be inhaled and cause serious health effects. PM10 refers to particles larger than 2.5 micrometers and smaller than 10 micrometers in diameter. PM2.5 refers to particles 2.5 micrometers in diameter and smaller (e.g. smoke and haze) (US EPA 2011).

Petroleum hydrocarbons: Compounds consisting of carbon and hydrogen that are the primary constituents in gasoline, oil, and diesel.

Petroleum volatile organic compounds: Organic chemical compounds in the gas state with a petroleum source.

Phenol: Any compound that has a six-member aromatic ring with a hydroxyl group (an –OH group) directly bonded to the aromatic ring.

Polycyclic Aromatic Hydrocarbons (PAH's): Chemical compounds composed of fused aromatic rings. Many of these compounds have been characterized as carcinogenic, mutagenic, or teratogenic.

Riprap: Rubble or rock often used to protect shorelines from erosion (Port of Bellingham/City of Bellingham 2010).

Soil Boring: A process by which soil samples are extracted from the ground and analyzed to determine the soil composition in an area.

Stepped Plateau: A series of plateaus descending in elevation over a horizontal distance.

Sulfur dioxide (SO₂): A colorless, reactive gas, produced during the burning of sulfur-containing fuels such as coal and oil, during metal smelting, and by other industrial processes. Belonging to a family of gases called sulfur oxides, major sources of SO₂ include power plants, industrial boilers, petroleum refineries, smelters, and iron and steel mills. Generally, the highest concentrations of sulfur dioxide are found near large sources of fuel combustion (US EPA 2011).

Thoroughfare: A main public road serving as a route between two places (WCOG 2007).

Upper Level Trough: An elongated low-pressure area between two high-pressure areas, existing in the upper air (NW Weather.net).

U.S. Army Corps of Engineers (USACE): The U.S. Army Corps of Engineers is responsible for investigating, developing and maintaining United States waters.

Washington Administrative Code (WAC): A compilation of regulations issued by the executive branch agencies of Washington State. The WAC is a source of primary law in Washington State (“WAC 197-11-444 –Elements of the Environment”).

Washington Department of Fish and Wildlife (WDFW): The goal of the WDFW is to protect, restore and enhance both fish and wildlife and their respective habitats.

WDFW survey methods: The Washington Department of Fish and Wildlife (WDFW) Intermediate Eelgrass/Microalgae Habitat Survey Guidelines are intended to correctly establish the presence and density of eelgrass (Grette Associates 2008).

Washington State Department of Natural Resources (DNR): The Washington State DNR manages approximately 5 million acres of state-owned lands, which include forests, agricultural lands and submerged aquatic lands.

Wave Action: The energy of waves on a shoreline.

Western Regional Climate Center (WRCC): The Western Regional Climate Center, inaugurated in 1986, is one of six regional climate centers in the United States. The regional climate center program is regulated by the National Oceanic and Atmospheric Administration (WRCC 2005).

Site History

The project area of Boulevard Park in Bellingham, WA was first occupied by a lumber mill in 1884 (Herrenkohl and Landau Associates 2010). The mill was situated on a dock extending 1,200 ft along the shoreline and 400 ft into Bellingham Bay. The mill was in operation until 1925 when a fire burned it to the ground. The wood pilings supporting the dock remained in the water until they were removed during the Park's development. Wood debris from the mill and demolition materials from the Fairhaven Hotel were used as fill and riprap to support the Park's shoreline.

Upper Boulevard Park served as the site of the Bellingham Bay Gas Company's gas works, which was in operation beginning December 18, 1890, and remained in operation until 1956 under different owners.

Forming a barrier between the upper and lower Boulevard Park is the Burlington Northern-Santa Fe railway. Originally the Fairhaven & Northern Railway in 1890, it transported coal and timber to the gas works and lumber mill. Contaminants have been historically found in the railroad ditch north of the project site.

In 1975, the city of Bellingham purchased the site from private owners for use as a public park. Development began in 1979 and included construction of a parking lot, a picnic shelter, and trails. Shoreline reinforcement by riprap was undertaken along with grading, filling, and landscaping. Soil pits and borings were taken and analyzed for fill materials and soil conditions (but not for chemicals). After beginning work on a pedestrian walkway and renovating an on-site building, the park was dedicated in June of 1980. EPA testing of soil samples in 1984 determined chemical levels in the lower park did not pose a significant health risk. State Ecology however, put the site on the Washington State Hazardous Site list in 1991. Later park developments include the addition of an outdoor stage in 2009 and renovation of the Pattle Point Trestle, located on the south end of Boulevard Park, in 2010 (Herrenkohl and Landau Associates 2010).

Chapter 1: Executive Summary

1.1: Executive Summary

Purpose

This Environmental Impact Assessment (EIA) has been completed to determine the possible detrimental impacts of a project by the City of Bellingham (COB) to address erosion by renovating the beachfront of Boulevard Park. The impacts of this proposed renovation are thoroughly investigated with regard to the Elements of the Environment outlined in the Washington Advisory Code (WAC), Section 197-11-444 (“WAC Section 197-11-444”). This report addresses the environmental impacts of the proposed action, an alternative shoreline renovation, taking no action on the shoreline erosion within Boulevard Park, as well as possible mitigation measures for each of these actions.

Problem Description

Boulevard Park is a mainstay for recreation on the Bellingham waterfront. Located on the Interurban Trail between downtown Bellingham and Fairhaven, the park hosts many different types of recreation. From walkers and bicyclists using the trail to college students enjoying sunny days playing Frisbee on the grass lawn covering most of the park, the park is host to large numbers of visitors throughout the year. The shoreline of the park is currently eroding as a result of inadequate beachfront armoring, reducing the stability of the shoreline and the land area of the park itself.

1.2: Description of Proposed Action and Alternatives

Proposed Action

The City of Bellingham Parks and Recreation Department proposes to address the waterfront erosion in Boulevard Park by removing the riprap currently armoring the shoreline and installing three gravel and sand beaches with supporting concrete groins along the beach (Boulevard Park Shoreline Improvements, COB). These beaches, placed in areas experiencing the largest amount of erosion (Figure 1), would stabilize the shoreline and reduce erosion during large storm events.

Alternative Action

The alternative action proposed by this report is to replace the inadequate riprap beachfront armoring with three concrete bulkheads along the length of the park’s shoreline. This alternative would not allow wave action to reach the park’s land during large storm events, removing the chance of erosion possible at sites of the three proposed bulkheads.

No-Action Alternative

The no action alternative is to not address the erosion and land loss within Boulevard Park. This action will result in the continued destabilization of the shoreline and loss of both lawn and topsoil occurring as a result of wave action during large storm events.

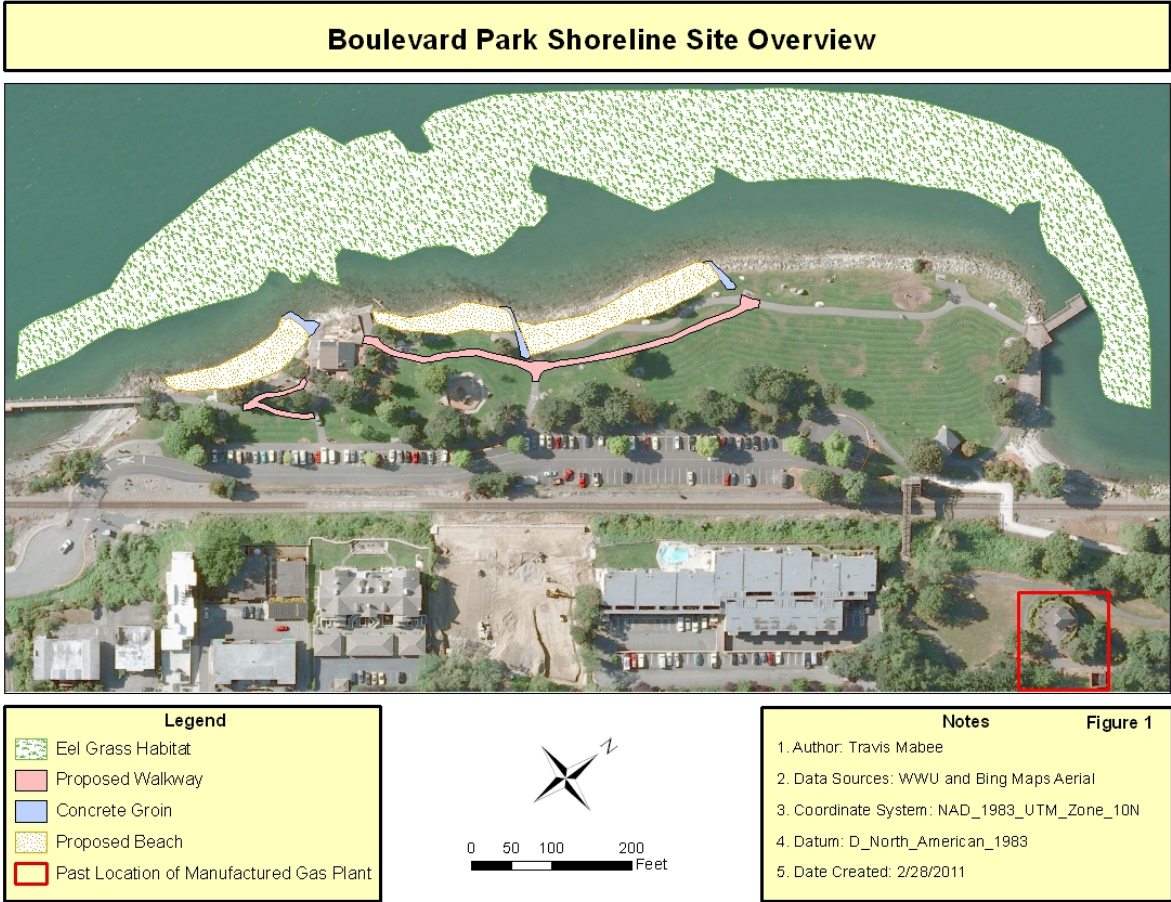


Figure 1: Overview of the proposed Boulevard Park shoreline renovation site, including beach and groin placement, location of eelgrass beds, and the remnants of the South State Street Manufactured Gas Plant.

1.3: Recommendation

Based on the potential impacts to the Natural and Built Environment as a result of the proposed actions, this report recommends the proposed action as the least detrimental, particularly in relation to erosion and impacts on environmentally sensitive species.

The construction of three bulkheads would require the removal of a much larger amount of earthen fill to remain stable, and would increase the erosion and wave action at the base of the bulkhead. This erosion would negatively affect the populations of eelgrass growing off the shoreline. Eelgrass beds serve as habitat for many species, particularly different life stages of salmonids listed as environmentally sensitive or threatened.

Of the three actions addressed by this report, the proposed action has the least associated detrimental environmental impacts. In order to mitigate the potential impacts on the built and natural environments, construction associated with the Proposed Action will occur above the habitat occupied by the eelgrass beds. As well, construction of the three beaches will take place at night and during the winter, when the associated impacts to the natural and built environments are lowest.

1.4: Decision Matrix

Natural Environment

	Proposed Action	Alternative Action	No-Action
Earth	1+	1-	1-
Air			
Air quality	(Temporary -) 0	(Temporary -) 0	0
Odor	(Temporary -) 0	(Temporary -) 0	0
Climate	0	0	0
Water			
Surface Movement / Runoff / Absorption	1+	1-	1-
Ground Water	0	0	0
Floods	0	0	0
Plants and Animals			
Eelgrass	0 *	1-	0
Bull Trout	1+ *	1-	1-
Chinook	1+ *	1-	1-
Surf Smelt	1+ *	1-	1-
Pacific Herring	0 *	1-	1-
Orca	1+ *	1-	1-
Energy and Natural Resources	(Temporary -) 0	(Temporary -) 0	0

Built Environment

	Proposed Action	Alternative Action	No-Action
Environmental Health			
Noise	(Temporary -) 0	(Temporary -) 0	0
Risk of Explosion	0	0	0
Toxic or Hazardous Materials	1- *	0	0
Land and Shoreline Use			
Existing land use and estimated population	0	0	0
Housing	0	0	0
Light and glare	1-	1+	0
Aesthetics	1+	1- *	1-
Recreation	1+	0	1-
Historic and Cultural Preservation	0	1-	0
Agricultural Crops	0	0	0
Transportation			

Transportation Systems	0	0	0
Vehicular Traffic	1- *	(Temporary -) 0	0
Waterborne and rail traffic	1+	0	0
Parking	1- *	(Temporary -) 0	0
Public Services			
Fire	0	0	0
Police	0	0	0
Schools and Utilities	0	0	0
Parks or other recreational facilities	1+	0	0
Maintenance	1+	1+	1-
Communications	0	0	0
Water/Storm Water	0	0	0
Sewer/Solid Waste	0	0	0
Other governmental services or utilities	0	0	0

	Proposed Action	Alternative Action	No-Action
Totals**	7	-8	-10
Mitigation Totals	9	1	0

1+ =Positive impact

1- =Negative impact

0 =Neutral

(Temporary -) = Temporary negative impact

* = Mitigation

**Note: Temporary impacts were not considered in totaling the effects on the various elements of the environment for the proposed action, alternative action, and the no-action alternative.

Chapter 2: Affected Environment, Environmental Impacts and Mitigations

2.1: Introduction to the Elements

Existing Conditions

Boulevard Park is situated on the eastern shore of Bellingham Bay. The park is owned and maintained by the City of Bellingham. The project site is a public park with pedestrian walkways, a playground, and picnic areas. It is host to a plethora of recreational activities, including kayaking, freebee, and volleyball. Woods Coffee operates a coffee shop on the southern side of the park near the Pattle Point trestle, which is available for both dining and private meetings.

Boulevard Park can be accessed by vehicle through Bayview drive, by bicycle or foot via the South Bay Trail, or by bus. Parking is available in the park's lower parking lot, which is accessed via Bayview Drive. Additional parking is available above the park along South State Street and at several points along the South Bay Trail, including in Fairhaven and at Pattle Point Trestle. The existing shoreline along the lower part of Boulevard Park consists of concrete rubble and riprap in addition to mixed gravel remaining from past shoreline filling and park development. This shoreline armoring has been ineffective in controlling erosion, made apparent by the numerous exposed tree roots found throughout the site.

Several threatened, endangered, and protected marine species migrate to the Bellingham Bay area during various times of the year. These species include, bull trout, chinook salmon, surf smelt, and pacific herring. Eelgrass, which provides refuge, nutrients, and spawning habitat for many of these species, exists continuously off of the shoreline at Boulevard Park.

Boulevard Park is in compliance with air quality and pollution standards.

Proposed Action

The proposed action involves softening the shoreline along Boulevard Park through the removal of concrete rubble and riprap currently armoring the shoreline. This hardened rubble will be replaced with sand and gravel beaches. The goals of the proposed action are to inhibit erosion, improve plant and animal habitat, improve bay access, and reduce the impact of storm surges.

Alternative Action

The alternative action involves the construction of three bulkheads along the shoreline of Boulevard Park. These three bulkheads would replace the riprap and concrete rubble currently in place along the shoreline with the intent of decreasing shoreline erosion. Boulevard Park would continue to have a hardened shoreline, and access to Bellingham Bay would not be increased.

2.2: Natural Environment

2.2.1: Earth

Existing Conditions

The land around Boulevard Park has been shaped by numerous influences on both geologic and human timescales. The topography of the area has a stepped plateau form, which has been created through a combination of glacial forces and human activity. This stepped topography extends from South State Street at approximately 80 feet above sea level down to approximately -20 feet mean low low water (MLLW) (Figure 1). The study area within the lower portion of Boulevard Park lies on the second plateau down from South State Street and extends west from the railroad tracks to the water's edge. The bedrock of the proposed site is comprised of splintered sandstone, shale, and siltstone, part of the larger Chuckanut Formation comprising the bulk of the bedrock within the city of Bellingham. Boulevard Park's bedrock has an undulating surface from South State Street down to sea level, having been eroded by glacial and hydrologic activities. In the area around Boulevard Park, the bedrock ranges from being exposed at the surface to depths of approximately 45 feet below ground surface (BGS) (Reid Middleton 2009).

Above the bedrock is soil referred to as the Bellingham Drift or Glaciomarine Drift, comprised of unstratified pebbles, sandy silt and clay material left behind as glacial ice melted and deposited the material onto the sea floor. The thickness of the Drift material is greatest near the shoreline, decreasing in depth upslope away from Bellingham Bay.

The majority of the soil comprising the lower portion of Boulevard Park itself is fill material from past shoreline filling and park development. These materials, consisting of construction debris (concrete, etc.), gravel, silt, sand, sawdust, clay, and topsoil comprise the majority of soils and range in depth from 25 feet BGS to approximately 10 feet BGS near the eastern edge of the park (Herrenkohl and Landau 2010).

Soil borings in the area report average soil composition of approximately 5 feet of earthen fill, 19 feet of wood waste fill, and 1 feet of sandy beach deposition over bedrock encountered at a depth of approximately 25 feet BGS (Reid Middleton 2009). The shoreline along the lower portion of Boulevard Park is comprised of concrete rubble and riprap with mixed gravel on top of the existing fill from past shoreline filling and park development. The shoreline is currently experiencing a significant amount of erosion due to wave action during high tide and storm events. Inadequate beach armoring in the form of riprap and gravel allows wave action to erode the top layer of earthen fill and grass above the shoreline.

Proposed Action

The construction of the three beaches along the shoreline (Figure 1) will have some detrimental short-lived environmental impacts within Boulevard Park. The construction process of removing the current gravel and riprap, as well as bringing in fill material for the beaches, will cause significant damage to the park's lawn. The proposed construction plans to bring trucks above the shoreline through the north end of the park, to access the three sites further south within the park. A large amount of truck traffic will have an impact on the loose topsoil fill and the grass in this area. As well, the removal of riprap will undoubtedly initiate erosion processes along the shoreline at the three sites, particularly during storm events while construction is ongoing. This impact, however, should be relatively short-lived and cease upon the construction of the beaches. The construction of the concrete groins will cause some short-term erosion around the footings as they settle into the shoreline and the ocean substrate, but the long-term erosion at the groins themselves will be negligible.

Alternative Action

The alternative action of constructing bulkheads along the shore where erosion is most prominent will have a significantly greater impact on the soils and ocean substrate within the park than the proposed action. The construction of bulkheads requires a much larger amount of earth to be removed, as the bulkheads' footing must be deep enough to remain stable. As well, construction of the bulkheads will require significantly more fill material, increasing the impact on topsoil and grass within the park. Bulkheads exposed to large amounts of wave action exhibit erosion at the shoreward base of the footing, which can eventually unsettle the footing and topple the bulkhead itself. The long-term effects of this alternative will have a significantly greater impact than the proposed action.

No-Action Alternative

If no action is taken on the shoreline it will continue to erode during high-tide winter storm events, further destabilizing the beachfront and reducing the land area of the park. Plantings along the shoreline may be undermined and eventually topple as the earth around their root base erodes and washes away.

2.2.2: Air

(i) Air Quality

Existing Conditions

Air quality in the Bellingham Bay area is regulated by the Environmental Protection Agency (EPA), Washington State Department of Ecology, and Northwest Clean Air Agency (NWCAA). Each of these agencies plays a role in regulating air pollution. The NWCAA is responsible for local regulation and permitting of stationary sources and construction emissions, while the Department of Ecology regulates mobile sources (NWCCA 2005). The EPA sets national standards and has oversight authority over the NWCAA and the Department of Ecology (US EPA 2011).

The EPA establishes air quality standards for six pollutants under the 1970 Clean Air Act. These standards are known as National Ambient Air Quality Standards (NAAQS). The NAAQS specify the maximum allowable concentrations within a set region considering seasonal change and atmospheric conditions. Regional air quality must not exceed set limits more than a given number of times per year for the region to be in compliance (US EPA 2011).

Airborne pollutants of concern are:

- Particulate Matter (PM₁₀ and PM_{2.5})
- Lead (Pb)
- Sulfur dioxide (SO₂)
- Carbon Monoxide (CO)
- Ozone (O₃)
- Nitrogen Dioxide (NO₂)

Current air quality data for Bellingham can be found on the NWCAA website. The NWCAA is one of seven agencies responsible for ensuring compliance with federal, state, and local air quality regulations in Whatcom County. Air quality is measured using the Air Quality Index (AQI). The EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide.

For these pollutants, the EPA has established NAAQS to protect public health. The values of AQI range from 0-500. The higher the AQI values, the more air pollution and greater the health impacts. AQI values below 100 are considered satisfactory and AQI values above 100 are considered to be unhealthy (NWCAA 2005). According to NWCAA, Bellingham currently has an AQI of 18, satisfying the NAAQS. Monitoring results show that air quality in Bellingham Bay is currently in compliance with all air quality pollutant criteria.

Proposed Action

Impacts of beach renovation include an increase in diesel emissions due to construction efforts. Diesel exhaust contains Particulate Matter, Carbon Monoxide, and Nitrogen Dioxide. However, this will only be a short-term effect. There are no long-term impacts to air quality in Bellingham Bay resulting from the proposed action.

Alternative Action

Short-term impacts of installing bulkheads on the beach are similar to those of the proposed action; construction vehicles will increase diesel emissions while the renovations are underway, but this will not cause air quality standards to be exceeded. The installation of bulkheads will not have any long-term impacts on air quality.

No-Action Alternative

The results of not renovating the shoreline will have no short or long-term effects on air quality in the region around Bellingham Bay.

(ii) Odor

Existing Conditions

Noxious odors are generally associated with local industries, wood smoke, vehicular traffic and construction activities. Air quality in the area is generally good due to proximity to low-density urban and forested areas, as well as open marine waters. A lack of topographical barriers relative to prevailing wind patterns ensures low pollutant loading and thorough air mixing (Engebretson 2010). Air in the vicinity of Bellingham Bay is free of noxious odors.

Proposed Action

Short-term impacts to the of Boulevard Park area include the release of construction emissions, temporarily increasing sulfur dioxide and nitrogen dioxide levels during the renovation period. Long-term unpleasant odor affects from the installment of a beach may be caused by the decay of dead organisms washed onto shore.

Alternative Action

Short-term impacts of installing bulkheads include the release of carbon monoxide due to the construction efforts. There are no long-term impacts of the alternative action affecting odor in the park.

No-Action Alternative

Lack of action will not result in any negative impacts on the odor of Boulevard Park.

(iii) Climate

Existing Conditions

Climate is one variable which may influence air quality, given the proper conditions. While climate alone does not cause high pollutant levels, under stable conditions air pollutants may become trapped and not allowed to disperse.

The coastal area of Whatcom County experiences a mild maritime climate, typified by cool summers and mild rainy winters. Temperatures on the coast are moderate due to the ocean's influence. Bellingham does occasionally experience harsh winter weather due to the upper level troughs pushing cold arctic air from the Canadian interior, usually the Fraser River Canyon. This cold air can collide with a Gulf of Alaska cold front, creating high winds, ice, snow, or heavy rains (Engebretson 2010).

According to the Western Regional Climate Center (WRCC), annual average maximum temperature is 57.5 °F and annual average minimum temperature is 42 °F. The period of these historical weather records of Bellingham dates from 1949 to 2005. The coldest months of the year are December and January, while the warmest months are July and August. Average precipitation is 35 inches per year (WRCC 2005). Prevailing winds are from the southwest in the winter and from the west and southwest during the remainder of the year; the wind rarely exceeds 20 miles-per-hour for extended periods of time (Engebretson 2010).

Proposed Action

There will be no short-term or long-term climatic impacts associated with the shoreline renovations at Boulevard Park.

Alternative Action

There will be no short or long-term impacts due to the installation of bulkheads at the park on the local climate.

No-Action Alternative

The results of leaving the site unchanged will not have any short or long-term negative impacts on the climate of the Bellingham area.

2.2.3: Water

The land and fill that make up Boulevard Park are a part of the shoreline of Bellingham Bay, one of a series of interconnected bays in northwest Washington that exchanges water with the Pacific Ocean. Bordered by Bellingham, the Lummi Reservation, and Lummi Island, the opening of the bay faces south and southwest, is 12 miles long and 3 miles wide. Water in the bay has a residence time of between one and eleven days, but is typically four to five days. The average tidal range of the bay is 5.2 feet (Herrenkohl and Landau 2010). Annual temperatures range from 47 to 55 °F. The freshwater entering the bay comes from Whatcom Creek and the Nooksack River. Water from the Nooksack River can influence the surface current of the bay which flows mostly clockwise. A deep water current from Rosario Strait brings water in from the Pacific Ocean on the south side of the bay and moves westward (Herrenkohl and Landau 2010).

The Port of Bellingham manages a marina and ferry terminal which are both located in the bay. Wastewater from the City of Bellingham is treated at the Bellingham Sewage Treatment Plant before it is discharged into the bay, though storm drains empty directly into the bay without treatment.

(i) Surface Water Movement/Runoff/Absorption

Existing Conditions

Surface water runoff travels through three drains located in the park's parking lot and paved pedestrian trail and through an eight-inch PVC pipe leading directly into Bellingham Bay (Herrenkohl and Landau 2010). Wastewater from the public restrooms is sent to the sewage treatment plant. Any rainwater falling in the park saturates the soil, filters through the fill beneath the topsoil, and seeps into the bay.

Proposed Action

Water falling on the gravel and sand beaches above sea level will percolate through inter-gravel spaces rather than saturating soil and fill. This water will make its way to the bay without causing saturation weakness and wasting. Runoff from the parking lot and wastewater would not be impacted by the proposed action.

Alternative Action

The installation of bulkheads will have no impact on existing surface water conditions.

No-Action Alternative

Rainwater falling near the shoreline would continue to saturate soils and weaken them with water weight. Wave-action erosion would continue to expose larger amounts of fill and riprap, allowing for percolation of water into the bay.

(ii) Ground Water Movement

Existing Conditions

The bedrock at the site is sandstone from the Chuckanut Formation and is considered to be an aquitard (Herrenkohl and Landau 2010). On top of this bedrock is a layer of fill material where some ground water can be found. This groundwater is assumed to be under the influence of tides, though no studies have been conducted on this influence. Any groundwater is considered to be non-potable.

Proposed/Alternative Action/No-Action Alternative

The proposed action, alternative action, and no-action alternative would not have a significant impact on groundwater movement, quantity, or quality. Groundwater would continue to be non-potable and under the influence of tidal forces.

(iii) Flood Hazard

Existing Conditions

Boulevard Park is located within a 100-year floodplain, and estimated sea level rise due to global warming could one day cover the park (Whatcom County CAO 2006)(Figure 2).

Proposed/Alternative Action/No-Action Alternative

Neither the proposed action, the alternative action, nor the no-action alternative would significantly impact the risk or occurrence of flooding at the site.



Figure 2: Map of 100-year flood plain, Bellingham, WA.

2.2.4: Plants and Animals

Existing Conditions

Eelgrass

Eelgrass exists continuously along the entire shoreline at Boulevard Park. At the dock located at the northern end of the park, eelgrass is present at -2.5 feet MLLW and becomes sparse 'waterward' of the dock. Both north and east of the dock, eelgrass is present beginning at -2.0 feet MLLW. Using proper WDFW eelgrass survey methods, Grette Associates found that the eelgrass band is approximately 130 feet wide in the southern part of the shoreline and a mere 36 feet wide near the existing dock at the northern end of the park. The average eelgrass density at the Boulevard Park site is 63.8 turions per square meter; the lowest densities were recorded near the existing dock (Grette Associates 2008).

Eelgrass has been designated as critical habitat, as it is the main source of habitat for bull trout, surf smelt (at +11 to +8 MLLW), Chinook salmon, and pacific herring in Bellingham Bay (Grisham 2011).

Bull Trout

Bull trout were listed as a threatened species on November 1st, 1999 and are protected under the Endangered Species Act (ESA). Although the majority of bull trout never go to the ocean (they stay in the stream they were born in or migrate to larger bodies of freshwater), an anadromous form of bull trout exists in the Coastal-Puget Sound. Migration in this region occurs between May and November (Fish and Wildlife Service 2010).

Current recovery plans geared towards protecting bull trout habitat in the Puget Sound, including in Bellingham Bay, are in place and focus on minimizing erosion along marine shorelines (U.S. Fish and Wildlife Service Portland, OR 2004).

Chinook Salmon

In 1999, the Puget Sound chinook salmon was listed as a threatened species under the ESA. These salmon are found throughout Bellingham Bay; more specifically three stocks of these salmon have been identified in the Nooksack Basin. The chinook salmon rely heavily on near-shore waters including Bellingham Bay. The chinook may stay up to 189 days in these shallow waters, which provide protection from predators for sub-yearlings via eelgrass. However, the riprap currently in place along Boulevard Park hardens the shoreline, increasing young salmon's vulnerability to predators (Port of Bellingham 2010).

Chinook salmon migration occurs between February and August; most chinook salmon leave the shallows by mid to late summer (Quinn 2005).

Surf Smelt

Surf smelt are referred to as a schooling fish that live in shallow, near-shore water along 200 miles of the Puget Sound. These fish eat plankton and are prey for seabirds, marine mammals, and chinook salmon. Surf smelt currently spawn on Bellingham's beaches (City of Bellingham 2008).

Pacific Herring

In 2007, the pacific herring was identified as a species needing attention and protection due to its declining population (City of Bellingham 2008).

Herring are the base of the food web for a variety of species, including chinook salmon and Orca whales (Vanderhoof 2008). They attach their eggs to eelgrass primarily in Chuckanut Bay, but are occasionally found in Bellingham Bay (City of Bellingham 2008). Most pacific herring spawning occurs between 0 and -10 feet MLLW (Friends of the San Juans 2004).

Orca Whale

There are three orca pods, including approximately 87 individuals, which live in the Puget Sound area from May through October. This population is known as the southern resident Orca whale population and was listed as endangered in 2010 by the National Marine Fisheries Service (NMFS). Ultimately, the decline in the chinook salmon populations in the Puget Sound is one of the largest factors concerning Orca extinction (Olsen 2006). The chinook salmon and orca whale populations are interconnected because chinook salmon are a vital food source for orca whales (National Wildlife Federation 2011). Pacific herring are also the base of the food web for orca whales (Vanderhoof 2008).

Proposed Action

Eelgrass

Eelgrass populations will not be impacted by the proposed action (Reid Middleton 2009).

Bull Trout

Current recovery plans established to protect the bull trout focus on minimizing erosion along marine shorelines; a total of 754 miles of marine shoreline has been designated as critical habitat for the Bull Trout. These plans coincide with the main goal of the proposed action, which is to minimize erosion along the Boulevard Park shoreline. Consequently, the proposed action will improve Bull Trout habitat (Fish and Wildlife Service 2010).

Chinook Salmon

Removing riprap from the Boulevard Park shoreline will soften the existing shoreline, while providing both richer and more productive habitat for the chinook salmon at all life stages (Port of Bellingham/City of Bellingham 2010).

Surf Smelt

Surf smelt prefer spawning in the sandy gravel beaches along Bellingham Bay. Therefore, the Boulevard Park Shoreline Improvements Project intended to replace rubble with sand and gravel beaches will create an ideal habitat for surf smelt (Grisham 2011).

Pacific Herring

Pacific herring will not be impacted by the proposed action (City of Bellingham 2008, Friends of the San Juans 2004).

Orca Whale

The improved habitats of the chinook salmon and pacific herring, resulting from the proposed action, will benefit the Orca whale because salmon and forage fish are important sources of food for this marine mammal (National Wildlife Federation 2011, Olsen 2006, Vanderhoof 2008).

Mitigation

To avoid negatively impacting eelgrass populations the location of said eelgrass will be taken into consideration before the shoreline improvements are implemented (Gobo-Austin 2008).

Construction will take place from September through February, which avoids the migratory patterns of various fish species. Both the surf smelt and the pacific herring spawn during the winter only on Bellingham Bay's beaches, migration of the chinook salmon to near-shore marine waters occurs from February through August, and migration of the bull trout occurs in the Nooksack region between May and November. The selected construction dates will avoid impacting the migratory patterns of all the preceding fish (City of Bellingham 2008, Fish and Wildlife Service 2010, Olsen, 2006, Quinn 2005).

To mitigate negative anthropogenic impacts on species' habitats, portions of the beaches could be blocked off to public access. This mitigation will allow for the coexistence of two goals set forth by the proposed action. These goals are to improve beach access and animal habitat.

Alternative Action

Eelgrass

Bulkheading will cut off the supply of sand from the Boulevard Park shoreline. Concurrently, only hardpan, cobbles and gravel will remain as tidal waves wash away smaller sediments. This new habitat will not support eelgrass and will, consequently, not support the various organisms that rely on eelgrass for habitat and as a foundation of the food web (Seattle P-I).

Bull Trout

Given that eelgrass will be removed from the Boulevard Park shoreline as a result of the bulkheading alternative, bull trout will be harmed because this foraging fish uses eelgrass as both a source of cover and as a source of food (Kahler et al. 2000).

Chinook Salmon

Since eelgrass provides shelter and food for juvenile salmon and bulkheading destroys eelgrass, chinook salmon will be harmed with the construction of bulkheads at Boulevard Park. In addition, bulkheading will disrupt longshore drift, which will ultimately deprive beaches of sediment- a detrimental alternative for juvenile salmon (Grisham 2011, Schlender 2011).

Surf Smelt

Bulkheading will damage the surf smelt's spawning beaches because it will eliminate crucial spawning substrate (Grisham 2011, Schlender 2011).

Pacific Herring

Eelgrass provides a refuge for both young pacific herring and for pacific herring in which to lay their eggs. Since eelgrass will be destroyed as a result of bulkheading, pacific herring populations in Bellingham Bay will suffer as a result of this alternative (Grisham 2011, Schlender 2011).

Orca Whale

As previously mentioned, chinook salmon and pacific herring are important sources of food for the Orca whale. If these fishes are harmed from the alternative action of bulkheading at Boulevard Park, the Orca whale populations will suffer as they will lose crucial food sources (National Wildlife Federation 2011, Olsen 2006, Vanderhoof 2008).

No-Action Alternative

Eelgrass

Eelgrass will not be impacted by the no-action alternative and existing conditions will persist (Cornell 2010).

Bull Trout

The erosion of the Boulevard Park shoreline will become more threatening if no actions geared towards erosion control are taken into consideration (Reid Middleton 2009). Erosion has been proven to have negative impacts on the Bull Trout populations and so the no-action alternative will further threaten this species (U.S. Fish and Wildlife Service Portland, OR 2004).

Chinook Salmon

Chinook salmon spawning habitat is also threatened by erosion. Without taking action to prevent erosion, chinook salmon populations will be eliminated from the area surrounding the Boulevard Park shoreline. Erosion control projects have been shown to positively affect Chinook salmon habitat (Montana Water Center 2007).

Surf Smelt and Pacific Herring

Increased beach erosion has detrimental impacts on both surf smelt and pacific herring spawning habitat (Grisham 2011, Vanderhoof 2008).

Orca Whale

Since chinook salmon and pacific herring are important links in the Orca whale's food web and will suffer from the erosion of the Boulevard Park shoreline, the no-action alternative can be inferred to harm the Orca whale as well (National Wildlife Federation 2011, Olsen 2006, Vanderhoof 2008).

2.2.5: Energy and natural resources

Existing Conditions

In Boulevard Park there are limited areas requiring electricity. Since the park is only open from 6am to 10pm, during daylight hours, a large amount of outdoor lighting is not necessary. There are eight light posts lining the border between the parking lot and the lawn, and two more at the north end of the park. One light post is near the railroad crossing and the other is close to the wharf. The bathrooms and porch at the north end of the park also have lighting. Fluorescent and HPS lighting provide most of the light in the park (Slack 2011). The only other area where energy is needed within the park is Woods Coffee. There is no lighting along the pathway by the water.

There is natural gas in Boulevard Park, which comes into the park via a natural gas pipeline running through the park entrance to Woods Coffee. The pipeline connects to the building on the east side, away from the water's edge (Herrenkohl and Landau 2011).

Proposed Action

Installation of the beaches will not cause any long-term changes in the current energy set up. The amount of energy being used in the park will increase during construction but will return back to its present amount upon the beaches' completion. The natural gas pipeline would not be affected.

Alternative Action

Installation of the bulkhead will not cause any long-term changes in the current energy set up. The amount of energy being used in the park will increase during construction but will return back to its present amount upon completion of the bulkhead. The natural gas pipeline would not be affected.

No-Action Alternative

The energy use in Boulevard Park will not change.

2.3: The Built Environment

2.3.1: Environmental Health

(i) Noise

Existing Conditions

Boulevard Park is classified as a Class A area. The state noise regulations for Class A areas are dependent on the time of day. From 7am to 10pm, 55 to 60 decibels can be received depending on the noise source. Between 10pm and 7am, the noise limitation is decreased by ten decibels (“Maximum permissible environmental noise levels” 2003). The noise at Boulevard Park currently comes from two main sources: park visitors and the costal railroad. Park visitors contribute to the noise during park hours, between 6am and 10pm daily. The costal railroad is operated by Burlington Northern Santa Fe Railway (BNSF) and runs along the east side of the park. Trains currently use the tracks throughout the day and night, and noise regulations are currently not being exceeded.

Proposed Action

The proposed action would temporarily increase the amount of noise in Boulevard Park due to construction. Construction would occur between September and February in order to decrease the amount of impact to the local marine species, and after park hours so that work can be done during the lowest tide. Since Boulevard Park is a Class A area, noise from temporary construction is not exempt from Washington State regulations between 10pm and 7am (“Exemptions” 2003). For construction to exceed the state noise regulations between 10pm and 7am the local government will need to apply for a Noise Ordinance Permit or set new maximum noise limits. Local government noise regulations take priority over state noise regulations. There will be a slight long-term increase of noise in Boulevard Park between 6am and 10pm, directly related to the increased number of park visitors attracted to the park due to increased water access. The park hours would remain the same and the train schedule will remain the same.

Alternative Action

The installation of a bulkhead will also require construction to occur outside of park hours in order to work during the low tides. The City of Bellingham will need to apply for a Noise Ordinance Permit or change local noise ordinance laws. Installation of a bulkhead will not lead to a long-term increase of noise in the park because it does not allow for increased beach access and there will therefore not be an increase in the number of park visitors.

No-Action Alternative

Noise in the park will remain as it currently is both short and long-term. Construction noise will not occur and there will not be an increase in park visitors. Washington State noise regulations will be followed.

(ii) Risk of explosion

Existing Conditions

Risk of explosion is low in Boulevard Park. The small risk of explosion comes from the costal train tracks on the east side of the park and the natural gas line that runs from the park entrance to Woods Coffee (Herrenkohl and Landau 2010). BNSF rail way transports a wide variety of cargo including hazardous materials (“BNSF - Customers” 2011). A train carrying explosive materials has risk of explosion in the case of a crash. The train tracks are on a steep slope, which increases the risk of explosion in the event of a natural disaster.

Proposed Action

The project would not affect train cargo or the slope of land by the train tracks. It would also not interfere with the gas pipeline. Installation of gravel beaches will not affect the risk of explosion in Boulevard Park.

Alternative Action

Installation of bulkheads would not affect the risk of explosion in Boulevard Park.

No-Action Alternative

Risk of explosion would not change.

(iii) Releases or potential releases to the environment affecting public health, such as toxic or hazardous materials

Existing Conditions

There are currently no direct threats of toxic or hazardous material affecting public health from Boulevard Park. There are toxic soils at the park but they are covered by fill material composed mostly of woody debris. Clean up and removal of these soils is not necessary at this time (Reid Middleton 2009).

Although there are no public health concerns originating at Boulevard Park, the park’s surroundings pose some potential threats. Many locations in Bellingham Bay are contaminated

with a variety of chemicals. Some of the locations of concern are very close to Boulevard Park, the closest being the South State Street Manufactured Gas Plant located on the north border of the park. Contaminants in this location that have potential threats to humans and the environment include: PAHs, petroleum hydrocarbons, petroleum volatile organic compounds, phenols, complex cyanide compounds, and a variety of heavy metals. These contaminants could potentially affect park visitors, through direct exposure while using the beach and shoreline (Herrenkohl and Landau 2010). Risk of exposure is high enough that cleaning up the gas plant site and Boulevard Park is one of the 2011 objectives for the Parks and Recreation department of the City of Bellingham (“City Department’s Objectives for 2011, Organized by Legacy” 2011).

Contaminant transport from the gas plant to the park could occur by four main pathways. The first is rainfall, which causes contaminants to leach from the surface soil into deeper soil layers. This pathway leads to contamination of ground water that eventually flows into the bay. The second pathway is movement of contaminants across land surfaces by surface runoff. The contaminated surface runoff flows directly into Bellingham Bay. The third route of exposure is by biomagnification, and the fourth route is by wind, as contaminated soils can blow into the bay or park. Increased interaction with water in the bay or sediments along the shoreline causes increased potential risk of contaminant exposure (Herrenkohl and Landau 2010).

Another close potential contaminant source is the Whatcom Waterway site, which includes 200 acres of Bellingham Bay and parallels the coast. Contaminants of concern in this site are left over from the Georgia-Pacific pulp and paper plant. These contaminants of concern include mercury, phenols, zinc and cadmium, which are found in concentrations above those allowed by the Model Toxics Control Act. These contaminants are found in relatively low concentrations in near-shore areas around Boulevard Park. The permitting and project design for the site cleanup are scheduled to be completed in 2011, followed by construction beginning in 2012 and continuing for about six years (“Whatcom Waterway – Bellingham Bay, Washington” 2011).

Other potential sources of toxic and hazardous material surrounding Boulevard Park include the railroad tracks and urban runoff. The railroad tracks are a potential source of petroleum hydrocarbons. Potentially hazardous products, such as creosote, have been used to treat the wood and control vegetation along the tracks, which can enter the park through the pathways mentioned above. Urban runoff from surrounding roads and neighborhoods can also carry potentially harmful toxins, including petroleum hydrocarbons, PAHs, and metal from vehicles (Herrenkohl and Landau 2010).

Proposed Action

The proposed beaches will increase public access to the water in Bellingham Bay and will therefore increase risk of exposure to the contaminants listed above. With more visitors coming to the park, more people will potentially be exposed to these contaminants. Exposure to contaminants from the railroad tracks and urban runoff will not change.

Mitigation

Clean up of the South State Street Manufactured Gas Plant and Whatcom Waterway site before installing the proposed beaches will decrease the potential risk of exposure before increasing public access to the water.

Alternative Action

Bulkheads will not increase risk of exposure because it will not increase public beach access.

No-Action Alternative

The water access and number of park visitors will remain the same. Therefore risk of exposure will remain at its current level.

2.3.2: LAND AND SHORELINE USE

(i) Existing Land Use Plans

Existing Conditions

The project site is currently a public park with pedestrian walkways, a playground, and picnic areas. The Woods Coffee operates a coffee shop on the southern side of the park near the Pattle Point trestle. Parking is accommodated further inland and a railroad track operated by BNSF railroad is just beyond it. The railroad is used to transport coal and other goods, and by Amtrak for passenger transport.

A rock sculpture composed of three boulders is located north of the proposed project. Further inland from the rock sculpture is an outdoor stage known as the “porch,” as well as public restrooms. A walkway and wood railing are located along the shoreline between the proposed “playground beach” and “Pete’s beach.”

The site is currently zoned as public land. The designation of the site under the current shoreline management master program is Conservancy Environment II. This designation is given to areas that are not uniquely natural, but allow the public to utilize and enjoy the shoreline.

Proposed Action

The implementation of the proposal, alternative, or no-action alternative will not change the designation of the site.

(ii) Housing

Existing Conditions

There is currently no housing located at the site; housing will not be affected by the project.

(iii) Light and Glare

Existing Conditions

Any light or glare coming from the project site is from sunlight refracting off of the surface of the bay. A small amount of urban light pollution comes from street lamps uphill on South State Street, but this occurs after the park is closed at dusk.

Proposed Action

The addition of a sand and gravel beach may increase glare off wet beach materials during low tide.

Alternative Action

Bulkheads along the shore would reduce glare from the setting sun by interrupting the refraction of sunlight off near-shore water.

No-Action Alternative

Sunlight refraction off the water surface will not be significantly impacted.

(iv) Aesthetics

Existing Conditions

The shoreline of Boulevard Park is armored with riprap and cobble abutting a grassy lawn lined with trees. The roots of a few trees are exposed along the shore due to wave-action erosion. Some trees have fallen due to the erosion and have been removed. The grassy lawn leads to a paved pedestrian walkway lined with benches that allow for relaxed sightseeing.

Proposed Action

The proposed action requires the removal of shoreline trees, riprap, and lawn extending past the pedestrian walk way. The walkway would be re-routed along the sand and cobble beaches and benches would be replaced. Instead of large concrete pieces and bricks, cobble sized rocks and sand would slope into the park from below the low-tide waterline.

Alternative Action

Bulkheads built along the shore may appear unnatural and visually disturbing.

Mitigation

Bulkheads can be fashioned to appear as natural sandstone outcroppings.

No-Action Alternative

Concrete riprap will remain along the shoreline and tree roots will continue to be exposed as shoreline soil erodes. The undermining of tree roots will lead to fallen trees, and eroding shoreline soils will expose more fill and riprap.

(v) Recreation

Existing Conditions

The lawn of the park is host to numerous recreation activities throughout the course of the year. Swimming often takes place off the shore of the park. A playground is available for children, and benches line a pedestrian walkway used by joggers, walkers, and bicyclists. Woods Coffee in the park is available for dining and private meetings.

Proposed Action

The proposed beaches would require the removal of lawn and relocation of the pedestrian walkway and benches. Any recreation requiring a lawn surface would be restricted to the main park lawn. Other activities using the pedestrian walkway would be hindered during the relocation of the walkway. Utilization of the memorial benches would also be interrupted during the construction process. After construction is completed, access to the bay by swimmers and kayakers would be improved by a sloping beach.

Alternative Action

The installation of bulkheads would prevent the removal of grass and relocation of the walkway and benches, though construction in the area would interrupt the use of the walkway, benches, and shoreline lawn. Bulkheads may block access of the beach to kayakers. The alteration of sediment movement in the bay by bulkheads may eventually hinder shore access along other areas.

No-Action Alternative

Continued erosion of the shoreline soil will eventually degrade the shoreline grass and may lead to dangerous conditions.

(vi) Historic and Cultural Preservation

Existing Conditions

Bellingham Bay is of cultural importance to the native tribes of the area because of the fish species that mature in and migrate through the bay (Bellingham Bay FEIS).

No sites of archaeological importance are located within Boulevard Park, and locations near the project site are on or proposed for preservation registers (Herrenkohl and Landau 2010).

Proposed Action

Native Tribes are culturally connected to local fish populations; any harmful effects to fish populations or migrations by the proposed action will negatively impact the culture of the Native Tribes. Impacts to fish species are discussed in Section 2.2.4.

Alternative Action

Bulkheads may alter sediment deposition and transport along the shoreline (WA Ecology). The transport of sediment will have direct and indirect impacts to fish will also impact native tribe cultural resources. These impacts are also found in Section 2.2.4.

2.3.3: Transportation

(i) Transportation Systems

Existing Conditions

The main arterial roads that serve Boulevard Park are South State Street to the north and 11th Street to the south. Boulevard Park can be accessed where South State Street turns into 11th Street, which feeds into Bayview Drive (City of Bellingham 2011).

Whatcom Transportation Authority (WTA) serves the Boulevard Park area on route 401 via the Red Line. This route runs weekdays from 6:10 am until 10:05 pm and Saturdays from 9:10 until 10:05 pm with service approximately every 30 minutes. The nearest stops are located along South State Street just above the park (WTA 2011).

Bike and walking paths offer further connectivity to Boulevard Park. Starting in Fairhaven to the South of Boulevard Park, the South Bay Trail follows the shoreline of Bellingham Bay beginning at 10th street from Douglas Avenue to Pattle Point Trestle. Pattle Point Trestle is a quarter-mile long boardwalk further connecting Fairhaven to Boulevard Park. This trail further extends downtown to East Maple Street and Railroad Avenue and is available for both walkers and bicyclists. Extending from Fairhaven to Downtown, this trail is roughly 2 miles long (Leuthold 2011).

Proposed Action

The proposed action will not have any significant impacts on the existing transportation systems.

Alternative Action

The alternative action will not have any significant impacts on the existing transportation systems.

No-Action Alternative

The no-action alternative will not have any significant impacts on the existing transportation systems.

(ii) Vehicular Traffic

Existing Conditions

The only access for vehicles going into Boulevard Park is through Bayview Drive, accessible via South State Street to the north and 11th Street to the south (City of Bellingham 2011).

In 1993, the ADTV at the intersection of South State Street and 11th Street was 12,500 vehicles. In 1999, the ADTV at this location rose 26.4% to 15,800 vehicles. Current numbers can be assumed to be greater than this 1999 statistic due to population increases in the area (WCOG 2007).

Approximately 1 mile north of this intersection on Boulevard Street, the ADTV was 14,942 vehicles in 2005. Approximately 0.2 miles south of this intersection, the Average Daily Traffic Volume was 11,403 vehicles in 2005 (Figure 3). No data were recorded for either of these two points prior to 2005. There is a higher concentration of vehicles near the entrance of Boulevard Park, showing that Boulevard Park increases the flow of nearby traffic (WCOG 2007).

Boulevard Park Average Daily Traffic Volume (ADTV)



<p>Notes:</p> <ol style="list-style-type: none"> 1. Author: Travis Mabee 2. Data Sources: WWU and ESRI 3. Coordinate System: GCS_WGS_1984 	<p>FIGURE 3</p> <ol style="list-style-type: none"> 4. Datum: D_WGS_1984 5. Date Created: 2/10/2011
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Figure 3: Traffic route from 11th street south of Boulevard Park extending north to Boulevard Street.

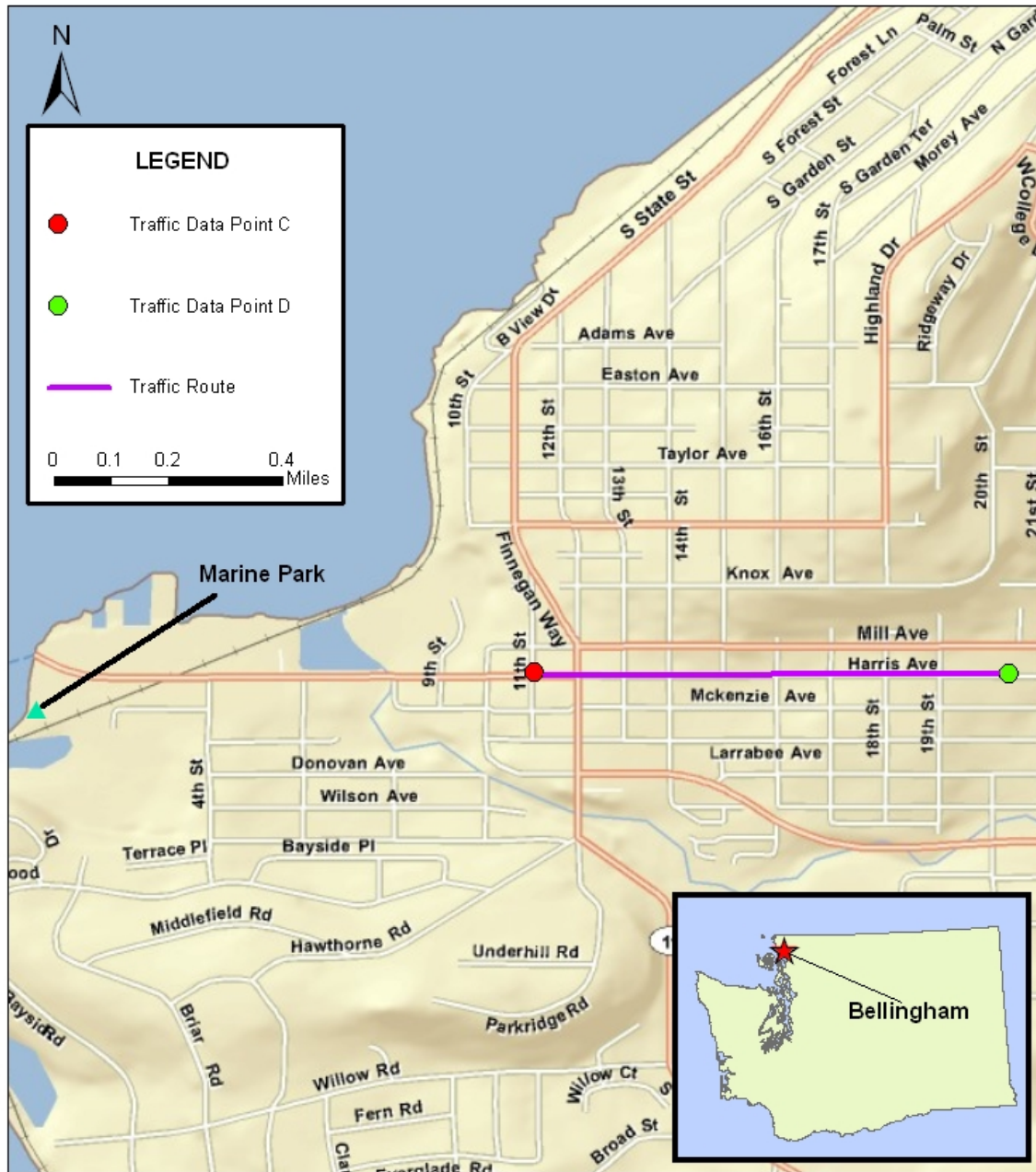
Proposed Action

It is expected that the proposed action will further increase the traffic counts by the entrance of Boulevard Park at the intersection of Boulevard Street and 11th Street. This assumption is supported by the results of the Marine Park Restoration Project, which began in September 2004 and was completed by early 2005. According to the City of Bellingham's Boulevard Park shoreline assessment, "this proposal is similar to the work at Marine Park in Fairhaven, where riprap was removed and a gravel beach was constructed" (Reid Middleton 2009).

Harris Street is the main thoroughfare providing access to Marine Park. Prior to construction of Marine Park in 2001, the Average Daily Traffic Volume at the intersection of Harris Avenue and 9th street (a half mile away from the site), was 3,200 vehicles. Post-construction in 2005 ADTV had increased 17.7% to 3,766 vehicles. However, at the intersection of Harris Avenue and 21st Street, approximately 1.2 miles east of Marine Park, Average Daily Traffic Volume only increased by 1.1% from 2,900 vehicles in 2001 to 2,931 vehicles in 2005 (figure 4). The large increase in the concentration of vehicles from 2001 to 2005 at the intersection nearest Marine Park and the lack thereof further east of the park is attributable to the improved beach access through the Marine Park Shoreline Restoration Project (WCOG 2007).

Since the Marine Park and Boulevard Park projects are analogous, a similar increase in vehicular traffic surrounding Boulevard Park can be expected post beach completion.

Marine Park Average Daily Traffic Volume (ADTV)



Notes:

1. Author: Travis Mabee
2. Data Sources: WWU and ESRI
3. Coordinate System: GCS_WGS_1984
4. Datum: D_WGS_1984
5. Date Created: 2/10/2011

FIGURE 4

Figure 4: Traffic route from 11th street and Harris Avenue extending east toward 21st street and Harris Avenue.

Alternative Action

The alternative action will not improve beach access and is, therefore, not comparable to the Marine Park Restoration Project. The concentration of vehicles near the entrance of Boulevard Park will, consequently, not increase as a result of shoreline renovations.

No-Action Alternative

The existing traffic concentrations will persist with the no-action alternative.

Mitigation

The City of Bellingham maintains over 1,300 parking meters in high-demand parking areas intending to increase turnover as quickly as possible, and these numbers are only increasing. Although Boulevard Park does not currently have metered parking or pay stations, either of these features will not only minimize long-term parking but will offer an incentive to use methods of transportation other than personal vehicles to commute to Boulevard Park. Ultimately, the concentration of vehicles near the park lessens, paralleling the City of Bellingham's long-term goal of reducing vehicle travel (Parking Services Division 2011).

(iii) Waterborne/Rail Traffic

Existing Conditions

Most waterborne traffic near the shoreline of Boulevard Park is from kayakers; the kayak launch site at the northeast corner of the park is commonly used as a launch (Reid Middleton 2009).

The Burlington Northern and Santa-Fe Railroad runs parallel to Boulevard Park at a distance of 120 feet from the shoreline (BNSF Railway Company 2011).

Proposed Action

The Marine Park Restoration Project, the precedent for this project, increased kayaking traffic by as much as 80%. Boulevard Park can expect to see a similar increase (Reid Middleton 2009). Improved access to the beach will improve access for kayakers. The Boulevard Park Shoreline Improvements Project will not significantly impact BNSF Railroad service efficiency.

Alternative Action

Bulkheads will not significantly impact BNSF Railroad Service or kayakers.

No-Action Alternative

The no-action alternative will not significantly impact BNSF Railroad Service or kayakers; existing conditions will persist.

(iv) Parking

Existing Conditions

Parking for Boulevard Park is available through its lower parking lot, which can be accessed from Bayview Drive. Additional parking is also available above the park along South State Street (City of Bellingham 2011). Further parking is available at several points along the South Bay Trail, including in Fairhaven and at Pattle Point Trestle.

Proposed Action

During the construction phase of Boulevard Park, an undetermined number of parking spaces will be coned off for construction equipment. This action will temporarily reduce the amount of available parking spaces for park visitors, as has been the case with various other construction projects (Gobo 2010). No parking spaces will be permanently eliminated, however. Increased vehicular traffic going into Boulevard Park, as determined in Section 2.3.3(ii), will increase the difficulty of finding a parking space near the park.

Alternative Action

The alternative action will also require the storage of construction vehicles and will, consequently, temporarily reduce the number of parking spaces available to visitors (Gobo 2010). However, since this alternative will not improve beach access, increased vehicular traffic and consequently increased parking is not anticipated to be an issue.

No-Action Alternative

The no-action alternative will not have any significant impacts on the existing parking conditions.

Mitigation

To alleviate parking congestion, the City of Bellingham has proposed that additional parking will be constructed with the construction of Cornwall Point Park. Since no studies have been performed determining the capacity of Boulevard Park to visitors, it is difficult to tell whether or not this is a viable mitigation measure (Reid Middleton 2009).

2.3.4: Public Services

Existing Conditions

As a city park, Boulevard Park hosts a large number of visitors throughout the year. Visitors enjoy the park's services in the form of foot and bicycle traffic on the interurban trail, running along the shoreline, and using the park as a place to relax and enjoy a view of Bellingham Bay. Woods Coffee on the park's premises is an additional draw for visitors interested in spending time at Boulevard. The park is under the jurisdiction of the City of Bellingham Police and Fire departments, and its facilities are maintained by the Bellingham Parks and Recreation Department. The current erosion along the shoreline causes a hazard to park users by creating unstable footing along the shoreline near the paved footway. Bellingham Parks and Recreation has attempted to remove the erosion problem and associated health risks to park users by filling around the concrete riprap and rubble with gravel in areas experiencing significant erosion.

Proposed Action

The construction of the beaches will necessitate short-term increases in park maintenance, as the lawn currently covering a majority of the park's area will suffer significant damage during the construction process. However, once the lawn is repaired the project will generate a long-term decrease in the amount of shoreline maintenance required as the Parks and Recreation department will no longer need to maintain the three areas currently experiencing the largest amount of erosion. An expected increase in park visitors due to increased water access and shoreline usability will necessitate additional maintenance of the lawn and bathroom services offered at the park. As well, the anticipated increase in park visitors may have an impact on the police department by necessitating additional patrols due to higher concentrations of visitors during peak times.

Alternative Action

Construction of bulkheads in place of beaches in the three identified sites within the park will not have an anticipated impact on public services. The shoreline currently experiences little use by visitors, which would not change with the implementation of bulkheads. There would also not be an anticipated increase in visitors with the construction of the bulkheads due to the lack of increase in beach access.

No-Action Alternative

A lack of action on the current erosion at the sites would not have a significant impact on Boulevard Park's public services.

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