

# SHORELINE INVENTORY AND ANALYSIS REPORT



**CITY OF BLAINE  
SHORELINE MASTER PROGRAM UPDATE**

**September 18, 2006  
Updated December 2014**

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**CITY OF BLAINE**  
**Grant No. G0500090**

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**SHORELINE INVENTORY**  
**AND ANALYSIS REPORT**

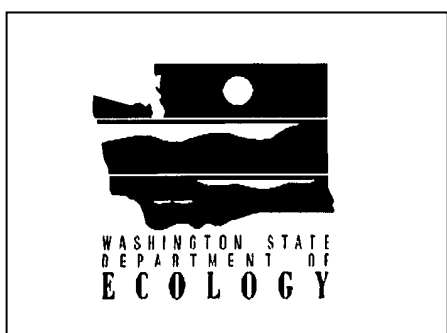
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**SHORELINE MASTER PROGRAM UPDATE**

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The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its subagencies.

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### **City of Blaine Shoreline Jurisdiction and Shoreline Individual Reaches**

## **APPENDIX**

### **Shoreline Inventory Data Sheets for Reaches 1-17 including References prepared by Northwest Ecological Services**

#### **Acronyms**

CMZ – Channel Migration Zone  
 CREP – Conservation Reserve Enhancement Program  
 DBH – diameter breast height  
 DOE – Washington State Department of Ecology  
 ESSI – Earth System Science, Inc.  
 ESU – Evolutionarily significant unit  
 FEMA – Federal Emergency Management Agency  
 LWD – Large woody debris  
 NWI – National Wetlands Inventory  
 OHWM – ordinary high watermark  
 PFOC – palustrine, open water, forested, seasonally flooded wetland  
 PHS – Priority Habitat Species  
 POWH – palustrine, open water, permanently flooded wetland  
 PSSC – palustrine, scrub-shrub, seasonally flooded wetland  
 SR – State Route  
 SWMP – Stormwater Management Plan  
 UGA – Urban Growth Areas  
 USFWS – United States Department of Fish & Wildlife Services  
 VCA – Vegetation Conservation Area  
 WAC – Washington Administrative Code  
 WDFW – Washington State Department of Fish & Wildlife



## **1.0 INTRODUCTION**

### **1.1 SETTING**

The City of Blaine is located in the northwest corner of Whatcom County adjacent to Drayton Harbor and Semiahmoo Bay. The City has approximately 10 miles of marine shoreline, all of which falls within the jurisdiction of the Shoreline Management Act, RCW 90.58. An additional 4 miles of marine shoreline are located within the City's designated urban growth area (UGA). The City and its UGA also include portions of two rivers, Dakota and California Creeks, each of which has a mean annual flow of over 20 cubic feet per second. These rivers, therefore, are also within shoreline jurisdiction. They include over seven miles of river shoreline within shoreline jurisdiction.

### **1.2 METHODOLOGY**

This report has been prepared as part of the City of Blaine's comprehensive update of its Shoreline Management Master Program. This document contains two main sections: the Ecosystem-wide Processes section and the Shoreline Reach Inventory and Analysis section. This report is intended to satisfy Task 2 of the Department of Ecology Grant Agreement No. G0500090 for the City of Blaine.

The goal of Task 2 is to compile and analyze relevant data sources and information for the shoreline jurisdictional areas within the City of Blaine and its designated UGA. The Ecosystem-wide Processes section of the report was developed primarily based on inventory work completed by Whatcom County and addresses the ecosystem-wide processes for the Drayton Harbor watershed and to a lesser degree the marine processes associated with Semiahmoo Bay. This section focuses on those processes most important to the shorelines within the City of Blaine. The final section of the report provides a detailed Reach Inventory and Analysis of the land and water areas within shoreline jurisdiction. This section addresses not only the physical features and characteristics present, but also provides an analysis of the shoreline functions provided in each reach.

## **2.0 ECOSYSTEM-WIDE PROCESSES**

### **2.1 OVERVIEW**

WAC 173-26-201(3(d)(i)) requires that an evaluation of ecosystem-wide processes affecting areas within shoreline jurisdiction be included in the shoreline inventory analysis and characterization reports prepared in conjunction with an updated Shoreline Master Program (SMP). This evaluation provides information on the Drayton Harbor Watershed Management Unit (WMU) and ecosystem-wide processes that have an affect on the shorelines within the City of Blaine and the City Urban Growth Areas (UGA). Whatcom County has completed an extensive review of the Drayton Harbor WMU. This prior work, Whatcom County Shoreline Management Program Draft Inventory and Characterization Report (2006), is referenced in this evaluation of the shorelines of the City of Blaine.

The relevant ecosystem-wide processes are viewed at the watershed level to understand how natural processes work and affect the City of Blaine. The City of Blaine shoreline areas are located on the shores of Drayton Harbor, Semiahmoo Bay, and California and Dakota Creeks. The largest portion of the City is located within the Drayton Harbor watershed management unit. See the Whatcom County Aquatic Resources Map for the location of the City and aquatic resources within this WMU.

Drayton Harbor WMU lies in the northwest corner of Whatcom County. The City of Blaine shorelines, with one exception, are within the Drayton Harbor WMU. The exception is the marine shoreline within the most southwestern section of the Blaine UGA, which lies in the Birch Bay WMU. Drayton Harbor is a protected bay and is sheltered by Semiahmoo Spit from the Georgia Straits. The shorelines include the harbor marine shoreline, surrounding wetlands, and two tributaries (California and Dakota Creeks). Unlike the majority of Whatcom County, Blaine and its waters are not connected to the Nooksack River System.

### **2.2 LAND USE AND LAND COVER**

The Drayton Harbor WMU contains many land uses, including, residential, commercial, open space, urban development, and agriculture. The City of Blaine accounts for the majority of the land area near Drayton Harbor. Agriculture (54%) and Forested/Other (21%) account for the majority of land-use in the WMU. Agricultural uses are more dense in the South Fork Dakota Creek area and in the upper and middle drainage of California Creek. The City of Blaine lies mostly west of the I-5 corridor and includes urban residential land uses with some commercial and open space designations.

Forested areas comprise 21% of the Drayton Harbor WMU, with the majority located northeast of I-5 in the Dakota Creek drainage. Forest is most dense in the Boundary Upland, with some pockets in the California Creek drainage. The Whatcom County Sediment Alterations Map shows the relative density and land covers in the WMU. A more detailed description of land use in this WMU can be found in Whatcom County Shoreline Inventory Characterization Report.

## **2.3 CLIMATE**

The City of Blaine shows climate characteristics similar to the rest of Whatcom County. The mean annual precipitation for the Drayton Harbor WMU is 45 inches per year. The rainiest seasons are between the months of October and March. Runoff is much greater during this period compared to the rest of the year. Increased runoff has greater impacts on urbanized areas such as Blaine due to the increased amounts of impervious surfaces.

## **2.4 GEOLOGY**

### Underlying Geology

The City is located in the northwestern portion of Whatcom County. The underlying geology of the marine shores is composed of glaciomarine drift deposited in the Everson Interstade during the Pleistocene epoch. The drift is characterized by moderately to well-sorted gravel, silt, sand, and clay.

Drayton Harbor WMU is divided into 3 distinct areas of surficial geology. These include the Boundary Upland, the Custer Trough, and the California Creek drainage basin. The Boundary Upland is composed of fine-grained glaciomarine drift and sand and gravel. The Custer Trough, to the south, is a section of the Sumas outwash plain. Farther south, in the California Creek drainage, the geology transitions to Sumas Stade and Bellingham drift.

Fluvial sediment produced by the Creeks provides small quantities of beach sediment to the Drayton Harbor shore. The Semiahmoo Spit geology is different from the aforementioned surficial geology. The Spit is composed of Quaternary beach deposits, transported through northward net shore-drift. The tide flats of the harbor contain sand, silt, clay, and gravel.

### Topography and Bathymetry

The topography within the City of Blaine surrounding Drayton Harbor is relatively flat. Northward, toward the Boundary Uplands near the Canadian border, the topography rises. The bluffs in the southwest corner of the UGA along Semiahmoo Bay are the highest elevated features. Features within the harbor consist of mud and sand tide flats and large nearshore sandbars west of Semiahmoo Spit. These sandbars are considered part of Semiahmoo Bay.

Bathymetry within the harbor is fairly shallow. The majority of the harbor is between 0 feet MLLW and MHHW (Whatcom County, 2006). The west-central portion of the harbor has depths up to -20 feet MLLW, and the Inlet to the harbor has depths from 30-66 feet below MLLW. For more specific information on elevations and bathymetry see the Whatcom County Shoreline Inventory and Characterization.

The Spit is surrounded by sand flats, which narrow gradually from north to south. Water depth drops more abruptly beyond the sand flats. This abrupt deep-water transition occurs moving north toward Drayton Harbor inlet.

## **2.5 HYDROLOGY**

### **Hydrologic Processes**

The Drayton Harbor WMU is not part of the greater hydrologic processes of Whatcom County associated with the Nooksack River system. The hydrologic processes of California and Dakota Creeks, Drayton Harbor, and Semiahmoo Bay all affect shorelines in the City of Blaine. The Boundary Upland supports baseflow to Dakota Creek, and its tributaries. Soil areas with high infiltration capacity are located between upper Dakota Creek and California Creek and along the upper mainstem of the South Fork Dakota Creek (Whatcom County 2006). The Whatcom County Infiltration and Storage Map illustrates these functions in the WMU.

Groundwater in this WMU is conditioned by geologic controls. The Drayton Harbor WMU is also included in the western extent of the Sumas-Blaine surficial aquifer and coincides with the recessional outwash deposits in the Custer Trough, which extend to the harbor. The Upper California Creek and much of the Custer Trough adjacent to the Boundary Uplands also provide water storage capacity.

The major alterations to these hydrologic processes include urban development within the City of Blaine and the degradation of wetlands throughout this WMU. The Whatcom County Water Storage Alterations Map illustrates the location of wetlands throughout the WMU. The urban areas and development along the I-5 corridor include large amounts of impervious surfaces that alter groundwater infiltration and affect runoff. See the Whatcom County Infiltration/Recharge and Peak Flow Alterations Map for the locations of impervious surfaces. Stream hydrography shows that many existing wetlands, especially in agricultural areas, have been drained, reducing their storage potential.

### **Sediment Transport**

The shorelines of the harbor are characterized by relatively low wave energy and are protected by surrounding landforms and shoreline modifications. This protection reduces sediment transport. The area was mapped as having “no appreciable net shore-drift,” by Jacobsen in 1980 (Whatcom County 2006). Urban development in Blaine and along the I-5 corridor is responsible for increased sediment transport to streams. Low wave activity in the harbor reduces sediment transport farther out in the harbor and bay.

Intensive mass wasting and surface erosion is rare in the Drayton Harbor WMU due to low relief and gradients. Refer to the Whatcom County Mass Wasting and Surface Erosion Map for an illustration of these processes in the WMU. The bluffs on the southern border of Drayton Harbor and along Semiahmoo Bay do pose a potential landslide hazard.

### **Water Quality**

The major sources causing nutrient input are concentrated in the upper Drayton Harbor WMU and are dominated by agricultural uses, dairies, fertilizer, and septic system uses. Rural residential development with on-site septic systems is the major nutrient source in

the middle watershed. The increase of impervious surfaces in the City directly affects runoff and water quality in the watershed.

The South Fork of Dakota Creek is a 303(d) listed area of concern for fecal coliform (Whatcom County, 2006). The California Creek data did not indicate excess fecal coliform. Potentially toxic levels of nitrates have been sampled from the North Fork Dakota Creek and fish kills have resulted from water contamination in the north and south forks of Dakota Creek. Nitrogen and phosphorous levels are also beyond acceptable amounts. Nutrient levels are much higher in California Creek than in Dakota Creek. High levels of cadmium also occur in both sediments and surface water in Dakota Creek (Whatcom County, 2006).

### Organic Matter

The Whatcom County Wood Delivery Alterations Map shows the vegetation and land cover in the Drayton Harbor WMU. Forest cover is sparse near the harbor and along most of the California Creek drainage. Pictometry (2004) indicates that the California Creek shoreline has a mix of low and high recruitment potential, while recruitment potential along the Dakota Creek shoreline is moderate (Whatcom County 2006). The Whatcom County Wood Recruitment Map illustrates the wood recruitment within 200 feet of stream buffers in the WMU. Large woody debris (LWD) is recruited primarily from riparian areas. For more information on LWD refer to the work provided by Whatcom County.

## **2.6 OCEANOGRAPHY**

### Circulation

Surface water currents in Drayton Harbor generally flow eastward into the harbor during a flooding tide. Ebb tidal current flow moves west out Drayton Harbor inlet toward the middle of Semiahmoo Bay. Surface currents then move southwest toward Birch Point, traveling farther on the spring than the neap tide (Schwartz 1976, Whatcom County 2006). More detailed information on tidal currents is available in the Whatcom County Shoreline Inventory and Characterization Report.

Shoreline modifications in the City have narrowed the tidal inlet and increased the rate at which the surface currents flow through the inlet to Drayton Harbor. The most significant impact on the harbor is associated with the industrial area within the City and the marina. The jetty and fill area construction of these developments segregated Drayton Harbor from adjacent Semiahmoo Bay to a greater extent. This segregation has resulted in a more protected, lower-energy bay environment.

### Nutrient Dynamics

Nutrient inputs, tides, and the exchange of waters with Semiahmoo Bay influence nutrients within the harbor. The inputs are associated with surface water runoff from both California and Dakota Creeks, and groundwater inputs to coastal waters (Whatcom County, 2006). Areas with the highest activity of nutrient cycling occur in freshwater and estuarine wetlands along the lower reaches of the Creeks, as well as in the intertidal sand and mud flats in Drayton Harbor.

Shellfish contamination has resulted from elevated nutrient inputs to the harbor. Shellfish closures are due to high levels of fecal coliform. Drayton Harbor is listed as impaired under 303(d) for 2002/2004. A portion of Drayton Harbor has recently been conditionally approved for shellfish harvesting by the public; however, much of Drayton Harbor, and Semiahmoo Bay, remains closed to such harvests. Large alga blooms are a side effect of increased nutrient loading in the harbor. Alga blooms within Drayton Harbor exceed amounts listed under 303(d). These blooms affect eelgrass habitat.

## **2.7 HABITAT**

Drayton Harbor, Semiahmoo Bay, and Dakota and California Creeks all provide habitat for priority species. Riparian habitat exists along sections of the two Creeks. Salmon have been documented in both Creeks. An estuarine zone is located at the mouth of the Creeks in Drayton Harbor. The harbor is home to harbor seal, bald eagle, and concentrations of a wide variety of waterfowl. A more detailed analysis of habitat is included in the shoreline functions and reach analysis sections of this report.

- \* Maps referenced are included in the Whatcom County Landscape Characterization Map Folio for Drayton Harbor.

### **3.0 REACH INVENTORY AND ANALYSIS**

The Shoreline Guidelines require jurisdictions to include an inventory and analysis of current shoreline conditions of those areas within shoreline jurisdiction. The following sections of this report describes the characteristics and functions of those areas within Blaine's shoreline jurisdiction, generally described as the land area within 200 feet of the ordinary high watermark (OHWM) of Drayton Harbor, Semiahmoo Bay, Dakota Creek and California Creek, plus the adjacent aquatic areas. See **MAP 1 – City of Blaine Shoreline Jurisdiction and Shoreline Reaches** for the location of shoreline jurisdiction within the vicinity of the City. For the purposes of this inventory the shorelines of Blaine have been divided into 17 reaches based on factors such as physical and biological characteristics, existing land use patterns and future development plans. The following analysis will characterize shoreline functions and will identify opportunities for protection, restoration, public access and shoreline use.

This portion of the Blaine Shoreline Inventory Report provides a detailed inventory and analysis of the land and water resources present within the jurisdiction of the Blaine Shoreline Management Master Program. This inventory was prepared based on a review of available data, such as City and County GIS mapping, state databases and local planning documents, and limited field verification. The primary inventory work was completed by Northwest Ecological Services (NES) during the first half of 2006. The results of the NES inventory investigation were provided in a series of tables or data sheets that presented the inventory information and analysis required by the Department of Ecology Guidelines, WAC 173-26. One data sheet was prepared for each of the 17 shoreline reaches identified by the City at the beginning of the inventory work. Copies of the data sheets have been attached to the reach inventory and analysis section of this report.

#### **3.1 REACH 1**

Reach 1 is described as the marine shoreline on Semiahmoo Bay from the Canadian border south to the mouth of Cain Creek. See the attached Data Sheet for Reach #1 for full inventory and analysis.

##### **Land Use and Zoning**

Land use in Reach 1 is dominated by the Burlington Northern railroad grade, Interstate highway, and the Peace Arch port of entry. The northern extent of this reach has undeveloped areas of trees and mowed grass. Zoning in this reach includes a mix of public, high density residential and central business-wharf.

##### **Physical Environment**

The topography in this reach includes a moderate slope between the OHWM and the railroad with the uplands being relatively flat. Aquatic vegetation is minimal except closer to Cain Creek at the south end of the reach. Upland vegetation has been modified and includes shrub species between the OHWM and the railroad and mowed grasses. Three large culverts drain into this reach from the U.S. Customs facility.

## Potential Species Present

Reach 1 includes a concentration area for dabbling ducks in vicinity of Cain Creek, (Northern Pintail, American Wigeon, Green Wing Teal, Mallard) and shorebirds (Greater Yellowlegs). The immediate shoreline is a high use area for all mentioned species. Coho salmon are listed as being present in Cain Creek, and Reach 1 is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, bull trout. The City has identified a wildlife protection area adjacent to the full length of this reach.

## Marine Aquatic Function

The aquatic substrate includes tidelands, mixed fines and coarse. No creosote structures or in-water structures were identified; however, nearly the entire reach is armored with rip rap to protect the railroad, except near the mouth of Cain Creek. The reach is identified as a CAT 5, polluted water for fecal coliform. The reach has full exposure to wave energy, and the drift direction is to the south towards Cain Creek.

## Marine Foreshore

The beach area is characterized by mixed coarse sand and gravel with some unconsolidated rip rap armoring. An accretion area is located near the mouth of Cain Creek.

## Historic and Cultural

The Peace Arch Park and border crossing are located within this reach and provide visual access to the shoreline.

## Function Analysis

### Reach Function

- Hydrologic: Functioning, although the shoreline processes have been altered due to shoreline modifications.
- Shoreline vegetation: Impaired due to prior alterations. Little opportunity for improvement due to existing development.
- Habitat: Terrestrial habitat is impaired; aquatic habitat is functioning.

### Limiting Factors

- Existing infrastructure – border crossing, railroad;
- Shoreline modification, armoring; and
- Water quality – possibly.

### Preservation/Enhancement Opportunities

- Preserve and enhance terrestrial vegetation associated with Cain Creek and control non-native plant species in this area.

## Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 1 include Urban and Aquatic. It is recommended



that the shorelands portion of Reach 1 be designated Urban Conservancy and the marine waters continue to be designated Aquatic.

## **3.2 REACH 2**

Reach 2 includes the marine shoreline on Semiahmoo Bay from Cain Creek to the west end of the Marine Drive peninsula. See the attached Data Sheet for Reach #2 for full inventory and analysis.

### **Land Use and Zoning**

Land use in Reach 2 includes public park (Marine Park) with trails and pavilions in the northeastern two-thirds of reach. Remainder of reach is developed with marine commercial uses. Zoning in this reach is public and central business-wharf.

### **Physical Environment**

This reach has been constructed out of man-made fill. Moderate to steep slopes at interface between upland and OHWM; uplands are flat. Very little aquatic vegetation except associated with Cain Creek. Eelgrass beds are present at western one-third of spit. Park is dominated by herbaceous vegetation that is mowed. There are some pockets of shrub vegetation adjacent to the shoreline and scattered trees. Japanese knotweed, a non-native invasive species, dominates portions of the shoreline. There appears to be some emergent/shrub wetland areas within the park. The remainder of the reach is developed and lacks vegetation. Six (6) buildings are present including commercial fisheries warehouses, Marine park features, and the Lighthouse Point Water Reclamation Facility which replaced the old sewer pump station. The Lighthouse Point Water Reclamation Facility treats all the city's sewage and reclaims the water for reuse or discharge depending upon demand.

### **Potential Species Present**

Reach 2 includes a concentration area for dabbling ducks in vicinity of Cain Creek (Northern Pintail, American Wigeon, Green Wing Teal, Mallard) and shorebirds in northeastern portion of reach (Greater Yellowlegs, Dunlin). Immediate shoreline is a high use area for all mentioned species. Southern extent of reach, at harbor entrance, is a high concentration area and important tidal dynamic area for sea ducks, bay ducks, Loons, Grebes, Mergansers and Cormorants. Pilings mid reach provide perch and roost sites for Black-bellied Plover, Bald Eagle and Black Turnstone. This reach is part of a high use flyway habitat for Bald Eagle and Peregrine Falcon. Reach 2 is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, and bull trout, and provides habitat for herring (spawning area at west end of spit in eelgrass beds). The City has identified a wildlife protection area adjacent to the full length of this reach.

### **Marine Aquatic Function**

The aquatic substrate includes mixed coarse (east two-thirds) and mixed medium at end of spit; Tidelands are mixed fines. Numerous relic pilings are present in tideland area, mainly concentrated in the eastern half of the reach with pier/platform at western end of

spit. Rip-rap bulkhead begins at western end of park, and continues to end of spit. The reach is identified as a CAT 5, polluted water for fecal coliform. The reach has full exposure to wave energy, and the drift direction appears to be west to east. There is a small spit extending eastward from the Marine Park shoreline. The waterward end of the spit appears to be artificial.

### Marine Foreshore

The beach area is characterized by mixed coarse materials with some silt/clay at west end of spit and tideland wetlands with mixed fines along nearshore. An accretion area is located near the mouth of Cain Creek.

### Historic and Cultural

An important community park, Marine Park, is located within the eastern two-thirds of this reach and provides physical and visual access to the shoreline. The park includes four bird viewing shelters. The pier/platform (Old Plank Boardwalk) at the end of the spit also provides access.

### Function Analysis

#### Reach Function

- Hydrologic: Functioning, although the shoreline processes have been altered due to shoreline modifications.
- Shoreline vegetation: Impaired due to prior alterations.
- Habitat: Terrestrial habitat is impaired; aquatic habitat is functioning.

#### Limiting Factors

- Existing infrastructure
- Shoreline modification, armoring

#### Priority Actions

- Preserve and enhance terrestrial vegetation associated with Cain Creek.
- Removal of non-native species – particularly the Japanese knotweed.
- Replace armored shoreline with other materials/methods where possible.
- Remove asphalt and waste rip-rap and replace with natural stone.

#### Preservation/Enhancement Opportunities

- Terrestrial vegetation enhancement in Marine Park area – shoreline and upland areas.
- Enhance shoreline vegetation with native species (dune grass).
- Remove creosote pilings, replace perches with environmentally safe material.

### Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 2 include High Intensity and Aquatic. It is recommended that the shorelands portion of Reach 2 be designated SMU-W, inclusive of the immediate off shore areas. The environment designation for the further off shore marine waters should remain Aquatic.

### **3.3 REACH 3**

Reach 3 includes the marine shoreline along Drayton Harbor from the tip of the Marine Drive spit back to the north-south shoreline adjacent to, but not including, the Burlington-Northern railroad right-of-way. See the attached Data Sheet for Reach #3 for full inventory and analysis.

#### **Land Use and Zoning**

Reach 3 includes the Blaine Marina and is fully developed with marine commercial and marina uses. The entire shoreline has been modified. Zoning in this reach is Central Business-Wharf.

#### **Physical Environment**

This reach has been constructed out of man-made fill. Aquatic vegetation includes eelgrass beds in the western half of reach outside the breakwater. The reach is dominated by the marina and other development. The only vegetation in the reach is mowed herbaceous species in the eastern most portion of the reach near the boat launch; a few trees and shrubs are present near the launch. The reach includes twenty-five (25) commercial buildings, and over 60% of the land area is covered by impervious surfaces.

#### **Potential Species Present**

The Southern extent of Reach 3, at harbor entrance, is a high concentration area and important tidal dynamic area for sea ducks, bay ducks, Loons, Grebes, Mergansers and Cormorants. Outer breakwater provides perching, roosting and nesting sites for Double-crested Cormorant and Glaucous-winged gulls. Dungeness crab are present. Reach 3 is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, and bull trout. Herring spawning occurs just beyond breakwater in eelgrass beds (western two-thirds of reach). This is a moderately protected marine embayment with free connection to open sea, bluff, marshes, eelgrass beds and intertidal habitat.

#### **Marine Aquatic Function**

Aquatic substrate type includes: Tideland, mixed fines; sand/silt/clay. Groin, jetty, bulkheads are present along entire length of reach. Numerous piers, pilings inside breakwater associated with marine commercial uses and marina are located within this reach. No pilings are apparent on aerial photos outside of breakwater. Condition of pilings and piers inside marina unknown. The reach is identified as a CAT 5, polluted water for fecal coliform.

#### **Historic and Cultural**

Aerial photos reveal that additional nearshore habitat has been converted to marina since 1977. Public access is provided by the Blaine Marina inside the breakwater, the

Plover ferry, and the public boat launch at the northern extent of the reach. Future pedestrian, public access trails are proposed within this reach.

### Function Analysis

#### Reach Function

- Hydrologic: Functioning, although the shoreline processes have been altered due to shoreline modifications.
- Shoreline vegetation: Impaired due to prior alterations.
- Habitat: Terrestrial habitat is impaired; aquatic habitat is functioning.

#### Limiting Factors

- Existing infrastructure
- Shoreline modification, armoring

#### Priority Actions

- Clean-up and removal of old waste in marine commercial area.

#### Preservation/Enhancement Opportunities

- 

### Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 3 include High Intensity and Aquatic. It is recommended that the shorelands portion, and areas within the existing breakwater of Reach 3 be designated SMU-W and the marine waters outside the breakwater continue to be designated Aquatic.

## **3.4 REACH 4**

Reach 4 includes the marine shoreline along Drayton Harbor south from the boat launch (and including the railroad right-of-way) to the point where Peace Portal Drive is located immediately landward of the Burlington-Northern railroad (near Cedar Street right-of-way). See the attached Data Sheet for Reach #4 for full inventory and analysis.

### Land Use and Zoning

Land use in Reach 4 includes an undeveloped marsh in the northern extent of reach, the railroad grade, which dominates the remainder of shoreline, and scattered commercial, residential and undeveloped parcels located on the uplands. Zoning in this reach includes a mix of central business-market, central business-wharf, and residential office.

### Physical Environment

The topography in Reach 4 includes a moderate slope up from the OHWM to the western portions of parcels located on the west side of Peace Portal Drive. There is no apparent nearshore vegetation. Eelgrass beds are located off shore. Terrestrial vegetation includes native herbaceous, shrub and tree species in northern most portion

of the reach associated with tidal marsh and freshwater marsh wetlands located between the railroad grade and the marina. In the northern two-thirds of reach (between the marina and Cherry Street) the shoreline is dominated by native shrub and tree species (between railroad and shoreline). The shoreline south of Cherry Street is generally un-vegetated, with some scattered shrubs. Some areas of native vegetation are present between the railroad grade and Peace Portal Drive; non-native species and landscaping predominate in disturbed areas. Several large culverts drain into this reach from the various street ends.

### Potential Species Present

The northern half of Reach 4 is a concentration area, moderate use area, for dabbling ducks (Northern Pintail, American Wigeon, Green Wing Teal, Mallard) and shorebirds (Greater Yellowlegs) and habitat for Dungeness crab. Reach 4 is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, and bull trout. Bald eagle utilize this area, and herring spawning occurs in eelgrass beds (interior portions of bay). This area is a moderately protected marine embayment with free connection to open sea, bluff, marshes, eelgrass beds and intertidal habitat.

### Marine Aquatic Function

Aquatic substrate type includes: Tideland, mixed fines; sand/silt/clay. Numerous relic pilings are present in the vicinity of Cherry Street. No in-water structures are apparent from aerial photos. The southern most portion of the reach may be armored with rip-rap to protect the railroad bed adjacent to the shoreline. The area includes mud and sand tide flats. Drayton Harbor is very shallow, with the majority of the harbor sitting between zero feet MLLW and MHHW. This area has low exposure to wave energy and the drift direction is north toward the marina. The reach is identified as a CAT 5, polluted water for fecal coliform.

### Marine Foreshore

The foreshore area has been modified at the north and south ends of the reach. A small area of feeder bluff exists just south of marina, followed by small accretion area south of bluff.

### Historic and Cultural

Visual public access is provided or has the potential to be provided by numerous street end parks (G Street, H Street, Boblett Street, Martin Street, Clark Street, and Cherry Street) as well as by the Blaine Boardwalk.

### Function Analysis

#### Reach Function

- Hydrologic: Functioning, although the shoreline processes have been altered due to shoreline modifications.
- Shoreline vegetation: Functioning in some areas (salt and fresh water marsh at northern extent, and tree/shrub area between railroad and shoreline at mid reach); southern extent of reach is impaired.

- Habitat: Terrestrial habitat is generally impaired, except for marsh area; aquatic habitat is functioning.

#### Limiting Factors

- Existing infrastructure – railroad grade
- Water quality

#### Priority Actions

- Preserve, enhance, and possibly expand salt water marsh habitat at north end of reach; preserve and enhance fresh water wetland in same area.

#### Preservation/Enhancement Opportunities

- Preserve marsh and wetland (see priority actions).
- Remove non-native vegetation from shoreline.

### Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 4 include Urban and Aquatic. It is recommended that the shorelands portion of Reach 4 be designated High Intensity, with a small area in the south designated Urban Conservancy and the marine waters continue to be designated Aquatic.

## **3.5 REACH 5**

Reach 5 includes the marine shoreline along Drayton Harbor where the Burlington-Northern railroad right-of-way is located immediately adjacent to Peace Portal Drive (approximately from Cedar Street to north of Albert Street). See the attached Data Sheet for Reach #5 for full inventory and analysis.

### Land Use and Zoning

Land use in Reach 5 is dominated by the railroad grade and Peace Portal Drive. The majority if not all of the shoreline is armored. Land uses north of road include residences and undeveloped parcels. Zoning in this reach is primarily residential office, with smaller areas of residential low density, and residential single/duplex.

### Physical Environment

The topography in Reach 5 shows a moderate slope at the shoreline interface. No apparent nearshore vegetation is present. Eelgrass beds are located off shore. Reach is dominated by disturbance and modification to terrestrial vegetation. Scattered pockets of native shrubs and trees are present, with some areas of beach grass. Some patches of native trees and shrubs are present between the railroad and Peace Portal Drive in northern half of reach. Twenty medium to large culverts drain into this reach from nearby City streets.

### Potential Species Present

Reach 5 is used by Harbor seal, Dungeness crab, and as a waterfowl concentration area. Reach 5 is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, bull trout and bald eagle. A bald eagle management zone is located in the southern half of this reach. Herring spawning occurs in eelgrass beds (interior portions of bay). This area is a moderately protected marine embayment with free connection to open sea, bluff, marshes, eelgrass beds and intertidal habitat.

### Marine Aquatic Function

Aquatic substrate type includes: Tideland, mixed fines; sand/silt/clay. Nearly entire length of reach has been armored with rip-rap. No creosote structures or in-water structures are apparent from aerial photos. Drayton Harbor is very shallow, with the majority of the harbor sitting between zero feet MLLW and MHHW. Moderate to high exposure to wave energy is possible at high tide levels in this area. The drift direction is north toward the marina.

### Marine Foreshore

The tidelands are mixed fines, sand/silt/clay. Little to no native beach is present due to armoring modifications.

### Historic and Cultural

Views of the shoreline are available from Peace Portal Drive. Public viewing site near 4<sup>th</sup> Street may increase visual access.

### Function Analysis

#### Reach Function

- Hydrologic: Functioning, although the shoreline processes have been altered due to shoreline modifications.
- Shoreline vegetation: Impaired due to past modifications.
- Habitat: Terrestrial habitat is impaired; aquatic habitat is functioning.

#### Limiting Factors

- Existing infrastructure – proximity of railroad and Peace Portal Drive to shoreline greatly limits most functions.
- Shoreline modification, armoring.

#### Preservation/Enhancement Opportunities

- Preserve and enhance the vegetation between the railroad and the OHWM where it exists or can be reintroduced.

### Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 5 include Rural/Urban and Aquatic. It is recommended that the shorelands portion of Reach 5 be designated Urban Conservancy and the marine waters continue to be designated Aquatic.

### **3.6 REACH 6**

Reach 6 includes the marine shoreline along Drayton Harbor from the point where the railroad leaves the shoreline south to the mouth of Dakota Creek. See the attached Data Sheet for Reach #6 for full inventory and analysis.

#### **Land Use and Zoning**

Land use in Reach 6 is residential with some undeveloped parcels. There is scattered shoreline armoring. Zoning in this reach is Residential low density.

#### **Physical Environment**

Moderate to steep slopes dominate the northern two-thirds of the reach; the upland area is flat. No apparent nearshore vegetation. Eelgrass beds are present off shore. The majority of the reach is developed with residential homes where the vegetation has been converted to lawn and landscaping. Twenty-two residences are present. One large stand of native trees remains on approximately four parcels in the middle of the reach. Shoreline vegetation varies from herbaceous to scattered shrubs and trees. The northern most extent of the reach is undeveloped, with the shoreline dominated by deciduous trees and shrubs, and the upland dominated by non-native grasses that are occasionally mowed.

#### **Potential Species Present**

Reach 6 provides habitat for Harbor seal (haul out area) and Dungeness crab, and serves as a waterfowl concentration area. Pilings off-shore provide perch and roosting sites for Cormorant. Southern end of reach is a concentration area for shorebirds and dabbling ducks. This reach is within a Bald eagle management zone. Herring spawning occurs in eelgrass beds (interior portions of bay). Drayton Harbor is classified as a moderately protected marine embayment with free connection to open sea, bluff, marshes, eelgrass beds and intertidal habitat. Reach 6 is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, bull trout and Bald eagle.

#### **Marine Aquatic Function**

The tidelands are mixed fines, sand/silt/clay. Numerous relic pilings are present along the shoreline; however, no in-water structures were apparent from aerial photos. Drayton Harbor is very shallow, with the majority of the harbor sitting between zero feet MLLW and MHHW. Moderate to high exposure to wave energy is possible at high tide levels in this area. The drift direction is southerly toward Dakota Creek.

#### **Marine Foreshore**

Moderate to steep bluffs dominate the northern portion of the reach. The beach area is narrow with debris logs, some rocks, some beach grass and native vegetation. Beach is affected by armoring modifications. Reach is characterized by feeder bluffs that have been modified with some armoring in a few places. A small accretion area is present near the mouth of Dakota Creek.



## Historic and Cultural

Archaeological site 45WH 564, a large shell midden site and possible remains of a village, has been identified within Reach 6. Montfort Park, one of the City's neighborhood parks, is located within this reach and provides visual access to the shoreline. Park users also have developed two social trails to scramble down to the shoreline and tideflats. Additional public access may be provided through development of street end view areas within Montfort Park, at Ruby and Pearl Street and Runge Avenue. Pearl Street ROW has been developed as "Hughes Bayview Park" offering visual access to the shoreline.

## Function Analysis

### Reach Function

- Hydrologic: Functioning, although the shoreline processes have been altered due to shoreline modifications.
- Shoreline vegetation: Mix of impaired and functioning.
- Habitat: Terrestrial habitat is impaired; aquatic habitat is functioning.

### Limiting Factors

- Existing land use and zoning.
- Water quality.

### Priority Actions

- Preserve vegetation corridor in center of reach (includes prime eagle habitat).

### Preservation/Enhancement Opportunities

- Preserve vegetation corridor in center of reach (includes prime eagle habitat).
- Enhance shoreline vegetation; preserve existing.
- Remove existing bulkheads – replace, if necessary, with soft armoring techniques.

## Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 6 include Conservancy and Aquatic. It is recommended that the shorelands portion of Reach 6 be designated Natural (immediately adjacent to the shoreline) and Shoreline Residential and the marine waters continue to be designated Aquatic.

## **3.7 REACH 7**

Reach 7 is defined as the shoreline of Dakota Creek from the mouth of the creek upstream to the city limits line (on the north bank) near Interstate-5. The south bank is located in unincorporated Whatcom County in the Blaine urban growth area. See the attached Data Sheet for Reach #7 for full inventory and analysis.

## Land Use and Zoning

Land use in Reach 7 is residential, with some light commercial uses and many undeveloped parcels. Zoning within the City is a mix of residential low density, planned commercial, and manufacturing class b. Zoning in the County is primarily urban residential.

## Physical Environment

Interstate 5, Peace Portal Drive and Blaine Road bisect the reach. The majority of the reach is characterized by residential development (8 residential structures are present) with lawn and landscaping. Varying widths of tree cover exist along much of the shoreline. Most tree stands are coniferous, except for the north side of the creek at the eastern end of the reach where deciduous trees are dominant. Existing tree stands do not offer significant habitat.

## Potential Species Present

This is a riparian environment that has significant tidal influences. Wetlands associated with Dakota Creek and forested and scrub-shrub areas within the flood plain of Dakota Creek are present. The mouth of Dakota Creek is a concentration area for shorebirds and dabbling ducks. Fall Chinook, coho, fall chum and winter steelhead have been documented as being present. This area is part of a Bald eagle management zone and is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, bull trout and bald eagle.

## Riparian Function

The channel gradient of Dakota Creek is less than 1%, and channel migration is unlikely in this reach due to tidal influence and location in watershed. Some relic pilings were observed in vicinity of Blaine Shipyard. No shoreline modifications were observed. Two residential docks are present on the south side of creek, one on the north side. Other in-water structures include Blaine Shipyard docks and access ramps, plus pilings and support structures for roadways. No fish passage blockages are present. Some woody debris is present in areas along the OHWM. Most of the shoreline has some level of tree cover, ranging in widths from 10-20 feet up to 200 feet. Recruitment potential is low in most areas. Blaine Shipyard is a State clean-up site. Lower half of reach is Category 1 water, tested and met parameter, for fecal coliform, and Category 2 water of concern for DO, pH, temperature in T40N, R1E, Section 8. Sources of pollution are generally understood to be located in upper portions of watershed.

## Historic and Cultural

This area does not show significant change over the past decades. The historic Blaine Shipyard is located on the south bank of Dakota Creek within this reach. Shoreline public access may be increased in the future through development of a community park in this reach, referred to as the Dakota Creek Shoreline Park. In 2009-2010 a shoreline access and small craft launch site was developed at the Washington Avenue ROW along Runge Avenue at the mouth of Dakota Creek.

## Functional Analysis

### Reach Function

- Hydrologic: Functioning with some impairment. Rainfall dominated, tidally influenced; flashy winter and early spring peaks, low summer flows, and variable spring and fall flows.
- Shoreline vegetation: Functioning, but limited due to narrow width of native vegetation along shoreline.
- Habitat: Terrestrial habitat is functioning, but limited by current land uses and development; aquatic habitat is functioning.

### Limiting Factors

- Existing land use and zoning.
- Water quality.

### Priority Actions

- Preserve riparian corridor.
- Water quality improvement in upper watershed

### Preservation/Enhancement Opportunities

- Preservation of terrestrial vegetation, habitat and associated corridors – particularly riparian corridors.
- Enhance riparian buffer – restore riparian buffer with native trees and shrubs

## Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 7 include Rural, Urban and Aquatic. It is recommended that the shorelands portion of Reach 7 be designated Natural (on the slopes and bluffs immediately adjacent to the shoreline) and Urban Conservancy and the water areas continue to be designated Aquatic.

## **3.8 REACH 8**

Reach 8 is defined as the shoreline of Dakota Creek upstream of the city limits to the limits of the former Blaine UGA. (This reach was removed from the City's UGA by the County in November of 2009.) All of this reach is located within unincorporated Whatcom County. See the attached Data Sheet for Reach #8 for full inventory and analysis.

### Land Use and Zoning

Land use in Reach 8 includes undeveloped parcels, with some urban and rural residential development and light agriculture (pasture, hay). Zoning in the County is urban residential.

### Physical Environment

Interstate 5 is located at the western edge of this reach. Approximately half of the reach is characterized by undeveloped native, mixed deciduous forest. The remainder of the reach is developed with rural residences (9) and pasture/agricultural land. These areas are vegetated with native and non-native herbaceous species. The native vegetation that is present has the potential to provide good habitat. Also, two tributary creeks are present within this reach.

### Potential Species Present

This is a riparian environment that has significant tidal influences. Wetlands associated with Dakota Creek and forested and scrub-shrub areas within the flood plain of Dakota Creek are present. Fall Chinook and fall chum have been documented as being present. Coho and winter steelhead have been documented as present and rearing. This area is within the ESU for coho, ocean Chinook, fall/winter chum, steelhead, and bull trout.

### Riparian Function

The channel gradient of Dakota Creek is less than 1%, and channel migration is unlikely in this reach due to tidal influence and location in watershed. No shoreline modifications and no relic pilings were observed. Five residential docks are present. No fish passage blockages are present. Very few pieces are scattered along the reach. Some woody debris is present in the main channel. Tree cover along the shoreline is moderate to high, with many areas over 200 feet in width. Recruitment potential is moderate to high. This reach is identified as being a Category 2 water of concern for DO, pH, and temperature. Sources of pollution are generally understood to be located in upper portions of watershed.

### Historic and Cultural

This area does not show significant change over the past several decades. Archaeological Site 45WH 058; an historic fish weir on the north bank of Dakota Creek, is located approximately 300-400 meters upstream from the Interstate 5 bridge.

### Functional Analysis

#### Reach Function

- Hydrologic: Functioning with some impairment. Rainfall dominated, tidally influenced; flashy winter and early spring peaks, low summer flows, and variable spring and fall flows.
- Shoreline vegetation: Functioning, with some areas impaired.
- Habitat: Terrestrial habitat is functioning; aquatic habitat is functioning.

#### Limiting Factors

- Existing land use and zoning.
- Water quality.

#### Priority Actions

- Preservation of riparian corridor.
- Water quality improvement in upper watershed.

### Preservation/Enhancement Opportunities

- Preservation of terrestrial vegetation, habitat and associated corridors. Particularly riparian corridors.
- Enhance riparian buffer: increase width of native shoreline vegetation in pasture areas.

### Shoreline Environment Designation

Reach 8 is not designated under the 1996 Blaine Shoreline Management Master Program. This reach is located outside the city's UGA..

## **3.9 REACH 9**

Reach 9 includes the marine shoreline along Drayton Harbor from the mouth of Dakota Creek to the mouth of California Creek. The entire reach is located within unincorporated Whatcom County within the former Blaine UGA. (This reach was removed from the City's UGA by the County in November of 2009.) See the attached Data Sheet for Reach #9 for full inventory and analysis.

### Land Use and Zoning

Land use in Reach 9 is residential. County zoning in this reach is urban residential.

### Physical Environment

Aquatic areas include unvegetated mudflats, with eelgrass beds located offshore and some salt marsh along shoreline. The majority of the reach is developed with residential homes where the vegetation has been converted to lawn and landscaping. Twenty single-family residences are present. Vegetation is predominately lawn and field with several nodes and strips of coniferous forest.

### Potential Species Present

Reach 9 is a seasonal waterfowl concentration area. The reach is located between dispersal areas for dabbling ducks. Harbor seal usage occurs in channels at low tide. Riparian, estuarine and wetland habitats are located in reach and support high concentrations of waterfowl. Dungeness crabs utilize the area, and Bald eagle nest and territory are located in this reach.

### Marine Aquatic Function

Aquatic substrate is sand/silt/mud. Armoring with bulkheads is present along approximately one-third of the reach. One dock is present. The area has low exposure to wave energy. Drift direction may be south toward California Creek.

### Marine Foreshore

The beach is characterized by silt-mud, sand. An erosion (feeder) zone is present along reach except where shoreline has been modified through armoring.

## Historic and Cultural

There are two archaeological site areas located in the reach between California and Dakota Creeks. These include Site 45WH 046 and Site 45WH 025. Site 45WH 046 is a buried shell midden site where fire-cracked rock, three cobble tools, a broken maul top, an abrader, a flaked core, and some early historic materials (ceramics, square nails) have also been identified. Site area 45WH 025 (site area may also be recorded as 45WH 041) is a shell midden located on the north shoreline and beach bank at the mouth of California Creek into Drayton Harbor. There was an ethnohistoric village at the same location at contact with Euroamericans. This appears to be the site that Suttles (1951:30) describes as an “*original Semiahmoo village named ε’Lε’lδη (“houses”). Drayton Harbor; More large aboriginal houses stood across Drayton Harbor from Tongue Spit, between the mouths of Dakota and California Creeks. At the mouths of the two creeks were more raised duck nets.*”

## Function Analysis

### Reach Function

- Hydrologic: Functioning, but at risk. General hydrologic functions in this reach are performing at a moderate level, but are at risk due to potential impacts from failing septic systems and shoreline armament.
- Shoreline vegetation: Functioning, but at risk. Shoreline vegetation functions are performing at low to moderate levels, but are at risk due to intrusions associated with residential development (filling of wetlands, landscaping).
- Habitat: Terrestrial habitat is functioning at low to moderate levels due to limited and discontinuous forested areas; aquatic habitat is functioning at moderate to high levels.

### Limiting Factors

- Existing land use and zoning.
- Water quality.

### Priority Actions

- Preserve forested habitat along shoreline.
- Limit bulkhead/jetty construction and, if required, encourage use of soft engineering technologies.

### Preservation/Enhancement Opportunities

- Encourage native plant landscaping for residential lots to increase wildlife function and decrease potential contaminants from lawn products in surface runoff.

## Shoreline Environment Designation

Reach 9 is not designated under the 1996 Blaine Shoreline Management Master Program. It is recommended that the shorelands portion of Reach 9 be designated Shoreline Residential and the marine waters be designated Aquatic.

### **3.10 REACH 10**

Reach 10 is defined as the shoreline of California Creek from the mouth of the creek to the bridge at Blaine Road. The entire reach is located in unincorporated Whatcom County within the former Blaine UGA. (This reach was removed from the City's UGA by the County in November of 2009.) See the attached Data Sheet for Reach #10 for full inventory and analysis.

#### **Land Use and Zoning**

Land use in Reach 10 includes single family residences. County zoning in this area is urban residential and rural.

#### **Physical Environment**

Aquatic substrate includes unvegetated mudflats and limited saltmarsh. Terrestrial vegetation includes mixed forested, lawns, open field and salt marsh. Forested habitat is narrow, but connects to several larger forested tracts. This reach includes thirty-five single-family residences.

#### **Potential Species Present**

Reach 10 provides riparian, wetland and estuarine habitat, and includes a waterfowl concentration area at the mouth of California Creek. Coho salmon (presence documented, rearing), winter steelhead (presence presumed), and cutthroat trout (presence documented) also use this area. Reach 10 includes Bald eagle nesting territory, and a nest is identified within one-half mile of this reach.

#### **Riparian Function**

The aquatic substrate includes unvegetated mudflats and high value salt marsh. The channel gradient of California Creek is less than 1%, and channel migration is limited, but possible, in some areas. There may be a fish passage blockage at Blaine Road. Low levels of LWD are present in the system, but forested riparian corridor provides moderate source for recruitment. This reach exceeds water quality standards for Fecal coliform. Sources of pollution are generally understood to be located in upper portions of water shed.

#### **Historic and Cultural**

No historic or cultural sites have been recorded in this area. This reach has a high potential for prehistoric and historic archaeological sites based on the following:

- Reach contains original site locations for early historic settlement in the Drayton Harbor area;
- Cemetery is located near the bridge with numerous historic settler burials; and
- Area near the Blaine Road bridge over California Creek is location of ethnohistoric and early settler trail.

#### **Functional Analysis**

### Reach Function

- Hydrologic: Functioning, but at risk. General hydrologic functions in this reach are performing at a moderate level, but are at risk due to impacts from polluted runoff and limitations to channel migration.
- Shoreline vegetation: Functioning, but at risk due to narrow width of forested corridor and potential for incremental loss associated with infill development.
- Habitat: Terrestrial habitat is functioning at moderate levels based on providing high quality habitat for Bald eagle nesting and foraging, but is limited due to lack of connection to other terrestrial and wetland habitats; aquatic habitat is functioning at moderate to high levels and provides important functions for waterfowl and salmonid species.

### Limiting Factors

- Restricted, disconnected riparian corridor.
- Water quality issues associated with adjacent land use.

### Priority Actions

- Preservation of forested riparian habitat.
- Provision of sewer and stormwater services to developing areas.

### Preservation/Enhancement Opportunities

- Preserve existing forested areas.
- Enhancement of shorelines with native plantings where lacking.

## Shoreline Environment Designation

Reach 10 is not designated under the 1996 Blaine Shoreline Management Master Program. This reach is outside the City's UGA.

## **3.11 REACH 11**

Reach 11 is defined as the shoreline of California Creek from the bridge at Blaine Road upstream to the eastern extent of the Blaine UGA. The entire reach is located in unincorporated Whatcom County within the former Blaine UGA. (This reach was removed from the City's UGA by the County in November 2009.) See the attached Data Sheet for Reach #11 for full inventory and analysis.

### Land Use and Zoning

Land use in Reach 11 includes single family residences. County zoning in this area is rural.

### Physical Environment

Aquatic substrate includes unvegetated mudflats. Terrestrial vegetation includes a mix of forested and open fields. This reach includes six single-family residences.

### Potential Species Present



Reach 11 likely provides significant habitat for waterfowl. Coho salmon (presence documented, rearing), winter steelhead (presence presumed), and cutthroat trout (presence documented) also use this area. Reach 11 includes Bald eagle nesting territory.

### Riparian Function

The aquatic substrate includes unvegetated mudflats and high value salt marsh. The channel gradient of California Creek is less than 1%, and channel migration is limited, but possible, in some areas. There may be a fish passage blockage at Blaine Road. Low levels of LWD are present in the system, but forested riparian corridor provides moderate source for recruitment. This reach exceeds water quality standards for Fecal coliform. Sources of pollution are generally understood to be located in upper portions of water shed.

### Historic and Cultural

Some important historic features are located near Blaine Road bridge over California Creek at western edge of this reach; however, no cultural resource surveys have been recorded in this reach.

### Functional Analysis

#### Reach Function

- Hydrologic: Functioning, but at risk. General hydrologic functions in this reach are performing at a moderate level, but are at risk due to impacts from polluted runoff and limitations to channel migration.
- Shoreline vegetation: Functioning, but at risk due to narrow width of forested corridor and potential for incremental loss associated with infill development.
- Habitat: Terrestrial habitat is functioning at moderate levels based on providing high quality habitat for Bald eagle nesting and foraging, but is limited due to lack of connection to other terrestrial and wetland habitats; aquatic habitat is functioning at moderate to high levels and provides important functions for waterfowl and salmonid species.

#### Limiting Factors

- Restricted, disconnected riparian corridor.
- Water quality issues associated with adjacent land use.

#### Priority Actions

- Removal of undetermined blockage to fish passage at Blaine Road.
- Preservation of forested riparian habitat.
- Provision of sewer and stormwater services to developing areas.

#### Preservation/Enhancement Opportunities

- Preserve existing forested areas.
- Enhancement of shorelines with native plantings where lacking.

## Shoreline Environment Designation

Reach 11 is not designated under the 1996 Blaine Shoreline Management Master Program. This reach is outside the City's UGA.

### **3.12 REACH 12**

Reach 12 includes the marine shoreline along Drayton Harbor from the mouth of California Creek west to the City limits. The entire reach is located within unincorporated Whatcom County within the former Blaine UGA. (This reach was removed from the City's UGA by the County in November 2009.) See the attached Data Sheet for Reach #12 for full inventory and analysis.

#### Land Use and Zoning

Land use in Reach 12 is low-density residential. County zoning in this reach is urban residential.

#### Physical Environment

The topography is generally flat near the mouth of California Creek and increases significantly toward the western portion of the reach. Aquatic areas include unvegetated mudflats, with eelgrass beds located offshore. Terrestrial vegetation includes estuarine emergent wetlands/ palustrine scrub-shrub wetlands and grassland (mostly fallow agricultural fields). Fifteen single-family residences are located in this reach.

#### Potential Species Present

Reach 12 serves as a shorebird and dabbling duck concentration area, along the shoreline and off-shore, and provides perch trees and forage area for Bald eagle. Important commercial/recreation shellfish bed area is located in this reach, as well as a surf smelt spawning area at extreme west end of reach.

#### Marine Aquatic Function

Aquatic substrate type includes sand/silt/clay, with areas of brackish marsh and sand-pebble cobble at east end of reach. Armoring with bulkheads is present at east end of reach near the mouth of California Creek. One boardwalk-like structure is present at western end of reach. The area has low exposure to wave energy and no appreciable drift.

#### Marine Foreshore

The beach in Reach 12 is characterized by sand, silt and marsh. A feeder bluff is located at the west end of the reach and accretion zone is identified along the rest of the reach.

#### Historic and Cultural

Archaeological Site 45WH 049, a large shell midden site and possible remains of a village, is located in this reach on the 12 meter terrace down to beach. Two new bird viewing shelters are proposed within this reach.

## Function Analysis

### Reach Function

- Hydrologic: Functioning, but at risk. General hydrologic functions in this reach are performing at a moderate level, but are at risk due to potential impacts from failing septic systems and shoreline modifications associated with Drayton Harbor Road.
- Shoreline vegetation: Functioning, but at risk. Shoreline vegetation functions are performing at low to moderate levels, but are at risk due to loss of vegetation associated with Drayton Harbor Road.
- Habitat: Terrestrial habitat is greatly impaired due to significantly limited and discontinuous vegetated areas; aquatic habitat is functioning at moderate to high levels.

### Limiting Factors

- Adjacent roads limit all functions.
- Reported algal blooms indicate nutrient inputs apparently based on human actions.

### Priority Actions

- Maintain water quality and existing aquatic habitat.

### Preservation/Enhancement Opportunities

- Preserve forested habitat along shoreline where it exists.
- Preserve wetlands in general contributing basin.
- Limit bulkhead/jetty construction and, if required, encourage soft engineering technologies.
- Encourage native plant landscaping for residential lots to increase wildlife function and decrease potential contaminants from lawn products in surface runoff.

## Shoreline Environment Designation

Reach 12 is not designated under the 1996 Blaine Shoreline Management Master Program. This reach is outside the City's UGA.

### **3.13 REACH 13**

Reach 13 includes the marine shoreline along Drayton Harbor from the city limits line to the beginning of Semiahmoo Spit. The entire reach is within the City. See the attached Data Sheet for Reach #13 for full inventory and analysis.

## Land Use and Zoning

Land use in Reach 13 is low to moderate density single-family and multifamily residential development. City zoning in this reach is Residential Planned Recreation.

### Physical Environment

The topography in this reach includes very steep slopes that have experienced slope failures in the past. Aquatic vegetation includes eelgrass beds offshore along the entire reach. Terrestrial vegetation includes a nearly continuous, mixed deciduous forest and areas of shrubs. Seventeen single-family residences and five multifamily residential structures are located in this reach.

### Potential Species Present

Reach 13 accommodates winter duck and waterfowl concentrations including large numbers of black brant; a double crested cormorant nesting colony is located offshore. Commercial/recreational shellfish bed areas (commercial harvest currently prohibited) and Dungeness crab habitat are located in this reach. Surf smelt and sand lance spawning has been reported at both ends of the reach. Herring spawning occurs in eelgrass beds located offshore. Two bald eagle nesting territories are in the vicinity of the reach (one nest within SMP jurisdiction), and Bald eagle perch trees are present along length of reach.

### Marine Aquatic Function

Aquatic substrate type includes sand/silt/clay. No creosote structures or in-water structures were identified, and only very infrequent, small rock or wood bulkheads are present. The area has low exposure to wave energy and no appreciable drift.

### Marine Foreshore

The beach in Reach 13 is characterized by sand, silt, clay with scattered boulders. Large woody debris is common. Reach 13 includes erosional bluffs. The reach is also located in an accretion zone with high connectivity with sediment supply in most areas.

### Historic and Cultural

Reach 13 contains numerous historical/archaeological site areas. In 1984, Grabert and Roulette (WWU) surveyed and monitored site preparation and underground utilities construction on 200 acres near the head of Semiahmoo Spit. Five prehistoric and six historic sites were inventoried. Two of the prehistoric sites, Site 45WH 216 and Site 45WH 217, were cobble tool locations on the 30 meter terrace. Two small shell midden sites, Site 45WH 211 and Site 45WH 212 were identified along the southwest shoreline of Drayton Harbor near the historic sites associated with the Drayton Mill (Roulette and Grabert 1985; Roulette 1987).

Historic sites recorded by Roulette in 1985 are all located along the southwestern shoreline of Drayton Harbor and are all associated with the Drayton Mill Company (Roulette 1985:59-70). Drayton Mill Dump Site, Site 45WH 213, is located on slope above beach. Drayton Mill Log Ramp, Site 45WH 214, is located on the beach at the base of slope leading from the road to the beach. Wreck of the ship *March*, Site 45WH

215, is located on the mudflat of the beach and includes 22 meters of exposed structural ribs and siding visible at low tide.

The Lummi Indian Nation Cultural Department surveyed and assessed the Drayton Hillside development (Smith, Alvis and Wessen 2002). The survey relocated sites recorded by Roulette and discovered additional cultural resources, including isolated cobble and spall tools, and culturally modified trees.

## Function Analysis

### Reach Function

- Hydrologic: Water quality, quantity and shoreline processes are functioning at a high level. Shoreline in this reach is indicated to be a significant feeder source for sediment and material that maintains and develops the Semiahmoo Spit formation.
- Shoreline vegetation: Functioning, but at risk. Shoreline vegetation functions are performing at moderate to high levels with nearly continuous cover and good screening, but are at risk due to potential loss of vegetation associated with future development.
- Habitat: Terrestrial habitat is functioning at a high level, but is at risk from future development; aquatic habitat is functioning at a high level, providing habitat for a wide range of fish, shellfish and waterfowl along this reach.

### Limiting Factors

- Potential loss of forested riparian vegetation due to development.
- Additional shoreline armament potentially reducing sediment transport.

### Priority Actions

- Protection of forested areas.
- Limiting bulkhead and jetty construction.

### Preservation/Enhancement Opportunities

- Preserve forested habitat along shoreline.
- Limit bulkhead/jetty construction and, if required, encourage soft engineering technologies
- Encourage native plant landscaping for residential lots to increase wildlife function and decrease potential contaminants from lawn products in surface runoff.

## Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 13 include Conservancy and Aquatic. It is recommended that the shorelands portion of Reach 13 be designated Natural (between the shoreline and the Old Drayton Harbor Road trail or top of the shoreline bluff which ever applies) and Shoreline Residential and the marine waters continue to be designated Aquatic.

### **3.14 REACH 14**

Reach 14 includes the marine shoreline along Drayton Harbor from the beginning of the neck of Semiahmoo Spit to the southwest edge of the Semiahmoo Marina. See the attached Data Sheet for Reach #14 for full inventory and analysis.

#### **Land Use and Zoning**

Land use in Reach 14 includes Semiahmoo Park (a county park), Semiahmoo Parkway and undeveloped multifamily residential parcels. City zoning in this reach includes Residential Planned Recreation and Marine Planned Recreation.

#### **Physical Environment**

This reach includes a portion of the southeast shore of Semiahmoo Spit. The topography is relatively flat, and access to the spit is from Semiahmoo Parkway, which runs through the upland portion of this reach. Aquatic vegetation includes eelgrass beds offshore. Terrestrial vegetation includes grasses and some shrubs, but very few trees. Three structures are present in Semiahmoo Park. An area of rip-rap at the northern end of the reach was removed in 2008/09 and replaced with a cobble armored beach. The restoration work reduced erosion potential and protected an exposed shell midden.

#### **Potential Species Present**

Reach 14 includes dabbling duck and sea duck concentration areas (winter); water fowl travel route, and avian food concentration area. Double crested cormorant colony is present offshore. Commercial/recreational shellfish bed areas (hardshell clam) and Dungeness crab habitat are located in this reach. Herring, smelt and sand lance spawning areas are also present. Bald eagle nesting and foraging habitat are located near the reach as well as foraging habitat for Peregrine falcons.

#### **Marine Aquatic Function**

Aquatic substrate type includes mixed fines on upper beach and sand/silt and clay offshore. No creosote structures, in-water structures or shoreline armoring are present. The area has low exposure to wave energy, and the drift direction is north.

#### **Marine Foreshore**

The beach in Reach 14 is characterized by sand. The reach is located in an accretion zone with high connectivity with sediment source.

#### **Historic and Cultural**

Archaeological Site 45WH 599, a shell matrix site with both historic and prehistoric components, was identified in 2002. The site is adjacent to the shoreline in the northern portion of the reach. Semiahmoo Park (a county park) is located in this reach and provides physical and visual access to the shoreline. A pedestrian/bike trail is located on the south side of Semiahmoo Parkway. A shoreline view point and additional shoreline trails were constructed in the eastern portion of this reach in 2008/09.

## Function Analysis

### Reach Function

- Hydrologic: Water quality, quantity and shoreline processes are functioning within this reach.
- Shoreline vegetation: Limited. General land management in combination with the natural soils and exposure of the reach result in limited forest development.
- Habitat: Terrestrial habitat is limited by low vegetation cover and diversity and competing human uses such as roads and trails; aquatic habitat is functioning at a high level, providing habitat for a wide range of fish, shellfish and waterfowl along this reach.

### Limiting Factors

- The narrow nature of the spit results in conflicts between wildlife usage and human use.
- Soil type and site exposure.

### Priority Actions

- Maintain offsite eelgrass beds and surf smelt and sand lance spawning areas.
- Provide visual screening along shoreline to reduce conflicts between wildlife usage and human activities.
- Require stormwater and water quality treatment for all developed surfaces.

### Preservation/Enhancement Opportunities

- Enhancement of open, mowed areas with native herbaceous and low shrub species targeting visual screening functions and wildlife habitat attributes.

## Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 14 include Natural, Urban/Rural and Aquatic. It is recommended that the shorelands portion of Reach 14 be designated Natural (immediately adjacent to the shoreline and in the park area) and SMU-S/Shoreline Residential in the master planned area and the marine waters continue to be designated Aquatic.

### **3.15 REACH 15**

Reach 15 is identified as the marine shoreline along Drayton Harbor and Semiahmoo Bay from the southern edge of the Semiahmoo Marina to the northwestern extent of the Semiahmoo Resort. See the attached Data Sheet for Reach #15 for full inventory and analysis.

### Land Use and Zoning

Land use in Reach 15 includes Semiahmoo Marina and Semiahmoo Resort City zoning in this reach is Marine Planned Recreation.

## Physical Environment

This reach includes the tip of Semiahmoo Spit. The topography is flat, and access to the spit is from Semiahmoo Parkway, which is located in the upland area adjacent to this reach. Aquatic vegetation includes eelgrass beds located offshore on the west side of the spit. Upland areas are developed with some grass areas. Eight buildings were present during the original inventory, including resort, marina buildings and old warehouses. In 2007/08 three additional buildings were started (Marin Condominiums); as of 2010 one is completed that others are partially completed.

## Potential Species Present

Reach 15 includes Harbor Seal haulout at south end of reach on docks, sea duck concentration area, rocky shorebird concentration area and Harlequin Duck roost on jetty. Raptor (bald eagle and peregrine falcon) perches are located in adjacent upland. Dungeness crab habitat, commercial and recreational shellfish (hard-shell clam), and herring and smelt spawning areas are also present. Pigeon guillemot nesting colony is located near this reach.

## Marine Aquatic Function

Aquatic substrate types include mixed fines and gravel (east) and sand (west). This reach includes many relic and in-water structures, including docks and jetties composed of concrete, rock, and wood. This reach includes areas identified as Cat. 5 polluted water for fecal coliform. The northwest side of the spit has high exposure to wave energy, and the drift direction is north on both sides.

## Marine Foreshore

The beach in Reach 15 is characterized by mixed fines. The reach is located in an accretion zone with moderate to high connectivity with sediment sources.

## Historic and Cultural

Archaeological Site 45WH 073, a shell midden site and possible remains of a village; is located in this reach and was adversely impacted by construction of the Semiahmoo Resort.

Significant physical and visual access to the shoreline is provided within this reach by the Semiahmoo Marina, piers adjacent to the Semiahmoo Resort, the dock for the Plover ferry, and existing and proposed public access trails and walkways.

## Function Analysis

### Reach Function

- Hydrologic: Limited due to marine and shoreline construction.
- Shoreline vegetation: Limited. Upland and marine construction limit all shoreline vegetation in this reach.



- Habitat: Terrestrial habitat is limited by upland and marine development; aquatic habitat is also limited by marine development, but important habitat is provided by docks and jetties and intact aquatic vegetation.

#### Limiting Factors

- Intensive development (existing and planned) in this reach.

#### Priority Actions

- Maintain and protect existing habitat uses where present.

#### Preservation/Enhancement Opportunities

- Redesign bulkhead features to improve habitat value.
- Replace creosote piles with steel and concrete.
- Develop strong harbor policies regarding boat maintenance and repair including spills, cleaning, etc.
- Shoreline planting enhancements of upland immediately west of marina to improve habitat for wildlife.

### Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 15 include Urban and Aquatic. It is recommended that the shorelands portion of Reach 15 be designated SMU-S/High Intensity and the marine waters within the breakwater and immediately offshore be designated SMU-S/Aquatic and the offshore areas outside the breakwater continue to be designated Aquatic.

### **3.16 REACH 16**

Reach 16 is identified as the marine shoreline along Semiahmoo Bay from the western extent of Semiahmoo Resort to the western edge of Semiahmoo Park (just east of the wastewater treatment plant). See the attached Data Sheet for Reach #16 for full inventory and analysis.

#### Land Use and Zoning

Land use in Reach 16 includes the Beachwalker Condominiums, undeveloped multifamily residential parcels and Semiahmoo Park. City zoning in this reach is Marine Planned Recreation and Residential Planned Recreation.

#### Physical Environment

This reach includes a portion of the northwestern side of Semiahmoo Spit. The topography is flat, and access to the spit is from Semiahmoo Parkway. Aquatic vegetation includes eelgrass beds along the entire reach. Terrestrial vegetation includes some landscaping, grass areas with limited dune communities and shrubs at south end of reach. Six buildings are present, including 3 multifamily structures and 3 park buildings. A FEMA-designated wave hazard area has been identified in the middle section of this reach. There are several undeveloped multi-family residential lots.

## Potential Species Present

Reach 16 includes a dabbling duck concentration area, shorebird feeding area, and raptor use in upland perch trees. Other species present include Dungeness crab, starry flounder (offshore), commercial and recreational shellfish (hard-shell clam), native oyster, and herring and smelt spawning areas. Bald eagle nest and territories are in the vicinity of the reach.

## Marine Aquatic Function

Aquatic substrate type includes sand and mixed fines. No creosote or other in-water structures were identified in this reach, and shoreline armoring is not present. The west side of the spit has high exposure to wave energy, and the drift direction is north.

## Marine Foreshore

The beach in Reach 16 is characterized by mixed fines. The reach is located in an accretion zone in high contact with sediment supply.

## Historic and Cultural

A number of archaeological sites have been recorded in the vicinity, but none has been identified in this reach. Semiahmoo Park (a county park) is located in this reach and provides physical and visual access to the shoreline. Additional shoreline trails were constructed in 2008/09 in the eastern portion of this reach. At the same time, access points to the beach were enhanced and formalized in the County park at the western end of the reach.

## Function Analysis

### Reach Function

- Hydrologic: Water quality, quantity and shoreline processes are functioning within this reach.
- Shoreline vegetation: Limited. General land management in combination with the natural soils and exposure of the reach result in limited forest development.
- Habitat: Terrestrial habitat is limited by low vegetation cover and diversity and competing human uses such as roads and trails; aquatic habitat is functioning at a high level, providing habitat for a wide range of fish, shellfish and waterfowl along this reach.

### Limiting Factors

- The narrow nature of the spit results in conflicts between wildlife usage and human use.
- Soil type and site exposure.

### Priority Actions

- Maintain offsite eelgrass beds and surf smelt and sand lance spawning areas.
- Provide visual screening along shoreline to reduce conflicts between wildlife usage and human activities.

- Require stormwater and water quality treatment for all developed surfaces.
- Evaluate the potential for shoreline protection (beach feeding or soft stabilization) to protect infrastructure (road and utilities) and to avoid rip-rap or emergency actions.

#### Preservation/Enhancement Opportunities

- Enhancement of open areas with native herbaceous and low shrub species targeting visual screening functions and wildlife habitat attributes.

### Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 16 include Natural, Urban/Rural and Aquatic. It is recommended that the shorelands portion of Reach 16 be designated Natural (immediately adjacent to the shoreline and in the park area) and SMU-S/Shoreline Residential and the marine waters continue to be designated Aquatic.

### **3.17 REACH 17**

Reach 17 is defined as the marine shoreline along Semiahmoo Bay from just east of the wastewater treatment plant southwest to the existing City limits and continuing southwesterly to the southern extent of the former Blaine UGA. Approximately one-third of this reach is located within the City and the remaining two-thirds is located in unincorporated Whatcom County. See the attached Data Sheet for Reach #17 for full inventory and analysis.

#### Land Use and Zoning

Land use in Reach 17 is predominately low density single family residential development, plus a small area occupied by the Blaine wastewater treatment plant. City zoning in this reach is Residential Planned Recreation. County zoning in this reach is urban residential.

#### Physical Environment

Topography within this reach includes some moderate to steep slopes with some areas of slope instability. Aquatic vegetation includes eelgrass beds along the entire reach. Terrestrial vegetation includes deciduous forested/shrub areas, limited conifer forest, wetland vegetation and developed/landscaped areas. 91 single family residences are located in this reach along with two wastewater treatment buildings. In some cases, stormwater from residences has been tight-lined to the beach.

#### Potential Species Present

Reach 17 provides Harbor seal haul out area along most of shoreline. This is important habitat for general haul out and pupping. Entire reach is designated for commercial and recreational shellfish beds. Dungeness crab and Herring and surf smelt spawning areas are indicated along entire reach. Starry flounder habitat area located off-shore. This

reach is moderate use area for Harlequin ducks, and Bald eagle nest and territories are identified in the vicinity of the reach.

### Marine Aquatic Function

Aquatic substrate includes mixed medium substrate. Small docks and shoreline armoring are present at low densities. The west side of the spit has high exposure to wave energy, and the drift direction is north.

### Marine Foreshore

The beach in Reach 17 is characterized by sand/cobble, mixed and low to high bank. The reach includes mixed zones with predominately transport and feeder zones. A small accretion area is present. High connectivity to feeder bluffs rated exceptional in some areas.

### Historic and Cultural

Numerous archaeological sites have been identified in this reach. The most significant is Archaeological Site 45WH 017, which includes a large shell midden site and remains of a named ethnohistoric and prehistoric village (National Historic Register Site NR List # 00000697). Research and excavations were carried out at the Semiahmoo Spit village location (Site 45WH 017) in 1977 and 1978 (Grabert, Cressman, Wolverton 1977:113). Occupation at this site area is estimated to be at least 4000 years (Grabert, Cressman, Wolverton 1977:102). Mitigation and rescue investigations have been carried out at the site (near the Blaine wastewater treatment plant) since construction impacts in 1999.

Additional sites include Archaeological Site 45WH 216, a large area, yet sparse cobble tool site on upper terrace above and south of Site 45WH 017; Archaeological Site 45WH 048, a lineal shell midden site along the top of erosion bank with possible remains of a village; and Archaeological Site 45WH 541, also a lineal shell midden site along the top of erosion bank at shoreline with possible remains of a village.

State Park property is located at south end of reach, but no developed areas for public access have been identified within this reach.

### Function Analysis

#### Reach Function

- Hydrologic: Water quality, quantity and shoreline processes are functioning within this reach, which provides a significant feeder source for sediment and material that maintains and develops the Semiahmoo Spit formation.
- Shoreline vegetation: Functioning, based on near continuous forest along the shoreline and only limited areas of reduced forest width near north end of reach (associated with development).
- Habitat: Terrestrial habitat is functioning and provides important functions for Bald eagle and other species, but is at risk from incremental loss due to development; aquatic habitat is functioning at a high level, providing habitat for a wide range of fish, shellfish and waterfowl along this reach.

### Limiting Factors

- Incremental loss of forest cover due to development.
- Incremental shoreline modification and armament.

### Priority Actions

- Protection of forested areas.
- Limiting bulkhead and jetty construction.

### Preservation/Enhancement Opportunities

- Preserve forested habitat along shoreline.
- Limit bulkhead/jetty construction and, if required, encourage use of soft engineering technologies.
- Encourage native plant landscaping for residential lots to increase wildlife function and decrease potential contaminants from lawn products in surface runoff.

### Shoreline Environment Designation

Under the 1996 Blaine Shoreline Management Master Program the shoreline environment designations for Reach 17 include Conservancy and Aquatic. It is recommended that the shorelands portion of Reach 17 be designated Natural (immediately adjacent to the shoreline including the beach and bluff) and Shoreline Residential and the marine waters continue to be designated Aquatic.