SUBAREA PLAN

EVERETT MARSHLAND

Prepared for

City of Everett
2930 Wetmore Avenue
Everett, Washington 98201

Prepared by

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1423 Third Avenue, Suite 300
Seattle, Washington 98101

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Norton-Arnold & Company
1932 First Avenue, Suite 802
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LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinance
City	City of Everett
County	Snohomish County
EIS	Environmental Impact Statement
GMA	Growth Management Act
MUGA	Municipal Urban Growth Area
NRCS	Natural Resources Conservation Service
PSE	Puget Sound Energy
RFFD	Rural Flood Fringe Designation
SCS	Soil Conservation Service
SDA	Special Development Area
SEPA	State Environmental Policy Act
SMA	Shoreline Management Act
SMP	Shoreline Management Program
WDFW	Washington Department of Fish and Wildlife
ALEA	Aquatic Lands Enhancement Account
RCO	Washington State Recreation and Conservation Office
NAWCA	North American Wetlands Conservation Act
NOAA	National Oceanic and Atmospheric Association
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

The Marshland Subarea Plan is intended to create a conceptual plan for future restoration, land use, and infrastructure opportunities in the City of Everett's eastern limits. Specifically, the plan identifies lands within the approximately 1,065-acre area[1] adjacent to the Snohomish River project area that are suitable for agriculture, habitat restoration, and passive recreation as well as some additional residential development. The Subarea Plan is the basis for revisions to the City of Everett (City) Comprehensive Plan and Shoreline Master Program (SMP) for the portions of the subarea that are within the City's urban growth area.

The Marshland subarea is an important area within the City as it is the largest vestige of open space within the City limits and the City's Municipal Urban Growth Area (MUGA), has significant fish and wildlife restoration potential, provides opportunities for passive recreation, has a large percentage of publically owned lands, and has existing valuable agricultural use. The Marshland's location is ideal for tidally-influenced wetland restoration and represents one of the last opportunities for large scale restoration of this type within the Snohomish River basin. Restoration actions within the subarea can also be blended with passive recreation, including open space areas and trails, to provide the public with opportunities to view and enjoy restored areas. Agricultural uses will continue outside of restoration areas, including commercial agriculture, small scale hobby farming, and personal livestock husbandry.

1.1 Overview of the Subarea Plan

The Marshland Subarea Plan is the result of a SMP settlement agreement between the City, the Washington State Department of Ecology (Ecology), Washington Environmental Council, and Everett Shoreline Coalition; a grant from Ecology; creation of an stakeholder group and scheduling of associated stakeholder meetings; development of a programmatic Environmental Impact Statement (EIS) to review and assess environmental issues related to the project; and public input on the EIS and at public meetings and hearings. The subarea plan provides for a combination of restoration, recreation, agricultural, and residential uses within the subarea.

[1] The area studied in the Marshland EIS included approximately 1,065 acres; however, only 846 acres of the area studies in the EIS occur within the City's municipal limits and its associated Urban Growth Area (MUGA).

Key features of the subarea plan include:

- Relocating the Marshland Flood Control Pump Station to the southern boundary of the subarea and providing fish passage into and out of the Marshland Canal if feasible.
- Reorienting the Marshland Canal so that it flows into the Snohomish River at the southeastern corner of the subarea if feasible.
- Creating two large tidally-influenced wetland areas that will connect to the Snohomish River through connections through the Lowell-Snohomish River Road.
- Restoring Wood Creek and allowing it to outlet into the southern tidally-influenced wetland area.
- Restoring multiple non-tidal freshwater wetland areas.
- Continuing ongoing agriculture in traditionally farmed pockets between and near habitat restoration areas.
- Providing an area for passive recreation in an approximately 500-foot-wide-strip bordering Lowell-Larimer Road. This passive recreation area would provide for small- to medium-sized parking areas along the roadside and large lawn areas for multipurpose informal activities.
- Establishing a recreational trail system in and around the passive recreation and restored areas.
- Excluding properties from restoration where property owners do not wish to have their properties included in restoration actions.
- Allowing residential uses in the Rural Flood Fringe District along Larimer Road where property owners can meet the requirements of floodplain development regulations.
- Protecting existing regional utility corridors and ensuring no interruptions in regional utility service.
- Establishing a policy foundation to complete appropriate studies of the feasibility and potential impacts of restoration activities prior to implementation.
- Preserving or improving flood control and drainage in areas outside restoration areas.

A summary of the existing and proposed land use types in the subarea is shown in Table 1-1 and the proposed land use types are shown in Figure 1-1.

Table 1-1

Existing and Proposed Subarea Plan Land Use

(in acres except where noted) [3]

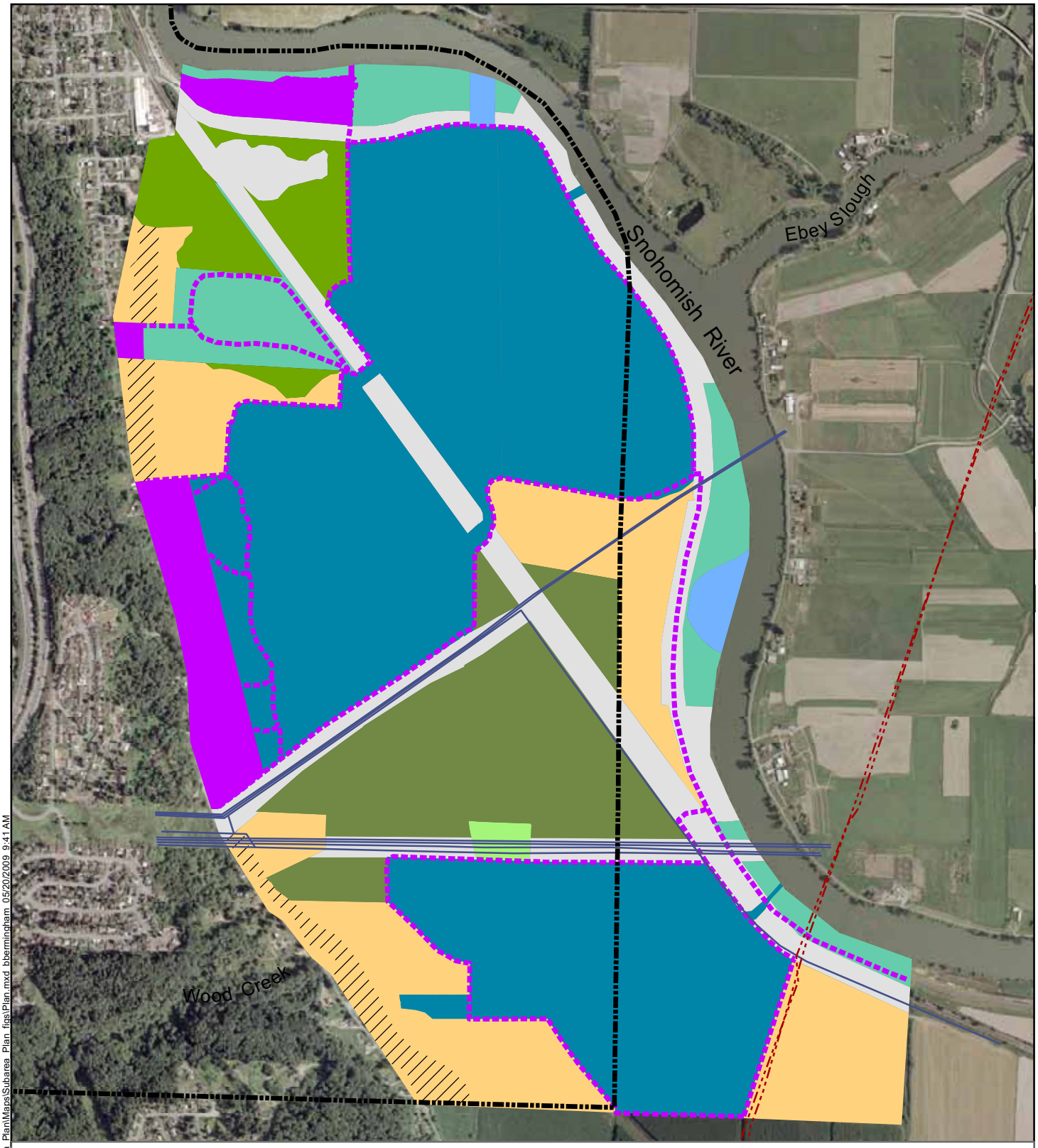
Land Use [2]	Existing	Subarea Plan
Agriculture	795.0	188.7.0
Fish and Wildlife Preservation/Enhancement	0.0	69.8
Fish and Wildlife Restoration	0.0	452.6
Fish Preservation/ Enhancement	8.6	9.0
Other/Infrastructure	157.8	133.2
Recreation [1]	15.6	48.1
Wildlife Preservation/ Enhancement	88.3 [2]	45.5
Wildlife Restoration (terrestrial only)	0.0	118.4
Totals	1,065.3	**1,065.3**

Notes:
[1] Total acres include Rotary Park at nearly 13 acres. Net new recreation includes 35.1 acres. This includes approximately 47,000 linear feet of new trails.

[2] Land Use categories are described in more detail below:

- Agriculture means activities involved in the production of crops or livestock operation.
- Preservation/Enhancement means streams, wetlands, or terrestrial ecosystems currently providing relatively high ecological functions that may benefit from actions that increase the critical area's functions.
- Restoration means the return of a stream or wetland, or terrestrial ecosystem, to a state in which its functions and values significantly approach its unaltered state.
- Other/Infrastructure includes road, railroad, power, and liquid petroleum product rights-of-way or easements or parcels.
- Recreation includes lands designed to encourage passive forms of exercise or refreshment.

[3] Land use acreages may change over time due to a number of factors, including changes in ownership, the results of future technical studies addressing restoration, and future changes in federal, state, or local policies.



Land Use

- Agriculture
- Fish Preservation / Enhancement
- Fish and Wildlife Preservation / Enhancement
- Wildlife Preservation / Enhancement
- Wildlife Preservation
- Fish and Wildlife Restoration
- Wildlife Restoration
- Recreation
- Other / Infrastructure
- Potential Buildable Land (See Note)
- Trails
- Underground Gas Pipeline
- Regional Overhead Utilities
- Everett City Limits

Note: Properties must meet City of Everett zoning requirements to be eligible for building new structures within the Subarea.

ANCHOR ENVIRONMENTAL, L.L.C.

0 625
Scale in Feet

This is a conceptual figure meant to represent the plan. Additional studies are necessary to determine technical feasibility and locations for dike breaches, dikes, and other structures. See Section 3.3.2.

Figure 1-1
Marshland Subarea Land Use Plan
Marshland Subarea Plan

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1.2 Settlement Agreement Background

The Everett SMP Settlement Agreement between the City, Ecology, Washington Environmental Council, and Everett Shoreline Coalition requires the preparation of a subarea plan for the Marshland area prior to allowing specific uses in the area. Accordingly, the City has initiated the subarea planning process to more directly and fully address future restoration and land use activities in the Everett Marshland subarea.

The planning process includes the following steps:

1. Create a stakeholder group made up of public and private property owners, utility providers, BNSF Railway, environmental groups, the Tulalip Tribe, the City, Snohomish County (County), and other public agencies to review and comment on the subarea plan project at each phase of its development
2. Conduct an inventory of current conditions for a range of natural and built environment topics
3. Prepare a suitability analysis identifying the appropriateness of specific locations within the Marshland study area for specific land uses, including fish and wildlife habitat preservation and restoration, agriculture, and active and passive recreation
4. Prepare alternative plans addressing a range of restoration and land use options based on the inventory and suitability analysis and stakeholder group input
5. Analyze the alternative plans in a Draft EIS
6. Following public comment prepare a Final EIS
7. Identify a preferred alternative with review and approval by the City's Planning Commission as a basis for the subarea plan
8. Based on public input, EIS findings, and the preferred alternative, develop a draft subarea plan, including associated City Comprehensive Plan, SMP, and development regulation amendments
9. Following additional public input, create a final subarea plan and SMP amendments
10. Adopt, via the City Council, the subarea plan and associated plan and regulation amendments
11. Submit the SMP amendments for approval by Ecology

1.3 Subarea Plan Objectives

The City's objectives for the future of the Marshland are based on the following project objectives developed for the subarea plan process with the stakeholders group in March 2008.

1. **Identify Fish and Wildlife Habitat Restoration Opportunities, and Feasibility** – Determine the area's restoration potential now, and what might feasibly be achieved in the future.
2. **Land Use** – Determine the appropriate land uses for the Marshland subarea given its physical conditions, current land uses and infrastructure, ownership, regulatory requirements, current land use planning policies, and future potential.
3. **Implementation and Funding** – Determine the implementation and funding strategies necessary to ensure that fish and wildlife habitat opportunities resulting from the project are carried out. Address timing issues and implementation mechanisms with respect to habitat restoration elements.
4. **Stakeholder and Public Involvement** Ensure that representative interests are invited to participate in, remain engaged throughout, and actively work on every element of the plan, so that the planning process is fully transparent and so that it fully incorporates the needs, interests, opinions, and perspectives of those who are most invested in its outcome.
5. **Integrated SEPA/GMA/SMA Process** – Ensure that environmental analysis under State Environmental Policy Act (SEPA) occurs concurrently with, and as an integral part of, the planning and decision making processes under Growth Management Act (GMA) and Shoreline Management Act (SMA). The Marshland Subarea Plan will become a part of the City's GMA Comprehensive Plan and SMA SMP.
6. **Everett SMP Settlement Agreement** – Meet the requirements of the Everett SMP Settlement Agreement. A settlement agreement on an appeal of the City's SMP requires a plan to be produced to address the feasibility of restoration in the subarea. The parties to the settlement agreement include the City, Ecology, Washington Environmental Council, and Everett Shoreline Coalition. Part 4.2 (8) of the Everett SMP Settlement Agreement will serve as the "Guiding Principles" for preparation of the project:

   > *The process shall produce a subarea plan that addresses: (1) a summary of the area's restoration potential and feasibility and a listing of restoration goals and opportunities; (2) timeframes and benchmarks for achieving the restoration goals and opportunities; (3) committed and potential funding sources; (4)*

anticipated improvement in the ecological functions of the areas identified by the plan for restoration; (5) shoreline master program regulations for protecting critical areas within the Marshland; (6) mechanisms and strategies to ensure implementation of the subarea plan; and (7) mechanisms to review the effectiveness of the subarea plan and make changes if review reveals the subarea plan is not effectively promoting the plan's identified restoration opportunities or meeting its other goals, policies and objectives. The subarea plan shall also make a recommendation to the City Council regarding a designation and permitted use table for the Marshland that is consistent with the Shoreline Management Act, the City's Shoreline Master Program, and the results and conclusions of the final subarea plan submitted to the City Council.

1.4 Relationship to Other Plans and Elements

The Marshland subarea plan will become a part of the City's GMA Comprehensive Plan and SMA SMP. The plan has been developed following an integrated SEPA/GMA/SMA process where environmental analysis for SEPA occurs in conjunction with the planning and decision making procedures of the GMA and SMA. These documents and their relationship with the subarea plan are described in more detail below.

1.4.1 GMA, SMA, Settlement Agreement Consistency

This section of the Subarea Plan provides general information on how the plan is consistent with the GMA, SMA, and Settlement Agreement. Additional specific information on how the plan is consistent with the GMA, SMA, and Settlement Agreement can be found in the City of Everett Marshland Subarea Plan EIS.

1.4.1.1 GMA

The GMA promotes a comprehensive framework for managing growth and development within local jurisdictions. Relative to the Marshland subarea, GMA goals encourage the conservation of agricultural land, retention of open space, enhancement of recreational opportunities, and environmental protection and enhancement. This subarea plan balances GMA goals by restoring tidal and wetland habitat and integrating passive recreation, while retaining agriculture on the balance of the subarea plan on private property.

1.4.1.2 SMA

The Marshland subarea is subject to the SMA and lies along the Snohomish River, a shoreline of statewide significance. Three key goals of the SMA are to protect ecologically sensitive lands, promote public access, and promote water oriented land uses. Specifically, the SMA promotes the development of shorelines in a manner that contributes to the public interest, including "protecting public health, the land and its vegetation and wildlife and the waters of the state and their aquatic life, while protecting generally public rights of navigation." The subarea plan promotes ecological protection and additional public access in particular, and will allow for greater enjoyment of the shoreline by Everett citizens. Specifically, the plan includes habitat elements such as tidal and non-tidal wetland restoration and riparian enhancements and public access elements, including a trail network and passive recreation area.

1.4.1.3 Settlement Agreement

The Everett SMP Settlement Agreement between the City, Ecology, Washington Environmental Council, and Everett Shoreline Coalition requires the preparation of a subarea plan for the Marshland area. The settlement agreement also added buffer requirements for the Urban Conservancy wetlands, and prohibited residential use and active recreation until the subarea plan is prepared. Several components are required in the subarea plan including goals, restoration opportunities, implementation strategies, and other items listed in Section 1.1.

The subarea plan meets the Settlement Agreement by:

- Documenting opportunities for restoration within the Marshland Subarea
- Providing a subarea plan that can be adopted into the City's SMP and zoning code
- Summarizing the subareas restoration potential and feasibility
- Providing a list of restoration goals and opportunities
- Establishing timeframes and benchmarks for achieving restoration goals and opportunities
- Detailing committed and potential funding sources
- Detailing the anticipated improvement in the ecological functions of the areas identified for restoration
- Providing mechanisms and strategies to ensure implementation of the subarea plan
- Providing mechanisms to review the effectiveness of the subarea plan

- Providing a designated and permitted use table consistent with the SMP, SMA, and the results and conclusions of this subarea plan (Appendix A)

1.4.2 Subarea Plan and Other Comprehensive Plan and Shoreline Master Program Elements

Comprehensive plans for cities planning under the GMA must include the following elements: land use (including a future land use map), housing, transportation, public facilities, parks and recreation, economic development, and utilities. Additional elements such as subarea plans may be added at the option of a local jurisdiction. The Marshland Subarea Plan is an optional element under GMA. The Subarea Plan has been integrated into the Comprehensive Plan and SMP with consistency amendments as needed.

1.5 Public Involvement

In accordance with the requirements of GMA, SMA, and SEPA, the City has provided for continuous public review and comment over the course of the Marshland planning process. Public involvement activities associated with the Marshland Subarea Plan process and EIS included formation of a stakeholder group, general property owner outreach, environmental review comment periods, and public meetings and hearings.

The City formed a stakeholder group made up of property owners, utility providers, BNSF Railway, environmental groups, the Tulalip Tribe, the City, the County, and other public agencies to review and comment on the subarea plan project at each phase of its development. Through the subarea plan issuance date, the Stakeholder Group has held six meetings. The meetings were open to the public and at each meeting there was period of time for public comment.

The City held a meeting for property owners to provide early information on the project, and offered to meet with property owners at their request. The City also sent mailings to all property owners to ascertain their interests in participating in restoration actions. Additionally, SEPA scoping notices describing the subarea plan and the alternatives, the Draft and Final environmental impact statements, and the draft Subarea Plan were sent to all property owners.

The SEPA process included a 25-day scoping period in advance of the EIS preparation, and a 30-day comment period after the Draft EIS (DEIS) was issued. Responses to comments were provided in the Final EIS (FEIS). These comment periods and documents were made available to citizens, property owners, elected and appointed officials, and other agencies and tribes.

A series of public meetings was held for the project to provide input by the public at various stages of the development of the subarea plan and its associated DEIS and FEIS. These meetings included:

- A Public Hearing on the scope of the EIS. The meeting was held by the Everett Planning Commission and Everett Parks Board of Commissioners on March 18, 2008.
- A Public Hearing on the alternatives developed by the stakeholder group prior to initiating the EIS process. The meeting was held by the Everett Planning Commission and included the Everett Parks Commission on July 15, 2008.
- A Public Hearing on the DEIS. The meeting was held by the Everett Planning Commission and Everett Parks Board of Commissioners on December 2, 2008.
- A meeting with the Parks Board of Commissioners on January 13, 2009, to present the alternatives.
- A Public Hearing held by the Parks Board of Commissioners to recommend an alternative to the Planning Commission on February 24, 2009.
- A Public Hearing on the Final EIS including adoption of the preferred alternative by the Everett Planning Commission on March 3, 2009.

In addition to the public meetings, City staff and consultants met with property owners, utility providers, and other interested groups, such as the Everett Rowing Association, Dr. Alex Alexander and agricultural interests, Snohomish County Agricultural Advisory Board, Lowell Civic Association, and the Valley View–Sylvan Crest–Larimer Ridge Neighborhood Association.

After the issuance of the draft subarea plan, the following steps are planned, and include more public meetings related to the subarea plan at which citizens may comment:

- Meet with property owners on the draft subarea plan
- Hold a stakeholder group meeting on the draft subarea plan
- Circulate the subarea plan and associated City plan and regulation amendments for

public review

- Hold a Planning Commission hearing on the subarea plan and associated City plan and regulation amendments
- Finalize Planning Commission recommendations to City Council
- Hold a City Council hearing on the subarea plan and associated City plan and regulation amendments
- Following public input, adopt the final subarea plan and associated plan and regulation amendments, via the City Council
- Following City Council adoption, submit SMP amendments for approval by Ecology

2 BACKGROUND INFORMATION

This section summarizes the subarea existing conditions information review and the feasibility analysis that were performed to develop alternative plans for the Marshland Subarea.

2.1 Existing Conditions Summary

This section summarizes information collected on the earth, surface water, plants and animals, land use, cultural resources, transportation, and utility conditions found within or near the subarea. This summary is intentionally brief; the reader should consult the EIS for detailed information on the existing conditions of the subarea.

2.1.1 Earth

The topography of the study area is relatively level, and is bounded on the west by a steep upland bluff. The entire subarea can be generally categorized as a Puget-Sultan Pilchuck soil type, generally characterized by very deep soils often found on floodplains (USDA 1978). The subarea also contains deep pockets of peat that may affect the design criteria of the proposed infrastructure proposed in this subarea plan. Most of the subarea is considered prime agricultural land and much of the subarea is actively farmed including the 305 acres owned by the City. The Marshland subarea is found within an area of low landslide and erosion potential; however, the bluff immediately west of the subarea has a high erosion potential and is a landslide hazard.

2.1.2 Surface and Ground Water

The subarea is located in the Snohomish River Basin and the Snohomish River bounds the Marshland subarea along its northern and eastern edges. The Snohomish River adjacent to the subarea is within the tidally-influenced portion of the river. Wood Creek is the only perennial and fish-bearing stream draining to the subarea though several other intermittent and perennial streams flow into the subarea. All of these streams ultimately flow into the Marshland Canal and are eventually pumped into the Snohomish River at the Marshland pump station.

The subarea is also within the Marshland Flood Control District, which was created in 1938 and encompasses 6,000 acres that abut the eastern edge of the Snohomish River from River

Mile 7 to 15.5. The district has a total of 8.5 miles of levees that protect it from flooding. Prior to the construction of the Marshland levees and drainage system, the floodplain in the Marshland area was generally inundated during late spring and early winter. The Marshland subarea has experienced eight major flood events since 1964. In general, any flood that exceeds a 5-year magnitude will result in flooding in the Marshland subarea.

The presence of a groundwater aquifer within the subarea is unknown (City of Everett 2002). However, a seasonal water table can be found at 18 to 36 inches in depth during wetter months of the year within the floodplain area (Toth and Houck 2001).

2.1.3 Plants and Animals

The general landcover types within the Marshland sub-basin include scrub-shrub communities, croplands, medium and high impervious surface, mixed forest, marsh, and open water (Purser and Simmonds from Toth and Houck 2001). Western hemlock, Douglas fir, red alder, and big leaf maple make up the majority of the forest cover. The sub-basin's riparian buffer is limited to one band of trees on the bank, and of this band, only 7 percent is found in areas that are not isolated by dikes (Toth and Houck 2001).

The Salmon Overlay (SO) to the Snohomish Estuary Wetlands Integration Plan (SEWIP) notes that seven species of anadromous salmonids are supported by the Snohomish River; these include Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), chum (*O. keta)*, and pink salmon (*O. gorbuscha*), steelhead (*O. mykiss*), and cutthroat (*O. clarkii*) and bull trout (*Salvelinus confluentus*). Large portions of the subarea were once potential salmon- and trout-rearing habitat during seasonal flooding. Today, these species are unable to access off-channel sites due to the dikes surrounding the area. Salmon do enter the Marshland area during flooding events with 5-year magnitude or greater. Then they are either stranded or damaged/killed as they go through the pump station back to the River.

Historically, the larger Marshland area has been described as containing thousands of acres of oxbows, beaver ponds, and emergent and forested wetlands (Tulalip Tribes 2001; Snohomish County and SCSRB 2005). By 1885, diking and draining within the greater Marshland area had "altered more than half of the original wetlands" (Toth and Houck 2001). The National Wetland Inventory (NWI) identifies 239 acres of wetlands within the Marshland (of which

the subarea is a part), 96 acres of which are Palustrine Forested/Scrub-Shrub wetlands. The remaining wetlands in the Marshland subarea are Palustrine Emergent wetlands.

The Washington State GMA defines fish and wildlife conservation areas as Critical Areas and requires their protection. Within the subarea, fish and wildlife conservation areas make up nearly 29 percent of the land area. The fish and wildlife conservation areas found within the Marshland include streams that can include the surrounding wetlands that they periodically inundate, and fishery, habitat, and wetland conservation areas.

As a result of implementing the restoration elements of the subarea plan, fish and wildlife habitat conditions will be improved throughout the subarea.

2.1.4 Land Use

The subarea is predominantly in agricultural production, with some areas in use as parks, such as Rotary Park to the north, or infrastructure, such as the Marshland Canal. The site also contains a portion of the BNSF Railway line, a wetland mitigation site, and multiple regional power and liquid petroleum product lines. The City owns 300 acres of undeveloped land, which are leased for agricultural use. The area generally contains a low level of development due to its location in the floodplains. Current City Comprehensive Plan and SMP policies and maps recognize the current land use pattern and generally foresee those patterns continuing. However, until the preparation of this subarea plan, some activities have been curtailed such as additional residential development until priorities for restoration could be determined.

2.1.4.1 City of Everett Comprehensive Plan

The current Everett Comprehensive Plan land use designation for the Marshland subarea in the City limits is “Agricultural” for the majority of the land and “Parks/Open Space” for Rotary Park. These designations essentially recognize the current agricultural, park, and low density residential uses that are found in the study area today.

2.1.4.2 Snohomish County Comprehensive Plan

The County Comprehensive Plan applies a “Riverway Commercial Farmland” designation to the unincorporated Urban Growth Area (UGA). Typically, agricultural lands are not

designated inside unincorporated UGAs, but in this case the County applied the designation in 2003, matching the City's agricultural zoning. County plans generally promote continued agricultural use, but several policies seek to improve ecological conditions and support salmonid species protection.

2.1.4.3 Shoreline Designations and Policies

Consistent with the SMA, the Everett SMP applies fully to the portion of the Marshland subarea in the City limits, including the tributary streams. The County SMP applies to the portion of the Snohomish River in the unincorporated portion of the study area.

2.1.4.4 City of Everett

The Snohomish River is considered a shoreline of statewide significance (City of Everett 2002). All other portions of the subarea are considered shorelines of the state and associated shorelands per the SMA. The current City SMP further classifies the shoreline areas in the subarea as Aquatic Conservancy (northwest section), Aquatic, Urban Conservancy Recreation (Rotary Park), Urban Conservancy Agricultural Interim, and Urban Conservancy. To promote restoration and added public access, and to allow additional residential development, this subarea plan proposes amendments to current SMP policies and regulations.

2.1.4.5 Snohomish County

The unincorporated land adjacent to the Snohomish River in the study area is designated with a "Rural" shoreline use environment. The County SMP permits beach or stream enhancement projects in the "Rural" environment. These enhancement projects must "ensure that aquatic habitats, water quality, flood conveyance, and flood storage capacity are not degraded by the action." The County SMP Rural Environment allows for limited passive recreation activities such as trails and scenic view areas among others, but does not permit golf courses, playing fields, and other large areas devoted to athletic activities on designated resource lands. The current County SMP permits beach or stream enhancement projects.

The County is currently updating its SMP but it is not yet fully adopted by the County and Ecology. In the draft update, unincorporated land in the MUGA is proposed as Urban Conservancy and unincorporated rural land is designated as Resource. The County's draft

SMP Update also includes a restoration element that addresses policies aimed at improving habitat functions. It is hoped that this Marshland subarea plan and the associated EIS may influence revisions to the proposed draft SMP to allow for more tidal restoration in unincorporated areas adjacent to the City limits and MUGA.

2.1.4.6 Zoning and Flood Hazard Regulations

The portion of the subarea in the City limits is primarily zoned as agricultural land (A-1), with a section designated as "Park" for Rotary Park along the north edge. Just outside the northwest subarea boundary, an area is zoned industrial (M-1 and M-2).

The A-1 Zone allows a variety of uses, including residential use (single family detached, accessory dwellings, adult family homes, and Class IA and IB group homes); farms, dairy, and horticulture; greenhouse and nursery; parks; and minor above-ground utilities. Uses such as agricultural industries, food products processing, commercial outdoor recreation, churches, commercial day cares, and major above-ground utilities are permitted through a public hearing process. Most of the uses allowed in the A-1 Zone are also allowed in the SMP. However, the Settlement Agreement on the Appeal of Everett's SMP resulted in removing residential use and active recreation as permitted uses in the Urban Conservancy Agriculture Interim designation.

Note that restoration is not specifically called out as a permitted use, but it is allowed in all zones in the City.

In addition to the base zones (e.g., A-1) overlay zones also apply. Properties must comply with overlay zone as well as base zone provisions. Flood Hazard Overlay Zones in the study area include Rural Flood Fringe Designation (RFFD) and Special Development Area (SDA).

Within the floodway, only uses that have a low flood danger potential are permitted, including agriculture, parking areas, and recreational uses. Within the Flood Overlay District and SDA, structures and fill are only allowed through a conditional use process when they can meet stringent standards, including demonstrating that they do not unduly affect the capacity of the floodway.

Permitted uses in the RFFD include those allowed in the SMP and the A-1, Agriculture Zone. The first floor of structures and outdoor storage areas must be raised at least 2 feet above the 100-year flood elevation. Parking areas and driveways can be no lower than 1 foot below the 100-year flood elevation.

Permitted uses in the Special Development Area are any use that is consistent with the SMP and any applicable subarea plan. As within the floodway, structures and fill are only allowed through a conditional use process where they can meet stringent standards, including demonstrating that they do not unduly affect the capacity of the floodway.

This Subarea Plan proposes to amend the zoning allowances and reinstate the ability to add residential dwellings in the RFFD. The City seeks to enhance passive recreation, and is not intending amendments to reinstate allowances for active recreation.

2.1.4.6.1 Snohomish County Zoning and Flood Hazard Regulations

All the land in the subarea that is within unincorporated Snohomish County is zoned Agriculture-10 Acre, supporting agricultural uses. Except for the northernmost section, the land is outside of the MUGA.

Allowable uses largely involve agriculture and agriculture related industries, as well as associated residential and agricultural structures. Public parks are also permitted.

The 100-year floodplain within Snohomish County jurisdiction is designated Density Fringe Areas in Zone AE. Permitted uses include farmhouses if they meet certain construction standards and provide for sanitary sewerage systems, among other provisions.

2.1.5 Transportation

2.1.5.1 Streets

Roadway access to the subarea is provided by the two-lane major collector street Lenora Street/Lowell-Snohomish River Road, which runs along the eastern/northern boundary of the subarea, and the two-lane minor arterial South 2nd Avenue/Larimer Road (also known as Lowell-Larimer Road), which runs north-south along the western boundary of the subarea. Levels of Service (LOS) for all roadways within the subarea are within the City's LOS

standard. Lowell-Snohomish River Road within the study area does not meet the City's standard for Collector Arterial or the County's standard for two-lane Rural Major Collector. Larimer Road within the study area does not meet the City's standard for Minor Arterial. The City indicated that current pavement conditions along Larimer Road do not meet standards and will require improvement; however, no road improvements are proposed under the subarea plan.

2.1.5.2 Non-motorized Facilities

There are currently no sidewalks along South 2nd Avenue/Larimer Road and Lowell-Snohomish River Road. The non-motorized facilities within the subarea are provided by Lowell Riverfront Trail and Lowell-Snohomish River Road. The Lowell Riverfront Trail is accessed by Rotary Park on the north side of Lowell-Snohomish River Road. It is a 10-foot-wide multi-use trail for both pedestrians and bicyclists. It extends approximately 1.75 miles from Rotary Park to the north along the riverfront. Bicycle lanes are provided on paved shoulders on both sides of Lowell-Snohomish River Road between the eastern City limit and Highway 9.

2.1.5.3 BNSF Railway

A BNSF primary rail line (mainline) bisects the subarea, running southeast to northwest. The BNSF mainline carries about 34 trains per day with about 87 million tons of freight per year. Under all of the proposed alternatives and the Subarea plan, no changes to the existing BNSF mainline alignment are proposed.

2.1.6 Utility Corridors

A number of electric power transmission lines, distribution lines, meters, and vaults can be found within and adjacent to the Marshland subarea. The most prominent of these lines include four Bonneville Power Administration (BPA) and three Puget Sound Energy (PSE) transmission lines. These seven transmission lines are key components of the regional power grid, transporting energy within Washington State and beyond, including key connections with Canada. Comcast Cable maintains overhead lines near the Marshland subarea, mostly along the west side of Larimer Road.

The majority of water distribution facilities and sewer mainlines and service lines within the Marshland subarea are also located near Larimer Road. Few stormwater pipes are found within the Marshland subarea. However, several storm drains and culverts cross Larimer Road to the west of the subarea.

Two liquid petroleum product pipelines cross the Marshland subarea at its southeastern corner. These pipelines are owned by BP-Olympic and connect the Allen Station to Woodinville Station. The pipelines convey refined petroleum and are listed as 16-inch and 20-inch diameter.

Any restoration actions or recreation development implemented under the subarea plan will be designed to not permanently impact existing utility corridors within the subarea, though some temporary impacts to service may occur during construction.

2.1.7 Cultural Resources

The Marshland study area was used by the Snohomish Tribe and later by European settlers. The two historic features that are visible in the modern-day include the BNSF Railway corridor and the Marshland drainage canal. Sixteen cultural resources surveys are reported to be within one mile of the subarea boundary. Other sites reported within 1 mile of the subarea boundary include historic industrial and residential/ranch sites and prehistoric shell midden and lithic scatter archaeological sites. Although no archaeological or historic sites are known to be located within the subarea, a significant number do occur within 1 mile and on landforms having similar characteristics to those represented by the subarea.

2.2 Feasibility Analysis

This section describes the feasibility analysis including the initial steps taken to develop and assess the restoration and land use alternatives.

2.2.1 Suitability Criteria

The suitability analysis focused on the feasibility of locating different land uses within specific locations of the subarea. Four general land uses were analyzed; fish and wildlife habitat preservation and restoration, agriculture, active recreation, and passive recreation. For each of these general land uses, criteria were developed to determine which of the four

land uses were most appropriate for a specific location within the subarea. This information was then used to develop the alternatives detailed in the EIS by assigning a given land use to the area most appropriate for that land use within each of the alternatives considered, The general suitability criteria used for each land use is shown in Table 2-1. Additional information on the suitability criteria can be found in the EIS.

Table 2-1
Land Use Suitability Criteria

Fish and Wildlife Habitat Preservation and Restoration
• Topography suitable for specific habitat types • Proximity to similar habitat, critical areas, priority species habitats, fish and wildlife conservation areas, existing and past wetlands or surface water corridors, intact native vegetation and completed restoration projects/opportunities • Potential for wetland enhancement or creation, floodplain reconnection and fisheries habitat restoration • The minimum patch size of a given habitat type to be sustainable and biologically functionable • Distance from regionally significant transportation and utility corridors • Landowner willingness to participate
Agriculture
• Topography suitable for agricultural use • Prime agriculture soils • Existing level of flood protection and ability to maintain or improve current flood protection levels • Ability of existing drainage infrastructure to protect agriculture viability
Active Recreation
• Ability to provide sufficient room for supporting infrastructure (parking lots; restrooms, etc.) • Potential for conflicts or perceived conflicts with adjacent land uses (opportunity for buffering from adjacent land uses) • Does not interfere with regionally significant transportation infrastructure • Does not interfere with regionally significant utility infrastructure • Compatibility with habitat preservation and restoration opportunities
Passive Recreation
• Topography • Potential conflicts or perceived conflicts with adjacent land uses • Need for changes to existing dike infrastructure • Compatibility with habitat preservation and restoration opportunities • Does not interfere with regionally significant transportation infrastructure • Does not interfere with regionally significant utility infrastructure

2.2.2 Restoration Goals and Opportunities

2.2.2.1 Restoration Goals

The main restoration goals of the subarea plan include both habitat and implementation goals. These goals were designed to allow for a variety of habitat types to be realized and also to allow for flexibility in implementing these goals. Achieving these goals will benefit a wide range of fish and wildlife species.

2.2.2.1.1 Habitat Creation Goals

- Provide "off-channel" areas and river edge habitats for young salmon to go during floods.
- Create tidally-influenced shallow water habitat areas that have gently sloping shorelines, naturally meandering channels, woody debris structures, and small natural substrates that support native emergent marsh vegetation.
- Increase the amount of native trees and shrubs along the shoreline of the mainstem river, created marsh habitats, streams, and ditches.

2.2.2.1.2 Implementation Goals

Implementation goals were developed both before and after the feasibility phase of the subarea plan, as follows:

- Only include properties in potential restoration areas where property owners are willing.
- Ensure that properties outside of restoration areas are protected from flooding impacts to at least the same extent as they are currently protected.
- Allow for phasing of restoration.
- Minimize costs of restoration by taking actions such as minimizing dike lengths.

2.2.2.2 Restoration Opportunities

Opportunities within the subarea abound for both habitat restoration and complementary passive recreation. This section describes in further detail the habitat types that can be supported within the site and the methods of providing public access to further citizen understanding and enjoyment of the Marshland Subarea. Additional information on these

restoration opportunities and the associated habitat types can be found in the Marshland Subarea EIS.

2.2.2.2.1 Habitat Types

Habitat types suitable for the subarea were determined by a number of factors including water depth and frequency of inundation, salinity, soil type, the ability to adapt to natural or human disturbances, and other factors. The Marshland subarea has been diked and in agricultural production for over 100 years. During this time it has been protected from daily tidal inundation but is still subject to periodic flooding. Typically, when land is diked and farmed for extensive periods of time, subsidence occurs. As a result, much of the area that could be restored to tidal inundation is relatively low, and is anticipated to initially be in a mudflat habitat type if no regrading to raise these areas occurs.

The combination of daily tidal inundation and periodic flooding within tidally restored areas will change specific habitat types over time through sedimentation (raising of grades) and/or erosion (lowering of grades) and through the deposition of natural woody debris. In general, more sedimentation than erosion is anticipated in restored tidal areas because these areas are composed of off-channel habitat with relatively low water velocities as compared to the mainstem of the Snohomish River. The following is a list of the habitat types that are anticipated within tidal and non-tidal restoration areas:

1. Mudflat
2. Tidally-influenced Emergent Marsh
3. Riparian Floodplain Forest
4. Tributary Channels
5. Blind Tidal Channels/Dendritic Channels
6. Non-tidal Freshwater/Palustrine Marsh
7. Large woody debris

2.2.2.3 Public Access

During the City of Everett's Shoreline Master Plan update from 1998 to 2001, participating citizens expressed great interest in shoreline access. This response prompted the development of a Shoreline Public Access Plan in 2003, which outlined public access proposals and implementation methods that would lead to a continuous trail system (with associated amenities) for Everett (City of Everett 2003). The Alternatives presented in the

subarea plan propose a number of public access corridors and recreation areas that would contribute to and further this goal of greater shoreline access.

While proposed trail locations are conceptual and have not been fully designed, they do provide a basic foundation towards connecting the subarea with adjacent neighborhoods and drawing recreation enthusiasts towards relatively rare habitat types. Most of the proposed trails are conceptually envisioned as foot trails with maintenance and emergency access included. Dikes and areas that would support boardwalk trail segments provide locations for loop trails within the subarea. In some cases, dikes may also be used for accessing properties and utilities, in these areas trails could be wider to accommodate vehicles. Multi-use trails along Lenora Street/Lowell-Snohomish River Road provide segments that can connect into a larger, regional network. The public access element of the subarea plan could also provide visual access into restored and preserved habitat through carefully placed viewpoints within the trail system.

The addition of trails could provide more "eyes on the street" to help prevent crime within a low density portion of the City. The subarea would also be incorporated in the Parks department's safety/security protocols, which would include periodic Ranger patrols of the trail system.

2.3 Summary of Alternatives

The City considered a No Action Alternative and three Action Alternatives through the feasibility analysis, including:

- No Action Alternative
- Alternative 1: Maximum Recreation Alternative
- Alternative 2: Stakeholder Preferred Alternative
- Alternative 3: Maximum Restoration Alternative

The No Action Alternative consisted of a continuation of the City's current Comprehensive Plan, SMP, and regulations applicable to the Marshland subarea. No specific restoration plan for the Marshland area would be developed under the No Action Alternative.

The Action Alternatives included Alternatives 1, 2, and 3. Each had a different combination of restoration, recreation, and agricultural activities. Residential use was eliminated as a

permitted use in the Interim Urban Conservancy Agriculture SMP designation (No Action Alternative) but would be permitted in the Action Alternatives. All of the Action Alternatives involved some level of change to the current flood control and diking facilities. For all the Action Alternatives, the intent was to not alter hydrology or flood protection upstream of the flood control structure and in areas outside of where restoration occurs. Where private land is shown for habitat restoration, one or more forms of landowner approval were obtained during the project planning process. In most cases, restoration was contingent on the sale of some or all of the private land to a public entity that would implement the restoration.

The general land use categories within each alternative included:

- **Agriculture**: activities involved in the production of crops or livestock operation.
- **Preservation/Enhancement**: Streams, wetlands, or terrestrial ecosystems currently providing relatively high ecological functions that may benefit from actions that increase the critical area's functions
- **Restoration**: the return of a stream or wetland, or terrestrial ecosystem, to a state in which its functions and values significantly approach its unaltered state
- **Other/Infrastructure**: road, railroad, power, and liquid petroleum product rights-of-way or easements or parcels.
- **Recreation**: lands designed to encourage active or passive forms of exercise or refreshment. Alternative 1 provides for active and passive recreation. Alternatives 2 and 3 provide for passive recreation.

2.3.1 No Action Alternative

The No Action Alternative retains the City's current Comprehensive Plan, SMP, and regulations applicable to the Marshland subarea and no formal restoration plan would be developed. The current Comprehensive Plan designation for the city limits would remain "Agricultural" for the majority of the land and "Parks/Open Space" for Rotary Park (City of Everett 2007a). Existing land uses, including the existing agricultural use of the City owned properties, would likely continue. Voluntary habitat enhancement projects could occur under the No Action Alternative; however, any voluntary restoration actions would more likely be piecemeal and are not likely to result in habitat creation and enhancement to the magnitude that would occur under the Action Alternatives.

The specific Land Uses within the No Action Alternative include:

- Agriculture – applies to majority of the land
- Recreation – Rotary Park
- Trails – consistent with the City's Shoreline Public Access Plan
- Wildlife Preservation/Enhancement – areas identified for habitat retention or enhancement along the Snohomish River
- Wildlife/Wetland Conservation– for lands that are allowed minimal development and greater critical area and shoreline protection in current plans and regulations
- Wildlife Preservation – for areas already in permanent protection

2.3.2 Alternative 1: Maximum Recreation

The Maximum Recreation Alternative provides areas for active and passive recreation, ongoing agricultural uses, and restoration actions that only require minimal changes to existing infrastructure. Alternative 1 includes active recreation opportunities on the west side of the BNSF Railway and a trail. Limited tidal habitat restoration would occur. No changes to the Marshland Flood Control Pump Station are included, though a portion of the Marshland Canal would be rerouted and some new dikes would need to be constructed. No fish passage would be provided through the Marshland Pump Station. Some freshwater wetland restoration and riparian habitat improvements are included under this Alternative. The specific Land Uses within the Alternative 1 include:

- Agriculture – applies to a large portion of the land
- Recreation – Rotary Park and proposed recreation west of BNSF tracks
- Trails – looping around restoration and running adjacent to some utility corridors
- Wildlife Preservation/Enhancement – areas identified for habitat retention
- Fish Preservation / Enhancement – areas identified for habitat retention
- Wildlife Preservation – Spane Wetland mitigation site
- Fish and Wildlife Restoration – Tidally restored lands east of BNSF tracks

2.3.3 Alternative 2: Stakeholder Preferred Alternative

Alternative 2, the Stakeholder Preferred Alternative, represented an alternative that was supported at stakeholder workshops in July 2008. Alternative 2 provides greater habitat restoration and fewer recreation opportunities than Alternative 1. The Stakeholder Preferred Alternative includes a 500-foot strip along Lowell Larimer Road where passive

recreation could occur and additionally a trail system through portions of the subarea. Alternative 2 includes substantially more tidal restoration and Wood Creek is connected to a restored tidal area through a flume over the Marshland Canal. Preserved forested wetland habitat is included on the west side of the railroad tracks. Large areas of restored non-tidal freshwater wetlands are also proposed.

The specific Land Uses within the Alternative 2 include:

- Agriculture – applies to smaller pockets of land
- Recreation – Rotary Park and proposed recreation strip bordering Lowell-Larimer Road
- Trails – looping around restoration and running adjacent to some utility corridors and roads
- Wildlife Preservation/Enhancement – areas identified for habitat retention
- Fish Preservation / Enhancement – areas identified for habitat retention
- Wildlife Preservation – Spane Wetland mitigation site
- Fish and Wildlife Restoration – tidally restored public and willing private lands

2.3.4 Alternative 3: Maximum Habitat Restoration

Alternative 3 provides the largest amount of habitat restoration within the subarea. Recreation opportunities in this alterative include a trail system and an associated parking area. The flood control pump station is moved to the southern boundary of the study area and the downstream outlet of the Marshland Canal is relocated so that it connects to the river in the same location as the restored channel of Wood Creek. Fish passage would be provided around or through the relocated pump station. A large area is proposed for tidal restoration on both public and private properties. This alternative also includes a large area of freshwater, non-tidal wetland restoration.

The specific Land Uses within the Alternative 3 include:

- Agriculture – applies to smaller pockets of land
- Recreation – Rotary Park and a small area near the northwest portion of the site
- Trails – looping around restoration and running adjacent to some utility corridors and roads
- Wildlife Preservation/Enhancement – areas identified for habitat retention
- Fish Preservation / Enhancement – areas identified for habitat retention

- Wildlife Preservation – Spane Wetland mitigation site
- Fish and Wildlife Restoration – tidally restored public lands and private lands where supported by willing owners

2.4 Alternative Outcomes

2.4.1 Land Use Areas by Alternative

A comparison of the amount of habitat restoration and recreation elements is shown in Table 2-2. Generally within the Action Alternatives, Alternative 1 retains the greatest amount of land for agricultural use and has the smallest amount of proposed restoration. Alternative 2 has about half the amount of lands in agricultural use as Alternative 1, has a relatively high amount of restoration and has the largest length of trails. Alternative 3 contains the same amount of agriculture as Alternative 2 and has the largest amount of tidal restoration.

Table 2-2
Alternative Land Use (in acres except where noted)

Land Use	No Action	Alternative 1: Maximum Recreation	Alternative 2: Stakeholder Group Preferred	Alternative 3: Maximum Restoration
Agriculture	795.0	416.5	190.7	190.7
Fish and Wildlife Preservation/Enhancement	0.0	38.6	73.4	74.5
Fish and Wildlife Restoration	0.0	150.2	417.7	485.9
Fish Preservation/ Enhancement	8.6 (includes Aquatic Conservancy)	9.0	9.0	9.0
Other/Infrastructure	157.8	161.2	134.8	134.5
Passive Recreation [2]	15.6	12.8	48.0	13.6
Active Recreation [2]	0	148.1	0	0
Trail Lengths (feet)	9,685.5	27,229.8	47,651.3	34,869.8
Wildlife Preservation/ Enhancement	88.3 [1]	71.4	40.5	37.8
Wildlife Restoration (terrestrial only)	0.0	57.4	151.2	119.3
Totals	**1,065.3**	**1,065.3**	**1,065.3**	**1,065.3**

Notes:
[1] Includes wetland/wildlife conservation, wildlife preservation, and wildlife preservation/enhancement
[2] Total acres include Rotary Park at nearly 13 acres. Net new recreation includes: Alternative 1, 145.9 acres; Alternative 2, 14.5 acres; and Alternative 3, 0.6 acre.

2.4.2 Planning Level Costs by Alternative

A comparison of the costs of each alternative reviewed during the feasibility and EIS phase is provided in Table 2-3. A more detailed cost breakdown is provided in Final EIS Appendix A – Revised Cost Estimates Associated with Each Action Alternative.

Table 2-3
Summary of Estimated Costs for Marshland Alternatives

Alternative	Cost
Alternative 1: Maximum Recreation Alternative	$45,916,238
Alternative 2: Stakeholder Preferred Alternative	$65,626,275
Alternative 3: Maximum Restoration Alternative	$60,580,034

2.4.3 Outcomes of the Alternatives

This section compares how well each alternative meets, partially meets, or does not meet the guiding principles and objectives of the subarea plan.

2.4.3.1 No Action Alternative

Meets objectives:

- Provides for ongoing agricultural use of the subarea
- Has no costs associated with restoration other than small-scale restoration that may occur on private properties
- Allows for ongoing diking and drainage activities to continue as presently preformed

Partially meets or does not meet objectives:

- Habitat restoration is more likely to be small-scale, piecemeal, and disjointed
- Does not provide for public recreation facilities on City-owned lands

2.4.3.2 Alternative 1: Maximum Recreation Alternative

Meets objectives:

- Provides for both active and passive recreation opportunities
- Provides for the largest agricultural area
- Provides some tidally-influenced and freshwater wetland restoration
- Does not require significant infrastructure changes
- Is lower in cost that Alternatives 2 and 3

Partially meets or does not meet objectives:

- Provides less habitat restoration than Alternatives 2 and 3
- Fish passage is not provided into the Marshland Canal, tributary streams, or Wood Creek

2.4.3.3 Alternative 2: Stakeholder Preferred Alternative

Meets objectives:

- Provides an area for passive recreation and a large public trail system
- Provides the second largest amount of overall habitat restoration
- Provides fish access to Wood Creek via a flume across the canal into a tidally-influenced wetland area rather than the Marshland Canal

- Provides for fish passage into the Marshland Canal through or around the pump station
- Provides fish access to the tributary channels from the adjacent hillsides

Partially meets or does not meet objectives:

- Requires significant infrastructure changes
- Is the most costly of the three alternatives

2.4.3.4 Alternative 3: Maximum Restoration Alternative

Meets objectives:

- Provides for a large public trail system
- Provides the largest amount of habitat restoration
- Provides fish access to Wood Creek by allowing it to outlet into a tidally-influenced wetland area rather than the Marshland Canal
- Provides for fish passage into the Marshland Canal through or around the pump station
- Provides fish access to the tributary channels from the adjacent hillsides

Partially meets or does not meet objectives:

- Has limited passive recreation opportunities outside of trails
- Requires significant infrastructure changes.

3 RESTORATION AND LAND USE CONCEPTS

The purpose of this section is to provide information on the guiding principles, features, impacts, and feasibility of the subarea plan.

3.1 Guiding Principles

The guiding principles for the subarea plan are based upon the requirements of the settlement agreement including addressing:

1. A summary of the area's restoration potential and feasibility and a listing of restoration goals and opportunities
2. Timeframes and benchmarks for achieving the restoration goals and opportunities;
3. Committed and potential funding sources
4. Anticipated improvement in the ecological functions of the areas identified by the plan for restoration
5. Shoreline master program regulations for protecting critical areas within the Marshland
6. Mechanisms and strategies to ensure implementation of the subarea plan
7. Mechanisms to review the effectiveness of the subarea plan and make changes if review reveals the subarea plan is not effectively promoting the plan's identified restoration opportunities or meeting its other goals, policies, and objectives

Additional project objectives and principles were discussed during the first stakeholder meeting and presented in the EIS. These note that the subarea plan should:

- Protect and restore salmon habitat
- Protect and restores wildlife habitat
- Protect existing agricultural uses
- Identify the best uses for the more than 300 acres of city-owned property
- Preserve valley views throughout the site
- Consider economic impacts, including major infrastructure investments
- Be technically feasible, but recognize that additional studies need to be completed to determine the final layouts and extents of restoration
- Protect property owners who are not included in restoration actions from potential adverse impacts of restoration
- Allow for adjacent private property owners to be fairly compensated for any impacts

to their property

- Overall, be a plan that members of the stakeholder advisory group can support, even if every member did not get 100% of what they were originally looking to achieve

3.2 Selection of the Subarea Plan Elements

The primary issue in developing the final subarea plan (see Figure 1-1) revolved around the balance and locations of restoration, recreation and agricultural uses. The Everett Planning Commission discussed the merits of each alternative presented through the EIS in order to decide on a preferred alternative to be used in developing the final subarea plan. The Planning Commission noted that the restoration shown within Alternative 3 was preferred over that of Alternative 2 as the Maximum Restoration Alternative (Alternative 3) would support the largest number of salmon and would provide greater function to Wood Creek through the relocation of the Marshland Canal and pump station. The Planning Commission also noted that the greater number of recreation/public access elements in Alternative 2 was preferred over Alternative 3. Because of these issues, the final subarea plan was mainly a combination of Alternative 2 and 3. Specifically, the passive recreation area and trails along Larimer Road of Alternative 2 were included with the remaining restoration proposals of Alternative 3. The final subarea plan also excluded any action from private property owners not interested in participating. Finally, the subarea plan would provide an allowance for residential development along Larimer Road where property owners can meet applicable development requirements.

3.3 Subarea Plan Features

The Marshland Subarea Plan provides for a balance in restoration, recreation, agriculture, and residential land uses within the Marshland Subarea. The specific features of the plan include:

- Relocating the existing flood control pump station and allowing fish passage around or through it if feasible and if impacts can be prevented or mitigated.
- Reorienting the Marshland Canal so that it flows into the Snohomish River at the southeastern corner of the subarea if feasible and if impacts can be prevented or mitigated.
- Establishing tidally restored areas on City- and privately owned properties in the central western and northeastern portions of the study area to provide a tidal connection between the City's undeveloped park property and private lands on both

sides of the BNSF Railway tracks via connections under the existing railroad trestles.

- Establishing an area for tidal restoration on most of the land area east of the Marshland Canal and south of the BPA power lines.
- Creating three paths for tidal exchange at the Lowell-Snohomish River Road (expanding the existing bridge associated with the pump station and developing two new bridge crossings over Lowell-Snohomish River Road).
- Connecting Wood Creek to the southeastern tidally restored area to provide fish passage between the tidal area and Wood Creek.
- Providing a connection between the streams flowing from the western hillsides to tidally restored areas and allowing these streams to flow into and through the tidal areas.
- Adding an area of preserved forested wetland habitat on the west side of the railroad tracks with fish access from the tidally restored area via a hydraulically controlled culvert. This area is privately owned and several properties have landowners willing to sell some of their lands for public use and habitat preservation/restoration.
- Proposing a large area of restored, non-tidal freshwater wetland in the center portion of the study area bounded by the PSE and BPA power line corridors. This restoration is shown on PSE land and other private lands. Access to the transmission lines is provided and wetland restoration below them is limited or excluded for this purpose.
- Two channels flowing underneath the BNSF Railway tracks where the existing trestles for the Marshland Canal and former Hardscrabble Slough are located. These two channels would be designed to convey water (and fish) to and from both sides of the tidally restored area only, and no wetland or tidal habitat per se would be created within the BNSF right-of-way. Some modifications to the trestle at Hardscrabble Slough may be required by the railroad.
- Constructing new dikes on the south and portions of the north and west sides of the tidally restored area in the central western and northeastern portions of the study area and around the entirety of the perimeter of the land area east of the Marshland Canal and south of the BPA power lines to protect adjacent property from tidal flooding.
- Continuing ongoing agriculture in traditionally farmed pockets between and near habitat restoration areas.
- Providing an area for passive recreation in a 500-foot-wide-strip bordering Lowell-Larimer Road. This passive recreation area would provide for small- to medium-sized

parking areas along the roadside and large lawn areas for multipurpose informal activities

- Establishing a recreational trail system in and around the passive recreation and restored areas.
- Excluding properties from restoration west of the BNSF railway where property owners do not wish to have their properties included in restoration actions.
- Allowing residential uses in the Rural Flood Fringe District along Larimer Road where property owners can comply with City development regulations and, if septic systems are required, Snohomish Health District requirements.
- Protecting existing regional utility corridors, providing for future utility improvements and upgrades, and ensuring no interruptions in regional utility service.
- Providing for future technical studies to address the impacts of restoration projects and mitigation measures.
- Allowing for flexibility in the ultimate design of restoration proposals if technical studies indicate faults with the current conceptual restoration proposal or new technology or other circumstances provide a more effective way to achieve restoration objectives.
- Preserving or improving flood control and drainage for areas outside of restoration areas. Future studies shall determine existing flooding and drainage conditions. Projects shall be designed to maintain or lessen flood water levels and durations and maintain or lower water levels in ditches and related groundwater levels outside of restoration areas.

The specific acreages of land uses within the Subarea Plan are shown in Table 3-1.

Table 3-1
Subarea Plan Land Use
(in acres except where noted) [3]

Land Use [2]	Subarea Plan
Agriculture	208.0
Fish and Wildlife Preservation/Enhancement	73.5
Fish and Wildlife Restoration	452.6
Fish Preservation/ Enhancement	9.0
Other/Infrastructure	133.2
Passive Recreation [1]	48.1
Wildlife Preservation/ Enhancement	18.2
Wildlife Restoration (terrestrial only)	118.4
Totals	**1,065.3**

Notes:
[1] Total acres include Rotary Park at nearly 13 acres. Net new recreation includes 35.1 acres. This includes approximately 47,000 linear feet of new trails.

[2] Land Use categories are described in more detail below:

- Agriculture means activities involved in the production of crops or livestock operation.
- Preservation/Enhancement means streams, wetlands, or terrestrial ecosystems currently providing relatively high ecological functions that may benefit from actions that increase the critical area's functions.
- Restoration means the return of a stream or wetland, or terrestrial ecosystem, to a state in which its functions and values significantly approach its unaltered state.
- Other/Infrastructure includes road, railroad, power, and liquid petroleum product rights-of-way or easements or parcels
- Recreation includes lands designed to encourage passive forms of exercise or refreshment.

[3] Land use acreages may change over time due to a number of factors, including changes in ownership, the results of future technical studies addressing restoration, and future changes in federal, state, or local policies.

These land uses are further defined as:

- Agriculture – applies to land in private ownership with a history of agricultural use and where property is either unsuited to restoration or the property owner is uninterested in participating in restoration currently
- Recreation – Rotary Park and proposed recreation strip bordering Lowell-Larimer Road
- Trails – looping around restoration and running adjacent to some utility corridors and

roads

- Wildlife Preservation/Enhancement – areas identified for habitat retention
- Fish Preservation / Enhancement – areas identified for habitat retention
- Wildlife Preservation – Spane Wetland mitigation site
- Fish and Wildlife Restoration – tidally restored public lands and private lands where supported by willing owners

3.3.1 Subarea Plan Outcomes

This section compares how well the Subarea Plan satisfies the goals and objectives of the settlement agreement

Meets objectives:

- Provides an area for passive recreation and a large public trail system
- Provides a large amount of habitat restoration
- Provides fish access to Wood Creek by allowing it to outlet into a tidally-influenced wetland area rather than the Marshland Canal
- Provides for fish passage into the Marshland Canal through or around the pump station
- Provides fish access to the tributary channels from the adjacent hillsides

Partially meets or does not meet objectives:

- Requires significant infrastructure changes
- Has a high cost

3.3.1.1 Proposed Habitat Types

Habitat types are determined by number of factors including water depth and frequency of inundation, salinity, soil type, the ability to adapt to natural or human disturbances, and other factors. The Marshland subarea has been diked and in agricultural production for over 100 years. During this time it has been protected from daily tidal inundation but is still subject to periodic flooding. Typically, when land is diked and farmed for extensive periods of time, subsidence occurs. As a result, much of the area proposed to be restored to tidal inundation is relatively low, and is anticipated to initially be in a mudflat habitat type if no regrading to raise these areas occurs. The combination of daily tidal inundation and periodic flooding will change habitat types over time with sedimentation (raising of grades) and/or

erosion (lowering of grades) and deposition of natural woody debris all occurring. In general, more sedimentation than erosion is anticipated in restored tidal areas because these areas are composed off-channel habitat with relatively low water velocities as compared to the mainstem of the Snohomish River. However, design level hydraulic modeling of specific restoration options would be needed to specifically predict where erosion and sedimentation would occur. The following is a description of specific habitat types that are anticipated once the tidal and non-tidal areas are restored:

1. Mudflat: This is a largely unvegetated habitat type that would be exposed at low tides and covered with water most of the time. Mudflat habitat is anticipated in areas that are approximately 2 feet or more below the daily high tides. Water depths at daily high tides (mean higher high water [MHHW]) would range from 2 to 9 feet in most areas. Mudflats would include areas with stranded large woody debris, particularly in shallower areas, as well as deeper channels from tributary creeks, and dendritic channels (described below). Initially, mudflats are anticipated to develop over the majority of the restored tidal areas if these areas are not regraded. The extent of these areas is anticipated to decrease over time as sedimentation from tidal inundation and periodic flooding, and establishment of adjacent marsh areas occurs.
2. Tidally Influenced Emergent Marsh: This habitat is anticipated to be dominated by freshwater emergent marsh species such as sedges (*Carex Sp.*), rushes (*Juncus Sp.*), bulrushes (*Scirpus Sp.*), cattails (*Typha Sp.*), and other herbaceous perennials such as Wapato (*Sagitaria Sp*) and Skunk Cabbage. These species grow from 1 to 4 feet high and would form a fringe between the riparian floodplain forest and the mudflat. They may also develop in "islands" that have the appropriate water depth and are surrounded by mudflats. Most of these emergent marsh species are capable of tolerating inundation of up to 2 feet; however, initial colonization would occur at shallower depths and move outward over time. These species also will occur up to 2 feet above high tide (MHHW) but would tend to be increasingly mixed with shrub and tree Riparian Floodplain forest species moving upgradient. Large woody debris, tributary and dendritic channels would also occur in this habitat type. Over time, this habitat type would expand into areas that are initially mudflat, as sedimentation from tidal inundation, periodic floods, and sequestration of sediment from the colonization by emergent plants themselves occurs.
3. Riparian Floodplain Forest: The riparian floodplain forest includes forested wetlands and non-wetland forests. Both types of forest would include a mix of deciduous and

coniferous trees and shrubs. Forested wetlands would include deciduous trees such as black cottonwood (*Populous trichocarpa*), red alder (*Alnus rubra*), and willows (*Salix Sp.*). These species are currently found in the subarea in large numbers. Coniferous forested wetland tree species include primarily Sitka spruce (*picea sitchensis*), shore pine (*pinus contorta*), and Western red cedar (*thuja plicata*). Some large specimens of Sitka spruce are growing in the northwest corner of the subarea. Forested wetlands in tidally inundated areas would have their lower limit approximately 2 feet above the high tide line (MHHW). Over time, trees may spread into areas initially lower than this. Non-wetland riparian forested habitat would occur along the slopes of levees and in areas above forested wetlands. This habitat type would include many of the tree species list in forested wetlands, but also include deciduous trees such as big leaf maple (*Acer macrophyllum*), and conifers such as Western hemlock (*Tsuga heterophylla*), grand fir (*abies grandis*), and Douglas fir (*pseudotsuga menziesii*). There are many other species of smaller trees and shrubs that would likely occur in the riparian forested areas. All the riparian forests are an important habitat for fish and wildlife and a source of large woody debris.

4. Tributary Channels: These relatively small channels include perennial and intermittent streams from the adjacent hillsides flowing through the three types of habitat described above. They would provide important habitat for fish including salmonids, and replace the existing ditches with more sinuous, natural channels and with vegetated banks and some large woody debris in the channels.
5. Blind Tidal Channels/Dendritic Channels: These channels would form most readily in the mudflat and tidal emergent marsh habitats. They may extend to the edges of forested wetlands. These channels also provide important access for fish including salmonids.
6. Non-tidal Freshwater/Palustrine Marsh: Freshwater, non-tidal wetlands are referred to as Palustrine in most wetland rating classifications. These wetlands are currently found in many parts of the subarea, and include forest, scrub/shrub, and emergent marsh plant communities. These wetlands would include most of the same plant species as the communities listed above for tidal emergent marsh and forested wetland. One significant difference is that these non-tidal wetlands would have significantly less natural disturbance than tidal wetlands. However, they would be affected by periodic large floods that overtop the dikes and deposit sediment and debris. Palustrine marshes could include tributary channels, but would not include

dendritic/blind channels and would be less available to fish, particularly salmonids, than tidal wetlands.

7. Large Woody Debris: This material consists of downed trees that either originate within the restored areas, or are deposited by tides, or floods. Woody debris provides important habitat structure in riparian, stream channel, and wetland habitats for fish, and a wide array of wildlife.

Table 3-2 shows the general amounts of habitat by use expected to result from the subarea plan, while Table 3-3 presents specific habitat types that will be found in tidal and non-tidal restoration/enhancement areas. Figure 3-1 presents the general habitat types, while Figure 3-1a presents more detailed land use, habitat features, and tidally-influenced wetland zones based on existing topography in the subarea.

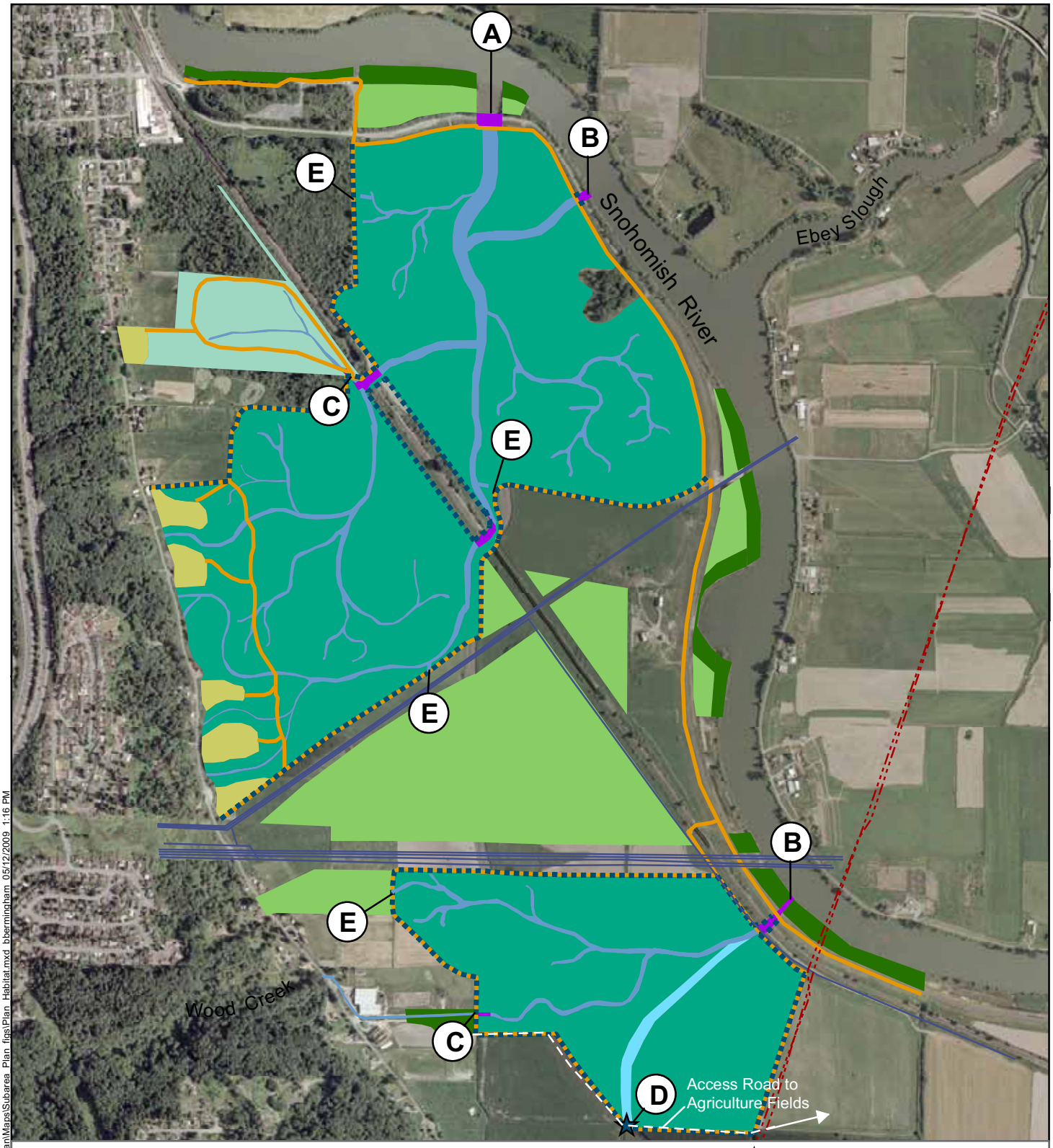
Table 3-2
Habitat Restoration and Enhancement Features

Restoration Activity	Subarea Plan	
	Acres	Length (feet)
Fish Accessible Channel [1]	36.9	46,155.0
Fish Passable Channel	2.8	N/A
Marshland Canal	4.1	2,750.8
Dikes	NA	26052.4
Trails	NA	47029.4
Non-tidal Wetland Restoration	132.5	N/A
Preserve Fish and Wildlife Habitat	27.9	N/A
Riparian Buffer Enhancement	25.3	9,394.1
Tidally-influenced Wetland Restoration	417.4	N/A
Total	646.9	

Notes:
[1] Only includes those portions of fish accessible channel within the subarea. Fish access outside of the subarea was not considered due to existing fish passage issues associated with high sediment loads coming from the hillsides to the west of the subarea.

Table 3-3
Habitat Types based on Designation and Existing Topography

Habitat Types	Area (square feet)	Area (acres)	Length (feet)
Subarea Plan			
Mudflat	17073013.7	391.9	-
Tidally-influenced Emergent Marsh	2576499.2	59.1	-
Riparian Floodplain Forest	2177429	50.0	-
Tributary Channel	-	-	24,881.4
Blind Tidal Channel/Dendritic Channel	-	-	22,542.5
Non-tidal Freshwater/Palustrine Marsh	6986497.8	160.4	-



Habitat Opportunities

- Fish Passable Channel
- Non-tidal Wetland Restoration
- Riparian Buffer Enhancement
- Tidally influenced Wetland Restoration
- Preserve Fish and Wildlife Habitat
- Low-tide Channel
- Marshland Canal
- Passive Recreation
- Trails
- New Dikes
- Flood Control Structure Location
- Regional Overhead Utilities
- Underground Gas Pipeline

A. Road bridge expanded, Flood control structure relocated
B. Channel cut through road/levee with new bridge
C. Culvert outlet with gate that controls backflow and upstream water level, and provides fish passage, coupled with additional gated culvert(s) and/or other means to rapidly evacuate floodwaters
D. Fish passage facilities at relocated pump station
E. Culvert outlet with backflow control gate or small pump station

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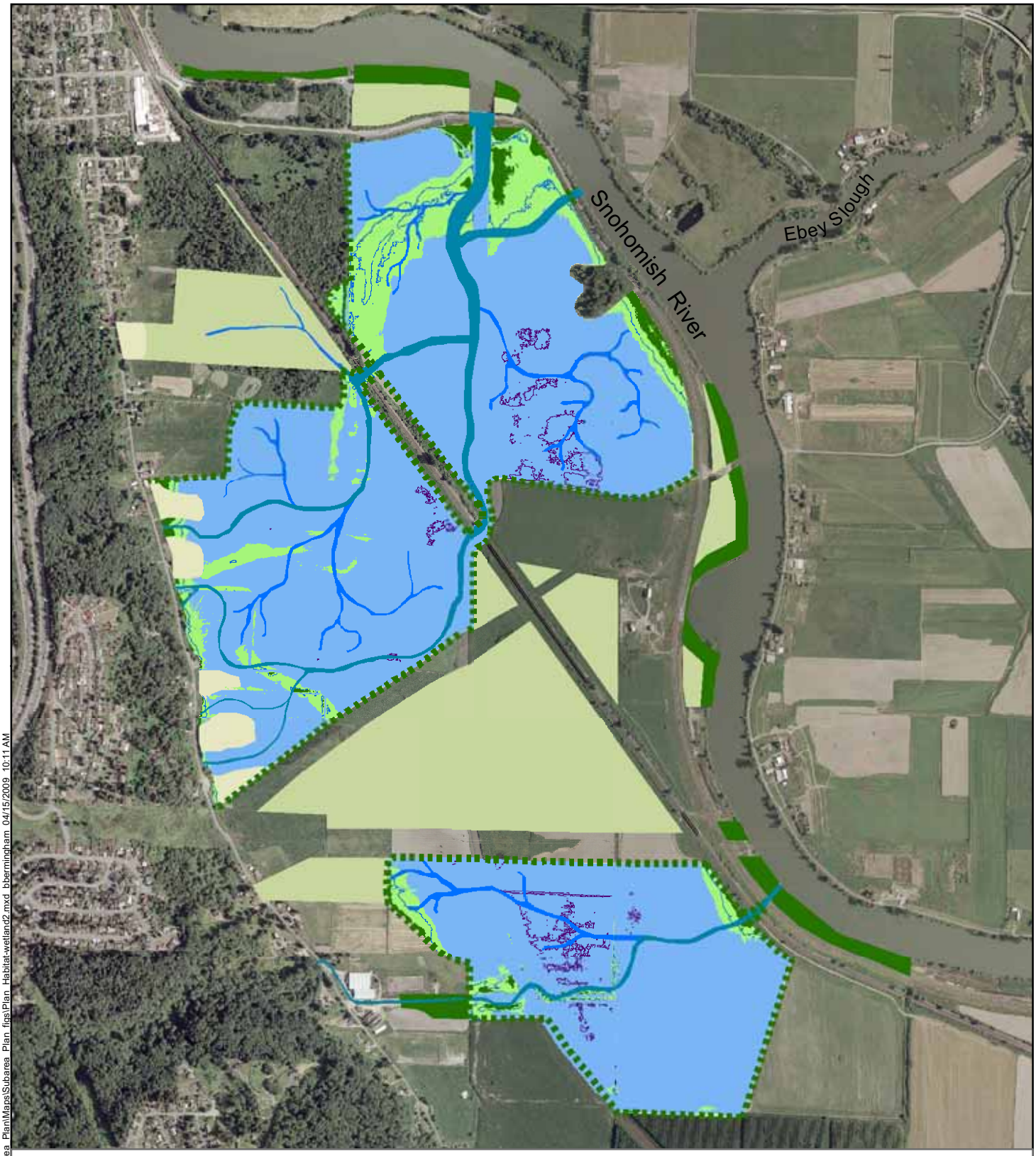
Scale in Feet

This is a conceptual figure meant to represent the plan. Additional studies are necessary to determine technical feasibility and locations for dike breaches, dikes, and other structures. See Section 3.3.2.

Figure 3-1
Marshland Subarea Habitat Plan
Marshland Subarea Plan



Tidal Habitat Zones (Elevation Range)

- Mudflat (Less than +7.0)
- Tidally Influenced Emergent Marsh (7.0 - 10.78)
- Riparian Floodplain Forest (Greater than 10.78)
- Blind Tidal / Dendritic Channel
- Tributary Channel
- Mean Lower Low Water (+0.5')
- Mean Higher High Water (+8.8')
- Dikes / Riparian Habitat
- Riparian Buffer Enhancement
- Non-tidal Freshwater/Palustrine Wetland
- Other Land Uses

Note:
Habitat Zone boundaries based on LIDAR Elevation Data, Vertical Datum: NAVD88

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Scale in Feet

This is a conceptual figure meant to represent the plan. Additional studies are necessary to determine technical feasibility and locations for dike breaches, dikes, and other structures. See Section 3.3.2.

Figure 3-1a
Subarea Plan - Tidally Influenced Wetland Zones based on Existing Topography
Marshland Subarea Plan

3.3.1.2 Ecological Functional Improvements

The habitat proposals in the subarea plan respond to the high priority need addressed in the Snohomish River Basin Salmon Conservation Plan to restore lost estuary habitat in the Marshland subarea. The plan provides a large amount of tidal wetland restoration, which will provide benefits for chum, coho, Chinook and potentially steelhead salmon. Juvenile chum salmon have been shown to highly utilize restored marsh in the Snohomish estuary (Cordell et al. 1998 as described in USFWS 1998). Lack of tidal wetlands and habitat is a limiting factor for Chinook in the lower Snohomish estuary (Snohomish County and SBSRF 2005). The tidal wetland restoration will improve conditions for Chinook, chum, and other salmonid species present in the area and downstream by providing refuge and feeding areas.

Chinook salmon generally require habitat diversity within a single stream for their spawning, rearing, and foraging activities. They also require cover for protection from predators. In small streams, undercut banks with slower water velocities are often used for rearing habitat. In larger rivers, nearshore areas of lower water velocity, such as scour pools associated with logs and roots, serve as rearing habitat. Foraging is done in faster waters, but access to lower-velocity areas, such as eddies behind boulders, are important "holding" areas where the salmon can expend less energy while waiting for prey to appear in the faster water (ISPG 2002). Salmonids are closely associated with woody debris, which offers cover from predators (ISPG 2002, USFWS 1998).

The tidal restoration areas will incorporate varying amounts of dendritic channels, which will provide better juvenile salmon habitat and year-round wetter and larger wetlands. Branching or dendritic tidal channels allow areas for juvenile fish to hide from larger predators, provide food from insects dropping from overhanging vegetation, and supply cooler waters compared to larger slough channels (Pentec Environmental 2001). Placement of large woody debris and other special habitat features within restoration areas will provide further cover for prey species and salmonids.

During flood events, juvenile salmon, like many small fishes, seek out shallow water areas with low velocities (Everest and Chapman 1972; Roper et al. 1994; and Bradford and Higgins 2001). Studies on juvenile Chinook behavior in floodplains show that juvenile Chinook salmon do not appear to be especially prone to stranding mortality, distribute equally throughout the entire

floodplain during flood events, and show no obvious preferences for pools, heavy vegetation, or deep water habitats (i.e., depression zones; Sommer et al. 2005; Sommer et al. 2001).
The subarea plan proposals will provide connections between the Snohomish River and the adjoining floodplain via the tidal wetland restoration areas. Reconnecting the Snohomish River to its floodplain will provide off-channel refugia habitat for juvenile salmonids. Improved groundwater connectivity will increase groundwater recharge and improve water quality in Wood Creek and the Snohomish River by contributing cooler, cleaner water.

In addition to tidal wetlands, the plan also proposes non-tidal wetland restoration. Both types of wetlands provide important water quality benefits from nutrient and sediment retention to water cooling (Pentec Environmental 2001). These benefits, in turn, provide a healthier environment for aquatic species.

Likewise, riparian buffers help reduce stream temperature (Pentec Environmental 2001). Within the Everett region there is a shortage of mature riparian forest, which was once prevalent (Pentec Environmental 2001). This project will contribute to the eventual establishment of mature riparian forest. Riparian forest has been correlated to improved habitat for fish through increased food supply via insects that drop to the water, large woody debris deposition, and temperature reduction (Pentec Environmental 2001; USFWS 1998). Overhanging vegetation shades the water, leading to reduced warming. This, in turn, assists in the maintenance of oxygen levels in the water that support fish and shellfish. The subarea plan proposals would increase riparian buffers, which would benefit salmonid species and upland species that would use the area for forage food and habitat.

Under the subarea plan the makeup of the wildlife population will likely trend towards greater diversity in aquatic, amphibious, bird, and insect species and away from terrestrial animal predominance. However, the increase in vegetation and natural habitat will increase food and foraging opportunities for all species, leading to greater population and diversity. Interconnected habitat will also provide more wildlife corridors for migration.

3.3.1.3 SEWIP Salmon Overlay Scores

The subarea plan was evaluated according to a modified version of the Tidal Habitat Model Rationale and Protocols per the SEWIP SO. This exercise resulted in the scoring of the

plan's functional potential for Chinook salmon rearing based upon the potential habitat components from each alternative coupled with a Beneficial Process Multiplier and a Detrimental Stressor Multiplier. This habitat function score was then multiplied by the number of acres of each of the restoration actions detailed in the plan. In each alternative, the scoring was calculated separately for the north and south portions of the Marshland area. The results of this exercise showed that subarea plan received an overall score of 30,843. The plan is estimated to provide nearly 154 times the habitat function of the present conditions of the Marshland subarea. The estimated SEWIP SO scores are detailed in Table 3-4.

Table 3-4
Estimated SEWIP SO Habitat Score for Chinook Rearing

Habitat Component	Existing Conditions		Subarea Plan	
	North	South	North	South
Hydrology	3	3	12	12
Water Quality	1	1	4	4
Physical Features	1	1	3	3
Exposure	0	0	2	2
Slope	1	1	2	2
Range of Depths	1	1	3	2
Sediments	1	1	3	2
Vegetated Edge Below OHW	1	1	2	1
Vegetated Edge Above OHW	3	3	4	4
Landscape	0	0	0	0
LWD Density	1	1	2	1
Submerged Vegetation	0	0	0	0
Subtotal	13	12	37	33
Beneficial Process Multiplier	1.0	1.0	3.0	3.0
Detrimental Stressor Multiplier	0.168	0.168	0.448	0.448
Estimated Total SEWIP Salmon Habitat Score	**2.2**	**2.2**	**49.7**	**44.4**
Restored Acreage	**83.3**	**7.0**	**401.0**	**245.8**
Total Salmon Indicator Value Assessment Score [1]	**199**		**30,843**	

Notes:
[1] Indicator Value Assessment Score was calculated as the sum of the product of the SEWIP Salmon Habitat Score and the Restored Acreage for the north and south portion of each alternative.
OHW = Ordinary High Water
LWD = Large Woody Debris

The number of salmonid smolts that the restoration areas can support can be estimated using information in *A Historical Analysis of Habitat Alterations in the Snohomish River Valley, Washington, Since the Mid-19th Century: Implications for Chinook and Coho Salmon,* Haas and Collins, February 2001. See FEIS amended Section 3.3 for more details. The number of salmonid smolts that can be supported by the subarea plan is shown in Table 3-5.

Table 3-5
Rough Estimate of Smolts Supported by the Subarea Plan

Chinook	Coho - Summer	Coho - Winter
36,569	40,832	99,200

3.3.1.4 Subarea Plan Planning Implications

The subarea plan would allow for a mix of land use including agriculture, recreation, habitat restoration or conservation, limited residential development and infrastructure. Completion of the subarea plan will lead to revisions in the City's Comprehensive Plan and SMP for the land in its city limits and the MUGA where the City can predesignate land use and shoreline use designations, though it would remain in the County jurisdiction until annexed. Such revisions include allowing residential uses in the rural flood fringe district, promoting passive recreation, ensuring adequate flood control protection, and anticipating future regulations for tidal restoration areas.

The subarea plan proposes buffer standards for the Marshland that will achieve greater consistency with the City's 2006 CAO Update. The proposed buffers combined with coordinated restoration activities and combined with the generally low intensity land uses in the subarea are expected to result in an overall net gain in functional habitat. Recognizing adjacent property owners, existing ongoing agriculture could continue. To ensure that restoration actions do not result in larger buffers on adjacent properties, restoration actions would be required to accommodate buffers, as feasible, on the site of the restoration, with no additional buffers extending onto adjacent properties as a result of the habitat project.

The subarea plan could result in future amendments to the FEMA floodplain maps and City floodplain overlay zones. Areas that are restored to tidal inundation would be reclassified to

Floodway from their current Flood Fringe or Special Development area overlay zones in the City or Density Fringe in the unincorporated County.

The subarea would be subject to new FEMA "reasonable and prudent alternative" elements including the requirement that floodplain activities meet mapping requirements and avoid habitat functional changes through avoidance or mitigation. Dikes within the proposal would also need to meet new vegetation requirements. Everett's floodplain regulations will be updated as FEMA updates requirements and guidance. The habitat restoration and dike setback proposals may assist the City in meeting criteria for lower flood insurance rates.

The City is supportive of state legislation, such as House Bill 2199, that would assure that while the ordinary high water mark may move further inland as a result of the tidal restoration, there would be a means to avoid additional shoreline regulations and permitting for adjacent properties not previously subject to such requirements.

3.3.2 Restoration Potential/Feasibility

The subarea plan proposes substantial habitat restoration and recreation/public access opportunities. This section will discuss the benefits and feasibility issues inherent in the plan. A breakdown of the amount and types of habitat creation and recreational facilities are shown in Tables 1-1 and 3-1.

3.3.2.1 Restoration Feasibility

The Marshland is an area that has been identified as having significant fish and wildlife restoration potential, but also significant technical challenges, including hydrology/hydraulic issues, geotechnical issues, diverse property ownership, transportation and utility facilities. The maximum restoration concepts in this plan appear to be feasible when considering factors such as property owner willingness to participate, and protection of utilities and transportation infrastructure. However, significant technical feasibility and design issues remain to be answered by future hydrologic and hydraulic studies, and geotechnical investigations and analysis. The future studies will likely result in changes to the existing conceptual plans, such as changes in dike locations, changes to the planned infrastructure shown in Figure 3-1, and changes to the habitat and wetland types shown in Figures 3-1 and 3-2. The studies should consider alternative designs that maximize restoration while minimizing impacts if future studies show that the restoration concepts are not feasible as

shown or would result in impacts that cannot be practicably mitigated. Alternative designs that maximize restoration based on the studies shall be consistent with the goals, objectives and policies in Section 4 of this Plan.

This section describes the additional work that will be required in order for the subarea plan to be designed and implemented.

3.3.2.1.1 Studies Required

There are several design considerations that will need to be further analyzed to take the subarea plan from its present planning level to the conceptual and final design levels. These studies include, but are not limited to:

- Developing an unsteady hydraulic model for the subarea to understand how water flow will occur within the subarea during flood conditions compared to existing conditions, and how flood protection and drainage of private and non-restoration areas will be achieved. This will include analysis of flood elevations throughout all properties and expected differential levels and overtopping conditions across all existing and new dikes, including cross dikes, as the basis for dike stability analysis. The key analysis result will be the changes in flood levels for selected recurrence interval flood events and the level of protection afforded to adjacent properties not included in the action area. Modeling will also better define when and where sediment deposition and erosion will occur.
- Developing a drainage study to determine how existing drainage patterns will be maintained for properties that are not included in restoration actions and that would no longer be connected to the pump station infrastructure.
- Determining the degree to which any new dikes would affect existing floodplain elevations and flood flows.
- Furthering various design elements including, but not limited to, whether channels will be excavated or allowed to form naturally and the precise and the final location and required size of the dike breaches and culverts to allow for tidal flushing while maintaining existing levels of flood protection.
- Developing design standards for dikes and other project elements for geotechnical stability under the maximum expected differential water levels and expected overtopping conditions, including accommodation of potential sea level rise and changes to the Snohomish River hydrograph due to climate change impacts.

- Developing a cost-benefit analysis to determine the most cost-effective elements of the project.
- Determining the potential effects of the project on septic systems within the subarea.
- Engineering of railroad and roadway crossings to ensure that existing transportation facilities are not compromised.
- Designing dikes to ensure they will not impact utilities or associated maintenance accesses.
- Conducting geotechnical investigations to determine the suitability of existing soils to accommodate various habitat types and public access features.
- Completing geotechnical investigations as necessary to verify the technical feasibility and associated cost estimate of constructing a new pumping plant.
- Completing an evaluation of the potential impacts to groundwater in areas outside of restoration areas, including potential mitigation measures to prevent detrimental impacts.
- The subarea plan proposal will likely affect lands that are under the ownership of the Washington Department of Natural Resources (WDNR) when implemented. At the time when one or more elements of the project move into the design phase, the location of any affected WDNR lands will be more clearly determined by a boundary survey. At that time, the project proponent will work with WDNR to obtain any needed approvals related to working on state owned lands.
- Completing a cultural resources study starting with a surface survey of the entire area, followed by a testing phase based on the results of that survey. In addition, an effort should be made to identify and interview local residents who may have specific knowledge about past use of the subarea.

It is assumed that no implementation of the restoration or recreation elements of the subarea plan will occur without these studies first occurring. Some of the studies to be performed would examine the overall effects of the restoration or recreation elements on the entire subarea and surrounding properties, while other more detailed studies, based on specific restoration proposals, would examine the effects of a particular proposal on specific locations within the subarea. The detailed studies will likely be conducted for individual projects in a phased approach rather than for the entire subarea restoration and recreation plan. Studies conducted for any individual project will need to address the cumulative impacts from the project being considered and any other projects that have been constructed. It is also

anticipated that a project level environmental review in accordance with the State Environmental Policy Act would be required to implement the subarea plan restoration and recreation elements. If federal funding is involved, National Environmental Policy Act (NEPA) environmental documentation will also be required.

4 GOALS, OBJECTIVES, AND POLICIES

The goals, policies, and objectives of the Everett Marshlands Subarea Plan are derived from the subarea planning process including Subarea Plan Objectives, Guiding Principals, and Planning Commission recommendations. The goals, policies, and objectives are also based on concepts found in the City of Everett Comprehensive Plan, Shoreline Management Program, and SEWIP SO.

Goals express the ultimate aim of the City and citizens for the Marshland Subarea. Objectives identify measurable steps that move toward achieving long-term goals. Policies are statements of principles that guide and determine present and future decisions.

4.1.1 Goals

- *Restoration Goal:* Restore tidal, wetland, and riparian habitat in the Marshland Subarea to increase the acreage and functional values of shoreline and to protect and restore proposed, threatened or endangered species and their habitat.
- *Land Use Goal:* Allow for a range of low intensity land uses consistent with floodplain constraints.
- *Public Access and Recreation Goal:* Increase passive recreation opportunities in the Marshland Subarea.
- *Citizen Involvement and Property Owner Coordination Goal:* Coordinate and consult with Marshland citizens and property owners about land use and restoration choices and avoid and minimize impacts to property owners as a result of habitat restoration activities.
- *Implementation and Interagency Coordination Goal:* Design and phase the restoration and recreation projects to be consistent with federal, state, county, special district, and city requirements and to take advantage of funding opportunities.

4.1.2 Objectives

- *Restoration Objective 1:* Increase tidal habitat leading to improved rearing and foraging habitat for salmon smolts.
- *Restoration Objective 2:* To the extent feasible restore natural hydrologic conditions and drainage patterns in restoration areas while maintaining flood control and drainage protection for adjacent private and utility property owners.

- *Restoration Objective 3:* Encourage restoration by limiting impacts on properties that are not being restored, such as ensuring buffers are not increased due to the restoration.
- *Land Use Objective:* Allow for a mix of land uses including agriculture, recreation, habitat restoration or conservation, infrastructure and limited residential development.
- *Public Access and Recreation Objective:* Increase passive recreation opportunities in the Marshland Subarea.
- *Citizen Involvement and Property Owner Coordination Objective:* Continue to provide information and offer opportunities for public comment and property owner participation in project-level environmental studies and design alternatives for restoration and recreation proposals.
- *Implementation and Interagency Coordination Objective:* Actively seek federal, state, non-profit, and other funding sources to implement cost-effective restoration and recreation designs.

4.1.3 Policies

4.1.3.1 Restoration Policies

1. Promote the increase of tidal wetlands, freshwater wetlands, and stream habitats on public properties, utility properties where consistent with utility function and maintenance, and private properties supported by willing property owners.
2. Provide "off-channel" areas and river edge habitats for young salmon to go during floods.
3. Create tidally-influenced shallow water habitat areas that have gently sloping shorelines, naturally meandering channels, woody debris structures, and small natural substrates that support native emergent marsh vegetation.
4. Increase the amount of native trees and shrubs along the shoreline of the mainstem river, created marsh habitats, streams, and ditches.
5. Reconnect Wood Creek to the Snohomish River.
6. Support a new Marshland Drainage District pump station that is fish friendly.
7. Support restoration designs that could result in mitigation opportunities for floodplain development and result in lowering of flood insurance rates.
8. Establish baseline environmental conditions such as existing levels of flood protection and groundwater levels. Ensure that property owners outside of restoration areas

have the same or better level of flood protection and drainage after restoration proposals as they presently have.

9. Ensure structural flood protection measures are consistent with the Snohomish River Comprehensive Flood Control Management Plan, and coordinated with Snohomish County, the Marshland Flood Control District, the Coordinated Diking Council, Natural Resources Conservation Service, affected utilities, BNSF, and property owners.
10. Ensure that maintenance agreements with the Marshland Flood Control District are in place prior to restoration construction activities.
11. Apply critical area regulations that are protective of fish and wildlife and wetland habitat and avoid undue regulations to property owners adjacent to habitat restoration areas.
12. Support state legislation that would allow property owners to avoid additional shoreline regulations and permitting on properties adjacent to the Marshland Subarea who are not currently in shoreline jurisdiction.
13. Coordinate with local utility providers to ensure that any required relocation or reconfiguration of water lines or communication lines is minimized or accommodated to ensure no drop in existing service levels.
14. Design new dikes and dike breaches to minimize impacts to buried utilities, overhead power lines, and associated services.
15. Ensure that any new dikes that would affect access to power or liquid petroleum product lines be constructed to accommodate the expected access needs of utility owners, including loading generated by typical utility vehicles, and the ability to withstand water loading.
16. Ensure that potential utility impacts or adjustments that result from restoration actions are addressed in the project scope and funding scheme.
17. Ensure new tidal channels and dike breaches are designed to avoid or mitigate impact to existing infrastructure, including Lowell-Snohomish River Road.
18. Ensure that access is maintained for farm equipment to agricultural fields adjacent to restoration areas.
19. Ensure that restoration actions locate trees away from conductors so as to not inhibit routine maintenance activities on overhead power lines operated at 200kV and above, as required by the North American Electrical Reliability Council. .

4.1.3.2 Land Use Policies

1. Continue to permit commercial agricultural activities and other compatible land uses as specified in the Everett zoning code.
2. Promote agricultural activities that benefit wildlife, such as "barley for birds."
3. Allow for low density residential uses in the Rural Flood Fringe District along Larimer Road and in areas outside the 100-Year floodplain.
4. Promote passive recreation that complements habitat restoration areas.
5. Ensure transportation and utility systems can continue and be improved.
6. Ensure access to utilities and agricultural fields.

4.1.3.3 Public Access and Recreation Policies

1. Allow for a variety of passive recreation opportunities including trails, fields for informal recreation and picnicking, and associated support facilities such as parking and restrooms.
2. Require public recreation and restoration proposals to dedicate and improve public access pathways.
3. Create an interconnected loop trail system along habitat restoration areas. Design trails to fit the site context and purpose. For example, some trails may be for pedestrians and have soft surfaces. Dikes and areas that would support boardwalk trail segments may also be used for accessing properties and utilities, and could be wider to accommodate heavy vehicles.
4. Add multi-use trails along Lenora Street/Lowell-Snohomish River Road that can connect into a larger, regional network.
5. Provide visual access into restored and preserved habitat through carefully placed viewpoints within the trail system.
6. Design recreation in consideration of long-term maintenance, emergency access, and privacy of adjacent properties.

4.1.3.4 Citizen Involvement and Property Owner Coordination Policies

1. Seek willing property owners to participate in habitat restoration opportunities.
2. Encourage land donations. Where purchase of property is negotiated, pay fair market value for private properties included in habitat restoration.

3. Seek public comment on project-level environmental and technical information and specific restoration and recreation designs.
4. Periodically mail project information and hold group and individual property owner meetings to ensure active participation and exchange of ideas and information.

4.1.3.5 Implementation and Interagency Coordination Policies

1. Approve restoration and recreation designs after adequate project level environmental review and public review is completed, appropriate to the scale and complexity of the proposals.
2. Cooperate with federal, state, and local governments in the design and permitting of habitat restoration projects.
3. Encourage Snohomish County to implement regional watershed planning and County Comprehensive Plan goals for fish and wildlife habitat restoration in the unique location of the Marshland along the mainstem Snohomish River.
4. Annex the municipal urban growth area to allow for a coordinated design and simplified permitting process for restoration on City owned lands.
5. Allow for restoration phasing which allows for deliberative decision making as more information becomes available and allows the City to leverage different funding sources when they are available.
6. Allow modifications of restoration areas to reduce costs, such as minimizing dike lengths.
7. Allow for the modification of restoration concepts, location of trails, and location of passive recreation areas based on results of future on-site studies, design development, estimated costs, environmental permitting, regulations, future transportation studies, hydraulic modeling and community input.
8. Allow for a wide range of mechanisms for potential implementation of restoration actions. Seek and implement a variety of funding sources which may include, but are not limited to, grants and landowner tax incentives. Look to design concepts that can function both as habitat restoration and as a means to collect funding, such as mitigation banking.

5 IMPLEMENTATION STRATEGIES AND MECHANISMS

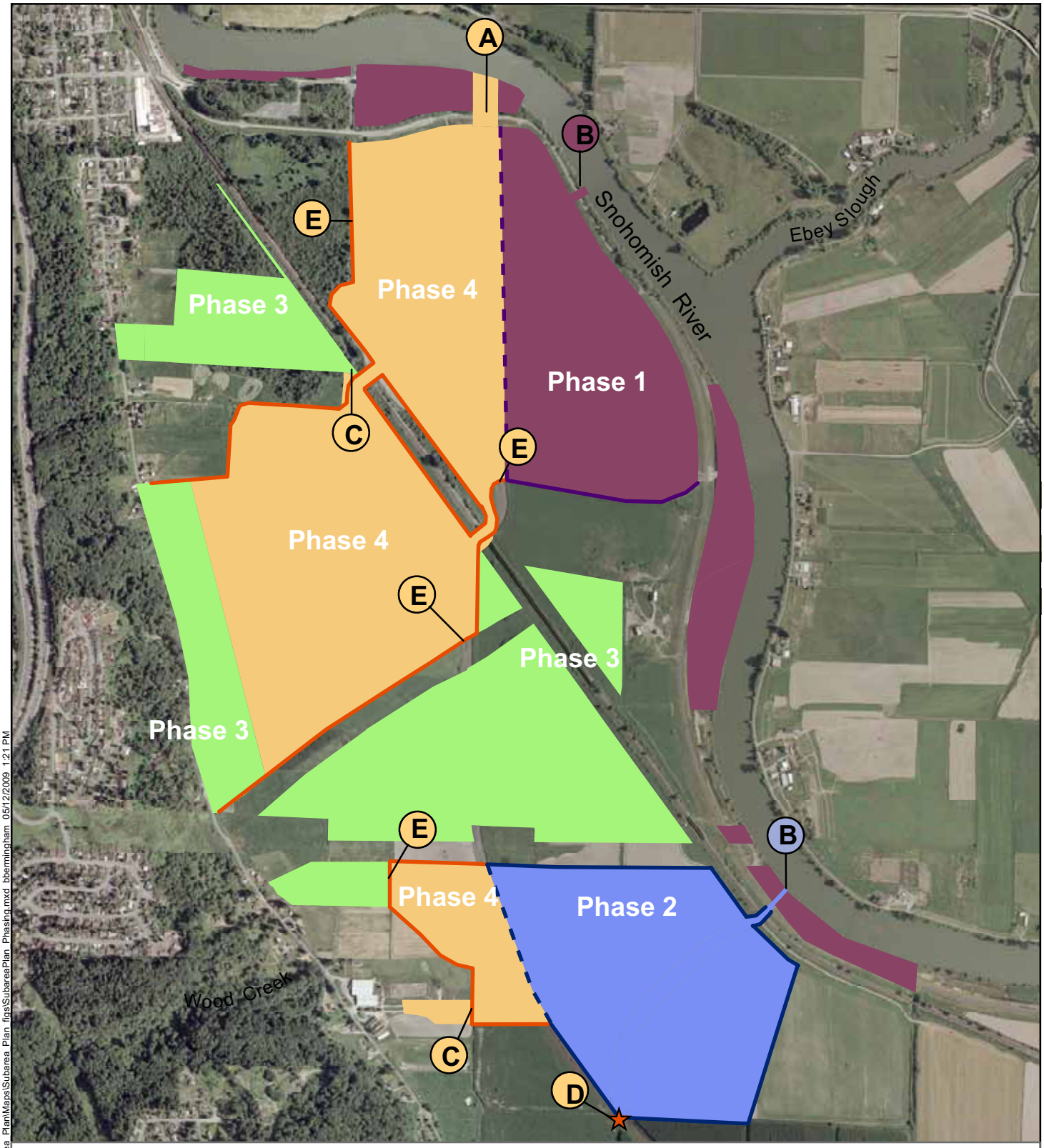
5.1 Strategies, Timeframes and Benchmarks

5.1.1 Phasing Strategies

The scope of the habitat restoration proposed in the subarea plan is sufficiently large to necessitate phasing due to costs, funding, and the need to evaluate the feasibility of different aspects of the project incrementally. The advantage of phasing is that the lowest cost, and least complex aspects of the project could be implemented sooner, providing incremental ecological benefits. More complex aspects of the project could be brought on-line over time as funding and technical issues are resolved. Prior to moving ahead with design and implementation of each phase, extensive hydraulic and hydrologic analysis and geotechnical investigations would be required as well as other studies including wetlands and cultural resources. The sequence of phasing could be based on a number of factors including, but not limited to: property ownership, degree/complexity of infrastructure change, ecological benefit, proximity to the river edge, the results of technical studies, design and implementation costs, and grant funding sources. This section includes a description of one potential approach to phasing. Note that this is only an example of how phasing of the project could occur and phasing may occur differently than detailed herein. Figure 5-1 shows how the project could be phased over time. Table 5-1 details the acreages of habitat associated with each phase and the cumulative acreages achieved over the phasing process.

Table 5-1
Phased Implementation of Habitat Proposals
(in acres) [1]

Land Use	Phase 1	Phase 2 (cumulative)	Phase 3 (cumulative)	Phase 4 (cumulative)
Fish and Wildlife Preservation/Enhancement	41.1	0 (41.1)	32.4 (73.5)	0 (73.5)
Fish and Wildlife Restoration	93.2	107.5 (200.7)	0 (200.7)	251.9 (452.6)
Fish Preservation/ Enhancement	6.6	0 (6.6)	0 (6.6)	2.4 (9.0)
Wildlife Restoration (terrestrial only)	0	0	118.4	0 (118.4)
Totals (cumulative)	140.9	107.5 (248.4)	150.8 (399.2)	254.3 (653.5)



Habitat Restoration

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Flood Control Structure Relocation: Phase 4

Dike Development

- Phase 1
- Phase 1 (temporary)
- Phase 2
- Phase 2 (temporary)
- Phase 4

A. Road bridge expanded, Flood control structure relocated
B. Channel cut through road/levee with new bridge
C. Culvert outlet with gate that controls backflow and upstream water level, and provides fish passage, coupled with additional gated culvert(s) and/or other means to rapidly evaculate floodwaters
D. Fish passage facilities at relocated pump station
E. Culvert outlet with backflow control gate or small pump station

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0 625
Scale in Feet

This is a conceptual figure meant to represent the plan. Additional studies are necessary to determine technical feasibility and locations for dike breaches, dikes, and other structures. See Section 3.3.2.

Figure 5-1
Habitat Restoration / Recreation Phasing
Marshland Subarea Plan

5.1.1.1 Phase 1

The Phase 1 area is close to the river, on existing public land, and requires no infrastructure changes to the flood control infrastructure (Marshland Canal and pump station). It would require a new connection to the river that would include a new bridge through the existing river levee on Lowell Snohomish Road. It would also require two new dikes, one paralleling the Marshland Canal on the east side and one bordering private property on the south side. The dike on the east side of the Marshland Canal would be temporary until Phase 4 is implemented; however, all of the material to build the dike could be reused in Phase 4. Phase 1 also includes low cost riparian habitat enhancement along the river shoreline. This phase's habitat improvements would provide high ecological benefit to fish and wildlife including substantial tidal marsh restoration. Phase 1 is the least complex phase and would therefore be one of the lowest cost phases. Phase 1 should include development of an unsteady hydraulic model for the entire subarea to understand how water flow will occur within the subarea.

5.1.1.2 Phase 2

The second phase is shown on private land that provides another substantial tidal marsh restoration opportunity without changes to the Marshland Canal and pump station. This phase would require acquisition of private agricultural land by a public agency prior to implementation. The current owner of this property is supportive of the restoration plan and is willing to sell. A new permanent dike would be required around the perimeter of the Phase 2 property; a portion of this dike adjacent to the existing Marshland Canal would be temporary. This tidal restoration would require a new connection to the river that would include a new bridge through the existing river levee on Lowell Snohomish Road and a channel under an existing BNSF Railway trestle. Excavation for the relocated Marshland Canal (implemented with the Flood Control Structure Relocation in Phase 4) could occur during Phase 2. Material excavated for the future canal could be used as material for the temporary dike. This material could again be reused for the permanent dike along the western edge of the restoration proposed in Phase 4. Phase 2 would nearly double the high ecological benefit from tidal marsh habitat restoration included in Phase 1.

5.1.1.3 Phase 3

This phase occurs on mostly private land and is one of largest phases in terms of acreage. This phase would require acquisition of private agricultural land by a public agency prior to implementation, except for lands owned by Puget Sound Energy. No changes to the Marshland Canal or pump station are required for Phase 3 to be implemented. The scope of this phase entails mostly restoring non-tidal freshwater marsh to areas that are currently agriculture. In cases where existing wetlands occur they would be preserved and enhanced. These restoration actions are low cost and mainly involve decommissioning of drain tile systems and protecting adjacent lands from hydrologic changes. Phase 3 also includes recreation amenities, such as trails, small parking areas, and passive open space, along Lowell Larimer Road.

5.1.1.4 Phase 4

The greatest changes to infrastructure are included in this phase. It also covers the largest area; however, it mostly occurs on publicly owned land. The major infrastructure changes include relocation of the pump station to the southern boundary of the site and relocation of the Marshland Canal through the southern tidal wetland area implemented during Phase 2. Other elements of this phase include a hydraulically controlled culvert connection to the land in the northwest portion of the site, two water channels below existing BNSF Railway trestles, improvements to the lower Wood Creek channel, and a connection through the dike conveying Wood Creek to an expanded tidal marsh. Phase 4 involves extensive dike construction to protect adjacent private lands, and relatively limited private property acquisition. Phase 4 has high ecological benefit, but requires significant costs to implement major infrastructure changes.

5.1.2 Committed and Potential Funding Sources and Funding Strategies

No committed funding sources to implement the subarea plan currently exist; however, there are many potential sources from which funding may be derived. The majority of funding for the subarea plan will likely originate from private and public grant funds. Additional funding for elements of the subarea plan may also come from special levees or bonds, from tax incentives for landowners, or through the establishment of public or private mitigation banks. Where possible, federal, state, and local funding sources or land resources

will be used to match grant funds and maximize funding opportunities throughout all phases of the project.

Snohomish County's Marshland Restoration Site is shown as part of the Phase I restoration areas along the Snohomish River. This site is owned by Snohomish County Public Works and the Marshland Flood Control District, and includes the area between the existing set-back dike and the Snohomish River, from the current Everett city limits upstream approximately 2 miles to the point where the set-back dike rejoins the dike on the river bank. The 34-acre site was developed in association with the Lowell-Snohomish River Road and Marshland Dike Relocation project, and provides compensatory mitigation for that project. The County has also completed compensatory mitigation for a number of other Public Works projects at the site, and will continue to use this area for compensatory mitigation projects in the future.

A portion of the Phase 3 non-tidal restoration in the center of the subarea is on property owned by PSE. PSE will give priority to its own restoration and mitigation activities on the property.

Public grant funds for implementing the subarea plan can come from a variety of sources including Corps of Engineers Puget Sound Nearshore Restoration Program and Puget Sound and Adjacent Waters Program, the Salmon Recovery Funding Board, Washington State Recreation and Conservation Office programs including the Aquatic Lands Enhancement Account, Land and Water Conservation Fund, Trails and Waters Access Grants, and the Estuary and Salmon Restoration Program (ESRP) administered by WDFW. Additional grant funding may be available through implementation of the WRIA 7 Salmon Recovery program. Table 5-2 contains a more detailed list of the grant opportunities applicable to the project.

Table 5-2
Potential Grant Opportunities

Grant Name	Agency	Funding Amount	Funding Cycle	Applicability
Estuary and Salmon Restoration Program (ESRP)	Puget Sound Nearshore Partnership	No minimum or maximum funding amount	Annually depending on available funding	For protection and restoration projects to support sustained nearshore ecosystem restoration in Puget Sound
Puget Sound and Adjacent Waters Program (PSAWR)	US Army Corps of Engineers	No minimum or maximum funding amount; Corps pays up to 65% of eligible costs	Program in place while authorized funds are unexpended	For implementing critical projects for the preservation, protection and restoration of critical ecosystem processes, habitats, and functions within the Puget Sound basin
Aquatic Lands Enhancement Account (ALEA)	Washington State Recreation and Conservation Office (RCO)	Up to $1,000,000; minimum of 2:1 matching funds	Biannually	For the purchase, improvement, or protection of aquatic lands for public purposes, and for providing and improving access to such lands.
Washington Wildlife and Recreation Program (WWRP)	RCO	$25,000 to $1,000,000; minimum of 2:1 matching funds	Dependant on type of project	Funding for parks, water access sites, trails, wildlife habitat, and farmland preservation
The Land and Water Conservation Fund (LWCF)	RCO	25,000 to $500,000; minimum of 2:1 matching funds	Biannually	For land acquisition and/or facility construction or renovation for public parks for outdoor recreation
Salmon Recovery Funding Board (SRFB) Grants	SRFB	$5,000 and up; 15% local match required	Annually	For protection and restoration of salmon habitat. Also supports feasibility assessments for future projects and other activities
North American Wetlands Conservation Act (NAWCA)	US Fish and Wildlife Service	$5,000 to $1,000,000 minimum of 1:1 matching funds	Typically 2 cycles per year	For protection, restoration, and enhancement of wetlands and uplands habitats for the benefit of wetland-associated migratory birds
Wetland Reserve Program (WRP)	Natural Resource Conservation Service	Dependent on extent of restoration or easement	Funds are provided based on eligibility	Offers landowners the opportunity to protect, restore, and enhance wetlands on their property

5.1.3 Policy Strategies

Policy strategies have been analyzed in relation to the project to recognize and aid any properties affected by the proposed restoration. House Bill 2199 was enacted by the Washington State Legislature to provide relief for properties impacted by shifts in shoreline location due to restoration projects. The bill states that a restoration project resulting in a landward shift in the ordinary high water mark (OHWM) inadvertently creates hardships for adjacent property owners, particularly in urban growth areas. As mitigation, this bill provides exemption from existing regulations to property owners that are affected by restoration projects.

5.1.4 Timing

Implementation of the project will occur as funding allows. The subarea plan could be implemented in phases as detailed in Section 5.1.1. Phase 1 would occur as funding is received and the appropriate environmental investigations and technical issues are resolved. Phase 2 requires acquisition of private agricultural land and is part of another restoration opportunity. Phase 3 involves the most land of all the phases and also requires the acquisition of private agricultural land for restoration. Phase 4, the final phase, includes recreation and changes to the infrastructure in the project vicinity. Due to the changes in infrastructure, this phase involves substantial costs and would therefore be dependent on funding opportunities. Ideally, Phase 4 would occur prior to the time that major improvements or upgrades are needed for the existing Marshland pump station.

It is understood that private landowner willingness may change over time. It is the intent of the City to be opportunistic about landowners shifting their decisions as the project moves forward. Such changes may provide more land for restoration and aid various project incentives.

Both the SEWIP SO and the Snohomish River Basin Salmon Conservation Plan include goals for restoration. The SEWIP SO includes the Marshland Subarea as part of the estuary, with a goal for achieving increases in salmonid habitat function, as defined by the Tidal Habitat Model, by 20 percent overall by 2016. The Snohomish River Basin Salmon Conservation Plan places the Marshland Subarea in the Mainstem – Primary Restoration category, rather than the estuary. The 10-year goal (2016) for restored off-channel habitat on the Mainstem

Primary Restoration group is 167 acres, with 40 to 60 percent of that within Snohomish County and 40 to 60 percent in King County. To date, 13 acres of side-channel restoration have been completed, and construction is pending on an additional 17.7 acres.

Within 10 years of the subarea plan's adoption, the City will review how the plan is being implemented, assess the reasons if restoration is not occurring, and evaluate whether any plan amendments are necessary.

5.1.5 Benchmarks

Benchmarks are a mechanism used to assess the progress of a project. Benchmarks in this project include habitat gains measured by acres restored and the SEWIP SO IVA model scores. As the project progresses, benchmarks will be achieved once a particular number of acreage is restored. The City of Everett Shoreline Master Program measures such gains in acre-points. These points are used to average restoration potential per acre and are applied to various sites throughout the City of Everett. The SEWIP SO estimated that the project area, known as Restoration Sites 7 and 14, has a potential gain of approximately 41,600 IVA acre-points. Based on the proposed Subarea Plan, a more reasonable potential gain of 30,843 IVA acre-points is estimated (see Table 3-2).

5.2 Feasibility Level Construction Cost Opinions

5.2.1 Feasibility Level Cost Opinions

For planning purposes, a cost opinion of the subarea plan was produced. Table 5-3 summarizes the expected magnitude of project costs associated with general requirements, earthwork, structures, restoration and enhancement, recreation and land acquisition. Contingencies for construction and unidentified items as well as a percentage for engineering, design, permitting and construction management costs are also included. These are planning level opinions of probable cost developed for comparative assessment of alternatives. These cost opinions should be re-evaluated and updated once funding is secured, previously described studies are completed, and detailed engineering designs are developed.

Table 5-3
Summary of Subarea Plan Costs [1]

Summary	
General Requirements	$6,041,000
Earthwork	$10,279,400
Structures	$15,862,000
Restoration/Enhancement/Preservation	$1,414,000
Recreation	$1,268,960
Subtotal	$34,865,360
Sales Tax	$0
Estimated Construction Subtotal	$34,865,360
Undefined Items at Planning-Level Estimate (10.0%)	$3,486,536
Construction Contingency at Planning-Level Estimate (30.0%)	$10,459,608
Estimated Construction Total	$48,811,504
Land Acquisition	$1,268,960
Engineering, Design, Permitting, Construction Management Costs (25.0%)	$12,202,876
Total Estimated Implementation Cost	**$62,283,340**

(1) Notes:
(a) Estimated construction costs are in May 2009 dollars
(b) Costs provided are planning level opinions of probable cost.
(c) Sales Tax not included for improvements constructed on City-owned properties

5.2.2 Feasibility Level Phased Cost Opinions

The scope of the habitat restoration proposed in the subarea plan is sufficiently large to necessitate phasing; a detailed discussion of the phasing strategy is discussed in section 5.1.1. For planning purposes, a planning level cost opinion for the phased implementation of the Preferred Plan was developed. Table 5-4 summarizes the expected magnitude of project costs associated with general requirements, earthwork, structures, restoration and enhancement, recreation, and land acquisition for each proposed phase of implementation. These are planning level opinions of probable cost developed for comparative assessment of alternatives. These cost opinions should be re-evaluated and updated once funding is secured, previously described studies are completed, and detailed engineering designs are developed.

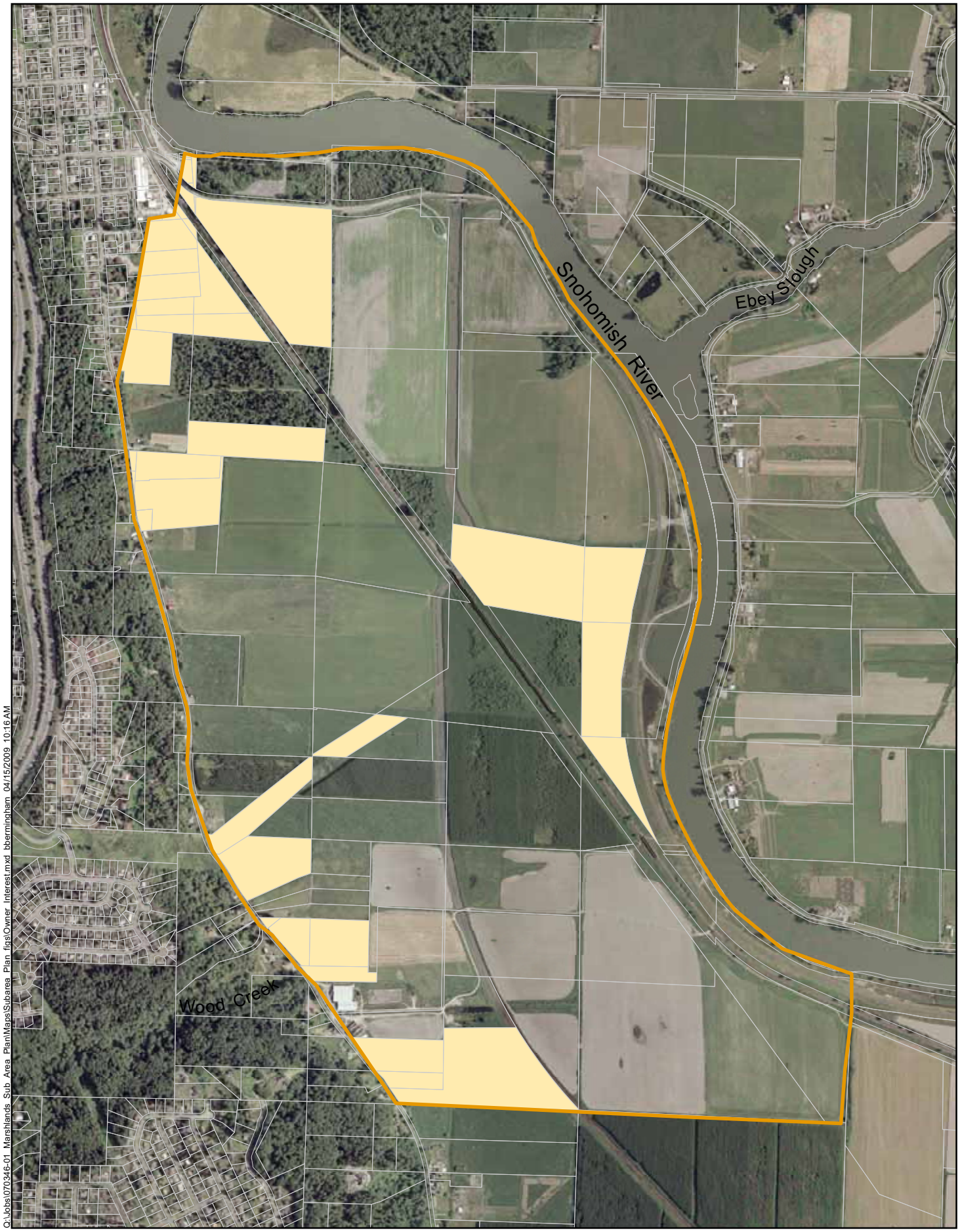
Table 5-4
Summary of Subarea Plan Costs by Phase [1]

Summary	Phase 1	Phase 2	Phase 3	Phase 4	Total
General Requirements	$900,000	$1,113,000	$573,000	$4,717,000	$7,303,000
Earthwork	$2,361,366	$4,080,872	$212,650	$9,947,580	$16,602,468
Structures	$1,235,000	$1,397,500	$0	$13,229,500	$15,862,000
Restoration/Enhancement/Preservation	$908,600	$94,600	$0	$410,800	$1,414,000
Recreation	$0	$351,019	$777,300	$215,141	$1,343,460
Subtotal	$5,404,966	$7,036,991	$1,562,950	$28,520,021	$42,524,928
Sales Tax	$0	$0	$0	$0	
Estimated Construction Subtotal	$5,404,966	$7,036,991	$1,562,950	$28,520,021	$42,524,928
Undefined Items at Planning-Level Estimate	$540,497	$703,699	$156,295	$2,852,002	$4,252,493
Construction Contingency at Planning-Level Estimate (10.0%)	$1,621,490	$2,111,097	$468,885	$8,556,006	$12,757,478
Estimated Construction Total (30.0%)	$7,566,952	$9,851,788	$2,188,130	$39,928,029	$59,534,899
Land Acquisition	$0	$351,019	$777,300	$215,141	$1,343,460
Engineering, Design, Permitting, Construction Management Costs (25.0%)	$1,891,738	$2,462,947	$547,033	$9,982,007	$14,883,725
Total Estimated Implementation Cost	**$9,458,691**	**$12,665,754**	**$3,512,463**	**$50,125,177**	**$75,762,084**

(1) Notes:
(a) Estimated construction costs are in May 2009 dollars
(b) Costs provided are planning level opinions of probable cost
(d) Sales Tax not included for improvements constructed on City-owned properties

5.3 Property Owner Interest in Restoration/Enhancement

To provide incentives for private landowners to participate in future planned critical areas restoration activities, it is recommended that the City adopt incentives into the subarea plan to allow landowners to have flexibility to allow critical areas to be established on their lands while protecting their rights to develop the remaining portions of their property. Several property owners have expressed interest in financially supporting the project. Fair compensation will be provided to these owners in the form of outright purchase of the land, easements, or tax incentives. Where technically feasible, the project team has incorporated these properties in this alternative. Figure 5-2 shows those parcels for which landowners have expressed a willingness to participate in or who have expressly stated they are not interested in participating in restoration actions on their parcels.



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Scale in Feet

Excluded Parcels
Parcel Boundaries

Figure 5-2
Parcels Excluded from Restoration based on Private Landowner Response
Marshland Subarea Plan

6 SUBAREA PLAN MONITORING

Monitoring is a mechanism utilized once all phases of a project are complete to review its effectiveness restoring a habitat and resulting in a positive environmental impact. The following section describes how these monitoring mechanisms are used to review effectiveness.

The Snohomish River Basin Salmon Conservation Plan (2005) provided initial recommendations for implementation, direct (Project) effectiveness, cumulative effectiveness, and validation monitoring. Currently, the Snohomish Basin Technical Committee is developing more specific recommendations for cumulative effectiveness monitoring. This work will identify the appropriate scale and metrics to use to determine landscape and population-level effectiveness for projects and programs implemented throughout the basin. In order to promote consistency and facilitate comparisons, the technical committee may weigh-in on preferred monitoring metrics for project-level effectiveness monitoring, but it will **not** develop project specific monitoring plans.

More specific project-level monitoring guidance is expected to be developed for estuary monitoring projects, through the Estuary Working Group. Currently, the NOAA Restoration Center is developing a monitoring plan for the Qwuloolt estuary marsh restoration project. This monitoring plan will treat the Qwuloolt Project as a case study of a nested ecosystem scale monitoring approach for estuarine restoration projects. This monitoring plan will: 1) be at system level, 2) take into account other restoration projects occurring in the Snohomish estuary, 3) be integrated into other past and planned future monitoring work (e.g. on-going juvenile salmon utilization study and the Basin salmon recovery monitoring and adaptive management plan), 4) be coordinated with local monitoring partners, and 5) be actionable given current resources or with small infusion of additional funds (e.g. one way to make it actionable would be to have different components or modules be able to be completed independently). This plan is currently under development, so project-specific monitoring recommendations are not yet available.

6.1 Mechanisms to Review Implementation

The Plan (2005) identifies the following implementation questions:

- Was a project started or completed? For ongoing projects, was maintenance

performed?

- What was accomplished on the ground? For restoration projects, this would include project type, location, acres and type of habitat restored, cost, and other information. For policies and programs, this would include status of regulatory updates; types of stewardship, outreach, funding, and enforcement; and project monitoring programs.

- Were any problems encountered? If so, what types?

- If actions are not being implemented as envisioned, why and what could be done to improve this?

Project implementation is tracked in a state-developed online database, the Habitat Work Schedule. This database collects quantitative project implementation data that is specifically tied to 10-year habitat benchmarks identified in the Snohomish Basin Conservation Plan (2005) and provides a tool to evaluate the basin's cumulative implementation progress. Specific metrics tracked for tidal marsh restoration include:

- Estuary or Nearshore: Channel Connectivity/Rehabilitation/Creation - Length (Linear Feet),
- Estuary or Nearshore: Enhance Channel Edge (Linear Feet),
- Estuary or Nearshore: Berm/Dike Modification/Removal - Area Affected (Acres)
- Estuary or Nearshore: Enhance Tidal Marsh (Acres)
- Activity Type - Estuary or Nearshore: Large Wood Placement - Amount Placed (Each)

6.2 Mechanisms to Review Effectiveness

Monitoring mechanisms to review restoration projects located in the Snohomish subbasin are described in the Snohomish River Basin Salmon Conservation Plan (2005). These mechanisms include targeted monitoring and evaluation that are intended to improve effectiveness and efficiency in salmonid habitat and population recovery as well as budget strategies for future projects. As a strategy to bring salmonid populations up to future healthy and harvestable levels, the Snohomish Basin Salmon Recovery Forum (Forum) has implemented adaptive management strategies regarding monitoring and evaluation of restoration projects.

The Snohomish River Basin Salmon Conservation Plan provides direction on how to monitor the effectiveness of a project and provides a set of direct effectiveness monitoring questions and indicators for restoration projects that can be used to assess the effectiveness of a given project. The general effectiveness questions that a project should answer include:

- Did the restoration or protection project achieve the desired habitat condition?
- Did the Project achieve the desired biological response?
- Did the project meet design criteria standards and permit requirements?
- Did the project implementer learn of any methods that may result in comparable benefits for less cost?
- Is some level of capacity building necessary for success?

Section 5.6 of the SEWIP Salmon Overlay provides guidance on design and implementation of compensatory mitigation and monitoring plans, establishment of performance criteria, and adaptive managements for projects undertaken using the SEWIP Salmon Overlay recommendations and policies. This guidance should be used in conjunction with the recommendations in the Snohomish River Basin Salmon Conservation Plan. The SEWIP Salmon Overlay is incorporated by reference in the SMP.

Project types and their associated direct effectiveness monitoring questions and indicators as found in Table 12.2 of the Snohomish River Basin Salmon Conservation Plan and applicable to the Marshland subarea are shown in Table 6-1.

Project implementers are responsible for collecting project-level data (implementation and effectiveness).

Table 6-1
Direct Effectiveness Monitoring Questions and Indicators

Direct Effectiveness Monitoring Questions And Indicators	Frequency of Data Collection
Fish Passage Enhancement Projects: Monitoring data needed for evaluation: Pre-project: % passable by juvenile and adult, linear length of habitat to be made accessible, abundance and life stage above barrier. Post-Project: abundance of adults and/or redds upstream of project; % passable by adult and juvenile	Pre- and post-project monitoring per Capital Improvement Plan standards
Riparian Function Enhancement Projects: Monitoring data needed for evaluation: Area re-vegetated; % survival; species composition	Pre- and post-project monitoring per Capital Improvement Plan standards
Floodplain Reconnection Projects: Indicators, stream morphology changes, changes in flow capacity, fish density and distribution in project reach	Pre-project for comparison information, post project every 5 years for long-term habitat change
Tidal Marsh and Nearshore Habitat Restoration Projects: Indicators: acres and types of habitat restored	Pre-project for comparison information, post project every 5 years for long-term habitat change

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