REVISED APPENDIX D
BIOLOGICAL ASSESSMENT & HABITAT MANAGEMENT PLAN

REVISED REPORT
BIOLOGICAL ASSESSMENT AND HABITAT MANAGEMENT PLAN
EVERETT RIVERFRONT REDEVELOPMENT
EVERETT, WASHINGTON

APRIL 11, 2008

FOR
OLIVERMCMILLAN EVERETT, LLC

GEOENGINEERS

File No. 06191-002-01

Revised Report
Biological Assessment and Habitat Management Plan
Everett Riverfront Redevelopment
Everett, Washington
File No. 06191-002-01

April 11, 2008

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REVISED REPORT
BIOLOGICAL ASSESSMENT AND HABITAT MANAGEMENT PLAN
EVERETT RIVERFRONT REDEVELOPMENT
EVERETT, WASHINGTON
FOR
OLIVERMCMILLAN EVERETT, LLC

INTRODUCTION

This draft report represents the Revised Biological Assessment (BA) and Habitat Management Plan (HMP) for the Everett Riverfront Redevelopment (Project) project by OliverMcMillan Everett, LLC (OliverMcMillan). The project, as currently proposed, will include; construction of mixed use commercial space, hotel space, single- and multi-family residential units, a kayak/small boat dock, and shoreline/habitat restoration (Determination of Significance on October 16, 2006) on the approximately 221-acre site. In addition to these improvements, the City of Everett (the City) is in the initial planning stages of site-specific wetland and stream habitat enhancement and restoration throughout the site. Once the City planning and design element is complete subsequent environmental review will be conducted to evaluate impacts of the City plans. This report has been completed to assess potential impacts of the project on species and critical habitats listed or proposed for listing under the Endangered Species Act (ESA). This report also addresses wetland impacts and the mitigation sequencing process followed for this project including avoidance and minimization measures that will be in-place during construction and occupation of the development.

Listed species use of the project area is described, and the potential effect that this project may have on each species and their habitat is evaluated. This report has also been completed to address and analyze habitat management opportunities in conjunction with potential impacts to fish and wildlife habitat conservation areas within the project boundaries and affected species resultant of the "Preferred Alternative" (Alternative 1) for the proposed project. Fish and wildlife conservation areas and affected species within the project area is described, and the potential effect the project may have on each conservation area and affected species is evaluated. In addition, several conservation and mitigation measures, such as low impact stormwater Best Management Practices (BMPs), are identified to reduce and compensate for planned and potential impacts to fish and wildlife conservation areas and each affected species. This BA/HMP report addresses the responsibilities of OliverMcMillan set forth in the City's Shoreline Master Program (SMP), Salmon Overlay to the Snohomish Estuary Wetland Integration Plan (SEWIP), City of Everett Municipal Code, Title 19, Chapter 33D Shoreline Overlay District, (EMC 19.33D) and is part of the informal consultation process that OliverMcMillan is expected to consult with the U.S. Army Corps of Engineers (USACE) and the Services (U.S. Fish and Wildlife Service [USFWS] and National Oceanic and Atmospheric Administration [NOAA] Fisheries).

PURPOSE OF PROJECT

For more than a decade, the City has been working on the cleanup, environmental conservation, public shoreline access and redevelopment planning for several properties located along segments of the Snohomish River within the City's urban growth boundaries. The area includes sites commonly known as the former Everett Landfill/Tire Fire Site, Eclipse Mill, Stuchell/Newland Sites and the former Simpson Site (riverfront properties). These sites and their associated landscapes, over the past 100 years, have been manipulated, heavily developed from historical conditions and continually utilized for various industrial purposes (GeoEngineers 2007a). The City's most desirable option for these riverfront properties would be a re-development action by one entity based on a Planned Development Overlay

Master Plan (Master Development Plan) reviewed through the City's public land use process. The City has entered into an agreement to sell the majority of these riverfront properties to OliverMcMillan, a private developer, who will redevelop the site in accordance with the City's regulations and vision and provide a Master Development Plan in partnership with the City. The City is developing plans for public amenities and environmental restoration within the project area that is not included in this evaluation. Additional environmental review to permit those amenities will be completed when design details are developed more fully over time.

Located in Sections 29 and 32 of Township 29 North, Range 5 East of the Willamette Meridian east of Interstate 5, south of Pacific Avenue and north of Lowell Snohomish River Road in Everett, Washington (Figure 1 – Vicinity Map), the proposed project is adjacent to the western shoreline of the Snohomish River within the tidally influenced lower section of the river. The project area includes five distinct zones, generally identified with the following site descriptions (Figure 2 – Site Boundary/Layout) which are based on their historical use:

1. **Tire Fire/Landfill Site:** This area is bordered on the north by 36th Street, on the west by the Burlington Northern Santa Fe (BNSF) mainline/right-of-way and on the east and south by the diagonal created by the former Milwaukee Road railroad right-of-way. This parcel is a fully loaded and properly closed municipal waste landfill.
2. **Simpson Development Pad:** This area (the Simpson Pad) is generally south and west of the area described below as the Simpson Category I Wetland and Riparian corridor, and the north of the area described below as the South Simpson Site. This area is identified in the Everett General Plan and related documents as the "Developable Portion of Simpson Site." This parcel supported a large timber mill for decades.
3. **Simpson Category 1 Wetlands and Riparian Corridor:** This area lies between the Tire Fire/Landfill site, the BNSF Mainline on the east and between the Snohomish River and the upland area known as the Simpson Pad or the "Developable Portion of the Simpson Site." This area is composed entirely of areas that are or will be aquatic or riparian habitat and public access. The wetland areas are associated with Bigelow Creek and portions of the Snohomish River.
4. **South Simpson Site:** This area lies between the BNSF Mainline on the west, the Snohomish River on the east, the Washington State Department of Transportation (WSDOT) water treatment property on the south and the Simpson Pad on the north. The South Simpson Site includes features identified in this report as South Simpson Wetland Areas and is composed entirely of areas that are or will be aquatic or riparian habitat and public access.
5. **Eclipse Mill.** This area lies north of the easterly extension of 36th Street, east of the BNSF 'C'-line track and right-of-way, west of the Snohomish River and south of Pacific Avenue. The Port of Everett also owns properties in this area that are proposed to be included in the proposed redevelopment. The Eclipse Mill was closed within the past four years and the site was inspected for contamination and underwent a cleanup action.
6. **Stuchell/Newland:** These properties are located north of the portion of the Eclipse property being transmitted by the City to OliverMcMillan extending to a property line about 400 feet south of Pacific Avenue and lying east of the BNSF tracks and Eclipse Mill Road to roughly the Snohomish River. These parcels are currently active with light industrial uses and will be transferred and incorporated into the redevelopment plans focusing on commercial and residential uses.

LISTED SPECIES

Information on species listed under Section 7(c) of the ESA that are potentially present in the project area was obtained from the USFWS (Appendix A –November 1, 2007 for Snohomish County), NOAA listing for Western Washington (Appendix A – June 26, 2007 for marine mammals and February 28, 2008 for salmon), the Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) maps and database (WDFW 2007a) and SalmonScape interactive mapper (WDFW 2007b). A Washington Department of Natural Resources (DNR) search of their online Natural Heritage Program database revealed no records of any listed plants, high quality ecosystems or other significant natural features within a 1-mile radius of the project area (DNR 2007).

The USFWS list, the NOAA list and the WDFW database indicate the presence of Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), bull trout (*Salvelinus confluentus*) and Puget Sound steelhead (*Oncorhynchus mykiss*) in the project vicinity. There is also a possibility that marbled murrelets (*Brachyramphus marmoratus)* and Steller sea lions (*Eumetopias jubatus)* could be present in the project vicinity. Table 1 summarizes the species that are either currently listed or proposed for listing under the ESA and may occur in the vicinity of the project.

Table 1. Protected Species Potentially Occurring Within the Project Vicinity and Designated Critical Habitat within the Project Vicinity

Common Name	Scientific Name	Federal Status	Critical Habitat Designated?
Bull Trout	*Salvelinus confluentis*	Threatened	No
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened	No
Puget Sound Chinook Salmon	*Oncorhynchus tshawytscha*	Threatened	Yes
Puget Sound Steelhead Salmon	*Oncorhynchus mykiss*	Threatened	Under Development
Steller Sea Lion	*Eumetopias jubatus*	Threatened	No

Other ESA-listed species occurring in Snohomish County which are not expected to be found in the project area are listed and summarized below:

- **Canada lynx (*Lynx Canadensis*) –** There are no known Canada lynx inhabiting the project vicinity. The likelihood of a lynx entering the project vicinity is minimal to none.
- **Gray wolf (*Canis lupus*) –** There are no known gray wolves inhabiting the project vicinity. The likelihood of a gray wolf entering the project vicinity is minimal to none.
- **Grizzly bears (*Ursus arctos*) –** There are no known grizzly bears inhabiting the project vicinity. The likelihood of a grizzly bear entering the project vicinity is minimal to none.
- **Northern spotted owls (*Strix occidentalis caurina*) –** Northern spotted owl habitat is designated in Snohomish County. The habitat nearest to the project site is within the Cascade Mountains of Snohomish County, which is more than 15 miles away. The project vicinity is far outside of the designated habitat therefore northern spotted owls are not expected to occur in the project vicinity.

- **Southern Resident killer whale (*Orcinus orca*) –** There are no known killer whales inhabiting the project vicinity. The likelihood of a whale entering the project vicinity is minimal to none.
- **Humpback whale (*Megaptera novaeangliae*) –** There are no known humpback whales inhabiting the project vicinity. The likelihood of a whale entering the project vicinity is minimal to none.

PROJECT DESCRIPTION

OLIVERMCMILLAN ACTIONS

The initial development concept and proposed project description are included in the Master Plan Development shown in Appendix B. The proposed project will rehabilitate former industrial sites and includes the construction of up to 900,000 square feet of mixed commercial use; 200,000 square feet of hotel space; and up to 1,400 single-family and multi-family residential units. The project may be amended over time in response to market demand for the proposed uses so that the ultimate mix of uses constructed will be determined by market demand and the land use capacity of the site (type, location, and size of uses and structures and infrastructure capacity). For example, as the amount of retail/office use increases, the total number of residential units decreases. The types of uses in the description of "commercial" include retail, hotel/motel, restaurant, theater and office use. Shoreline and habitat restoration will also be constructed along with any required mitigation actions to offset unavoidable impacts to natural resources.

There are 66.66 acres of wetland and 16,848 linear feet of stream (Bigelow Creek and Snohomish River shoreline, and Streams AA, BB and CC) within the project boundaries. The preliminary re-development design for the site has been developed to maximize use of previously developed land and minimize impact of critical areas. The project designers have tried to avoid impacts to aquatic resources as much as possible but impacts will result from creation of access roads and construction of a small boat facility for public use.

The proposed project will result in a total of 0.15 acres (6,510 square feet) of wetland fill (Wetlands J, K and M) and 0.29 acres (12,775 square feet) of wetland removal by incorporation into expanded Snohomish River habitat (Wetland X) associated with the accommodation of the proposed project footprint. Wetlands J and M will be impacted due to construction of a road that is required to provide adequate access to the northern portion of the development from Pacific Avenue. Impacts proposed to Wetland X will be necessary for construction of proposed public amenities along the Snohomish River, providing shoreline access and small public boat facility.

- OliverMcMillan and the City have committed to the concept of a Memorandum of Agreement with the Department of Ecology for the development of a tidal restoration plan for Wetland C. This plan is proposed to include modeling, surveys, and will evaluate priorities for improvements necessary to have a buildable plan which restores tidal process and functions in a majority of Wetland C (including dendritic channels). Target for completion, 12-18 months; - pursue required permits to implement the plan and begin construction based on the priorities within 18 months of receipt of permits. Enhanced buffers of the widths outlined in the DEIS as well as inclusion of the increased width of the side slope along the landfill slope and conversion of the eastern railroad track bed adjacent to Wetland C into a buffer.
- The present buffer conditions are nonexistent to minimal and are all well below 50 feet in width. The proposal entails removal of invasive plants and debris, addition of substantial volumes of engineered soils to provide a growing media, enhancement of water quality functions and substantial planting of

native plants. The proposed use of rain gardens will help ensure sufficient hydrology for the plants to flourish and perform their functions. These rain gardens will be designed to provide a stable shoreline edge / buffer and will be designed not to erode. The assessment provides documentation that these measures will enhance the present functions.

- OM will also underwrite the costs of piling pulls (up to 50) associated with the tidal plan.
- Enhance the wetland system by removing culverts in two locations running along the to-be-abandoned railroad corridor east of the landfill site. One set of culverts that are presently blocked will be removed at the south end of this area just north of the Simpson Pad Access road. The culvert section to the east was a principle connection to Wetland C but has been blocked by sediment and beaver activity and inhibits fish movement. The culverts will be removed and replaced by improved access channel and a habitat pool. A similar replacement will occur at the present Wetland V/W outlet (see Figure 12 in the Revised BA/HMP in this FEIS).

After track removal the eastern track bed adjacent to Wetland C will be covered with a suitable depth of topsoil and planted with native vegetation providing a substantial new buffer zone. (This is more fully described later in this document under proposed Enhancements).

In addition to proposed wetland fill and removal activities, buffer impacts to Wetlands D and N are anticipated to accommodate a required emergency access road (see Figure 17) either across Wetland D via a former road grade or along the southern edge of Wetland D and western edge of Wetland N. If the former of the two proposed alternatives for the fire access road alignment is selected, 0.05 acres (2,349 square feet) of wetland fill will be required to accommodate a 20-foot wide emergency access road. In addition, approximately 84 feet linear feet of bridge span will be required. No other wetland or stream buffer, or wetland or stream impacts are proposed in development plans for the site at the time this report was prepared. Total wetland and buffer impacts will not be available until an alignment for the proposed fire access road has upon the fire access road has been determined. Therefore proposed wetland fill associated with Alternative 2 for the fire access road is not discussed within the mitigation action section of this report. If Fire Access Alternative 2 is selected by the City in order to accommodate its restoration proposals, the City will be responsible for the mitigation required for that alternative. Total buffer impact, based on the alignment of the preferred alternative 1, will result in 27,623 square feet (0.64 acres) of encroachment and about 2,800 feet of impact to vegetation. A section on the Fire Access Alternatives is included later in this document. A conceptual wetland and stream mitigation plan has been prepared and is presented in the Mitigation Plan section of this report.

The proposed development will be designed and constructed using sustainable building practices such as those embodied in the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED system. Sustainable practices like those included in the LEED system are intended to "transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life" (US Green Building Council, 2006, LEED for New Construction Version 2.2 Reference Guide). The project includes innovative stormwater design that utilizes pervious surfaces, treatment and infiltration of stormwater runoff. Stormwater impacts will be further reduced with the enhancement of critical area buffers utilizing native vegetation and establishment of rain gardens along the outer edge of the buffer.

A Consent Decree between the City of Everett and Washington Department of Ecology (Ecology) for the Tire Fire/Landfill Site includes a detailed Cleanup Action Plan (CAP) that specifies requirements for existing, undeveloped conditions and for potential future developed conditions. These requirements address all environmental exposure pathways of concern (landfill gas, groundwater, surface water and direct contact) and include both design/performance standards and review/approval procedures (City of

Everett & Federal Highway Administration [FHWA] 2004). The landfill leachate collection system and project design will be rebuilt and upgraded by the City, then maintained and managed in accordance with the existing CAP.

Public amenities that are included in the proposed development are wetland and shoreline enhancements and restorations, trail extensions, multi-use public spaces for indoor and outdoor gathering, park spaces on the Tire Fire/Landfill Site and Simpson Pad, and a multi-purpose water dependent use facility to include, a boat dock (capacity estimated at 12 to 15 boats ranging in size from 12 to 45 feet) for kayaks/small boats (including crew shells). Public access improvements would include extension of the riverfront trail to the north, as well as additional trails associated with habitat enhancements/restoration. These improvements are intended to provide pedestrian and bicycle trails and access along the waterfront, and linkages to adjacent retail, commercial, wetland interpretive areas and open space.

Mitigation Actions

Mitigation efforts begin with attempting to avoid impacts if possible and define methods and measures to reduce and minimize aquatic habitat and buffer impact as much as possible. This project has accomplished the mitigation sequencing that has resulted in a minimized impact scenario and proposed mitigation measures are reasonable and effective toward restoring already or existing damaged habitats and providing increased functions for fish and wildlife.

Mitigation for wetland impacts will consist of the creation and enhancement of Category I wetlands, establishment of vegetated buffer zones and restoration of stream habitat. Conceptual mitigation plans proposed include:

- Create a total of 0.19 acres (8,150 square feet) of riverine open water wetland, and associated palustrine emergent and scrub-shrub wetland to compensate for the fill of 0.15 acres (6,510 square feet) of isolated palustrine, emergent and scrub-shrub wetlands,
- Create a total of 0.48 acres (21,102 square feet) of riverine, open water wetland to compensate for the removal of 0.29 acres (12,775 square feet) of isolated palustrine, scrub-shrub wetland,
- Enhance 2.74 acres (119,221 square feet) of Snohomish River shoreline buffer
- Enhance 13.87 acres (604,307 square feet) of wetland buffer.

A Conceptual Wetland and Stream Mitigation plan has been prepared and is located in the Mitigation Plan section of this report.

CITY OF EVERETT ACTIONS

Public Amenities, Trail System and Shoreline Restoration

City of Everett proposes construction of an approximately 3 acre waterfront park located near 36th Street to provide enhanced public access to the Snohomish River shoreline and provide a nexus where the public can access the proposed riverfront trail system. The park site was previously used as a mill and is currently cleared and undeveloped. The park program and alignment and type of trail crossings will be finalized later during the design process and will require additional environmental review. Facilities associated with this park area may include a public boat dock, restrooms, open play areas, trails, and enhanced riparian shoreline areas. The waterfront park will be designed to be consistent with the SMP.

Avoidance and minimization of wetland impacts will be a primary emphasis of the final design. Part of Wetland K is located in an area set aside for a City park and public use purposes with the remainder extending into OM property. Wetland K is also adjacent to a planned road and will be filled to accommodate road construction and mitigation for that is included in OM's plans. Any other wetland impacts from City projects will be restored or mitigated elsewhere within the property boundary in a manner consistent with the SMP. It is anticipated that for the park area that all areas of temporary wetland and buffer impacts will be restored to provide equal (for Category 1 impacts) or higher (for other wetland classes) habitat value and function. Additional environmental review to permit those amenities will be completed when design details are developed more fully over time. It is currently anticipated that additional SEPA analysis and permit applications for a portion of the work will be completed in September 2008.

Surcharging of Tire Fire/Landfill Site

In order for any redevelopment to occur on the Tire Fire/Landfill, the City of Everett must complete the final closure procedure that allows the public and others to use the landfill area. This activity must be completed regardless of the actions proposed by OliverMcMillan. The City intends to proceed with surcharge and site preparation immediately upon acceptance of the Final Environmental Impact Statement and approval by the City. This work will include upgrade and relocation of the leachate collection system, placement of surcharge and final site leveling to prepare for any future development.

Wetland and Stream Restoration

The City also proposes wetland and stream restoration on the adjacent properties. The City and Ecology will commit in a MOA to develop an integrated wetland and stream restoration plan. The City will conduct hydrologic modeling, and topographic surveys necessary to have a feasible plan that restores tidal processes and functions in a majority of Wetland C (including dendritic channels). The City's actions relative to development and implementation of the restoration plan are summarized below.

- Development of an integrated wetland and stream restoration plan that restores tidal processes and functions to Wetland C.
- Preparation of a tidal restoration plan will be complete within 18 months of the MOA being signed by the City and Ecology,
- Local, State and Federal permits required prior to construction associated with the plan will be diligently pursued,
- Construction associated with the restoration plan will begin within 18 months of receipt of all the required permits for the plan.

Restoration may include wetland rehabilitation and enhancement through removal of invasive species and installation of native shrub and forest species, placement of Large Woody Debris (LWD), stream channel reconfiguration, establishment of functioning buffers, and restoring River connections. Design details of the City's trail system and proposed wetland and stream restoration are not available at this time and therefore impacts have not been identified and will not be addressed in this HMP. The City of Everett is committed to completing the public trail and wetland restoration. Additional environmental review to permit the restoration work will be completed when design details are developed more fully. (It is currently anticipated that additional SEPA analysis for a portion of the work will be completed in September 2008).

CONSTRUCTION TIMING

The project is phased with construction spanning multiple years. The full build out is expected to take up to ten years. At this time, upland site base grading and preparation as well as the proposed kayak/small boat docks, and dike and levee repairs, and upgrades are expected to occur first in the late fall and/or winter of 2008/2009, with construction of those facilities ending approximately two years after the commencement. Once the upland areas are prepared for construction and segregated, systematic, phased construction will occur for residential communities and commercial buildings.

A preliminary estimate of phased project construction includes:

Table 2. Everett Riverfront Milestone Schedule

• City reviews, revises and issues Final EIS	June/2008
• Landfill/Tire Fire Site, Building permits	Mar/2009
• Landfill/Tire Fire Site, Zoning Approvals Complete	Oct/2008
• Landfill/Tire Fire Site, Shoreline permits complete	June/2009
• Simpson Pad, Grading permit	June/2009
• Simpson Pad, receive building permit	Mar/2010
• Eclipse Mill/Drywall, Permit for Road	Oct/2009
• Landfill/Tire Fire Site, Grading permit	June/2008
• Landfill/Tire Fire Site, receive building permit	May/2009
• Begin roundabout and bridge to Simpson site	Mar/2008
• Begin work on landfill grading, fill and surcharge	June/2008
• Begin utility installation at landfill site	Mar/2009
• Begin Landfill Gas System Installation	May/2009
• Begin Building Construction on Landfill/Tire Fire Site	May/2009
• Begin Site Work on Landfill/Tire Fire Site	Mar/2009
• Occupancy on Landfill/Tire Fire Site	Sept/2010
• Begin Grading at Simpson Pad	June/2009
• Begin Construction at Simpson Pad	Mar/2010
• Occupancy on Simpson Pad	May/2011
• Eclipse Mill/Drywall Grading	May/2009
• Begin Construction at Eclipse Mill/Drywall	May/2009
• Occupancy on Eclipse Mill/Drywall	Sept/2010
• Construct dock below gather place	May/2010
• City Wetland Enhancement and Trail Extension	July/2010
• City Park at 36th Street	Oct/2010

Construction Work Windows

The approved construction work window for in-water work in Snohomish River is from **June 1st – October 31st** to avoid impacts to listed chinook salmon and listed bull trout. There is currently no approved construction work window for steelhead. However, due to the general similarities in life history to Pacific salmon, they will be placed in the same construction work window as Pacific salmon. The approved work window for bald eagle nesting is from August 16th to December 31st of any year. A complete summary of construction work windows for listed species documented for the project area are listed below in Table 3.

Table 3. Designated Work Windows for Construction

Species	Construction Work Windows
Bull trout[a]	In-water June 1 – October 31
Puget Sound Chinook salmon[a]	In-water June 1 – October 31
Puget Sound steelhead[b]	In-water June 1 – October 31

Notes:
[a] All fish species work windows were documented as follows: Approved Work Windows for Fish Protection in all freshwaters excluding waters within national park boundaries, Columbia River, Snake River and lakes. (USACE 2006).
[b] There is currently no approved construction work window for steelhead. However, due to the similarities in life history to Pacific salmon, they will be placed in the same construction work window as Pacific salmon.

CONSTRUCTION EQUIPMENT AND MATERIALS

Construction materials will be brought to the site on an as needed basis in an effort to limit unnecessary stockpiling. Staging of new materials as well as parking and project operations building will be located within designated areas outside of wetlands and wetland buffers. All construction-related waste materials will be sorted with respect to recycling categories and disposed of off-site in accordance with applicable regulations.

Anticipated construction materials to be used in building the project include:

- Concrete,
- Framing, roofing and siding materials,
- Building insulation,
- Steel beams,
- Concrete and/or steel pilings,
- Riprap and Quarry spalls
- Clean fill for preload and flood proofing,
- Asphalt,
- Gravel filter and drain material, and
- Pipes, wiring and conduit for utilities and stormwater conveyance.

Anticipated construction equipment includes:

- Earth moving equipment (grade and fill),
- Heavy machinery (bulldozers, excavators, front end loaders and trenchers, etc.),
- Cranes,
- Barges,
- Pavers and rollers,
- Pile drivers (land and water based vibratory and impact hammers),
- Diesel or gas-powered generators,

- Dewatering pumps,
- Concrete trucks (concrete will be imported and pumped), and
- Lattice boom crawler crane.

CONSTRUCTION SEQUENCE

The project sequence may be amended over time in response to market demand for the proposed uses and the land use capacity of the site (type, location, and size of uses and structures and infrastructure capacity). However, the anticipated sequence of construction-related activities is to begin with residential development at the Simpson Pad followed by the Tire Fire/Landfill Site. Work at both sites is anticipated to begin along the shoreline (including any in-water work) and then progress inland or west towards Everett. In-water and out-of-water sequencing is as follows:

In-Water Work

- Mobilize to the site,
- Provide source control stabilization measures,
- Construct and maintain temporary/permanent erosion and sedimentation control facilities for water quality protection,
- Install, commence and maintain any earthfill cofferdams or diversion pipes, dewatering pumps will be installed at this time as needed,
- Cut and fill in areas where the structures, repairs and/or upgrades will be located,
- Install and/or remove pilings (impact hammer use may require wood block and bubble curtain),
- Construct or upgrade structures,
- Install new utilities (power, communications, etc.),
- Restore natural water flow of Bigelow Creek and remove cofferdams and/or diversion pipes,
- Remove temporary erosion and sediment control devices,
- Site clean-up, and
- De-mobilize from the site.

Out-Of-Water Work

- Mobilization to the site,
- Install necessary traffic controls and/or detours,
- Construct stabilized construction entrance(s),
- Install temporary/permanent erosion control measures throughout the construction zone and along staging and stockpiles areas,
- Clear and grade the minimum site area required for construction,
- Construct buildings and structures,
- Install new utilities (power, communications, etc.),
- Site clean-up, and

- De-mobilize from the site.

Project Completion

- Clean up and restore staging and stock piling areas,
- Install landscaping and vegetative enhancements along with public lighting,
- Remove necessary traffic controls and/or detours, and
- Complete all construction as-built drawings for permit compliance.

CONSERVATION MEASURES

A variety of conservation measures and BMPs will be utilized to minimize impacts to federally protected species and the surrounding habitat during the construction. They are as follows:

General Conservation Measures

The following general conservation measures will be taken to ensure that impacts to terrestrial and aquatic species and their habitat are minimized throughout the duration of the project:

- Disturbance will be limited to the smallest area feasible for each phase of the project and element under construction and will stay within the limits of clearing identified on site plans and demarcated in the field with temporary exclusion fencing,
- Regulated wetlands and shoreline buffers will be isolated in the field with temporary exclusion fencing to prevent construction crews from inadvertently disturbing these areas,
- Waste materials will be collected and sorted with respect to recycling categories and disposed of off-site and in accordance with applicable regulations,
- Entrance rumble areas will be installed to remove soil from truck traffic,
- Truck wash areas for equipment and deliveries (on and off-site) will be provided,
- Stockpile and staging locations will be identified and approved,
- Active stockpile areas will be contained within a soil berm and equipped with erosion control measures,
- Approved stormwater and sediment erosion control plans will be implemented, inspected daily and maintained properly throughout construction,
- Fueling areas will be distinctly identified and established within the construction areas. These locations will be equipped with spill prevention and control devices,
- Adequate materials and procedures will be on site to respond to unanticipated weather conditions or accidental releases of materials (sediment, concrete or fuel),
- Concrete piles for in-water construction elements will be used versus steel piles and all concrete will be fully cured prior to arrival at the site,
- Floating silt curtains may be necessary for shoreline restoration work to contain sediment released from shoreline setback activities, and
- Use of a bubble curtain and a 6-inch-thick piece of wood between the impact hammer and the pile during in-water pile driving activities will be in place to attenuate underwater sound pressures.

Spill Prevention

A Spill Prevention, Control and Countermeasures (SPCC) plan will be available for this project. No pollutants are expected to be discharged during construction. However, any potential spills will be handled and disposed of in a manner that does not contaminate the surrounding area. The SPCC will include the following elements:

- Site and project-specific information,
- Specific operating and construction procedures for work on and above the landfill site,
- Spill prevention, control and containment methods,
- Response protocols and reporting procedures for construction-related leaks or spills,
- Contingency plan and provisions,
- Waste disposal methods and locations, and
- Proper management of oil, gasoline and solvents used in the operation and maintenance of construction equipment.

The SPCC will ensure that equipment will be free of external petroleum-based products prior to entering the work area, during the work and for making any necessary repairs prior to returning the equipment to operation in the work area. This SPCC will be consistent with the City's Comprehensive Emergency Plan and the State of Washington Oil Spill Contingency Plan.

OPERATIONS AND MAINTENANCE

Following the completion of the construction phase of this project, monitoring and maintenance associated with mitigation and replanting of the project area will occur. Road maintenance may be needed at some time in the future. Periodic cleaning and other routine maintenance operations of the stormwater system and facilities are also anticipated.

ACTION AREA

The action area includes the geographic extent of physical, biological and chemical impacts of a project and is defined as the maximum area of potential impacts associated with the project's direct and indirect effects as well as effects from interrelated and interdependent activities, taking into consideration the impact minimization measures that will be implemented.

The action area for the project was determined based on the project features and activities described above. Most of the project impacts are expected to occur in the immediate vicinity of the construction "footprint" -- i.e., the actual area of ground disturbance associated with materials stockpiling, site preparation, grading and filling, wetland and stream fill, building construction and surface paving -- as well as areas beyond the footprint that are directly or indirectly affected during construction. The project includes water dependent uses, such as kayak/small boat dock, that would increase human disturbance and pose potential water quality related issues within the Snohomish River. The project would also facilitate an increase in traffic and economic development within the project vicinity. These interrelated or interdependent activities would have physical, biological or chemical impacts that could influence the extent of the action area.

The footprint of the development has been described above and is shown in the design drawings presented in Appendix B. Of the construction activities described above, the associated impacts that typically carry beyond the footprint are noise, water quality, air quality (smoke and dust), and quantity and human disturbance. Each zone of impact is addressed below. These elements are briefly discussed below in order to help define the Action Area for this evaluation.

NOISE

In-Water

Construction related pile driving activities associated with the construction of kayak/small boat dock would temporarily increase in-water noise levels. The level of underwater noise generated from pile driving varies with different types and diameters of piles, type of hammers, and by different types of substrates. Each configuration can produce different sound levels and waveform characteristics. The proposed project is currently designed so that concrete piles will be used due to their inert non-corrosive qualities. Standard concrete piles vary in diameter (12-inch up to a 24-inch square or octagonal) depending on the project requirements and can be installed by either driving them into the ground or drilling a shaft and filling it with concrete. Since specific design elements have not been finalized a used worst-case scenario (24 inch diameter concrete piles installed with an impact hammer) has been used to evaluate project impacts and determine the action area.

The water surface elevation of the Snohomish River within the project area is controlled by tides and raises and lowers with the flow and ebb of the tides. However, salt-sensitive plant species characterize the area adjacent to ordinary high water mark (OHWM), indicating that salt concentrations in this portion of the river are low. The areas below OHWM are mostly void of vegetation and consist of sandy silts (mud). The mean high higher water (MHHW) for this area is 11.1 feet with mean range of 7.5 feet and mean tide of 6.5 feet, according to the USACE tidal datum. These on-site tide shifts significantly reduce the depth of water immediately along the shoreline and allows for a reduction in the number of piles that will be installed within the river margins by timing construction during low tides. Another undecided design element is the use of cofferdams and floating silt fences which would isolate the areas where piles are to be installed. Current and other variables must be more fully evaluated to discern the effectiveness of these features. Shallower water (e.g., water less than 3 feet deep) does not propagate sound energy effectively (Urick 1983 in WSDOT 2006) therefore; project impacts to be analyzed from pile driving may be less than described in this analysis of worst-case scenario.

Standard noise reduction and minimization strategies will be used to attenuate underwater sound pressures during in-water pile driving activities such as working within the fish work windows and the use of a bubble-curtain and a 6-inch-thick piece of wood if impact hammers are utilized. No baseline underwater ambient noise information was found specific to the project area. Feist et al. (1992) measured ambient levels at Everett Home Port approximately fifteen years ago to be between 80 and 90 dB, however did not specify if these were peak or rms values which would be used in calculations for underwater noise attenuation. Since more recent studies measured ambient underwater noise levels in the Puget Sound and Duwamish River to be 130 dB_{peak}, (WSDOT 2006) 90 dB_{peak} or 90 dB_{rms} is a conservative estimate that can be used in our worst-case scenario analysis. Underwater noise levels 10 meters (33 feet) from pile driving activities associated with 24 inch diameter concrete piles is expected to be 188 dB_{peak} or 173 dB_{rms} with a 15 dB reduction in peak and rms values with use of a bubble curtain (WSDOT 2006). Using the Nedwell model in a freshwater system under worst-case scenarios underwater noise associated with pile driving activities would dissipate at 1,186 meters or 0.73 miles. The Practical Spreading Loss model (in use by the National Marine Fisheries Service [NMFS] and USFWS) would generate distances much further. However, sound pressure travels in a linear direction away from the

source; when the sound intersects land, it is assumed that it attenuates to background levels; it should not travel through the land or reflect off the land or through the bends in the Snohomish River. Consequently, the action area determined for underwater noise impacts for this project as the in-water area within straight-line distance from the project area, approximately 0.5 miles south of the Simpson Pad and 0.5 miles north of the Newland site as shown in Figure 3 – Action Area Map.

Terrestrial (airborne emissions)

A potential impact associated with this project was identified from airborne noise disturbance through use of construction equipment and heavy trucks. Ambient background noise in an urban area adjacent to freeway traffic (Interstate 5 for the project) is expected to be 88 dBA (Cavanaugh and Tocci 1998 in WSDOT 2006). The construction equipment (listed above) was reviewed for purposes of establishing the action area for the project. The WSDOT (WSDOT 2006) rules for decibel addition for common construction equipment noise were used to determine at what distance noise impacts from the project area would attenuate to background (ambient) noise levels (88 dBA).

The impact area was determined by assuming a worst-case scenario that general construction equipment was representative of point source noise with a maximum noise level of 100 dBA while any vehicular (truck) noise disruptions associated with the construction activity would be represented of line-source noise at a maximum noise level of 96 dBA. Noise studies take into account the existing conditions at a site based on vegetated or developed state. Soft-site conditions are described by heavily vegetated conditions and hard site conditions are described as lacking vegetation, paved and fully developed. If the topography surrounding the project area is considered soft-site conditions (heavily vegetated), construction noise levels (point source) would attenuate at a rate of 7.5 dBA per doubling of distance while the traffic noise levels (line source) would attenuate at a rate of 4.5 dBA. This would result in background noise levels being reached within 200 feet of the project. If the topography surrounding the project area is considered hard-site conditions (developed, void of vegetation), construction noise levels (point source) would attenuate at a rate of 6 dBA per doubling of distance while the traffic noise levels (line source) would attenuate at a rate of 3 dBA. This would result in background noise levels being reached within 400 feet of the project.

Noise impacts will vary across the site. While the riparian corridor along the Snohomish River, on-site wetlands (especially the Simpson Category 1 Wetlands and Riparian Corridor) and some of the area east of the Snohomish River would be considered soft site conditions much of the remaining project area and surrounding area lacks trees and would be considered hard site conditions. Assuming hard-site conditions as a worst-case scenario, any general construction ambient noise created by the project is expected to be attenuated to background (ambient) levels within 400 feet of the project. Consequently, the action area for general construction ambient noise impacts for this project is the area within a 400-foot or 0.08 mile radius from the project area as shown in Figure 3.

This project may require some pile driving to install or proof piles for building foundations. Occasional pile driving activities will produce sound in the range of 81 to 115 dBA (using 115 dBA as worst case scenario). If the topography surrounding the subject site is considered soft-site conditions, construction noise levels (point source) would attenuate at a rate of 7.5 dBA per doubling of distance. This would result in background noise levels being reached within 800 feet of the project. If the topography surrounding the subject site is considered hard-site conditions, construction noise levels (point source) would attenuate at a rate of 6 dBA per doubling of distance. Assuming hard-site conditions as a worst-case scenario, any maximum construction ambient noise created by the project is expected to be attenuated to background (ambient) levels within 1,600 feet of the project. Consequently, the action area

for maximum construction ambient noise impacts for this project is the area within a 1,600-foot or 0.30 mile radius from the project area as shown in Figure 3.

In summary, most of the temporary terrestrial noise impacts would come from general construction noise that would extend up to 400 feet or 0.08 mile radius from the work areas. However, during the use of impact hammers for pile driving the maximum construction noise impact would be higher than background levels up to 1,600 feet or 0.30 mile radius of the project. Operational noise would be significantly less than construction noise.

WATER QUALITY AND QUANTITY

Activities associated with project construction, operation and maintenance has the potential to alter water quantity (base flow, peak flow and duration) and the quality of water through potential increase in the release of containments and sediment loads. For example: the increase in new impervious surface (e.g., rooftops, roads and parking lots) could generate runoff during rainfall events that would otherwise infiltrate into the ground which in turn could affect water quality, activities associated with in-water recreation (crew races, transient moorage and boat traffic) could increase pollutants, temporary diversion of water and in-water construction could increase sediment loads and increase in human and vehicle traffic volumes could increase pollutant loads. Conservation measures to minimize impacts, including stormwater and drainage system designed with innovative BMPs and vegetation enhancement and site-specific conditions, will be maximized to the extent possible. All environmental exposure pathways of concern (landfill gas, groundwater, surface water and direct contact) will be included both in design/performance standards and review/approval procedures according to the Consent Decree and CAP for the Tire Fire/Landfill Site that specifies requirements for potential future developed conditions.

The greatest water quality impact is expected from a temporary increase in fine sediments that would be suspended during in-water construction and restoration/enhancement activities. In 2001 NMFS issued a Biological Opinion (NMFS Tracking No. 2001/00533) in response to the 41st Street Overcrossing Freight Mobility Project and Railroad Track Removal and Upgrade Project which was located within and adjacent to the project area and addressed a conceptual development plan of the project area as part of a cumulative effects analysis. In 2004 NMFS reinitiated the BO (NMFS Tracking No. 2003/00337). In the 2004 BO, NMFS defined the action area for water quality impacts to include the mainstem Snohomish River downstream from the southeastern boundary of the project at River Mile (RM) 7.0 to the confluence with the Snohomish estuary. Additionally, to accommodate the conservative estimate of RM 8.0 as the maximum upstream extent before tides reverse and carry the water back downstream, the action area was expanded to include the mainstem Snohomish River channel from bank to bank up to RM 8.0. The same action area for water quality impacts for this project is the same as that determined by NMFS for the 41st Street Overcrossing Freight Mobility Project and Railroad Track Removal and Upgrade Project (Figure 3).

HUMAN DISTURBANCE

Increased human activity and traffic would increase within the project area as a result of the proposed project. Projected increases in the economy could increase the need for more public services, public transportation, stores, restaurants, recreational facilities and residential and commercial development outside of that proposed within the project area. Higher levels of human activity during construction and operational activities will increase noise, waste generation (garbage), use of herbicides and chemicals, mowing, tree trimming, and use of winter road treatments such as salting and sanding. Increased emissions (smoke, light, dust, automobile emissions) may result from the project. Construction could generate dust and other emissions. These emissions could be carried beyond the project area during

construction in the summer when earth has been exposed, the atmosphere is dry and winds are sufficient to mobilize surface particles if conservation measures are not adhered to effectively. With proper construction practices and management, these impacts should remain largely contained to the immediate project area. Wind and climate will influence emissions. For this reason, airborne emissions have the same action area as noise.

The action area determined for noise and water quality and quantity is inclusive to that of the greatest extent of human disturbance that can be readily quantified. Impacts associated with cumulative economic development are somewhat harder to predict, quantify and locate. Since the Snohomish River borders the east side of the project and the northern and western sides are extensively developed the most likely area for increased human disturbance from economic growth is south of the project area. At this time the action area will not include cumulative economic increase because there are currently no plans to develop this area that is contingent on the project. Cumulative economic impacts will be discussed in the impact analysis of this document.

WETLANDS AND STREAMS

Physical impacts to wetlands and stream will result from the project. The proposed development plan includes a total of approximately 6,510 square feet (0.15 acres) of unavoidable wetland fill of Wetlands J, K and M and 12,775 (0.29 acres) square feet of Wetland X removal by incorporation into expanded Snohomish River habitat. Direct wetland impacts will be mitigated by creation of onsite wetland habitat designed in conjunction with the integrated wetland restoration plan developed for the site. Indirect impacts to adjacent wetlands and streams from increased stormwater will be reduced by removing invasive species and creating native vegetation buffers.

SUMMARY

The impacts with the largest associated area for this project are ambient terrestrial noise disturbance, water quality and quantity and human disturbance. Consequently, an action area of 0.5 miles surrounding the site and the Snohomish River downstream to the estuary has been defined as the Action Area for this project and is depicted in Figure 3.

BASELINE ENVIRONMENTAL CONDITIONS

As previously discussed, the intention of this project is redevelopment of the project area to include commercial and residential uses. The term redevelopment inherently implies the natural landscape of the site has been previously manipulated, developed and utilized for commercial, industrial or residential purposes. For well over 100 years, the project area has sustained intensive heavy and light industrial uses. Previous consultants, as well as GeoEngineers, have conducted site investigations to observe, document and determine the extent of remaining on-site fish and wildlife habitat conservation areas, specifically streams and wetlands. Aquatic, terrestrial and wetland resources discussed in the following sections describe on-site ecological features, which are the focal point of this BA/HMP. Site photographs are presented in Appendix C and document existing conditions of aquatic, terrestrial and wetland features within the project area.

Research associated with this report included a detailed review of available historical aerial photography of the project area to document landscape alterations and their respective occurrences (GeoEngineers 2007b). Aerial photography, dating back to 1947, confirms intensive industrial use within the project area and associated anthropogenic alteration of the surrounding landscape. The photography indicates and reveals the extent of historical land use within the project area dates as far back as 1947. A majority of

the current wetland and stream boundaries are either; resultant of excavation activities associated with the installation of railroad grades, or became established after industrial structures were removed from the site. Bigelow Creek was altered prior to 1947 and the natural stream course prior to the development of the site remains undetermined. A stream channel is evident in photography from 1947 to 1985 that depicts the stream passing through or adjacent to the West Wetland Complex and through the North Wetland Complex before discharging into the Snohomish River. Sometime between 1985 and 1993 human disturbance, grading and filling activities, associated with the removal of a railroad crossover line, altered and redirected the flow of Bigelow Creek so that the railroad track facilitated an additional confluence with the Snohomish River through an existing culvert immediately north of North Wetland Complex.

Local regulatory jurisdiction and buffer width determination is guided by conditions of two legal settlements related to appeals of the City of Everett Shoreline Master Plan, a 2003 settlement agreement between the City of Everett and the Tulalip Tribes of Washington (informally referred to as the Tulalip Agreement), and a 2004 settlement agreement between the City of Everett and the Pilchuck Audubon Society and the Public Employees for Environmental Responsibility (informally referred to as the Pilchuck Agreement). As part of the settlements the City of Everett would continue use of the old "Environmentally Sensitive Areas Ordinance" (which pre-dated the current Title 19 Critical Areas Ordinance) for all areas within shoreline jurisdiction along with additional conditions mitigate impacts of development. That action has been codified and is included in Title 19, Chapter 33D Shoreline Overlay District (Everett Municipal Code19.33D). The areas within the project area that are regulated under EMC 19.33D are included in the Shoreline and Shoreland Jurisdiction Map (Figure 4). All onsite wetlands and streams are within shoreline jurisdiction and therefore regulated pursuant to EMC 19.33D.

AQUATIC HABITAT

Snohomish Estuary

The portion of the river near the subject site is described in the SMP and is included in Ecological Management Unit (EMU) 1. As described in the City of Everett's Snohomish Estuary Wetland Integration Plan (1997), EMU 1 generally includes freshwater wetlands in the southern portion of the Snohomish watershed. The majority of the wetlands within this unit are diked and in agricultural production. River and slough banks are typically steep, consisting of sands with rock riprap and occasional pilings. A narrow shoreline of sandy silts (mud) is present throughout. Prior to diking, the area was a mosaic of tidal marshes, forested wetlands, sloughs and mudflats that were flooded daily. Agriculture has been the primary land use in the unit. However, much of the lower estuary and watershed has been developed for industrial and commercial uses (Port of Everett and Everett).

The Snohomish Estuary includes parts of Possession Sound, Port Gardiner Bay and the mouth of the Snohomish River; and is a major source of fresh water for the Puget Sound (Gustafson et al. 2000). This estuary is productive, supporting many species of estuarine and near-shore marine plant and animal species. The estuary provides essential ecological functions for anadromous salmonids, including feeding (rearing), migration, predator avoidance, and saltwater/freshwater or more regulatory adaptation (City of Everett and Pentec Environmental 2001).

Snohomish River

The mainstem Snohomish River is below the confluence of the Snoqualmie and Skykomish Rivers, and enters Puget Sound near the City of Everett at Port Gardiner Bay. The project area is bordered on the east by the Snohomish River from north of RM 5 (approximately RM 5.5) to RM 7 (Figure 5, 5a & 5b –

Stream Delineation and Buffer Maps). Uses along the river within the project area include heavy equipment storage, aggregate storage, solid waste landfills, railroads and Rotary Park with pedestrian paths at the south end of the site. The river currently consists of steep, diked banks (with areas of large concrete, riprap or construction waste as protection) and extensive pilings placed throughout the lower river zone. These extensive man-made earthen dikes have been in place since the mid-1930s and confine the limits and influence of the river (Haring 2002). The water surface elevation of the Snohomish River within the project area is controlled by tides and raises and lowers with the flow and ebb of the tides. However, due to a weak salt wedge influence, there are no salt-tolerant plant species in the area immediately adjacent to the river. The riparian vegetation consists primarily of Himalayan blackberry (*Rubus armeniacus*), Sitka willow (*Salix sitchensis*), Pacific willow (*Salix lasiandra*), salmonberry (*Rubus spectabilis*), red alder (*Alnus rubra*), black cottonwood (*Populus trichocarpa*) and big-leaf maple (*Acer macrophyllum*). Lack of riparian vegetation and species diversity, in conjunction with extensive diking, results in limited recruitment of LWD that is large enough to function as cover or influence channel morphology (Haring 2002). In addition to production losses experienced to date, future production potential for salmonids (parr and pre-smolt) in the river could decrease if existing LWD continues to decay and is not replenished through new recruitment (Haas and Collins 2001).

Bigelow Creek

Bigelow Creek is located on the project area and enters the west bank of the Snohomish River at RM 5.8 north of Simpson Pad. The creek flows through the partially filled Simpson Category 1 Wetlands and Riparian corridor prior to entering the Snohomish River (Figure 5, 5a & 5b). Extensive fill was placed in historic wetlands, and the creek was ditched, channelized and piped through the mill site and along the railroad (delineated Wetlands V and W) (Haring 2002). A tide gate through the dike at the mouth of Bigelow Creek previously impaired access into the creek, but has been removed (Haring 2002). Since the removal of the tide gate, the creek experiences tidal influence from the Snohomish River. The existing stream habitat and buffers of Bigelow Creek have been impacted by the construction and maintenance of the adjacent rail-lines for decades. The channel has been constructed as linear, low gradient drainages (ditch) with little to no channel complexity, receive untreated runoff from the rail beds, and exhibit no riparian conditions. Natural LWD is lacking and pool or riffle segments are absent. Invasive hydrophytic vegetation dominates this area.

Haring (2002) rates the overall riparian condition of Bigelow Creek as poor to fair in the anadromous zone of the watershed, but recognizes the potential to improve as riparian vegetation matures. Recent onsite evaluations have concluded that the riparian conditions for Bigelow Creek are at best poor (GeoEngineers 2007) with enhancement opportunity. Juvenile salmonid use has been documented by the Tulalip Tribes (Loch 1999), and is also documented in Haring (2002). The creek segment flowing through Wetland C has a large and extensive network of beaver (*Castor canadensis*) dams which has influenced adjacent wetland by contributing hydrology. This increase in wetland complexity and hydrology is used in turn by other animal species.

Bigelow Creek Water Quality

Much of the Bigelow Creek watershed is fully developed. Urban runoff constitutes much of the flow in the system. Water quality, as well as sediments is impaired in Bigelow Creek which includes the project area. According to information obtained from the Environmental Health Technical Data Summary Report, dated February 8, 2007, prepared by GeoEngineers (2007c), Bigelow Creek sediment may contain total petroleum hydrocarbons, benzene, toluene, ethylbenzene, and xylenes, metals and polychlorinated biphenyls (Floyd and Snider 1999). Residual contamination and/or materials and conditions not encountered during earlier investigations may be present and encountered during future site development. If contaminants are discovered during the redevelopment process, appropriate

precautions will be taken to ensure the health and safety and to prevent additional contamination. More specifically, restrictions on stream alterations are contained in the Ecology Final Consent Decree and CAP dated April 2, 2001 for the site.

Additional Streams

Additional stream features identified on-site, by ESA Adolfson during 2007 field efforts, include; Streams AA, BB, and CC. Figure 5, 5a and 5b, depict the location of these drainages and their relative buffers within the project area.

Wetland Habitat

There are 66.66 acres of wetlands surrounding the project area. Most of the wetlands are concentrated on the southern portion of the site, which comprises various portions of the Simpson Site. It has been estimated that approximately 25 acres of wetlands have been filled on-site over the last 25 years (GeoEngineers 2007a). Approximately 10 acres of wetlands were filled in connection with the railroad track construction on the western portion of the site, and approximately 15 acres of wetlands located on the southern portion of the site were also filled.

Wetland features within the project vicinity and their respective associated community types (Cowardin classification) are identified by the USFWS (National Wetland Inventory maps) and the WDFW (PHS data). Wetland community types within the project area are; palustrine emergent (PEM), palustrine scrub/shrub (PSS), palustrine forest (PFO) and riverine tidal. The location of wetland community types within the project area and adjacent parcels are shown in Figure 6 – Habitat Types and Plant Communities Map.

Wetlands within the project area have been delineated and described several times over the past 10 years. Pentec Environmental, Inc. (1994), City of Everett and Pentec Environmental (2001), Associated Earth Sciences, Inc. and A.C. Kindig & Co. (2003), and Watershed Company (2005 and 2006) all present detail investigations of the wetlands involved with this Project. The most recent wetland delineation and classification was performed by ESA Adolfson, who was retained by the City of Everett in 2007 as part of this impact evaluation. Wetland rating forms have been prepared and were provided for reference, but the final report to the City will not be completed before the publication of the EIS (GeoEngineers 2008).

Aforementioned reports prepared for the project area provide extensive discussion and description of the wetland features within the project area. Although the advantages of having multiple site investigations and reports, encompassing nearly 15 years, are numerous, labeling of on-site features has remained inconsistent. All wetland features within the project area and their respective boundaries have been determined by previous consultants. For the purposes of this BA/HMP, information relative to each wetland area as detailed in the GeoEngineers (2008) report entitled *"Revised Wetland and Stream Compilation and Review, Everett Riverfront Redevelopment"* has been reviewed.

A compilation of delineations conducted during 2006 to 2007, is presented with this report (Figure 7, 7a and 7b – Wetland Delineation and Buffer Maps) and stands as the most recent comprehensive delineation of onsite wetland features. These figures also show the required buffer widths per applicable City code (EMC 19.33D) for each wetland feature within the project area.

TERRESTRIAL HABITAT

Although terrestrial habitat is not regulated as strictly as aquatic or wetland habitat, it is considered to be an important component of the natural environment. A 2002 aerial photograph was used to identify land cover and wildlife habitat types within the project vicinity (Figure 6). The following four land cover types depict the amount of upland vegetation (or lack thereof) within the project vicinity:

- **Forested upland** – Areas containing trees, conifer stands and mixed stands of conifers and hardwoods.
- **Agricultural/cleared/herbaceous** – Areas containing shrubs, grasses, or herbaceous vegetation or all three. This also includes areas of agriculture and areas that have been cleared or deforested.
- **Urban** – Developed areas with little to no natural vegetation or that have been extensively developed with buildings, roads or houses.
- **Buffers (fringed upland habitat associated with the wetlands)** – Most wetlands have been regulated such that a protective buffer is established around the perimeter and usually contains upland habitat. Because the wetlands are classified by USFWS using the Cowardin system and characterized by vegetation life forms, this information can be used to extrapolate information concerning the upland buffer areas.

Existing Buffer Conditions

An evaluation of existing habitat within shoreline and wetland buffers on-site was conducted. In general, historical and on-going commercial and industrial activities have resulted in extensive degradation of stream and wetland buffers on-site and upland habitat adjacent to these features provides little to no function. A detailed buffer function analysis was prepared for stream buffer adjacent to the Snohomish River along the Tire Fire/Landfill and Eclipse Mill Sites, and wetland buffer adjacent to Wetlands C through I, V and W as detailed in the GeoEngineers (2008) report entitled *"Revised Wetland and Stream Compilation and Review, Everett Riverfront Redevelopment"*. A summary of the existing conditions discussed in that report are provided below.

Shoreline

Habitat along the shoreline of the Snohomish River from the northern edge of Wetland C to the most northern extent of the Stuchell/Newland Site has been altered by armoring and diking and the width of vegetated buffer varies greatly across the site. Disturbance of natural shoreline habitat has resulted in establishment of nonnative invasive species which currently dominates much of the area. A list of vegetative species present within the shoreline buffer and each species respective noxious weed status is provided in Table 4 (WSNWCB 2008).

Table 4. Shoreline Vegetation – Species List and Noxious Weed Status

Species	Noxious Weed Status[1]
Birdsfoot Trefoil (*Lotus corniculatus*)	NA
Canada Thistle (*Cirsium arvense* L.)	Class C[2]
Common Tansy (*Tanacetum vulgare)*	Class C
Himalayan Blackberry (*Rubus ameniacus*)	NA
Japanese Knotweed (*Polygonum cuspidatum*)	Class B[3]
Purple Loosestrife (*Lythrum salicaria*	Class B
Red Alder (*Alnus Rubra*)	NA
Scot's Broom (*Cytisus scoparius*)	Class B

Notes:
[1] Washington State Noxious Weed Control Board.
[2] Class C noxious weeds are either already widespread in Washington or are of special interest to the agricultural industry (WSNCB 2008).
[3] Class B noxious weeds are non-native species whose distribution is limited to portions of Washington State.

Presently, buffer habitat associated with the Snohomish River shoreline along the Stuchell/Newland and Eclipse Mill Sites range from 0 to 50 feet in width. Variations in buffer width correlate to landscape alterations such as, railroad, commercial and industrial facilities and on-going related activities (e.g. stockpiles of soil, concrete and various construction related debris). The existing buffer is this area has been heavily encroached by invasive species and has very limited functions to service wildlife opportunity. Approximately 200 feet of shoreline, immediately north of the edge of Wetland C, is stabilized by riprap and is void of vegetation. The former Milwaukee Road railroad tracks are directly adjacent to the shoreline in this area and no upland habitat is currently present. The historical and current uses have centered on the timber and water trade routes and have resulted in the past development in close proximity to the River. The existing location of these uses poses a limit to the available buffer recovery that may be achieved in the northern zone of the Project. For these reasons, the shoreline buffer along the landfill and northern portion of the Project is proposed to be an enhanced 50 buffer to recover some buffer function, maintain shoreline access and Shoreline use focus, and promote the historical maritime setting of the site.

Wetlands C, D, J, K, M, T, U, V W and X

In general, the buffer habitat within these small and highly disturbed wetland areas is of low value due to disturbance associated with long term railroad activities which include frequent train traffic (noise and vibration) and stormwater runoff collection and treatment (which is the main source of hydrology to Wetlands J, K, M, T, U and X. Wetland buffers in the vicinity of these features, overlap to the extent that the buffer extending from the west bank of Wetlands T and V (Bigelow Creek stream channel) establishes the western edge of the cumulative buffers. Buffer habitat is severely limited. These present buffer areas consist of up to 15 feet of vegetated upland from the western edge of Wetland C and D to the former Milwaukee Road railroad tracks, slight areas associated with the steep banks of Bigelow Creek and Wetlands U and W (West Ditch Drainage), and the eastern boundary of the Tire Fire/Landfill Site. The Tire Fire/Landfill Site can be characterized as monotypic, early-successional native plant communities that co-dominate with non-native, invasive plant communities because of the amount of disturbance (Watershed Company 2005). The invasive plant species identified in Table 4 are established within the all the wetland buffers on site and Bigelow Creek.

Simpson Development Pad

The Simpson Pad is bound by Wetland C to the north, Wetland D to the west and south and Wetlands E through I to the east. Each wetland's respective buffer encroaches onto the development pad. Buffer vegetation adjacent to Simpson Pad may be characterized as scrub/shrub or forested. However, because of the extensive amount of historical wetland fill projects completed before regulations were in place, upland buffer quality within the project area should not be considered pristine nor is it considered high quality habitat.

Four locations around the perimeter of the development pad were selected where distance measurements, general observations, and plant species presence was documented along a transect. Transects were located at the northwest corner (T1), northeast corner (T2), southeast corner (T3) and along the western edge of the development pad. Figure 8, 8a – 8d illustrate the location of each transect and Table 5 presents data collected along each transect.

Table 5. Simpson Development Pad Transect Data

Transect	Adjacent Wetland	Buffer Width	Transect length (feet)	Undisturbed Zone width (feet)	Disturbed Zone (feet)	Trail Width (feet)
T1	C	75	79	25	54	12
T2	I	50	91	14	77	7
T3	F	50	73	13	60	11
T4	D	50	47	32	15	8

Table 6 presents vegetation observed within buffers adjacent to the development pad.

Table 6. Simpson Development Pad Existing Vegetation

Species	Undisturbed Buffer	Disturbed Buffer
Black Cottonwood (Populus balsamifera spp. trichocarpa)	Observed and Abundant	Only Saplings Observed
Black Hawthorn (*Crataegus douglasii*)	Observed	
Common Plantain (*Plantago major*)		Observed and Abundant
Common Tansy (*Tanacetum vulgare*)		Observed and Abundant
Himalayan Blackberry (*Rubus ameniacus*)	Observed	Observed and Abundant
Indian Plum (*Oemleria cerasiformis*)	Observed	
Pacific Willow (*Salix lasiandra*)	Observed	
Red Alder (*Alnus rubra*)	Observed and Abundant	
Red-osier Dogwood (*Cornus stolonifera*)	Observed	
Scot's Broom (*Cytisus scoparius*)		Observed and Abundant
Scouler's Willow (*Salix scouleriana*)	Observed	
Sitka Willow (*Salix sitchensis*)	Observed	
Sword Fern (*Polystichum munitum*)	Observed	
Trailing Blackberry (*Rubus laciniatus*)	Observed	Observed
Fescue (*Festuca sp.*)		Observed
Velvet Grass (*Holcus sp.*)		Observed

Wildlife Corridors

Physical removal of vegetation and subsequent habitat loss, resulting from human development activities within the vicinity of the project has been extensive and of long duration. The construction of levees and

dikes separated the Snohomish River from the historical floodplain and onsite wetlands. In addition, residential development, buildings, railroads, local streets, stormwater facilities, outfalls, and highways have fragmented and removed formerly continuous forests, thus eliminating and/or restricting habitat use to animals. There is no sizable amount of intact habitat remaining in the vicinity of the project site compared to historical standards (Haring 2002).

The existing remains of wildlife habitats, as well as potential barriers to movement within the project vicinity, have been identified. Habitat (by type) and potential corridors are limited within the vicinity of the project site are presented in Figure 9 – Wildlife Corridor and Species Use Map. Figure 9, illustrates that the project area is essentially isolated from other habitats by I-5, the existing railroad tracks, the parking lot northwest of Rotary Park, and Lenora Street and Lowell Snohomish River Road.

SPECIES AND HABITAT INFORMATION

The status, habitat requirements and life histories of the listed species previously summarized in Table 1 are described in detail in Appendix D of this report. Species utilization and potential for occurrence in the action area are discussed below.

SPECIES UTILIZATION

Information on ESA species presence in the project area was reviewed from the USFWS (website at http://www.usfws.gov), NOAA Fisheries (website at http://www.nwr.noaa.gov), Washington DNR Natural Heritage Program (website at http://www.dnr.wa.gov/nhp/contact/selfservicesys.html) and WDFW PHS database (January 05, 2007). Note that USFWS identifies species potentially present anywhere in Snohomish County and defers to the WDFW PHS database for site-specific information. OliverMcMillan has prepared this BA/HMP to specifically avoid or minimize adverse impacts to habitats of primary association of federally listed fish and wildlife species as a result of the proposed project. The information contained in this report encompasses local critical area requirements for the assessment of aquatic and terrestrial species and habitat.

Occurrence of ESA Listed Species

Bull Trout

The proposed project is located in designated coastal Puget Sound critical habitat for bull trout. Bull trout can potentially swim into the project area both as juveniles and as adults during certain times of the year. There are no documented occurrences of bull trout/dolly varden in Bigelow Creek but occurrences have been documented in the Snohomish River (WDFW 2007a). The extent of known bull trout/dolly varden spawning areas in the Snohomish River is very limited. However, these species require very specialized water temperatures (cold), stream attributes and other habitat conditions within clear, cold running streams for spawning and early rearing. These special requirements for spawning do not exist in the project action area within the Snohomish River or in Bigelow Creek due to its disturbed nature, the primarily silty mud substrate and numerous beaver dams which stagnant the creek. Juvenile bull trout in the Snohomish River system migrate downstream to Puget Sound each spring where they spend the summer feeding in the estuarine system near the confluence. It is believed that sub-adults return to the lower Snohomish River each fall to overwinter. Adults migrate upstream to spawning habitat in the upper Skykomish River and tributaries beginning in early summer and continuing through early fall. Terrestrial organisms of riparian origin, aquatic macroinvertebrates and fish species for bull trout foraging are located in the immediate vicinity of the project and within the action area. Bull trout could forage in the general vicinity of the project and would be expected to be found along the project area shoreline of Snohomish River and in the lower confluence of Bigelow Creek.

Marbled Murrelets

Marbled murrelet nests are associated with old growth forests; there are no old growth forests in the vicinity of the project area. The nesting habitat nearest to the project site is located within the Cascade Mountains in East Snohomish County more than 15 miles away. While no marbled murrelets have been identified in the vicinity of the project and PHS data does not indicate records of marbled murrelets in the project vicinity, marbled murrelets have been documented as using Port Gardner Bay and Possession Sound for foraging (City of Everett 1997). The project vicinity is located inland from any marine foraging habitat and far away from nesting habitat however; marbled murrelets may migrate along the Snohomish River from foraging to nesting habitat.

Puget Sound Chinook

Chinook have been documented within the freshwater and estuarine waters of the action area including Bigelow Creek. The project area includes critical habitat for Puget Sound Chinook along the Snohomish River. Special habitat protection consideration is warranted in these areas to ensure that necessary habitat conditions are maintained. A description of the potential impacts on these critical habitats is addressed in the Essential Fish Habitat (EFH) Assessment section of this report.

PHS data documents the presence of chinook within Bigelow Creek and City of Everett & FHWA 2004 cited personal communications which documented chinook presence in an on-site off channel portion of Bigelow Creek. A single chinook salmon, a 45-millimeter juvenile, was found within a ditched outlet from on-site wetlands to the Snohomish River. While Bigelow Creek (at least the lower confluence) is accessible to adult salmon, there are no observations of adult chinook in the creek and it is doubtful that the Bigelow Creek system would be valuable spawning habitat because the substrate is primarily silty mud and degraded habitat resulting from the lack of riparian vegetation and artificial banks. Bigelow Creek provides some limited rearing/foraging habitat for juvenile chinook and other salmonids.

Chinook use of the Snohomish River near the project area is limited mainly to upstream and downstream migration and some year-round rearing activity, but most rearing is expected to occur between February and July in the project area (Williams *et al*. 1975). Chinook adults pass through the area each year on their way upstream to spawn. Peak migration periods are from May through October. Spawning habitat for the summer/fall run of chinook starts near the City of Snohomish and continues upstream, thus approximately 6 miles upstream of the action area. Spawning occurs from August through November, with peak activity in September and October. Terrestrial organisms of riparian origin and aquatic macroinvertebrates and fish species for chinook foraging are located in the immediate vicinity of the project. Chinook could forage in the general vicinity of the project and would be expected to be found along the project area shoreline of Snohomish River.

Puget Sound Steelhead

Steelhead have been documented within the freshwater and estuarine waters of the action area including Bigelow Creek. While PHS data from WDFW does not list steelhead in Bigelow Creek, one 17.78-centimeter juvenile steelhead was documented by an aquatic ecologist with the Tulalip Tribes during a field investigation of fish usage in Bigelow Creek (Loch 1999). PHS data does indicate that both summer- and winter-run steelhead have been identified within the Snohomish River. In 2002, SaSSI characterized three distinct stocks of winter steelhead (Snohomish/Skykomish, Pilchuck, and Snoqualmie) and three distinct stocks of summer steelhead (North Fork Skykomish, South Fork Skykomish and Tolt) that inhabit or migrate through the action area. Steelhead use of the Snohomish River near the project area includes upstream and downstream migration and year-round rearing activity but does not include spawning. Steelhead pass through the area on their way upstream to spawn, spawning migrations occur throughout the year, with seasonal peaks of activity. Peak spawning periods for winter stocks are from March through June and February through April for summer stocks. The

spawning season for one summer stock is unknown however; the spawning period is probably similar to other summer stocks (WDFW 2002). The closest spawning habitat near the action area is on the Pilchuck River, the closest spawning habitat in the mainstem Snohomish River is near the confluence of the Skykomish River, thus the closest spawning habitat is more than eight miles upstream of the action area. Terrestrial organisms of riparian origin and aquatic macroinvertebrates and fish species for steelhead foraging are located in the immediate vicinity of the project. Steelhead could forage in the general vicinity of the project and would be expected to be found along the project area shoreline of Snohomish River and in the lower confluence of Bigelow Creek. Juveniles would tend to stay relatively close to shore and use woody debris and other riparian habitat features for refuge. Both adults and juveniles of this species are expected to be present in the project vicinity all times of year.

Steller Sea Lion

There are no known Steller sea lions in the Snohomish River or the action area and there is no critical habitat designated for them in the action area (WDFW 2007a). The Steller sea lion uses haulout sites primarily along the outer coast from the Columbia River to Cape Flattery, as well as occasionally on navigation buoys in Puget Sound. Steller sea lion numbers vary seasonally in Washington with peak counts on the outer coast of 1,000 animals present during the fall and winter months (Jeffries *et al.* 2000). There are around 600 to 700 individuals from Cape Flattery to La Push on the outer coast and there may be 1 to 2 individuals in inland Puget Sound at any time (Gearin 2002). Due to slight similarities in behavior, foraging habits and prey species between Steller sea lions and the more common California sea lions, if Steller sea lion individuals happen to be in the Puget Sound it is possible that they would be found in areas where California sea lions are found. There is a documented California sea lion haulout site in Port Gardiner Bay, within the Snohomish estuary, just outside of the defined action area (WDFW 2007a). While no records of California sea lions in the Snohomish River or within the project area exist, foraging may occur in the lower Snohomish River confluence as these animals and other marine mammals (harbor seals) range to find optimal foraging conditions. If California sea lions could potentially be in the action area then it is possible for Steller sea lions to be in the action area. Presence of a Steller sea lion entering the action area would be expected to occur on an extremely rare occasion and would be for foraging purposes only.

NON-LISTED SPECIES

There is no confirmed, documented or suspected record of ESA listed invertebrates, amphibians or reptiles. However, non-ESA species are present within the project area and possibly provide food for documented ESA listed fish and bird species. Comprehensive information concerning wildlife species within the action area and western Snohomish County has been documented in the report entitled, "*Plants and Animals Technical Data Summary, Everett Riverfront Redevelopment Everett, Washington*" (GeoEngineers 2007e). Species documented within the project area and PHS data obtained January 05, 2007 from WDFW indicated the following species in the project vicinity:

Bald Eagle (*Haliaeetus leucocephalus*): reside in and migrate through Snohomish County, using forested areas in the vicinity of the project as nesting areas. Bald eagles typically perch, roost, and build nests in mature trees near water bodies and available prey. Most nesting occurs within 250 feet of open water. According to the WDFW PHS database, there are two bald eagle nests located in the vicinity of the project area. The two nests are located along the waterfront in Everett more than 1.5 miles west of the project area and outside of the defined action area identified in the Biological Assessment completed for the project (WDFW 2007a). The PHS database identifies no eagle winter foraging areas in the vicinity of the project area. There has been no designation of critical habitat for bald eagles in Washington State. Bald eagles were recently de-listed from the ESA, but were included in our assessment of impacts to ensure their continued success.

Bullfrog (*Rana catesbeiana*): vocalizations documented by Pentec Environmental, Inc. (1994).

Osprey (*Pandion haliaetus*): documented within the project area by Pentec Environmental, Inc. (1994), no nests were observed. A documented nest is located in a log storage yard at the confluence of the Snohomish River (WDFW 2007a); their presence within the action area is expected to occur on an opportunistic foraging basis.

Great blue heron (*Ardea herodias*): documented within the project area but no rookeries were observed (personal observation), their presence is expected to occur on an opportunistic foraging basis.

Priority waterfowl concentrations: occur on the eastern side of the action area on the eastern bank of the Snohomish River (WDFW 2007a), their presence within the action area is expected to occur on an opportunistic foraging basis.

Peregrine falcon (*Falco peregrinus*): nest documented at the confluence of the Snohomish River (WDFW 2007a), their presence within the action area is expected to occur on an opportunistic foraging basis.

Purple martin (*Progne subis*): documented at the confluence of the Snohomish River (WDFW 2007a), their presence within the action area is expected to occur on an opportunistic foraging basis.

Artic tern (*Sterna paradisaea*): breeding documented on a gravel construction site on a U.S. Naval Base northwest of and outside the action area (as defined) (WDFW 2007a), their presence is not expected to occur in the project area and may only occur just within the northern portion of the project vicinity at the confluence of the Snohomish River on an opportunistic foraging basis.

California sea lion (*Zalophus californianus*): haul out site located outside of the action area (as defined) within the Snohomish Estuary (WDFW 2007a), their presence within the action area is expected to occur on an opportunistic foraging basis within the Snohomish Estuary.

Harbor seal (*Phoca vitulina*): expected to occur within or near California sea lion haul out sites within the Snohomish Estuary. Seal presence within the action area is expected to occur on an opportunistic foraging basis within the Snohomish Estuary.

Non-priority mammalian species; cottontail rabbit (*Sylvilagus floridanus*), beaver, weasel (*Mustela sp.*), Coyote (*Canis latrans*) and rat (*Rattus sp.*): observed on the subject site through personal observations or as indicated by Pentec Environmental, Inc. (1994).

Non-ESA fish species listed in Table 7: documented by WDFW 2007a, an aquatic ecologist with the Tulalip Tribes during a field investigation in Bigelow Creek (Loch 1999) and as reported by The City of Everett Department of Public Works and the FHWA which cited personal communications of reported fish species within Bigelow Creek (City of Everett & FHWA 2004).

Bird species listed in Table 8: observed within the proposed project area through personal observations or as indicated by Pentec Environmental, Inc. (1994).

Table 7. Non-ESA Listed Species Documented within the Project Area

Common Name	Scientific Name	Reference	Documented Location
Brown Bullhead	*Ameirus nebulosus*	City of Everett & FHWA 2004	Bigelow Creek
Chum Salmon (fall)	*O. keta*	WDFW 2007a/ City of Everett & FHWA 2004	Bigelow Creek/Snohomish River
Coho Salmon	*O. kisutch*	City of Everett & FHWA 2004/Loch 1999	Bigelow Creek
Lamprey	*Lampetra sp.*	City of Everett & FHWA 2004	Bigelow Creek
Largemouth Bass	*Micropterus salmoides*	WDFW 2007a	Snohomish River
Longnose Dace	*Rhinchthys cataractae*	City of Everett & FHWA 2004	Bigelow Creek
Peamouth	*Mylocheilus caurinus*	City of Everett & FHWA 2004/Loch 1999	Bigelow Creek
Pink Salmon	*O. gorbuscha*	WDFW 2007a	Bigelow Creek/Snohomish River
Resident Cutthroat Trout	*O. clarki*	WDFW 2007a/Loch 1999	Bigelow Creek/Snohomish River
Scuplin	*Cottus sp.*	City of Everett & FHWA 2004/Loch 1999	Bigelow Creek
Three-spine Stickleback	*Gasterosteus aculeatus*	City of Everett & FHWA 2004/Loch 1999	Bigelow Creek
Sockeye Salmon	*O. nerka*	WDFW 2007a	Snohomish River

Table 8. Bird Species Documented within the Project Area

Common Name	Scientific Name	Common Name	Scientific Name
Barn Swallow	*Hirundo rustica*	Towhee	*Pipilo maculates*
American Robin	*Turdus migratorius*	American Goldfinch	*Carduelis tristis*
Song Sparrow	*Melospiza melodia*	Flycatcher sp.	*Empidonax sp.*
Townsend's Solitaire	*Myadestes townsendi*	European Starling	*Sturnus vulgaris*
Hairy Woodpecker	*Picoides villosus*	Black-capped Chickadee	*Parus atricapillus*
Common Yellowthroat	*Geothlypis trichas*	Rock Pigeon	*Columba livia*
California Quail	*Callipepla californica*	Great Blue Heron	*Ardea herodias*
Redwing Blackbird	*Agelaius phoeniceus*	Kingfisher	*Ceryle alcyon*
Northern Harrier	*Circus cyaneus*	Osprey	*Pandion haliaetus*
Night-hawk	*Caprimulgus Americanus*	Various waterfowl	

ANALYSIS OF EFFECTS

This section describes anticipated direct, indirect, interdependent and interrelated, and cumulative effects of the project. To begin, it is important to note that measures were taken to avoid, reduce, and minimize impacts associated with this project. Given the highly disturbed nature o the site, ditched streams, railroad presence (with removal options), and previous City of Everett decisions to maximize redevelopment potential for the property, some impact to wetlands and stream/ditches became unavoidable at an early stage of the project. Impact minimization and reduction was practiced to the

extent possible. Where impacts have been identified, a compensatory mitigation concept has been proposed that meets the joint wetland mitigation guidelines established between the Ecology, USACE and the U.S. Environmental Protection Agency (Ecology *et al.* 2006a).

DIRECT EFFECTS

Direct effects include all impacts directly associated with project implementation and construction activities as well as any disturbances that would occur very close to the time of construction. The potential direct effects likely to result from the project are listed here and discussed in the following paragraphs:

1. Construction noise,
2. Construction related traffic,
3. Loss/alteration of habitat,
4. Increased turbidity and sedimentation,
5. Increase human activity,
6. Stormwater,
7. Potential release of contaminants, and
8. Shoreline/wetlands enhancement and restoration.

Construction Noise

There will be a temporary increase in noise as a result of the operation of construction equipment at the project construction site and increased vehicle traffic to and from the project and staging areas. Background or ambient noise levels within the vicinity of the project area come from existing vehicle (car and truck) traffic associated with Interstate 5 and normal operations within an urban and industrial area. Daytime ambient noise levels were assumed to be in the range of 88 dBA based on typical traffic noise levels adjacent to a freeway (WSDOT 2006). All construction equipment and vehicles used at the project will meet Washington State noise emission standards. Noise levels generated by general construction equipment and truck traffic may result in a temporary (worst-case scenario) increase of levels above daytime ambient (88 dBA) up to a 0.08 mile radius from the project area (Figure 3). This increase in noise levels is not expected to be continuous and will occur primarily during daylight hours. Maximum construction terrestrial noise impacts associated with pile driving activities will extend up to a 0.30 mile radius from the project area and maximum construction in-water noise impacts associated with pile driving will extend 0.73 miles upstream and downstream of the in-water construction site unless absorbed by land before reaching the 0.73 miles (Figure 3).

Marbled murrelets are the only listed species that could potentially be affected by terrestrial noise impacts. It is important to note that there is no specific limitation of available habitat in the vicinity of the project. Some foraging is possible but the available habitat is less than optimum for this species. Marbled murrelets are not known to acclimate to human activity and typically avoid areas of strong human activity. The land and water dependent uses in the action area that are in addition to the proposed project would limit marbled murrelet use. The presence of migrating marbled murrelets is highly unlikely but if they did happen to be in the area during the increase in construction related noise, they could easily avoid any area of disturbance. Their migration from foraging to nesting habitat would not be physically impeded.

Listed fish species and Steller sea lions could potentially be affected by in-water construction noise impacts. The presence of foraging Steller sea lions is highly unlikely but if they did happen to be in the area during the increase in in-water noise, they could easily swim outside of any area of disturbance. Noise impacts to adult chinook and bull trout would be minimized because in-water work would occur within the approved USACE fish work windows when adults are less likely to occur in the action area. However, adult steelhead could potentially be present in the action area at all times of the year due to their life history characteristics. Steelhead (adults and juveniles), juvenile chinook, and bull trout could be in the action area during in-water construction activities.

Another factor that will limit aquatic noise impacts is the existing channel morphology. While the action area is defined as the greatest extent that impacts could occur, actual pile driving activities will be localized with sound attenuation occurring in a radius from the pile. Sound pressure travels in a linear direction away from the source. When sound intersects land; it is rapidly attenuated to background levels. Therefore pile-driving related noise is not expected to travel past the bends in the Snohomish River or be heard past I-5 above background levels.

Construction-Related Traffic

There will be an increase in construction related traffic traveling to and from the project. Construction-related traffic will be limited to existing arterial streets and highways, and improved roads within the project area. Vehicle traffic on nearby arterials may be temporarily interrupted or congested during some phases of the project. Dump trucks with pup trailers will haul dirt off-site and will truck new material to the project in addition to the necessary construction related tasks to mobilize to the area. All equipment and vehicles will meet Washington State noise emission standards. This increase in traffic will be temporary and will not affect listed species.

Loss/Alteration of Habitat

There will be a minor direct loss of some herbaceous and scrub shrub upland habitat and wetland and wetland buffer habitat as a result of the construction of the project. The project construction zone is focused on the redevelopment of severely disturbed areas (Simpson Pad and Landfill sites along with a few other already heavily disturbed sites associated with the Snohomish riverfront industrial area). Access to and between the development sites including required emergency access routes will require the widening and improvement of existing roads and removal of vegetation which includes mostly shrubs and roadside grasses. Existing gravel or dirt access roads within the project area will be improved with asphalt which will increase the amount of new impervious surface and decrease the amount of vegetation. Impacts to wetlands have been minimized to the greatest extent possible as described elsewhere in this report.

Wetland, stream, and buffer impacts will result in response to a variety of development requirements. These are: 1) traffic access between the development sites by crossing ditched wetlands located between the BNSF railroad tracks and providing access from the north via Pacific Avenue, 2) provide trails for pedestrian access 3) realign an existing gravel trail to allow adequate emergency access to the Simpson Pad from the south and 4) provide shoreline access including a small public boat facility. The planned physical aquatic habitat impacts have been estimated to be 0.44 acres of wetlands. Locations proposed for a dock structure in the Snohomish River will be altered by excavating upland and isolated palustrine wetland habitat adjacent to the shoreline to create backwater areas for the dock facilities, which will increase aquatic habitat, provide better riverbank stability, remove selected bank armoring, and improve river access.

The majority of the area proposed for development and where trails would be located will result in the removal of immature shrubs and grasses including invasive reed canarygrass and Himalayan blackberry. Removal of reed canarygrass and Himalayan blackberry and re-vegetation with native shrub species is a beneficial result of the project and will also result in overall widening of existing effective buffer widths. Tree species that would be removed within the project area are not large mature trees. Planting plans incorporate a mix of coniferous and deciduous native tree species that, over time, will provide physical macro- and micro- habitat for a wide variety of wildlife species.

Overall, the loss of habitat is limited and is compensated by enhancement and restoration activities summarized above and more fully described in the Mitigation Plan section of this report. The development sites are highly disturbed and maintained (mowed), and would benefit from enhancement activities minimizing habitat loss or alteration.

Increased Turbidity and Sedimentation

There may be a low incidence of turbidity and sedimentation resulting from on-site erosion and stormwater runoff during the construction of the project. To minimize off-site flow of stormwater runoff and associated sediment and/or pollutants, an approved stormwater and sediment erosion control plan will be followed during construction. This plan will provide details for BMPs such as installing silt fences and mulch berms around the construction sites and staging area to prevent site derived silt from moving off-site as well as how stockpiled soils will be covered when they are not in use or during wet weather. With proper implementation of this plan and routine maintenance of the BMPs most impacts from construction related turbidity and sedimentation are expected to be minor and inconsequential.

Construction and enhancement/restoration activities within and along Snohomish River, Bigelow Creek and wetlands could potentially allow an increase in sediment to be carried downstream and upstream (during an incoming high tide) within the Snohomish River. It is difficult to estimate the volumes and locations to which the various sized particles that make up the sediment would be redistributed downstream. A majority of sediment generated by the project construction will be trapped and contained by erosion control measures. Work within the river and along the river banks pose the highest probability of fugitive erosion associated with this project. The largest sediment particles will be contained in the immediate vicinity of the in-water construction area. Sediment with the very finest silts and clays could be carried as suspended sediment downstream through the mainstem of the river and ultimately in the Snohomish estuary but it is most likely most of the fine sediments would be deposited along the Snohomish River before reaching the estuary. It is expected that the initial suspended sediment load would decline within a few days/weeks following activity. However, as the disturbed area equilibrates during periods of high flow or seasonal variation in water flow, the suspended sediment concentration would increase again.

Potential mobilization of sediments during the initial construction period may result in Total Suspended Solids (TSS) concentrations that could affect listed fish species. For example, the increased turbidity can adversely affect both primary food production (i.e., phytoplankton and attached benthic algae growth) and fish feeding efficiency. In addition, depending on the magnitude of the TSS concentrations, impairments to other biological functions such as respiration (i.e., gill clogging) and reproduction is possible. While the river bottom is mostly void of vegetation, the redeposited sediment would likely cover large areas of benthic habitat, which could cause a short-term localized disruption in the primary productivity and food supply for salmonids. However, timing of the work windows is set to minimize the overlap of active foraging and out migration of anadromous species in the vicinity of the project. Most anadromous species will have migrated out to the Puget Sound by the time this work commences. With the exception of steelhead, which may reside in the mainstem Snohomish River longer than other species, impacts

should be short term and minimal. Primary production in aquatic systems occurs in blooms and coincides closely with out-migration timing so newly arriving smolts receive abundance food supply. In-water work windows were specifically developed to avoid and minimize impacts to primary production and food supply for fish.

In the long-term, an improvement in river bank conditions will result from the shoreline treatments proposed along with enhanced buffers and proposed instream habitat features. These shoreline treatments could ultimately increase the water quality in the downstream Snohomish River and estuary by buffering the effects of river flooding on adjacent uplands and by increasing the areas ability to reduce nutrient and sediment loading from upstream urban sources.

Increased Human Activity

There will be an increase in traffic and human disturbance during the construction of the project. Construction-related increases in human activity will be limited to existing arterial streets, highways and improved roads and development pads within the project area. A variety of conservation measures and BMPs will be utilized to minimize impacts to federally protected species and the surrounding habitat during construction. Disturbance will be limited to the smallest area feasible for each phase of the project and element under construction and will stay within the limits of clearing identified on site plans and demarcated in the field with temporary exclusion fencing. Regulated wetlands and shoreline buffers will be demarcated in the field with temporary exclusion fencing to prevent construction crews from inadvertently disturbing these areas. Waste materials will be collected and sorted with respect to recycling categories and disposed of off-site and in accordance with applicable regulations. Approved stormwater and sediment erosion control plans will be implemented and adequate materials and procedures will be on site to respond to unanticipated weather conditions or accidental releases of materials (sediment, concrete or fuel). This increase in construction-related human activity will be temporary and will not affect listed species. In the long term, human activity (residential, commercial) will increase above current levels will increase. Past actions on the project site were heavy industrial and pollutant generating actions. Future conditions will be more constant activity with less pollutant generation. Given the project upland area offers minimal habitat to species, long term impact from human activity will not be significant. Wetland and shoreline improvements will allow human access to the River and associated wetlands, however, the long term benefits of enhanced habitat outweigh the impacts of human presence along the proposed trails and access points.

Stormwater

The project will minimize impacts to the Snohomish River, Bigelow Creek, and surrounding wetlands by implementing several additional stormwater control measures during construction. The control measures will include implementing an approved and effective erosion and sediment control plan and installing and maintaining temporary erosion control such as construction scheduling, silt fence, temporary catch basin inlet protection, compost berms, and vegetated buffers. Storm treatment BMPs such as gravity settling, filtration, biological uptake, and soil adsorption will be used to remove contaminants that may leach into stormwater. Impacts from impervious surfaces and concentrated flows will be mitigated for by installing permanent energy dissipation devices at outfalls such as stabilized pipe outfalls or dispersion areas.

The Snohomish River is listed as a basic treatment receiving water and is exempt from flow control. There is no flow control exemption for Bigelow Creek which discharges to the Snohomish River at the location of the existing Bigelow Creek outfall (Perteet 2007). Enhanced water treatment standards apply and will be implemented to portions of the project that discharge to Bigelow Creek and wetlands. Bio-infiltration swales such as rain gardens and filter berms will be implemented along the outer edge of

buffer areas. Rain gardens and filter berms can reduce stormwater runoff, sediment, vehicle fluids, equipment waste, and other pollutants. The swales will be vegetated with native plant species, which can reduce site maintenance and create habitat for wildlife. Rain gardens will be integrated into buffer areas and will provide habitat complexity as well as water quality functions. The adjacent wetland buffers have been heavily impacted by removal of vegetation and human alteration and currently provide little habitat or water quality function. The project will create critical area buffers enhanced with native vegetation that will slow stormwater runoff, reducing erosion and sedimentation, increase biological uptake. Infiltration methods will not be implemented on the Tire/Fire Landfill Site due to its historical use and possible adverse water quality impacts.

By properly implementing a combination of these measures, sediment will be reduced and impacts to the waterways will be minimized and are expected to be minor and inconsequential.

Potential Release of Contaminants

The project could result in accidental release of contaminants such as fuel or grease from on-site construction equipment and refueling activities that may be conducted within the project or staging areas. The potential for this type of impact is low. Spill cleanup materials will be kept on-site so that in the event of a spill, it can quickly be cleaned up or contained to decrease any potential environmental impact.

INDIRECT EFFECTS

Indirect effects are those that could result from the project, but occur later in time such as during the use or maintenance of the project. The potential indirect effects likely to result from the project are or are related to the listed items and discussed in the following paragraphs:

1. Operational impacts,
2. Shoreline development, and
3. Impacts to prey and food sources for listed species.

Operational Impacts

There will be an increase in traffic, human disturbance, development and land use beyond what currently exists in the area as result of the project.

- Additional pedestrian and automobile traffic,
- Increased boat traffic in the Snohomish River,
- Increased waste generation – garbage, debris, emissions (smoke, light, dust, automobile),
- Increased contaminates including run off from lawns and washing cars, and in-water contaminants from boats,
- Increase noise throughout the project area, and
- Increased human presence along the shoreline and wetland areas after the development of trail and interpretive centers.

While operational impacts related to human activity are hard to strictly enforce, there are educational opportunities and regulatory restrictions that can help minimize impacts. During the occupational phase

of the project, residents and business owners should be made aware of the responsibility associated with activities in close proximity to a wetland and shoreline environment. Permanent posting of wetland and critical/sensitive area signs will serve as a reminder and will designate areas for protection. Planting mature dense native vegetation will provide buffer areas from human activity. Pedestrian traffic should be confined to trails lined with shrubs or on walkways. Residential areas and the operation of commercial businesses should include a covenant limiting the use of pesticides or chemicals in a way that it may enter stormwater and prohibiting dumping of soil or yard waste, paints, chemicals or fuels into or in a way that it may enter waterways.

Any future landscaping features should be compatible and blend with the native buffer and native wildlife. WDFW Backyard Wildlife Sanctuary Program and The National Wildlife Federation sponsor certification and recognition programs designed for those that plan and voluntarily implement a wildlife habitat plan. Future homeowners should be made aware of this information and encouraged to participate in the program.

Educational materials should be posted at the boat facility to inform patrons of ways to minimize their impact to natural resources. Sufficient garbage receptacles and collection tubes for monofilament should be placed at access areas. Access points should be clearly designated and designed to allow use of the shoreline without a gradual expansion of the access trails, pathways or travel lanes into nearby riparian vegetation caused by foot, vehicle or boat traffic. This can be accomplished by planting larger, more mature native vegetation along the edges to clearly delineate the access point.

Shoreline Development

In-direct effects of shoreline development (dock) and their associated uses (boat impacts) could be of concern for juvenile salmonids. Areas targeted for these developments have minimal riparian habitat due to the proximity of the active BNSF railroad tracks. Historical riparian clearing and development have simplified the nearshore habitat and reduce structural diversity, forcing juvenile salmonids to migrate in areas with little or no cover. In addition, shading from in-water structures associated with the proposed dock could provide habitat and attract predators that prey on juvenile salmonids. LWD features constructed as mitigation or enhancements associated with the shoreline development similarly could attract predators of salmonid species. The conceptual drawings of the proposed in-water structures have been designed to reduce adverse impacts from shoreline development and provide a diverse nearshore habitat to reduce predation on juvenile salmonids.

Conservation measures for overwater structure design have been established by various agencies and include; grating features, plank spacing and/or the use of prisms to reduce shade impacts use of inert durable and non-toxic materials, walkways will be as narrow as possible, skirting will be eliminated, pilings will be concrete and will not contain creosote and the number and size of pilings will be minimized and the distance between pilings will be maximized. Agencies also promote habitat integration with shoreline developments. Since much of the nearshore habitat in the northern extent of the project area and adjacent to the most probable locations for the dock is essentially devoid of extensive vegetative cover and habitat, a vegetative buffer will be planted adjacent to the dock to provide overhanging shading and LWD will be anchored under and adjacent to the docks in the nearshore areas to provide habitat.

Impacts to Prey and Food Sources for Listed Species

A decrease in small mammal prey availability from the development of the existing herbaceous upland habitat and the loss of potential foraging habitat during the short-term avoidance of the shoreline area

would be an indirect effect to raptor such as bald eagles, osprey and hawks. In the long term, large trees would be expected to become prominent features along the restored shoreline areas, which would be expected to substantially improve nearshore aquatic refugia and foraging habitat suitability for raptors on fish in the Snohomish River.

A decrease in prey availability (macroinvertebrates) and the loss of potential foraging habitat during the short-term avoidance of the shoreline area would be an indirect effect to listed fish species. However, in the long-term habitat enhancements would improve conditions for listed fish species inhabiting the lower Snohomish River, by providing shoreline shade, LWD recruitment, increased rearing habitat and improved food production.

EFFECTS OF INTERRELATED AND INTERDEPENDENT ACTIONS/ACTIVITIES

An interrelated activity depends on the larger action for its justification (such as slash burning and replanting which will occur after a timber sale and harvest has been completed). An interdependent activity is one that has no independent utility apart from the proposed action (such as construction of a road needed to access the site of a timber sale and harvest).

Projected increases in the economy could increase the need for more public services, public transportation, stores, restaurants, recreational facilities and residential and commercial development outside of that proposed within the project area. Effects of interdependent actions resulting from the project include widening, grading and use of existing roads during the construction and the maintenance of these roads after the project has been completed.

Additional effects of interrelated activities resulting from the project include mitigating for lost/altered habitat within the construction areas and replanting impacted areas with native vegetation. Replanting specifications are provided in a mitigation plan and include associated monitoring and maintenance activities.

CUMULATIVE EFFECTS

Cumulative effects are defined as the effects of future state, local or private actions (but not federal actions) that are reasonably certain to occur within the action area. Cumulative effects analyses are required by the ESA only for those projects undergoing formal consultation. Given that the proposed project is a re-development, cumulative effects are viewed as a balance from past actions and proposed actions. Overall, past action impacts such as intense shoreline activity and pollution have been removed and contained, future actions will generate less pollution that those past actions on this location. Light, noise, and human activity will also be a general balance with overall less activity in the Snohomish River since log shipment, rafting and handling are not be part of this proposal. Economic growth of Everett and the surrounding area is expected to occur as a result of this project. However, Everett, in the vicinity of this project is fully developed and new development is not anticipated unless it occurs in the form of redevelopment similar to this project. Major roads and highways have already been expanded or are currently permitted for construction. This project constitutes one of the last large development opportunities in the City of Everett limits and is occurring on currently zoned light industrial land that has been planned and designated for residential/commercial development for years.

EFFECT DETERMINATIONS

BULL TROUT

The proposed project is located in designated critical habitat for bull trout. Bull trout can potentially swim into the project area both as juveniles and as adults during certain times of the year. There are no documented occurrences of bull trout/dolly varden in Bigelow Creek but occurrences have been documented in the Snohomish River.

Considering the information referenced in this report and project information provided in the project design plans, the project **may affect** bull trout in the following ways:

- Terrestrial organisms of riparian origin, aquatic macroinvertebrates and fish species for bull trout foraging are located in the immediate vicinity of the project and within the action area.
- Bull trout could forage in the general vicinity of the project and would be expected to be found along the project area shoreline of Snohomish River and in the lower confluence of Bigelow Creek.
- Juvenile bull trout may be in the action area and encounter in-water construction work.
- Disturbance from the construction of the proposed project will increase sedimentation and in-water noise levels above the existing levels.
- Shoreline development could indirectly reduce nearshore habitat for juvenile bull trout and increase predators that prey on juvenile bull trout.

The project is **not likely to adversely affect** bull trout because:

- The nearest suitable spawning grounds for bull trout are much farther upstream than the action area.
- Any effects would not preclude adults from completing the migration route.
- Fish will be excluded from wetland, shoreline and stream segments during in-water construction.
- In-water construction will be scheduled within the USACE approved work windows.
- The probability of bull trout occurring in the project area during in-water construction can be considered low.
- It is not believed that increased levels of noise and sediments will have a deleterious effect on bull trout continued existence. Any effects would be discountable since the likelihood of bull trout encountering construction impacts is low and the effects will have a temporary duration and return to pre-project conditions after the completion of the project.
- A temporary shift in sediment could reduce the availability of prey, but not likely to be significant due to the BMPs and will be short-term.
- The amount of impacted foraging habitat in the action area will be minimized since most of the potential habitat is located along the shoreline and within wetlands which are protected under the local Critical Areas Ordinance.
- Long-term habitat enhancements would improve conditions for bull trout inhabiting the lower Snohomish River, by providing access to off-channel refugia, rearing habitat and improved food production.

- The conceptual plan for the proposed in-water structures has been designed to reduce adverse impacts from shoreline development and provide a diverse nearshore habitat to reduce predation on juvenile bull trout.

MARBLED MURRELET

The proposed project will likely have no adverse impact to the marbled murrelet or its associated habitats. USFWS has identified that marbled murrelets can be adversely affected by impacts to their nesting habitat, marine foraging habitat, and food supply, as well as direct mortality. Marbled murrelet nests are associated with old growth forests, there are no old growth forests in the vicinity of the project area and no marbled murrelet nests have been identified in the vicinity of the project. While PHS data does not indicate records of marbled murrelets in the project vicinity, it is possible for marbled murrelets to utilize the marine water of Port Gardiner Bay area for foraging. However, the project is expected to have no impact on nearshore shoreline environments. Another possibility is that marbled murrelets will migrate along the Snohomish River from foraging to nesting habitat. If individuals happen to occur in the project area during construction, they could easily fly outside of any area of disturbance.

The project is anticipated to have **No Effect** on the marbled murrelet or their critical habitat.

PUGET SOUND CHINOOK

The proposed project is located in designated critical habitat for chinook. Juvenile and young chinook utilize Bigelow Creek and the edge habitat of the mainstem Snohomish River for feeding, rearing and refuge and adult chinook migrate through the Snohomish River and thus have some potential to be affected by the project.

Considering the information referenced in this report and project information provided in the project design plans, the project **may affect** chinook because:

- Terrestrial organisms of riparian origin, aquatic macroinvertebrates and fish species for chinook foraging are located in the immediate vicinity of the project and within the action area.
- Chinook could forage in the general vicinity of the project and would be expected to be found along the project area shoreline of Snohomish River and in Bigelow Creek.
- Juvenile chinook may be in the action area and encounter in-water construction work.
- Disturbance from the construction of the proposed project will increase sedimentation and in-water noise levels above the existing levels.
- Shoreline development could indirectly reduce nearshore habitat for juvenile chinook and increase predators that prey on juvenile chinook.

The project is **not likely to adversely affect** chinook because:

- The nearest suitable spawning grounds for chinook are much farther upstream than the action area.
- Any effects would not preclude adults from completing the migration route.
- In-water construction will be scheduled within the USACE approved work windows.
- Fish will be excluded from wetland, shoreline and stream segments during in-water construction.

- The probability of chinook occurring in the project area during in-water construction can be considered low.
- It is not believed that increased levels of noise and sediments will have a deleterious effect on chinook continued existence. Any effects would be discountable since the likelihood of chinook encountering construction impacts is low and the effects will have a temporary duration and return to pre-project conditions after the completion of the project.
- A temporary shift in sediment could reduce the availability of prey, but not likely to be significant due to the BMPs and will be short-term.
- The amount of impacted foraging habitat in the action area will be minimized since most of the potential habitat is located along the shoreline and within wetlands which are protected under the local Critical Areas Ordinance.
- Long-term habitat enhancements would improve conditions for chinook inhabiting the lower Snohomish River, by providing access to off-channel refugia, rearing habitat and improved food production.
- The conceptual plan for of the proposed in-water structures has been designed to reduce adverse impacts from shoreline development and provide a diverse nearshore habitat to reduce predation on juvenile chinook.

PUGET SOUND STEELHEAD

There is currently no designated critical habitat for steelhead. Steelhead have been documented within the freshwater and estuarine waters of the action area including Bigelow Creek. Both adults and juveniles of this species are expected to be present in the project vicinity all times of year and thus have potential to be affected by the project.

Considering the information referenced in this report and project information provided in the project design plans, the project merits an effect determination of **may affect** steelhead because:

- Terrestrial organisms of riparian origin, aquatic macroinvertebrates and fish species for steelhead foraging are located in the immediate vicinity of the project and within the action area.
- Steelhead could forage in the general vicinity of the project and would be expected to be found along the project area shoreline of Snohomish River and in Bigelow Creek.
- Adult and juvenile steelhead may be in the action area and encounter in-water construction work.
- Disturbance from the construction of the proposed project will increase sedimentation and in-water noise levels above the existing levels.
- Shoreline development could indirectly reduce nearshore habitat for juvenile steelhead and increase predators that prey on juvenile steelhead.

The project is **not likely to adversely affect** steelhead because:

- The nearest suitable spawning grounds for steelhead are much farther upstream than the action area.
- Any effects would not preclude adults from completing the migration route.
- Fish will be excluded from wetland, shoreline and stream segments during in-water construction.

- In-water construction will be scheduled within the USACE approved work windows.
- The probability of steelhead occurring in the project area during in-water construction can be considered low.
- It is not believed that increased levels of noise and sediments will have a deleterious effect on steelhead continued existence. Any effects would be discountable since the likelihood of steelhead encountering construction impacts is low and the effects will have a temporary duration and return to pre-project conditions after the completion of the project.
- A temporary shift in sediment could reduce the availability of prey, but not likely to be significant due to the BMPs and will be short-term.
- The amount of impacted foraging habitat in the action area will be minimized since most of the potential habitat is located along the shoreline and within wetlands which are protected under the local Critical Areas Ordinance.
- Long-term habitat enhancements would improve conditions for steelhead inhabiting the lower Snohomish River, by providing access to off-channel refugia, rearing habitat and improved food production.
- The conceptual plan for the proposed in-water structures has been designed to reduce adverse impacts from shoreline development and provide a diverse nearshore habitat to reduce predation on juvenile steelhead.

STELLER SEA LION

The project would not affect the Steller sea lion due to their small population size in the project vicinity and action area and even smaller possibility of individuals in the project area, only one or two Steller sea lions would be expected in Puget Sound at any time. Steller sea lions are much more common on the outer coast of Washington and in the Strait of Juan de Fuca. The closest California sea lion haulout station identified by WDFW is located in Port Gardiner Bay. Foraging may occur in the lower Snohomish River confluence as these animals and other marine mammals (California sea lions and harbor seals) range to find the optimal foraging conditions. Their presence would be even less likely during the summer months that are approved for work if Steller sea lions happen to occur in the project area during construction, they could easily swim outside any area of disturbance.

Therefore the project is expected to have **No Effect** on the Steller sea lion or its habitat.

BA SUMMARY

The environmental baseline in the proposed action area will be slightly altered by:

- Short-term increase in turbidity in the Snohomish River and Bigelow Creek,
- Short-term increase (above daytime ambient) in terrestrial and in-water noise levels,
- Increased operational noise, lighting and air emissions,
- Increased human activity, and
- Habitat alteration.

However, because of the number of environmental controls that will be placed on construction operations to limit the overall impacts to the physical and biological environment and the level of beneficial effects

that have been integrated into the project design, the environmental baseline in the proposed action area will be maintained. The following BMPs, environmental conservation measures and restoration and enhancement activities will be implemented:

- Working under an approved sediment erosion and stormwater control plan,
- Limiting the hours of construction to daylight working hours and maintaining all equipment with Washington State standard emissions and noise control requirements,
- Limiting the number and size of trees in the Snohomish River riparian zone to be removed during construction,
- Conducting in-water work within USACE approved fish work windows,
- Excluding fish wetland, shoreline and stream segments during in-water construction.
- Installing concrete pilings with augers if possible and using appropriate noise-dampening devices on pile drivers,
- Designing and constructing the project to meet, at a minimum, a certification level of Silver from the U.S. Green Building Council's LEED Green Building Rating System.
- Implementing the habitat restoration plan developed for the City of Everett with the guidance of the city, the Tulalip Tribes and a Citizen Advisory Board including members of the Pilchuck Audubon Society, the Everett neighborhoods, Public Employees for Environmental Responsibility and the Everett Area Chamber of Commerce.

Table 9 below summarizes the determination of effects for listed species possibly occurring within the project action area.

Table 9. Determination of Effect for Listed Species Occurring Within the Action Area

Common Name	Effect Determination
Bull Trout	May affect, not likely to adversely affect
Marbled Murrelets	No Effect
Puget Sound Chinook	May affect, not likely to adversely affect
Puget Sound Steelhead	May affect, not likely to adversely affect
Steller Sea Lion	No Effect

In summary, based on field work and literature review, this proposed project will have no effect on marbled murrelets or Steller sea lions and may affect, but is not likely to adversely affect bull trout, chinook or steelhead, their habitat, and prey base, provided that the above BMPs, environmental conservation measures and restoration and enhancement activities are implemented for the project.

If significant changes occur to the scope or design of the project, the OliverMcMillan should contact GeoEngineers for additional evaluation.

EFH ASSESSMENT

The objective of this EFH assessment is to determine whether or not the proposed project "may adversely affect" designated EFH for relevant commercially, federally-managed fisheries species within the proposed action area. This report provides a description and assessment of EFH in the project area; a

description of the project and its potential impacts on these habitats; and describes conservation and mitigation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action.

EFH BACKGROUND

The Sustainable Fisheries Act of 1996 amended the Magnuson-Stevens Fishery Conservation and Management Act (now called the Magnuson-Stevens Act) to require federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH. The EFH guidelines (50 CFR 600.05-600.930) outline the process for federal agencies, NOAA Fisheries, and the Fishery Management Councils to satisfy the EFH consultation requirement under Section 305(b(2)-(4)) of the Magnuson-Stevens Act. As part of the EFH consultation process, the guidelines require federal action agencies to prepare a written EFH Assessment describing the effects of that action on EFH (50 CFR 600.920(e)(1)). This document has been prepared to satisfy that requirement.

EFH is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity". For the purpose of interpreting this definition of EFH: "*waters"* include aquatic areas (marine waters, intertidal habitats, and freshwater streams) and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "*substrate"* includes sediment, hard bottom, structures underlying the waters, and associated biological communities; *necessary* means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "*spawning, breeding, feeding, or growth to maturity"* covers a species' full life cycle (50 CFR 600.10); "*adverse effect"* means any impact that reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810). The Magnuson-Stevens Act promotes the protection of these habitats through review, assessment, and mitigation of activities that may adversely affect these habitats. The significance of small-scale projects lies in the cumulative and synergistic effects resulting from a large number of these activities occurring in a single watershed.

The EFH mandate applies to all species managed under a Fishery Management Plan (FMP). In Washington, Oregon, and California, there are three FMPs covering groundfish, coastal pelagic species, and Pacific salmon. Federal agencies must consider the impact of a proposed action on all three types of EFH.

IDENTIFICATION OF EFH IN THE PROJECT ACTION AREA

Identification of EFH in the project action area was based on Biological Opinions issued on May 11, 2001 and February 13, 2004 by NMFS (NMFS Tracking No. 2001/00533 and 2003/00337, respectively) for the City of Everett 41st Street Overcrossing Project and Railroad Track Removal and Upgrade Project, which analyzed the effects of a conceptual riverfront development as an interdependent action and has an identical action area as defined for the project.

The project is located along the Snohomish River with a defined action area that reaches the confluence of the river with Port Gardiner Bay. The marine influence and possible saltwater intrusion within the action area requires that marine species of fishes and their associated life history stages with designated EFH will need to be addressed.

The majority of the action area is identified as Pacific salmon EFH for the Pacific Coast Salmon FMP. This includes all streams, lakes, ponds, wetlands, and other water bodies currently and historically utilized by Pacific salmon. Excluded are some areas upstream of certain impassable man-made barriers (e.g., dams as identified by the Pacific Fishery Management Council in Appendix A of Amendment 14 to the Pacific Coast Salmon Plan), and longstanding, naturally-impassable barriers (*e.g.*, natural waterfalls in existence for several hundred years) (Pacific Fishery Management Council 1999).

Based on the available life history information, important elements of salmon EFH are (1) estuarine rearing, (2) early ocean rearing, and (3) juvenile and adult migration and feeding (Roni et al. 1999). Important features of the habitat include (1) adequate water quality, (2) adequate temperature, (3) adequate prey species and forage base (food), and (4) adequate depth, cover, and marine vegetation in estuarine and nearshore habitats (Roni *et al.* 1999). Potential threats to these habitat features and life history components include (1) direct (hydrologic modifications); (2) indirect (loss of prey or reduction of species diversity); (3) site-specific; or (4) habitat-wide impacts that are chemical, biological, and physical in nature and may result in individual, cumulative, or synergistic consequences (Wilbur and Pentony 1999).

The action area is designated EFH for chinook, coho and pink salmon and the species listed below in Table 10. In addition to Pacific salmon species, groundfish and coastal pelagic species have designated EFH in the Puget Sound. Table 10 lists the species of fishes and life-history stages with designated EFH in the Puget Sound that may occur in the action area as determined by Biological Opinions issued by NMFS.

Table 10. Species of Fishes and Life-History Stages with Designated EFH in the Action Area

Species	Scientific Name	Adult	Spawn/ mate	Juvenile	Larvae	Eggs/ parturition
Groundfish Species						
Spiny Dogfish	*Squalus acanthias*	X	X	X		X
California Skate	*R. inornata*	X				
Ratfish	*Hydrolagus colliei*	X				X
Lingcod	*Ophiodon elongatus*	X	X	X	X	X
Cabezon	*Scorpaenichthys marmoratus*	X	X	X	?	X
Kelp Greenling	*Hexagrammos decagrammus*	X	X	X	X	X
Pacific Cod	*Gadus macrocephalus*	X	X	X	X	X
Pacific Whiting (Hake)	*Merluccius productus*	X		X		
Sablefish	*Anoplopoma fimbria*	X		X		
Bocaccio	*S. paucispinis*	X	?	X	X	
Brown Rockfish	*S. auriculatus*	X	?	?	X	
Copper Rockfish	*S. caurinus*	X		X	?	
Quillback Rockfish	*S. malinger*	X		X	?	
English Sole	*Parophrys vetulus*	X	X	X	X	X
Pacific Sanddab	*Citharichthys sordidus*	X		X	X	X
Rex Sole	*Glyptocephalus zachirus*	X	X	X		X
Starry Flounder	*Platichthys stellatus*	X	X	X	X	X

Species	Scientific Name	Adult	Spawn/ mate	Juvenile	Larvae	Eggs/ parturition
Pacific Salmon Species						
Chinook Salmon	*Oncorhynchus tshawytscha*	X		X		
Coho Salmon	*Oncorhynchus kisutch*	X		X		
Pink Salmon	*Oncorhynchus gorbuscha*	X		X		
Coastal Pelagic Species						
Northern Anchovy	*Engraulis mordax*	X	X	X	X	X
Pacific Sardine	*Sardinops sagax*	X				
Pacific Mackerel	*Scomber japonicus*	X				
Market Squid	*Loligo opalescens*	X				

POTENTIAL ADVERSE EFFECTS OF THE PROPOSED PROJECT ON EFH

The definition of "adverse effect" is "any impact that reduces quality and/or quantity of EFH, including direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810). For this project, most of the effects of the action have already been discussed in the ESA effects analysis section of this report and would apply to EFH. These adverse effects are:

- Short-term degradation of habitat because of in-water construction activities, including sediment impacts and noise impacts associated with construction and pile driving;
- Long-term degradation of habitat because of increased human disturbance and shoreline development;
- Short-term loss of foraging species and habitat.

Thus, the project may **adversely affect** EFH for a short duration for chinook, coho and pink salmon as well as steelhead trout (although not listed in the table above).

However, the main effects of the project upon EFH in the project area will be beneficial because it is designed to improve many of the important elements of salmon *freshwater* EFH. Long-term habitat enhancements would improve conditions for chinook, coho and pink salmon inhabiting the lower Snohomish River, by providing access to off-channel refugia, rearing habitat and improved food production. The project proposes enhancements to available riparian habitat will improve sediment transport in the system, will remove fish passage barriers for migratory fish, and it will increase the riparian vegetation and LWD upon which many of species depend.

MITIGATION PLAN

MITIGATION APPROACH

As noted earlier in this document, mitigation sequencing was practiced for this project and avoidance of impacts was the first order of action once impacts were identified. However, past actions, locations and practices of the railroad within the site (and railroad removal actions to be completed jointly with this project), and City of Everett decisions to maximize potential redevelopment of this property have identified several unavoidable impacts to aquatic habitat. Where possible, these impacts have been

limited to already degraded areas where compensatory mitigation can bring a net benefit and improved environmental condition. Current regulatory policies accentuate the importance of providing mitigation for loss of wetland function resulting from development. Typically, mitigation consists of preserving, restoring, creating, and enhancing wetland areas either onsite, offsite, in-kind or out-of-kind, wetland banking or any combination of these.

The general approach is to redevelop the project in accordance with the City's SMP, SEWIP and EMC 19.33D. Development will mainly occur on manipulated, heavily developed industrial areas and mitigation for development impacts will be conducted through a combination of on-site wetland preservation, creation and enhancement, and buffer creation and enhancement. The proposed mitigation areas will focus on the creation, enhancement, expansion and rehabilitation of Wetlands C, V, and W. For the purposes of this mitigation plan, these terms are defined in accordance with the USACE Regulatory Guidance Letter (USACE 2002), as follows:

- **Preservation** (called Protection/Maintenance in the guidance letter): The removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This term includes the purchase of land or easements, repairing water control structures or fences, or structural protection. Preservation does not result in a gain of wetland acres but may result in a gain in functions over the long term.
- **Restoration**: The manipulation of the physical, chemical, or biological characteristics of a property with the goal of returning natural or historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into:
  - **Re-establishment**: The manipulation of the physical, chemical, or biological characteristics of a property with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres and/or functions. Activities could include removing fill, plugging ditches, breaking drain tiles, etc. Compensatory mitigation is not evaluated until appropriate and practicable *avoidance* and *minimization* has been accomplished.
  - **Rehabilitation**: The manipulation of the physical, chemical, or biological characteristics of a property with the goal of repairing natural or historic functions (and processes) of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain, returning tidal influence to a wetland, etc.
- **Creation** (called "Establishment" in the guidance letter): The manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deepwater property, where a wetland did not previously exist. Establishment results in a gain in wetland acreage and function. A typical action is the excavation of upland soils to elevations that will produce a wetland hydroperiod and hydric soils, and support the growth of hydrophytic plant species.
- **Enhancement**: The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention, or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. Examples are planting vegetation, controlling non-native or invasive species, and modifying property elevations to alter hydroperiods.

Table 11 below outlines the wetland replacement ratios established in the SEWIP which will be utilized for this project. Acreage impacted and planned for creation is based on compensation ratios established in the City's SEWIP and are included below. Ecology's wetland replacement ratios (Ecology *et al.* 2006a) are embedded in the table in comparison to the City's impact replacement ratios.

The SEWIP (EMC 19.33D.090.35) has established required calculations for determining compensatory mitigation ratios for wetland and shoreline impacts within the Snohomish River Estuary. These calculations are based on functional assessments of existing conditions at a location of proposed impact and estimated potential function of a proposed restoration site. Functional assessments are conducted by use of the Indicator Value Assessment (IVA) Model For Everett Vegetated Wetlands. The model requires completion of a data sheet consisting of a series of site specific questions regarding functional parameters. Each answer is scored relative to function provided and cumulative scores are used to evaluate IVA scores. The equation below was used to estimate compensatory ratios for impacts to Wetlands J, K, M and X presented in Table 10. An example IVA data sheet is included in Appendix E.

$$\frac{\text{IVA Score per Acre Function Lost}}{\text{IVA Score per Acre Function Gained}^{*}} \times 1.25 \quad \times \text{Acres Lost} \quad = \text{Acres of Compensation}$$

An IVA worksheet has been developed for this mitigation project. According to the analysis, it is anticipated that the function gained will be larger than functions lost. Therefore the required mitigation ratio for the project will be 1.25:1 for all impacted wetlands. Table 11 below outlines the proposed impacts to each wetland and the proposed compensation in created square feet.

Table 11. Wetland Impact Summary and Replacement Ratios

Wetland	Habitat Classification[1]		Ecology Wetland Rating	SEWIP Restoration/Creation Ratios (ft^2 Restored/Created: ft^2 impacted	Area Impacted (ft^2)	Area Needed to Meet Required Ratio	Proposed Area created (ft^2)
	System	**Class**					
J	Palustrine	Scrub-Shrub	III	1:25 R/C	**2,192**	**2,740**	**2750**
K	Palustrine	Scrub-Shrub	III	1:25 R/C	**3,639**	**4,549**	**4,550**
M	Palustrine	Emergent	III	1:25 R/C	**679**	**849**	**850**
X	Palustrine	Emergent	III	1:25 R/C	**12,775[2] (removal/replacement with river edge habitat)**	**15,969**	**21.102**

Notes:
[1]Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al 1979).
[2] Wetland area calculated based on survey data. Field observations indicate actual wetland area is less than the area represented in the survey.

[*] IVA Score is an estimate of function gained at the time of impact.

WETLAND FILL

The proposed fill of Wetlands J, K and M is required to construct the access road for portions of the project north of 36th Street (Figure 10 – Proposed Wetland Impacts Map). A total of 8,150 square feet (0.19 acres) of Riverine wetland creation is proposed to compensate for impacts to palustrine wetlands (Wetland J and M) (Figure 11 – Wetland J K, and M Mitigation Plan). The riverine and associated palustrine wetland creation will include removal of two culverts that connect Wetland W to Wetland V and Wetland V to Wetland C, and creation of a habitat pool within Bigelow Creek for improved hydrologic connection and fish passage in and out of Wetland C. All of this work will be directly connected to the Snohomish River via an open channel designed to fish passage criteria. The fringe areas of the habitat pool will be planted with inundation tolerant wetland species typically found in the immediate vicinity. Currently, the two culverts are blocked by beaver activity and limit fish access to Wetland C. Removal of these culverts and creation of an open connection will improve fish access, increase wetland habitat, allow for the movement of oxygen and nutrients from Bigelow Creek, and improve the overall habitat function of Wetland C. This portion of the mitigation plan proposes a habitat creation ratio of 1.25:1 for isolated palustrine wetland habitat, which is equal to the 1.25:1 mitigation ratio suggested by Ecology in the February 4, 2008 DEIS comments.

WETLAND REMOVAL

Additional wetland impacts related to the construction of the boat dock basin have been proposed. Approximately 12,775 square feet (0.29 acres) of Wetland X will be removed with the excavation of a boat dock basin to accommodate a floating dock as part of the proposed public amenities (Figure 10).

Mitigation for the proposed impacts to Wetland X is partially compensated for by expanding the Snohomish River wetted area and nearshore clean-up actions and includes removal of the Wetland V culvert at the confluence with the Snohomish River and creation of riverine wetland habitat related to the construction of a habitat pool at that location (Figure 12 – Proposed Boating Facility). The proposed habitat pool will create an additional 21,102 square feet (0.48 acres) of riverine/tidal wetland and will improve fish access, increase tidal flushing of the lower portion of Wetland V, create additional wetland area and improve the overall habitat of Wetland V. This part of the proposal will also increase the amount of available shoreline habitat by increasing the overall function and square footage of river shoreline habitat and creation of a habitat pool at the outlet of Wetland V.

The existing shoreline slope will be excavated and a new slope will be created. This slope will allow for installation of habitat features such as LWD and provide planting areas for native shoreline vegetation. The lower segment of Wetland V, approximately 1,272 linear feet, currently receives tidal backwater from the Snohomish River. Removal of the Wetland V culvert will create an unimpeded hydrologic connection to tidal influence of the Snohomish River and allow fish access across a wider range of tidal elevations.

To mitigate for additional impacts related to proposed public amenities, creosote pilings will be removed from the shoreline area immediately adjacent to the proposed boat dock basin. Up to six piles may be required to construct the facility within the created aquatic habitat. Removal of existing nearby creosote pilings will reduce the amount of contaminants leaching into the river, decrease dangerous isolated obstacles in the water, and create a more aesthetically pleasing view of the river.

Additional mitigation for the proposed boat facility areas will include installation of a log jam at the outlet of Wetland V and establishment of a native vegetation buffer zone along the River. The log jam will be strategically placed to the north of the outfall of Wetland V along the shoreline. The log jam will provide

in-river habitat, be sited outside of the transit lanes of the river and protect the proposed boat dock area from elevated river flows and floating debris. The water dependent use area will also include an enhanced buffer area. The buffer surrounding the facilities will be planted with native vegetation, including coniferous trees for long-term LWD recruitment and LWD will be placed along the shoreline edge to provide immediate habitat for fish and wildlife. Figure 12 illustrates the proposed small boat facility.

This portion of the mitigation plan proposes a habitat creation ratio of 1.65:1 for isolated palustrine wetland habitat, which is greater than the 1.25:1 mitigation ratio suggested by Ecology in the February 4, 2008 DEIS comments. Table 11 outlines the proposed impacts to each wetland and the proposed compensation in created square feet.

COMPENSATORY PLAN

The compensatory mitigation plan focuses on reducing impacts to wetlands and streams and enhancement of multiple functions of Wetland C, V and W. Mitigation for wetland, stream and buffer impacts will consist of the creation of Category I wetlands, establishment of vegetated buffer zones and restoration of stream habitat. The proposed mitigation plan provides habitat enhancement activities, which utilize an integrated wetland restoration approach to create wetland and concurrently improve multiple functions of Wetland C, V and W proportionate to the proposed impacts. The proposed mitigation activities have been coordinated with the City's plans to restore Bigelow Creek, Snohomish River shoreline and associated wetlands and will be an integral part of the proposed ecosystem restoration. The proposed development plan includes a total of approximately 6,510 square feet (0.15 acres) of unavoidable wetland fill of Wetlands J, K and M to accommodate and 12,775 square feet (0.29 acres) of wetland removal Wetland X (Figure 10). This mitigation plan proposes a wetland creation ratio of 1.25:1 for isolated palustrine emergent and scrub-shrub wetland habitat (Wetlands J, K, and M), and 1.65:1 for isolated palustrine scrub-shrub wetland habitat (Wetland X). The proposed compensatory mitigation is equal in part and greater in part than the 1.25:1required mitigation ratio as defined in the SEWIP and recommended by Ecology.

Mitigation efforts are proposed to expand and enhance several habitat features identified as components of high-quality wetland habitat. These features include:

- High structural diversity, especially emergent, shrub and forested canopy layers,
- Increased hydrologic continuity and functions,
- Enhanced wetland and shoreline buffers to install and protect native plants and to provide key components of habitat,
- Placement of LWD at select locations within on-site wetlands and buffers,
- Increase the potential long term recruitment of LWD into buffer, wetland, stream and river habitats,
- Undisturbed corridors between rivers, streams, wetland systems, improved upland buffer habitats and other natural areas,
- Rehabilitate and increase diversity of stream channel habitat,
- Increase diversity and abundance of native plants and wildlife use opportunities.

Many of the above components are planned for incorporation into this mitigation plan. High structural diversity can be achieved by the proposed removal of invasive species and planting of three canopy layers. Native plants will be planted and desirable native volunteers will be permitted.

MITIGATION OBJECTIVES

The objectives of this mitigation plan are outlined in this section and discussed in further detail below. Specific mitigation objectives include:

- Provide no-net-loss in wetland acreage and function.
- Provide out-of-kind, onsite compensatory mitigation.
- Create a total of 8,150square feet (0.19 acres) of riverine and palustrine wetland creation to compensate for the reduction of 6,510 square feet (0..15 acres) of isolated palustrine wetland habitat (Wetlands J, K and M).
- Create an unimpeded hydrologic connection between Wetland C and Bigelow Creek.
- Create unimpeded fish passage in and out of Wetland C through Wetland V and W.
- Create a total of 21,102 square feet (0.48 acres) of open water wetland habitat to compensate for the reduction of 12,775 square feet (0.29 acres) of isolated palustrine wetland habitat (Wetland X).
- Increase the Snohomish River edge area to accommodate the proposed boat facility without any river fill.
- Provide an integrated wetland restoration approach to restore functions to Wetland C in conjunction with the City's ecosystem restoration plan.
- Create an unimpeded hydrologic connection between the Snohomish River and Wetland V and W.
- Create unimpeded fish passage in and out of Wetland V.
- Provide a natural plant community within the created wetland area that will surpass the diversity and structural complexity currently found at the mitigation site.
- Vegetate the area using native plant species that are known to occur in the project vicinity.
- Vegetate wetland and buffer areas with species that will provide a broad food base for wildlife or that are high in cover value. River buffer enhancement will result in a vegetative canopy that will provide for overhanging conditions as desired by ECC 19.33D.090.20.
- Use Best Management Practices during construction to protect water quality in adjacent wetland areas.

BUFFER ENHANCEMENT PLAN

Upland buffers next to wetland and stream habitat increases habitat function and heterogeneity by providing multiple niches for more species. The range of studies consistently demonstrates the positive relationship between habitat diversity and species richness (Azous and Horner 2001). Existing stream and wetland buffer conditions provide little to no function for potential removal of sediments, nutrients, metals, or toxins and pathogens from stormwater (see *Revised Wetland and Stream Compilation and Review, Everett Riverfront Redevelopment* for a synthesis of the literature used to derive this determination). In addition, the degraded nature and limited width of on-site buffers provide limited

habitat function and minimal opportunity to reduce noise impacts. Buffer areas (Snohomish River buffer along the Tire Fire/Landfill and Eclipse Mill Sites, wetland buffers adjacent to Wetlands C through I, and W) identified in the buffer functional analysis provided by GeoEngineers (2008) have been specifically identified for opportunities to increase buffer, stream and wetland function above existing conditions substantially.

Benefits of buffer creation and enhancements include improved water quality and increased habitat complexity and greater wildlife opportunities both in macro- (physical trees, shrubs and LWD) and micro- (shade and three-dimensional structure) habitat. Proposed buffer enhancements will increase potential utilization of the site by a greater number of species and provide a variety of habitats adjacent to the onsite wetland, stream and river features. Buffer creation and enhancement will be achieved by using BMPs and conservation measures that will ensure no-net- loss of wetland and buffer functions and by implementing the proposed enhancements outlined below.

Buffer enhancement is proposed for the Snohomish River along the Tire Fire/Landfill and Eclipse Mill sites, and along the northwest of boundaries of Wetlands C and W and the perimeter of the Simpson pad (Wetlands C through I). Buffers surrounding these areas will be enhanced to protect wetlands, streams and shoreline functions as part of an integrated restoration plan for the proposed development of the site. Where existing structures (Stuchell/Newland Site) are located on the shoreline, buffers will not be enhanced as part of this plan, and existing uses and activities will continue.

PLANTING/LANDSCAPE PLAN

As indicated for each area below, buffers will be enhanced by restoring natural riparian processes and by improving buffer functions from existing conditions by installing native vegetation.

One objective of the planting plan is to use native vegetation that has been documented or typically occurs in the vicinity of the project area. The vegetation proposed for planting includes species documented at the site and typically found in nearby areas. Plant selection is based upon their hydrologic requirements, and attributes such as being able to support wildlife and their ability to improve water quality. Vegetation is a major factor in the distribution of wildlife. Plants provide food, shelter against predators and weather, and areas for nesting, resting, perching and breeding (Leedy *et al*. 1978). Other areas with existing vegetation that are valuable to wildlife will be maintained within the designed buffer.

Another objective is to prevent conflict and minimize beaver damage to proposed planting enhancement areas by selecting plants based on species that establish and regenerate quickly without assistance (i.e. cottonwood, willow and alder) and that are not a preferred food source (i.e. conifers and Pacific ninebark). Beavers prefer deciduous trees as forage such as alder, cottonwood and willow. Coniferous trees and some deciduous trees such as Pacific ninebark are occasionally eaten but are not a preferred food source (Link 2004). Beaver foraging activities occur within 328 feet of wetland and stream habitat utilizing preferred plant species closest to the waters edge first (Bradt 1938 and Hall 1970 in Castelle *et al*. 1992). The plant species selected will sustain and provide habitat for beaver populations and facilitate the objective of the enhancement plan.

Proposed Plant List

Table 12 outlines the native plant species proposed for installation as part of the buffer enhancement plan as well as plant classification and characteristics for each species. Appendix F discusses the attributes of the various plants selected for use at the mitigation areas.

Table 12. Proposed Native Plant Species for Mitigation Planting and Buffer Enhancement

Common Name	Scientific Name	Indicator Status	Minimum Rooting Depth (inch)	Class	Zones
Buffer Vegetation					
Douglas Fir	*Pseudotsuga menziesii*	FACU	26	Tree	Forested
Western Red Cedar	*Thuja plicata*	FAC	30	Tree	Forested
Western Hemlock	*Tsuga heterophylla*	FACU-	36	Tree	Forested
Big Leaf Maple	*Acer macrophyllum*	FACU	24	Tree	Forested
Black Cottonwood	*Populus trichocarpa*	FAC	30	Tree	Forested
Red Alder	*Alnus Rubra*	FAC	25	Tree	Forested
Western Swordfern	*Polystichum munitum*	FACU	14	Herb	Scrub/Shrub
Vine Maple	*Acer circinatum*	FAC-	24	Shrub	Forested, Scrub/Shrub
Salal	*Gaultheria shallon*	FACU	12	Shrub	Forested
Red Huckleberry	*Vaccinium parvifolium*	FACU	16	Shrub	Forested, Scrub/Shrub
Evergreen Huckleberry	*Vaccinium ovatum*	UPL	16	Shrub	Forested, Scrub/Shrub
Salmonberry	*Rubus spectabilis*	FAC+	10	Shrub	Scrub/Shrub
Wetland Vegetation					
Pacific Willow	*Salix lasiandra*	FACW+	36	Shrub	Scrub/Shrub
Red-osier Dogwood	*Cornus sericea*	FACW	20	Shrub	Scrub/Shrub
Pacific Ninebark	*Physocarpus capitatus*	FACW-	20	Shrub	Scrub/Shrub
Nootka Rose	*Rosa nutkana*	FAC	6	Shrub	Scrub/Shrub
Slough Sedge	*Carex obnupta*	OBL	12	Herb	Emergent
Small-fruited Bulrush	*Scirpus microcarpus*	OBL	12	Herb	Emergent

LWD RECRUITMENT PLAN

Coniferous forest and associated vegetation is proposed for improvements to the buffers to enhance natural recruitment of LWD into the ecosystem. Establishment of tree species – especially coniferous species - adjacent to wetland and stream habitat, will eventually mature, die (or be subject to windthrow) and potentially fall into wetland or stream areas providing LWD into these habitats. Once the forest has matured, continual native recruitment of coniferous tree species is anticipated, which will provide long-term recruitment of LWD into aquatic habitats within and adjacent to the site.

Placement of LWD into streams, wetlands and buffers has been shown to be beneficial for fish and wildlife in the Pacific Northwest. LWD can enhance primary productivity of a stream by adding organic matter and nutrients (Fischenich and Morrow, 2000). Valuable habitat such as pools, refugia, spawning grounds are created for fish by the addition of woody debris and, it can also provide substrate for aquatic invertebrate prey. Birds and other wildlife benefit from increased perching, loafing, and basking sites. Amphibians, which move among different wetlands and between uplands and wetlands during various life stages (Lloyd 2007), use LWD to provide cool moist microhabitat in exposed upland areas. LWD can also serve as migration corridors between breeding areas for amphibians (Link 2004).

Everett Municipal Code identifies the importance of enhancements that focus on establishing opportunities for LWD to become established through planned plantings and recruitment (EMC 19.33D.090.A.24). In addition, the mitigation plan includes specific additions (short-term LWD

recruitment plan) of downed LWD at selected locations along the wetland margins and buffer interfaces. Buffer preservation and enhancement surrounding the mitigation wetland will ensure that wetland functions remain intact and are sufficiently isolated from surrounding development. The planned wetland buffer enhancements have focused on long-term LWD production (long-term LWD plan) and shading along the wetland margins where currently there is minimal or only deciduous species of vegetation.

PROPOSED ENHANCEMENT AREAS

Snohomish River Shoreline Buffer Enhancement

Existing Buffer Condition

An evaluation of existing buffer within the shoreline of Snohomish River was conducted. In general, historical and on-going commercial and industrial activities have resulted in extensive degradation of on-site buffers and upland habitat adjacent providing little to no function. A detailed buffer function analysis was prepared for stream buffer adjacent to the Snohomish River along the Tire Fire/Landfill and Eclipse Mill Sites as detailed in the GeoEngineers (2008) report entitled *"Revised Wetland and Stream Compilation and Review, Everett Riverfront Redevelopment"*. A summary of the existing conditions discussed in that report is provided below.

Currently, 0-50 feet of relatively undisturbed vegetated buffer separates the Snohomish River from existing commercial and industrial properties at the Eclipse Mill Site. Disturbance of natural shoreline habitat has provided opportunity for nonnative invasive species to become established and invasive species dominate the vegetated areas of the shoreline buffer. Based on the recommended buffer widths provided by the buffer function analysis, the existing buffer provides a low level of function for maintenance of microclimate, contribution of wildlife habitat/corridor and noise abatement, and removal of sediments, nutrients, and metals. Lack of riparian vegetation and species diversity, in conjunction with historic and present land use activities has resulted in limited recruitment of LWD that is large enough to function as cover or influence channel morphology (Haring 2002). In addition to production losses experienced to date, future production potential of LWD adequate for use by salmonids (parr and pre-smolt) in the River could further decrease if limited existing LWD continues to decay and is not replenished through new recruitment (Haas and Collins 2001).

Proposed Buffer Habitat Enhancement

Given the degraded nature of the shoreline buffer and existing structures located along the river bank in several locations, the proposal incorporates a 50-foot enhanced shoreline buffer to gain important vegetation along the river bank and improve the overall shoreline habitat condition. The 50-foot enhanced shoreline buffer is a large improvement over the historic and present buffer conditions. Buffers will not be enhanced where existing activities (Stuchell/Newland Site) are occurring along the shoreline. When those existing activities cease, buffer enhancement options will be evaluated and installed as appropriate to the future use at those locations.

Buffer enhancement is proposed for 2,318 linear feet (110,668 square feet [2.54 acres]) of shoreline buffer along the Snohomish River adjacent to the project, from the culvert at Wetland V and extending north to approximately Pacific Avenue, including the Eclipse Mill Site. That portion of the shoreline that falls within the 3-acre City Park set-aside will be enhanced by the City as part of the Park plan and is not included in this evaluation at this time. Figure 13 – Proposed Snohomish River Buffer Enhancement Plan, identifies the proposed shoreline buffer enhancement area.

The Wetland V culvert outfall is located slightly south of the proposed public amenities (Figure 12) where the railroad tracks are visible and parallel to the river. The shoreline along the tracks is stabilized with

large rip rap within the proposed boat dock basin area and vegetation is currently non-existent. Railroad tracks in this area are scheduled to be removed during 2008. From the Wetland V outfall, continuing north to the end of the large rip rap stabilizing the shoreline (approximately 950 feet), the following potential habitat enhancement and creation opportunities were identified, which include but are not limited to;

- Removal of the adjacent railroad tracks,
- Removal of invasive vegetative species,
- Enhancement of existing vegetative buffer with installation of clean organic soil (Stutz *et al.* 2003) and native plant species,
- Establishment of a native vegetative buffer in areas where no buffer presently exists,
- Establishment of coniferous tree species for long term LWD recruitment,
- Removal of the Wetland V culvert under the railroad tracks,
- Creation of a habitat pool in continuity with the Snohomish River at the culvert location,
- Removal of existing creosote treated pilings along the shoreline and in the river adjacent to the project (as described in Compensatory Mitigation Plan), and
- Placement of two log jams north and south of Wetland V outfall for added shoreline protection and habitat enhancement.
- Temporary trails will be constructed along the railroad grade with a pedestrian bridge over Wetlands V and W to provide public access to the riverfront area.

From the edge of the large rip rap stabilizing the shoreline along the railroad tracks, north along the Eclipse Mill Site to the southern boundary of the Newland Construction property (approximately 200 linear feet), evidence of previous and continued commercial and industrial operations was observed. The following potential habitat enhancement and creation and buffer zone enhancement and establishment opportunities were identified in that zone, which include but are not limited to;

- Removal of invasive vegetative species,
- Enhancement of existing vegetative buffer with installation of clean organic soil (Stutz *et al.* 2003) and native plant species,
- Establishment of a native vegetative buffer in areas where no buffer presently exists,
- Establishment of coniferous tree species for long term LWD recruitment,
- Removal of miscellaneous 1900's rubble and debris,
- Removal of concrete rubble, and
- Removal of one culvert (Wetland V outfall) and reconfiguration and design outfall.

Shoreline buffer enhancement proposed for this project will entail removal of non-native vegetation and planting of native vegetation within a 50-foot wide buffer. Soil augmentation may be necessary and will be determined at the time of plant installation. Table 12 identifies potential native buffer species that will be utilized for buffer enhancement. Native vegetation will also be established along areas where the buffer is currently absent. Removal of concrete rubble, debris, large rip rap, sheet piling, and miscellaneous waste along the shoreline and within the buffer boundary is also proposed at select

locations (where shoreline integrity can withstand the alteration) will help to restore the buffer to a more natural state.

Enhanced Buffer Function Analysis

The existing buffer provides a low level of function. The functions of the 110,668 square foot (2.54 acres) proposed enhanced buffer are expected to improve and provide greater functions than what currently exists even with an increase in land use. Native plant installation not only increases habitat complexity and noise abatement but increases soil stabilization, water attenuation and infiltration, potential LWD recruitment and improve water quality by reducing stormwater sediments, nutrients and contaminants. The proposed buffer treatment will also establish an unrestricted 50 foot continuous greenbelt along the river which currently does not exist. This treatment will promote increased wildlife use, migration corridor, resting refugia and other habitat attributes that do not exist today. Although the descriptions in the table that follows indicates a lift in function level from low to moderate, the magnitude of lift in reality is much greater due to the severely degraded state of the existing buffers on the entire project site. Buffer function analysis for the current and proposed enhanced buffer along with the corresponding proposed enhancements and function improvement category are summarized in Table 13.

Table 13. Enhanced Buffer Function Analysis for Snohomish River Buffer along the Tire Fire/Landfill and Eclipse Mill Sites

Buffer Function	Current Function Level[1, 2]	Proposed Enhancements (119,221 ft^2)	Proposed Level of Function[1]	Buffer Function Improvement
Sediment Removal	Low	Increased Buffer Width, Native Plant Installation, Decrease in Impervious Surface	Moderate	Yes
Nutrient Removal	Low	Increased Buffer Width, Native Plant Installation	Moderate	Yes
Metals Removal	Low	Increased Buffer Width, Native Plant Installation	Moderate	Yes
Maintenance of Microclimate	Low	Increased Buffer Width, Native Plant Installation	Moderate	Yes
Contribution as Wildlife Habitat/Corridor	Low	Increased Buffer Width, Native Plant Installation, Removal of Invasive Species	Moderate	Yes
Noise Abatement	Low	Increased Buffer Width, Native Plant Installation	Moderate	Yes

Notes:

[1]Current function level based on existing undisturbed buffer and minimum buffer widths (Castelle *et al*. 1994).
[2]GeoEngineers (2008) report entitled *"Revised Wetland and Stream Compilation and Review, Everett Riverfront Redevelopment"*.

Wetland C (Western Edge) and Wetland W Buffer Enhancement

Existing Buffer Condition

An evaluation of existing buffers of Wetland W and adjacent to the west side of Wetland C was conducted. In general, historical and on-going commercial and industrial activities have resulted in extensive degradation of on-site buffers and upland habitat adjacent providing little to no function. A

detailed buffer function analysis was prepared for wetland buffer as detailed in GeoEngineers (2008). A summary of the existing conditions discussed in that report is provided below.

In general, the existing Wetland C west buffer provides little to no function due to impacts from historical land use, disturbance associated with fill, and construction and maintenance of the adjacent rail-lines. The existing buffer habitat along the west boundary is limited to 15 feet from the wetland edge, terminating at the existing railroad grade. The area beyond the railroad grade and associated rail-lines consists of the channelized banks of Bigelow Creek, ditched Wetlands V and W, and the eastern boundary of the Tire Fire/Landfill Site

The area of buffer west of Wetland W is located adjacent to the Tire Fire/Landfill Site and currently contains minimal to no vegetation. There is an existing access road, which abuts the top of the ditch and the toe of the landfill slope. In general, the existing Wetland W buffer provides little to no function due to impacts from historical land use, disturbance associated with fill, operation, construction and maintenance of the adjacent rail-lines. The existing buffer on the west side of the wetland can be described as a 5-foot disturbed zone and a 60-foot zone of little to no vegetation. Buffer east of the wetland consists of a 5-foot disturbed zone consisting of Himalayan blackberry, Japanese knotweed, morning glory, Nootka rose and Scot's broom, railroad tracks and then Wetland V.

The existing buffers for Wetland W and the west side of Wetland C provide low levels of function for sediment removal, nutrient removal, metals removal, maintenance of microclimate, contribution of wildlife habitat/corridor and noise abatement. Buffers consist of a narrow vegetative buffer, lack active LWD recruitment and are in close proximity of other lower functioning wetlands.

Proposed Buffer Enhancement

Wetland C buffer and existing railroad tracks located along the western edge incorporates a 60-foot enhanced buffer along the western edge (Figure 14 – Proposed Wetland C (Western Edge) and W Buffer Enhancement Plan). A 65-foot enhanced buffer is included in this proposal (Figure 14).

Buffer enhancements for Wetland W will incorporate 126,802 square feet (2.91 acres) of buffer. Buffer enhancement proposed along the western edge of Wetland C, begins at the southern tip of the Tire/Fire Landfill site extending south to the northern tip of Wetland C and incorporates 120,682 square feet (2.77 acres). Two sets of railroad tracks and associated railroad grade adjacent to the west edge of Wetland C are scheduled to be removed by BNSF in 2008, prior to construction of the project. In addition to the creation and enhancement of Wetland C buffer this enhancement plan includes specific measures to enhance habitat function within Wetland C. An increase in wetland habitat function will be accomplished by placement (short-term recruitment) of LWD along the upland-wetland interface and installation of native coniferous and deciduous species that will promote continued LWD recruitment (long-term recruitment) in the wetland from the enhanced buffer.

The objectives of buffer creation and enhancements planned for Wetland C (Western Edge) and Wetland W are summarized below and will include, but are not limited to;

- Removal of invasive vegetative species,
- Removal of historical rail-lines buried along the western edge of the wetland,
- Creation of a planting berm with the placement of approximately four feet of amended organic soil on top of the railroad grade following removal of the existing rail-lines (Stutz *et al.* 2003). This will ensure an adequate growth medium for that plant species (Table 12) with a minimum rooting depth of no more than 36 inches.

- Installation of approximately two feet of amended soil throughout the enhanced Wetland W buffer. Addition of top soil is required in this area due to the underlying land fill cap (approximately two below the existing soil surface).
- Establishment of a native vegetation community within the proposed Wetland C (Western Edge) buffer that will improve buffer function. This area will be planted with native coniferous and deciduous tree species and commonly associated shrub vegetation (Table 12).
- Establishment of a native vegetation community with the proposed Wetland W buffer, including the face of the development fill slope adjacent to the wetland, which will improve buffer function. This area will be planted with shallow rooting native shrub species to increase buffer function beyond existing conditions while maintaining the integrity of the underlying landfill cap.
- Placement (short-term recruitment) of LWD along the upland-wetland interface of Wetland C.
- Installation (long-term recruitment) of native coniferous and deciduous tree species within the Wetland C (Western Edge) buffer that will increase the potential for continued LWD recruitment into Wetland C.

Enhanced Buffer Function Analysis

The existing buffers for Wetland C (Western Edge) and Wetland W provide low levels of function. The functions of the proposed enhanced buffer are expected to improve and provide greater functions than what currently exists even with an increase in land use. Water quality, hydrologic retention, and available wildlife habitat was considered in the planning process and is expected to increase as a result of the added complexity to the habitat.

Buffer preservation and enhancement surrounding the wetlands will ensure that wetland functions remain intact and are sufficiently isolated from surrounding development. Many of the buffers are damaged from historic and present land use practices at the site and have developed patchwork vegetation that is less effective as wildlife habitat, water quality improvement, and shade areas to the adjacent wetlands. The enhancement measures will increase habitat complexity, noise abatement, soil stabilization, water attenuation and infiltration, potential LWD recruitment and improve water quality by reducing stormwater sediments, nutrients and contaminants.

The planned wetland buffer enhancements for Wetland C (Western Edge) buffer have focused on LWD production and shading along the wetland margins where currently there is minimal or only shrub vegetative species. The proposed 60-foot buffer on the west side of the Wetland C will provide a continuous wildlife corridor, continued LWD production, increased shade, and better water quality treatment as compared to current conditions.

The proposed buffer treatment will also establish an unrestricted continuous greenbelt along the wetland which currently does not exist. This treatment will promote increased wildlife use, migration corridor, resting refugia and other habitat attributes that do not exist today. Although the descriptions in the table that follows indicates a lift in function level from low to moderate, the magnitude of lift in reality is much greater due to the severely degraded state of the existing buffers on the entire project site. Buffer function analysis for the current and proposed enhanced buffer along with the corresponding proposed enhancements and function improvement category are summarized in Table 14.

Table 14. Enhanced Buffer Function Analysis for Wetland C (Western Edge) and Wetland W

Buffer Function	Current Function Level[1, 2]	Proposed Enhancements (247,484 ft^2)	Proposed Level of Function[1]	Buffer Function Improvement
Sediment Removal	Low	Increased Buffer Width, Organic soil[3] and Native Plant Installation, Removal of Existing Rail-lines	Moderate	Yes
Nutrient Removal	Low	Increased Buffer Width, Organic soil[3] and Native Plant Installation,	Moderate	Yes
Toxics and Pathogens Removal	Low	Increased Buffer Width, Organic soil[3] and Native Plant Installation, Removal of Existing and Historic Rail-lines	Moderate	Yes
Maintenance of Microclimate	Low	Increased Buffer Width, Organic soil[3] and Native Plant Installation, LWD Placement and Retention	Moderate	Yes
Contribution as Wildlife Habitat/Corridor	Low	Increased Buffer Width, Organic soil[3] and Native Plant Installation, Removal of Invasive Species, LWD Placement and Retention	Moderate	Yes
Noise Abatement	Low	Increased Buffer Width, Organic soil[3] and Native Plant Installation	Moderate	Yes

Notes:

[1]Current function level based on existing 25-foot undisturbed buffer and minimum buffer widths established in *Adapting Watershed Tools to Protect Wetlands* (Cappiella *et al.* 2005).

[2]GeoEngineers (2008) report entitled "Revised Wetland and Stream Compilation and Review, Everett Riverfront Redevelopment".

[3]Stutz, J., S. Donahue, E. Mintzer and A. Cotter. 2003. Compost in Landscaping Applications. Tellus Institute, Resource and Environmental Strategies. Boston, MA. Dated May 12, 2003.

Simpson Pad Buffer Enhancement (Wetland C through I)

Upon review of the Draft Environmental Impact Statement (DEIS) prepared for the project, questions were raised regarding proposed wetland buffer widths overlying the Simpson Pad. Specifically, the capability of the proposed enhanced buffers to provide adequate buffer functions following development of the adjacent upland areas. The key physical characteristics that influence the effectiveness of buffers are vegetation (composition, density and roughness), percent slope, soils and buffer width and length. Wetland buffers provide protection and maintenance of wetland functions including removing sediment from surface water flowing across the buffer, treating surface and groundwater through plant uptake or biological conversion of nutrients (phosphorous and nitrogen) and toxics (bacteria, metals and pesticides) into less harmful forms, bind dissolved pollutants by absorption onto clay and humus particles in the soil, help maintain water temperature, reduction of noise levels and provide upland habitat. The buffer functional analysis provided by GeoEngineers (2008), used these buffer functions for determining if proposed buffer widths would perform appropriate protective functions for associated wetlands as good as

or better than the existing conditions (summarized below). In addition to buffer functions, impacts to wildlife habitat associated with human intrusion and an increase in land use was a concern. The following information addresses specifically how wildlife habitat will be provided and human intrusion will be minimized.

Wildlife Habitat

Vegetated uplands adjacent to wetlands are considered one of the richest zones for aquatic and wildlife habitat. Vegetation is a major factor in the distribution of wildlife by providing wildlife corridors. Plants also provide food, shelter against predators and weather, and sites for nesting, resting, perching and breeding (Leedy *et al.* 1978). A buffer that consists of a mix of trees, shrubs and groundcover best serves the multiple needs of assorted wildlife (Emmons & Olivier Resources 2001). The use of native plants within the buffer will provide wildlife habitat opportunities. However, the Simpson Pad is currently isolated from other contiguous wildlife habitats, surrounded by major roads, Interstate 5, and includes significant human built environments railroad and urban development (Figure 9). These factors preclude large mammal use or connection to significant habitats. The proposed buffer widths on the Simpson Pad will provide continuity for small mammals, birds, amphibians, and adequate protection for aquatic species. The enhanced Simpson Pad buffers will be well suited for amphibian and bird habitat. Amphibians must move among different wetlands and between uplands and wetlands during various life stages (Lloyd 2007). The characteristics of Wetlands within the site were also considered in this assessment. Many hummocks and rises existing throughout the wetland which provide dry areas for amphibians to utilize in addition to the buffer zone surrounding the wetland perimeter adjacent to the development. The placement of LWD along the wetland edge will provide cool moist microhabitats in currently exposed upland areas and can serve as migration corridors between breeding areas for amphibians. Seasonal or isolated wetlands that are absent of fish predators benefit amphibians, placement of LWD within buffer areas and buffer enhancement areas (specifically associated with non-fish bearing Wetlands D through I) will improve on-site amphibian habitat. Birds such as Redwinged blackbird (*Agelaius phoeniceus*), which have been documented utilizing on-site wetlands for nesting habitat and foraging in adjacent wetland buffers, will potentially benefit from an enhanced buffer.

Human Intrusion

Fencing will be installed to separate the residential development from wetland buffers. Outside of the fenced areas, residents and business owners will be informed of the responsibility associated with wetland/shoreline environments by permanent wetland and critical/sensitive area signage posted along buffer boundaries. Proposed enhancements (planting dense native vegetation within buffers) and designated trails lined with vegetative deterrents (dense shrubs) or walkways will confine pedestrian traffic and provide protection from human activity. The conversion of land use of the Simpson Pad to a residential area will provide an inherent level of enforcement that will eliminate dumping of trash and debris, which currently occurs and has been documented along the Wetland D Buffer (GeoEngineers 2008). Fencing, increased regulation oversight, and sufficient signage placed at access areas will further deter dumping.

According to the U.S. Pet Ownership & Demographics Sourcebook (American Veterinary Medical Association 2007), 65.8 percent of households in Washington have cats or dogs. Of those with cats and dogs, the average number of those pets per household is two cats and 1.6 dogs. There are 530 dwellings (166 single family dwellings, 20 duplexes and 344 townhouses) proposed for construction. Application of pet data statistics for Washington to actual housing mix proposed for the development results in approximately 303 cats and 226 dogs of which 100 cats and 74 dogs will be adjacent to buffers (roughly one-third of proposed development). Fences and requirement of leashes on trails will reduce buffer impacts from dogs. Impacts to wildlife from the increased presence of cats may occur. However, the presence of coyotes and raccoons (*Procyon lotor*) will help to mitigate this impact.

Bioretention Areas (Rain Garden)

The *2005 Stormwater Management Manual for Western Washington* (Ecology) refers to the *2005 Low Impact Development Technical Guidance Manual for Puget Sound* (Puget Sound Action Team) for bioretention design specifications, procedures for determining infiltration rates and flow control devices. Bioretention is an integrated stormwater management practice that uses the chemical, biological and physical properties of plants, microbes and soils to remove or retain pollutants from stormwater. All of the primary pathways for removing pollutants from storm flows are active in bioretention systems. These primary pathways include sedimentation, filtration, absorption, infiltration, phytoremediation, plant resistance, volatilization and thermal attenuation.

The *2005 Low Impact Development Technical Guidance Manual for Puget Sound* and EPA Stormwater Technology Fact Sheets identify the pollutant removal efficiency of bioretention areas for metals, nutrients, hydrocarbons and bacteria (EPA 1999a-d, Cappiella *et al.* 2005).

- Research has shown that bioretention areas have the potential for removal of heavy metals and suspended solids from stormwater (Cappiella *et al.* 2005). An estimate of percent removal rates for copper, lead, total suspended solids and zinc ranged from 90 to 98 (EPA 1999a).
- Removal of phosphorus from stormwater in bioretention areas results from the adsorption of phosphorus onto aluminum, iron and clay minerals (Cappiella *et al.* 2005). An estimate of the percent removal rate ranged from 70 to 80 (EPA 1999a)
- Nitrate removal has been shown to vary in bioretention areas (Cappiella *et al.* 2005). However, creating a fluctuating anaerobic and aerobic zone in the bottom of the bioretention area can enhance the denitrification process. An estimate of the percent removal for total Kjeldahl nitrogen (TKN) ranged from 65 to 80 (EPA 1999a).
- The median percent removal of hydrocarbons from stormwater treated through various vegetated swale designs has been shown to approach 60 (EPA 1999c).
- Approximately 90 percent removal of organics and bacteria from stormwater has been documented (EPA 1999a).

Existing Buffer Condition

An evaluation of existing buffer conditions adjacent to Wetlands C through I and overlying to the Simpson Pad was conducted. In general, historical and on-going commercial and industrial activities have resulted in extensive degradation of on-site buffers and upland habitat adjacent providing little to no function. A detailed buffer function analysis was prepared for wetland buffer as detailed in GeoEngineers (2008). A summary of the existing conditions discussed in that report is provided below.

In general, the existing buffers that extend onto the Simpson Pad provide little to no functions due to impacts from historical land use and disturbance associated with fill. The existing buffer condition along the southern edge of Wetland C can be described as a 25-foot span of relatively undisturbed vegetation. Beyond the undisturbed area of vegetation, a 12-foot-wide trail constructed of impervious materials and vegetation such as black cottonwood saplings, common plantain (*Plantago major*), Himalayan blackberry, Scot's broom, velvet grass and fescue (*Festuca sp.*) presently exists. The existing buffer condition adjacent east of Wetland D can be described as up to 32 feet, but as little as 10 feet of relatively undisturbed vegetation. Beyond the undisturbed vegetation is an 8-foot-wide gravel trail. The existing buffer along the western edge of Wetlands E through I (on the Simpson Development Pad) can be described as 14 feet of relatively undisturbed vegetation with a 7-foot-wide gravel trail at 15 feet.

Overall, the existing buffer provides a low level of function for sediment removal, nutrient removal, metals removal, maintenance of microclimate, contribution of wildlife habitat/corridor and noise abatement.

Proposed Buffer Enhancement

Given the degraded nature of the wetland buffers on the Simpson Pad, this proposal incorporates a 75-foot enhanced wetland buffer for the southern edge of Wetland C and a 50-foot enhanced wetland buffer for the east side of Wetland D and the west side of Wetlands E through I (Figure 15 – Proposed Simpson Development Pad Buffer Enhancement Plan).

Areas of proposed buffer enhancement on the Simpson Pad include the following: the southern edge of Wetland C (102,507 square feet; 2.35 acres), the east side of Wetland D (135,346 square feet; 3.1 acres), and the west side of Wetlands E through I (collectively, 119,018 square feet; 2.73 acres). The objectives of buffer creation and enhancements planned for these wetland buffers (on the Simpson Pad) will include but are not limited to;

- Removal of invasive vegetative species,
- Enhancement of existing vegetative buffer with installation of native plant species, Figure 16 & 16a – Proposed Simpson Development Pad Buffer Enhancements provides a schematic of the typical buffer enhancement planting plan associated with the Simpson Pad buffer enhancements.
- Establishment of a native vegetative buffer in areas where no buffer presently exists,
- Establishment of coniferous tree species for long term LWD recruitment,
- Replacement of an existing impervious trail within the buffer with a pervious trail outside of the buffer (Wetland C only),
- Implementation of low impact stormwater solutions (e.g. bioswale/rain garden and/or filter berm) to allow for rain infiltration. Creation will occur along ten feet of the outer buffer area (EMC 33D.090). Figure 16 & 16a, provides a cross sectional view and illustrates the implementation of the rain garden and filter berm along the site,
- Inclusion of native herbaceous wetland species identified in Table 12 within the rain garden,

Enhanced Buffer Function Analysis

The functions of the proposed enhanced buffer are expected to improve and provide greater functions than what currently exists even with increased land use intensity. Water quality, hydrologic retention, and available wildlife habitat was considered in the planning process and is expected to increase as a result of the greater wetland area and added complexity to the habitat. The proposed rain gardens will largely remove pollutants and sediment from runoff entering the buffer as well as infiltrate water subsurface providing hydrology for vegetation and metering inflow of water into the wetland. Vegetative uptake and soil processes will further cleanse stormwater prior to release into the wetland areas.

Buffer preservation and enhancement surrounding the wetland will ensure that wetland functions remain intact and are sufficiently isolated from surrounding development. The planned wetland buffer enhancements have focused on water quality improvement, LWD production and shading along the wetland margins where currently there is minimal or only deciduous species of vegetation. Many of the buffers are damaged from past practices on the site and have developed patchwork vegetation that is less effective as wildlife habitat, water quality improvement, and shade areas to the adjacent wetlands. The proposed 75-foot and 50-foot buffers surrounding the Simpson Pad will provide a continuous wildlife corridor, LWD production, increased shade, and better water quality treatment as compared to current

conditions. The installation of stormwater rain gardens along the development margins of the buffer will also provide hydrology to the buffer to water plants and also to the wetland to support wetland hydrology over time.

The proposed buffers on the Simpson Pad are based on landscape position, past land disturbances, proposed project stormwater treatment and control, and a proposed buffer enhancement plan. The proposed buffer widths attempt to provide continuity for small mammals, birds, adequate protection for aquatic species, and are also of sufficient width to provide a barrier or separation between human and natural environment. The site is isolated from other contiguous wildlife habitats, surrounded by major roads and highways, includes significant human built environments railroad and urban development) that preclude large mammal use or connection to significant habitats.

The enhancement measures will increase habitat complexity, noise abatement, soil stabilization, water attenuation and infiltration, potential LWD recruitment and improve water quality by reducing stormwater sediments, nutrients and contaminants. The proposed buffer treatment will also establish an unrestricted continuous greenbelt along the wetland which currently does not exist. This treatment will promote increased wildlife use, migration corridor, resting refugia and other habitat attributes that do not exist today. Although the descriptions in the table that follows indicates a lift in function level from low to moderate, the magnitude of lift in reality is much greater due to the severely degraded state of the existing buffers on the entire project site. Buffer function analysis for the current and proposed enhanced buffer along with the corresponding proposed enhancements and function improvement category are summarized in Table 15.

Table 15. Enhanced Buffer Function Analysis for Wetland Buffers Associated with Wetlands C through I that extend onto the Simpson Pad

Buffer Function	Current Function Level[1, 2]	Proposed Enhancements (356,871 ft^2)	Proposed Level of Function[1]	Buffer Function Improvement
Sediment Removal	Low	Increased Buffer Width, Native Plant Installation, Decrease in Impervious Surface, Low Impact Stormwater Solutions	Moderate	Yes
Nutrient Removal	Low	Increased Buffer Width, Native Plant Installation, Low Impact Stormwater Solutions	Moderate	Yes
Toxics and Pathogens Removal	Low	Increased Buffer Width, Native Plant Installation, Low Impact Stormwater Solutions	Moderate	Yes

Buffer Function	Current Function Level[1, 2]	Proposed Enhancements (356,871 ft^2)	Proposed Level of Function[1]	Buffer Function Improvement
Maintenance of Microclimate	Low	Increased Buffer Width, Native Plant Installation, LWD Placement and Retention	Moderate	Yes
Contribution as Wildlife Habitat/Corridor	Low	Increased Buffer Width, Native Plant Installation, Removal of Invasive Species, LWD Placement and Retention	Moderate	Yes
Noise Abatement	Low	Increased Buffer Width, Native Plant Installation	Moderate	Yes

Notes:

[1]Current function level based on existing 25-foot undisturbed buffer and minimum buffer widths established in *Adapting Watershed Tools to Protect Wetlands* (Cappiella *et al.* 2005).

[2]GeoEngineers (2008) report entitled "Revised Wetland and Stream Compilation and Review, Everett Riverfront Redevelopment."

REVISED FIRE ACCESS ROAD ALTERNATIVES

Alternative 1

As required by the City emergency access to the Simpson Development Pad is necessary to accommodate emergency vehicles. Figure 17 – Proposed Fire Access Road Alternatives, presents alternates for alignment of a road providing fire access to the proposed development. As presented in Appendix D of the DEIS prepared for the project, Alternative 1 will consist of approximately 990 linear feet of access road through the existing, low-quality buffer along the western edge of Wetland N. The remaining segments, to the south and east, will be improvements to the existing gravel road. Approximately 700 linear feet of existing road will need to be widened to accommodate emergency vehicles. Proposed widening would be up to four feet and the exact dimensions will be determined during final design of the access road. To avoid, wetland impacts as a result of widening the access road vertical retaining walls will be placed outside of the wetland boundary and backfilled to created adequate driving surface. Since this road is planned to provide emergency access to the Simpson Pad it will not be expected to be utilized by vehicular traffic on a regular basis, nor be subject to vehicle emission build-up. The road will have a gravel surface and it will be expected that the primary use of road will be by pedestrian foot traffic and bicycles.

Alternative 2

In response to City comments, and upon further review of historical aerial photography an alternative alignment has been reviewed and proposed. Historical aerial photographs indicate an access road formerly crossed Wetland D, oriented northeast to southwest from the Simpson Development Pad to the upland area west of Wetlands N and D. Field observations confirmed the presence of an existing upland berm extending approximately 271 linear feet to the southwest through Wetland D, but the berm no longer traverses the entire wetland. In addition to the approximately 990 linear feet of access road through the existing, low-quality buffer along the western edge of Wetland N proposed for Alternative 1, Alternative 2 will require 610 linear feet through low-quality Wetland D buffer and a bridge span of approximately 84 linear feet crossing Wetland D. The approximately 694 linear feet of proposed fire

access road will require; reestablishment of 271 linear feet of former road grade, installation of approximately 84 linear feet of bridge span and construction of 694 linear feet of gravel road. Approximately 212 linear feet of existing former road grade will need to be widened to accommodate emergency vehicles. Proposed widening would require approximately 2,349 square feet (0.05 acres) of wetland fill to meet established access road width standards. The exact dimensions will be determined during final design of the access road. To avoid additional wetland impacts as a result of widening the access road vertical retaining walls will be placed outside of the wetland boundary and backfilled to created adequate driving surface. Since this road is planned to provide emergency access to the Simpson Pad it will not be expected to be utilized by vehicular traffic on a regular basis, nor be subject to vehicle emission build-up. The road will have a gravel surface and it will be expected that the primary use of road will be by pedestrian foot traffic and bicycles.

MONITORING PLAN

A detailed Habitat Restoration Plan and Wetland and Stream Mitigation report will be prepared during final design and will coordinate all proposed restoration and mitigation activities on the site. The final restoration and mitigation plans will include a detailed list of success standards and performance measures that will served as benchmarks for a formal monitoring and maintenance program that will be initiated following construction. The habitat monitoring and maintenance program will be initiated following completion of construction and shall occur as stated in the environmental permit conditions pertaining to these activities or for a period of at least 5 years, whichever is greater.

A specific set of performance standards corresponding to the stated mitigation goals has been established. The goals listed in the previous section are implemented below. These standards will be used to judge the results of this project. The success of this mitigation is dependent upon the components specified in this plan.

Monitoring will occur for a minimum of five years for buffers and 10 years for wetland mitigation per EMC 33D.090.32 and 33 and 35B). The first observation event will occur following completion of the installation of the vegetative species. This event will document that the created wetland appears to meet the construction plans. Items to be noted will include: plants were installed as specified and that the wetland appears to be receiving hydrology as planned. At this time, the wetland specialist will aid in the production of the "as-built drawings." The monitoring report prepared subsequent to this first observation will include the as-built drawing.

Whether the second monitoring event will occur in the spring or in the fall depends on the time of year during which the planting of the created wetland has occurred. The following annual monitoring events will occur at approximately 6-month intervals following the second monitoring event. The primary focus of the annual spring monitoring event will be on hydrologic functions with the fall monitoring event focusing on vegetative diversity, cover and mortality. A brief monitoring report will be prepared subsequent to each monitoring visit and will be submitted to the appropriate agencies. Following third-year monitoring, staff from the City of Everett will be notified and a visit to the mitigation site will be scheduled for concurrence on the success of the mitigation area.

METHODS

Making a photographic log of pre-construction and post-construction environmental conditions will be a primary method of monitoring the success of the mitigation. Observations to be recorded include plant survival and growth rates, hydrologic factors, and wildlife occurrences. Photographs will also be taken at each monitoring event of the monitoring stations to document the evolution of the mitigation site over the

monitoring period. Photographs will be taken in all four cardinal directions, from the same point, height, and focused in the same direction.

- Permanent monitoring stations will be established in the mitigation area. Each monitoring station will consist of circle with an 11.8-foot radius (0.01 acres) with a reinforcing bar embedded in the center.
- Monitoring of each station will be accomplished by determining the survival rate of the planting by counting both dead and live plants of each species respectively within the station. Each species will be recorded by name along with its coverage. Also, the general condition of each plant, such as observations of new growth and signs of stress or disease, will be noted.
- Monitoring of aerial coverage of the vegetation within the wetland creation area will be accomplished by estimating the percentage of the ground covered within the monitoring station, by planted and volunteer species. Estimating will occur immediately after planting and during each monitoring event. Trees, shrubs and herbaceous species will be included in the estimate of coverage. Desirable native volunteer species will be identified and documented; and undesirable non-native species such as reed canarygrass, Himalayan blackberry, cutleaf blackberry *(R. laciniatus)* and Scot's broom will be identified, counted and their percentage of aerial coverage will be estimated and compared to performance standards listed below. Upon completion of this documentation, the undesirable species will be removed.
- Hydrology and presence of hydric soil will be verified by tracking soil saturation or ponding water within the created and enhanced wetland areas during the spring monitoring events. Thriving obligate plant species will be documented as indicators of a successful hydrologic regime.
- Wildlife recordings are to be made as general notes by the monitoring biologist during the monitoring events. Observations may include sighting of individual species, nests, burrows, droppings, or other indicators. The results will be recorded, including date and time of day, and included in the report for the monitoring event.
- Maintenance requirements such as trash removal and vandalism repair will also be noted. These observations, along with mitigation site photographs and a brief report will be submitted to the City of Everett after the annual monitoring event is completed.
- It is understood that in order for monitoring to occur, the biologist will be required to cross the existing wetland and associated buffer in order to enter the mitigation area. Access will be restricted to only authorized personnel, who will be aware of the sensitivity of the existing and created wetland. The landscape contractor will also be made aware of this, and should be careful not to disturb desirable vegetation when removing non-native species. In both instances, trained professionals who will be able to determine a path of minimal disturbance to the existing wetland should be hired.

PERFORMANCE STANDARDS

- Invasive, exotic and undesirable species shall be represented by less than 10 percent coverage in the created wetland area after the 10-year monitoring period as determined by observations made within the monitoring areas.
- There shall be a minimum of 80 percent survival of all planted materials throughout the monitoring period. Survival of the enhancement plantings will be determined by counting and

documenting the numbers of dead versus live plants within the enhanced area. Species, quantities, general conditions and sizes of enhancement plants will be described and recorded.

- Acceptable cover standards for the wetland trees and shrubs:
  - end of year 1: minimum of 20 percent
  - end of year 3: minimum of 30 percent
  - end of year 5: minimum of 50 percent
- Acceptable cover standards for the wetland herbaceous species will be at least 80 percent end of year 10 of monitoring.

MAINTENANCE

Plant maintenance of the wetland creation areas will be conducted throughout the monitoring years. Maintenance during the first two years will include periodic watering (irrigation) and control of undesirable species. Maintenance during the subsequent years will be focused on weeding (invasive plant removal). Also, if crowding of newly planted vegetation by grass species is determined to affect plant survival during the monitoring events, the maintenance company will return to trim grasses from around the drip lines of the planted vegetation.

Irrigation of the wetland creation area and enhanced buffers may be required for the first 2 years after installation of native plants. A temporary irrigation system may be utilized or a regular watering schedule established if onsite water is not available. Watering during the plant establishment period is crucial for plant survival. During the dry months, usually June through September, it may be necessary to add up to 3 gallons of water per plant per week. Extremely warm weeks may necessitate watering on a more frequent basis. An irregular watering interval will encourage the development of deep root systems, which in time will reduce the need for any future watering.

Control of undesirable species will be maintained by periodic weeding of the mitigation area. Species to be removed primarily include exotic invasive species such as: reed canarygrass, Himalayan blackberry, cutleaf blackberry and Scot's broom. Only desirable native volunteer species in addition to those planned for the area will be encouraged to grow. Wetland buffer slopes will be reseeded with grasses if deemed necessary due to erosion or sedimentation into the newly created wetland areas. Some of the other maintenance responsibilities such as trash removal and vandalism repair will be performed on an as-needed basis.

CONTINGENCY PLAN

If the project fails to meet the standards discussed above, implementation of a contingency plan will be required by Ecology (1998). The proposed mitigation plan can fail if certain unfavorable factors occur. Human activity, fire, erosion, settling and disease may have a negative effect on newly planted vegetation. Plants obtained for this project may be diseased or become diseased over time and result in poor survival. Monitoring notes should include observations regarding these and other possible problems that may be occurring over the monitoring period. As problems are recorded, suggestions and possible solutions should be forwarded to the City of Everett as a component of the monitoring reports.

If more than 20 percent mortality of plantings occurs within any of the monitoring years, the problem areas will be replanted, preferable in the dormant season and provided with better maintenance to ensure

higher plant survival. If, in the judgment of the monitoring biologist, alternative plant species are needed to improve survival, the selection of alternative species will be made.

The photographic record and monitoring data shall determine the need for contingency plan activation. The success of the mitigation plan is dependent upon creating one wetland with the component characteristics described in the plan. The monitoring period may be extended if survival has not stabilized by the end of monitoring year three. The applicant is responsible for all costs associated with replanting and plant maintenance.

CONCLUSION

This BA/HMP and conceptual mitigation plan addresses conceptual buffer enhancement, creation, rehabilitation, and creation and enhancement of wetlands and streams. Highlights of this plan included:

- Maintaining required and creating buffer on all sides of preserved, restored, and created wetlands on the property and enhancing buffer functions.
- Preserving and limiting impacts to onsite wetlands and making significant improvements to existing wetland functions.
- Compensating for the loss of 6,510 square feet of regulated Category III (City of Everett) wetlands through the creation 8,150 square feet of wetlands associated with Bigelow Creek, the Snohomish River and Wetlands C, V and W.
- Compensating for the removal of 12,775 square feet of regulated Category III (City of Everett) wetland through the creation 21,102 square feet of wetland associated with the Snohomish River and Wetland V.
- Re-establishing native plants, increasing habitat diversity, potential LWD recruitment and improving overall wetland and stream functions throughout the site.

The wetland mitigation and buffer enhancement plan is in response to the current development proposal. Mitigation will focus on enhancement of wetland functions within Wetland C and the lower portion of Wetland V/W. Mitigation actions proposed will improve the hydrologic connections between Bigelow Creek and Wetland C and Wetland V/W and the Snohomish River. The proposed mitigation plan is part of an integrated wetland restoration program that the City is currently proposing for the lower Bigelow Creek corridor. Mitigation planning has been coordinated with the City as part of the ecosystem restoration of Bigelow Creek, the Snohomish River and associated wetlands, the City is currently proposing.

Buffer enhancement is also proposed to improve buffer habitat, protect wetland and stream functions and enhance multiple habitat functions for short and long term habitat improvement. Buffer enhancement will include removal of invasive species, removal of railroad tracks, reduction of noise impacts, installation of native buffer vegetation, creation of rain gardens, placement of LWD within wetlands, and re-vegetation with coniferous tree species for long term LWD recruitment.

The buffer widths required to filter out sediments, nutrients, toxics and pathogens discussed above is based on tests using stormwater that has not been treated by a stormwater filtration system. A search of BAS on pretreated stormwater entering wetland buffers did not result in any studies discussing this scenario. The *2005 Stormwater Management Manual for Western Washington* (Ecology) states that sites with more than 10% impervious area and less than 65% maintained natural vegetation will require stormwater treatment prior to leaving the site. The use of bioretention areas throughout the site is

proposed for stormwater treatment. Therefore, all stormwater will be pretreated before dispersing into sheet flow on wetland buffers on site. The pretreatment of stormwater will reduce the required width of buffers to adequately filter sediments, nutrients, toxics and pathogens. The 50- to 75-foot buffers around the Simpson Pad proposed for Wetlands C and D will remove sediments, nutrients, toxics and pathogens from stormwater.

LIMITATIONS

GeoEngineers has prepared this draft revised report in general accordance with the scope and limitations of our proposal. Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices for biological assessments in this area at the time this report was prepared. No warranty or other conditions express or implied should be understood.

This draft revised report has been prepared for the exclusive use of OliverMcMillan and their authorized agents and regulatory agencies, following the described methods and information available at the time of the work. No other party may rely on the product of our services unless GeoEngineers agrees in advance to such reliance in writing. The information contained herein should not be applied for any purpose or project except the one originally contemplated.

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