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memorandum

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to Corbitt Loch, City of Snohomish

from Aaron Raymond and Mark Johnson, ESA

subject **City of Snohomish, Shoreline Master Program Update – Draft Cumulative Impacts Analysis; Grant Agreement No. G1000030, Task 3**

With the assistance of a grant from the State Department of Ecology, the City of Snohomish is updating its Shoreline Master Program (SMP) consistent with state guidelines (WAC Chapter 173-26). Under the shoreline guidelines, local jurisdictions are required to evaluate and consider cumulative impacts of reasonably foreseeable future development in the shorelines of the state (WAC 173-26-186(8)(d)). This memorandum assesses the potential cumulative impacts that would result from development and activities in the shoreline within the city over time under the provisions contained in the Draft SMP (June, 2010). This memorandum is prepared as a grant deliverable (SMA Grant No. G1000030, Task 3) and will be revised to reflect the locally adopted SMP.

The City of Snohomish is located on the north side of the lower Snohomish River valley, approximately 11 miles upstream from where the river enters Puget Sound at Everett. The city is bordered by the Snohomish River to the south and the Pilchuck River to the east. The Pilchuck River enters the Snohomish River 0.5 miles south of the city limits. The city encompasses an area of approximately 3.25 square miles and as of 2011 the city's population was approximately 9,200. Incorporated in 1890, the city has a long physical presence and history. Today, it is an important residential and cultural center of the county with a diverse economic base. There are approximately 4.57 miles of shoreline representing designated shorelines of the state (shorelines) in the City's planning area (city limits). The City's shoreline planning area has been organized into eight distinct segments or "reaches" based broadly on the physical characteristics along the shoreline, the level of ecological functions provided by each segment, as well as existing land uses and zoning.

The purpose of evaluating cumulative impacts is to ensure that, when implemented over time, the proposed SMP goals, policies and regulations will achieve no net loss of shoreline ecological functions from current "baseline" conditions. Baseline conditions are identified and described in the City of Snohomish Draft Shoreline Inventory and Characterization Report (ESA Adolphson, June 2010). The draft Snohomish SMP provides standards and procedures to evaluate individual uses or developments for their potential to impact shoreline resources on a case-by-case basis through the permitting process. The purpose of this memorandum is to determine if impacts to shoreline ecological functions are likely to result from the aggregate of activities and developments in the shoreline that take place over time.

The guidelines state that, “to ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts among development opportunities. Evaluation of such cumulative impacts should consider:

- Current circumstances affecting the shorelines and relevant natural processes;
- Reasonably foreseeable future development and use of the shoreline; and
- Beneficial effects of any established regulatory programs under other local, state, and federal laws.¹

This cumulative impacts assessment uses these three considerations as a framework for evaluating the potential long-term impacts on shoreline ecological functions and processes that may result from development or activities under the proposed SMP over time. In addition, Appendix A evaluates provisions of the draft SMP in the context of shoreline ecological functions and ecosystem-wide processes as defined by the guidelines.

Current Circumstances

As part of the City’s SMP update process, a shoreline inventory and characterization and map folio were prepared and submitted for technical agency review in June 2010. The Shoreline Inventory and Characterization (ESA Adolphson, 2010) identifies existing conditions and evaluates the ecological functions and processes in the City’s shoreline jurisdiction. The inventory included all shoreline areas within the City of Snohomish and its designated UGA. A summary of key findings and baseline conditions resulting from the inventory and characterization is included in Chapter 2 of the Draft SMP. Baseline conditions are summarized very briefly below. For additional discussion and detail please refer to the inventory and characterization report and/or Chapter 2 of the SMP.

Physical and Ecological Processes

The City’s shoreline jurisdiction is defined by the surface geology and hydrology of the valley floor of the Snohomish River Basin including its major tributaries (Pilchuck, Skykomish, and Snoqualmie Rivers) and contributing streams. The headwaters of both the Snohomish and Pilchuck Rivers are predominantly located within the Cascade Mountains and foothills, Mount Baker-Snoqualmie National Forest, and private commercial timberlands. The landscape of the jurisdiction has been heavily influenced by frequent flooding events which have historically covered the valley with layers of mud, silt, ash, and glacial debris. The broad floodplains of both river systems have created a vast mosaic of fluvial materials and silts eroded from headwater sources.

The Snohomish River Basin covers an area of approximately 1,856 square miles across both King and Snohomish Counties and contains about 2,718 miles in stream length, making it the second largest basin draining into Puget Sound. The Skykomish and Snoqualmie Rivers originate in the Cascade Mountains and join near the City of Monroe where they become the Snohomish River. The Snohomish River flows into the estuary downstream from the City of Snohomish and empties into Puget Sound between Everett and Marysville.

¹ WAC 173-26-286(8)(d)

The Snohomish River Basin was one of the earliest areas settled in the Puget Sound region. Historically, the study area was characterized by large tracts of old-growth forests, fertile river valley soils, and abundant runs of salmon.

Urbanization and development within the upper watershed of the Snohomish River Basin have been limited compared to lower watershed where urbanization has occurred in the Puget Sound lowlands. The upper watershed of the Snohomish River has been affected by timber harvest and road building practices that have reduced the ability of riparian areas to provide wood and shade to the river and stream channels. These areas also continue to contribute to fine sediments from road construction and landslides in each river system. The lower watershed has experienced historical clearing of forests, construction of impervious surfaces, and stabilization of the riparian corridor that combine to alter the quality and movement of water through the watershed.

Habitat and Species

The shorelines within Snohomish provide important habitat for a number of fish and wildlife species. The aquatic environment of both rivers is an important riverine corridor from the Cascade Mountains to Puget Sound. Most notably, the Snohomish and Pilchuck Rivers have been designated as critical habitat for Chinook salmon, steelhead, and bull trout. All three species are listed as threatened under the Federal Endangered Species Act. Therefore, fish passage, especially for federally listed species, is an important function of the shorelines within the City of Snohomish. Priority fish species have not been identified within the Blackmans Lake shoreline planning area.

Modifications to the river system and Blackmans Lake shoreline have resulted in reduced levels of ecosystem functioning, including hydrology, water quality, riparian habitat, sediment transport, and in-stream as well as lacustrine habitat. Changes to hydrology focus on modified flow regime due to dam construction, intake diversion, and urban development. River management and shoreline stabilization have reduced the connection between the rivers and Blackmans Lake with their respective floodplains, changing the spatial extent of habitats, and increasing the potential for negative water quality impacts. Disturbances to the channel banks and lake shorelines have resulted in areas that are dominated by non-native invasive species. Wood, in the form of riparian trees and in-channel wood, is generally lacking throughout the system, which negatively impacts riparian and aquatic habitats. In general, the level of modification increases moving downstream and toward the city center in both river systems; higher occurrence of riverine disturbances consequently result.

Important features of the City of Snohomish's shoreline environment that provide habitat include:

- Streams (fish and wildlife corridors and sources of fluvial sediments);
- Riparian zones (vegetated bars and vegetation overhanging the stream reach);
- Lakes;
- Wetlands; and
- Aquifer recharge areas.

Examples of aquatic and terrestrial species found in or near the City of Snohomish that utilize crucial shoreline habitat include:

- Salmonids (including listed species such as Chinook, steelhead, and bull trout);
- Resident cutthroat,
- Waterfowl, bald eagle, bats, great blue heron, and pileated woodpecker;
- Salamanders, frogs, amphibians; and
- Mammals: raccoons, beavers, deer.

Land Use and Public Access

According to Snohomish County Assessor records (2009), current land use in Snohomish’s shoreline planning area is a mix of mainly residential, parks and open spaces with some commercial uses. One notable exception is the City’s Wastewater Treatment Plant at the city’s western edge which, including associated wetlands, comprises 35 percent of the entire shoreline planning area.

Table 1. Land Use Designations in Shoreline Planning Area

Waterbody	Industrial	Residential	Park and Open Space	Commercial	Mixed Use	Urban Horticulture	Historic Business	Grand Total
Blackmans Lake	0.00%	76.64%	23.36%	0.00%	0.00%	0.00%	0.00%	100.00%
Pilchuck River	0.00%	19.41%	44.14%	5.02%	29.65%	1.79%	0.00%	100.00%
Snohomish River	60.86%	2.80%	16.59%	9.52%	0.00%	7.48%	2.75%	100.00%
Total	34.54%	25.20%	22.98%	6.24%	4.94%	4.54%	1.56%	100.00%

Residential areas constitute the second most common land use (25 percent of entire shoreline planning area) located along the northern half of the Pilchuck River shoreline and the southern half of Blackmans Lake (77% of Blackmans Lake planning area). Parks and Open Space comprise nearly a quarter of the shoreline planning area and are focused mostly near the confluence of the Pilchuck and Snohomish Rivers. Additional pockets of open space can be found on the shores on the Pilchuck within the city limits. Farmland located at the south end of Lincoln Avenue is zoned for urban horticulture, and is used for recreational events as well as agricultural purposes.

Commercial uses, including the historic business district, are slightly less common and are mainly concentrated along the north shore of the Snohomish River in the city center (13 percent of the Snohomish River planning area). Mixed use areas are located completely within the Pilchuck River planning area and account for 5 percent of total land uses within the city-wide planning area.

The demand for water-dependent uses has decreased with the change in the economic basis of the community. Where the Snohomish once depended on the Snohomish River as a source of transportation and commerce, the city and the river have now become a destination for recreation and tourism. Strengthening and further developing the downtown area’s orientation to the Snohomish River is a key goal for the near future, as well as promoting both rivers and Blackmans Lake for tourism and increased public access. The City’s water treatment plant on the Pilchuck River is expected to continue and is a water-dependent facility.

Shoreline Alterations

Snohomish River

The construction of levees, rip rap and armoring on both the north and south shores of the Snohomish River have altered the river's flow patterns disconnecting the river from its floodplain and some associated wetlands.

Because the extensive diking and channelization severely limit overbank flows, finer materials such as sand, silt, and clay tend to be deposited in the flatter, slower moving portions of the lower river channel rather than being distributed across the nearby floodplain affecting soils, vegetation, and floodplain habitat. Decades of industrial and commercial uses have increased the amount of impervious surfaces along the shoreline and beyond. As a result surface runoff, stormwater pollution, and sediment input to the river have increased while infiltration has decreased.

Historical and intense in-stream gravel mining between 1962 and 1991 may have caused incision of the riverbed and a change in channel elevation; however, the degree to which the shorelines of the Snohomish River were affected by mining is not fully known. Mining is no longer occurring within city limits.

There are three over-water structures within the Snohomish River shoreline planning area: the SR 9 and Avenue D bridges, and the railroad trestle. The boat launch at Cady Park and the unnamed beach access at the east end of the city are the only water access points along this stretch of the river. There are no piers or docks in the Snohomish River shoreline planning area.

Pilchuck River

The Pilchuck River's floodplain is constrained by steep bluffs on the western bank and levees along the eastern bank. The levees disconnect the river from portions of its floodplain and contribute to channelization. Because the river is cut off from its floodplain, sediments become deposited within the channel. Rip rap and other types of shoreline armoring are evident in places, especially beneath the bridges. The floodplain widens near the confluence with the Snohomish River.

The City water treatment plant is located approximately 16 miles northeast from the city center at RM 26.4. A dam diverts river water to the treatment plant which produces approximately one million gallons of potable water a day at full operation. There are numerous other private water withdrawals on the river for agriculture, irrigation, and other uses located outside city limits. During summer months, it is estimated that withdrawals by the City of Snohomish can remove 5 to 20 percent of the summer low flows from the river. During period of high precipitation, the river receives high flows from Swifty Creek, the outlet stream from Blackmans Lake.

Gravel mining between 1969 and 1991 removed gravel from the river channel, gravel bars, and floodplain may have altered channel profile. Gravel mining and bank erosion have contributed to excess sediment in the river. In-stream mining has not occurred for several decades. Gravel mining continues within the floodplain on the east side of the river in unincorporated Snohomish County.

Blackmans Lake

Approximately half of the watershed feeding Blackmans Lake has been urbanized, leading to an associated increase in impervious surfaces and stormwater runoff. In response, the hydrology of Blackmans Lake has been

significantly altered to maintain desired water levels in the lake. The lake historically discharged to Swifty Creek, which runs south through the city into the Snohomish River. In the 1980s, a flow splitter was installed to direct flows in Swifty Creek above 1 to 2 cubic feet per second through a pipe system along 6th Street that discharges into the Pilchuck River. Low flows discharge to the Snohomish River near Cady Park. Past removal of emergent vegetation from lake may also have contributed to erosion of shoreline beach on south side of lake

Restoration Opportunities

In addition to the inventory and characterization report, a draft Shoreline Restoration Plan has been developed as part of the SMP update (ESA 2011). The draft plan identifies potential projects that could benefit shoreline ecological functions. However, because these restoration projects are not currently funded, they are not considered in this analysis.

Reasonably Foreseeable Future Development and Use

Snohomish River

Plans for development of the downtown riverfront area include potential relocation of the boat launch at the base of Maple Avenue to location outside downtown as well as improvement to the Riverfront Trail. Properties west of Avenue D are not likely to redevelop in near future, but could be developed for mixed use development. For those City owned properties at the west end (wastewater treatment plant and City shop yard), the City has conducted numerous studies to redevelop this area with new parks and trails. Implementation and development of any new parks and trails is contingent upon funding.

Potential exists for more formalized and enhanced public access in the urban horticultural area by the base of Lincoln Avenue, including relocation of the current boat ramp at Maple Avenue. For the remaining privately owned commercial properties abutting the river, mixed-use redevelopment may occur but would occur within established standards set by the City including provisions for buffers. Mining would be prohibited in this and all other shorelines in the city.

Pilchuck River

Parks and open space exist at the north (Morgantown Park) and south (Pilchuck Park and Recreational Fields) ends of the urban conservancy designation and little redevelopment potential exists within these areas. The western bank of the river between these two points consists mostly of steep banks with upland development outside of the steep slope and required buffer. While there is little room for infill development, redevelopment of some existing uses in the shoreline planning area is likely in the long-term. Provisions may allow some non-water dependent uses as long as they are outside the buffer. At the City's water intake facility property, potential projects to reduce the effects of the dam including removal have been studied. However, final plans and funding have not been identified. Mining would be prohibited in this and all shorelines.

Blackmans Lake

Most of area available for residential development has already been developed with only one parcel having potential for future subdivision. Wetlands on the south shore and north shore also restrict future redevelopment due to critical area provisions and protections.

Limited over-water development water may occur. Of the 28 existing lots on the lake, 23 contain small docks; therefore, there is limited potential for new docks in the future.

The City is planning to further control the water levels in the lake by replacing the existing outlet culverts and installing a flow control weir near 13th Street, which should benefit shoreline ecology by stabilizing the water level thereby reducing flooding.

Beneficial Effects of Any Established Regulatory Programs under Other Local, State, and Federal Laws

A variety of other regulatory programs, plans, and policies work in concert with the City's SMP to manage shoreline resources and regulate development near the shoreline (see Chapter 1 of the Inventory and Characterization Report).

Snohomish Municipal Code and Long Range Plans**Snohomish Comprehensive Plan**

The City's Comprehensive Plan establishes the general land use pattern and vision of growth and development the City has adopted for areas both inside and outside the shoreline jurisdiction. Chapter 4 of the Comprehensive Plan contains goals and policies specifically for shoreline management and is intended to maintain consistency with the Shoreline Master Program goals and policies.

Title 14 Land Use Development Code (Snohomish Municipal Code)

SMC Chapter 14.90 State Environmental Policy Act (SEPA) Every project requiring a shoreline permit must also demonstrate compliance with the State Environmental Policy Act (SEPA). For non-exempt proposals, the SEPA process assures that significant adverse environmental impacts are identified, minimized and mitigated, where possible. The City's SEPA procedures and policies are outlined in Chapter 14.90 of the SMC, including adoption of the state's SEPA rules by reference (Chapter 197-11 WAC).

SMC Chapters 14.255, 14.260, 14-270, 14.275, and 14.280 Critical Areas: City of Snohomish critical areas regulations restrict development in and near wetlands, aquifer recharge areas, flood hazard areas, geologic hazard areas, and habitat conservation areas. All shorelines in the city are classified as habitat conservation areas, and some areas are also classified as other types of critical areas as well. In habitat conservation areas, most uses must maintain an undeveloped, vegetated buffer of 100 feet. Under limited circumstances, some uses may encroach within 50 feet of the water's edge, provided mitigation is included to protect against loss of ecological functions

of the buffer and habitat area. Development within wetlands and within the floodway is also prohibited. Development may be permitted in other flood hazard areas and geologically hazard areas provided the project design considers these hazards. The critical area regulations have the effect of protecting most of the remaining riparian vegetation and in-water habitat in the shorelines, while generally allowing existing development to remain.

SMC Chapters 14.240 Landscaping, Screening, Fencing, and Retaining Walls: As related to environmental protections, the purpose of the regulations are to: “preserve any existing natural wooded character; reduce erosion; promote utilization of natural systems; provide permeable surface areas to recharge subsurface aquifer and reduce quantity of stormwater runoff; maintain or replace existing vegetation; moderate the microclimate; protect and enhance watercourses, riparian habitat, and associated wildlife; and reduce impacts of development on the storm drain system” (14.240.010).

Title 15 Sewer, Water, and Stormwater (Snohomish Municipal Code)

SMC Chapter 15.16 Stormwater Management: The intent of the City’s stormwater management, as stated in Chapter 15.16 of the SMC, is to “promote the public health, safety, and welfare by providing for the comprehensive management of surface and storm waters, erosion control, and flooding.” (SMC 15.16.020). The City adopts the 2005 Department of Ecology Stormwater Management Manual for Western Washington together with amendments or corrections. Stormwater management regulations have been established “to minimize water quality degradation; to prevent flood damage, siltation, and habitat destruction in the City’s creeks, streams, and other water bodies; to protect property owners adjacent to developing land from increased runoff rates which could cause stream erosion and damage to public and private property; to promote sound development and redevelopment policies which respect and preserve the City’s watercourses and aquatic habitat; to promote low impact development practices; to reduce impervious surface and stormwater runoff; to ensure the safety of City streets and rights-of-way; and to prevent water quality degradation and promote ground water recharge through the implementation of comprehensive and thorough permit review, construction inspection, enforcement, and maintenance programs” (15.16.010). The manual also “encourages low impact development (LID) best management practices (BMPs), as an alternative to conventional stormwater management systems that rely on detention ponds and closed conveyance” (SMC 15.16.060). Low impact development is intended to manage runoff close to the source of generation and to mimic the predeveloped hydrologic condition of a site.

State and Federal Regulations

A number of state and federal agencies may have jurisdiction over land or natural elements in the City’s shoreline jurisdiction. Local development proposals most commonly trigger requirements for state or federal permits when they include work in or over waters of the state; impact wetlands or streams; potentially affect fish and wildlife listed under the federal Endangered Species Act (ESA); result in over one acre of clearing and grading; or affect the floodplain or floodway. As with local requirements, state and federal regulations may apply throughout the

city, but regulated resources are common within the City’s shoreline jurisdiction. The state and federal regulations affecting shoreline-related resources include, but are not limited to:

Endangered Species Act: The federal ESA addresses the protection and recovery of federally listed species. The ESA is jointly administered by the National Oceanic and Atmospheric Administration (NOAA) Fisheries (formerly referred to as the National Marine Fisheries Service), and the United States Fish and Wildlife Service (USFWS).

Clean Water Act (CWA): The federal CWA requires states to set standards for the protection of water quality for various parameters, and it regulates excavation and dredging in waters of the U.S., including wetlands. Certain activities affecting wetlands in the City’s shoreline jurisdiction or work in the adjacent rivers may require a permit from the U.S. Army Corps of Engineers and/or Washington State Department of Ecology under Section 404 and Section 401 of the CWA, respectively.

Federal Emergency Management Agency (FEMA) National Flood Insurance Program: Communities that participate in the National Flood Insurance Program receive federally backed flood insurance. In order to participate, the community must adopt and enforce floodplain management ordinances, which reduce future flood damage. The National Flood Insurance Program is also responsible for mapping the country’s flood hazard areas.

National Pollutant Discharge Elimination System (NPDES): Ecology regulates activities that result in wastewater discharges to surface water from industrial facilities or municipal wastewater treatment plants. NPDES permits are also required for stormwater discharges from industrial facilities, construction sites of one or more acres, and municipal stormwater systems that serve census-defined Urbanized Areas, which include any urbanized areas with more than 50,000 people and densities greater than 1,000 people per square mile.

Hydraulic Project Approval (HPA): The Washington Department of Fish and Wildlife (WDFW) regulates activities that use, divert, obstruct, or change the natural flow of the beds or banks of waters of the state and which may affect fish habitat. Projects in the shoreline jurisdiction requiring construction below the ordinary high water mark of rivers or lakes could require an HPA from WDFW. Projects creating new impervious surface that could substantially increase stormwater runoff to waters of the state may also require approval.

Conclusion

The cumulative actions taken over time in accordance with the City of Snohomish’s proposed SMP are not likely to result in a net loss of shoreline ecological functions from existing baseline conditions. This conclusion is based on an assessment of the three factors identified in the Ecology guidelines for evaluating cumulative impacts:

- Current circumstances affecting the shorelines and relevant natural processes;
- Reasonably foreseeable future development and use of the shoreline; and
- Beneficial effects of any established regulatory programs under other local, state, and federal laws.

The regulatory provisions of the Draft SMP (September 2011) would serve to maintain or improve the overall condition of shoreline resources. The proposed SMP provides a new system of shoreline environment

designations that establishes more uniform management of the City's shoreline. The updated development standards and regulation of shoreline modifications provides more protection for shoreline processes. The updated standards and regulations are more restrictive of activities that would result in adverse impacts to the shoreline environment. The restoration plan, when implemented, would provide the City with opportunities to improve or restore ecological functions that have been impaired as a result of past development activities. In addition, the proposed SMP is meant to compliment several city, county, state and federal efforts to protect shoreline functions and values.

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**City of Snohomish, Shoreline Master Program Update
Nov 2, 2011 Cumulative Impacts Analysis**

**Appendix A
Assessment of Shoreline Functions Along Snohomish Shorelines**

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