

9 RESTORATION PLAN

9.01 INTRODUCTION

This restoration plan is a framework for restoration and is based on the Inventory and Characterization Report which was prepared for the City of Lynden. The restoration plan is designed to assist the City of Lynden in meeting the “no net loss” standard of the SMP guidelines. A map of the shorelines in the City of Lynden and the shore line reach designations is provided in Appendix A - Map Folio.

9.02 DEGRADED AREAS, IMPAIRED FUNCTIONS AND SITES WITH POTENTIAL FOR RESTORATION

As part of the SMP process, an Inventory and Characterization Report was prepared which summarized the watershed process, shoreline function, and alterations.

9.02.01 DEGRADED AREAS AND IMPAIRED FUNCTIONS

Typical of urban streams, Fishtrap Creek is nearly completely developed in the City of Lynden. Most portions of the creek have been permanently impaired by development (pavement and buildings). Impaired functions include alteration to the hydrology (low in-stream flows and increased flooding during rain events), sediment cycle (high turbidity during rain events, erosion of stream banks, and channelization of portion of the stream), nutrient loading, and lack of large woody debris in the stream and in the riparian areas.

A summary of the processes and alterations for each reach of the Fishtrap Creek and the Nooksack River reach is provided in Table 9-1. The rankings in Table 9-1 are based on the Inventory and Characterization Report conducted for the Lynden SMP update. The rankings reflect the urban nature of the Fishtrap Creek and may not be directly comparable to rankings performed by other jurisdictions.

9.02.02 SITES WITH RESTORATION POTENTIAL

The permanently impaired portions of Fishtrap Creek have low restoration potential due to development along the shoreline but efforts should be taken to educate landowners on steps which can be taken to restore some function of the shoreline including proper landscaping (including increasing the shade and removal of undesirable vegetation), nutrient loading, “soft” armoring methods, and other practices which can provide some benefit to Fishtrap Creek.

One side effect of the urbanization in Lynden is the increase in peak flow in Fishtrap Creek. In portion of the creek with a confined channel, the increased flows can read to extensive erosion along the stream bank. Technical experts identified on particular location along North Bridgeview Drive that is undergoing extensive erosion. This location is shown in Map Folio A. Additional creek capacity during higher flow events

Table 9-1. Lynden SMP Reach Restoration Potential

	Hydrology				Sediment				Water Quality				Large Woody Debris		Riparian Vegetation		Comments
	Groundwater Infiltration and Recharge		Water Storage		Erosion		Sediment Storage		Inputs		Storage & Nutrient Degradation		Process	Alteration	Process	Alteration	
	Process	Alteration	Process	Alteration	Process	Alteration	Process	Alteration	Process	Alteration	Process	Alteration					
Reach 1	M	L	H	M	M	M	H	M	L	L	H	L	H	M	H	M	Reach 1 is the most natural part of Fishtrap. Efforts should include restoring vegetation to increase LWD and reduce surface erosion potential along step slopes.
Reach 2	H	H	L	H	H	H	L	H	M	M	L	H	H	M	H	H	Reach 2, 3, and 4 are all highly altered. Efforts should be undertaken to restore wetlands where land is available and increase riparian function. In addition, as these reaches are in areas of high infiltration potential, efforts can be taken to restore mo
Reach 3	H	H	L	H	M	H	L	H	M	M	L	H	H	H	H	H	
Reach 4	M	H	M	H	M	M	M	M	M	M	M	M	H	H	H	M	
Nooksack River	M	M	H	H	L	H	H	H	M	L	M	M	L	H	L	H	Armoring and levee construction have separated the river from the floodplain. Creation and protection of wetlands and increasing riparian function be possible in this reach.

Orange indicates moderate or high process intensity with high degree of alteration
 Yellow indicates high process intensity with moderate degree of alteration or low intensity with high degree of alteration
 White indicates moderate or low intensity with moderate alteration and areas with low alteration

Based on Inventory and Characterization Report for Lynden

such as overflow channel construction coupled with soft armoring measures along the stream could reduce the erosion in this area.

Undeveloped areas along Fishtrap Creek should be preserved if possible. Creek buffers can be established to retain some degree of riparian function. In addition, overflow and side channels should be considered to retail adequate hydraulic capacity during high flow events. A map of sites with restoration potential is provided in Map Folio A.

Undeveloped areas in the Fishtrap Creek Shoreline Jurisdiction with potential for restoration include the following properties (shown in Map Folio A):

1. The undeveloped property south of Kok Road (restoration efforts have been undertaken in this area including the placement of large woody debris and revegetation).
2. The Northwest Washington Fairgrounds property which borders Fishtrap Creek is undeveloped and has the potential to support restoration projects.
3. The City Park and City Trail system offer opportunities for restoration including revegetation and riparian enhancement. The City Park property offers excellent public access and could be used to provide education about the creek and the function of the shorelands.
4. The Lynden Middle School property also offers restoration opportunities as this portion of Fishtrap Creek (on the south side) is undeveloped.
5. The area north of Main Street, though privately owned, has the potential for restoration if the property could be purchased or an easement obtained.

9.02.03 Other Restoration opportunities

The Fishtrap Creek channel in Heritage Park is restricted due to vegetation on the channel configuration. Additional overflow channels in this area could improve stream capacity in this area.

Another opportunity to restore shoreline function along Fishtrap Creek would be moving the dike in the southern portion of Reach 1 to allow the creek to retain a more natural character in this area. This project would be difficult as the dike also serves as a flood protection measure for the Nooksack River.

The 17th Street Bridge is a know fish passage barrier due to outfall drop and sheet flow in low flow conditions. The Bridge is constructed as a triple culvert. Replacement or modification of the bridge to allow improved salmon passage would also be a benefit to the creek.

The Pepin Creek Reroute is an important project currently being developed which involves rerouting drainage ditches (principally the Double ditches and Benson Road ditch) in the north part of the City of Lynden. Flooding has been a common problem in this area. Channel capacity is limited and habitat has been highly altered along these

ditches due to straight-line hydrology and loss of riparian area. In addition, Double Ditch has seen returns of Steelhead and other salmonids which could be enhanced by better habitat.

This is not directly part of the Lynden Shoreline Jurisdiction but these water bodies are major tributaries to Fishtrap Creek and play an important role in the delivery of water, sediment, and toxins to Fishtrap Creek.

In addition to the Pepin Creek Reroute, restoration of the Fishtrap Creek water shed north of the City of Lynden would provide a benefit to the Lynden Shoreline Jurisdiction especially related to mitigating flow events and improving water quality. Some options include improved water treatment of the Benson Road and Depot Road ditches prior to entering the culverts south of Badger Road and improving the Fishtrap Creek channel itself north of Lynden.

A map of these restoration opportunities is provided in Map Folio A.

9.03 GOALS AND PRIORITIES FOR RESTORATION OF DEGRADED AREAS AND IMPAIRED FUNCTION

The ultimate goal of the restoration is to restore shoreline functions and to achieve no-net-loss in shoreline function when the SMP is adopted. The restoration of shoreline function will take time and therefore some overarching goals and priorities are important to the process.

Loss of wetlands along both Fishtrap Creek and the Nooksack River has negatively affected the water quality and function of the shorelines. One of their principle functions is to provide water storage and retention which can improve low flow conditions during the dry season and attenuate flooding during the wet season. As these two issues have been identified as critical issues in Fishtrap Creek, the preservation of wetlands to perform this vital function should be considered.

Revegetation along Fishtrap Creek is important for restoring shoreline function. Proper vegetation reduces erosion potential by stabilizing banks and steep slopes and provides shade for the creek which reduces water temperature and increases dissolved oxygen. Vegetation along the stream also improves riparian function by providing water filtering and habitat.

Fishtrap Creek in Lynden is also lacking in large woody debris and recruitment potential is low in most reaches in Lynden. Large woody debris provides habitat for aquatic organism and can play an important role in the sediment cycle in a watershed. Due to low recruitment potential in Lynden, large woody debris placement is important to restoring Fishtrap Creek function. In order to provide future large woody debris for the creek, revegetation efforts should also be given a priority. The efforts should also focus on providing shade for the creek and removing unwanted vegetation.

Development along Fishtrap Creek upstream of the City of Lynden continues and flooding along Fishtrap Creek is anticipated to be more common. This increased flow should be accounted for in future projects. This would also be true for future projects

which add stormwater flows to the creek, stormwater detention and treatment should be designed to minimize the effect on Fishtrap Creek.

Public access to Fishtrap Creek is important to residents of Lynden. Restoration projects along Fishtrap Creek should implement a public access element as well.

9.04 EXISTING AND ONGOING RESTORATION PROJECTS

While a complete listing of all restoration projects completed in Lynden is not available, a listing of the known existing and current projects for both Fishtrap Creek and the Nooksack River was developed with the help of the technical advisory team and City Planning officials.

9.04.01 Fishtrap Creek Ongoing and Existing Projects

Existing restoration projects for the Fishtrap Creek in Lynden include revegetation and side-channel construction along Bender Fields, riparian area re-vegetation in Heritage Park (south of Badger Road) and riparian enhancement in the area north of Kok Road. Restoration efforts at the City Park have also been performed including large woody debris placement and channel modifications.

Numerous small planting projects have been undertaken throughout the City along Fishtrap Creek and its tributaries. These projects include: planting projects along Bender Park Boulevard in Reach 4, along the City Trail system and in the City Park in Reach 3, in portions of Reach 2 from Main Street to 14th Street, in Reach 2 downstream of 17th Street, and in of Reach 1.

There are three ongoing Fishtrap Creek restoration projects in the City including:

1. Large woody debris placement, revegetation, and riparian planting in the area south of Kok Road in Reach 1.
2. Vegetation planting in the area downstream of Depot Road in Reach 3.
3. Large woody debris placement, vegetation, and riparian planting near the confluence of Double Ditch and Fishtrap Creek in Reaches 1 and 2.

9.04.02 Planned Restoration Projects in Fishtrap Creek Watershed

Planned restoration projects include the replacement of the culvert on Fishtrap Creek at the Main Street crossing in 2012. This bridge has been noted as a potential fish passage barrier in the Whatcom County Public Works 2006 Fish Passage Survey due to outfall drop. The culvert replacement will improve fish passage. Restoration efforts are also planned on the Lynden Middle School property along with a trail extension and pedestrian bridge construction. This project will improve public access and viewing opportunities for Fishtrap Creek which is a critical element of the SMP process.

Students at Lynden Christian High School have been involved in a number of significant restoration projects along Fishtrap Creek. The students, directed by Biology Teacher

Harlan Kredit, operate a small hatchery along the City Trail in Reach 3 of the Fishtrap Creek. The students have undertaken planting projects along Fishtrap Creek north of the city limits and in all reaches in the City. Current projects which are being performed include planting on the bank near Fairside Drive (two year project) and planting along Fishtrap Creek near the Ford Dealership south of Kok Road.

The reroute of Pepin Creek is also in the planning stage. The scope of the project is not known at this time and the likelihood of the project being implemented depends on a variety of factors including the high project cost and acquiring the needed property to construct the new channel but the benefits to Fishtrap Creek, the landowners along Double Ditch and Benson Road, and the Nooksack River would be significant.

9.04.03 Nooksack River

Restoration efforts along the Nooksack River have been coordinated by regional groups. As part of WRIA 1, a salmonid habitat restoration strategy has been prepared that identifies specific projects related to restoring habitats and shoreline function along the Nooksack River and throughout WRIA 1. Another WRIA 1 project is the development of the WRIA 1 Watershed Management Plan which addressed issues related to water quality, flows, and habitat within WRIA 1. Whatcom County, during their SMP update, cited the Watershed Management Plan as an important element in meeting the no-net-loss goals of the County SMP. The Conservation Reserve Enhancement Program (CREP) is another project being undertaken in Whatcom County and in the Nooksack River watershed to improve stream buffers on agricultural lands.

9.05 PROJECTS AND STRATEGIES TO MEET RESTORATION GOALS

The restoration plan for Lynden includes the following elements:

1. Individual actions by landowners to improve riparian function (revegetation, soft armoring methods, etc.)
2. Restoration of riparian function, wetland function, and preservation of riparian areas in the undeveloped shoreline areas along Fishtrap Creek and the Nooksack River.
3. Community-wide revegetation efforts lead by Lynden Christian students and Nooksack Salmon Enhancement Association.
4. Mitigation of stream bank erosion along North Bridgeview Drive.
5. Implementation of restoration projects in other opportunity areas as identified in Section 9.02.03. Completion of these projects is contingent on finding funding sources.

9.06 PARTNERSHIPS, TIMELINES, AND BENCHMARKS FOR IMPLEMENTING RESTORATION PROJECTS AND ACHIEVING RESTORATION GOALS

The best way for Lynden to meet its restoration goals is to work with partners and coordinate with agencies and other groups who have expertise in restoration along Fishtrap Creek and the Nooksack River. One group important to Whatcom County is the Nooksack Salmon Enhancement Association (NSEA). Lynden has and should continue to partner with NSEA to search out funding and plan restoration projects. Public agencies which are important include the Washington Department of Fish and Wildlife and the Department of Ecology.

In addition, Lynden should work with neighboring jurisdictions including Lummi Nation, the Nooksack Tribe, and Whatcom County in planning restoration projects. Lynden should continue to be a part of the WRIA 1 process as well.

The timelines and benchmarks for implementing individual projects depend on the feasibility and cost of the projects. In general, those projects which provide high restoration potential should be given priority. In particular, vegetation surveys and revegetation projects should be emphasized.

Major restoration efforts (including rerouting Pepin Creek and other opportunities) will depend on the funding available. Funding sources should be identified before projects are planned. NSEA in particular can be both a source of funding and may provide assistance in obtaining grants to perform restoration.

The City should periodically evaluate the restoration efforts with the stated goals, objectives, and priorities of the restoration plan and the SMP in general. Of primary importance is evaluating if the no-net-loss standard is being achieved.