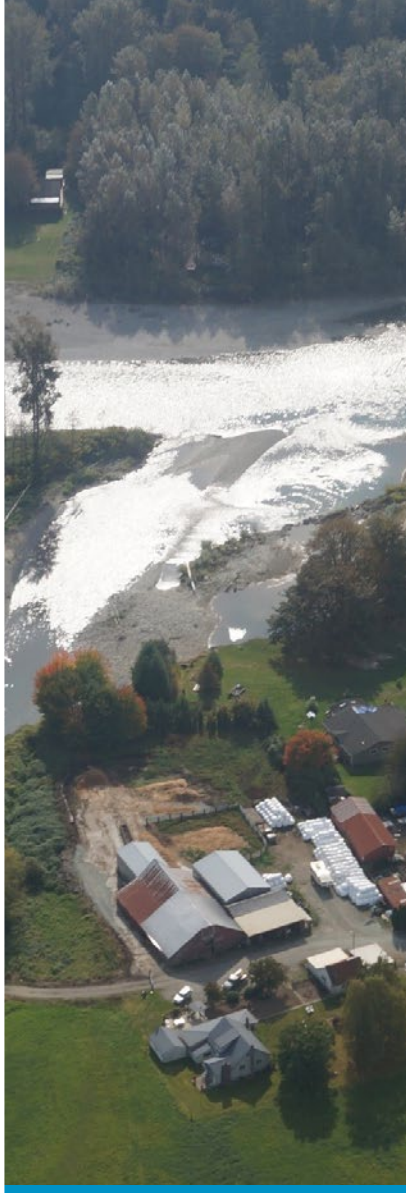
Stillaguamish River

Snohomish River and Estuary



Lower Skykomish River

Introducing the Reach-scale Plans a Product of the Sustainable Lands Strategy

Snohomish County Washington

Department of Ecology State of Washington

March 2019

www.snohomishcountywa.gov/3808/Reach-Scale-Plans
www.farmfishflood.org

With the SLS approach, diverse land and water benefits are expected—here in the Stillaguamish Estuary and in other areas.

The Sustainable Lands Strategy of Snohomish County is committed to finding net gains for farm, fish, and flood management interests

The Sustainable Lands Strategy (SLS) was launched in 2010 by Snohomish County, the Tulalip and Stillaguamish tribes, state and federal agencies, and agricultural and environmental stakeholders as a forum to improve coordination and generate progress for farm, fish, and flood (F3) management interests. SLS members agreed that a one-size-fits-all approach is not the best way to support these three related interests in different parts of the county. Reach-scale plans were developed to document baseline conditions and identify actions to advance F3 interests in four priority reaches—the Lower Skykomish River, Mainstem Stillaguamish River, Snohomish River, and Snohomish Estuary. Reaches are sections of rivers and estuaries defined for planning purposes, based on natural characteristics and existing land uses.

The purpose of the reach-scale plans is to identify a coordinated set of multi-benefit projects to improve natural functions within the reaches while generating a net gain for F3 management interests

Salmon habitat and natural floodplain conditions are being restored for future generations.

KEY PLAN GOALS

FARM

Support and strengthen the agricultural sector

FISH

Reduce the risk of flood damages for farms, homes, and infrastructure in the floodplain

Restore and protect salmon habitat

FLOOD

Improve integration across F3 management interests

Benefits of a multi-benefit planning framework

Each reach contains important salmon habitat and prime farmland, and each experiences damages from periodic flooding. The reach-scale plans assess the relevant factors that influence the ecosystem and propose a package of coordinated strategies, actions, and projects that will benefit local agricultural operations, fish habitat, and flood risk reduction.

The reach-scale plans provide avenues to address common issues such as flood storage capacity in floodplains and water resource availability in a changing climate. The primary benefit of this planning is the opportunity to accelerate progress toward achieving a sustainable multi-benefit vision for land management in each reach.

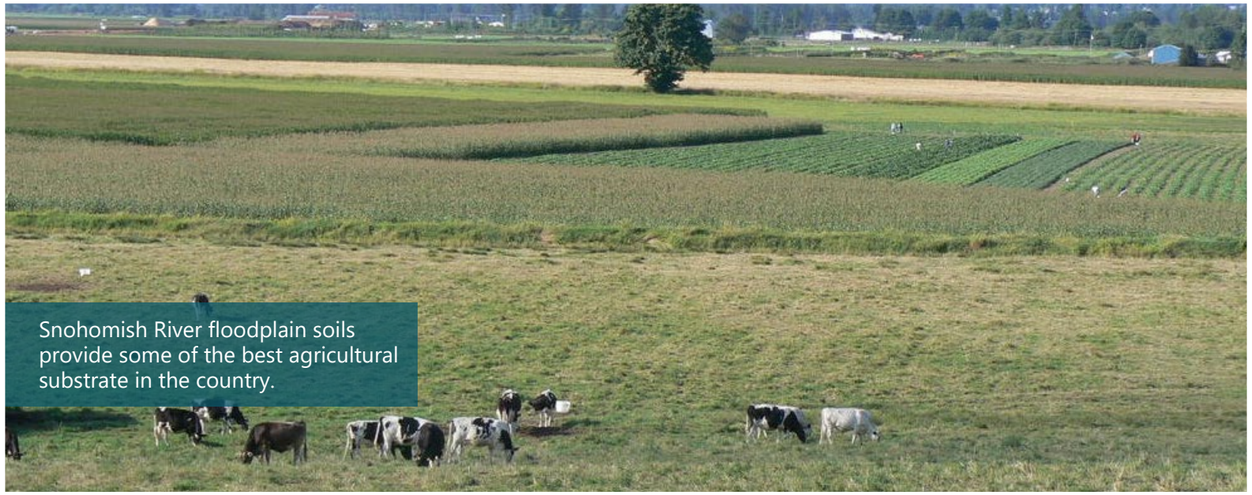
By focusing on a reach as a whole, instead of individual projects or properties, SLS can achieve long-term benefits for local participants and agreement on larger net gains needed. Reach-scale plans have been completed for the Lower Skykomish River, Mainstem Stillaguamish River, Snohomish River, and Snohomish Estuary.

Engineered log structures increase habitat quality and mimic natural wood accumulations.

The reach-scale plans provide the initial planning framework for multi-benefit opportunities in local watersheds. They also summarize baseline information from existing studies and other forums and link to other planning efforts. Each plan summarizes the natural characteristics and land uses that drive strategic planning priorities. Finally, the plans describe how land use patterns and geomorphic, hydrologic, hydraulic, water quality, and habitat characteristics of the reaches relate to specific considerations relative to agriculture, salmon habitat, water quality, and flood risk reduction.

At a regional scale, SLS integrates and builds on existing monitoring and evaluation programs, such as:

- The Puget Sound Partnership's Vital Signs and the Snohomish-Stillaguamish Local Integrating Organization's Ecosystem Recovery Plan
- The Stillaguamish Watershed Council's and the Snohomish Forum's respective salmon recovery plan goals and objectives
- Water quality indicators (e.g., 303(d)-listed impaired waterbodies under the Clean Water Act)
- U.S. Department of Agriculture farm data and monitoring



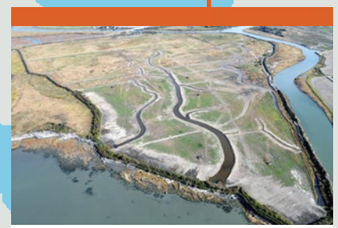
Snohomish River floodplain soils provide some of the best agricultural substrate in the country.

Channel migration and erosion threaten homes and property along the Lower Skykomish River.

Examples of success in the reaches

zis a ba Tidal Restoration

This restoration reconnects approximately 100 acres of former Port Susan Bay estuary lands—currently disconnected by dikes—to tidal influence. The project primarily benefits listed salmonid species, especially juvenile Chinook salmon of the Skagit and Stillaguamish systems, which rear in tidal wetlands on their way to the ocean. An increase in this type of estuary is called for in both the Skagit and Stillaguamish Chinook Recovery Plans, and this project contributes toward the thousands of acres needed to restore properly functioning habitat conditions in local watersheds.



Leque Island Tidal Restoration

This project will provide refuge and forage habitat for juvenile salmon, as well as estuarine habitat for shorebirds, waterfowl, and invertebrates. Phase 1 work inside the dike is complete, including 3.7 miles of constructed tidal channels with 11 inlets. Upcoming removal of 2.4 miles of perimeter dike will complete restoration of the entire 250-acre island.

Dairy Nutrient Distillation System

An advanced vapor recompression distillation system, potentially combined with a biodigester, is being constructed as a pilot project at a local dairy. If successful, it could be an innovative way of processing manure and reducing the risk of surface and groundwater contamination.

Riverbend Farm Conservation

In 2006, previously highly productive agricultural land near Arlington was subdivided into fifteen 10-acre lots, each bisecting the floodplain. The property had a deed restriction prohibiting commercial agriculture and was being prepared for development. Through the County's Purchase of Development Rights program and the work of SLS partners, the subdivision was withdrawn, development rights were extinguished, and 130 acres were saved in a conservation easement to permanently protect the land's agricultural character. The farmland property was sold to a young third-generation farmer and is being used in rotational crop farming. Conservation of the farm was also intended to address the closure of shellfish beds in nearby Port Susan and South Skagit Bay. The farmer recently won Snohomish Conservation District's farmer of the year award for modeling best practices that minimize the potential for pollutant runoff that could otherwise flow into the Stillaguamish River and affect the shellfish beds.

Stillaguamish River Reach

Snohomish Estuary Reach

Snohomish River Reach

Lower Skykomish River Reach

STANWOOD
ARLINGTON
MARYSVILLE
LAKE STEVENS
EVERETT
SNOHOMISH
MONROE
SULTAN

Stillaguamish River
North Fork Stillaguamish
South Fork Stillaguamish River
Snohomish River
Skykomish River
Snoqualmie River

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Miles
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Examples of success in the reaches

Qwuloolt Estuary Restoration

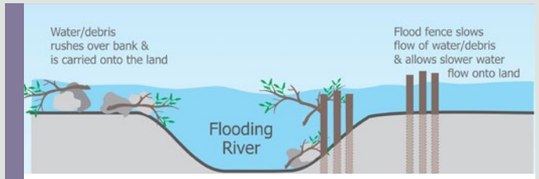
This project breached a levee, restoring river and tidal connection, mudflats, tidal marsh, and stream channels. For more than 100 years, the project area had been cut off from the natural influences of the Snohomish River and Puget Sound tides by levees, drained by ditches instead of stream channels and characterized by a monoculture of invasive reed canarygrass instead of native shrubs and grasses. Restoration of this 400-acre area is important to salmon recovery, floodplain capacity, and surrounding agriculture.

Moga Back-channel Restoration

This project was developed to reconnect a side channel, remove fish passage barriers, and improve riparian and instream habitat. Agricultural uses of the land were maintained, and the farm's owners gained better access to the fields below the farmstead, prime wildlife viewing, and plantings to provide improved forage and habitat for pollinators. Flood storage capacity during high flows was expanded, and side channel connection to existing wetlands was also provided. This area is critical spawning and rearing habitat for both the Snohomish-Skykomish and Snoqualmie populations of Chinook salmon, as well as steelhead and other species of salmon. Substantial improvements in habitat are needed in this area for the Snohomish River Basin to meet salmon recovery goals.

Qualco Energy Anaerobic Digester

This digester provides F3 benefits by improving dairy nutrient management and water quality, as well as dairy operability and long-term economic viability, while producing value-added products (biogas, compost, fiber, and water). The digester tank holds 1.4 million gallons of manure from 1,300 cows in the reach. The methane gas is burned in the generator, and electric power is sold to Puget Sound Energy.



Skykomish Floodplain Enhancement

Floodplain and salmon habitat enhancement was conducted along a 2.8-mile area with multiple landowners and partners. The landowners provided access, as well as knowledge, time, materials, equipment, and a portion of their working land. Protection for working lands is provided by flood fencing, which reduces flood debris on fields. The natural berm and vegetated riparian zone provides filtration, as well as reduces erosion, flooding, and river avulsion. For fish habitat, riparian plantings and materials provide increased shading and reduce erosion, turbidity, and other contaminants. Large woody materials provide shade and habitat complexity, essential for both juvenile and adult salmon. The combination of strategies applied in this project balance natural channel processes to stimulate habitat and water quality improvement, while encouraging the productivity of adjoining working farms in the floodplain.

Tualco Valley Flood Risk and Conversion Pressure Measures

In an area affected by repetitive flood losses, the County assisted one willing property owner with applying for FEMA funds to secure a buyout and replanted the property with native plants. Restoring natural conditions on the property increases flood storage capacity when high flows reoccur. The County's Purchase of Development Rights program was also used to purchase agricultural conservation easements on three farms, which cover a total of 127 acres, at the northern end of the Tualco Valley. This permanently extinguished development rights and conserved the land for agricultural uses in perpetuity.

Stillaguamish River Reach

Snohomish Estuary Reach

Snohomish River Reach

Lower Skykomish River Reach

STANWOOD
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532
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Snohomish River
MONROE
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Skykomish River
Snoqualmie River
SULTAN
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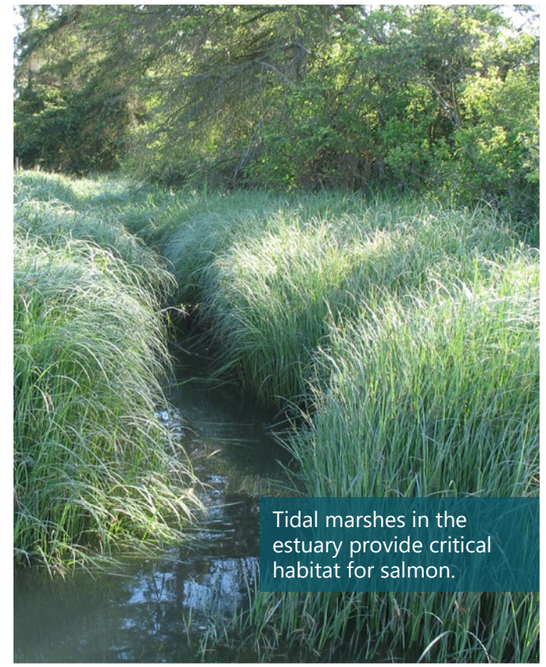
Plan implementation and integrated floodplain management

Integrated floodplain management is an iterative approach to land use that balances preserving and restoring natural functions with reducing flood risk, so all F3 management interests make progress toward their goals. Addressing different priorities and needs across the landscape is challenging, as some projects or actions will mostly benefit farms, while others will mostly benefit fish or focus on reducing flood risk. At the scale of a reach, however, there is significant common ground between the opportunities.

By implementing multi-benefit, balanced project packages at a reach scale, the costs, benefits, and trade-offs of different improvements can be more easily evaluated and balanced than would be possible at the scale of individual projects or properties



Tidal marshes in the estuary provide critical habitat for salmon.

Juvenile salmon emerge from gravels in the reaches or from upriver reaches and tributaries.

The Skykomish River has significant bank erosion.

Preliminary packages of projects have been developed for the reaches. Some of the approaches that benefit multiple interests include:

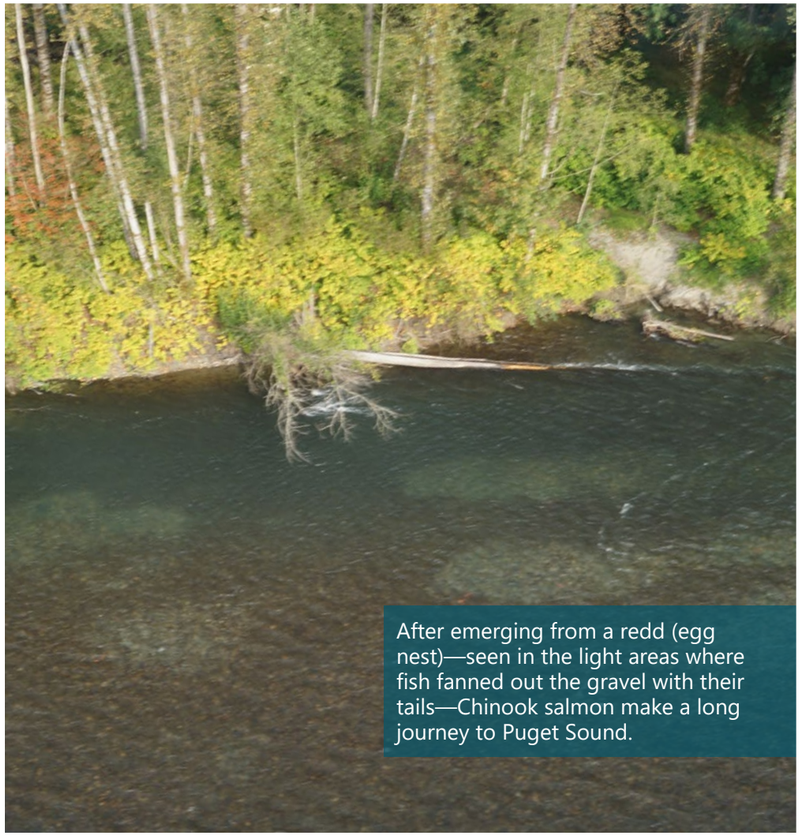
- Bio-engineered bank stabilization protection, which can also improve edge conditions for rearing salmon
- Allowance for channel migration processes at locations with limited, compatible, or willing adjacent agricultural use
- Side channel reconnections packaged with levee setbacks to protect agricultural areas that are farther upland from the re-routed streamflow
- Re-creation of previous channel forms to provide additional routes for water to flow and lessen flood impacts to land uses, which can also be used to reduce erosion for landowners on an opposite river bank or can be planned to influence flows and processes farther downstream
- Flood fencing to keep flood debris off agricultural fields, build a natural berm and vegetated riparian zone to improve water quality and prevent erosion, and create roughened edge habitat
- Incentives for providing ecosystem services that can allow agricultural operators to balance economic pressures and maintain natural resource lands

Katahdin sheep are raised in the Stillaguamish Valley.

The Integration Team is beginning to implement the plans, facilitate integrated project packages, and incorporate new information

Locating, designing, and facilitating projects requires the technical assistance, participation, and coordination of agencies, tribes, landowners, and other partners. SLS partners recently formed an Integration Team to carry out the reach-scale plans and provide progress updates to the SLS Executive Committee to adaptively manage the reach-scale plans. The Integration Team will:

- Focus on how projects and plans integrate and coordinate on the landscape
- Develop tools and processes to proactively select work sites
- Determine appropriate scales, interactions, and sequencing for projects in a reach
- Determine integrated, shared goals and appropriate indicators of progress
- Provide a mechanism for incorporating new information into the reach-scale plans
- Implement integrated project packages at the reach or subreach scale



After emerging from a redd (egg nest)—seen in the light areas where fish fanned out the gravel with their tails—Chinook salmon make a long journey to Puget Sound.

Several other efforts are planned or underway in the reaches, from which future SLS decisions can benefit. Those efforts include:

- Studies to update or improve baseline information and mapping
- Models that include more parameters to support multi-benefit projects
- Efforts to monitor change in the reaches
- A climate change decision tree for improved floodplain management
- Improvements to the integrated information system (http://gismaps.snoco.org/slsmaps; see next page for more information)
- Landowner outreach
- Detailed funding strategies
- Improved integration with other efforts, including the Agriculture Resilience Plan, flood hazard management plans, salmon recovery plan updates, and water quality improvement plans

Agricultural uses on North Spencer Island have been reduced, as implementation of the Port of Everett's Blue Heron Slough mitigation project has advanced.

Opportunities for cooperation and change over time

It is important to get projects on the ground and start learning from them. The reach-scale plans are intended to be living documents—modified, refined, or enhanced as new information is available.

Data layers used in the reach-scale plans can be viewed and overlaid at http://gismaps.snoco.org/slsmaps. This integrated information system is evolving as the plans are implemented. Future updates are expected to include the locations and status of projects, climate change scenarios, updated geomorphic assessments of river processes and hydraulic modeling, and other related plans, studies, and data layers.

SLS partners gather at a Stillaguamish Valley Protection Initiative meeting.

Water quality monitoring verifies clean water conditions and healthy habitats.

Volunteers plant the Mosher Creek restoration site.

A continued emphasis on engagement and collaboration among key SLS partners is essential for continued progress

SLS is a forum of organizations, agencies, and individuals that are working to balance the need to restore vital salmon habitat, reduce the risk of flood damages, and protect the viability of local agriculture in Snohomish County. Active participants work together to solve complex problems ranging from floodplain connectivity to regulatory efficiency, and work to improve integration across F3 interests.

SLS partners working together in the reaches

Key parties that work together to test and demonstrate multi-benefit tools and strategies in the reaches include:

- Farmers, landowners, community groups, and recreational groups
- The Tulalip Tribes
- The Stillaguamish Tribe of Indians
- Snohomish County
- Snohomish Conservation District
- Snohomish Basin Salmon Recovery Forum and Snohomish Basin Salmonid Recovery Technical Committee
- Stillaguamish Watershed Council and the Stillaguamish Technical Advisory Committee
- Diking and Drainage Improvement Districts 1 through 5 and 7, the Marshland Flood Control District, the French Slough Flood Control District, and the Stillaguamish Flood Control District
- Cities of Everett, Marysville, Lake Stevens, Monroe, Snohomish, Stanwood, and Arlington
- Port of Everett
- Non-governmental organizations (PCC Farmland Trust, The Nature Conservancy, Forterra, Ducks Unlimited, Sound Salmon Solutions, EarthCorps, and Pilchuck Audubon Society)
- State and federal partner agencies (National Oceanic and Atmospheric Administration, Washington Department of Fish and Wildlife, Washington State Department of Ecology, and Washington State Department of Agriculture)

SLS Executive Committee

Cherry Lane Farms
Brian Bookey, Co-Chair

Ducks Unlimited
C.K. Eidem

Snohomish Conservation District
Monte Marti

Tulalip Tribes
Terry Williams, Co-Chair

Werkhoven Dairy
Andy Werkhoven

Farming a few feet above sea level is a challenging balance of too much and too little water.

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