



Vision, Strategies and Actions for Puget Sound Major River Floodplains

March 2016



Floodplains by Design

• REDUCING RISK, RESTORING RIVERS •



Floodplains by Design: Vision, Strategies and Actions for Puget Sound Major River Floodplains

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This Report was prepared by The Nature Conservancy and consultants for the Floodplains by Design partnership with funding from the Washington State Department of Ecology and the U.S. Environmental Protection Agency.



Funding for the Floodplains by Design effort has been provided by the Washington State Department of Ecology, U.S. Environmental Protection Agency, Puget Sound Partnership, National Oceanic and Atmospheric Administration, The Boeing Company, National Fish and Wildlife Foundation and The Russell Family Foundation.



Executive Summary



Floodplains by Design: Protecting Our Communities and Restoring Our Rivers (A New Approach to Managing River Corridors)

Floodplains by Design (FbD) is an ambitious public-private partnership focused on integrating and accelerating efforts to reduce flood risks and restore habitat across Puget Sound’s major river corridors. By working together, we can coordinate state and federal investments with locally-driven solutions that solve multiple floodplain management problems and serve a broad range of affected interests. The partnership’s goal is to improve the resiliency of these floodplains for the protection of human communities and the health of the ecosystem, while supporting values important in the region such as agriculture, clean water, a vibrant economy and outdoor recreation.

Over the last three years tremendous success has been achieved for those working towards the FbD vision. Thanks to the leadership of legislators and a diverse coalition of supporters, the Washington State Legislature appropriated \$80 million to advance this multiple benefit approach – allowing the Department of Ecology to implement a new, innovative grant program to fund integrated floodplain projects across the state. These projects aim to reduce flood risks to local communities, and restore natural floodplain functions while supporting regional values such as agriculture, clean water, increased open space, and recreation.

A growing number of communities are engaged in collaborative processes to define the future of their river corridors and achieve benefits for multiple interests. Momentum is building across the region to transform freshwater systems to support thriving rivers, salmon recovery, flood management, and water quality to achieve a healthier Puget Sound.

The Nature Conservancy, Puget Sound Partnership, and Department of Ecology lead the FbD partnership with active support from the Environmental Protection Agency (EPA), National Oceanographic & Atmospheric Administration, tribes, businesses and other local and federal agencies. Funding for this report was provided through EPA's National Estuary Program and is focused on Puget Sound's major rivers. However, many of the strategies and needs expressed in this report are pertinent to other regions of the state.

Puget Sound's lowland river valleys are among the region's most valuable assets, delivering a wealth of economic, natural and social benefits. These floodplain areas contain the region's richest farmland, and host the Sound's signature salmon runs. They feature commercial, residential, and industrial development valued at over \$18 billion. They support wetlands and forests that filter pollutants out of our water sources. They recharge aquifers and provide recreational opportunities for the 4 million people who live in the Puget Sound region.



People, Farms and Fish at Risk

Despite the many values they contain, Puget Sound floodplains are also home to the most damaging natural disasters in the state: floods. Over 1,000 critical public facilities, including hospitals, schools, and fire stations are located within Puget Sound's floodplain areas.

Population growth and development continues to change the landscape, increasing the number of people in harm's way and compromising river functions. The agricultural industry is trying to maintain its viability in the face of increasing development, habitat restoration and regulatory pressure. Meanwhile, salmon runs continue to decline, despite the recognition that the protection and restoration of floodplain ecosystems is a critical component of salmon recovery in Puget Sound. With the region's population growing rapidly and climate change forecasts calling for more frequent and severe winter flooding,

rising sea levels, increased sediment loads and more severe summer drought, the problems continue to grow.

Floodplain management programs in the past tended to be narrowly focused, some on reducing flood hazards to property and people and others on restoring salmon habitat or enhancing water quality. Planning for these multiple uses of the floodplains is critical, yet the systems for managing them have been disjointed, uncoordinated and inadequately resourced. Meanwhile, flood response and repair costs are increasing while federal funds for flood control facilities are decreasing, and investments in salmon recovery and water quality improvements are overwhelmed by investments in activities that degrade river functions.

The Solution: Innovation through Collaboration

To confront these challenges, floodplain managers and stakeholders are increasingly gravitating toward an integrated approach to floodplain management. FbD embraces a holistic and collaborative approach to decision-making that brings together multiple interests to find common agreement on local floodplain vision, strategies and actions. By working together we can better confront shared challenges and reconcile competing priorities. By integrating flood risk reduction, salmon recovery, agriculture, recreation and other floodplain management goals we can make greater strides—more efficiently. We can also make wise capital investments that take into account projected climate impacts for the future. This collaborative, holistic approach to floodplain management can deliver more benefits (and fewer risks) to more people, and do so in a way that makes better use of limited public funding than advancing those goals in silos. Integrated floodplain management requires a tailored approach in each river corridor to effectively address



current conditions, stakeholder interests, and projected local climate impacts.

In May 2015, the FbD team asked partners working in local watersheds to articulate the current status of their integrated floodplain management vision and efforts. Leaders in most of the largest floodplains of Puget Sound provided summaries of their current efforts and

plans for the future, including the Nooksack, Stillaguamish, Snohomish, Puyallup, Skokomish, Dungeness, Snoqualmie/South Fork Skykomish, Cedar, and Green/Duwamish watersheds. The results are a snapshot of current aspirations for floodplain management

and provide a sense of the scale of potential on-the-ground actions. Below are highlights from the information the watersheds provided.

- Local leaders and partners in many watersheds have significant aspirations for improving the conditions of their floodplains for people and nature. There is an interest to significantly improve reaches of major rivers in over 40 percent of the 800 miles of floodplain in Puget Sound as well as protect the areas that are currently functioning naturally.
- Currently, there is a process in the majority of Puget Sound major river floodplains to create a unifying, broadly-supported vision and action plan to transform their floodplains. There are strong commitments to advance local integration and develop stakeholder agreement to take significant action.
- However, only a few areas currently have specific agreements on the goals, suites of actions or costs associated with achieving their local vision, goals and strategies.
- More capacity and funding is needed for local and regional processes focused on building reach scale visions, strategies and actions that meaningfully address flooding, habitat restoration and other pressing issues.
- It is clear a substantial increase in project funding is needed.



What we do over the next 10 years will define the quality of life for Puget Sound's communities. It will influence the vitality of its salmon runs, the cleanliness of its waters, and the health of the region's agricultural industry. Smart floodplain management is the key to safeguarding commercial areas like the Kent Valley and Port of Tacoma, and population centers such as Stanwood, Orting, Snoqualmie, Auburn and Burlington.

Accelerating the Pace of Action

The FbD partnership has worked with diverse stakeholders to identify barriers to success, practical solutions to those barriers, and an aggressive suite of projects. The initial phase of work has been marked by rapid progress and growing momentum.

Yet the combined estimated cost for reducing flood risk and restoring salmon habitat over the next 10 to 20 years is approximately \$3 billion -- far in excess of currently available funding. Our challenge now is to build on the groundbreaking examples of integrated floodplain management taking shape across Puget Sound to increase the pace and scale of our efforts to restore our salmon runs and make this a safer, more livable region. If these examples are taken to scale, we can attract additional resources and break the trend of decreasing environmental quality and increasing flood damages associated with our floodplains. Through a collaborative regional effort, programs and projects can be created that respect local community goals, achieve local results and meet regional priorities for habitat restoration and floodplain management.

The Puyallup River Watershed: An Example of Integrated Floodplain Planning

An example of a reach-scale integrated process is the Lower Puyallup River. An integrated management team including representatives of various Pierce County departments, the Muckleshoot Tribe, the Puyallup Tribe, the Lead Entity, the Pierce Conservation District, PCC

Farmland Trust, Forterra, and the Cities of Puyallup and Sumner meet monthly to manage the *Puyallup Floodplain Reconnections Project*, which is funded by Floodplains by Design. The project includes four large levee setback and floodplain reconnection projects which will both restore habitat and reduce flood risk. The project also includes actions that address flood risk only (such as improvements to the Fife Pump Station and the Puyallup Treatment Plant Floodwall Project) and actions that provide habitat benefit only (the Dead Man's Pond project). The Farming in the Floodplain Project, also part of the broader reach-scale strategy, will explore the needs of the agricultural community in the Clear Creek area of the reach in order to fully integrate agricultural viability into any capital projects in the area. A basin-wide monitoring program is being developed to ensure delivery of the community's multiple objectives.



Moving Forward: 5 Key Actions

The following key actions are critical to the overall effort to integrate floodplain management across Puget Sound and the rest of the state. These key actions were developed in consultation with leaders across Puget Sound as well as state, federal and tribal partners. An institutional framework that implements these key actions will help achieve local and regional aspirations for reduced flood risk, healthy ecosystems and other community needs.

1. Advance local agreement for reach-scale action

The 17 largest rivers in Puget Sound and their associated floodplains have been adopted by FbD as priority areas for floodplain project work. These are also the places with the greatest risk for flood damages to critical facilities, commerce, residences and farmlands and the places more important to salmon recovery. In addition to current risk, there is a need for incorporation of climate predictions into the planning and on-the-ground actions. Integrated floodplain management is necessary to achieve stakeholder agreement to take substantive reach-scale action. While integrated floodplain management presents a major opportunity for watershed leaders and partners, there are many barriers to successfully integrating floodplain interests. True integrated floodplain management takes time, requires hard and consistent work by local partners, and has to generate specific deliverables within reasonable timeframes if trust is to be built and increased over time. Integrated management requires continuous capacity at the local level as well as financial, technical, and operational support from a regional collaboration of governments, NGOs, and funders. State and federal support as well as private funding for local processes is critical for success.

2. Advance regional agreement on integrated vision, goals and action steps

The FbD partnership will continue to refine a 10-year regional vision and work plan based on the visions and strategies developed for each of the 17 major river floodplains. This work will be used to inform the development of a regional Floodplain Implementation Strategy and Puget Sound recovery planning. The work plan will include elements of geographic specificity, adaptive management and an assessment of relevant on-going



programs. This regional vision will help inform the priorities and focus of state and federal agencies involved in floodplain management and recovery in Puget Sound.

3. Build support for increased investment

The FbD partnership will pursue new financing, either through growing or repurposing existing funds or creating new revenue streams. One option that is gaining momentum is to address the state's broader water infrastructure project backlog (stormwater, water supply and floodplain restoration) through a multi-billion dollar bond measure. The FbD partnership also encourages local governments to expand dedicated local revenue sources to implement integrated floodplain management projects. Capital funding needs far outweigh existing sources, creating a need to rely on a set of local, state, federal and private sources – with a growing state FbD grant program at the core.

4. Focus investments and reduce administrative costs and project implementation delays

The FbD partnership seeks to advance a coordinated investment strategy for Puget Sound which will better allocate funding for ecosystem restoration and flood risk reduction. Aligning state and federal funding behind shared priority projects will increase efficiency and accelerate implementation. Agencies are already implementing measures to better coordinate funding programs and ease administrative burdens on project sponsors. Building on these efforts, the FbD partnership has identified specific opportunities to expand coordination, streamline grant processes, and incorporate flexibility in funding program requirements. There is also a need to streamline the local, state and federal permit process.

5. Increase organizational resiliency and adaptively manage the FbD partnership

The FbD partnership will continue to build and manage a regional organization comprised of local, regional and state partners to adaptively manage the regional floodplain implementation strategies and program. The partnership will foster a learning organization by regularly bring local and regional partners together to assess what's working, what's not, identify action priorities, work across floodplain interests to track progress towards collective goals and identify where progress is hindered and use the learning organization structure and other strategies to address barriers.



A Vision for the Future

Thanks and appreciation goes to everyone working at the local and regional level to improve the resiliency of Puget Sound's floodplains for the safety and well-being of our communities and the health of the environment. Our shared success over the past few years would not have been possible without the contributions of many. Building on our success will be critical to ramping up the efforts to reduce the risk of catastrophic flood damage to residences, farms and other businesses, to restore the ecological health of the major river floodplains in Puget Sound and to maintain the rich quality of life that we enjoy in this region. The vision below comes from the collaboration between local, tribal, federal and private interests working across Puget Sound.

FbD envisions a future 10 years from now where:

- A transformation of Puget Sound's floodplains is underway to reduce flood risk and restore habitat at an unprecedented scale.
- Spurred by a regional vision of resilience and revitalization and \$1 billion in new investments, reach-scale integrated plans to achieve flood risk reduction, habitat restoration and other floodplain improvements are being implemented.
- Floodplain actions are enabled by locally-driven plans, increasing political support, strategic and efficient program management, strong local-state-federal coordination, and a proven track record of results.



Achieving our future policy, funding and on-the-ground management goals will require continued engagement and leadership spanning local, state, federal, tribal and private sector interests. Success will mean a major step taken in securing our region's unique quality of life. It will make our families safer, protect public and private property, and allow Puget Sound communities to continue to enjoy and build their cultures and livelihoods around fishing, farming and outdoor recreation for generations to come.

Funding support for Floodplains by Design comes from the Washington State Legislature, Washington State Department of Ecology, U.S. Environmental Protection Agency, Puget Sound Partnership, National Oceanic and Atmospheric Administration, The Boeing Company, and The Russell Family Foundation.

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1 Introduction

1.1 Why Create an Integrated Floodplain Vision

Over the past three years, the Floodplains by Design partnership has worked to increase the pace of integrated floodplain management in Puget Sound and Washington State as a whole. Integrated floodplain management addresses community interests in managing flood risks, restoring fish and wildlife habitat, securing clean water, maintaining viable agriculture, and fostering a high quality of life for people in floodplain communities. Healthy, well-managed floodplains are good for people and nature.

1.2 Purpose of this Report

This report provides a vision for integrated floodplain management for the major rivers in Puget Sound and the strategies necessary over the coming years to achieve that vision. Floodplains by Design (FbD) is an ambitious public-private partnership focused on integrating and accelerating efforts to reduce flood risks and restore habitat across Puget Sound's major river corridors. The Nature Conservancy, Puget Sound Partnership, and Department of Ecology (FbD Team) lead the FbD partnership with active support from local partners, many Puget Sound tribes, as well as federal and state agencies. The FbD partnership strives to improve the resiliency of floodplains for the protection of human communities and the health of the ecosystem while supporting values important locally and regionally such as agriculture, clean water, a vibrant economy, and recreation.

This report has been prepared for the Floodplains by Design partnership by The Nature Conservancy with funding from the National Estuary Program through a contract with the Washington State Department of Ecology.

Over the next several months, the Department of Ecology and Puget Sound Partnership (PSP) will be creating a Floodplain Implementation Strategy to support the Puget Sound Action Agenda. This report has been written in the format of a PSP Implementation Strategy so it can serve as a foundation for the PSP Implementation Strategy development process. While the report is intended to inform the Puget Sound Floodplain Implementation strategy, its utility is meant to be broader. Many of the issues and priorities outlined in Puget Sound transcend regional barriers and are applicable throughout the state (and beyond). The information in this document is also useful for funders to consider along with other information as they target investments based on the current status of integrated management and the assistance that can be most helpful in advancing local visions and the strategies necessary to achieve the vision.

1.3 Process to Create the Vision and Strategies for Integrated Floodplain Management

In order to create an integrated floodplain management vision and implementation strategy for the Puget Sound region, it is necessary to tap the knowledge and insights of leaders and experts working at the local floodplain level as well as those working at the Puget Sound scale. Those working at the local scale have a better understanding of the conditions within their floodplains, community aspirations, and what it takes to make actions happen on the ground. Regionally, floodplain projects need to add up to a significant contribution to make progress towards the Floodplain Vital Sign target as outlined in the Action Agenda and to other goals held by the state, region, and other partners. This report is the product of an effort to integrate local and regional needs and interests.

In order to develop a local and regional process to come up with a vision and set of strategies for integrated floodplain management, the FbD partnership local and regional partners were engaged over a series of steps: 1) seeking agreement on the need for a vision and set of strategies; 2) defining how to develop a vision and strategy; 3) working with local partners to develop watershed-scale information; and 4) rolling information up to a regional level and developing conclusions and strategies.

The **agreement to complete a floodplain implementation strategy** was crafted over a series of large regional workshops, smaller meetings with floodplain leaders working at the local scale, and conversations with tribal, regional, state, and federal organizations. Partners at all levels agreed that integrated floodplain management and multiple-benefit floodplain projects are important to advance in order for the region to make greater strides towards achieving its human well-being and ecosystem recovery goals. They also agreed that creating a regional vision and a set of strategies are necessary early steps for success.

In order to **define how to develop the vision and strategy**, the FbD team developed an approach to generally categorize existing information on a local scale in order to roll it up to the regional scale. The FbD team developed a set of measures to define both current conditions and the outcomes of the work that local partners hope to complete in their floodplains in the next ten years. The measures were drawn from metrics developed by the Puget Sound Partnership and the National Oceanic and Atmospheric Administration (NOAA) for other planning efforts and were designed to capture information that likely already broadly existed or was consistently being captured at the local level. The same set of metrics will be used by the Department of Ecology to track results of the FbD grant program. Members of the FbD team met with partners working in local watersheds in Fall 2014 to share the potential measures being considered. Out of these conversations, FbD team members developed a set of four broad categories that could be used to explain the current status of floodplain reaches and actions that local partners planned to take to address floodplain issues across a river reach.

In May 2015, the FbD team asked partners working in local watersheds to articulate the current status of their integrated floodplain management vision and efforts in brief ten-year Floodplain Vision and Implementation Strategy documents. The documents include an overview of the watershed; a list of the priority benefits of integrated floodplain management in that watershed; a list of the impacts of inaction in the watershed; a narrative description of the existing conditions and strategies and outcomes for each reach; and a table of metrics defining the key strategy, context, long-term goals, and ten-year goals for each reach. Reach definitions and boundaries were decided at the local level and often used pre-existing reach definitions. Partners who participated in this effort are listed by watershed in Section 2.3.3.

Completion of the 10-year Floodplain Vision documents was a voluntary effort by local leaders across Puget Sound with support from the FbD Team. The local efforts to develop the documents was not funded by the FbD partnership. The results are a snapshot of current aspirations for floodplain management and provide a sense of the scale of potential on-the-ground actions. Local leaders had approximately four months to complete the process. The process varied greatly by watershed. In some watersheds, a broad group of local partners participated in shaping the document. In others, a smaller group of local partners drafted documents and a larger group reviewed the drafts. In several watersheds, a small subset of staff from a few organizations developed the 10-year Floodplain vision document that captured the results of larger processes and plans.

The Floodplains by Design Team received Floodplain Vision documents for nine of the 17 major Puget Sound watersheds, including the Nooksack, Stillaguamish, Snohomish, Puyallup, Skokomish, and Dungeness watersheds. King County also provided a summary of the status of the Snoqualmie/South Fork Skykomish, Cedar, and Green/Duwamish watersheds.

The FbD Team then analyzed the watershed-scale information to **develop regional conclusions and strategies**, which are reflected in the content of this report. On October 15, 2015, members of the Floodplains by Design team met with local watershed leaders representing the Nooksack, Stillaguamish, Snohomish, Snoqualmie, Cedar, Green/Duwamish, Puyallup, and Skokomish watersheds to present preliminary results of the information included in this report. At the meeting, watershed leaders provided feedback which has been incorporated into this report.

1.4 Report Organization

This document is organized into seven sections:

- Section 1 provides an introduction, including information on the purpose of the report and the process undertaken to develop the information in the report.
- Section 2 includes information on the importance of Puget Sound's floodplains and integrated floodplain management; a list of the 17 major floodplains in Puget Sound; and information on the current status of floodplains in Puget Sound. The subsection on the current status of Puget Sound floodplains includes definitions for the four key

strategies defined by the FbD team as well as summaries of the Floodplain Vision documents provided by local partners.

- Section 3 describes the regional vision and goals and their relationship to the Puget Sound Action Agenda Vital Sign and target for floodplains.
- Section 4 provides information on the key pressures on Puget Sound’s floodplains and the challenges and barriers to integrated floodplain management.
- Section 5 includes the five strategies developed by the FbD partnership based on local and regional needs and goals.
- Section 6 details the key uncertainties, research, and monitoring needs.
- Section 7 describes lessons learned from this effort and provides next steps, including two-year near-term actions.

Acknowledgements and the references used in this report follow Section 7. Appendices to accompany information presented in this report will be attached in the final report.

2 Why Are Floodplains and Integrated Floodplain Management Important?

2.1 Overview

Puget Sound’s lowland river valleys and deltas are among the region’s most valuable assets, delivering a wealth of natural and economic benefits.

Floodplains provide storage for floodwater, reducing the likelihood that developed areas (including homes, businesses, critical infrastructure) will be inundated and reducing the pressure put on flood control infrastructure such as levees. Floodplains also provide critical habitat for salmon and other species. In Puget Sound watersheds, floodplain restoration is essential for salmon recovery (Puget Sound Partnership, 2015a). Floodplains recharge aquifers and support wetlands and forests that filter pollutants out of our water sources. Tribal communities depend on Puget Sound floodplains not only for food sustenance, but also to maintain their cultural practices. Floodplains also contain many of the region’s most productive and valuable agricultural lands. Historically, many cities and urban areas in Puget Sound were built in floodplains – along rivers and bayfronts. Indeed, Puget Sound’s floodplains include commercial, residential, and industrial development valued at over \$18 billion. Rivers and estuaries are a major recreational draw in many communities, providing boating, floating, fishing, and hunting opportunities. Floodplains are also the location of many recreational trails.

As European settlers and others moved into Puget Sound in the 1800s, floodplains were among the first areas in Puget Sound to be developed because they provided easy access to water transportation networks and rich soil for productive farmland. Development of these floodplain areas over the last hundred and fifty years has provided economic benefits that spurred the growth and expansion of the region. There have been two major unplanned consequences of this development. First, flood risks and damages and the need to build and maintain flood control structures have grown along with human development in the floodplains. Second, water quality and fisheries have declined as productive floodplain habitat has disappeared or been degraded. In the future, climate change is predicted to further stress floodplain ecosystems and will exacerbate both of those unintended consequences. In recent decades, scientific understanding of the ecological functions of floodplains has expanded, and in many areas of Puget Sound goals that include significant restoration of floodplain areas are important components of ecosystem recovery plans and flood risk reduction efforts.

There is a high and growing interest among watershed leaders who see the importance of integrated floodplain management because of its increased potential to develop strategies and actions that are politically viable, to secure and align additional funding, and to advance the recovery of multiple Action Agenda Vital Signs through multiple-benefit projects. In short, where interest for collaboration exists among the parties, integrated floodplain management is a pathway to reaching the level of commitment and funding necessary for success. Integrated floodplain management can include many local issues of importance in a given floodplain or floodplain reach, including flood risk reduction, salmon recovery, viable agriculture, community resilience, improved water quality and water quantity, recreational access, and other interests. In many areas, the lack of integration is a significant barrier to achieving the diverse community interests, as the actions of one interest conflict with the actions of another.

The Puyallup Watershed is one example of the benefits of integrated floodplain management. Integrating flood risk reduction, habitat enhancement, agricultural interests, and the interests of small cities not only positioned partners in the Puyallup for Floodplains

Definition of the Floodplain

At the local scale, most floodplain partners use the 100-year floodplain mapped by the Federal Emergency Management Agency (FEMA) to define the floodplain area. The FEMA floodplain is a good definition for the purposes of regulatory floodplain management, but it excludes some areas that are ecologically valuable or have residual flood risks despite being located behind a levee. USGS mapped the region's large floodplains using topographic and hydrologic data. The USGS analysis has the benefits of regional coverage and a consistent methodology, but it doesn't always correspond with the maps or site-specific information used by floodplain managers. There is no agreed upon method of delineating floodplain extent. However, the Puget Sound Partnership and other FbD partners have been working to establish another definition of the floodplain more appropriate for integrated floodplain management as described below in Section 4.2.

by Design grant funding (\$9.2 million in the 2015-2017 state Capital Budget) but also prepared them to submit a grant application to the U.S. Department of Housing and Urban Development for tens of millions of dollars in resiliency funding.

2.2 Puget Sound's Major Floodplains

For the purposes of the Floodplains by Design program, Puget Sound is divided into 17 major floodplains, as shown in the figure below. These floodplains correspond to the 17 largest rivers and river deltas (the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) 16 plus the Cedar) in the region. Floodplain by Design has focused on large floodplains because of their size they provide greater ecological functions and ecosystem services and contain the communities with highest level for risk of flood damage.

The 17 floodplains are:

- Nooksack
- Skagit
- Samish
- Stillaguamish
- Snohomish
- Snoqualmie/South Fork Skykomish
- Cedar/Sammamish
- Green/Duwamish
- Puyallup
- Nisqually
- Deschutes
- Skokomish
- Dosewallips
- Duckabush
- Quilcene
- Dungeness
- Elwha

The Floodplains by Design Team received Floodplain Vision documents for the Nooksack, Stillaguamish, Snohomish, Puyallup, Skokomish, and Dungeness watersheds. King County also provided a summary of the status of the Snoqualmie/South Fork Skykomish, Cedar, and Green/Duwamish watersheds. Although a number of floodplain areas did not participate in this process, those that did comprise a significant portion of Puget Sound and are those most ready or already moving forward on integrated floodplain management.

Figure: Puget Sound Major River Floodplains.

2.3 Reach-Scale Integrated Strategies

As described in Section 1.3, the FbD partnership asked local partners to prepare Floodplain Vision documents describing reach-scale strategies. The reach scale is the right scale for integrated floodplain management because it allows partners to move past site-scale work, which is limited in its ability to address multiple interests and can easily be undermined by other site-scale projects implemented within the watershed. Reach-scale strategies are a foundational building block for collaborative work at a meaningful scale. When planning on a reach scale, partners can balance multiple interests across the landscape. For example, a reach-scale strategy could include several large site-specific multiple-benefit projects as well as several single-benefit projects that add up across the reach to achieve the goals of all interests.

An example of a reach-scale integrated process is the Lower Puyallup River. An Integrated Management Team including representatives of various Pierce County Departments, the Muckleshoot Tribe, the Puyallup Tribe, the Lead Entity, the Pierce Conservation District, PCC Farmland Trust, Forterra, and the Cities of Puyallup and Sumner meet monthly to manage the Puyallup Floodplain Reconnections Project, which is funded by Floodplains by Design. The project includes four large levee setback and floodplain reconnection projects which will both restore habitat and reduce flood risk. The project also includes projects

that address flood risk only (such as improvements to the Fife Pump Station and the Puyallup Treatment Plant Floodwall Project) and projects that provide habitat benefit only (the Dead Man's Pond project). The Farming in the Floodplain Project, also part of the broader reach-scale strategy, will explore the needs of the agricultural community in the Clear Creek area of the reach in order to fully integrate them into any capital projects in the area. A basin-wide monitoring program is also part of the strategy.

Below are the four key strategies that local partners were asked to use in categorizing the floodplain reaches. These categories were used to have a common way of rolling up the results from individual floodplains to create a regional picture of the aspirations for floodplain management across Puget Sound's major rivers.

The four key strategies are:

- **MAINTAIN in Highly Modified Reaches:**
Maintain highly constrained floodplain with current infrastructure with some critical habitat improvements.
- **MODIFY in Highly Modified Reaches:**
Significantly modify current infrastructure at a reach scale to reduce risk of flood damage and improve habitat.
- **IMPROVE in Slightly Modified Reaches:**
Reduce flood risk and improve habitat at the site-specific scale in reaches partially constrained by infrastructure.
- **PROTECT in Slightly Modified Reaches:**
Maintain flood risk levels and protect existing habitats with some critical habitat and/or flood hazard reduction improvements in reaches.

Where local partners have not reached agreement about what the general integrated floodplain management strategy is for a reach but a planning process is currently underway, local leaders were encouraged to select **In Process** as their key strategy. Where Floodplain Vision documents were not developed or there is no process in place, rivers or reaches have been classified as **Unknown**.

Reaches

At its simplest, a reach is a length of river. River reaches are defined differently and with differing lengths for different purposes. For the purposes of the Floodplain Vision documents and this report, local leaders were asked to divide their river into its major reaches based on what made most sense to them for planning and management purposes. The key criteria for determining reaches were the level of development of the reach; the key strategy for the reach; and existing boundaries used in planning documents such as flood plans and salmon recovery plans. The lengths of reaches varied by size of the watershed, from a one-mile reach in the Skokomish to a 65-mile reach in the Snohomish.

Categories of Strategies

The four main strategies (Protect, Improve, Significantly Modify, Maintain) were built out of discussions with local watershed staff about specific conditions and plans in their watershed and how they understand the differences between river reaches. Some partners have expressed concern that the categories mix two different elements (existing conditions and future plans) and detailed definitions for the strategies were provided or applied. The mixing of existing conditions and future plans is a deliberate feature of the strategies. FbD team members found that future plans for how to address floodplain issues by necessity were based on existing conditions in regard to the degree of modification from natural conditions. The second issue (related to detailed definitions) is focused on the concern that there could be overlap between the categories and that individual reaches could have a combination of conditions or could be incorrectly categorized. These concerns have been heard by the FbD Team, but FbD believes that the amount of effort necessary to create more detailed categories and to further assess reaches would not significantly improve the basic information provided in this early analysis. For the purposes of assessing current efforts, exploring potential regional measures, and building a case for investment, FbD partners feel confident this level of effort is sufficient for current needs given current resources.

2.3.1 Overarching Findings

While the Floodplain Vision documents (are available on request now and will be attached as appendices in the final draft) show a broad range of conditions, strategies, goals, and aspirations across Puget Sound's floodplains, several overarching themes emerged:

- Across Puget Sound, there is strong local interest in further integration of floodplain management, taking into account multiple benefits to achieve flood risk reduction, habitat restoration, agriculture, the needs of urban areas, recreation and other benefits.
- Local leaders and partners in many watersheds have significant aspirations for improving the conditions of their floodplains for people and nature as represented by the number of river miles classified in the Significantly Modify and Improve strategies.
- Every area that submitted a Floodplain Vision document is in some stage of building or sustaining agreement around integrated floodplain goals or a set of tangible actions. There are strong commitments to advance local integration and agreement for action.
- However, only a few areas currently have specific agreements on the suites of actions or costs to achieve their local vision and strategies.
- More capacity and funding is needed for local and regional processes focused on building reach scale visions, strategies and actions that meaningfully address flooding, habitat restoration and other pressing issues.

While the FbD partnership originally had hoped to provide quantifiable measures for floodplain goals at the scale of Puget Sound, it is not yet possible to do so, as few local

floodplains have defined actions and costs. However, nine reaches across four watersheds (Nooksack, Puyallup, Skokomish, and Dungeness) have integrated and agreed-upon strategies with specific actions and cost estimates. These nine reaches represent approximately 175,000 acres of floodplain.¹ Looking at the information for these nine reaches provides an example of the outcomes of investing in integrated floodplain management.

The results of an approximately \$340 million investment in these nine reaches:

- In 7 of the 9 reaches, the assessed value of these reaches is greater than \$500 million. The proposed investment would increase the protection of human development.
- Up to 3,000 acres of floodplain would be restored (including 620 acres of estuarine floodplain),
- Ecosystem functions would be improved on up to 24 miles of rivers,
- Up to 10 miles of levees would be set back or otherwise improved,
- Up to 115 homes would be acquired and removed from the floodplain,
- Up to 1000 acres would be acquired, and
- Up to 1500 acres of farmland would be protected.

In previous report by the FbD team (Fall 2014), estimates were developed identifying the magnitude of funding needed for integrated floodplain management. These estimates were derived by collecting information from salmon recovery and flood risk reduction plans.

In 2014, Salmon Recovery Work Plans include an estimated \$788 million in floodplain-related capital costs alone (over the next three to five years). Some of this need is covered by the existing state and Federal funds described above, but it is clear that there is a significant funding gap between the full range of salmon recovery needs and the available funding. It is difficult to quantify the amount of the funding gap because the \$788 million estimate is only for the floodplain-related costs in the 3-Year Work Plans (the total cost of the 3-Year Work Plans is considerably higher).

Similarly, existing data suggests that the funding gap for flood risk reduction efforts in Puget Sound is also significant. The total estimated capital costs included in flood risk reduction plans across Puget Sound total \$2.2 billion over the next 6 to 20 years. The dedicated annual revenue from Flood Control Zone Districts is approximately \$49 million per year. Even if local revenues were dedicated solely to capital needs (which they are not), there would still be a substantial gap between the flood risk reduction funding need and the available local revenue.

These estimates are clearly approximations, but they are grounded in the best information available regarding planned floodplain project costs and likely revenue streams. However, it is important to keep in mind that: 1) floodplain project funding needs will increase significantly as plans are completed or updated; 2) the estimates do not include related

¹ Acreage is based on a roll-up of local measurements of floodplain area provided in submitted materials

water quality, agricultural, and recreation needs associated with Puget Sound floodplains; and 3) these estimates are for capital expenses and there is a significant need for noncapital costs like maintenance, monitoring and the collaborative process to obtain and maintain partner agreement.

2.3.2 Puget Sound Strategy Breakdown

The Floodplain Visions provided by local watershed leaders, combined with information about total river miles in watersheds that did not provide Vision documents, provide high level information about aspirations across Puget Sound. Since there is not yet a standard definition of floodplain area that reflects ecological considerations as well as flood hazard reduction needs, river miles of major rivers or tributaries are used as a surrogate for floodplain acreage. For the purpose of this analysis, Puget Sound’s major floodplains include over 800 river miles total.

When the watersheds in Puget Sound are combined, the percentage breakdown of the major river strategy categories is:

- Maintain: 2%
- Significantly modify: 8.5%
- Improve: 35.5%
- Protect: 1.5%
- In process: 19%
- Unknown: 33.5%

The percentage breakdown above shows that local leaders and partners in many watersheds have significant aspirations for improving the conditions of their floodplains for people and nature, as represented by the number of river miles classified in the Significantly Modify and Improve strategies. Where agreement exists, partners see the need for significant change (44%) as opposed to simple maintenance (2%) or protection (1.5%). The percentage of river miles in the Unknown category (33.5%) represents the watersheds that did not provide a Floodplain Vision document. It is not known at this time whether the key strategies in these watersheds are represented in a similar proportion as for the nine watersheds that did provide Vision documents.

Estuary reaches in the Nooksack, Stillaguamish, Snohomish, and Dungeness watersheds were categorized in the Significantly Modify strategy, while the Skokomish estuary was categorized under Protect since restoration has already occurred and the Puyallup estuary is In Progress.

2.3.3 Individual Floodplain Status Summaries

This section includes highlights, current strategies, next steps, and information on participants for those watersheds that provided Floodplain Vision documents. This information was provided by watershed leaders as a snapshot of the current status of their integrated floodplain management activities. In most watersheds, local leaders are involved in ongoing processes to develop agreement amongst partners for these visions,

strategies and actions. The information presented here is expected to continue to evolve in each watershed as their integrated planning processes continue.

Since partners define floodplains differently and because data availability varies across watersheds, information on the status of individual floodplains is not provided in floodplain acreage. Instead, river miles are used as an indicator of the scale of the work being planned.

In the **Nooksack** watershed, the process of filling out the Floodplain Vision document stimulated further discussions about integrated planning. The document notes preliminary agreement on a broad strategy for the estuary reach with defined actions and cost estimates. Next steps are to continue to build agreement on goals, strategies, and specific action steps. Participants and reviewers included the WRIA 1 Management Team (Whatcom Local Integrating Organization), System-Wide Improvement Framework (SWIF) Interagency Team, Lummi Tribe, Nooksack Tribe and Flood District Advisory Committee.

Current reach strategies in the Nooksack:

- Maintain: 17.1 miles
- Significantly modify: 6.5 miles
- Improve: 40.9 miles
- Protect: 7.4 miles
- In process: 6.4 miles

Extent of Strategies

River miles document the size of the reach in which local leaders intend to implement the strategy, not the size of the project area for any specific actions. For example, the summary of the Nooksack Watershed states that the current strategy is “Significantly Modify” for 6.5 river miles. This does not mean that 6.5 river miles will be significantly modified, but that local leaders plan to implement a package of projects at various sites along a 6.5-mile long reach in order to significantly modify the current infrastructure to reduce the risk of flood damage and to improve habitat.

In the **Stillaguamish** watershed, partners have a desire to build consensus on quantified goals and specific action steps and costs. Next steps include establishing specific targets for flood risk reduction, salmon recovery, and agriculture. Better modeling is likely necessary to help establish these targets. Participants and reviewers included the Agricultural Advisory Board, Snohomish/Stillaguamish Local Integrating Organization, Sustainable Lands Strategy, Stillaguamish Watershed Council, and Snohomish County Surface Water Management.

Current reach strategies in the Stillaguamish:

- Significantly modify: 26 miles
- Improve: 81 miles

Similar to the Stillaguamish, partners in the **Snohomish** watershed have a desire to build consensus on quantified goals and specific action steps and costs. Next steps include establishing specific targets for flood risk reduction, salmon recovery, and agriculture. Better modeling is likely necessary to help establish these targets. Participants and

reviewers included the agricultural advisory board, Snohomish/Stillaguamish Local Integrating Organization, Sustainable Lands Strategy, Snohomish Recovery Planning Forum, and Snohomish County Surface Water Management.

Current reach strategies in the Snohomish:

- Significantly modify: 6.9 miles
- Improve: 126.3 miles

In the King County portion of the **Snoqualmie/South Fork Skykomish** watersheds, there are four active corridor planning initiatives to identify strategic river and floodplain management approaches to reduce flood risks, improve habitat conditions, protect agricultural soils, enhance farmland productivity, achieve sustainable levels of recreational access and opportunities, and other beneficial outcomes. Corridor planning efforts are underway in the South Fork Snoqualmie River, Middle Fork Snoqualmie River (currently on hold), Lower Snoqualmie River, and Tolt River. A floodplains summary was provided by King County. For the purposes of this report, all reaches in the Snoqualmie have been classified as In Progress.

In the **Cedar** watershed, King County is developing a Cedar River Corridor Plan to develop approved goals and objectives for the lower 22 miles of the river. To date, the Cedar River has benefited from coordinated capital investments that produced flood risk reduction and habitat restoration outcomes. Next steps include completing the Corridor Plan in 2016. A floodplains summary was provided by King County, but it did not define river reaches. For the purposes of this report, the Cedar has been classified as In Progress.

In the **Green/Duwamish** watershed, the King County Flood Control District is leading the Green River System Wide Improvement Framework (SWIF) planning process, which seeks to ensure that levees in the Lower Green maintain their enrollment within the PL 84-99 program, in a manner that supports FEMA accreditation, optimizes flood safety, and addresses environmental laws governing listed salmonid species. Next steps include completing the SWIF and submitting a plan to the U.S. Army Corps of Engineers in February 2016. A floodplains summary was provided by King County. For the purposes of this report, the Green/Duwamish has been classified as In Progress.

In the **Puyallup** watershed, Floodplains by Design grant funding has brought a broad range of partners together to develop a more fully integrated approach to floodplain management. In addition, goals, strategies, and costs are defined for three of five reaches. In the Lower Puyallup there is robust agreement on a number of actions and their cost, but discussions are still occurring about the extent of major restoration of one portion of the reach. Next steps include building a strong collaborative structure to increase trust and integration as projects are implemented and better articulating and quantifying goals for agriculture and habitat restoration in order to ensure that the suite of actions produces the results necessary for success. Participants and reviewers included Pierce County Surface Water Management, Planning and Land Services, and the Executive's Office; Puyallup Tribe of Indians; Muckleshoot Indian Tribe; Pierce Conservation District; City of Sumner; City of

Puyallup; Pierce County Agricultural Round Table Farmland Conservation Committee; Forterra; and PCC Farmland Trust.

Current reach strategies in the Puyallup:

- Modify: 26.7 miles
- In Process: 38.3 miles

The Floodplain Vision in the **Skokomish** watershed builds from previous efforts (including the U.S. Army Corps of Engineers' General Investigation, Federal Energy Regulatory Commission requirements, and salmon recovery planning) and leverages a \$100 million investment by Tacoma Public Utilities. Previous and current efforts in the Skokomish are expected to lead to a fully restored estuary over the next several years. Next steps include evaluating whether currently proposed habitat actions will result in necessary flood risk reduction or if further integration of flood risk reduction into project designs is necessary. The Skokomish Tribe and the Mason Conservation District developed the Floodplain Vision document, which describes the results of previous efforts that had extensive collaborative processes.

Current reach strategies in the Skokomish:

- Improve: 32.9 miles
- Protect: 3.5 miles

The **Dungeness** watershed has broad support for an integrated plan based on years of planning and integration work. Next steps include attempts to more effectively acquire land and continued improvement to integrate flood risk reduction and habitat efforts with irrigators and other water supply and water quality interests. A subcommittee of the Dungeness Floodplains by Design workgroup prepared the Floodplain Vision document.

Current reach strategies in the Dungeness:

- Significantly Modify: 3.3 miles
- Improve: 5.5 miles
- Protect: 3.2 miles

3 Vision and Goals

3.1 Vision and Goals

3.1.1 Vision

The Floodplains by Design partnership envisions a future 10 years from now in which:

A transformation of Puget Sound's floodplains is underway to reduce flood risk and restore habitat at an unprecedented scale.

Spurred by a regional vision of resilience and revitalization and \$1 Billion in new investments, reach-scale integrated plans to achieve flood risk reduction, habitat restoration and other floodplain improvements are being implemented.

Floodplain actions are enabled by locally-driven plans, increasing political support, strategic and efficient program management, strong local-state-federal coordination, and a proven track record of results.

3.1.2 Goals

The Floodplains by Design partnership envisions a future 10 years from now in which:

1. People and communities are better protected in the face of more frequent and larger floods;
2. Salmon are on the positive path towards more harvestable and sustainable runs;
3. Farmland is less vulnerable to development, flooding and climate change impacts;
4. The regional quality of life is enhanced through improved greenways and recreation opportunities;
5. Water quality has been improved through floodplain restoration;
6. Floodplain communities and ecosystems are more resilient to climate change;
7. Productive partner relationships and strong political support enables substantive advancements in floodplain management; and
8. Federal, state and local policies, programs, regulations and funding work in concert to support an accelerated program of integrated floodplain action.

3.2 Relationship to Puget Sound Vital Sign, Target, and Other State Goals

The goals and vision of the Floodplains by Design partnership are closely linked to the Floodplain Vital Sign and Target established by the Puget Sound Partnership (a member of the FbD partnership). The Puget Sound Partnership's Leadership Council adopted the following ecosystem recovery targets for floodplains by 2020:

- 15 percent of degraded floodplain areas are restored or floodplain projects to achieve that outcome are underway across Puget Sound, and
- There is no additional loss of floodplain function in any Puget Sound watershed relative to a 2011 baseline.

The Puget Sound Partnership has not yet defined how these targets will be achieved or adopted a definition of the geographic extent of their floodplain focus. In 2014, an analysis prepared by USGS established a definition for floodplains and then determined that achieving the 15 percent target would likely require restoration of over 35,000 acres of land.

At this time, there is not a quantified regional vision or target for flood risk reduction, though the State of Washington has long been interested in reducing flood hazards across

the state, especially in those areas with highest future risk or significant past damages. Across the Puget Sound region there are local visions for salmon recovery, flood risk reduction, and other community values such as agriculture, though establishing quantified local measures as well as regional measures to look at the sum of the various parts is not yet possible.

In June 2015, a group of Puget Sound Partnership, Ecology, and The Nature Conservancy staff met to discuss the definition of floodplains for the PSP Vital Sign. It was determined that, due to issues with USGS analysis dataset and differences with local datasets, it is not ready to be adopted as the baseline for the floodplain Vital Sign at this time. The group agreed to a short-term approach that would use the FEMA 500-year floodplain as the baseline floodplain extent. This short-term approach was used to report on the Floodplain Indicator in the *State of the Sound* report (Puget Sound Partnership, 2015b). The group also agreed, as a short-term approach, to use the USGS analysis of land cover to define degradation. PSP staff is working to develop more detailed information about the Floodplains Vital Sign based on these decisions. Over the long term, the group will work to incorporate an analysis of ecological functions into the definition of the floodplain. The group agreed that there is valuable information in the USGS assessment that needs to be incorporated. The group will also work to define disconnected areas as part of the definition of degradation. The floodplain extent will be ultimately be determined through the Puget Sound Ecosystem Monitoring Program (PSEMP) process.

FbD is working with local communities to identify and commonly describe the opportunities for stewarding Puget Sound floodplains for long-term ecosystem health and viability, human and community benefits, reduced flood risk, and other needs. By better clarifying local visions and suites of actions it will be increasingly possible to understand how close these actions, when “rolled up” to the regional scale, come to achieving the Floodplain Vital Sign target as well as local aspirations.

4 Key Pressures, Challenges, and Barriers

4.1 Pressures on Puget Sound Floodplains

Each floodplain objective (whether flood risk reduction, ecosystem restoration, or agricultural viability) faces pressures, some which are common across the objectives for integrated floodplain management and some that are unique to the individual objective. In some cases, the solution to the pressures for one objective can in turn become a pressure on another. For example, a levee may reduce the pressures of increased flooding while placing new pressures on salmon. This section focuses on the high-level pressures that various floodplain objectives have in common. These pressures can be divided into three categories: historic development and resource use decisions; current development pressures; and climate change.

Historic development and resource use decisions have placed homes, businesses, and infrastructure in floodplain areas, degraded habitat, and, in recent decades, allowed the conversion of farmland to other uses. Aging flood control infrastructure no longer provides the same level of flood risk reduction and often requires expensive repairs. In many cases, existing flood control infrastructure is incompatible with habitat needs due to the disconnection of floodplain habitat, the lack of fish passage, and the lack of riparian vegetation to provide shade for rivers. Farmers depend on agricultural infrastructure that requires ongoing maintenance that has become increasingly difficult to permit.

As Puget Sound communities grow, there is continued development pressure in floodplain areas. Development in the floodplain leads to more flood damage and a greater need for new flood control infrastructure in the future. Development continues to pressure the agricultural industry by converting or threatening to convert the agricultural land base to residential development. And continued development in the floodplain leads to further degradation of floodplain habitat. Puget Sound communities need to balance a variety of needs when planning for development, and both population growth and the need for economic growth continue to lead to further development in floodplain areas.

Changes in climate conditions are projected to cause larger and more frequent storm events along with rising sea levels and increased sediment loads. Without additional actions, this will likely result in more frequent and severe flooding, which will lead to increased flood damage. Climate change is also anticipated to cause more droughts in the future, leading to low flows in the summer, which can hinder agricultural productivity and be fatal to fish. Events which currently seem abnormal are projected to increase in frequency over the next century becoming more common norms. Impacts consistent with climate change projections have already been observed across Puget Sound. For example, farmers across Puget Sound are reporting increased drainage problems on their land, decreasing their productivity, while salmon runs are regularly impacted by increased peak flow and changes in flow timing.

A draft series of results chains developed by FbD consultants that are built off of the prototype results chains developed by PSP staff and are included in a separate attachment.

4.2 Challenges and Barriers to Integrated Floodplain Management and Achieving the PSP Target

In Fall 2014 the Floodplains by Design team produced a report that outlined the challenges and barriers for integrated floodplain management (“A New Approach to Managing River Corridors”). The team pulled information from past reports, conducted an online survey, convened a workshop of over 150 floodplain partners, and hosted multiple smaller workshops and discussions with local project proponents and floodplain managers in order to identify and understand the barriers to floodplain management. The 2014 report found that people working at the local and regional level most commonly identify the following list of challenges as critical to address if we are to successfully achieve the vision:

1. Lack of locally integrated floodplain management visions, strategies, and sets of actions.
2. Conflicts between Federal, state, and local policies, programs, regulations, and funding.
3. Uncertainty in the future of Federal programs that are part of the foundation for how floodplains are managed.
4. Inadequate protection of naturally functioning floodplain areas.
5. Insufficient funding and lack of funding alignment with an integrated vision, strategy, and suite of actions for floodplain management.
6. Unpredictable and inefficient process for permitting projects and ensuring ecological outcomes are met.
7. Lack of effective partnerships with landowners to develop a realistic and implementable suite of actions that achieves floodplain goals.
8. Lack of capacity and governance structures at the local and regional levels needed to implement a much larger set of actions on the ground in a shorter period of time.

The *Draft Implementation Strategy for Puget Sound's Estuaries Recovery Target* identifies regional priorities within large river deltas, a subset of the large river floodplains that this Implementation Strategy is focused on. The Estuary Implementation Strategy developed by PSP defines six key ingredients for success in estuary recovery at the local level. These ingredients are applicable to the success of broader integrated floodplain management visions and actions as well:

- **Capacity:** the available labor to complete work.
- **Funding:** the ability to obtain sufficient funds on time to complete work.
- **Knowledge:** the ability to predict the outcome of our work.
- **Land:** the ability to access and modify land to complete work.
- **Vision:** the willingness of local communities to accept the risks and tradeoffs to do the work.
- **Regulation:** the permission from local, state and federal authorities to do work.

The table below shows how the key ingredients of recovery can address the eight challenges and barriers identified in the 2014 report.

Barrier and Challenge	Key Ingredient of Recovery
Lack of locally integrated floodplain management visions, strategies, and sets of actions.	Vision and Knowledge
Conflicts between Federal, state, and local policies, programs, regulations, and funding.	Regulation and Funding
Uncertainty in the future of Federal programs that are part of the foundation for how floodplains are managed.	Regulation

Inadequate protection of naturally functioning floodplain areas.	Vision, Regulation and Knowledge
Insufficient funding and lack of funding alignment with an integrated vision, strategy, and suite of actions for floodplain management.	Vision, Funding and Knowledge
Unpredictable and inefficient process for permitting projects and ensuring ecological outcomes are met.	Regulation
Lack of effective partnerships with landowners to develop a realistic and implementable suite of actions that achieves floodplain goals.	Land and Knowledge
Lack of capacity and governance structures at the local and regional levels needed to implement a much larger set of actions on the ground in a shorter period of time	Capacity

5 Accelerating Integrated Floodplain Management: Strategies and Early Actions

Accelerating actions across Puget Sound to reduce flood damage, improve ecological functions and achieve other desired benefits will take a coordinated effort in each local floodplain with coordinated support from regional partners. The FbD partnership developed the strategies and actions presented in this section based on input received at large regional workshops from individuals representing various floodplain interests. These strategies were discussed with a group of local floodplain leaders at a meeting on October 15, 2015, and that group agreed these strategies would help the region achieve its floodplain goals over the next 10 years.

5.1 Strategy One: Advance local agreement for reach-scale action

Support high quality local processes that create agreement across key interests and result in an integrated plan with a vision, quantified goals and actions, a clear description of capacity and funding needs, and a schedule with specific milestones.

Strategy One - Ten-Year Objective:

Transformative, basin-scale actions are being implemented in a majority of Puget Sound watersheds

Potential actions associated with Strategy One include:

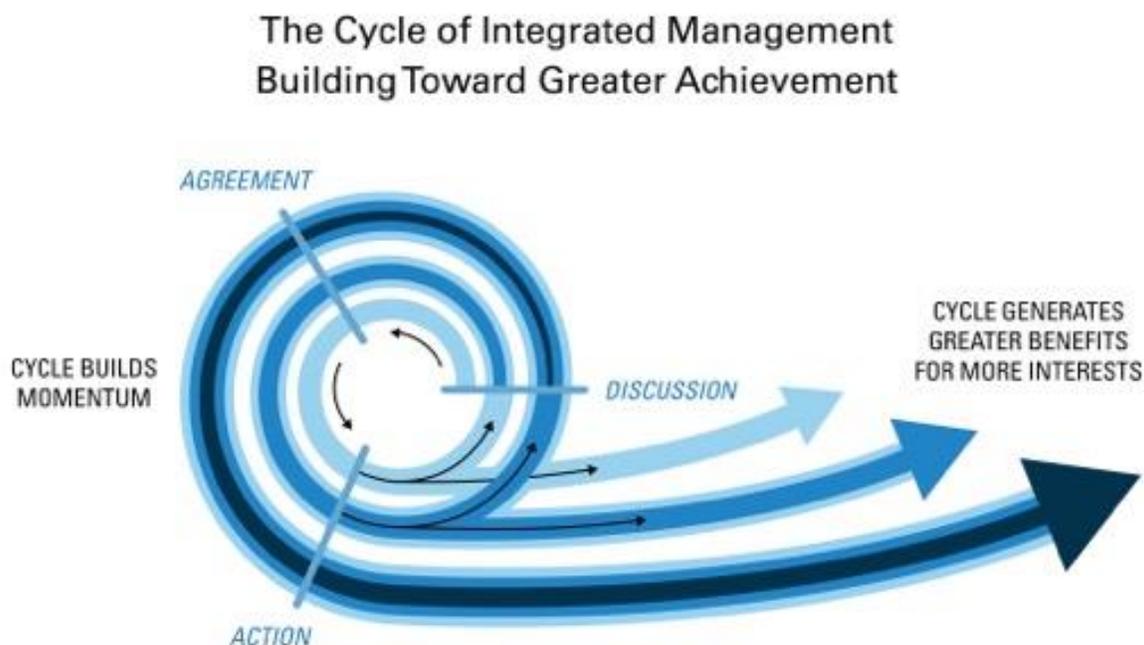
- Continue and expand capacity at the regional level to track and provide strategic and facilitation support for local integrated planning processes.
- Provide additional funding to local processes where needed.
- Revise state floodplain planning guidance to support integrated floodplain management at the local level.
- Support the development and incorporation of climate information into watershed plans in order to build ecosystem and community resilience.

Two-Year Outcome: Within a majority of Puget Sound watersheds, key stakeholders have reached agreement around a set of measurable floodplain goals and specific reach scale actions to achieve the goals.

Two-Year Outputs:

- Framework and schedule to guide development of local integrated floodplain Implementation Strategies
- Climate information translated for 5 watersheds
- Integrated floodplain strategies from at least 5 watersheds

Integrated floodplain management is necessary to achieve local agreement for reach-scale action. While integrated floodplain management presents a major opportunity for watershed leaders and partners, there are many barriers to successfully integrating floodplain interests. True integrated floodplain management takes time, requires hard and consistent work by local partners, and has to generate specific deliverables within reasonable timeframes if trust is to be built and increased over time. Integrated management requires continuous capacity at the local level as well as financial, technical, and operational support from a regional collaboration of governments, NGOs, and funders. It also requires that local partners be held accountable for delivering agreement in increasing specificity alongside adequate funding to implement agreed upon actions in a timely fashion. As seen in the figure below and as noted in the status of integrated floodplain management in Section 2 above, integrated floodplain management is built in stages and requires continuous nurturing and support. Thus, an area that has general agreement on a strategy but lacks specificity will likely need to move through an “In Process” stage to gain the next level of agreement.

Figure: Agreement for Floodplain Action is Built in Stages

At the meeting of local floodplain leaders in October 2015, attendees agreed that the following components were important to achieve a successful integrated planning process:

- trust and relationships between partners,
- staff consistency,
- clear deliverables and schedules,
- partners who clearly articulate their needs and goals,
- trusted technical information and modeling,
- geographically based teams, and
- examples of success in other watersheds.

5.2 Strategy Two: Advance regional agreement on integrated vision, goals and action steps

Refine regionally agreed upon vision, goals, strategies and actions as agreement is achieved in local floodplains and regional analyses are completed.

Potential actions associated with Strategy Two include:

- Create a regional floodplain implementation strategy through the PSP process that is led by Ecology, building off of the initial land use, estuary and floodplain

Strategy Two - Ten-Year Objective:

A collective vision has mobilized political, financial, and other resources.

implementation strategies, efforts to integrate floodplain management efforts at the local/watershed scale across Puget Sound (see Strategy 1), and incorporating climate change considerations.

- Conduct regional analysis on the impacts of increasing sediment loads, climate change, and other technical issues on floodplain projects, presenting information that is scalable to local watersheds and identifying areas where regional approaches are merited.
- Refine the definition of floodplains and the analysis of the level of ecological degradation in floodplain areas.
- Analyze locally proposed efforts and determination if proposed efforts achieve regional and local goals.
- Work with partners to further define the goals of the State for agriculture, flood risk reduction, and ecosystem restoration and integrate these goals with other floodplain goals.

Two-Year Outcome: Increased broad based support for making significant on-the-ground changes to the region's floodplains.

Two-Year Outputs:

- Updated Floodplain Implementation Strategy reflecting significant advancements in local floodplain strategies, goals and project plans.
- A compelling regional vision including specific and broadly supported goals for addressing some of the region's most pressing challenges including salmon recovery, flooding, and climate change.

5.3 Strategy Three: Build support for increased investment

Expand the support across each of the local floodplains, private, state and federal funders in support of integrated floodplain management.

Potential actions associated with Strategy Three include:

- Track and report on results of FbD funded projects to demonstrate benefits of program
- Develop communication materials to make the case for investments in floodplains; materials will actively promote local and regional needs and address climate impacts.
- Develop a funding strategy for the long-term that builds support through broad regional and local coalitions.
- Build understanding and a base of evidence for how integrated, ecological process based approaches can revitalize our waterways and make our communities more livable and resilient to flooding and climate change.
- Convene and facilitate a series of regional/state FbD workshops.

Strategy Three - Ten-Year Objective

Significantly increase the funding and political support needed to achieve regional floodplain goals

Two-Year Outcome: Increased understanding amongst local, regional and state decision makers regarding the very significant and real benefits that can be derived through increased investment in integrated floodplain management.

Two-Year Output:

- A suite of print and web-based products that communicate qualitative and quantitative information regarding the benefits of taking significant action to recover the health of Puget Sound floodplains.

5.4 Strategy Four: Focus investments and reduce administrative costs and project implementation delays.

Focus investments. Deliver coordinated funding and regional support. Where there is a large-scale plan and agreements, provide flexible funding at the reach scale to implement the suite of actions. Where there is not yet an agreed upon strategy, fund specific projects that build trust and consensus within the group. Identify and resolve highest priority barriers that can be resolved regionally, with an initial focus on:

- *The slow pace of land acquisition*
- *The lack of coordination across grant programs*
- *The project permitting process*

Strategy Four - Ten-Year Objective:

Recovery actions are implemented faster and cheaper leading to greater results by 2020.

Potential actions associated with Strategy Four include:

- Assess opportunities for addressing acquisition challenges (e.g. inability to exceed fair market value; inability to act within seller timelines).
- Support project sponsors and watershed groups by bringing awareness and expertise on how to successfully plan and implement reach-scale, integrated projects FbD projects.
- Improve efforts to coordinate investment across state and federal programs.
- Support multi-agency technical and permit team to make permitting process more predictable and less resource intensive for floodplain recovery projects.

Two-Year Outcome: Funding, permits and technical capacity are more readily available to local project proponents, allowing them to devote a greater portion of their resources to more or larger project work.

Two-Year Outputs:

- A multi-agency management team is in place to support development and implementation of integrated, reach scale projects.
- A Memorandum of Understanding (MOU) is signed between several state and federal agencies outlining steps that will be taken to align funding with major

recovery opportunities in ways that reduce the administrative costs of respective grant programs.

- A multi-agency technical team is in place and supporting the development and permitting of large floodplain/estuary projects.
- A strategy paper is written outlining potential opportunities for addressing acquisition challenges.

5.5 Strategy Five: Increase organizational resiliency and adaptively manage the FbD partnership

Continue to build and manage a regional organization comprised of regional and local partners to adaptively manage the regional floodplain implementation strategies and program. Foster a learning organization in support of the broad FbD Partnership. Work across floodplain interests to track progress towards collective goals. Identify where progress is hindered and use the learning organization structure and other strategies to address barriers.

Strategy Five - Ten-Year Objective:

Local and regional leaders are increasingly focused on and able to implement large-scale floodplain actions

Potential actions associated with Strategy Five include:

- Continue to refine the regional metrics for local goals, actions and costs connected to achieving regional floodplain vision and goals.
- Develop climate metrics to help focus grant funding on projects that best support climate resilient communities and ecosystems.
- Use metrics to track and report on FbD metrics and Floodplain vital sign; and to hold FbD grant program accountable to priority outcomes.
- Regularly convene and staff regional floodplain partners to achieve identified floodplain vision and goals and identify and resolve barriers.
- Convene local and regional partners both separately and together for shared learning and problem-solving.
- Identify the next suite of priority policy changes that need to be addressed.
- Evaluate progress toward regional habitat, flood risk and other floodplain goals with particular focus on ensuring alignment between grant programs and goals.

Two-Year Outcome: The regional FbD partnership continues to grow in size and depth of participation and uses FbD results data and regular interchanges to become more collectively effective at developing and implementing reach-scale project work.

Two-Year Outputs:

- Monthly meetings of the multi-agency management team overseeing implementation of Floodplain Implementation Strategy.
- A minimum of four large regional workshops and four floodplain leaders meetings.

- A report outlining the quantitative results of the first four years of Floodplains by Design funding.

6 Key Uncertainties, Research, and Monitoring Needs

6.1 Key Uncertainties

There are significant processes underway in many local areas that are working to integrate floodplain management and advance projects that more effectively address the multiple interests of local communities. However, many areas have yet to develop a comprehensive list of specific agreed upon actions or are not able to articulate specific goals. Local processes must continue to define the actions necessary to achieve their goals and strategies and to gain agreement from the affected parties for a suite of actions. Without defined actions and agreement, it is uncertain how many habitat restoration and flood risk reduction improvements can be implemented in the next ten years. This uncertainty must be addressed in order to have confidence in the outcomes from local actions. Also, the lack of a collective method to gather and describe actions means it is not yet possible to “roll up” efforts across the region to see whether local contributions add up to achievement of a regional goal such as the Puget Sound Floodplain Vital Sign targets. In addition, as described in Section 2.3, seven of the major Puget Sound watersheds did not develop Floodplain Vision documents. There is greater uncertainty about the status of integrated floodplain management in these watersheds and the future for the region.

Even with the uncertainty about the needed actions at the local level, it is clear that the current level of funding is not adequate for large scale projects where there is agreement, such as the \$60M identified for the Lower Nooksack reach or the \$40M identified for the Middle Puyallup reach. The uncertainty and lack of consistent and dependable funding for both capacity and capital projects must be addressed in order to stimulate the continued work necessary to recover floodplain ecosystems and revitalize communities across Puget Sound. Developing a larger dedicated source of funding for this important work is a top priority for FbD partners and the strategies outlined above will help collectively build the case and support needed to succeed.

The effects of climate change – including increased peak and low flows, increased sediment transport, and sea level rise – create a variety of uncertainties in Puget Sound rivers. Floodplain managers are only beginning to identify the potential impacts of these changes. Local and regional floodplain managers and salmon recovery experts should work to incorporate climate change information into basin plans and project designs to ensure actions taken now will continue to be beneficial into the future.

6.2 Research

This element will be defined in the development of the floodplain implementation strategy which is occurring in the first half of 2016 through the leadership of Ecology.

6.3 Monitoring Needs

This element will be defined in the development of the floodplain implementation strategy which is occurring in the first half of 2016 through the leadership of Ecology.

7 Conclusions

7.1 Lessons Learned from this Effort

Integrated floodplain management is at an early stage in a long-term effort to truly address restoration of ecological functions and reduction of flood hazards at a meaningful scale as well as achieve other local and state interests to protect and enhance the use of floodplains for other societal interests. Over many decades, regulations and programs have been developed and implemented to address single issues like flood hazard, salmon habitat, water quality, and agricultural protection, among others. However, it has only been more recently, as these interests have been unable to address their concerns and aspirations due to conflicts with others, that local and regional leaders have increasingly seen the need to integrate floodplain management to more effectively achieve the multiple goals local communities have for their rivers and floodplain areas. While many partners throughout Puget Sound are coming to an understanding of the value of multiple-benefit projects, institutional change is just starting. It will take vigilance, intention and detailed attention at all levels of government to alter existing institutional structures that no longer serve our region. We must create an institutional framework that helps us achieve local and regional aspirations for reduced flood risk, healthy ecosystems and other community needs.

This section highlights several key lessons learned over the past two years.

- Collaborative processes must be facilitated in a manner that produces results
- Integrated management does work
- Flood managers have experience to deliver reach scale actions
- Locally scaled climate change information is needed
- Institutional change is important and takes time
- Public-private partnerships are critical

Collaborative processes must be facilitated and supported in a manner that produces results
In areas where partners view an integrated approach as critical to achieving their specific goals, support is important to develop both broadly accepted technical information and the processes necessary to advance a collective vision and set of specific actions within an established timeframe. Collaborative integrated planning is dynamic and non-linear, and efforts across the region have produced varying degrees of success in delivering tangible results. Specifically, a number of efforts in Puget Sound have taken steps towards crafting a broader integrated vision and set of actions, including the Snohomish Sustainable Lands Strategy, the SWIF processes in the Nooksack and Green River, the Skokomish Watershed Action Team, the Cedar River Corridor Plan, the Dungeness efforts, the Tolt River Corridor

plan, and the Puyallup Floodplains by Design. Only a few of these have been able produce an agreed upon set of actions with a budget and statements about how the expected results achieve measurable goals across local interests.

Facilitation of the floodplain processes is critical to getting to meaningful agreement. Facilitators of local processes can learn from each other and increase their collective contribution to results. Also, it will take an intentional and continued effort to learn from these early efforts to create collaborative processes across Puget Sound where local decision-makers and partners can clearly and collectively articulate their vision and plans. These visions will need to then be supported by regional organizations, state and federal governments in order to advance efficiently, which some call “Coordinated Investment”.

Integrated Management Does Work

The case for integrated management is strong. There are clear efficiencies gained from targeting multiple benefits, increased likelihoods of achieving support from affected parties, and a higher likelihood for increased funding. It is clear from initial results emanating from the new Ecology FbD grant program that accelerating integrated floodplain management is a path to address some of the most important ecological and societal needs of each major floodplain in Puget Sound. For example, the Calistoga Levee Setback project, funded in part from the FbD grant program, has significantly reduced flood risk in Orting. Similarly, the success that Puyallup was able to build upon and readily use its FbD large scale capital project and community support to quickly develop a competitive application for the HUD resiliency grant. This demonstrates that integrated floodplain processes can be important to securing different revenue streams to accomplish local ambitions.

Flood managers have experience to deliver reach scale actions

The Floodplains by Design Team has also learned that, on the local scale, it is often easier for flood managers to operate at a reach or watershed scale because they have more experience with engineered infrastructure, with managing large capital programs at the reach scale. Where flood management authorities are divided across multiple institutions (i.e., dike districts, local governments, etc.), it seems more difficult to develop an integrated basin-scale vision. Flood managers also appear to be much more familiar with ecosystem needs and processes whereas ecosystem proponents may have much less understanding of flood risk reduction needs.

Locally scaled climate information is needed

The FbD partnership has also observed that, despite the increasing abundance of information about climate change, few local partners are incorporating it into their plans and project designs. In many instances this is because the information available is still at a scale or in formats not yet usable by local interests. Additional work to take regionally identified climate drivers and work at the local scale to determine what next steps are necessary to bring the information into decision-making is an important next step.

Institutional change is important and takes time

At a regional scale, the FbD partnership has observed that it is difficult to develop effective multi-agency partnerships through both its own work and its support of the federal/state Coordinated Investment effort. Even where collaboration exists within one level of the organization, it can be difficult to establish the same level of enthusiasm at all the other levels of the organization to the degree necessary to truly institutionalize an integrated management approach. The work being undertaken by the Coordinated Investment effort, the staff networking through efforts such as the Delta Consortium and other regular convening of federal and state partners will be critical to continued success moving forward. Thoughtful, consistent and strategic partnerships that work across both management and on-the-ground staff levels have the potential to be a game-changer over time.

Public-private partnerships are critical

Whether the public-private partnerships bring additional dollars or play a support and local advocacy role, the need to have both public and private interests as part of the FbD collaboration is clear. Having non-governmental organizations focused on promoting local and regional interests has been key in establishing a FbD grant program capable of identifying local and regional needs, and seeking to secure a broad range of resources to fulfill those needs. Similarly, participation by local, tribal, state and federal governmental organizations is critical to ensuring efforts meet mandates, fairly allocate resources, and build on agency efforts. Consideration should be given to expanding this public-private partnership to the rest of the state.

7.2 Next Steps

In the next two years, the Floodplains by Design team will pursue the following actions and priorities:

- Increase capacity for integrated floodplain planning at the local level (including climate change),
- Continue regional collaboration on integrated vision, goals, and action steps,
- Continue to build political support for increased funding,
- Pursue policy changes to reduce the costs and delays of project implementation, and
- Continue to build the strength of the Floodplains by Design partnership.

References

Puget Sound Partnership. 2015a. *Puget Sound Vital Signs: Floodplains*. Available at: http://www.psp.wa.gov/vitalsigns/flood_plains.php. Accessed on December 18, 2015.

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Appendices

Appendix A: Results Chains

Appendix B: Local Floodplain Vision and Strategy Documents