



**FLOODPLAINS
FOR THE FUTURE**
PUYALLUP, WHITE & CARBON RIVERS

Shared Monitoring Plan

Tracking Progress Toward Shared Goals for Integrated Floodplain Management in the Puyallup River Watershed



FEBRUARY 2018



PIERCE CONSERVATION DISTRICT
Conserving Pierce County's Natural Resources Since 1949



Above: Early Bird Farm, Tacoma; Cover photo: Carbon River at RM 7

Introduction

Floodplains for the Future — *Collaborating for Multi-Benefit Floodplain Management*

Rivers in the Puyallup Watershed need more room. Development activity and levees have reduced the natural floodplain along the Puyallup, White, and Carbon Rivers. This has put people, property, habitat, farms, and critical infrastructure at risk. Salmon runs are in peril, prime floodplain soils are removed from production, and the Puyallup watershed now ranks among the highest in the state for frequency and magnitude of flood damage.

Floodplains for the Future—Puyallup, White & Carbon Rivers is an inter-organizational partnership working to support the recovery of floodplain functions and to protect the health and safety of communities around

them. Floodplains for the Future (FFTF) works to balance farm, fish, and flood management values, to provide a safe place to voice varied opinions and needs, and to advance integrated floodplain management solutions in the Puyallup, White, and Carbon Rivers. FFTF Partners collaborate to support, fund, and implement multi-benefit floodplain projects in the Puyallup River watershed. Grant funds from the Floodplains by Design program provide a major source of support for FFTF activities, but additional funding from federal, state, municipal, and private sources is needed to pursue the mission and vision of FFTF.



Bank Repair on Carbon River at RM 0.9



Floodplains by Design

• REDUCING RISK, RESTORING RIVERS •

FLOODPLAINS BY DESIGN

Floodplains by Design (FbD) is an ambitious public-private partnership, led by The Nature Conservancy, Department of Ecology and Puget Sound Partnership, focused on integrating and accelerating efforts to reduce flood risks and restore habitat across Puget Sound’s major river corridors. By working together, State and federal investments can be coordinated with locally driven solutions that solve multiple floodplain management problems and serve a broad range of affected interests. The goal of FbD is to improve the resiliency of these floodplains for the protection and enhancement 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. FbD embraces a holistic and collaborative approach to decision-making that brings together multiple interests to find common agreement on local floodplain visions, strategies and actions.

<http://www.floodplainsbydesign.org/>



FFTF Mission and Vision

The Floodplains for the Future Integrated Management Group (IMG) is a group of stakeholder organizations with interest in the Puyallup River watershed. FFTF Partners include:

- American Rivers
- City of Orting
- City of Puyallup
- City of Sumner
- Floodplains by Design
- Forterra
- King-Pierce Farm Bureau
- Muckleshoot Indian Tribe
- PCC Farmland Trust
- Pierce Conservation District
- Pierce County
- Pierce County Agricultural Program
- Port of Tacoma
- Puget Sound Partnership
- Puyallup Tribe of Indians
- Strategic Conservation Partnership
- South Puget Sound Salmon Enhancement Group
- The Nature Conservancy
- UW Climate Impacts Group
- Washington State Department of Ecology
- WRIA 10/12 Lead Entity
- WSU Extension

FFTF Partners understand that a 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. FFTF Partners have developed and are taking direct action in advancing the following Vision and Mission Statements:

Our Vision

Restored connections between rivers and land improve habitat for salmon, protect communities and critical infrastructure from flooding, and provide new opportunities for recreational and cultural uses while preserving agricultural lands in the Puyallup River Watershed.

Our Mission

To encourage shared leadership in a trusting and transparent environment in order to plan, fund, and implement multi-benefit floodplain projects in the Puyallup, White, and Carbon River floodplains.

The IMG operates under a Charter that establishes a common purpose and need among FFTF partners, guiding principles, clarification about meetings and member participation, and support for collaborative decision making. The Charter can be viewed at the FFTF webpage available at: <http://www.floodplainsforthefuture.org/aboutus/>.

Definition of Floodplain Health

Floodplain health is a key concept for FFTF partner activities and investments. Healthy floodplains can maintain or protect valuable services such as flood protection, improved water quality, fish and wildlife habitat, and recreation. FFTF partners have developed a definition for floodplain health that supports their long-term vision for the Puyallup River watershed.

FFTF partners believe:

Healthy Puyallup floodplains will **support sustainable salmon populations** through their natural physical and biological processes, the **long-term viability of agricultural lands**, and communities with **reduced risk to regular and catastrophic flooding**.

Thus, floodplain health is defined as:

“The condition of multiple elements that when considered together contribute to a functioning floodplain, including the natural physical processes and biological factors that support salmon populations; the long-term viability of agricultural lands; and the reduction of the risk of flooding.”



PCC Farmland Trust

LONG-TERM AGRICULTURAL VIABILITY

Long-term agricultural viability can be defined as the ability of a farmer or a group of farmers to: (a) productively farm on a given piece of land or in a specific area; (b) maintain an economically viable farm business; (c) keep the land in agriculture long-term; and (d) steward the land so it will remain productive into the future.

FFTF Goals for Puyallup Watershed

FFTF Partners have identified a set of watershed-wide goals relevant to improving and maintaining floodplain health.

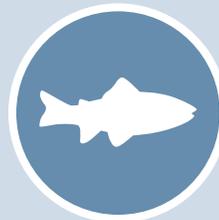
- Make communities more resilient to flooding and reduce flood risk and damage to private property
- Reduce flood risk and damage to public infrastructure
- Integrate agricultural interests into proposed large levee setback projects
- Protect/conservate agricultural lands
- Prevent conversion of agricultural lands to non-ag uses
- Maintain viable farming economy/critical mass of farmland and farm businesses
- Improve drainage on existing farms
- Reconnect floodplain to the river (at various flow levels)
- Re-establish intertidal habitat in estuary
- Improve spawning habitat quality and increase salmon abundance
- Provide more space for the river to migrate
- Improve water quality
- Increase public access to floodplains

INTEGRATED FLOODPLAIN MANAGEMENT

Integrated floodplain management seeks common agreement on visions, strategies, and actions. Integrated management can lead to multiple-benefit projects that meet the needs of more than one floodplain value in one place. Integrated solutions make better use of limited funding and lead to wiser capital investments.



FARM



FISH



FLOOD RISK

Intent of Shared Monitoring Plan

The intent of this long-term monitoring plan is to help FFTF Partners ascertain progress relative to shared goals for integrated floodplain management as well as gauge their continued support for implementation of an aggressive capital program to improve floodplain health in the Puyallup River watershed. This is a high-level monitoring plan for the purpose of tracking the collective work of FFTF Partners at a landscape scale; it is not a project-specific monitoring plan. Project-specific

monitoring of the FFTF supported long-term capital projects or other restoration actions will occur as each project is implemented and as it relates to project goals.

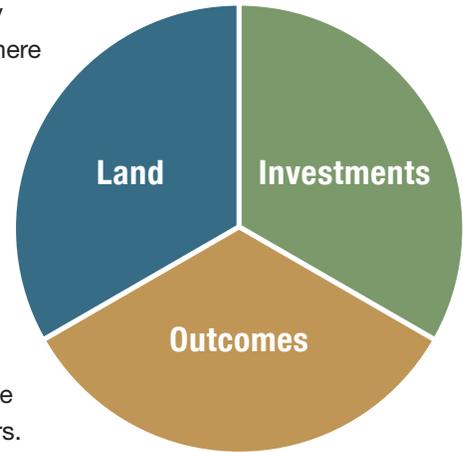
The key to successful collaborative floodplain management is ensuring that integration of individual stakeholder issues and goals is occurring at the project and watershed scales. In addition, it is critical for partners to be able to observe progress toward goals.

An Index of Floodplain Health

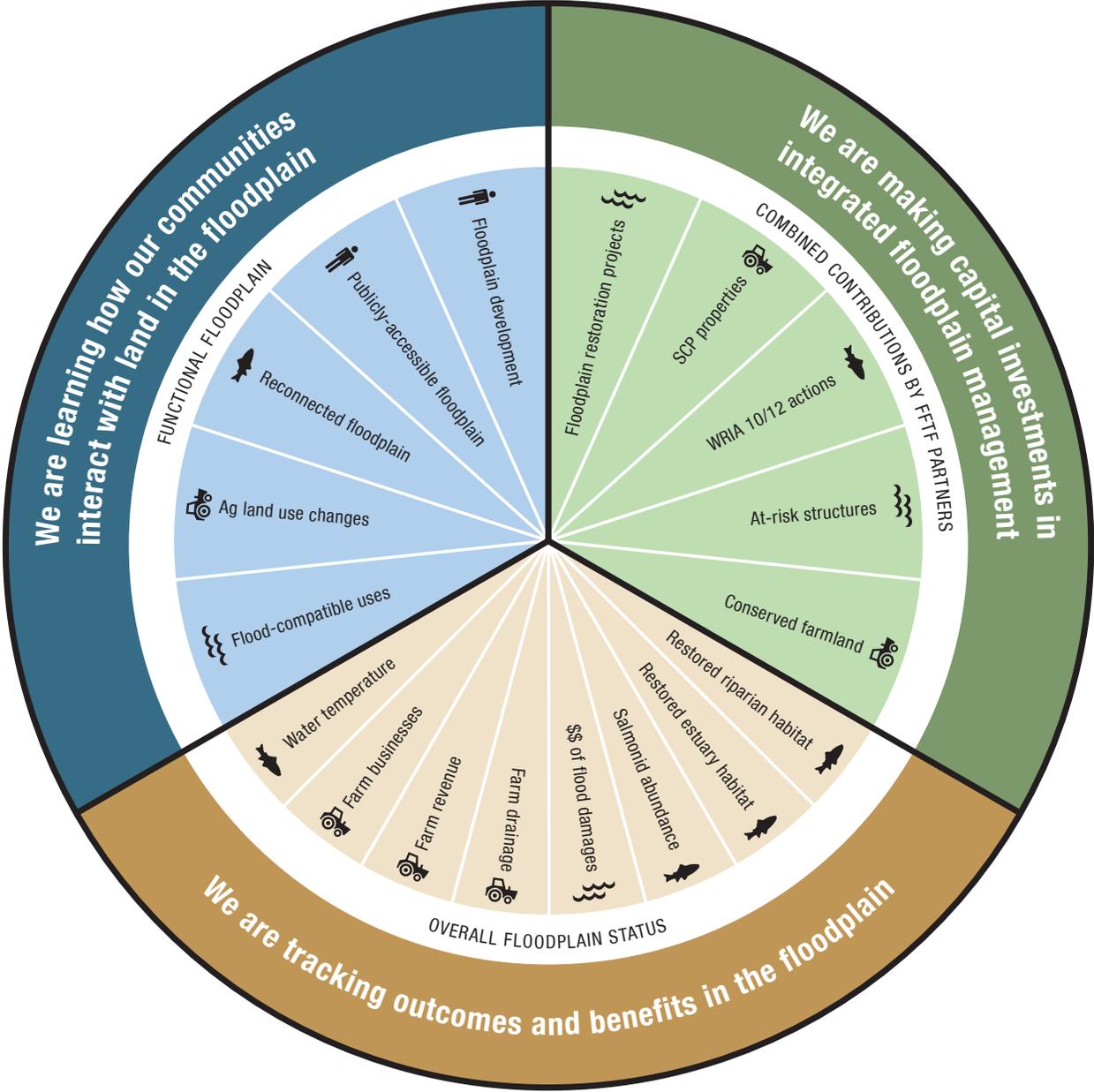
The Index of Floodplain Health presents a measurement for answering the key question asked by FFTF Partners: How are we improving floodplain health? There is no single answer to this question. Rather, the index is comprised of several individual and integrated metrics focused around three themes:

- We are learning how our communities interact with **land** in the floodplain
- We are making capital **investments** in integrated floodplain management and making progress toward our goals
- We are tracking **outcomes** and benefits in the floodplain

Using the metrics to track these themes will help understand whether or not capital and programmatic investments made within the Puyallup watershed are contributing substantially to achieving the goals identified by the FFTF Partners. This understanding will inform and direct future efforts of the FFTF Partners.



THEME	We are learning how our communities interact with land in the floodplain	We are making capital investments in integrated floodplain management and making progress toward our goals	We are tracking outcomes and benefits in the floodplain
DESCRIPTION	Group of metrics that tracks the cumulative impacts of policies, programs, and capital investments coming together in the floodplain.	Group of metrics that tracks investments by FFTF partners along with progress toward goals identified by FFTF partners.	Group of metrics that tracks trends in the quality and quantity of things we value (farm viability, salmon recovery, flood risk reduction) in the floodplain.
INTEGRATED METRIC	Amount (acres) of functional floodplain (Tier 0)	Amount (dollars) of FFTF investments in integrated floodplain management	Overall status of floodplain health and condition
INDIVIDUAL METRICS	Amount (acres) of reconnected or restored floodplain Amount (miles) of publicly-accessible trails in floodplain Type and extent of agricultural land use changes Number and amount (acres) of floodplain development permits and other specific developments Amount (acres) of flood-compatible land uses	Number and status of floodplain restoration projects Number of at-risk structures removed from flood risk Amount (acres) of conserved farmland Number of Strategic Conservation Partnership properties conserved Number and status of WRIA 10/12 Salmon Recovery Strategy Actions	Amount (dollars) of farm revenue Number of farm businesses Changes in farm drainage Changes in water temperature Cost of flood damages (dollars) Amount (acres) of restored riparian habitat Amount (acres) of restored estuary habitat Status of salmonid abundance



INDEX OF FLOODPLAIN HEALTH

FFTF Partners have selected a set of **high-level metrics** for this purpose which can be easily tracked and clearly communicated to decision-makers and the public. The metrics are presented as the Index of Floodplain Health, a system for tracking floodplain improvement or degradation from the multi-benefit perspective established by FFTF stakeholders.

-  Fish and Habitat
-  Flood Risk Reduction
-  Agricultural Viability
-  Public Access

Monitoring Baselines

POINT IN TIME: FLOODPLAINS BY DESIGN GRANT FUNDING

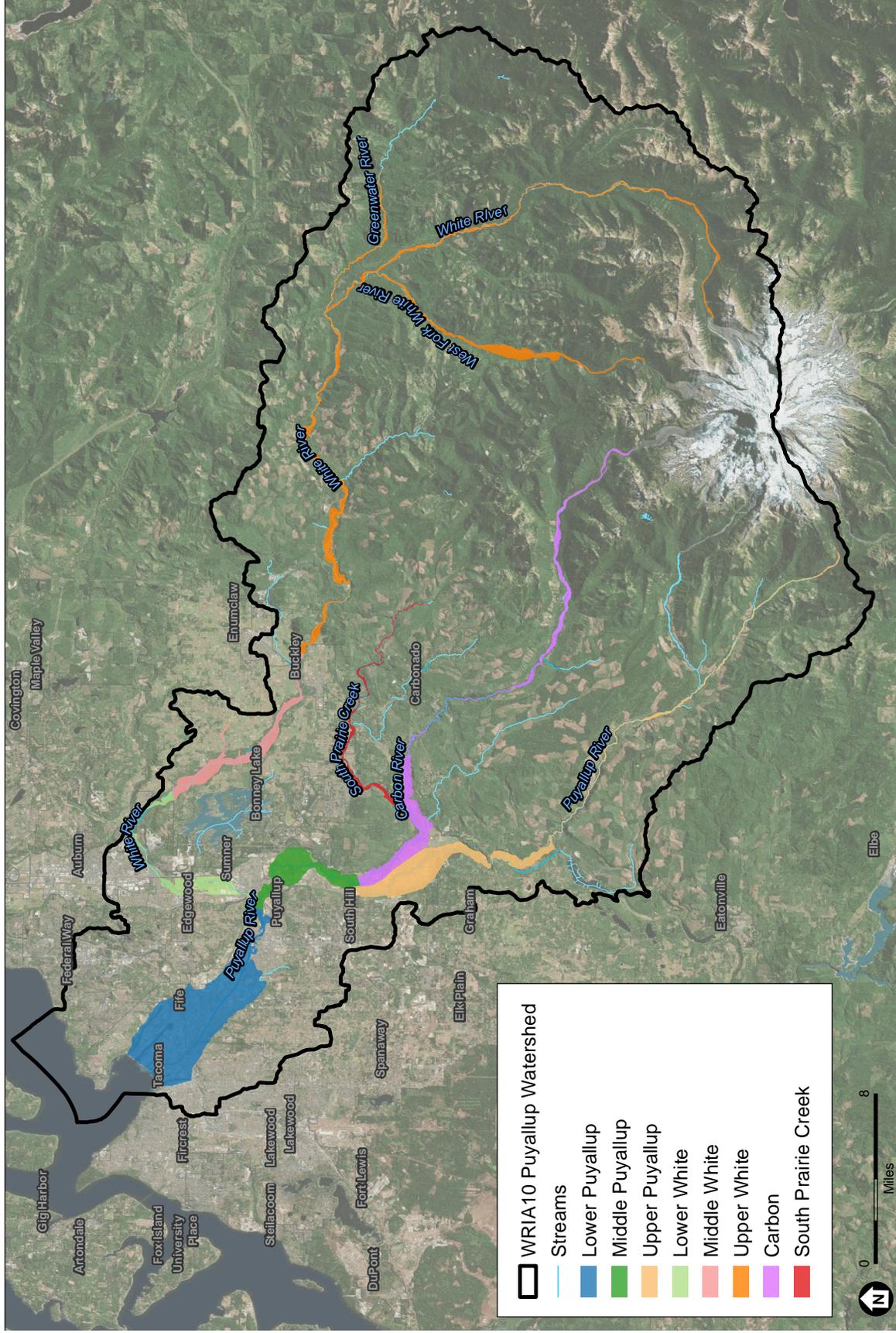
For the purposes of this Monitoring Plan, the baseline for tracking metrics related to FFTF Partner investments in integrated floodplain management will be the beginning of FbD grant funding. The first biennial funding cycle (Round 1) for the Puyallup River watershed began in Fiscal Year (FY) 2013. The current cycle (Round 2) is 2015-2017 and the next cycle (Round 3) will be 2017-2019. For simplicity purposes, January 1, 2013 will serve as the point in time for tracking investments. The baseline for other metrics (e.g., salmonid abundance, water temperature) may be unique and specific to the individual metric as indicated in the protocols section.

EXTENT OF MONITORING AREA: FLOODPLAIN PLANNING AREA

For the purposes of this Monitoring Plan, the baseline for tracking metrics related to land use, farmland, habitat, and other inherently spatial metrics is the “Puyallup FFTF Floodplain Planning Area.” The Floodplain Planning Area (FPA) refers to the low-lying areas in the Puyallup watershed that are adjacent to the largest river channels (Puyallup, White, and Carbon), and the estuarine embayment of Commencement Bay, that can be inundated by flood water or channel migration. This area is intended to capture areas of the historic floodplain that could potentially be restored and therefore includes floodplain areas within the channel migration zone and also behind levees. This area also includes the larger tributaries to the main river channel. The floodplain extent, or width, of the tributaries varies and can include a constrained channel.

The FPA will be used as a basis or baseline extent for tracking changes in spatial metrics as specified in the FFTF monitoring plan. A description of the FPA delineation methods is available as Attachment B to this monitoring plan. The FPA baseline extent for entire Puyallup watershed includes 44,365 acres. The following table and graphic display the delineated FPA for the watershed and by individual reach.

REACH	EXTENT OF FPA (ACRES)
Lower Puyallup River	13,894
Middle Puyallup River	3,704
Upper Puyallup River	8,353
Lower White River	1,643
Middle White River	3,223
Upper White River	6,616
Carbon River	5,176
South Prairie Creek	1,756
TOTAL WATERSHED	44,365



Floodplain Planning Area – Puyallup River Watershed



Puyallup River at Kapowsin Creek

Implementation

Reporting Process and Timelines

This monitoring plan relies on the efforts of multiple entities and individuals to be responsible for tracking, compiling, and transmitting information to the Pierce Conservation District (PCD). As the lead of the monitoring plan component, PCD is not responsible for tracking all of the individual metrics but rather provides the synthesis of the information and ongoing administrative structure.

information and data will be summarized and provided each year, biennially, or every five years. Additional details about information specific to each metric that should be provided to PCD are described in the Protocols section of this plan.

Metric leads will provide information to PCD by February 15th of each year or for metrics that are tracked on a biennial basis in even years (2018, 2020...) to account for the most recent FbD funding cycle, which occurs on odd years (e.g., 2017-2109). Depending on the metric,

REPORTING FREQUENCY – INTEGRATED AND INDIVIDUAL METRICS

ANNUAL	2 YEARS	5 YEARS
Reconnected floodplain	Functional floodplain	Publicly-accessible floodplain
Floodplain development	Agricultural land use changes	Farm revenue
At-risk structures removed from flood risk	Flood-compatible land uses	Farm businesses
Conserved farmland	Combined Contributions by FFTF Partners	Flood damages
Strategic Conservation Partnership properties	Floodplain restoration projects	
WRIA 10/12 Salmon Recovery Actions	Overall floodplain status	
Restored riparian habitat	Farm drainage	
Restored estuary habitat	Salmonid abundance	
Water temperature		

COMMUNICATION

PCD will be responsible for compiling information and working with metric leads to understand results. PCD will then distribute results per the tools and approaches identified in the FFTF Communication Strategy. This includes the following means:

- FFTF Monitoring Website
- State of Floodplain Summit Meeting
- Presentations to policy makers
- Presentations to grant organizations and foundations
- Presentations to public and stakeholders

Information that is uploaded to the website or in other communication materials will be reviewed and vetted by the IMG. PCD will ensure that information is brought forward for review prior to distribution.

STATE OF THE FLOODPLAIN SUMMIT

The State of the Floodplain Summit is an opportunity for FFTF partners to look across data from the individual metrics to draw insights into floodplain management and future FFTF priorities and investments. It is conceived as a bi-annual (every two years) meeting, held during the first quarter of each year. The purpose of the meeting is to provide a structured opportunity for key FFTF partners and leaders to review draft metrics information and data, and discuss the state of the Puyallup floodplain with regards to land use changes, activities, investments, and outcomes of integrated floodplain management. The outcome of the summit will be to provide additional information on metrics and/or adjustments of metrics outcomes (if appropriate) as well as a synthesis of the context for and meaning of the metrics. Attendees will include, but are not limited to, current FFTF partners and members. Over time, the vision is for the State of the



South Fork Floodplain Restoration, Puyallup River

Floodplain summit to provide an important opportunity to celebrate individual and collective successes, expand understanding of floodplain science, address shared challenges, and build partnerships. It will be a central part of ensuring joint adaptive management of the shared monitoring approach.

Two initial State of the Floodplain Summits in 2018 and 2019 will set the foundation for future efforts. The first meeting will have three objectives: 1) identify priority metrics for near-term monitoring over the next two years; 2) discuss and finalize baselines for the priority metrics; 3) confirm protocols for tracking priority metrics and sharing metrics information; and 4) describe next steps for remaining metrics. Following the first summit meeting, the monitoring plan may be adjusted (if needed) to reflect the initial monitoring priorities. The goal is to have the first summit meeting in 2018, early in the 2-year grant cycle (depending on funding); it is anticipated as

a day-long meeting (approximately 6 hours), attended by FFTF partners with monitoring responsibilities. The second summit meeting will be held in 2019 to focus on metrics information (i.e., the first round of measurement) produced for the priority metrics. The purpose of this meeting will be to discuss initial monitoring results and insights and confirm how monitoring information will be reported, confirm monitoring approaches and/or adaptively manage methods based on findings from the first year of data collection and summary and to discuss the path forward for metrics that were not prioritized in the initial monitoring effort. It is expected that this meeting will occur at an appropriate time during 2019 and also be a day-long meeting.



South Fork Floodplain Restoration Overview, Puyallup River



Lower White River (Photo credit: Ron Clausen)

Protocols

Overview

The following section describes protocols for tracking progress toward shared goals of the FFTF collaboration. Each integrated and individual metric is listed with a description of the metric, the unit of measure, the scale at which information will be summarized, the frequency of reporting, data sources, the metric lead, and a description of the methods for reporting the information to PCD. The metrics are grouped by the three themes identified for improving floodplain health: land, investments, and outcomes.



South Prairie Creek



Land

We are learning how our communities interact with land in the floodplain

Integrated Metric

FUNCTIONAL FLOODPLAIN

METRIC

Amount of functional floodplain (Tier 0)

DESCRIPTION

This metric tracks the combined area of floodplain that is classified as Tier 0 floodplain of the Floodplain Planning Area or FPA. This floodplain type is characterized by unaltered natural systems connected to mainstem rivers with no levee or flood control structures, support natural vegetation, and have minimal land uses (i.e., passive recreation).

UNIT

Acres

SCALE

Reach

FREQUENCY

2 Years

DATA SOURCE

Multiple; baseline is FPA Tier 0 functional floodplain (GIS polygon created by PCD contractors; managed by PCD staff)

METRIC LEAD

Pierce Conservation District

METHOD

PCD or PCD contractor will use GIS-based tools to measure the amount of change (increase or decrease) in areas that meet the definition of “Tier 0 Functional Floodplain” from the FPA baseline. Changes in the FPA Tier 0 baseline will include the following: newly constructed levee setback projects and newly constructed roads, buildings, levees, and any other built environments. On January 1st of even years (2018, 2020...), PCD will request the following from Pierce County Planning & Public Works, King County, City of Puyallup, etc. constructed project boundaries either as GIS files or map that can be used to create a GIS polygon that have been completed in the past two years (or since last reporting). Other changes in the FPA baseline will be made by PCD or PCD contractor using aerial imagery and heads-up digitization methods to reflect newly constructed features within the FPA.

BASELINE

TBD. FPA baseline extent of Tier 0 floodplain area to be calculated in future phase according to documented geospatial methods (Appendix A). The entire FPA baseline extent includes 44,366 acres for the Puyallup watershed (Tier 0-Tier 4 floodplains).

Individual Metrics

RECONNECTED FLOODPLAIN

METRIC

Amount of floodplain that has been reconnected or restored

DESCRIPTION

This metric tracks changes in reconnected floodplain to understand amount of additional storage and refuge habitat for fish during high frequency events (2-year) as projects are implemented and constructed. Metric includes all types of floodplain reconnection projects including salmon recovery (Pierce County Lead Entity) and levee setback (Pierce County Planning & Public Works, etc.).

UNIT	SCALE	FREQUENCY
Acres	Reach	Annual

DATA SOURCE

Habitat Work Schedule

METRIC LEAD

Pierce County Lead Entity Coordinator with support from Planning & Public Works staff and project sponsors

METHOD

Pierce County will provide metric information to the PCD every year by February 15th. Information will be supplied in tabular format and will include the following: Project Name, total acres of reconnected floodplain, assumed storm event (e.g., 2 year, 5 year, etc.) for inundation calculation (if available), and total acres of reconnected floodplain for all projects in WRIA 10.

Future refinements to metric: GIS methods for evaluating the amount of reconnected floodplain at different flood stages to understand amount of additional storage and refuge habitat for fish during major floods (100-year); refuge habitat during regular floods (2-year); and, rearing habitat (mean annual flow).

BASELINE

2013 (First year of Floodplains by Design funding)

PUBLICLY-ACCESSIBLE FLOODPLAIN

METRIC

Amount of publicly-accessible trails in floodplain

DESCRIPTION

This metric tracks changes in the amount of publicly accessible trails in the floodplain. Existing and proposed trails within the FPA will be based on the Tahoma to Tacoma Trail Network and Plan by the Puyallup Watershed Initiative.

UNIT	SCALE	FREQUENCY
Miles (or lineal feet)	Watershed	5 years

DATA SOURCE

Pierce County Regional Trails Plan GIS layer (showing existing and proposed trails) (note: there is no spatial geodatabase of the Tahoma to Tacoma Trail Network, but the Pierce County Regional Trails Plan GIS layer includes the trail network along with other Pierce County trails and can be used for this purpose).

METRIC LEAD

Floodplains for the Future Coordinator w/support from Pierce Conservation District

METHOD

Floodplains for the Future Coordinator will provide metric information to the PCD every 5 years by February 15th (2018, 2023, etc.). Information will include the following: Trail Name, description, and total miles constructed in past 5 years. A map of the trail location and access points will also be provided. Using the information provided, the PCD or PCD contractor will use GIS-based tools to measure the amount of new publicly accessible trails within the FPA. Existing and proposed trail alignments are available in GIS format from Pierce County GIS.

BASELINE

2010 (Pierce County Regional Trails Plan GIS data as of September 2010)

AGRICULTURAL LAND USE CHANGES

METRIC

Type and extent of parcels with changes in agriculture land use
 Sub-metric: Number of parcels located within zip codes that are Organic Trade Association (OTA) organic hotspots

DESCRIPTION

This metric tracks changes in land uses from agricultural to non-agricultural land uses to provide a measure of progress toward the goal of prohibiting or limiting conversion of agricultural land. Tracking the number of parcels within OTA organic hotspots (zip codes) will provide a federal benchmark for linking economic health at the county level to organic agriculture (OTA organic hotspots boost household incomes and reduce poverty levels — at greater rates than general agriculture activity).

UNIT	SCALE	FREQUENCY
Individual parcel	Reach	2 Years

DATA SOURCE

Pierce County Assessor-Treasurer property use codes; Organic Trade Association (OTA) organic hotspots, City of Sumner, City of Puyallup

METRIC LEAD

Floodplains for the Future Coordinator with support from Pierce County Planning and Land Services

METHOD

Pierce County Planning and Land Services (PALS), City of Sumner and City of Puyallup will provide metric information to the PCD every other year by February 15th in even years (2018, 2020...). Information will be supplied in tabular format and will include the following: Parcel number, size (area), location, and description change in land use for parcels within the FPA. A map will also be provided. The OTA organic hotspots will also be overlaid with the parcels within the FPA to provide the sub-metric number. Organic hotspots are specific zip codes that can be overlaid with parcel information (<https://www.ota.com/hotspots>). PCD will provide Pierce County the FPA extent in GIS during the first year for use by PALS.

BASELINE

2018 (First year of reporting)

FLOODPLAIN DEVELOPMENT

METRIC

Number of development permits in the floodplain and other specific developments

DESCRIPTION

Metric tracks development authorized in the regulatory floodplain to provide a measure of progress toward the goal of prohibiting or limiting land uses in the floodplain that are not flood-compatible. Tracking floodplain development is part of the annual verification and certification cycle conducted by participants in the National Flood Insurance Program’s (NFIP) Community Rating System (CRS). Pierce County has participated in the CRS program since 1995, Orting has participated since 2008, and the cities of Puyallup and Sumner are expected to join in the future. Additional specific developments of note (not captured as part of the CRS review) will also be tracked as part of this metric.

UNIT	SCALE	FREQUENCY
Acres (every three years) Individual permit (annually)	Reach	Annual

DATA SOURCE

NFIP CRS verification and certification information; Pierce County CRS Coordinator, City of Orting, City of Puyallup, City of Sumner permit databases (until CRS participation)

METRIC LEAD

Floodplains for the Future Coordinator

METHOD

The County CRS Coordinator and City representatives will provide metric information to the Floodplains for the Future Coordinator every year by February 15th. Information will be supplied in tabular format and will include the following: Parcel number(s), size (area), location, and description of proposed development under floodplain permit. The Coordinator will also record additional specific developments not captured as part of the CRS review.

BASELINE

2018 (First year of reporting)

FLOOD-COMPATIBLE USES

METRIC

Amount of flood-compatible lands in the floodplain (Tier 1)

DESCRIPTION

This metric tracks area of floodplain that is classified as Tier 1 floodplain of the Floodplain Planning Area or FPA. This floodplain type is characterized by agricultural uses, open space, or low density development that is connected to the floodplain. This area of the floodplain can be periodically flooded without damage to property or risks to public safety and is considered partially functional floodplain.

UNIT	SCALE	FREQUENCY
Acres	Reach	2 years

DATA SOURCE

Multiple; baseline is FPA Tier 1 partially functional floodplain (GIS polygon created by PCD contractors; managed by PCD staff)

METRIC LEAD

Pierce Conservation District

METHOD

PCD or PCD contractor will use GIS-based tools to measure the amount of change (increase or decrease) in areas that meet the definition of “Tier 1 Partially Functional Floodplain” from the FPA baseline. Changes in the FPA Tier 1 baseline will include the following: newly constructed levee setback projects and newly constructed roads, buildings, levees, and any other built environments. On January 1st of even years (2018, 2020...), PCD will request the following from Pierce County Planning & Public Works, King County, City of Puyallup, etc. constructed project boundaries either as GIS files or map that can be used to create a GIS polygon that have been completed in the past two years (or since last reporting). Other changes in the FPA baseline will be made by PCD or PCD contractor using aerial imagery and heads-up digitization methods to reflect newly constructed features within the FPA.

BASELINE

TBD. FPA baseline extent of Tier 1 floodplain area to be calculated in future phase according to documented geospatial methods (Appendix A). The entire FPA baseline extent includes 44,366 acres for the Puyallup watershed (Tier 0-Tier 4 floodplains).



Investments

We are making capital investments in integrated floodplain management and making progress toward our goals

Integrated Metric

COMBINED CONTRIBUTIONS BY FFTF PARTNERS

METRIC

Amount of FFTF investments in integrated floodplain management

DESCRIPTION

This metric tracks the combined financial investments in multi-benefit floodplain projects made by FFTF Partners for flood risk reduction, fish and fish habitat, and agricultural viability.

UNIT

Dollars

SCALE

Watershed

FREQUENCY

2 Years

DATA SOURCE

Multiple; compiled in “FFTF Financial Investment Tracking Spreadsheet”. Includes, but is not limited to: Pierce County Planning & Public Works (PPW); Pierce County Flood Control Zone; Pierce County Real Estate Excise Tax (REET); Salmon Recovery Funding Board (SRFB); Estuary and Salmon Restoration Program (ESRP); Puget Sound Acquisition and Restoration Fund (PSAR); Regional Conservation Partnership Program (RCP); Pierce County Conservation Futures; Pierce County Transfer of Development Rights Program (TDR); Private Foundations; Floodplains by Design; and, other sources as applicable.

METRIC LEAD

Floodplains for the Future Coordinator with support from PCD

METHOD

The FFTF Coordinator and PCD will work together to acquire investment information from the following partners: Pierce County SWM, Pierce County Lead Entity Coordinator, and the Strategic Conservation Partnership Coordinator. Investments will be summarized by February 15th in even years (2018, 2020...) to account for the most recent FbD funding cycle, which occurs on odd years (e.g., 2017-2019). The Coordinator is responsible for compiling the information into the FFTF Financial Investment Tracking Sheet. The first year of financial investment tracking will require the most effort as the tracking spreadsheet will need to be refined from its current format to match the level of detail available. It is expected that additional funding sources will be discovered as well as staff support activities. Refinements to the spreadsheet will focus on keeping the information as simple as possible so that it can be summarized for communication purposes. Subsequent years are expected to require reduced effort through continual updates to FFTF activities. The information should be summarized to the extent possible, then provided to FFTF component leads and/or partners for review during IMG meetings or other meetings. The spreadsheet will be updated based on partner input and finalized after vetting by the IMG.

BASELINE

2013 (First year of Floodplains by Design funding)

Individual Metrics

FLOODPLAIN RESTORATION PROJECTS

METRIC

Number and status of projects related to reconnection or restoration of floodplain. Categories: a) identified/proposed; b) completed; c) currently in progress; and d) future. For in progress projects, the project phase will also be noted, including: 1) acquisition or easements 2) feasibility and preliminary design; 3) design; 4) construction and implementation.

DESCRIPTION

This metric tracks the number of floodplain reconnection and restoration projects as a measure of progress toward multiple FFTF goals. It is expected that the bulk of the projects tracked under this metric will be Pierce County projects included in the Rivers Flood Hazard Management Plan. Projects from other local jurisdictions (King County, City of Sumner, City of Puyallup, City of Orting) will also be reported as they occur.

UNIT	SCALE	FREQUENCY
Individual project	Reach	2 years

DATA SOURCE

Pierce County Rivers Flood Hazard Management Plan & Flood Control Zone District Comprehensive plan of Development (2013)

METRIC LEAD

Pierce County Planning & Public Works
 King County
 City of Sumner
 City of Puyallup
 City of Orting

METHOD

Pierce County Planning & Public Works and other public agencies or entities will provide metric information to the PCD by February 15th in even years (2018, 2020...). Information will be supplied in tabular format and will include the following: Project Name, status, and description of activity in past year. Projects by other local jurisdictions (i.e., King County, City of Sumner, City of Puyallup, City of Orting) where Pierce County is not a partner are expected to be minimal. Therefore the PCD will be responsible for contacting other local jurisdictions to gather information on additional projects not included in Pierce County adopted plans.

BASELINE

2013 (First year of Floodplains by Design funding)

AT-RISK STRUCTURES REMOVED FROM FLOOD RISK

METRIC

Number of “at-risk” structures that have been removed from within the regulated floodplain or have reduced flood risk. Categories:

a) Physically removed through acquisition; b) Reduced flood risk through structural solution (i.e., levee setback); c) Removed from flood risk through abandonment after natural event.

DESCRIPTION

This metrics tracks the number of at-risk structures that have been removed from the floodplain or reduced from flood risk to provide a measure of progress toward reducing the overall risk to people and property in the floodplain. Properties include those identified in adopted flood management plans or repetitive loss plans of local jurisdictions.

UNIT	SCALE	FREQUENCY
Individual structure	Reach	Annual

DATA SOURCE

Pierce County Rivers Flood Hazard Management Plan (2013); King County Flood Hazard Management Plan (2006) and Update (2013); City of Puyallup Hazard Mitigation Plan Update (2017);

METRIC LEAD

Pierce County Planning & Public Works
 King County
 City of Sumner
 City of Puyallup
 City of Orting

METHOD

Pierce County Planning & Public Works and other public agencies or entities will provide metric information to the PCD by February 15th every year. Information will be supplied in tabular format and will include the following: Property Name, description of at-risk status, and description of activity in past year.

BASELINE

2013 (First year of Floodplains by Design funding)

CONSERVED FARMLAND

METRIC

Number of acres of conserved farmland

DESCRIPTION

This metric tracks the amount of conserved farmland to provide a measure of progress toward Strategic Conservation Partnership goals

UNIT

Acres

SCALE

Watershed

FREQUENCY

Annual

DATA SOURCE

Strategic Conservation Partnership

METRIC LEAD

Coordinator of Strategic Conservation Partnership

METHOD

The Strategic Conservation Partnership Coordinator will provide metric information to the PCD by February 15th every year. Information will be supplied in tabular format and will include the following: Parcel Name/Number, location, area (size), status, description of activity in past two years, and status of conservation goals.

BASELINE

2013 (First year of Floodplains by Design funding)

STRATEGIC CONSERVATION PARTNERSHIP PROPERTIES

METRIC

Number of properties that are conserved or converted to non-agricultural land uses

DESCRIPTION

This metric tracks the number of properties conserved to provide a measure of progress toward prohibiting or limiting conversion of agricultural lands identified through Strategic Conservation Partnership GIS-based prioritization of farmlands in Pierce County

UNIT

Individual properties

SCALE

Watershed

FREQUENCY

Annual

DATA SOURCE

Strategic Conservation Partnership-funded Pierce County GIS-based prioritization

METRIC LEAD

Coordinator of the Strategic Conservation Partnership

METHOD

The Strategic Conservation Partnership Coordinator will provide metric information to the PCD by February 15th every year. Information will be supplied in tabular format and will include a description of activity on properties and status of conservation goals.

BASELINE

2013 (First year of Floodplains by Design funding)

WRIA 10/12 SALMON RECOVERY STRATEGY ACTIONS

METRIC

Number of projects identified in WRIA 10/12 Salmon Habitat Protection and Restoration Strategy by reach that are: 1) completed; 2) underway; and 3) proposed for funding.

DESCRIPTION

This metric tracks the number of completed/underway/proposed salmon recovery projects to understand progress toward Pierce County Lead Entity goals

UNIT

Individual parcel

SCALE

Reach

FREQUENCY

Annual

METRIC LEAD

Pierce County Lead Entity Coordinator with support from Planning & Public Works staff and project sponsors

METHOD

The Pierce County Lead Entity Coordinator will provide metric information to the PCD by February 15th every year. Information will be supplied in tabular format and will include the following: Project Name, status, and description of activity in past year.

BASELINE

2013 (First year of Floodplains by Design funding)

DATA SOURCE

Habitat Work Schedule



Outcomes

We are tracking outcomes and benefits in the floodplain

Integrated Metric

OVERALL FLOODPLAIN STATUS

METRIC

Overall status of floodplain health and condition

DESCRIPTION

This metric is a high-level qualitative assessment made by FFTF partners about the current status of the floodplain.

UNIT

N/A

SCALE

Watershed

FREQUENCY

2 Years

DATA SOURCE

State of the Floodplain Summit

METRIC LEAD

Pierce Conservation District

METHOD

PCD or PCD contractor will convene a biennial meeting of FFTF partners on even years (2018, 2020...) to review ongoing results of monitoring metrics and discuss the state of the Puyallup floodplain (see State of Floodplain Summit description). Using information revealed by individual metrics along with first-hand knowledge, the floodplain will be characterized (e.g., improving, declining, or staying the same). Identification and consensus on characterization will be an outcome of the summit meeting.

BASELINE

2018 (First year of reporting)

Individual Metrics

FARM REVENUE

METRIC

Gross and net revenue from farming

DESCRIPTION

This metric tracks the number of individual farms to provide an indication of increase, decrease, or maintenance of farming activity

UNIT

Individual farm

SCALE

County (note: USDA information summarized at County scale and not watershed scale)

FREQUENCY

5 years (with Census reporting)

DATA SOURCE

US Department of Agriculture (USDA) Census of Agriculture by National Agricultural Statistics Service (NASS)

METRIC LEAD

Pierce Conservation District

METHOD

PCD will download census data for Pierce County from the USDA NASS website. The NASS provides summarized data at the County level with each publication, called County Profile. PCD will record the following for this metric: 1) Total income from farm-related sources, gross before taxes and expenses, and 2) Net cash farm income of operation. The County Profile summary also includes data on the change from previous census. The next census will be 2017 and the data will be released in February 2019.

BASELINE

2012 Census

FARM BUSINESSES

METRIC

Number of farm businesses

DESCRIPTION

This metric tracks the number of individual farms to provide an indication of increase, decrease, or maintenance of farming activity

UNIT

Individual farm

SCALE

County (note: USDA information summarized at County scale and not watershed scale)

FREQUENCY

5 years (with Census reporting)

DATA SOURCE

US Department of Agriculture (USDA) Census of Agriculture by National Agricultural Statistics Service (NASS)

METRIC LEAD

Pierce Conservation District

METHOD

PCD will download census data for Pierce County from the USDA NASS website. The NASS provides summarized data at the County level with each publication, called County Profile. PCD will record the following for this metric: 1) Number of Farms, and 2) Land in Farms. The next census will be 2017 and the data will be released in February 2019. The County Profile summary also includes data on the change from previous census. The next census will be 2017 and the data will be released in February 2019.

BASELINE

2012 Census

FARM DRAINAGE

METRIC

Results of Farming Information Survey

DESCRIPTION

This metric tracks changes in responses from farmers to questions about drainage and constraints on farm production to provide an indication of drainage (improvement or degradation) generally.

UNIT	SCALE	FREQUENCY
N/A	Watershed	2 Years

DATA SOURCE

Survey (responses)

METRIC LEAD

Outside contractor or other entity such as Pierce County Agricultural Community of Interest, Strategic Conservation Partnership Coordinator, County Agricultural Program, Forterra, or PCC Farmland Trust

METHOD

The survey lead will use standard interview/inquiry methods to conduct survey of 20-30 farmers in the watershed. Development of the survey questions, methodology, and resources necessary for execution to be developed by survey contractor as well as survey area (it is expected that the survey will be online with some phone or in-person conversations as appropriate). Surveys will be conducted in spring (March through May). Survey results will be provided to PCD in tabular and report format.

BASELINE

N/A

FLOOD DAMAGES

METRIC

Cost (dollars) of flood damages

DESCRIPTION

This metric tracks the amount of money incurred by flood damages to public infrastructure estimated as part of the Federal Emergency Management Agency (FEMA) assistance funds

UNIT	SCALE	FREQUENCY
Dollars	Watershed	5 years

DATA SOURCE

Pierce County and Cities of Puyallup, Sumner, and Orting

METRIC LEAD

Pierce Conservation District

METHOD

County and cities will provide metric information to the PCD by February 15th every 5 years (2018, 2023...). Information will be supplied in tabular format and will include the following: amount (dollars) of FEMA Disaster Relief and Emergency Assistance Funds provided to public entity, year, and description of events. Using the information provided, PCD compile the amount for costs incurred by FFTF partners. Other costs will not be able to be tracked such as the loss of economic productivity during and after a storm event, expenses incurred by private parties, and the costs of first responders and emergency help.

BASELINE

2018 (First year of reporting)

RESTORED RIPARIAN HABITAT

METRIC

Amount of riparian restoration

DESCRIPTION

This metric tracks the amount of riparian habitat that has been restored to provide a measure of progress toward improved floodplain health

UNIT

Acres

SCALE

Reach

FREQUENCY

Annual

METHOD

The Pierce County Lead Entity Coordinator will provide metric information to the PCD by February 15th every year. Information will be supplied in tabular format and will include the following: Project Name, number of acres of riparian restoration, and description of activity in past 2 years.

BASELINE

2013 (First year of Floodplains by Design funding)

DATA SOURCE

Habitat Work Schedule

METRIC LEAD

Pierce County Lead Entity Coordinator with support from Planning & Public Works staff and project sponsors

RESTORED ESTUARY HABITAT

METRIC

Amount of estuarine habitat restored

DESCRIPTION

This metric tracks the amount of estuary habitat that has been restored to provide a measure of progress toward improved floodplain health

UNIT

Acres

SCALE

Reach

FREQUENCY

Annual

METHOD

The Pierce County Lead Entity Coordinator will provide metric information to the PCD by February 15th every year. Information will be supplied in tabular format and will include the following: Project Name, number of acres (or square feet) of estuary restoration, and description of activity in past 2 years.

BASELINE

2013 (First year of Floodplains by Design funding)

DATA SOURCE

Habitat Work Schedule

METRIC LEAD

Pierce County Lead Entity Coordinator with support from Planning & Public Works staff and project sponsors

WATER TEMPERATURE

METRIC

Changes in water temperature

DESCRIPTION

This metric will track changes in water temperature to provide a measure of water quality of streams and rivers. Temperature will be used as a proxy for pH level, dissolved oxygen concentrations, and other constituents.

UNIT	SCALE	FREQUENCY
Individual station	Watershed	Annual

DATA SOURCE

Washington Department of Ecology Statewide Water Quality Network (26 stations in watershed; 6 TMDLs)

METRIC LEAD

Pierce Conservation District

METHOD

PCD will download water quality data for the one long-term monitoring station (#10A070) for the Puyallup watershed from the Washington Department of Ecology River and Stream Water Quality Monitoring website. Ecology provides summarized data for the current year and trends overall in the water quality index score, after a two-year vetting process (before the data can be accessed & downloaded). PCD will record the following for this metric: 1) WQI score for temperature, and 2) overall WQI score. Annual Water Quality Reports are released in the fall months of each year. Future refinements to metric: Additional water quality monitoring station will be installed in the watershed. Also, results from annual monitoring for the Water Quality Index (WQI) published by Pierce County Planning & Public Works will be incorporated into this metric.

BASELINE

2012 (Ecology 2012 Water Year Annual Report)

SALMONID ABUNDANCE

METRIC

Status and trends in abundance of ESA-listed and non-listed salmonids

DESCRIPTION

The metric will track changes in escapement estimates for adult salmon and steelhead.

UNIT	SCALE	FREQUENCY
Number of fish	Individual stream or river segment	2 Years

DATA SOURCE

Puyallup Tribal Fisheries Department and Washington Department of Fish and Wildlife

METRIC LEAD

Puyallup Tribe

METHOD

Data and information collected through the Puyallup Tribe's ongoing annual escapement monitoring will be used for this metric. The Tribe will work with the PCD in the first year to determine which individual stream segments currently monitored for spawning use are relevant to FTF activities (i.e., affected by) and what type of information will be included for the abundance metric (e.g., live fish, dead fish, number of redds, etc.). The Tribe will provide the information to the PCD by February 15th in even years (2018, 2020...). Information will be supplied in tabular format accompanied by a map and will include the following: Stream/Reach Name, relevant data, and description of status and trends.

BASELINE

TBD

Attachment A

Letters of Support from FFTF Partners

City of Orting

Building Department

110 Train St SE, P.O. Box 489, Orting, WA 98360-0489

Phone: (360) 893-2219

Fax: (360) 893-6809

December 4, 2017

Ryan Mello, Executive Director
Pierce Conservation District
308 W. Stewart Ave.
P.O. Box 1057
Puyallup, WA 98371

Dear Mr. Mello:

City of Orting is writing in support of the Floodplains for the Future Shared Monitoring Plan. We are an active participant in the Floodplains for the Future (FFTF) partnership and committed to working with Pierce Conservation District (PCD) to successfully implement the plan and to use the results of the shared monitoring effort to adaptively manage the FFTF partnership.

In supporting the Shared Monitoring Plan, we acknowledge that in January of each year monitoring is carried out – every other year for most metrics -- PCD staff will contact us to request information for the metrics listed as our responsibility in attached table, “Metrics by Responsible FFTF Partner”. We understand that we will provide the data we are responsible for to PCD staff by mid-February. We will participate with PCD staff and other FFTF partners in a State of the Floodplains Summit to discuss the monitoring data and to collaboratively manage the monitoring program. We understand that PCD will use the data we submit to produce integrated metrics according to the Shared Monitoring Plan and to publish monitoring information on the Shared Monitoring Website.

The contact for City of Orting to work with PCD staff is: Ken Wolfe, Building official;
kwolfe@cityoforting.org, (360) 893-2219.

Thank you for leading the Shared Monitoring effort; we look forward to working with you.

Sincerely,



Ken Wolfe,
City of Orting Building Official

“Small Town—Big View”



January 11, 2018

Ryan Mello, Executive Director
Pierce Conservation District
308 W. Stewart Ave.
P.O. Box 1057
Puyallup, WA 98371

Dear Mr. Mello:

Pierce County Planning & Public Works, Surface Water Management is writing in support of the Floodplains for the Future Shared Monitoring Plan. We are an active participant in the Floodplains for the Future (FFTF) partnership and committed to working with Pierce Conservation District (PCD) to successfully implement the plan and to use the results of the shared monitoring effort to adaptively manage the FFTF partnership.

In supporting the Shared Monitoring Plan, we acknowledge that in January of each year monitoring is carried out – every other year for most metrics -- PCD staff will contact us to request information for the metrics listed as our responsibility in attached table, “Metrics by Responsible Partner” dated October 16, 2017 [as updated]. We understand that we will provide the data we are responsible for to PCD staff by mid-February. We will participate with PCD staff and other FFTF partners in a State of the Floodplains Summit to discuss the monitoring data and to collaboratively manage the monitoring program. We understand that PCD will use the data we submit to produce integrated metrics according to the Shared Monitoring Plan and to publish monitoring information on the Shared Monitoring Website.

The contact for Pierce County Planning & Public Works to work with PCD staff is:

Anne-marie Marshall-Dody
Planning & Partnerships Manager
Pierce County Planning & Public Works
2702 S 42nd St, Suite 201
Tacoma, WA 98409
(253) 798-2494

Thank you for leading the Shared Monitoring effort; we look forward to working with you.

Anne-marie Marshall-Dody
Planning & Partnerships Manager
Pierce County Planning & Public Works



City of Puyallup

OFFICE OF THE CITY ENGINEER

333 S Meridian, Puyallup, WA 98371

(253)435-3640

December 13, 2017

Mr. Ryan Mello, Executive Director
Pierce Conservation District
308 W. Stewart Ave
P.O. Box 1057
Puyallup, WA

Subject: Support of the Floodplains for the Future Shared Monitoring Plan.

Dear Mr. Mello:

City of Puyallup is writing in support of the Floodplains for the Future Shared Monitoring Plan. We are an active participant in the Floodplains for the Future (FFTF) partnership and committed to working with Pierce Conservation District (PCD) to successfully implement the plan and to use the results of the shared monitoring effort to adaptively manage the FFTF partnership.

In supporting the Shared Monitoring Plan, we acknowledge that in January of each year monitoring is carried out – every other year for most metrics -- PCD staff will contact us to request information for the metrics listed as our responsibility in attached table, “Metrics by Responsible FFTF Partner”. We understand that we will provide the data we are responsible for to PCD staff by mid-February. We will participate with PCD staff and other FFTF partners in a State of the Floodplains Summit to discuss the monitoring data and to collaboratively manage the monitoring program. We understand that PCD will use the data we submit to produce integrated metrics according to the Shared Monitoring Plan and to publish monitoring information on the Shared Monitoring Website.

The contact for City of Puyallup to work with PCD staff is: Hans Hunger, Acting City Engineer, hhunger@ci.puyallup.wa.us, 253-435-3640.

Thank you for leading the Shared Monitoring effort; we look forward to working with you.

Sincerely,

Hans P. Hunger, P.E., Acting City Engineer
Phone: 253.435.3640 Cell: 253.225.4241

Email: hhunger@ci.puyallup.wa.us



Puyallup Tribe of Indians



November 8, 2017

Ryan Mello, Executive Director
Pierce Conservation District
308 W. Stewart Ave.
P.O. Box 1057
Puyallup, WA 98371

Dear Mr. Mello

The Puyallup Tribe Fisheries Department is writing this note in support of the Floodplains for the Future Shared Monitoring Plan. We are an active participant in the Floodplains for the Future (FFTF) partnership and committed to working with Pierce Conservation District (PCD) to successfully implement the plan and to use the results of the shared monitoring effort to adaptively manage the FFTF partnership.

In supporting the Shared Monitoring Plan, we acknowledge that in January of each year monitoring is carried out – every other year for most metrics – PCD staff will contact us to request information for the metrics listed as our responsibility in attached table, “Metrics by Responsible Partner” dated October 16, 2017 [as updated]. We understand that we will provide the data we are responsible for to PCD staff by mid-February. We will participate with PCD staff and other FFTF partners in a State of the Floodplains Summit to discuss the monitoring data and to collaboratively manage the monitoring program. We understand that PCD will use the data we submit to produce integrated metrics according to the Shared Monitoring Plan and to publish monitoring information on the Shared Monitoring Website.

For now, I will be the contact for the Puyallup Tribe to work with PCD staff but Char Naylor will also be an active participant.

Thank you for leading the Shared Monitoring effort; we look forward to working with you!

Sincerely,

Russ Ladley, Director
Puyallup Tribal Fisheries



October 25, 2017

Ryan Mello, Executive Director
Pierce Conservation District
308 W. Stewart Ave.
P.O. Box 1057
Puyallup, WA 98371

Dear Mr. Mello:

The Shared Conservation Partnership is writing in support of the Floodplains for the Future Shared Monitoring Plan. We are an active participant in the Floodplains for the Future (FFTF) partnership and committed to working with Pierce Conservation District (PCD) to successfully implement the plan and to use the results of the shared monitoring effort to adaptively manage the FFTF partnership.

In supporting the Shared Monitoring Plan, we acknowledge that in January of each year monitoring is carried out – every other year for most metrics -- PCD staff will contact us to request information for the metrics listed as our responsibility in attached table, "Metrics by Responsible Partner" dated October 16, 2017 [as updated]. We understand that we will provide the data we are responsible for to PCD staff by mid-February. We will participate with PCD staff and other FFTF partners in a State of the Floodplains Summit to discuss the monitoring data and to collaboratively manage the monitoring program. We understand that PCD will use the data we submit to produce integrated metrics according to the Shared Monitoring Plan and to publish monitoring information on the Shared Monitoring Website.

The contact for the Strategic Conservation Partnership to work with PCD staff is: Spencer Easton, SCP Facilitator, seaston@esassoc.com, 206-789-9658.

Thank you for leading the Shared Monitoring effort; we look forward to working with you.

A handwritten signature in blue ink, appearing to read "Spencer Easton".

Spencer Easton, CFM
Strategic Conservation Partnership Facilitator
Environmental Science Associates
5309 Shilshole Avenue NW, Suite 200
Seattle, WA 98107
206.789-9658 | 206.789-9684 fax
seaston@esassoc.com



CITY OF
SUMNER
WASHINGTON

October 19, 2017

1104 MAPLE STREET, SUMNER WA 98390

PUBLIC WORKS DEPARTMENT

Suite 260

253-299-5700 Fax: 253-299-5539

Ryan Mello, Executive Director
PIERCE CONSERVATION DISTRICT
308 W. Stewart Ave.
P.O. Box 1057
Puyallup, WA 98371

Dear Mr. Mello:

The City of Sumner is writing in support of the Floodplains for the Future Shared Monitoring Plan. The City is an active participant in the Floodplains for the Future (FFTF) partnership and the City is working with Pierce Conservation District (PCD) to successfully implement the plan and to use the results of the shared monitoring effort to adaptively manage the FFTF partnership.

In supporting the Shared Monitoring Plan, the City acknowledges, in January of each year, monitoring is carried out – every other year for most metrics -- PCD staff will contact the City to request information for the metrics listed as per the City's responsibility in the attached table, "Metrics by Responsible Partner" dated October 16, 2017 [as updated]. The City understands we are to provide data the City is responsible for to PCD staff by mid-February. The City will participate with PCD staff and other FFTF partners in a State of the Floodplains Summit to discuss the monitoring data and to collaboratively manage the monitoring program. The City understands PCD will use the data we submit to produce integrated metrics according to the Shared Monitoring Plan and to publish monitoring information on the Shared Monitoring Website.

The contact for the City to work with PCD staff is: Doug Beagle, Deputy Public Works Director, 253-299-5715, dough@sumnerwa.gov.

Thank you for leading the Shared Monitoring effort; the City looks forward to working with you.

Regards,

Mike Dahlem, P.E.
Public Works Director

Attachment B

Floodplain Planning Area – Methods and Use

Floodplain Planning Area – Methods and Use

For the purposes of this Monitoring Plan, the phrase “Puyallup FFTF Floodplain Planning Area or FPA” refers to the low-lying areas in the Puyallup watershed that are adjacent to the largest river channels (Puyallup, White, and Carbon), or the estuarine embayment of Commencement Bay, that can be inundated by flood water or channel migration. This area is intended to capture areas of the historic floodplain that could potentially be restored and therefore includes floodplain areas within the channel migration zone and also behind levees. This area also includes the main tributaries to the main river channel (as mapped by FEMA and USGS). The floodplain extent, or width, of the tributaries varies and can include a constrained channel. The FPA will be used as a basis or baseline extent for tracking changes in spatial metrics as specified in the FFTF monitoring plan. A list of metrics is provided below.

WHY NOT USE THE FEMA 100-YEAR FLOODPLAIN?

The FEMA 100-year floodplain is a standard floodplain area used across the country to regulate and insure floodplain areas. The 100-year floodplain is mapped by FEMA to include areas with a 1% annual chance of flooding. The FEMA floodplain does not include areas protected by flood control structures (such as levees) that provide protection from the 100-year flood.

The FFTF Shared Monitoring Plan is an effort to track progress toward recovery of floodplains in the Puyallup Watershed. One of the primary strategies adopted by FFTF participants is floodplain reconnection – pursuing projects like levee setbacks that reconnect areas of the floodplain behind levees to the river. Reconnected floodplain areas provide increased flood storage capacity, reduce the maintenance needs for infrastructure, and provide improved habitat.

Basing the FFTF Shared Monitoring Plan on a floodplain extent that does not include those historic but disconnected floodplain areas would not include the highest priority restoration sites. A Monitoring Plan that tracks progress needs a floodplain extent that captures the range of potential work to improve floodplains. Therefore, the FEMA 100-year floodplain is not a suitable floodplain extent.

DELINEATION OF FLOODPLAIN PLANNING AREA

To provide a spatial baseline for this Shared Monitoring Plan, the FPA has been delineated for the entire Puyallup Watershed (see figure below). The FPA synthesizes several existing sources of data for the Puyallup Watershed to create a single floodplain footprint that includes disconnected floodplain areas with restoration potential. The FPA includes the following data layers:

1. The 1% Annual Chance Flood Hazard area and 0.2% Annual Chance Flood Hazard area from the FEMA Digital Flood Insurance Rate Map (DFIRM) for Pierce County adopted on March 7, 2017
 - Metadata for this data source is available at: http://gisdata-piercecowa.opendata.arcgis.com/datasets/3d6338fbf4244c37b584dc62957055ae_0
 - The 1% Annual Chance Floodplain represents those areas with a 1% chance of flooding on an annual basis. The 1% Annual Chance Floodplain is mapped by FEMA and used for regulatory and insurance purposes.
 - The 0.2% Annual Chance Floodplain represents those areas with a 0.2% chance of flooding on an annual basis. The 0.2% Annual Chance Floodplain is mapped by FEMA to identify those areas with residual flood risk and also includes areas with reduced flood risk due to levees.
 - Areas mapped by FEMA as being within the 1% or 0.2% Annual Chance Floodplains but that are not contiguous with the Puyallup River, its tributaries, or other portions of the FPA have been excluded from the FPA, which is intended to focus on riverine floodplains.
2. The Channel Migration Zone (CMZ) developed by GeoEngineers (2003) for the Puyallup Watershed
 - Metadata for this data source is available at: <http://matterhorn.co.pierce.wa.us/CVMetaData/County/Hydro%20Topographic/Flood%20Data%20Regulated/CMZ%20Floodway.htm>
 - The CMZ analysis is based on the unconfined channel conditions, that is, in the absence of levees, revetments, and other confining structures adjacent to the channel.
 - The CMZ analysis identified areas with severe, moderate, and low risk of channel migration. After a review of the three data layers compared with other FPA layers and with land use and topography information, it was determined that the low risk CMZ area was an appropriate extent to include in the FPA because it best identified areas that were part of the historic floodplain of the Puyallup River and/or have restoration potential. Therefore, the FPA includes all three CMZ zones: low, moderate, and severe migration potential.
3. Floodplain Seclusion Areas as mapped by Pierce County based on the FEMA DFIRM.
 - Metadata for this data source is available at: http://gisdata-piercecowa.opendata.arcgis.com/datasets/056d577c74af41039eb1e32efadae938_0
 - Due to issues about FEMA levee mapping policies that have not been resolved at a Federal level, the updated FEMA DFIRM for Pierce County (adopted in March 2017) includes seclusion areas which retain the mapping and flood hazard analysis from the previous FIRM. This data and mapping was adopted in 1987 and is based on 1970s data.

- Seclusion areas are specifically those areas behind levees that have been determined to not meet Federal levee standards.
4. Identified levee setback areas from the Levee Setback Feasibility Analysis for the Puyallup River Watershed, developed by GeoEngineers (2008).
- The Levee Setback Feasibility Analysis identified 32 potential sites for floodplain reconnection projects based on the following factors: floodplain elevations; presence of abandoned channels and/or topographic low points; flood storage capacity; character of existing in-channel geomorphic processes; sufficient sediment transport capacity to accommodate site needs; high potential for channel forming processes; property acquisition cost/benefit analysis; and, estimated levee setback project costs.
 - The levee setback areas (i.e., project footprint) from the Levee Setback Feasibility Analysis represent the most feasible and highest priority areas for large-scale floodplain restoration through reconnection and are therefore included in the FPA.

After these data layers were combined, additional refinements were made to the floodplain footprint to focus on the major river and tributary floodplains, which are the focus area of the Monitoring Plan. First, Lake Tapps was removed from the FPA since it is a controlled lake. Second, areas classified as shallow flooding areas on the FEMA DFIRMs, which are not connected to rivers, were removed. Third, lakes not connected to river channels were also removed. Fourth, small tributaries (those other than the White and Carbon rivers and South Prairie Creek) were removed.

As a final step, the FPA was divided into eight reaches that are consistent with current planning and this Shared Monitoring Plan:

- Lower Puyallup River (RM 0 to 10.3)
- Middle Puyallup River (RM 10.3 to 17.4)
- Upper Puyallup River (RM 17.4 to 28.6)
- Lower White (confluence to Auburn city limits)
- Middle White (Auburn city limits to Buckley diversion)
- Upper White (upstream of Buckley diversion)
- Carbon River (RM 0 to 8.4)
- South Prairie Creek

TYOLOGY OF FLOODPLAIN TYPES AND PROPOSED DELINEATION

The Floodplain Planning Area can be further divided into tiers to allow tracking of metrics within specific types of floodplain based on their characteristics (i.e., land cover and land use) and levels of function (i.e., fully functional, partially functional, etc.). Table 1 provides a four-tiered typology of floodplain types.

Table 1. Typology of Floodplain Types

TIER	DESCRIPTION
Tier 0	Functional Floodplain – Unaltered natural systems connected to mainstem rivers, have no levee or flood control structures, support natural vegetation, and have minimal land uses (i.e., passive recreation).
Tier 1	Partially Functional Floodplain – Areas characterized by agricultural uses, open space, or low density development that are connected to the floodplain (no levee or flood control structures are present)
Tier 2	Potentially Functional Floodplain – Fragments of natural systems separated from functional floodplain by levee or flood control structures
Tier 3	Developed Floodplain – Altered areas characterized by commercial, industrial, and other developed uses that occur behind levees or other flood control structures

This phase of the Shared Monitoring Plan project included development and testing of a methodology for classifying the FPA into the four tiers. This method is outlined in a set of sequential steps below. As part of the development and testing, an example area was delineated (Figure 1). Classification of the entire FPA extent is expected to occur in a future phase of this project.

To determine floodplain type, data for connectivity to active channels and condition of land cover is assessed at the parcel level and then grouped with like parcels. The data layers used are maintained by Pierce County GIS with some available on their web portal. Steps to delineate and classify the four floodplain types include the following:

1. Determine connectivity using Pierce County’s Levees and Revetments GIS data layer and Railroad and Historic Rail GIS data layers. Parcels that are separated from the active river channel by a levee, railroad line, or remnant rail line are considered disconnected.
2. Determine condition using Pierce County’s Existing Land Use GIS dataset to sort parcels by level of development (natural, low-density, or high-density). In the dataset, parcels are sorted based on land use category and, in some instances, by attribute description. Table 2 shows how categories should be sorted based on category and attribute. Current aerial imagery should also be reviewed to correct sorting of parcels as necessary.

3. Sort parcels into the four tiers based on connectivity and condition:

- Tier 0: Connected and natural
- Tier 1: Connected and low-density
- Tier 2: Disconnected and low-density
- Tier 3: Disconnected and high-density

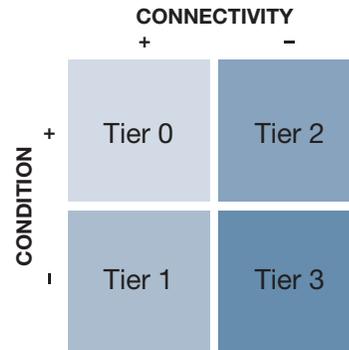


Table 2. Crosswalk Table for Land Use Categories and Level of Development

LAND USE CATEGORY	ATTRIBUTE DESCRIPTION	LEVEL OF DEVELOPMENT
Commercial/Service	all	High-Density
Education	all	High-Density
Group Quarters/Other	all	High-Density
Industrial	all	High-Density
Mobile Home	Mobile Home	Low-Density
	Mobile Home Park	High-Density
	MH Title Elimination	Low-Density
Multi-Family Residential	all	High-Density
Open Space/Recreation	Floodway	Natural or Low-Density (determined by review of aerial imagery)
	all others	Low-Density
Public Facilities	all	High-Density
Quasi-Public Facilities	all	High-Density
Residential Outbuildings	all	Low-Density
Resource Land	Mining Activities	High-Density
	Quarry Sand & Rock	High-Density
	Designated Forest Land	Natural
	Saltwater Tidelands	Natural
	all others	Low-Density
Single-Family Residential	all	Low-Density or High-Density (determined by review of aerial imagery)
Transportation/ Communication/ Utilities	all	Determined by review of aerial imagery
Unknown	all	Determined by review of aerial imagery
Vacant	all	Determined by review of aerial imagery
Water Bodies	all	Natural

Figure 1 below shows this delineation applied to a portion of the Middle Puyallup reach.

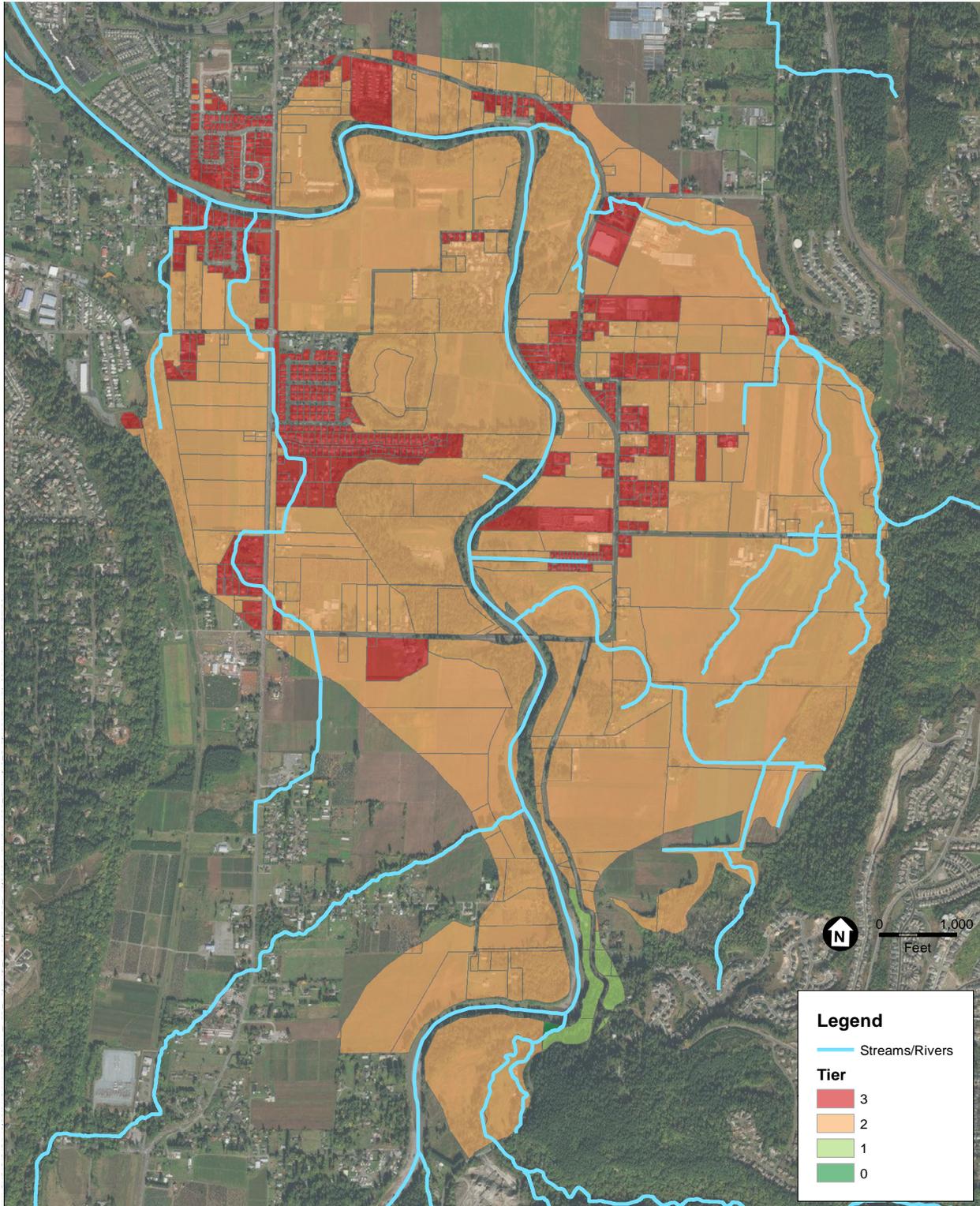


Figure 1. Example Area – FFTF Floodplain Types

FUTURE DEVELOPMENT OF METHODS AND CLASSIFICATION OF ENTIRE FPA

The following notes and suggestions are provided for additional development and testing of the methodology in the future.

- Classification of the FPA has only been conducted for a portion of the Middle Puyallup Reach. Future efforts should include classification of the remaining portions of the FPA.
- Use of Pierce County land use data to determine level of development requires substantial manual classification of parcels using aerial imagery. Future efforts could explore the possibility of using land cover data, which may allow for greater automation.
- Land use data is based on parcels and does not cover roadways. It also does not exactly match hydrology data for the location of the active river channel. The example in Figure 1 has not been adjusted to address these issues. Future development of the FPA classification, if based on land use data, should address these issues.
- The FPA for the portion of the White River in King County does not include channel migration zone (CMZ) data. Future development of the FPA should seek CMZ data for this area and include it in the FPA if possible.
- Additionally, classification methods for the King County portion of the White River have not yet been developed. Methods should be similar to those for the rest of the FPA, but King County-specific data sources will need to be identified.

References

Puget Sound Partnership. 2016. Implementation Strategy for Puget Sound's Floodplains Recovery Targets Phase 1 Final – Revised. Sept 9, 2016.

Konrad, C.P., 2015, Geospatial assessment of ecological functions and flood-related risks on floodplains along major rivers in the Puget Sound Basin, Washington: U.S. Geological Survey Scientific Investigations Report 2015-5033, 28 p., <http://dx.doi.org/10.3133/sir20155033>.

GeoEngineers. 2003. Geomorphic Evaluation and Channel Migration Zone Analysis Puyallup, Carbon and White Rivers for Pierce County Public Works and Utilities Environmental Services, Water Programs Division. June 19, 2003. <http://gisdata-piercecowa.opendata.arcgis.com/datasets/channel-migration-zone-floodway>

FEMA National Flood Hazard Layer source data - updated Digital Flood Insurance Rate Map (DFIRM) for Pierce County were effective on March 7, 2017. (These mapping products replace the FIS & FIRM issued to Unincorporated Pierce County in 1987 and the other incorporated communities between 1980 and 1985). http://gisdata-piercecowa.opendata.arcgis.com/datasets/3d6338fbf4244c37b584dc62957055ae_0

Pierce County Open GeoSpatial Data Portal. <http://gisdata-piercecowa.opendata.arcgis.com/>