



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

Annual Report **2021**



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What's New this Year

METRICS REPORTED IN THIS ANNUAL REPORT

INVESTMENTS

- Combined Contributions
- Floodplain Reconnection Projects
- At-Risk Structures
- Agricultural Viability
- Restored Habitat
- Conserved Farmland

LAND

- Connected/Natural Floodplain
- Weather and Climate Conditions

OUTCOMES

- Farm Drainage
- FEMA Flood Claims
- Salmonids

This Annual Report provides the results from the 2021 Results Cycle and highlights work conducted in the past year to support Floodplains for the Future. During the 2021 Results Cycle, results were generated for 11 of the 18 metrics in the Index of Floodplain Health.

The 2021 results show an impressive level of investment and collaboration from the FFTF partners at an equally large geographic scale. Results show we are successfully restoring more connected and natural floodplain acres than we are losing to development. However, the pace of floodplain reconnection is not happening rapidly enough, and inconsistent floodplain management across jurisdictions leaves more floodplain areas at risk of development. At the same time, we are not yet seeing the target trajectory for farmland conservation – we are losing much more farmland than we are conserving, and greater investment is needed. It is also not yet clear whether we are on the necessary trajectory for salmon recovery, even with recent restoration projects successfully completed, due to the complexity of factors affecting salmon (including factors outside of the Puyallup River Watershed, such as marine conditions).

The results also raise questions about function that can only be answered at the site-level scale. For example, knowing the acres of reconnected floodplain does not reveal the magnitude of function that has been restored, and conserving farmland protects area from development, but conservation alone is often not enough to keep the land viable for farming. Nevertheless, the investments in restoring natural processes show FFTF's commitment to increasing the resilience of the Puyallup River watershed for agriculture, salmon recovery, and flood risk reduction.

Results for past years can be found at floodplainsforthefuture.org



We define floodplain health 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.

OUR INTEGRATED MANAGEMENT GROUP

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

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

Our Focus

Dear Reader,

Since 2013, when Floodplain for the Future (FFTF) began, our partners have worked together to unite the interests of flood risk reduction, salmon recovery, and agriculture in the Puyallup River watershed to achieve the goals of integrated floodplain management. Over the past 8 years, our partners have made great strides toward protecting communities from flood events, restoring salmon habitat, and promoting agricultural viability. Together, since 2013, we have removed over 115 at-risk structures from the floodplain, conserved nearly 400 acres of farmland, restored critical fish habitat, and contributed over \$71 million toward the strategies of the FFTF program. While great progress has been made, significant work remains before the goals of the program are fully realized.

In 2021, our partners built upon this progress and continued to advance important work throughout the watershed. As in 2020, FFTF partners continued to face several challenges that arose due to the COVID-19 pandemic. However, after a year of virtual meetings and remote work, our partners adeptly navigated these obstacles and continued their tradition of collaboration and engagement.

The success of Floodplains for the Future lies in the commitment and dedication of our partners. As evidenced in the following pages, FFTF partners have made great strides over the past year to balance the needs of flood, fish, and farm interests in the watershed. We look forward to sharing our work with you through this Annual Report and thank you for your support.

—Floodplains for the Future Partnership



Why Integrated Floodplain Management

Integrated floodplain management is a strategy that seeks to balance the varied interests and priorities of several partners in a watershed. The floodplains of the Puyallup River watershed are home to diverse communities, critical fish species, and a robust agricultural community; however, these interests are at risk from increasing development pressure, climate change, and severe flood events. These challenges threaten to remove agricultural lands from production, exacerbate the challenges facing salmon health in the watershed, and weaken the ability of communities to respond to flood events.

To thoughtfully address these threats, partners in the watershed are working together to advance integrated floodplain management through the Floodplains for the Future (FFTF) program. Through FFTF, partners agreed on a set of shared visions, strategies, and action to improve floodplain health while balancing the needs of flood risk reduction, salmon recovery, and agricultural viability. This approach enables partners to collaboratively implement multi-benefit solutions and efficiently leverage limited funding and resources. Since the inception of the program, FFTF partners have initiated several projects that provide shared benefits across farm, fish, and flood interests.

Integrated Management in Action

One of the first integrated management projects that was completed is the Calistoga Levee Setback project along the Puyallup River near the City of Orting. Completed in 2015, this project involved the removal of nearly 3,800 feet of existing levee and the construction of a new setback levee resulting in over 29 acres of newly connected floodplain habitat. By reconnecting the river to its historic floodplain, this action restored natural river processes such as channel migration, which created new areas of salmon habitat. Immediately after construction was completed, juvenile salmon were observed using the new habitat areas. This project also greatly expanded flow capacity of the river, protecting the surrounding communities from severe flood events.

Although integrated floodplain management aims to catalyze lasting solutions in the watershed, it is not always easy to find common ground across the goals and priorities of each interest group. However, as has been shown through the Calistoga Levee Setback project and others like it (such as the South Fork Reconnection project, the Matlock Farm Conservation Easement, and the Ball Creek Restoration project) integrated floodplain management can increase the pace, magnitude, and resilience of actions to improve floodplain health throughout the Puyallup River watershed.

Our Goal is Integrated Floodplain Management

Integrated floodplain management seeks common agreement on visions, strategies, and a variety of actions to meet the needs of farm, fish, and flood risk interests throughout the Puyallup River watershed. Integrated solutions make better use of limited funding and staffing and lead to wiser capital investments.



FARM



FISH



FLOOD RISK





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.

Our Goals

- 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.
- Minimize the 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).
- Protect existing functional salmon habitat.
- Restore historic function for spawning, foraging, and rearing habitat.
- Increase salmon abundance.
- Provide more space for the river to migrate.
- Improve water quality.
- Increase integration and collaboration across FFTF members and interests (fish, farm, and flood).
- Increase the resilience of flood management infrastructure, the ecosystem, and agriculture as the climate changes.

Leveraging Partnerships and Resources

FFTF partners have identified over \$500 million in infrastructure, restoration, and farmland conservation needs throughout the floodplains of the Puyallup River watershed. In an era when investment in infrastructure, agriculture, and salmon recovery continues to be well below the levels of need, creativity and strategic opportunism are required.

By establishing a compelling and inclusive vision guided by strategies and actions, the 21 partner organizations in the FFTF program can efficiently unite their efforts toward securing funding from local, state, and federal sources to achieve their goals and advance their work.

Together, FFTF partners have crafted the following broad strategies to guide their efforts:

- Reconnect floodplain through levee setbacks and side channel reconstruction
- Remove structures at-risk of flooding through parcel acquisition and demolition
- Preserve agricultural land through conservation easements
- Restore habitat and watershed processes to support all salmon and trout species
- Identify agricultural resiliency opportunities and action plans
- Develop a strong, commonly understood collaborative structure and partnership



The Puyallup Tribe Fisheries Division, US Fish and Wildlife Service, Pierce County Surface Water Management, the Port of Tacoma, and South Puget Sound Salmon Enhancement Group are assessing the physical and biological properties of the Clear Creek landscape to inform the feasibility and design of a restoration project at this location.



The body of work includes assessing salmon and trout use in the Clear Creek watershed as non-natal estuarine rearing habitat; seine nets were used to safely corral fish.

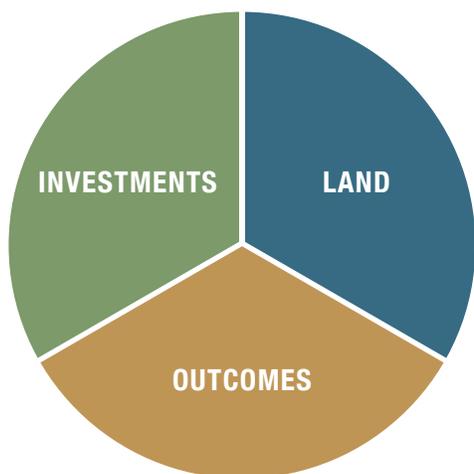
Once captured, non-lethal sampling methods were used to pump the fish's stomach to see what they are eating to compare fish diets to food web production as it relates to habitat conditions.



To better understand movement within the Puyallup River system, the work includes tagging fish captured in Clear Creek and throughout the watershed with Radio Frequency Identification tags, similar to the tags used in pet microchipping. So far, over 2,000 young Chinook, Coho, Steelhead, Cutthroat, and Bull Trout have been tagged throughout the watershed.

Monitoring to Move Forward

To track progress toward their goals, FFTF partners have developed a robust monitoring plan referred to as the Monitoring and Adaptive Management Program. This program is comprised of 18 high-level metrics that track capital investments in the FFTF program, monitor the progress of actions by FFTF partners, and report on conditions in the watershed outside of the direct influence of FFTF partners that nevertheless affect the program. Together, these 18 metrics comprise the Index of Floodplain Health, which groups the metrics around three themes:



INVESTMENTS

Investment metrics track the financial contributions of FFTF partners

LAND

Land metrics help partners learn how communities interact with land in the floodplain

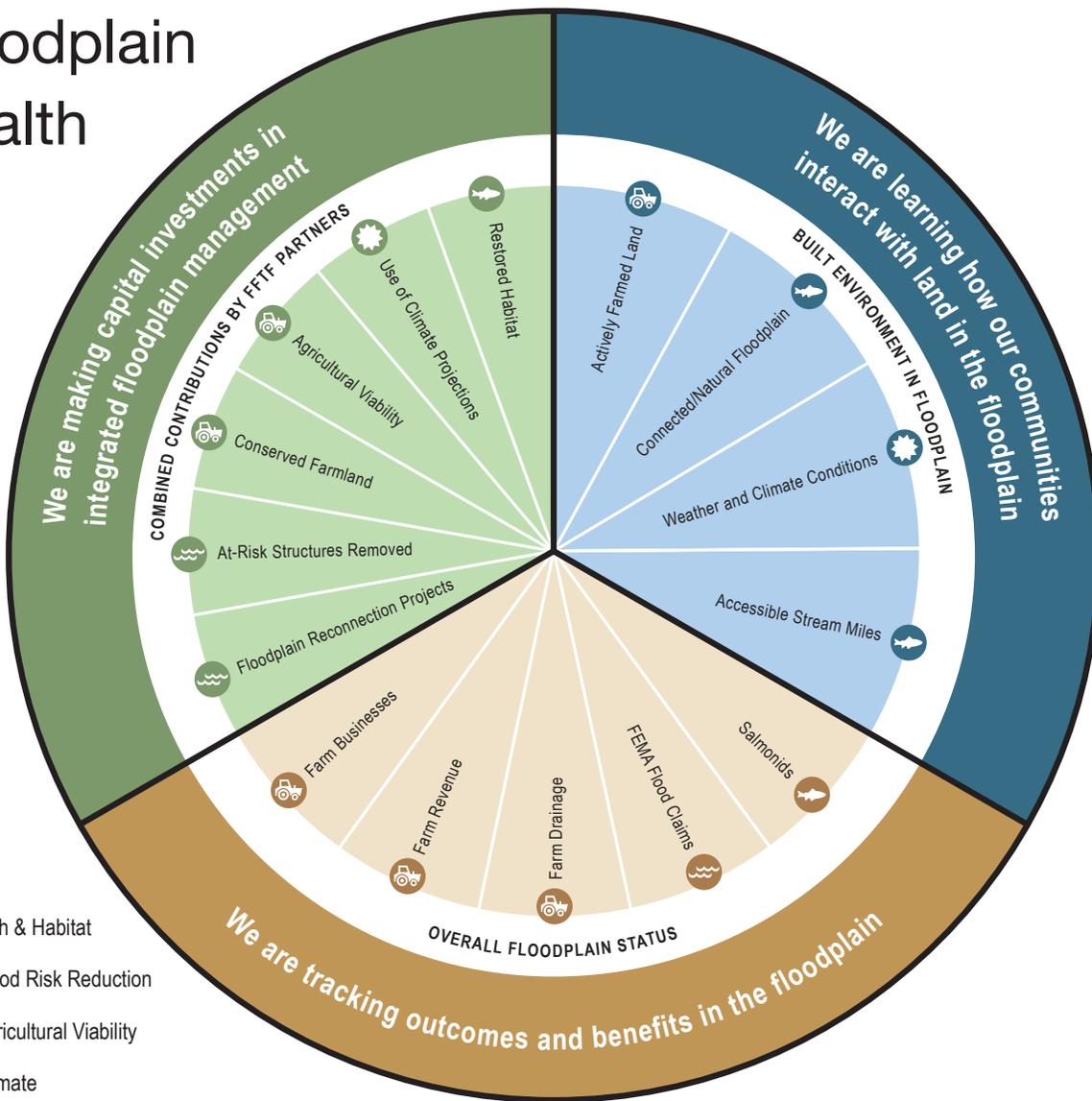
OUTCOMES

Outcome metrics reflect trends in floodplain conditions

The success of integrated floodplain management lies in ensuring that individual stakeholder issues and goals are integrated at both project and watershed scales. By monitoring their actions through these metrics, FFTF partners are able to understand the degree to which their efforts and investments in the watershed align with their shared visions, strategies, and actions. This iterative process of reflection allows partners to celebrate their successes, identify areas where they are falling short of their goals and where collaboration can be improved, and ultimately, move closer to achieving integrated floodplain management in the Puyallup River watershed.

Each year, we report on a subset of the metrics in the Monitoring and Adaptive Management Program, based on what information is available and on established frequencies for each metric. This 2021 Annual Report provides results for 11 of the 18 metrics in the Index of Floodplain Health. The results included in the Annual Report are those gathered and presented in 2021, and typically reflect investments and conditions made in 2020 or previous years (depending on the information available for each metric). Project specific monitoring of actions support by FFTF will occur as each project is implemented by the project sponsor.

Index of Floodplain Health



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OUTCOMES

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- FEMA Flood Claims
- Salmonids

Investments

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

INTEGRATED METRIC

COMBINED CONTRIBUTIONS BY FFTF PARTNERS

FFTF partners are working together to support the recovery of floodplain functions and protect the health and safety of communities around floodplains. Working independently and collaboratively, FFTF partners seek and acquire funding from multiple sources, including federal, state, and local grants; rate-based fees and taxes; and private foundations. Partners provide match funds in many cases and use existing grants to leverage additional funds where possible. Together, the combined investment of all FFTF efforts serves as an indicator of progress toward the shared goals of the FFTF program. In 2020, partners contributed over \$10 million toward FFTF activities, bringing their total combined contributions to over \$70 million since FFTF was formed in 2013.

YEARLY BREAKDOWN



FUNDING

\$10,168,320
in 2020

\$71,060,258
total to date (since 2013)



Funding Source and 2020 Amount

Local	\$4,083,570.93
State	\$4,263,679.53
Federal	\$1,810,738.21
Private	\$10,331.66
TOTAL	\$10,168,320.33

INDIVIDUAL METRICS

FLOODPLAIN RECONNECTION PROJECTS

Floodplain reconnection projects reconnect floodplains to rivers and tributaries, providing room for rivers to migrate, lessening the impacts of severe flood events, and creating additional habitat. This metric tracks the total acreage of completed floodplain reconnection projects as well as the number of reconnection projects in progress and proposed by Pierce County.



65 acres
of floodplain reconnected in 2020
*From completion of the South Prairie Creek Preserve
Floodplain Reconnection Project*

15
projects
in-progress

5
proposed
projects

*Information on proposed and in-progress projects
can be found at www.floodplainsforthefuture.org*

AT-RISK STRUCTURES

Removing at-risk structures from the floodplain is an effective way to prevent future flood damages and reduce costs associated with emergency response, clean-up, and recovery. This metric uses data from Pierce County to track progress made toward reducing flood risk.



7
at-risk structures
removed in 2020

118
at-risk structures
removed 2013-2020

CONSERVED FARMLAND

Agriculture has long been a major land use in the floodplains of the Puyallup River watershed. Compared to commercial, residential, or industrial development, agriculture is a compatible floodplain land use, and conserving a viable agricultural land base reduces the amount of development in the floodplain. This metric tracks the completion of farmland conservation projects carried out by FFTF partners, including Pierce County, Washington Farmland Trust, and Forterra. While no projects were completed in 2020, several projects were in progress; farmland conservation efforts typically take multiple years to complete due to the requirement for project development, alignment of funding sources, and the complex decision-making required by the landowner.



393 acres
of farmland conserved
2013 through 2020

0
acres of
conserved
farmland in 2020

3
projects in
progress in 2020

INDIVIDUAL METRICS (CONTINUED)

AGRICULTURAL VIABILITY



This metric tracks the financial investments made toward improving agricultural viability throughout the Puyallup River watershed. This metric only tracks financial investments; staff time is not included.

\$1,833,740
contributed toward
agricultural viability
in 2020

\$5,488,293
contributed toward
agricultural viability
total (2013-2020)

RESTORED HABITAT



The restoration of wetlands, floodplains, and riparian areas provides important habitat benefits for fish and wildlife. This metric uses data from the Pierce County Salmon Recovery Lead Entity to track habitat restoration and reflect progress toward FFTF goals related to improving habitat. In 2019, this included 1.26 acres of restoration and 0.4 stream miles restored (in addition to 11 acres of reconnected floodplain, tracked elsewhere). In 2020, there were 0.95 acres of habitat restoration and 1.2 stream miles restored (in addition to 65 acres of reconnected floodplain). FFTF partners have identified that a comprehensive system to track restored habitat is needed to capture all the restoration that is occurring in the watershed; it is likely that this metric is currently under-reporting the acres of restored habitat.

1 acre
of restored
habitat in 2019

1 acre
of restored
habitat in 2020

170 acres
of restored habitat
2013-2020



Land

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

INDIVIDUAL METRICS

CONNECTED/NATURAL FLOODPLAIN



This metric measures the amount of land in the watershed with natural land cover and unobstructed access to rivers and tributaries. This type of floodplain can provide beneficial habitat for fish and can mitigate the impacts of severe flooding events. Of the 21,341 acres of connected and natural floodplain in the watershed, over 30% occurs in the upper White River and only 2% is within the Middle Puyallup River reach. A 2013 baseline for this metric was calculated in 2018 based on GIS mapping, and has been updated for 2015 and 2017 based on high resolution change detection data from the Washington Department of Fish and Wildlife (WDFW) and implemented floodplain reconnection projects. Updates will be calculated for additional years in the future as data availability allows.

21,078 acres
of connected floodplain with
natural land cover in 2013

21,217 acres
of connected floodplain with
natural land cover in 2015

21,341 acres
of connected floodplain with
natural land cover in 2017

Data collected and analyzed for the Monitoring and Adaptive Management Program allow us to compare the loss of connected/natural floodplain to development with the restoration of connected/natural floodplain through floodplain reconnection projects. The data show that we are creating restored connected/natural floodplain faster than we are losing it to development, and that we are on the right trajectory to accomplish FFTF goals. Between 2013 and 2015, 7.3 acres of connected/natural floodplain were converted to built environment. During the same period, 146 acres of floodplain were restored and reconnected. Between 2015 and 2017, 3.48 acres of connected/natural floodplain were developed while 121 acres were restored and reconnected.

However, it is important to note that there is still development in other portions of the floodplain that are not connected/natural but that still provide floodplain functions, such as agricultural or open space areas. Between 2013 and 2015, although only 7.3 acres of new floodplain development were in connected/natural areas, a total of 350 acres were developed or redeveloped across the floodplain planning area. Also, the pace of the increase in connected/natural floodplain is slow. That said, the results for this metric are highly encouraging in showing that FFTF actions are on track.

INDIVIDUAL METRICS (CONTINUED)

WEATHER AND CLIMATE CONDITIONS



Climate conditions and events influence the actions of FFTF partners and nearly all metrics tracked by the FFTF Monitoring and Adaptive Management Program. This metric generates information about air temperature, heavy rainfall events, snowpack, streamflow, water temperature, and air quality to provide necessary context used to interpret the results of the other metrics in the FFTF monitoring plan. Data for this metric are generated from Washington State University, U.S. Department of Agriculture, U.S. Geological Survey, and the Puget Sound Clean Air Agency. Even as FFTF partners were collecting data on weather and climate conditions in 2020, we observed notable conditions in 2021, including the major heat wave in June 2021.

2020 Air Temperature:
12 days above 85°F. 3
days above 90°F.

Heavy Rainfall Events:
4 days with precipitation
over 1 inch in 2020

Snow Water Equivalent
on April 1st, 2020:
24.3 inches

Maximum Low-elevation
Snow Water Equivalent:
3.3 inches on 1/23/2020

Peak Streamflow, Water
Year 2020: **39,500 cfs**

Streamflow above 2-year
Flood Level, Water Year
2020: **3 days above**
21,500 cfs

Lowest 7-day Average
Streamflow: **1,370**
cfs from 10/3/2020 –
10/10/2020

Highest 7-day Average
Daily Maximum Water
Temperature in 2020: **19°C**

Air Quality: 7 days with
PM2.5 above 55.5 $\mu\text{g}/\text{m}^3$
(unhealthy for all groups) in
2020. Average concentration
on days above 55.5 $\mu\text{g}/\text{m}^3$ =
102.4 $\mu\text{g}/\text{m}^3$



Outcomes

We are tracking outcomes and benefits in the floodplain.

INDIVIDUAL METRICS

FARM DRAINAGE



Adequate drainage is necessary for successful farm operations. This metric uses a survey to track responses from farmers about drainage conditions on farms throughout the watershed for a given year.

On a scale of 1 (not an issue) to 10 (unable to farm the land), drainage issues in 2020 were a 6, according to 11 farmers



FEMA FLOOD CLAIMS



This metric provides a relative estimate of damages incurred from flood events. These results are reported for Pierce County as a whole, not specific to the Puyallup River watershed. FEMA claims represent the amount of funding provided by FEMA to individuals with active FEMA insurance policies to cover structural damages. These results only reflect the amount FEMA pays on the insurance policies, not necessarily the total damage caused by a flood. Additionally, property owners may experience flooding and associated damages and choose not to file a claim. While there is no perfect approach to report on flood damages, there is value in tracking indicators of outcomes. Data are not yet available for 2017 – 2020.

2013:
1 claim, \$0
in FEMA
flood claims

2014:
8 claims, \$60,413
in FEMA
flood claims

2015:
18 claims, \$160,316
in FEMA
flood claims

2016:
7 claims, \$58,472
in FEMA
flood claims

From 2013 – 2016:
Total of 34 claims, \$279,201
in FEMA flood claims

INDIVIDUAL METRICS (CONTINUED)

SALMONIDS



Salmon are an invaluable resource in the Puyallup River watershed, and FFTF partners recognize the importance of the relationship between floodplain management and salmon abundance. The 2014 Puyallup Watershed Assessment estimated that the historic (early 1900s) annual Chinook run was 78,000. This metric uses data from the Puyallup Tribe and WDFW to monitor the populations of natural origin Chinook on the Puyallup and White Rivers.

547

adult Puyallup River Fall Chinook
of natural origin (2020)

156,935

total juvenile Chinook
outmigration abundance
estimate (2019 run)

633

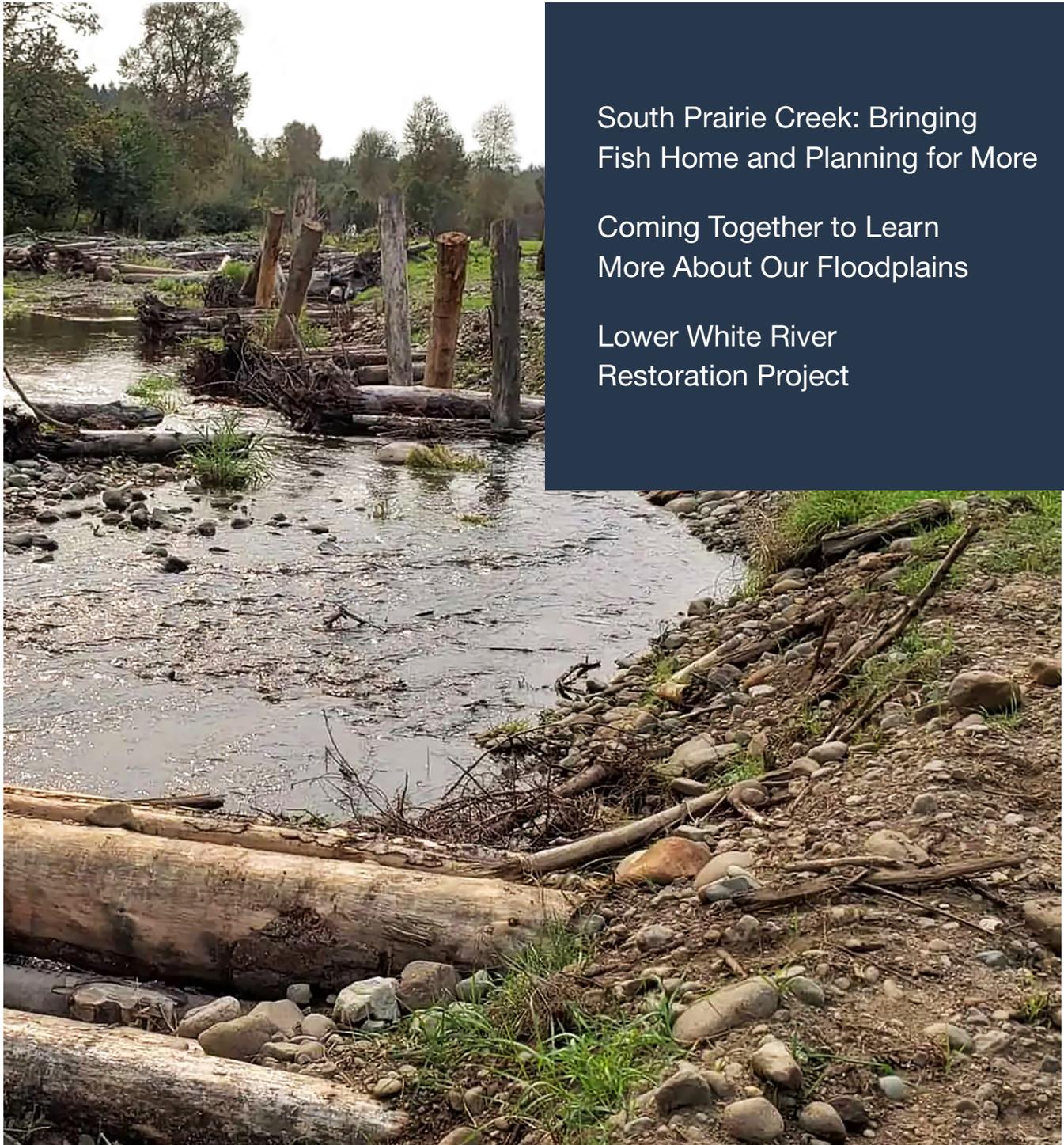
adult White River Chinook of
natural origin (2020)

4.51%

freshwater survival (2019 run) in
Puyallup River



Stories of Accomplishment



South Prairie Creek: Bringing
Fish Home and Planning for More

Coming Together to Learn
More About Our Floodplains

Lower White River
Restoration Project

Story of Accomplishment

South Prairie Creek: Bringing Fish Home and Planning for More

In 2021, FFTF partners increased their focus on the South Prairie Creek reach of the watershed. South Prairie Creek, a tributary of the Carbon River, may be misnamed – despite being labeled a creek, its flows can be as high as 10,000 cubic feet per second. South Prairie Creek is a primary producer of Fall Chinook and Steelhead and also provides important habitat for Bull Trout. Throughout conversations held in 2021, FFTF partners articulated goals for flood risk reduction, salmon recovery, and agricultural viability and explored potential future actions to provide benefits for all three interests in this reach. FFTF partners also worked together on complex property acquisitions that will be key to success in the reach.

In addition, 2021 marked the successful completion of the South Prairie Creek Preserve Floodplain Restoration project, a 7-year initiative with an intersection of farm, fish, and flood benefits. The project was led by the Pierce Conservation District and South Puget Sound Salmon Enhancement Group with substantial contributions from other organizations. Several partners collaborated to design and implement extensive restoration activities across 65 acres, successfully restoring important habitat for fish species, reconnecting the natural floodplain, and maintaining opportunities for agricultural services in the reach.

The South Prairie Creek restoration effort was a massive undertaking. Partners installed 118 engineered log jams, demolished 9 buildings, re-forested 10,700 native plants and trees, and re-created a half-mile of river channel habitat. At this scale, the project will have real impact and contribute to positive changes for the landscape well into the future. Fish were spotted returning to the creek shortly after partners completed construction. The success is attributed to the contributions and dedication of several partners who worked together to restore the land and re-establish critical habitat.

Unlike other floodplain reconnection projects completed in recent years, the South Prairie Creek Preserve Floodplain Restoration project was not funded with Floodplains by Design funds. Rather, the project was funded through 12 grant programs, including local, state, and federal sources. It is an example of watershed partners diversifying funding strategies to achieve more benefits.

This project has set the stage for expanding this type of collaborative, large-scale restoration work throughout South Prairie Creek and the rest of the Puyallup River watershed and is a proven example of how partners can work together to leverage resources. Building on this project's success, funding has been secured from the Puyallup Tribe, Washington Salmon Recovery Funding Board, and Floodplains by Design to develop more projects in the watershed.

A COLLABORATIVE EFFORT:

- City of South Prairie
- City of Wilkeson
- Forterra NW
- Pierce Conservation District
- Pierce County Ag Program
- Pierce County Capital Improvements Program
- Pierce County Floodplain and Watershed Services
- Puyallup Tribe of Indians
- Recreation and Conservation Office
- South Puget Sound Salmon Enhancement Group
- Strategic Conservation Partnership RIA 10/12 Lead Entity
- WSDOT

FUNDING CONTRIBUTORS:

- Pierce County Surface Water Management
- Pierce Conservation District
- Puyallup Tribe of Indians
- Department of Ecology
- Washington State Conservation Commission
- Pacific Coast Salmon Recovery Funds
- Puget Sound Acquisition and Restoration Puget Sound National Estuary Program

Story of Accomplishment

Coming Together to Learn More About Our Floodplains

In fall 2021, the South Puget Sound Salmon Enhancement Group began a study of groundwater conditions in the Clear Creek area of the Lower Puyallup River reach. Groundwater is important to FTF strategies and goals because it recharges the stream channel during times of low flows, helping maintain baseflows and moderate water temperature. Groundwater levels also affect the ability to drain an area for agricultural use. While installing groundwater wells may not sound exciting at first glance, it drew together a diverse group of FTF partners who wanted to be part of the process and learn more about groundwater and soil in the region. Rawley Johnson, a Clear Creek area farmer and the owner of Early Bird Farm, was inspired to share his observations of the groundwater well installation, and the broader FTF effort, in his weekly newsletter to the farm's Community Supported Agriculture (CSA) members.

Rawley wrote:

Since we moved here in 2013, I've been involved in an initiative grant-funded by the Washington State Department of Ecology called "Floodplains for the Future." The goal is to implement floodplain improvement projects that benefit farms, fish, and flood risk reduction. While most of the projects remain in the research and planning phases, this past week was an exciting one—13 groundwater wells were installed on properties in our local watershed, including one on our farm. The wells are 20 feet deep and will be giving us year round data about the depth of the groundwater table and water temperature.

Kristin Williamson is a biologist for the South Puget Sound Salmon Enhancement Group and also an Early Bird Farm CSA member. She is managing the groundwater well project, so I asked her a few questions about the goals of the research. Kristin said that the wells will give researchers a better picture of how water moves through the whole system—specifically how the Puyallup River, the Clear Creek, tidal influence, and rainwater all interact with the groundwater table throughout the year. This will help better inform planning for future habitat restoration projects in the area. The data could also help us better understand agricultural drainage. Knowing which areas drain well and which areas stay saturated could help explain the issues that some local farmers have with perennially wet fields. The ultimate goal is a habitat restoration project in the area that both creates new salmon habitat and provides a place for all that water to drain off of our farm fields.

The well drilling also provided us with a 20-foot-deep soil core, which is a literal window into the history of the floodplain. Our soil sample is a fascinating mix of sand and clay layers—evidence of repeated past flood events and sedimentation. There are even some preserved grasses from an ancient marsh about 4 feet down. Researchers will be carbon dating the grass to figure out how old it is. Hopefully, all this information from the past will help us understand how to recreate a thriving floodplain for the future that benefits both fish and farms.

CSA Share Week 19:

1 bunch celery
2 fennel bulbs
3 onions (1 red one yellow)
1 kabocha winter squash
1 head samantha lettuce
cosmic purple carrots
1 daikon radish
3 bosc pears
*leave on the counter for a week or so to ripen



About the Produce/Recipe Ideas:

Daikon radish is spicy when used raw, so a simple thing to do would be to grate it on top of a **lettuce salad** for a little extra kick. When cooked, daikon really sweetens up. I often simmer chunks of peeled daikon into [miso soup](#). Here are a couple other suggestions for cooked daikon:

[Simple Boiled Daikon Radish](#)
[Simmered Daikon with Tofu](#)
[Braised Daikon Radish](#)
[Quick pickled carrots and daikon grain bowl](#)

Celery and Fennel pair well for a bright and crunchy salad:

[Celery, Apple and Fennel Slaw](#)
This time of year I like to roast fennel with other root vegetables:

[Oven Roasted Fennel and Carrots](#)

Recipe of the Week:

Roasted Fennel Casserole with Apples,
Taleggio Cheese and Almonds
From *Six Seasons* by Joshua McFadden
Sausage and Fennel always make a good pair. For this casserole you could sub another soft cheese like Fontina, Havarti, or Gruyere.
Heat oven to 375. Heat a large skillet over medium high heat, add **1 tsp olive oil**, then add **½ pound fennel sausage** (bulk or with casings removed). Cook 5 minutes until no longer pink, breaking up into popcorn sized bits. Scoop out of pan and set aside.

Reduce heat to medium low, add **1 tbsp oil** and **2 cloves smashed garlic** and cook 5 minutes until garlic is browned. Add **½ tsp dried chili flakes**, stir, then add **2 bulbs fennel, sliced lengthwise into eighths**. Pour **½ cup water** into pan and cover it, so the fennel steams and simmers. Add water if needed and cook fennel for 10 minutes until tender and water has evaporated.

Return sausage to the pan and add **1 large apple, thinly sliced**, **½ cup toasted almonds**, **1 tsp thyme**, and **3 oz Taleggio cheese**. Toss and season with salt and pepper.

Pile this mixture into a 2-3 quart baking dish, top with **3 oz more cheese** and **½ cup dried bread crumbs** and dot with **1 tbsp butter**. Bake 30 to 35 minutes until cheese is melted and sizzling. Let casserole rest for 5 minutes then serve hot.

News from the Farm

Since we moved here in 2013, I've been involved in an initiative grant-funded by the Washington State Department of Ecology called "Floodplains for the Future." The goal is to implement floodplain improvement projects that benefit farms, fish, and flood risk reduction. While most of the projects remain in the research and planning phases, this past week was an exciting one—13 groundwater wells were installed on properties in our local watershed, including one on our farm. The wells are 20 feet deep and will be giving us year round data about the depth of the groundwater table and water temperature.

Kristin Williamson is a biologist for the South Puget Sound Salmon Enhancement Group and also an Early Bird Farm CSA member.



She is managing the groundwater well project, so I asked her a few questions about the goals of the research. Kristin said that the wells will give researchers a better picture of how water moves through the whole system—specifically how the Puyallup river, the Clear Creek, tidal influence, and rainwater all interact with the groundwater table throughout the year. This will help better inform planning for future habitat restoration projects in the area. The data could also help us better understand agricultural drainage. Knowing which areas drain well and which areas stay saturated could help explain the issues that some local farmers have with perennially wet fields. The ultimate goal is a habitat restoration project in the area that both creates new salmon habitat and provides a place for all that water to drain off of our farm fields.

The well drilling also provided us with a 20 foot deep soil core, which is a literal window into the history of the floodplain. Our soil sample is a fascinating mix of sand and clay layers—evidence of repeated past flood events and sedimentation. There are even some preserved grasses from an ancient marsh about 4 feet down. Researchers will be carbon dating the grass to figure out how old it is. Hopefully, all this information from the past will help us understand how to recreate a thriving floodplain for the future that benefits both fish and farms. There's a short video about the project on this link: [floodplainsforthefuture.org](#)

Story of Accomplishment

Lower White River Restoration Project

In 2021, the City of Sumner received a \$15 million investment commitment from the Puget Sound Acquisition and Restoration (PSAR) Fund for the Lower White River Restoration Project, allowing the project to meet its \$102 million funding goal and move forward to construction. The project represents a major opportunity to restore floodplain habitat and achieve multiple benefits in the Lower White River reach.

The project is in Sumner's warehouse distribution center, the largest distribution center in Pierce County and one of the largest throughout the region. When this area floods, the impacts extend well beyond the local scale and affect the widespread communities and businesses served by this distribution center.

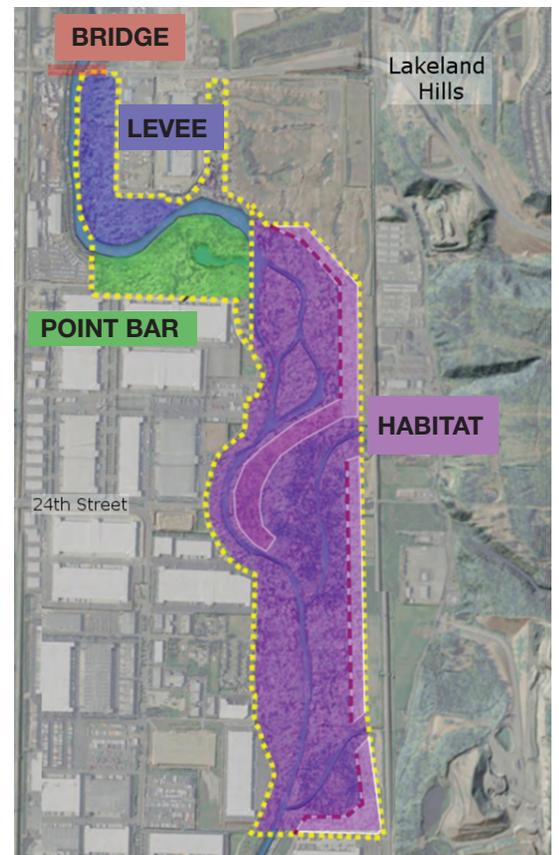
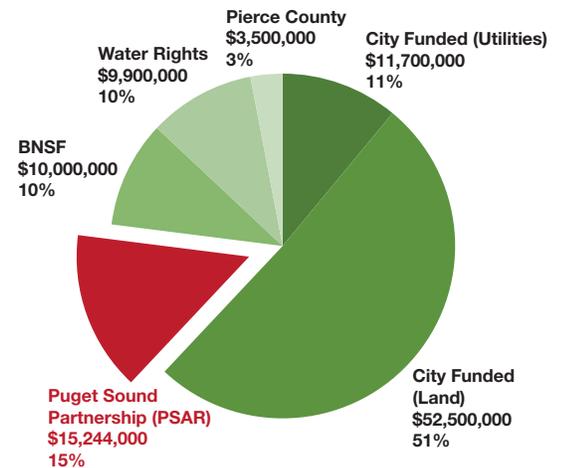
Emerging from the need to address impacts on the regional business center, the Lower White River Restoration Project has evolved into an impressive multi-benefit restoration effort that will mitigate flooding, provide critical fish habitat, and improve conditions for the surrounding community.

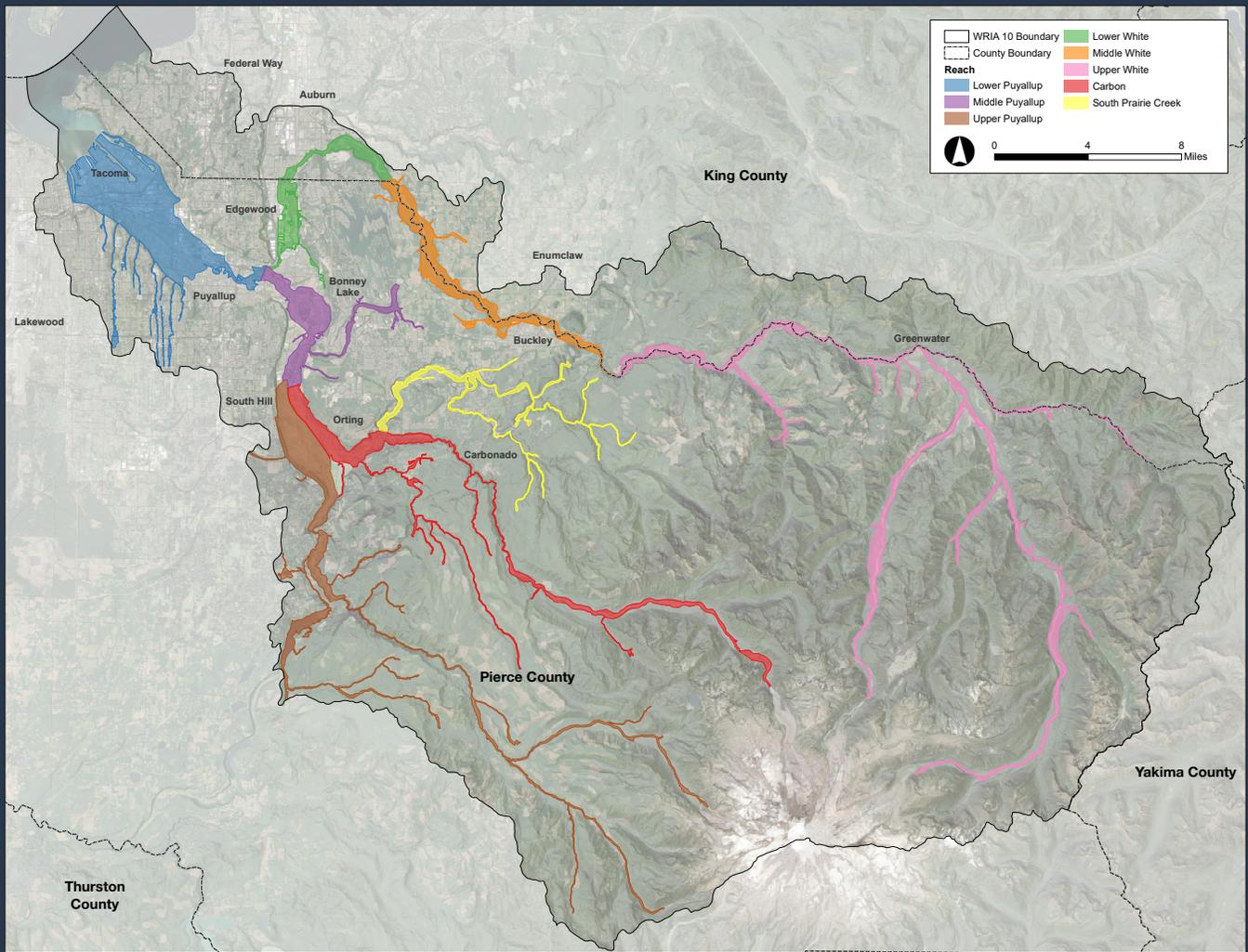
Project partners include the City of Sumner, Puyallup Tribe of Indians, Pierce County, Muckleshoot Indian Tribe, BNSF Railway, and Cascade Water Alliance, who have provided funding and other resources to advance the project.

The project includes four interrelated components:

- Restore 170 acres of fish habitat
- Create adjacent floodplain and riparian habitat to make space for floodwaters
- Construct a levee to protect the neighboring businesses
- Replace a bridge, allowing the river to migrate and improving conditions for multi-modal transportation (including connection to a regional trail system)

The Lower White River is an important reach with substantial constraints for floodplain restoration. This project will also leverage other major investments in habitat and flood risk reduction in the Lower White River, both completed (i.e., the Countyline Levee Setback and Mud Mountain Dam projects) and planned.





Puyallup Watershed: FTFF Reaches

LEARN MORE

The monitoring component of the FTFF Monitoring and Adaptive Management Program is guided by the Shared Monitoring Plan. This document contains detailed information about the protocols used to track each metric, including the data source and collection methods.

More information about the results presented in this Annual Report, including the Shared Monitoring Plan, graphics, tables, benchmarks, and data along with the results from previous years of monitoring (2013–2020), can be found on the Floodplains for the Future website: www.floodplainsforthefuture.org.



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

