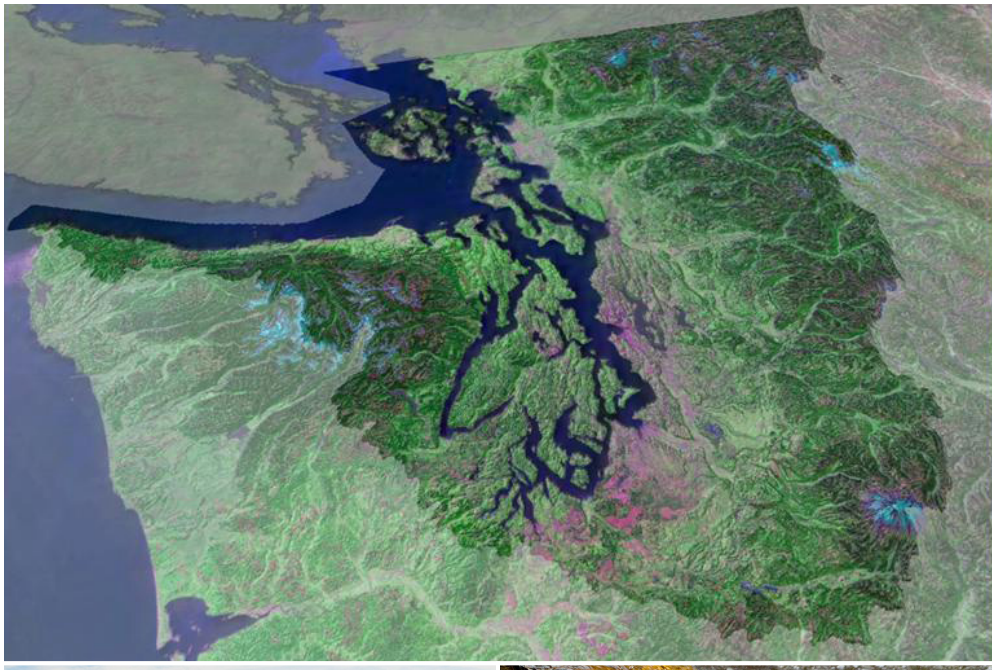





PUGET SOUND FEDERAL TASK FORCE

ACTION PLAN

2022-2026

May 2022

FEMA

USGS
science for a changing world

NRCS

US Army Corps of Engineers®

Contents

1.0 Introduction

On September 30, 2016, the Managing Director of the Council on Environmental Quality, Administrator of the Environmental Protection Agency, Under Secretary of the Department of the Army, Assistant Secretaries of the Department of Transportation and the Navy, Commander of the U.S. Coast Guard, and the Secretaries of the Department of Interior, Department of Commerce, Department of Agriculture, signed a Memorandum of Understanding (2016 MOU) creating the Puget Sound Federal Task Force (PSFTF). This was an update of an existing 2008 MOU.

This PSFTF Action Plan fulfills the 2016 MOU requirement to develop and approve a five-year action plan that leverages and coordinates diverse programs on a specific suite of priorities.

This PSFTF Action Plan builds on past work[1] and is informed by all available strategic, economic development and other related plans, including the Puget Sound Partnership's Action Agenda. This Action Plan is also informed by the Western Washington Treaty Rights at Risk Initiative; federal administration priorities around climate and environmental justice; engagement with tribal, state, and local partners; Salmon Recovery Plans; the Coastal Nonpoint Pollution Control Program, and other regional protection and recovery plans.

1.1 Integrating Federal Activities in the Puget Sound Action Agenda

A key purpose of the Puget Sound Federal Task Force is to strengthen the early and ongoing integration of federal activities and capabilities into the Puget Sound Action Agenda and its implementation.

Integrating federal activities into the implementation of the Action Agenda is important because the Action Agenda is our region's shared vision for Puget Sound protection and recovery. The Action Agenda aims to concentrate efforts, energy, and investment on transformational changes that will enable collective progress toward the statutory goals and system of ecosystem indicators, known as Vital Signs, that guide Puget Sound recovery. The Action Agenda serves as the Comprehensive Conservation and Management Plan under Section 320 of the Clean Water Act.

This PSFTF Action Plan helps integrate federal activities into the implementation of the Puget Sound Action Agenda in the following ways.

- The PSFTF Action Plan is organized around the three Strategic Initiatives (habitat, shellfish, and stormwater). The Strategic Initiatives lead specific Implementation Strategies to achieve Action Agenda recovery objectives, which make them key mechanisms for aligning federal, state, and local efforts.
- The PSFTF Action Plan reflects high mutual interest and substantial coordination and collaboration in several areas, including, for example: riparian protection and restoration; fish

[1] See the PSFTF 2017-2021 Progress Report

passage restoration; restoration project permit streamlining; green infrastructure and stormwater; science and monitoring; and habitat protection and restoration.

- Strategies, high-level actions, and key opportunities from the 2022-2026 Action Agenda were systematically considered and meaningfully influenced this PSFTF Action Plan's *Priority Federal Actions to Protect and Restore Puget Sound.*
- The PSFTF and Puget Sound Partnership will use this PSFTF Action Plan and continue to work together to improve understanding, recognition, and, alignment of federal Ongoing Programs with Action Agenda implementation.

1.2 Western Washington Treaty Rights at Risk Initiative

Another key purpose of the PSFTF is to strengthen intergovernmental coordination of federal actions with tribal governments, and, to contribute to fulfilling federal trust responsibilities.

One way that the PSFTF meets these purposes is through staffing and coordinating the reinforcing Western Washington Treaty Rights at Risk Initiative.

The PSFTF and Western Washington Treaty Rights at Risk Initiative are reinforcing governmental coordination efforts because:

- they share an overall goal of supplementing federal communication and coordination with tribes through early, interagency, high-level, consideration of tribal rights, knowledge, and interests
- the staff, managers and federal leaders involved in the Puget Sound Federal Task Force are involved in the Western Washington Treaty Rights at Risk Initiative
- the benefits of many of the actions listed in this plan extend beyond the boundaries of Puget Sound.

The Western Washington Treaty Rights at Risk Initiative is a synchronizing mechanism, accelerator for rights protection, and refers to the July 2011 report from the treaty tribes of western Washington, Treaty Rights at Risk: Ongoing Habitat Loss, the Decline of Salmon Resource, and Recommendations for Change. This report identifies the ongoing habitat loss and declining salmon resource in the Pacific Northwest and its associated impact to the tribes' treaty-reserved fishing rights.

REGIONAL FEDERAL AND TRIBAL LEADERS MEETING, NOVEMBER 2021

In September 2011, CEQ directed regional leaders for NOAA, EPA, and USDA to co-lead an effort to improve agency coordination and outcomes for salmon and their habitat. Since 2011, regional leaders from NOAA, EPA, USDA, and the Army Corps of Engineers have met regularly and achieved

notable progress on non-point water pollution, marine shoreline and riparian habitat, hatcheries, and vessel traffic.

Key meetings between regional federal leaders of all 13 PSFTF member agencies and Western Washington Tribal leaders in late 2021 and early 2022 updated agencies' understanding of tribal priorities and established federal and tribal working groups to focus efforts on five areas of work: Water Quality, Toxics and Stormwater; Nearshore and Estuary Protection; Riparian Habitat; and Recreational Impacts.

For over a decade, Swinomish and other tribes have provided specific asks of our federal trustees to take action, and yesterday that request was couched in the urgent pleas that we are running out of time. – Swinomish Indian Community February 25, 2022 letter on the draft PSFTF Action Plan

1.3 Regional and National Federal Coordination

A third key purpose of the PSFTF is to strengthen the coordination among federal agencies and provide for closer and more efficient coordination between regional and national federal leadership in the setting and execution of federal priorities.

Current federal Administration priorities include infrastructure, climate, environmental justice, and tribal issues.

- On infrastructure, this PSFTF Action Plan includes a commitment to continue coordinating member agencies toward effective and environmentally beneficial use of funding from the Infrastructure Investment and Jobs Act
- On climate and environmental justice, the PSFTF is part of a whole-of-government effort. Important climate and environmental justice priorities and policies, applicable to all federal agencies, are included in Executive Order 14008 Tackling the Climate Crises at Home and Abroad and Executive Order 13985 Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.
- On tribal issues at a national level, the PSFTF is engaged with and helping to execute new Tribal Treaty Rights and Tribal Homelands initiatives led by the White House Council on Native American Affairs.

The PSFTF will continue to provide for closer and more efficient coordination between regional and national federal leadership consistent with protecting and restoring Puget Sound, one of the most important estuary ecosystems in the United States.

2.0 Priority Federal Actions to Protect and Restore Puget Sound

This PSFTF Action Plan's *Priority Federal Actions to Protect and Restore Puget Sound* (Appendix A) fulfill the PSFTF 2016 MOU requirement for a five-year action plan that leverages federal programs across agencies and serves to coordinate diverse programs on a specific suite of priorities.

The actions in this plan are actions that have been updated from previous Puget Sound Federal Action Plans, were added by teams of federal staff based on their own experience and knowledge, added by federal staff to align with the Action Agenda, and added to respond to tribal knowledge, expertise, and interests.

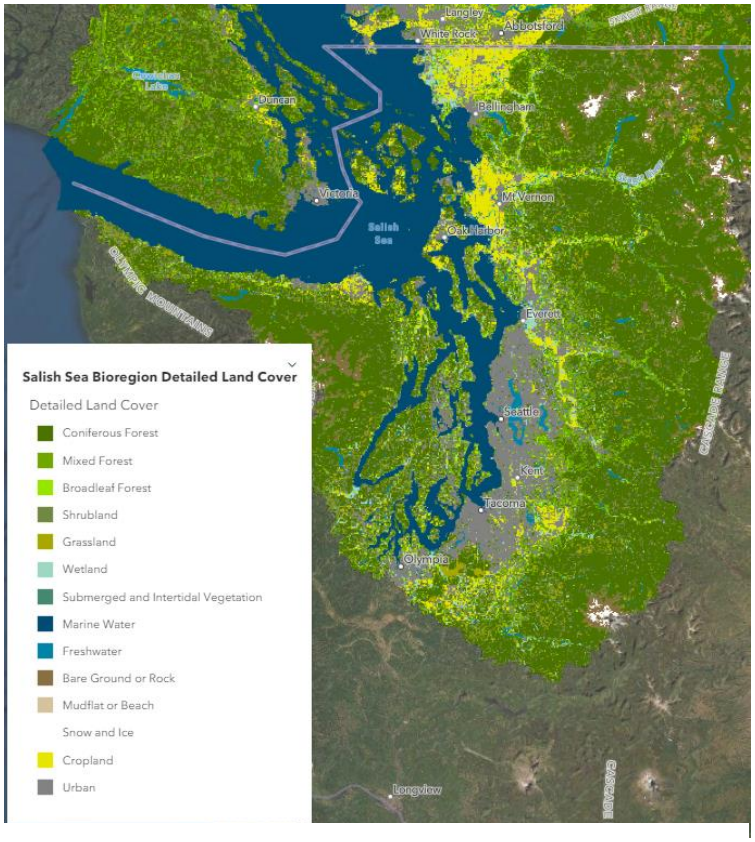
The actions include agency and inter-agency efforts, ongoing programs, and certain projects. A focus of the overall effort is on actions that benefit from interagency and inter-governmental coordination.

2.1 Cross-cutting Actions

Cross-cutting actions are multi-benefit, co-benefit, and/or address multiple priorities, for example, EPA's National Estuary Program.

2.2 Habitat

Protecting and restoring habitat involves identifying, protecting, and restoring the lands, waters, and ecological processes essential to Puget Sound communities and tribal treaty rights.



SALISH SEA ATLAS, AQUILA FLOWER, 2021

The [Northwest Indian Fisheries Commission 2020 State of Our Watersheds] report and the [Puget Sound Partnership 2021 State of the Sound] report indicate that vital signs of ecological health in Puget Sound are generally static or are getting worse. The Species and Food Web indicators have not improved. Chinook Salmon and Southern Resident Orcas are far from their recovery targets and on worsening trajectories. Many indicators related to marine and freshwater quantity and quality are also worsening, and the impacts of climate change will further hasten downward trends. A few indicators are on an improving trajectory: "During the past two years, conversion of forests and ecologically important lands slowed down. Investments in restoration continue to improve degraded habitats in many Puget Sound watersheds. Salmon runs in Hood Canal are improving."

Priority federal actions to protect and restore habitat aim to achieve and accelerate positive trends in habitat recovery and sustain the many beneficial uses of Puget Sound.

2.2.1 Cross-cutting Habitat Actions

While the habitat actions are divided into three habitat types: nearshore and shoreline; floodplains, riparian, and estuary; and fish passage; recovery must also be approached as an integrated system at a watershed scale. Cross-cutting habitat actions reflect the integration of the recovery efforts in these habitat types.

2.2.2 Nearshore and Shoreline

Protect and restore nearshore and shoreline habitat

Nearshore and shoreline habitats are some of the most productive ecosystems on earth because, for example, they provide nursery and feeding grounds for numerous ecologically and economically valuable fish and shellfish species.

From time immemorial to today the shores of Puget Sound have been integral to Native Americans' lives and cultural practices. Nearshore and shoreline areas are also at the heart of early industry and development, the backdrop for major cities, the location of many transportation corridors, and where people make their homes, recreate, and explore nature.

Nearshore and shoreline habitat are particularly vulnerable to land use and development pressures and have not been spared from the pressures of rapid population and economic growth, which is expected to increase in the decades to come.

Priority federal actions to protect and restore nearshore and shoreline habitat include funding for implementation of restoration projects in marine shorelines, monitoring and evaluation of these projects, and policies or programs to protect and improve restoration.

Federal agencies support the PSP Shoreline Armoring Implementation Strategy and its key elements: improve and expand incentives and education for property owners; increase and improve regulatory implementation, effectiveness, and communication; increase and improve coastal processes-based design and technical training; and improve long-term strategic planning.

Photos: WA Ecology Coastal Atlas

2.2.3 Floodplains, Riparian, and Estuaries

Protect and restore floodplains, riparian, and estuarine habitat

Floodplains include riparian habitat, streams, and estuaries. These systems are dynamic and diverse landscapes that provide invaluable ecosystem services including critical habitat for the health, growth, and survival of Pacific salmon and steelhead, flood damage mitigation, improved water quality, vital habitat for myriad flora and fauna, recreational opportunities, economically valuable farmlands, and culturally important lands for western Washington Tribes.

MIDDLE FORK SNOQUALMIE RIVER FLOODPLAIN. PHOTO: KING COUNTY

Riparian areas are adjacent to streams and rivers. Riparian habitat performs many functions including shade for stream temperature regulation, erosion and sedimentation control, stream flow regulation, woody debris input, and food and nutrients for aquatic organisms and fish.

As population growth and the associated development continues to modify floodplains, the ability of floodplain systems to provide ecosystem services becomes increasingly impaired, with potentially adverse consequences to people, property, habitats, and the species that depend on floodplains. This is further exacerbated by changing climate and ocean conditions that threaten salmon, tribal treaty-reserved rights, wildlife habitat, and human well-being.

Priority federal actions to protect and restore floodplains, riparian and estuarine habitat include funding for implementation of restoration projects; developing implementation strategies and coordination efforts; and research, policies, and programs to protect habitat and improve restoration in these systems.

Federal agencies partner with State agencies and other entities to implement the PSP Floodplains and Estuaries Implementation Strategy. The Implementation Strategy identifies three strategies to increase and accelerate floodplain and estuarine habitat restoration: a Sound-wide strategy defining regional integrated management support; a river-basin strategy describing integrated planning and project implementation; and a risks and costs strategy defining the risk tolerance and cost subsidy framework and analyses to advance regional and river-basin strategies. Federal agencies are collaborating with Washington State and tribes on a shared strategy to protect and restore riparian areas as part of a larger salmon recovery strategy.

2.2.4 Fish Passage

Reconnect spawning and rearing habitat for salmon and steelhead.

Correcting salmon, steelhead and other native resident fish migration barriers caused by undersized culverts and other human-made structures are key action items that reconnect spawning and rearing habitat and restore natural stream processes. Federal agencies with land management or facilities management responsibilities have identified numerous fish migration barriers under their respective jurisdictions and are working to correct high priority sites. Multiple federal programs provide technical assistance and help fund fish passage barrier assessments and restoration projects. A portion of those funding programs are utilized as matching funding to state priority and funded fish passage projects.

PHOTO: KING COUNTY

In general, this work undertaken by agencies will have a strong connection to recovery of federally listed Chinook salmon and steelhead trout. In addition, the Action Plan sets a pathway for more effective alignment of Federal fish passage programs to those of the State of Washington.

2.3 Stormwater

Reduce stormwater and wastewater pollution

Washington State's Department of Ecology has recently evaluated toxic pollutant contributions to Puget Sound and determined that "A variety of diffuse (nonpoint) sources appear to account for the majority of contaminant releases in the Puget Sound basin. In addition, surface water runoff during storms was identified as the major delivery pathway for most contaminants."[2]

THE COHO URBAN RUNOFF TOXICITY SYNDROME. TOP PANEL: A WESTWARD VIEW OF TYPICAL TRAFFIC ON SR520, THE SOURCE OF ROADWAY RUNOFF FOR MANY NEP-SUPPORTED TOXICITY AND GREEN INFRASTUCTURE STUDIES. RUNOFF IS COLLECTED FROM DOWNSPOUTS TO THE NOAA NORTHWEST FISHERIES SCIENCE CENTER (AT RIGHT IN PHOTO; CREDIT JULANN SPROMBERG, NOAA). MIDDLE PANEL: AN ADULT COHO RETURNING TO SPAWN IN A SMALL PUGET SOUND STREAM (PHOTO CREDIT: KEN KING, USFWS). FOCUSED STORMWATER SCIENCE HAS SHOWN THAT COHO ARE PARTICULARLY VULNERABLE THE ACUTELY LETHAL EFFECTS OF UNTREATED URBAN RUNOFF. BOTTOM PANEL: EXAMPLE OF COHO PRE-SPAWN MORTALITY IN A REPRESENTATIVE URBAN STREAM (LONGFELLOW CREEK, WEST SEATTLE; CREDIT JANA LABENIA, NOAA). KNOWN RATES OF ANNUAL COHO LOSSES TO THE URBAN MORTALITY SYNDROME ARE BASED PRIMARILY ON FIELD COUNTS OF DEAD, UNSPAWNED FEMALES.

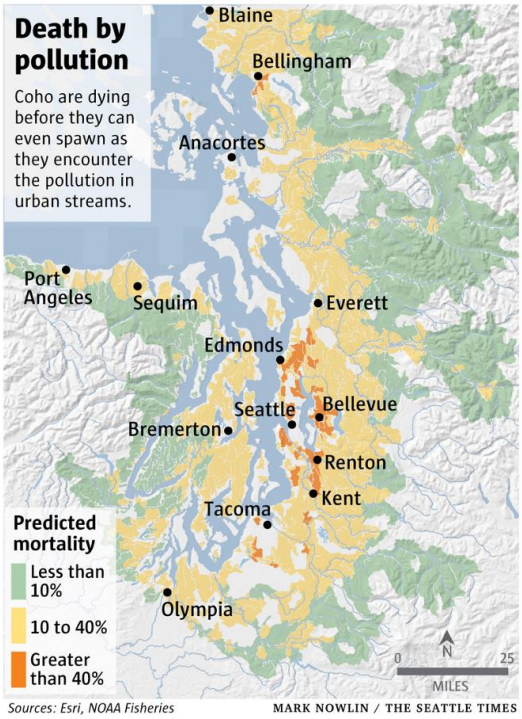
Human population growth and development pressures are accelerating trends toward land conversion. Exurban development replaces forests, rangelands and farmlands with roads, parking lots, buildings and similar hardscapes that do not readily absorb rainfall, but shunt rainwater into surface flows that mobilize and transport contaminants to rivers, lakes, wetlands, and marine waters. The Puget Sound region is expected to add more than 1.6 million people by 2030 and exemplifies many of the challenges that stormwater poses across socioeconomic sectors – e.g., growth management, transportation, natural resource (e.g., salmon, and Southern Resident killer whale) conservation, and environmental justice.

Stormwater problems are generally divided into two distinct but related categories: water quantity and water quality. The problems associated with high runoff volumes and public safety (water quantity) have been well understood for decades and are the basis for much of the "grey" infrastructure currently in place in Puget Sound – e.g., storm drains, detention ponds, underground conveyance systems, and outfalls. Problems related to stormwater quantity are generally in the civil engineering domain and include flooding (property damage, transportation risks) and adverse physical impacts on aquatic habitats via scour, sedimentation, and similar hydrologic processes.

Relative to water quantity, the challenges associated with stormwater quality can be much more complex, particularly in urbanizing watersheds where runoff contains dynamic mixtures

[2] https://apps.ecology.wa.gov/publications/documents/1103055.pdf

(i.e., changing in space and time) of thousands of distinct compounds, the vast majority of which have not been identified or characterized in terms of adverse environmental effects. This represents a growing challenge because major federal clean water statutes have not kept pace with the 80,000+ chemicals currently in production, a number that does not include related transformational processes in the environment (e.g., bacterial metabolism and abiotic photo-modification) that can further change chemical structure and potential toxicity. Thousands of these chemicals originate from motor vehicles (brake pads, exhaust, tire wear, leaking oil and grease, etc.), and thus stormwater runoff from the transportation grid represents a major emerging environmental health threat to salmon and other keystone species in Puget Sound, such as marine forage fish and Southern Resident killer whales.



Unlike temperature, sediments, nutrients, dissolved oxygen, and other conventional water quality parameters, there are at present several emerging pollutants (such as 6PPD-quinone) for which there are no EPA criteria. Similarly, interactions between chemicals in numerically complex mixtures, or interactions between toxics and parallel habitat stressors (pathogens, ocean acidification, surface water warming) are largely unknown.

In the face of this uncertainty, and accelerating growth and development trends in the region, the PSFTF is focused on identifying and implementing strategies to mitigate the adverse ecological impacts of untreated stormwater, particularly in the form of green stormwater infrastructure methods to capture and remove pollutants from runoff using biofiltration and similar methods.

Priority federal actions involving stormwater are generally intended to minimize flooding (water quantity) and ecological decline (water quality). They involve the management of runoff on federal facilities, using a combination of traditional grey and green infrastructure methods. Federal partners are also funding state-level innovations in stormwater management, in close coordination with Washington State agencies, tribes, and other regional stakeholders. Finally, federal scientists are at the forefront of targeted research on stormwater toxicity and the effectiveness of pollution reduction strategies.

2.4 Shellfish

Protect, Restore, and Re-open shellfish beds

Shellfish have been harvested for thousands of years from Puget Sound. The region's tribes rely on shellfish for cultural, subsistence and commercial purposes. Historically, Tribes created intertidal habitats to grow clams and oysters. Commercial scale farming has grown over the past hundred years, and now supports over 3,200 jobs - many in rural communities - and bringing in an estimated $180 million to the region each year. Recreational shellfish harvest also provides economic benefits, as well as a strong sense of place for residents of Washington. Shellfish play a key role in our marine ecosystem. They are at the base of the food web, provide habitat and help filter and clean water.

COCKLE SPAWNING PROJECT AT NOAA'S MANCHESTER FACILITY

But shellfish harvests are threatened by bacterial and chemical pollution that has closed more than 100,000 acres of Puget Sound beaches to human consumption. The health of our local shellfish beds begins on the land. By reducing pollution from contaminated stormwater runoff, fixing failing on-site sewage systems, and mitigating emerging threats to shellfish from microplastics to ocean acidification, we can increase the health of shellfish populations.

Federal agencies are leading and funding work to restore native Olympia oyster populations and to monitor and protect water quality in Puget Sound to help ensure shellfish are safe to harvest. From examining the ecological functions of shellfish aquaculture, writing permits for shellfish aquaculture to take place, conducting native shellfish genetic risk assessments to developing an online story map about pathogenic Vibrio predictive models for shellfish harvesters,[6] Puget Sound's federal agencies are stepping up to the challenge.

2.5 Science and Monitoring

Fund and coordinate cutting edge science and monitoring

Credible and salient scientific information, interpretation, and technical support are needed at the regional, sub-regional, and local levels to support recovery planning and implementation processes, address policy barriers, and inform the best next steps for recovery.

Within the broader community of partners, federal agencies have extensive scientific expertise, capabilities, and assets to support Puget Sound ecosystem recovery, including planning, implementation, and adaptive management activities related to the Puget Sound Federal Action Plan, the Puget Sound Action Agenda, salmon recovery plans, watershed recovery and protection plans, and other related efforts. Federal agencies also have access to extensive national and regional programs, assets, and human capital, collectively representing significant potential fundamental science and monitoring capacity. In this context, the term "science" encompasses the natural and social sciences, engineering disciplines and other relevant scientific and technical disciplines engaged by federal agencies within the Puget Sound Federal Task Force.

The PSFTF recognizes the responsibilities of federal agencies to coordinate scientific activities and priorities across federal agencies and with non-federal partners, including the National Estuary Program Management Conference participants, the Puget Sound Action Agenda Strategic Initiative Leads, State and Tribal partners, the Puget Sound Ecosystem Monitoring Program (PSEMP), and others. While there are significant efforts to coordinate science and monitoring activities through the Puget Sound Partnership Science Panel, the Puget Sound Ecosystem Monitoring Program, and other forums, federal agencies have tended to engage as individual agencies in support of their respective missions, often at the individual program or project level.

More strategic federal engagement that encompasses inter-agency coordination across national programs, human capital, and science assets is expected to better support the implementation of the PSFTF Action Plan and the needs of our non-federal Puget Sound recovery partners. In particular, the PSFTF recognizes that improved inter-agency federal coordination of science and monitoring activities and programs is essential to 1) meet broad federal responsibilities and goals supporting Puget Sound ecosystem recovery and Tribal Treaty rights and 2) meet federal responsibilities and goals to coordinate science and monitoring effectively with state, Tribal, and local partners.

Appendix A of this Action Plan tabulates high-priority on-going and planned federal science and monitoring activities to support Puget Sound recovery, including activities to support planning and implementation of the Action Agenda, the PSFTF Action Plan, salmon recovery plans, and other

important recovery efforts. Appendix A also details collaborative efforts to improve science coordination within the PSFTF and between Federal agencies and the non-federal Puget Sound recovery science and monitoring community.

3.0 Puget Sound Federal Task Force Governance and Action Plan Implementation

The Governance structure for the Puget Sound Federal Task Force and process for Action Plan development and reporting is established in the 2016 Puget Sound Federal Task Force Memorandum of Understanding.

Evaluation and Progress Reporting

The PSFTF MOU requires a "progress report" and evaluation aimed at modifying the Action Plan to adapt to new circumstances and events. The PSFTF will continue to meet this requirement and will continue to build on past work to improve the value of such efforts. The most recent Progress Report discloses performance monitoring findings for 2017-2021. An overarching goal is to use a rolling-five-year Action Plan-Progress Report process to set and execute the specific federal programmatic, regulatory, incentive based and other actions that will truly drive recovery of Puget Sound.

The PSFTF MOU states that the Task Force will, "Outline implementation costs and ensure they are achievable within available resources". The PSFTF will continue to collect information on federal resources.

Appendix A: Priority Federal Actions to Protect and Restore Puget Sound 2022-2026

ID	Action Title	Plan 2022-2026
Section Action #/ID Lead Agencies Other Agencies		**Outcomes** (why?): Change in environmental condition, behavior, or knowledge. **Outputs** (what?): Federal products and/or service. **Resources:** Federal human, financial, organizational resources, and (non-federal resources).
Crosscutting 2.1.1 EPA	Puget Sound National Estuary Program	**Outcomes:** Improved implementation of the Puget Sound Action Agenda **Outputs:** • Fund Strategic Initiative Leads, Tribal Lead Organization, Tribal capacity, the Puget Sound Partnership, and Local Integrating Organizations • Support backbone coordination for Puget Sound Recovery • Approve the Puget Sound Action Agenda • Utilize increased EPA funding from the IIJA to support leveraging federal and state programs to accelerate riparian habitat, climate resilience, environmental and tribal justice, and science. **Resources:** ~$52M or more per year EPA Puget Sound Geographic Funds, depending on appropriations
Crosscutting 2.1.2 NOAA	Recovery Planning for Threatened & Endangered Species	**Outcomes:** Improved pace and effectiveness of recovery planning for ESA-listed species in Puget Sound **Outputs:** • Evaluate the status and trends of imperiled species listed under the ESA that occupy Puget Sound • Update regional and watershed recovery plans meet federal standards and objectives **Resources:** NOAA staff from the West Coast Regional Office, with science support from the Northwest Fisheries Science Center
Crosscutting 2.1.3	Endangered Species Act Regulation	**Outcomes:** Monitor and improve compliance with Endangered Species Act **Outputs:**

NOAA – WCR		• Continue to ensure that federal actions including regulation of work in 'waters and wetlands of the United States' are consistent with Endangered Species Act **Resources:** NOAA staff time
Crosscutting 2.1.4 EPA, NOAA, USFWS, FEMA, USACE, USCG, USFS, NRCS, FHWA, FTA	Federal Coordination - Infrastructure Investment and Jobs Act and other funding	**Outcomes:** Effective and environmentally beneficial use of Infrastructure Law and other funds **Outputs:** • Prioritize, leverage, and coordinate new funding in the Infrastructure Investment and Jobs Act • Direct inter-agency communication and coordination through meetings and associated supporting materials. • Capability to provide timely and accurate information to partners, such as the state and tribes and interested entities. • Communicate preference toward natural infrastructure and multi-benefit approaches in the Puget Sound Region toward more unified understanding across communities, project planners, and State agency staff implementing delegated programs. (Follow example such as FEMA Guidebook on nature-based hazard mitigation grants). • Develop/distribute/fund communication tools that reinforce what federal agencies are being asked to do by the Administration re: climate change, environmental justice, tribal treaty rights, tribal consultation. • Collaborate and coordinate funding among agencies and the appropriate State agencies on the new Federal Climate Adaptation Plans and connect these plans to Puget Sound recovery actions. • Collaborate on funding PSP, Tribes, LIOs, Comprehensive Planning for Regional Transportation Plans and Regional Economic Strategies, and others to help ensure Puget Sound recovery goals are integrated into federal infrastructure investments even if they are via “grey infrastructure” project development pathways. • Leverage existing federal expertise in reporting/piloting how artificial intelligence, crowdsourcing, smart sensors, and other technologies could contribute toward accelerating Puget Sound recovery, water, and climate solutions. (Follow example of Ecology’s Grid Modernization and Smart Grid programs). **Resources:** Federal staff time
Crosscutting 2.1.5 NOAA	Ecosystem Service Quantification	**Outcomes:** Expand use of ecosystem services quantification toward practical application in a variety of environments. Increased regulatory efficiency related to ESA and effectiveness of development actions **Outputs:** • Develop methods to quantify impacts to threatened and endangered species to increase efficiency and effectiveness of development regulation, so actions with impacts to ecosystems can efficiently compensate for

(EPA)		those impacts by supporting recovery efforts. Current efforts are focused on quantification of shoreline development effects, with efforts underway to expand tools for assessment of actions in estuaries and river deltas. • Consider ecosystem service quantification products available in EPA ORD's Strategic Research Area Plans. **Resources:** • Multiple workgroups from WCR/RC/NWFSC provide fractions of FTEs to develop and implement these efforts. There are unmet needs to improve models, increase training in their use, increase science support, coordinate with other regulatory authorities, and expand assessment tools to floodplains and stormwater impacts
Crosscutting 2.1.6 EPA, USACE, FEMA, NOAA,	Coordinated Technical Assistance and Resources for Most Vulnerable Populations and Community-Based Organizations	**Outcomes:** • Improved water, hazard mitigation and climate resilience planning • Increased support toward Action Agenda Strategy "Protect human health, considering disproportionate impacts on sensitive populations, through programs that educate communities and limit harmful exposures from air and water contaminants" **Outputs:** • EPA: Competitive funding for cross-agency integrated planning/engineering consultant contract that would offer focused resilience planning resources and early technical support needed to be competitive for future project funding (e.g., project feasibility and options analysis) • Use NEP granting or other federal funding to offer technical assistance for water, hazard mitigation and climate resilience related planning efforts for communities at high risk for climate impacts, but without a strong local tax base or planning staff. • Coordinate across federal programs to prioritize technical assistance support for climate-vulnerable communities. (e.g., coastal/riverside towns experiencing storm surge and flood events, communities after wildfire events) **Resources:** EPA NEP funding, EPA, USACE, FEMA, and NOAA Staff time
Crosscutting 2.1.7 BIA	Tribal Fish, Wildlife, and Recreation Program	**Outcomes:** Continued/increased support for tribes' meaningful exercise of their treaty fishing, hunting, and gathering rights through the Fish, Wildlife, and Recreation Program under the Rights Protection Implementation Plan **Outputs:** Maintain or improve performance of the following programs under the Fish, Wildlife, and Recreation Branch within the Puget Sound Basin

		• Wildlife and Parks Program • Fish Hatchery Operations & Maintenance Programs • Endangered Species Program • Tribal Management/Development Program • Rights Protection Program • FERC/Hydroelectric Licensing/Re-Licensing Program **Resources** • Wildlife and Parks Program $230,221 • Fish Hatchery Operations & Maintenance Programs $6,559,318 • Endangered Species Program $1,405,980 • Tribal Management/Development Program $3,160,263 • Rights Protection Program $28,296,335.
Crosscutting 2.1.8 FTA, FHWA (NOAA, USFWS)	Planning, Review, and Funding to Reduce Transportation Impacts on the Environment	**Outcomes:** • Reduced transportation impacts on the environment through the improvement of public transportation. • Supports Action Agenda by leading to smart development and protect intact habitats and processes by channeling population growth into transit-oriented urban centers with easy access to natural spaces **Outputs** • *State/ Metropolitan Planning.* In coordination with FHWA, work with WSDOT and Metropolitan Planning Organizations (MPOs) in the Puget Sound region to develop short and long-range transportation plans that encourage higher density, transit-supportive development through the implementation of increased multimodal transportation options, including public transit, walking, and biking. • *Environmental Review.* Continue and improve environmental review of capital projects so that the design and performance of public transportation infrastructure reflects the best available information. Partner with FHWA and improve consultation with NOAA and USFWS regarding best practices to prevent or limit environmental impacts and mitigation for any impacts that do occur. • *Project Funding.* Provide regular, ongoing federal investments in public transportation to support and encourage low-impact land use development patterns that reduce overall environmental impacts. Continue and expand weighting criteria in discretionary funding opportunities that promote projects supporting low-impact, environmentally sustainable land use patterns. **Resources:** FTA and FHWA staff time and funding

Crosscutting 2.1.9 EPA (Environment and Climate Change Canada)	Implement the Canada – U.S. Cooperation in the Salish Sea 2021-2024 Action Plan	**Outcomes:** Improved awareness at the federal level of respective federal initiatives and activities relating to Salish Sea protection **Outputs** • Senior Staff for the PSFTF and U.S. Chair of the SoC Working Group will meet regularly to implement U.S. federal commitments under the SoC Action Plan • The PSFTF will track, maintain awareness, and focus implementation assistance - as requested by the SoC working group - on commitments made under Salish Sea Action Plan PAI6 – federal-federal information exchange. • Tracking commitments under PAI6 is primarily done through SoC Progress Reports. **Resources:** • EPA staff time to share in the administration of the SoC Working Group • EPA funding for Salish Sea Ecosystem Conference
Crosscutting 2.1.10 USCG, EPA	Implement the Puget Sound Area Contingency Plan	**Outcome:** Improved protection of public health, safety, and the environment **Outputs** • Ensure coordinated, efficient, and effective support of the federal, state, tribal, local, and international responses to significant oil and hazardous substance incidents within the USCG Thirteenth District Area of Responsibility that is Endangered Species Act (ESA) Section 7 compliant with respects to critical habitat or endangered species. • The U.S. Coast Guard will maintain a robust Area Contingency Plan to better prepared and respond to oil and hazardous substance incidents. The Puget Sound Area Contingency Plan provides for orderly and effective implementation of response actions to protect the people, natural resources in the Pacific Northwest. It promotes the coordination of and describe the strategy for a unified and coordinated federal, state, tribal, local, responsible party, response contractor, response cooperative, and community response to a discharge or substantial threat of discharge of oil or a release or substantial threat of a release of a hazardous substance into the marine environment. • Regional planning, guidance, and coordination of preparedness and response actions are outlined in the Northwest Area Contingency Plan managed by the Regional Response Team (RRT). The standing RRT is co-chaired by EPA and USCG District 13 with participation of 16 federal agencies, three States and numerous Indian Tribes. The role of the standing RRT includes evaluation of communication systems and procedures, planning, coordination, training, evaluation, preparedness, and related matters on a region-wide basis. The RRT also evaluates the use of dispersants, in-situ burning, and surface washing agents.

		Resources: Staff time
Crosscutting 2.1.11 USCG (Canadian Coast Guard, EPA, NOAA, Department of Interior)	Coordinate International Cooperation for Preparedness and Response Activities	**Outcomes:** Improved habitat and species protection through improved transboundary oil spill response **Outputs** • Work to ensure the response to marine pollution or threat of marine pollution is consistent with the Canadian Coast Guard Marine Spills Contingency Plan - Pacific Region and the Northwest Area Contingency Plan (USCG • Plan and sponsor CANUSPAC Joint Response Team Exercise to be held in 2022 • Contingency Planning, Transboundary Oil Spill Exercises, International/Interagency collaboration/coordination • In the spirit of preparedness and ability to respond to oil spills that may impact, or initiate from Canada, the U.S. Coast Guard will plan and prepare for transboundary oil spills with Canada. The U.S. Coast Guard will identify specific processes whereby both the USCG and Canadian Coast Guard communicate, consult, and coordinate in response to discharge or threat of discharge of pollution into the contiguous waters of interest of both Canada and the United States. • The Canada - US Joint Marine Pollution Contingency Plan (JCP), and a Geographic Annex for the Pacific Coast, also known as CANUSPAC, will present the basic information necessary to execute an efficient and effective response operation in the contiguous waters to which the CANUSPAC applies to include Straits of Juan de Fuca, Haro, and Georgia Straits as well as Boundary Passage. The CANUSPAC Joint Response Team (JRT) members facilitate the movement of response personnel and equipment across the borders and can activate other federal agencies as needed. • Maintain Indigenous Community Engagement (Tribes & First Nation) as a key objective of the CANUSPAC Joint Response Team (Canadian CG & USCG), bi-annual exercises, meetings in/around Tribal/First Nation land, inclusion and/or consultation during emergency/incident management. • Provide consultation on a case-by-case basis related to vessel traffic and emergency/incident management impacts on usual & accustomed treaty areas. **Resources:** -
Crosscutting 2.1.12 USCG	Vessel Traffic Management System	**Outcomes** • Improved prevention of collisions, groundings, maritime casualties and ensuing environmental damage • Increased visibility of vessels within the Vessel Traffic System allowing for greater awareness of operators in congested waterways.

(Canadian Coast Guard)		• Vessels that use Automatic Information System (AIS) will have better information for collision avoidance decreasing the number of incidents and gain greater visibility of the locations of vessels that are carrying Certain Dangerous Cargoes. • The addition of fishing vessels that carry AIS will help us identify potential conflicts for vessels operating in the same area **Outputs** • Continue to monitor Canadian Coast Guard Vessel Traffic System Marine Mammal Desk initiative intended to protect Resident Killer Whales off Vancouver Island near shipping lanes • The purpose of Vessel Traffic Service Puget Sound is to function as an integral part of the Coast Guard waterways management efforts by facilitating the safe and efficient transit of vessel traffic to assist in the prevention of collisions, groundings, maritime casualties and ensuing environmental damage. • Carefully trained military and civilian watch standers monitor and communicate with vessels in the Strait of Juan de Fuca, San Juan Islands, and Puget Sound. • The Coast Guard will monitor the doubling the number of vessels required to use AIS carriage onboard vessels that have previously not been required to broadcast AIS. This includes smaller passenger, towing, and fishing vessels as well as dredging operations inside or near shipping lanes. **Resources:** USCG personnel time
Crosscutting 2.1.13 USCG	Towing vessel inspection regulations	**Outcomes** • Reduced pollution from towing vessels through greater oversight of vessel design and machinery. • Greater oversight enabled by increased awareness of operations and condition of the towing vessel fleet. **Outputs** • Continue to implement inspection standards and regulations for towing vessels, including requirements for a Safety Management System. • Continue focus on Pilothouse Resource Management, including enhancing manning and increased mariner credentialing. • Evaluate compliance levels in USCG Thirteenth District area of responsibility **Resources:** No additional resources needed at this time

Crosscutting 2.1.14 USFS, EPA (USGS, NRCS, NOAA, others)	Integrate the Green-Duwamish Urban Waters Federal Partnership with Puget Sound Recovery	**Outcomes**: • Increased integration between GDUWFP, other watershed scale programming (e.g., WRIAs), the National Estuary Program, the Puget Sound Partnership, and other Puget Sound recovery efforts • Application of GDUWFP proven engagement and restoration programs across Puget Sound **Outputs** • Involvement of 10-12 new organizations and communities in Federal Puget Sound recovery efforts. • 6-10 new Federally funded upland efforts align practices to support Puget Sound recovery. • 3-5 proven programs transferred from the Urban Waters Federal Partnership locations and applied to locations across Puget Sound. **Resources:** • $90,000 annually secured staff time, and some project funding. Additional project funding needed. Subject to appropriations • (1:1 match identified from local partner sources)
Habitat Crosscutting 2.2.1 NOAA – WCR/RC, EPA, USACE, FEMA, USFWS	Habitat Restoration Regulation Efficiency	**Outcomes:** Expedited, facilitated federal permitting for priority habitat restoration projects in the Puget Sound Basin **Outputs:** • Continue work with the federal-state Multi-agency Regulatory Review Team (MART) permitting program on beneficial nearshore projects • Expand the existing joint federal-state multiagency permitting process and program for expediting permits for salmon recovery projects that qualify under the State's Habitat Recovery Pilot Program (HRPP) (2021 Act) regarding streamlined permitting for habitat recovery projects (HB 1382). Federal permitting agencies partner with State agencies involved in the HRPP to expedite federal permits for projects going through the HRPP. • Federal agencies work with state regulatory partners and local implementation partners to ensure that Puget Sound recovery and resilience projects happen quickly and without unintended adverse consequences. • Implement continuous improvement of the MART permitting process • Assess and implement using the MART to permit multi-benefit projects, such as those funded by Floodplains by Design • Develop a joint federal-state strategy to ensure that salmon recovery projects are permitted in compliance with FEMA and State Flood Management regulations: RCW 86.16, 44 CFR and Executive Orders 11988, 13690, and 14030. Use MART process to troubleshoot permitting issues and implement solutions to compliance of floodplain management regulations for restoration projects.

		• Support expected significant increases in federal funding for salmon recovery projects through expediting permits for these projects. **Resources:** • Dedicated 0.25 to 1 FTE from each federal agency: EPA, NOAA, USACE, and FEMA specifically for permitting restoration projects • (6-8 dedicated State funded regulatory staff dedicated to this new program)
Habitat Crosscutting 2.2.2 NOAA	Pacific Coastal Salmon Recovery Fund	**Outcomes:** Restore critical salmon habitat to perpetuate survival of the imperiled species. Improved fish passage and understanding of salmon populations. **Outputs:** • Habitat restoration projects, population assessments and monitoring, and fish passage projects including culvert upgrades per state and NMFS criteria**.** • Project management, funding, assessment, and monitoring • Fund salmon recovery efforts through local, state, and regional organizations and the Salmon Recovery Funding Board **Resources:** Annual Pacific Coastal Salmon Recovery Fund award to Washington State and Western Washington Tribes
Habitat Crosscutting 2.2.3 EPA	Habitat Strategic Initiative Implementation Lead	**Outcomes:** Improved identification, protection, and restoration of the lands, waters, and ecological processes essential to Puget Sound communities, tribal treaty rights, and resources **Outputs:** • Improve habitat protection regulations • Remove barriers to habitat protection and restoration efforts • Manage land development to prevent further degradation of local aquatic ecosystems and contributing habitat loss. • Support development and funding of integrated actions identified in respective Vital Sign Implementation Strategies **Resources:** • EPA funding (state funding both leveraged and match)

Habitat Crosscutting 2.2.4 NRCS	Environmental Quality Incentive Program (EQIP)	**Outcomes:** Improved soil, water, plant, animal, air and related natural resources on agricultural land and non-industrial private forestland. **Outputs:** • Continue or increase provision of financial and technical assistance to landowners or operators in agricultural or forest production to plan and implement conservation practices • Maintain or increase the funding levels for the next 5 years to improve fish habitat and riparian restoration. • Continue to have salmon habitat restoration initiative funding. • Continue funding for removal of fish passage barriers. • Prepare and distribute annual reports at the end of each fiscal year showing levels of funding and accomplishments. • USDA climate farming will promote climate resilient landscapes and rural economic systems to respond to climate changes • USDA will coordinate to ensure resources are available for diverse urban communities and healthy food access for residents. **Resources:** Funding will vary by year. Activities can be annually forecasted but due to the voluntary nature of our programs we cannot predict the exact level of participation in any given year.
Habitat Crosscutting 2.2.5 USFWS	Washington Coastal Program (aka. Puget Sound Coastal Program)	**Outcomes:** Increased protection and restoration of coastal habitats, including preventing invasive species, restoring nearshore, protecting wetlands and upland habitats, improving fish passage **Outputs:** • Fund 4 to 5 projects per year (2 to 3 are within Puget Sound or Hood Canal) aimed to restore or preserve aquatic habitats for Federal trust and at-risk species, including salmonids. • Partner to achieve voluntary habitat restoration on any land ownership, generally on coastal tidally influenced habitats. For example, with FY2017 to FY2021 funds, USFWS supported: the protection of 0.4 riparian miles; restoration of approximately 4 riparian miles; protection of 108 wetland acres; restoration of 328 wetland acres; protection of 10 upland acres; and restoration of approximately 100 upland acres. USFWS supported the removal of barriers to aquatic species by funding a portion of the deconstruction of the Nooksack Dam, which opened miles of spawning and rearing habitat for bull trout and Chinook salmon, thereby accomplishing an important Recovery Plan goal. • Provide technical assistance and funding for coastal riparian, wetland, and upland restoration/protection projects as well as aquatic organism barrier removal projects.

		Resources: • Approximately $200,000 to $250,000 per year. USFWS usually funds 4 to 5 projects per year, and most funding decisions are made in January and February. • Additionally, funds are annually allocated as pass-through funding to Long Live the Kings and the Hood Canal Salmon Enhancement Group. In FY2021, for example, the USFWS passed through approximately $137,000 to Long Live the Kings and the Hood Canal Salmon Enhancement Group.
Habitat Crosscutting 2.2.6 U.S. Navy	Readiness and Environmental Protection Integration (REPI) Program	**Outcomes:** • Tens of thousands of acres for preservation of watershed and estuarine processes protected. In some cases, working farms and forestlands preserved, while also protecting wetland functions, aquifer recharge areas, and natural drainage courses. • Maintain land use compatibility with Navy mission. **Outputs:** Continue U.S. Navy Region Northwest formal multiyear partnerships with the Trust for Public Land, Jefferson Land Trust, the Washington Department of Natural Resources and the Great Peninsula Conservancy in Hood Canal and Jefferson County, and the Whidbey Camano Land Trust in Island County, to conserve lands and protect waterways adjacent to Puget Sound. The U.S. Navy's partnerships support working forests and helps further and develop local agribusiness, while protecting the watershed and the U.S. Navy mission, the local economy and is consistent with the visions of the local comprehensive land use plans and other programs that increase habitat recovery. **Resources** • As of 2022, approximately $40M in Navy and DOD funds. (With an equal or greater cost share from partners, collectively approximately $80M in the areas of Hood Canal, the Olympic Peninsula and Whidbey Island) • The Navy has approximately seven staff engaged in supporting this effort part time. (Partners with four land trusts and one state agency also staff the transactions taking place and contribute funds. Of note, all property owners must be willing to sell interests in their lands in support of these efforts.) • The Navy has requested approximately $14M to continue transactions in FY22. (Partners are applying for grants and funding in approximately the same amount).
Habitat Crosscutting 2.2.7	Readiness and Environmental Protection Integration (REPI) Program	**Outcomes** • First and only mitigation bank serving Kitsap and portions of Mason County. • Reduced uncertainty of compensatory mitigation success for Navy modernization of the PSNS by facilitating the permitting process for in-water and near-shore work. • Increased financial resources, planning, and scientific expertise, not as available to many permittee-responsible compensatory mitigation proposals.

U.S. Navy	Mitigation Bank Partners	**Outputs** • Implement Navy-Waterman Mitigation Partners Sikes Act cooperative agreement. • Waterman Mitigation Partners will own, develop, and operate a regional mitigation bank in Kitsap and Mason counties with credits available for any applicant within the service area • The Navy will have a reserved amount of credits available to purchase from the mitigation bank. • Pre-compliance mitigation bank that will create mitigation solutions to enable on time construction work for Puget Sound Naval Shipyard (PSNS) modernization and other work at NBK, with technical and legal concurrence from regulatory agencies. • The bank will be available to non-federal applicants. **Resources** • $5M in Navy / DOD REPI funding and staffing support through project realization. (Partner funding (4:1) up to $21M, and primary staffing) • State, federal, and local regulators, as well as tribal entities, will be engaged in the development of the bank to ensure that it meets requirements • U.S. Army Corps of Engineers serves as federal lead for the mitigation bank approval process and will engage other agencies and tribes as appropriate through the Inter-agency Review Team.
Habitat Crosscutting 2.2.8 USFS, NPS, FHWA (USFWS)	Utilize flexibility within the Emergency Relief for Federally owned Roads (ERFO)	**Outcomes:** Reduce stream impacts and fish passage concerns, while preventing future road crossing failures **Outputs:** • Utilize flexibility within the ERFO program to balance aquatic ecosystem and water quality needs with meeting current road standards when repairing or replacing flood damaged roads or related structures on federal and tribal owned roads and on publicly owned roads on the National Tribal Transportation Inventory. • Emergency Relief funds cover construction of replacement structures on roads that meet current standards as an accepted practice when replacing flood damaged structures with Emergency Relief funds, as opposed to only funding replacement to a level that meets out of date standards. • Provide similar flexibility when replacing flood damaged structures on National Forest System and National Park roads with ERFO funds which would improve structure performance, reduce stream impacts and potential fish passage concerns, and reduce the potential for the same site to repeatedly fail. • Additionally, Federal land management agencies and tribes can supplement ERFO funds to change the scope of the ERFO eligible repairs • Identify road crossing and road failures eligible for funding. Project design to meet aquatic organism passage. Project funding.

		Resources: • Emergency Relief funds • Additional resources necessary to fund modifications to improve structure performance will be dependent on the number and magnitude of storm damage sites and annual congressional appropriations • Federal land management agencies and tribes can supplement ERFO funds to change the scope of the ERFO eligible repairs.
Habitat Nearshore and Shoreline 2.2.2.1 USACE	USACE Puget Sound Restoration Tiered Implementation Strategy	**Outcomes:** Completion of nearly 6,000 acres of nearshore restoration **Outputs:** • Implementation of 12 projects under other Corps' authorities (Puget Sound and Adjacent Waters (§544), Continuing Authorities Program (§206), and General Investigations). These projects were selected from the 2016 PSNERP Study of 500 sites and 2,500 miles of Puget Sound shoreline. Can be implemented without new Congressional Construction Authorization. **Resources:** • 50-65% Federal share for each $3-$15M project depending on the project phase (state or entities shares funding). Annual resource needs will vary
Habitat Nearshore and Shoreline 2.2.2.2 NOAA	Coastal Ecosystem Resiliency Funding Community Based Restoration (NOAA Restoration Center)	**Outcomes:** Increased functional lift for ecosystem and community **Outputs:** • Fund community restoration projects. Fish access and habitat improvement in deltas, estuaries, and floodplains via dike and levee breaching (e.g., Kilisut Harbor Channel restoration (~$550k in FY17), and delta dike breaching in the Stillaguamish River (~$1M in FY16). • Support salmon and steelhead barrier correction projects through Coastal Ecosystem Resiliency funding, Community Based Restoration Program **Resources:** NOAA funding
Habitat Nearshore and Shoreline	Foster the Development of a Marine Conservation Marketplace	**Outcomes:** Continued development and support of conservation marketplaces, including in-lieu fee and conservation banks **Outputs:**

2.2.2.3 NOAA, EPA		• Continue to develop conservation credit and debit system (i.e., nearshore Conservation Calculator) based on nearshore habitat projects and impacts to salmonids • Foster growth opportunities for the development of conservation banks • Coordination of program with Tribes, regional conservation partners, agencies, and NGOs **Resources:** TBD
Habitat Nearshore and Shoreline 2.2.2.5 USACE, NOAA, USFWS	Complete the Salish Sea Nearshore Programmatic ESA Consultation	**Outcomes:** Nearshore/shoreline restoration that improves net ecological gain or at least provides no net loss for both direct and temporal loss of ecological functions due to repairs and replacement of existing structures and building of new structures. This is a critical step toward preventing cumulative effects from occurring over time and supports species recovery in the nearshore and estuary environment. **Outputs:** • USACE, NOAA, USFWS work together to complete a Nearshore Programmatic tool that covers repairs and replacement of existing structures and possibly building of new structures in Summer 2022 • USACE and NOAA implement the Nearshore Programmatic in 2022 • NOAA: Nearshore Programmatic is complemented by development and implementation of appropriate mitigation/offsets **Resources:** • USACE staff • NOAA staff • USFWS staff • (Tribal staff)
Habitat Floodplains, Riparian and Estuaries 2.2.3.1	Federal Coordination on Integrated Floodplain Management	**Outcomes:** • Improved coordination of the federal contribution to inter- and intra- agency floodplain management • Increased scale and efficacy of floodplain restoration for the benefit of fish, farms, and flood hazard reduction. • Increased development of integrated floodplain efforts. For example, in the Nooksack, and Stillaguamish and Snohomish watersheds. • Increased success of watershed scale planning efforts and faster implementation of better projects. Accelerate funding and implementation of reach-scale plans. • Collaborative watershed planning and implementation, increased funding leverage through coordinated investments, maintained and improved agricultural viability, improved ecological function and habitat quality, and restored floodplains through integrated, watershed-wide strategies, funding, and project implementation.

NOAA, USFWS, NRCS, FEMA, USACE, EPA		**Outputs:** • FEMA: Create and coordinate an Integrated Interagency Floodplain Management Working Group to address impediments to above outcomes and develop collaborative strategies to support them. • USACE: Support integrated floodplain management and agency coordination in the working group. • NOAA: Support development of integrated floodplain management and agency coordination as a state-wide standard to support fisheries, farms, and reduce flood hazard under climate change. • NRCS: Support, encourage, and engage in integrated corridor project planning and implementation that increases floodplain connectivity, improves agriculture viability, improves instream and riparian habitat, and increases the flood resilience of communities. • USFWS: Secure, restore, and manage adequate year-round aquatic habitat for Federal and at-risk species in associated floodplain habitats. When and where possible, support, encourage, and engage in statewide and/or regionwide floodplain restoration partnerships and efforts. Action from USFWS 2021 Strategic Plan. • Increase integration of Floodplains by Design (FbD) efforts with federal task force • Increase integration with Habitat SIL efforts, coordination of regulatory improvement efforts between MART, FbD and Salmon Recovery groups. • Coordination between FEMA, USACE, and NOAA to de-silo floodplain efforts. • Prioritize integrated, multi-benefit projects when considering projects. • Consider and discuss mechanisms and opportunities for restoring natural processes when planning and implementing emergency repairs of floodplain infrastructure such as levies. **Resources:** • Support from two NOAA staff – TBD • Funding from USFWS is TBD • Support from 1.5 FEMA staff. • Support from two NRCS staff
Habitat Floodplains, Riparian and Estuaries 2.2.3.2	Integration of ESA Compliance into Local NFIP Floodplain Management	**Outcomes:** • Improved local administration and enforcement of development standards designed to meet the requirements of the 2008 NFIP Puget Sound BiOp (2006-00472) • Improved floodplain and riparian ecosystem functions • Increased federal engagement in and contribution to regional floodplain strategy • Increased federal collaboration with and support of local entities and tribes **Outputs:**

FEMA, NOAA		• Update and improve guidance documents on community compliance requirements. • FEMA staff and partners (NOAA, WA Dept. of Ecology) provide NFIP-participating communities in the Puget Sound basin (122 total identified as of August 2021) with training and guidance, as well as implementation and enforcement strategies, to administer floodplain management performance standards designed to avoid jeopardy for threatened and endangered species and adverse modification of their habitat. • Leverage leadership support for improved data collection, RIT support to build interagency awareness. **Resources:** • FEMA: 1 FTE • NOAA approx. 0.1 FTE; potential future increase subject to appropriations
Habitat Floodplains, Riparian and Estuaries 2.2.3.3 NRCS, USFWS, FEMA, USFS, NOAA, EPA, USACE	Federal Coordination - Riparian Habitat	**Outcomes:** Improved protection and restoration of riparian habitat **Outputs:** • Contribute to the development of a coordinated state and federal shared riparian habitat restoration strategy that will support salmon recovery and resilience to climate change. • Contribute to the development of a shared approach to incentivize and work with landowners to protect and restore riparian habitat • Coordinate and leverage funding from EPA and NRCS (and other federal and state agencies) to increase landowner participation in riparian conservation programs • Consider and address recommendations from the State-Tribal Riparian Protection and Restoration Workgroup and local salmon recovery lead entities • Identify specific policy, science or program needs that, if addressed, would catalyze additional riparian protection or restoration efforts across urban, agriculture and forested rural and wildland zones • Identify specific local watersheds where coordinated investment in riparian protection/restoration would most benefit specific resource recovery objectives (Chinook, shellfish, etc.) **Resources:** • Federal agency staff time. Approx. 0.1 – 0.2 FTE / agency. FEMA: 0.25 • Base appropriations + Infrastructure Law funding • (State engagement from Commerce, ECY, DNR, PSP, RCO/GSRO, WDFW, WSCC, WSDA)
Habitat	Protection and Restoration of	**Outcomes:** Permanent protection of riparian areas concentrated within prioritized agricultural stream reaches across Puget Sound. Improved water quality for beneficial uses, such as Chinook salmon.

Floodplains, Riparian and Estuaries 2.2.3.4 EPA, NRCS	Riparian Areas in Priority Reaches	**Outputs:** • Continue or improve protection of riparian areas using a reach scale restoration planning approach to salmon recovery and sustainable farm management in priority agricultural landscapes • Continue to develop and improve modeling to support prioritization of reaches, buffer segments and parcels • Develop a competitive solicitation for a contractor who would identify focus areas for conducting reach scale riparian planning and conservation implementation • Continue or increase permanent protection of riparian and associated wetland areas through a variety of regulatory and incentive mechanisms • Explicitly connect the tasks above to 1) the State-Tribal Riparian Work Group process; and 2) local salmon recovery lead entities **Resources:** • EPA Puget Sound Geographic Funds, coordinated and leveraged with NRCS and other federal funds
Habitat Floodplains, Riparian and Estuaries 2.2.3.5 USACE	Puget Sound Nearshore Ecosystem Restoration Project	**Outcomes:** Restores 2,100 acres of estuarine critical habitat to support salmon, Orca whales, and other species at three authorized locations. **Outputs:** • Continue to implement 38-acre Duckabush Estuary restoration project to reconnect the Duckabush River to its floodplain and intertidal wetlands by removing and bridging existing causeway and bridges and elevating Highway 101 onto a single spanning bridge. The project will restore tidal inundation and hydrology and reconnect distributary channels to promote greater delta wetland habitat diversity. This project was selected from the 2001 PSNERP Study of 500 sites and 2,500 miles of Puget Sound shoreline. • Continue to work towards implementing Nooksack River Delta, and North Fork Skagit River Delta projects that have been authorized to be funded and constructed under this program. These projects were selected from the 2001 PSNERP Study. **Resources:** • Total authorized cost for PSNERP is $452M. • At the Duckabush, $4.94M in federal funding has been received through FY21
Habitat	Improve ecological resilience through climate change	**Outcomes:** Increased understanding of the trophic linkages among zooplankton, herring, and salmon and effects from climate change **Outputs:**

Floodplains, Riparian and Estuaries 2.2.3.6 NOAA, USFWS	science, modeling, and response	• NOAA and USWFWS continue using ecosystem models to study changes in the parts of the food web (including zooplankton) • NOAA and USFWS continue engagement with, and support of, the Puget Sound Salmon Recovery Council. • NOAA continued engagement in reviews of project proposals, prioritization of work, and funding decisions. • NOAA continued statewide awards to match state funds to provide implementation resources for salmon recovery actions and effectiveness monitoring. **Resources:** • USFWS' Coastal Program awards up to approximately $200,000 to $250,000 per year for restoration work. • Federal staff time (TBD) waiting for allocations from Infrastructure Bill. Notified of successful grant award. • Additionally, funds are annually allocated as pass-through funding to Long Live the Kings and the Hood Canal Salmon Enhancement Group.
Habitat Floodplains, Riparian and Estuaries 2.2.3.7 NRCS	Address Natural Resource Concerns on a Watershed Scale	**Outcomes:** Increased protection of riparian areas **Outputs:** • Promote and develop a watershed management approach focused on both salmonid habitat and drainage management in priority agricultural landscapes • Continue work with the Swinomish Tribe, the Skagit River System Cooperative, the Skagit Conservation District, and local landowners to address riparian concerns in the Skagit River watershed • Consider and utilize watershed modeling tools from USGS and EPA • Continue working with Swinomish tribe, on identification of partners and landowners to establish the first mile of river to riparian buffers. **Resources:** • NRCS EQIP funding, will also need to include EPA GAP, and CWA funding • NRCS to cochair the riparian buffer work group with governor's representative
Habitat Floodplains, Riparian and Estuaries	Pacific Coast Salmon Recovery Fund	**Outcomes:** Continued or increased funding to restore salmon habitat in Puget Sound and monitor effectiveness. **Outputs:** • Continue NOAA's engagement with the Puget Sound Salmon Recovery Council • Continue NOAA's and USFWS engagement in restoration project funding reviews and prioritization

2.2.3.8 USFWS, NOAA		**Resources:** • NOAA staff time, since 2000 averaged $74 million/year distributed to states and tribes through competitive grants (leveraged $1.8 in non-PCSRF funds) • USFWS provides staff time
Habitat Floodplains, Riparian and Estuaries 2.2.3.9 NOAA - RC	Restoration and Resilience Awards	**Outcomes:** Promote high value restoration targets through community-based program funds **Outputs:** • Competitive allocation of national community-based restoration program funds to high value restoration targets. **Resources:** • $1-2M per year • (Even as the maturity of the Puget Sound restoration system may secure 10-25% of national funding, 90% of proposals are unfunded)
Habitat Floodplains, Riparian and Estuaries 2.2.3.10 NOAA	Damage Assessment and Restoration	**Outcomes:** Restoration funding is increased from settlement agreements with polluters **Outputs:** • Collect damages for injuries to the public trust from oil spills and from toxic releases to support restoration • Continuing evaluation and advancement of damage claims and restoration in the Lower Duwamish River/Elliott Bay, Commencement Bay, Port Gardner, Port Angeles, and Port Gamble. Damage assessment and restoration planning can occasionally include various legal actions. **Resources:** • NOAA staff time, variable; from FY2017 to FY2021, settlements generated approximately $70 million for compensatory habitat restoration and damage assessment in these basins and resulted in the development of an innovative, long-term stewardship program at Commencement Bay.
Habitat Floodplains, Riparian and Estuaries	Ecosystem Grant Coordination	**Outcomes:** Maximize efficiency and effectiveness of ecosystem recovery funding through coordination of state and federal awards **Outputs:** • Support state-federal alignment and coordination of funding over $250M/year of state and federal awards through the Align Grant Coordination Workgroup to maximize efficiency and effectiveness.

2.2.3.11 NOAA (EPA, NRCS, FEMA)		• Reduce administrative and financial burden to tribes and under-resourced communities by working with state agencies distributing federal dollars to update scoring criteria of the programs to reflect federal match waivers. For example, NOAA Community-based Restoration Program has statutory authority to waive match yet it awards bonus scoring points for projects with additional leveraged funds. PSAR Large Capital funding modified their scoring criteria to remove leveraged funds as part of its project evaluation. • Grow efficiencies across grant programs to reduce burden for multiple-benefit projects that are patchworking funding from several agencies. Fully engage with State ALIGN grants work group to problem solve and pilot solutions for chronic administrative challenges across federally delegated grant programs. • Increased alignment across competitive granting programs toward lowering the administrative burden for multi-benefit projects. **Resources:** NOAA - RC 0.25 FTE
Habitat Floodplains, Riparian and Estuaries 2.2.3.12 NOAA, USGS	Snohomish Estuary Restoration Evaluation	**Outcomes:** Improve effectiveness of nearshore and estuarine protection efforts and restoration projects in Snohomish Estuary and Puget Sound (change in behavior) by improving understanding of estuary system salmonid use and distribution and effects of changing conditions due to climate change (knowledge). **Outputs:** • Continue facilitating Snohomish estuary condition and fish distribution monitoring program to inform restoration. • Provide technical assistance to Counties and Tribes • Prepare reviewed, published manuscripts that: capture an assessment of changes to estuary conditions due to climate change, share the results of a comparative evaluation of restoration in Nisqually, Snohomish, Skagit, and Nooksack deltas. • Develop a forum through Puget Sound Ecosystem Monitoring Program (PSEMP) for coordination of restoration science to inform cross-agency funding actions. • Coordinate/collaborate with State 2021 Estuary and Salmon Restoration Program (ESRP) estuary climate change study **Resources:** • ~$200,000 per year, 0.5 FTE NOAA staff. Funding also through NRDA work in the system and the Veterans Conservation Corps. • (Non-federal resources through partnership with Snohomish County and Tulalip Tribe)

Habitat Floodplains, Riparian and Estuaries 2.2.3.13 USFWS	National Coastal Wetland Conservation Grant Program	**Outcomes:** Increased restoration and protection of coastal wetland habitats **Outputs:** • Continue and increase grants awarded and managed. For example, in from FY2017 to FY2021, the National Coastal Wetland Conservation Grant Program provided 23,935,531 million dollars to Puget Sound projects. • The National Coastal Wetland Conservation Grant Program acquires, restores, and protects wetland habitats. For example, from FY2017 to FY2021, the USFWS, through the grant program, acquired, restored, and protected over 5,000 acres in the Puget Sound basin. **Resources:** Approximately $20 million nationally, up to $1 million per project.
Habitat Floodplains, Riparian and Estuaries 2.2.3.14 NOAA - RC	Geographic Technical Assistance	**Outcomes:** Increased local capabilities for watershed scale salmon recovery **Outputs:** Focused staff engagement with watershed scale salmon recovery implementation to support local capabilities **Resources:** NOAA: 6 FTE
Habitat Floodplains, Riparian, and Estuaries 2.2.3.15 USACE, NRCS	Skokomish River Ecosystem Restoration Project	**Outcomes:** • Improve and restore floodplain and salmon habitat in Skokomish River Ecosystem. • Restores natural geomorphic processes and provide critical fish passage at all flows. Approximately 18 miles of habitat that will be opened during low flow. **Outputs:** • Complete 277 acres of habitat restoration and restoration of year-round fish passage to the South Fork Skokomish River. **Resources:** • $13.6M in federal funds for construction received by USACE in 2019. Awaiting submittal of necessary real estate from Mason County to proceed with construction.

Habitat Floodplains, Riparian, and Estuaries 2.2.3.16 USACE	Green/Duwamish River Ecosystem Project	**Outcomes:** Restore lost habitat at up to 19 distinct sites along the degraded Green/Duwamish River **Outputs:** Restore over 1,000 acres of riverine and wetland habitat supporting ESA listed species recovery **Resources:** • Total project cost of $260M. • $20M received to date for completion of 7 sites. 8 additional sites completed by others
Habitat Floodplains, Riparian and Estuaries 2.2.3.17 NRCS	Agricultural Conservation Easement Program (ACEP)	**Outcomes**: Land protected by agricultural land easements provides additional public benefits, including environmental quality, historic preservation, wildlife habitat and protection of open space. Agricultural Land Easements protect the long-term viability of the nation's food supply by preventing conversion of productive working lands to non-agricultural uses. Voluntarily Conserve agricultural lands and wetlands and their related benefits. **Outputs**: • Continue to implement ACEP to provide financial and technical assistance to conserve agricultural lands and wetlands and their related benefits under two component programs: Agricultural Land Easements (ALE) and Wetlands Reserve Easements (WRE) • Continue to offer ACEP ALE to non-governmental organizations to protect working agricultural lands and limit non-agricultural uses of the land. Under ALE, NRCS provides a portion of the acquisition cost to an eligible partner entity. • Prioritize ALE funding for conservation plans/easements that include protection or enhancement measures for threatened and/or endangered species. • Continue or increase WRE funding to restore, protect and enhance enrolled wetlands. Under WRE, NRCS provides 100% of the funding for easement acquisition and restoration cost. **Resources**: Annual investments vary year to year
Habitat Floodplains, Riparian and Estuaries 2.2.3.18	Resource Conservation Partnership Program	**Outcomes**: Increased conservation of salmon habitat on agricultural lands. Ecosystem-wide process for targeting high priority areas to improve water quality and habitat for at-risk species, including Chinook salmon, bull trout, and steelhead and shellfish resources downstream. **Outputs**: • Continue water quality and habitat improvement contracts through NRCS financial and technical programs.

NRCS		• Continue providing financial and technical assistance to owners of land in agricultural production to plan and implement conservation practices. Within focus areas, a farmer-to-farmer approach will be used to increase participation and ensure buy-in from the local community. • Continue to work on fish barrier removal projects. 16 fish passage barriers were removed over last 5 years. • Continue financial and support for Nooksack Watershed Restoration project. **Resources:** • The NRCS contribution is a portion of the total project cost for technical and financial assistance. • (Partner match leverages NRCS Farm Bill program dollars, at minimal of 1-1 match. Additional partnerships could be secured dependent on partner proposal application process.)
Habitat Floodplains, Riparian and Estuaries 2.2.3.19 USFS	Decommission and Stabilize National Forest System roads	**Outcomes:** Reduced adverse impacts from National Forest System roads **Outputs:** • Continue decommissioning and/or stabilize 20 miles of roads that pose high risk to aquatic resources. Priority watersheds for restoration are included in the Dungeness River, Suiattle River, Upper White River/ Greenwater River, and NF Nooksack River. • Continue to use the Watershed Condition Framework (WCF) analysis tool to identify new priority watersheds beyond those mentioned above. If funding allows, decommission and/or restore roads that pose high risks to aquatic resources in new priority watersheds. • If funding allows, USFS may complete road decommissioning and stabilization in other non-Priority Watersheds per shared stewardship actions items with Washington State DNR and WDFW as well as key partnership work with Tribes. • There are 1,425 miles of forest roads on the Mt. Baker-Snoqualmie and Olympic National Forests that pose high risk to aquatic resources based on the recently completed Sustainable Roads Strategies (426 miles OLY, 999 miles MBS). The Forests are decommissioning unneeded roads and implementing corrective actions to stabilize roads in Watershed Condition Framework (WCF) Priority Watersheds. **Resources:** • Future appropriations TBD • The Olympic and Mt. Baker-Snoqualmie National Forests will seek out funding to implement road decommissioning and stabilization through USFS Great American Outdoor Act and National Asset Management funding, Federal Lands Transportation Program (FLTP), Legacy Roads and Trails and related programs under the Infrastructure Investment and Jobs Act, and other grants with partners.

		• Resources are subject to future appropriations matched with external partner grants and various types of retained receipts. • Accomplishments will be proportional to available funding and our capacity to plan, design, and implement projects. As restoration work is completed in the current priority watersheds and moves into new priority watersheds there will be a need for additional resources to develop collaborative restoration action plans, complete watershed-scale road assessments and NEPA documents, and design appropriate corrections so they can be implemented on-the-ground. Specific projects to address the highest-priority problems will be identified at that time.
Habitat Floodplains, Riparian and Estuaries 2.2.3.20 USFS	Protect Aquatic Habitat on National Forest System lands	**Outcomes:** • Over the next 5-year period increase the National Watershed Condition Framework score from "Functioning At Risk" to "Fully Functioning" for at least 1 Priority Watershed. • Over 80% of management activities meet Best Management Practices as reflected in the USFS BMP monitoring program. **Outputs:** • Continue to implement Forest Plans and the Northwest Forest Plan (NWFP) Aquatic Conservation Strategy to protect and restore aquatic resources. • Partner with WRIA planning groups, Washington State, Tribes and NGO's in conducting targeted salmon recovery and aquatic habitat restoration actions on the Mt. Baker-Snoqualmie and Olympic National Forests. • Olympic and Mt. Baker-Snoqualmie National Forests managed under their respective Forest Plans and the NWFP Aquatic Conservation Strategy **Resources:** • Resources are subject to future appropriations. • Appropriated agency funds provide support for aquatic specialists to provide input and monitor activities effecting aquatic habitats. • The capacity of Forests to monitor watershed conditions, develop partnerships, and implement restoration projects will be proportional to the funding and staffing available.
Habitat Fish Passage 2.2.4.1	Collaborate with Washington State Brian Abbott Fish Barrier Removal Board (FPRB)	**Outcomes**: Increased number of barriers repaired as a means of restoring fish passage and improved coordination to repair the highest priority fish passage barriers **Outputs**: • Collaborate with the Brian Abbott FBRB and WDFW.

NOAA, USFWS, FHWA, NRCS, Navy, USFS, NPS, USACE, FEMA, FTA		• Emphasize fish passage related Federal funding programs and land and facility management actions to help contribute to State strategic approaches and priorities, especially where overlap of such programs occurs with recovery of Federally listed chinook salmon and steelhead trout. • To the extent feasible, Federal funding programs assist with matching dollars for Puget Sound FBRB priority project implementation and barrier assessment efforts. Washington State's 2022 Supplemental budget included $2.4 billion in new funds for fish passage and federal partners will coordinate with the State on priority projects that provide the highest benefit to fish. • Implement and/or plan targeted fish passage restoration actions on Federal land and pertinent facilities. • Federal agency representation at FBRB meetings to stay informed of developing State strategies and priorities. • Continue PSFTF Fish Passage Subteam coordination, which include representatives from State and Federal agencies managing fish passage related programs. **Resources** • NOAA provides 0.1 FTE of effort {note: this function could be combined with fish passage efforts under the new infrastructure bill described separately below}
Habitat Fish Passage 2.2.4.2 NRCS	Collaborate with WDFW Fish Screening and Passage Division	**Outcomes:** Increased capacity to Identify fish barriers on private property. **Outputs:** • Continue or increase staff capacity and expertise to inventory stream crossings on private land using the WDFW Barrier Inventory Protocol and entering results into State's Barrier Database. • Develop a new 5-year Contribution Agreement with WDFW in FY22 as funding allows to support fish passage barrier correction or removal. **Resources:** NRCS financial contribution: $850,000 over five years
Habitat Fish Passage 2.2.4.3 USFWS	National Fish Passage Program	**Outcomes:** • Restore native fish and other aquatic species to self-sustaining levels by reconnecting habitat. Priority based upon the benefits to species and the geographical area. • Reconnect and re-open habitat for fish and aquatic species. **Outputs:** • Miles/Acres reopened to aquatic species. As of September 2021, two Puget Sound and Strait of Juan de Fuca funded projects with FY2021 funds will open 17.6 miles of upstream habitat.

		• Provide technical assistance on project development and funding for native fish and aquatic species barrier correction projects • Funding aquatic organism passage projects in western Washington, including Puget Sound. Incorporates state agency and other planning mechanisms, such as Lead Entity recovery planning and other partnership planning tools, to inform and support passage and habitat improvements. • Provide technical assistance and funding for barrier correction projects. **Resources** • Western Washington National Fish Passage Program typically receives $100K - $200K annually, dependent upon Congressional allocations. (25% non-federal cost share requested). Funds for this can be used in all of Washington not just Puget Sound. Allocated funds for fish passage projects are based on fisheries recovery plans.
Habitat Fish Passage 2.2.4.4 FHWA, NOAA	National Culvert Removal, Replacement, and Restoration Grant Program	**Outcome**: • Increased ecological baseline conditions by increasing habitat that is currently blocked • Streamline recovery efforts and ensure the highest priority projects are implemented first. **Outputs** • Provide technical expertise to increase access to spawning and rearing habitats for ESA-listed salmonids • Coordination with state, tribal, and local government partners; and federal grant funds through the National Culvert Removal, Replacement, and Restoration Grant Program. Program development: Federal funding via matched grant funds (<80% NOAA) to priority fish passage barriers in Puget Sound • Prioritization methods synchronized with state barrier removal programs (e.g., FBRB, FFFPP, etc). (Later metrics should include # barriers removed; and effectiveness results (# fish returning) **Resources** • Starting in 2022 - National Culvert Removal, Replacement, and Restoration Program per the Infrastructure Investment and Jobs Act funding • Federal grant manager (awards and manages funding) (0.5 FTE), Federal technical coordinator (ensure consistent methods) (0.5 FTE), Federal grants
Habitat Fish Passage	Salmon and Steelhead Barrier Correction Projects	**Outcomes:** Improved fish passage **Outputs:** • Exercise oversight over the Federal-aid Highway program.

2.2.4.5 FHWA	on Federal-aid Eligible Roadways	• Removal of fish barriers in Washington State, particularly the 818 barriers identified in the Tribal lawsuit injunction for removal by 2030. **Resources:** The Federal-aid program is funded through 2026. Washington State receives over $600M in Federal-aid Highway funding annually. Additional Emergency Relief funds are provided in response to natural disasters.
Habitat Fish Passage 2.2.4.6 FHWA	Fish passage barrier correction projects on roads that access Federal and Tribal lands and on roads owned by Federal and Tribal entities (WFLHD)	**Outcomes:** Improved fish passage **Outputs:** • Removal of fish barriers on Federal, tribal, and publicly owned land. • Specific projects are chosen by the federal land management agencies, states, and tribes. **Resources:** • FLTP is an available funding source for federally owned routes. FLTP projects compete for funding nationwide. • The Federal Lands Access Program (FLAP) is an available funding source for a public road or transit system that is located on, is adjacent to, or provides access to Federal lands, for which title or maintenance responsibility is vested in a State, county, town, township, tribal, municipal, or local government. FLAP projects compete for funding within the state (approximately $13M annually in Washington State). • The Tribal Transportation Program (TTP) is an available funding source for tribal owned and tribal designated publicly owned roads. TTP projects are designated by the tribes.
Habitat Fish Passage 2.2.4.7 USACE (USFWS, NOAA)	Re-Authorize, Design, and Construct a new downstream fish passage facility at Howard Hanson Dam	**Outcomes:** • Restore the biological connection of the upper watershed (45% of total area) to the lower watershed via salmon migration • Substantially increase salmon and steelhead productivity by providing over 100 miles of high-quality river and tributary habitat • Increase ability of ESA-listed Chinook salmon to access substantially more spawning and rearing area – 221 square miles of undeveloped watershed • Provide access for coho salmon and ESA-listed steelhead to the 90% of their habitat area that was disconnected by the dam • Expected to increase population of Chinook salmon, the primary food source for ESA-listed Southern Resident Killer Whales • Restore ecosystem functions and values to a protected watershed; restoring salmon populations will provide for bears, eagles, osprey, river otters, and dozens of other species

		• The NMFS BiOp states that meeting performance standards will likely lead to abundant, self-sustaining populations of Chinook and steelhead, dramatically improving the likelihood for recovery **Outputs:** • Fish passage design at Howard Hanson is completed and reviewed by NMFS • Construction of fish passage facilities is underway **Resources:** Collaboration with NOAA, USFWS, State and Tribes on design and construction $220M received in IIJA for design and first increment of construction, additional funding required to complete construction
Habitat Fish Passage 2.2.4.8 USFS	Correct salmon and steelhead culvert fish passage barriers on National Forest System roads	**Outcomes**: Fish passage culvert barriers that block passage for salmon and steelhead occur across National Forest roads within the Mt. Baker-Snoqualmie (MBS) with 2 anadromous barriers remaining on the Olympic (OLY) National Forest. The barrier culverts limit upstream accessibility and production, including localized rearing opportunities in smaller tributaries. The Forests are correcting barriers at undersized road crossings by replacing the defective structures with appropriate fish passage designs or removing the structures permanently if they are no longer needed. Barrier replacements are prioritized based on the amount of salmon and steelhead habitat that would be accessed and sites within identified Priority Watersheds, which includes Lower Greenwater River (White River), Glacier Creek and Hedrick Creek (NF Nooksack River). In addition, MBS and OLY NF's will continue to work with State and Tribal partners on strategic fish passage restoration sites in other basins (Skagit, Stillaguamish, Elwha, etc.) which have high value to chinook salmon, steelhead and bull trout recovery and overlap with State priorities. **Outputs**: • Work with tribes and NGOs on implementing key fish passage projects. • Over the next 5-year period, the USFS aims to correct and/or permanently remove (via road decommissioning) 8 fish passage barrier culverts on salmon and steelhead streams under current funding levels (1 barrier for the OLY, 7 for the MBS). • Maintain and implement WCF Priority Watershed Restoration Action Plans (WRAPs), which include fish passage restoration essential actions. For instance, Lower Greenwater River WRAP has 12 fish passage restoration projects identified as part of a larger suite of essential actions to improve watershed condition with a total estimated cost need of $2,150,000. • MBS will continue its Shared Stewardship work with Washington Department of Natural Resources (DNR) via Good Neighbor Authority agreements that provide avenues to implement fish passage restoration projects. **Resources**:

		• Subject to future appropriations and staffing levels, $1,300,000 is needed to design and replace an AOP barrier with a bridge on the Olympic and the other AOP barrier needing replacement would cost an estimated $350,000 for design and implementation. • An estimated $1,720,000 is needed to correct 7 salmon and steelhead culvert barriers within the 5-year period on the MBS. • Annual needs will vary depending on the specific projects selected, construction logistics, etc. • More recently, the Forests have sought out funding to implement fish passage culvert barrier corrections through Great American Outdoor Act and USFS National Asset Management funding programs, FLTP, Legacy Roads and Trails and related programs under the Infrastructure Investment and Jobs Act, conservation finance, other grants, and key partnerships. • Additional funding to accelerate important fish passage restoration accomplishments would increase the rate of barrier corrections. Accomplishments will be proportional to available funding and capacity to design and implement projects.
Habitat Fish Passage 2.2.4.9 NPS	Correct salmon and steelhead culvert fish passage barriers on National Park Service roads	**Outcomes**: Reconnect spawning and rearing habitat and reestablish natural stream processes. **Outputs** • Culvert barrier project prioritization and planning project design, securing funding, project implementation. • There are eight priority fish passage culvert barriers that block passage for salmon and steelhead at Rainier (MORA). Altogether the eight priority culverts limit accessibility and production from approximately 0.6 miles of anadromous streams at MORA. The Park is working to correct culvert barriers by replacing the defective structures with appropriate fish passage designs as funding allows. **Resources** • Approximately $100K/year is needed to correct the 8 identified salmon and steelhead culvert barriers at MORA within the 5-year period. Mount Rainier will pursue funding to implement fish passage culvert barrier corrections provided through the Federal Lands Recreation Enhancement Act, Federal Lands Transportation Program, and grants from the Washington State Salmon Recovery Funding Board. • Accomplishments will be proportional to available funding.
Habitat Fish Passage 2.2.4.10	Correct salmon and steelhead culvert fish passage barriers on U.S. Navy property	**Outcomes:** Reconnect spawning and rearing habitat, reestablish natural stream processes **Outputs:** • Navy has compiled a list of habitat improvement actions for fish passage. • As funding becomes available, Navy will implement actions for fish passage.

U.S. Navy		• Projects undertaken will follow all state and federal regulatory requirements for in-water work, including in-water work windows. **Resources:** Staff time and funding to execute habitat improvement actions for fish passage.
Stormwater 2.3.1 NOAA, USFWS (HUD, DOT)	Integrating stormwater science into ESA Section 7 compliance	**Outcomes:** Reduced stormwater pollution through improved incorporation of stormwater science in ESA Section 7 consultations **Outputs:** • Work proactively across federal agencies to streamline and expedite stormwater-related consultations under the Endangered Species Act, with particular emphasis on the Puget Sound regional transportation grid. • Respond to the priority concerns of tribal comanagers as they relate to stormwater, salmon conservation, and community health, via the ongoing Treaty Rights at Risk government-to-government process. • Continue the long-term, NOAA-led research effort (20+ years) to understand the causes and consequences of the urban runoff mortality syndrome for coho and Chinook salmon, as well as steelhead. • Develop new decision support and modeling tools to characterize stormwater risks more precisely to ESA-listed marine mammals, rockfish, salmon, and steelhead in Puget Sound. • Evaluate the likelihood that toxic stormwater runoff upstream of existing fish passage barriers will undermine the restoration goals of ongoing and future physical habitat restoration projects (e.g., culvert replacements). • Develop and standardize analytical methods for 6PPD/6PPD-quinone and other contaminants of emerging concern, in coordination with federal, state, and academic partners. • Assess impacts of untreated runoff on keystone species for Puget Sound marine food webs, with an emphasis on shore-spawning marine forage fish (Pacific herring, surf smelt). This work will more directly link NOAA science on oil spills and urban stormwater runoff. • Determine the sublethal impacts of 6PPD-quinone on ESA-listed species, particularly steelhead and Chinook. • Investigate the interactive effects of multiple habitat stressors in Puget Sound, including stormwater toxicity (as a consequence of regional growth and development) and thermal stress (as consequence of climate change). **Resources:** • NOAA staff time
Stormwater 2.3.2	Puget Sound Stormwater Strategic Initiative Funding	**Outcomes:** Prevent toxics from impacting Puget Sound aquatic life, protect and restore Puget Sound freshwater streams, address nutrient pollution in Puget Sound. Achieve Puget Sound Action Agenda stormwater goals. **Outputs:**

EPA		• Provide funding to operationalize the Toxics in Fish, B-IBI Freshwater Stream Quality, and Marine Water Quality Implementation Strategies. This could include: green stormwater infrastructure; watershed planning to consider climate change and hydrology; multi-benefit investments like stormwater parks; applied CEC or toxics research; managing stormwater runoff and legacy contamination by improving regulatory frameworks and incentives, using a comprehensive approach at the site and landscape scales; incentivize redevelopment in areas associated with high loads of toxic chemicals; increase local stormwater management capacity (including funding, staffing resources, and management tools and information); increase and stabilize funding that supports actions, incentives, and local capacity to reduce nutrient loads; adjust stormwater permitting requirements or other local government programs to address nutrients in stormwater from residential and commercial lands; identifying priority hotspots—such as wastewater sources, high loading land-uses, and transportation corridors; increase the pace of clean-up of priority contaminated sites (information, planning, funding, implementation, monitoring); New development and retrofits should prioritize GSI and biophilic design elements; promote green and nature-based infrastructure as a stormwater, climate adaptation, carbon sequestration, and human wellbeing solution. • Provide funding to support the maintenance of a Strategic Initiative Advisory Team (SIAT) to advise in Stormwater Strategic Initiative decision-making. • Providing funding for Implementation Strategy Lead for the Toxics in Fish, B-IBI, and Marine Water Quality Vital Signs and form technical and/or policy workgroups to develop, refine, adaptively manage, and operationalize Implementation Strategies. • Providing funding for the Stormwater Strategic Initiative Lead to participate in the PSP and National Estuary Program (NEP) Management Conference processes and work groups as well as proactively coordinate with tribes and Local Integrating Organizations (LIOs) and tribal partners to accomplish stormwater and ecosystem recovery work. • Consider and prioritize environmental justice and climate change impacts when allocating EPA stormwater funds. **Resources:** • ~$5M or more per year EPA Puget Sound Geographic Funds awarded to the Stormwater Strategic Initiative a (coalition of the Washington Department of Ecology, and Washington Stormwater Center, and the Washington Department of Commerce)
Stormwater 2.3.3	Stormwater Treatment as Part of Transportation Projects	**Outcomes:** Infrastructure upgrades to manage stormwater flooding risks and reduce toxic runoff from the Puget Sound regional transportation grid. **Outputs:**

FHWA (NOAA, USFWS, EPA)		FHWA federal-aid funding continues to support transportation projects which include stormwater retrofits and other improvements to the Puget Sound highway system by WSDOT and local agencies. These activities are guided by regional stormwater management strategies (e.g., the WSDOT Highway Runoff Manual, the Ecology Stormwater Manual) and informed by the emerging science on stormwater threats to salmon and green infrastructure solutions, as well as environmental justice and climate change considerations. • NOAA and EPA will convene federal agencies, including FHWA, to partner with WSDOT, Ecology, WDFW, and other agencies to proactively address stormwater pollution from the regional transportation system – including stormwater treatment of the I-5 Ship Canal Bridge (a major source of toxic loading to Puget Sound). • Update the existing programmatic ESA consultation between NMFS and FHWA to reflect current stormwater science and provide appropriate conservation protections for fish and habitat. • ESA programmatic agreements with NMFS and USFWS are a key factor in FHWA's ability to deliver our Federal aid Highway program in a way that protect salmonids and their habitat. They provide predictability and time savings. They encourage minimization of impacts and require high standards for protection and mitigation. • We know that green infrastructure works. Federal agencies support green stormwater infrastructure in key locations to mitigate toxic loading and road runoff. • FHWA and the Services work together with WSDOT to update existing programmatic agreements and to complete the programmatics we are developing for Local Agency projects and Washington State Ferries projects. • FHWA and WSDOT review transportation construction projects for stormwater implications. • Fish Passage coordination and prioritization Fed, State, Local – funding, permitting etc. • Support additional research to better understand the effectiveness of small footprint green stormwater treatment and other bioinfiltration approaches such as filter strips along highways, as well as the cost and feasibility of implementing these approaches at a large scale. • Clarify funding opportunities and project development pathways within transportation-focused federal programs for performance incentives, green stormwater treatment, and innovation related to voluntary retrofit/rollback of legacy pollution • Culvert replacements include stormwater treatment best practices as part of those earth-moving projects in high priority salmon bearing streams. Federal agencies strive to ensure that poor upstream water quality from road runoff does not undermine costly habitat restoration efforts like culvert removals by opening habitat with poor water quality. **Resources** • Washington State receives Federal-aid highway funds each year. Projects are chosen by WSDOT and local public agencies to address safety and capacity needs on the highway and ferry systems. The FHWA decided

		more than a decade ago that FHWA needed a full-time biologist in the Washington Division. This is very rare in FHWA Division Offices and illustrates our ongoing commitment to protection of Puget Sound listed species. • Infrastructure Law funding increases available funding for transportation projects and includes culvert removal funds. • NOAA staff time for ESA consultations. NMFS is working closely with FHWA and WSDOT to integrate new stormwater and toxics science - including 6PPD - into ESA consultations. • EPA staff time, plus potential for SRF or Puget Sound Geographic Funds, as appropriate and via Ecology competition processes
Stormwater 2.3.4 EPA, NOAA, USFWS	NPDES Stormwater Permitting	**Outcomes:** Improved stormwater management on federal and tribal lands and facilities under EPA's CWA jurisdiction **Outputs** • EPA complete the following NPDES permits and associated ESA consultations: Tulalip Tribes MS4; MS4 Permits (3) for discharges to lower Puyallup River: WSDOT/Pierce Co./Tacoma; Joint Base Lewis-McChord MS4 (permit renewal) • NOAA/USFWS completed ESA consultations • EPA collaborate with Puget Sound Tribes via CWA Sec. 401 certifications and govt-to-govt consultations • EPA collaborate with WA Ecology via CWA Sec. 401 certifications • Additional permits for municipal stormwater from Tribal or Federal lands may be necessary as a result of new Urbanized Area boundaries based on Year 2020 Census. **Resources:** • EPA staff (at least 2-4 FTE/annually) needed to manage and/or issue Stormwater permits in EPA's jurisdiction • USFWS/NOAA NMFS need significant additional staff resources to synchronize the timing of consultations to allow the incorporation of reasonable and prudent measures into NPDES permits. • 1 – 2 FTE/year, in the form of permitting and technical staff at EPA, and USFWS/NOAA to complete permit development and technical analysis, including appropriate coordination, negotiation, and consultation with all regulated entities. • ~$250,000/year in grants or discretionary funding to assist regulated Tribal governments within the Urbanized Area with capacity development and implementation of their local storm water management program.

Stormwater 2.3.5 EPA, NOAA, USFWS	NPDES Wastewater Permitting for Federal and Tribal facilities	**Outcomes:** NPDES permits that are appropriately protective and restorative to Puget Sound. **Outputs:** • NPDES permits for Tribal (e.g., Lummi, Suquamish, and Tulalip) wastewater treatment facilities that discharge into Puget Sound. • NPDES permit for Naval wastewater treatment facilities that discharge into Puget Sound • NOAA/USFWS completed ESA consultations **Resources:** • EPA staff (at least 2 FTE) needed to maintain permits within EPA's jurisdiction • USFWS/NOAA NMFS need significant additional staff resources to synchronize the timing of consultations to allow the incorporation of reasonable and prudent measures into NPDES permits. • $200,000 - $500,000/ year in grants or discretionary funding to assist regulated tribal governments with capacity development and implementation of advanced wastewater treatment in a manner that is affordable and equitable for their utility customers.
Stormwater 2.3.6 EPA	NPDES Permitting state oversight	**Outcomes:** NPDES permits ensure state's mandatory standards for clean water and the federal minimums are being met **Outputs:** Real time review and Permit Quality Review Report of Washington Department of Ecology's NPDES Program **Resources:** EPA staff time
Stormwater 2.3.7 EPA	Clean Water State Revolving Fund, Overflow and Stormwater Grant Program, Clean Water Indian Set-Aside Program	**Outcomes:** Support stormwater and wastewater infrastructure improvements to reduce pollutant loading to Puget Sound **Outputs** • EPA's Clean Water State Revolving Fund (CWSRF) provides capitalization grants to Ecology to grow the State SRF program which provide low interest loans to communities. • EPA's Sewer Overflow and Stormwater Reuse Municipal Grants (OSG) program is a new grant program which provides grants to manage combined sewer overflows, sanitary sewer overflows, and stormwater flows. • EPA's Clean Water Indian Set-Aside (CWISA) funds wastewater systems upgrades for tribal communities. **Resources:**

		• Annual grants allocation to Washington State Department of Ecology, CWSRF SY21 was $27M, OSG FY21 was $730K. EPA CWISA FY 21 allotment for Idaho, Washington and Oregon was $1.3M. Annual funding of these programs is expected to continue. • In the past, over 50% of Washington's Clean Water SRF went to projects in Puget Sound • Additional funds through infrastructure law.
Stormwater 2.3.8 EPA, NOAA	Federal Oversight of CZARA in Washington State	**Outcomes:** Timely approval of Washington's Coastal Nonpoint Program facilitates shifting resources to implementation **Outputs** • Publish final approval of Washington's Coastal Nonpoint Program by Spring 2022 • Continue to provide federal technical assistance to the state's voluntary clean water guidance development process • Work with Ecology to better align specific actions to the CZARA Management Measures during major planning and program updates such as during the State's next Nonpoint Source Management Plan update **Resources:** EPA and NOAA staff time
Stormwater 2.3.9 EPA	CWA Section 319 and 106 Funding	**Outcomes:** Prevent nonpoint source pollution **Outputs:** • EPA funding to state and tribes, for example, Puget Sound Nutrient forum work • Workplans are negotiated through PPA and individual tribes **Resources** • Federal funding to state and tribes • (Centennial fund from state).
Stormwater 2.3.10 EPA	Human Health Criteria	**Outcomes:** Strengthen clean water and ensure human health criteria (HHC) protect tribal members exercising treaty subsistence fishing rights in the state of Washington, and other fisher communities **Outputs:** • Issue a notice of a proposed draft rule to restore protective HHC for Washington State within nine months of the Court granting EPA's request to "pause" the litigation (April 2022) • Finalize a federal rule within nine months of the date of the proposed rule (January 2023)

		Resources: EPA staff time
Stormwater 2.3.11 EPA (NOAA, USFWS)	Aquatic Life Criteria	**Outcomes:** Establish new and updated aquatic life criteria for surface waters in Washington for pollutants where EPA recommended criteria are available. **Outputs:** • In coordination with the State, evaluate the list of EPA recommended criteria and prioritize the highest need based on the latest science • If needed, work with the State to adopt updated criteria and/or propose a rule promulgating federal aquatic life criteria • NOAA and USFWS to work to prioritize and efficiently work through the ESA consultation processes **Resources:** • EPA staff time • NOAA and USFWS consultation
Stormwater 2.3.12 EPA	Contaminants of Emerging Concern (CECs) in Stormwater: Technical Assistance to States and Tribes on Improved Stormwater Management and BMP Effectiveness	**Outcomes:** Improve water quality through improved stormwater management. **Outputs:** • Work with Region 10 state or tribal water quality programs on the best translation methods for including CECs such as 6PPD-quinone in their implementation of the "No toxics in toxic amounts" narrative criteria to be used in NPDES permits. • Work towards including monitoring requirements in permits such as monitoring for current green stormwater infrastructure to assess how well existing infrastructure is working. Contribute to existing efforts to ground truth green stormwater infrastructure BMP effectiveness in the short term and long term. This approach could include: Work towards whole effluent toxicity (WET) testing requirements to include acute and chronic effects to sensitive species like coho. • Translation from an LC50 to an LC low to prevent acute impacts to coho (and other species, if and when data become available) from wastewater. • WET testing for stormwater. In parallel, work towards screening level methods, incorporating benchmark information into that process. These could include developing environmental assays on caged fish for screening for impacts from stormwater and/or tire chemicals or collecting water and expose fish or invertebrates in a lab setting to control for environmental factors.

		• As we learn more about the methods, provide technical support to Region 10 states and tribes on developing and implementing them. • Work with Ecology to apply the results of BMP effectiveness data for 6PPD-quinone and other tire chemicals into the Ecology 2024 Stormwater Manual update. Specific activities could include refine and make specific to tire wear particles/6PPD: source control, street sweeping, line cleaning, catch basin cleaning, etc. • EPA could assist Ecology to expand Washington state Technology Assessment Protocol - Ecology (TAPE) as needed to formally evaluate new stormwater technologies for effectiveness. • Bioretention Media Testing: The EPA is conducting preliminary research to evaluate and test methods using bioretention media to capture tire and road wear particles and limit the release of chemicals from them, such as 6PPD-quinone. **Outputs:** • EPA staff time • (state and tribal staff time)
Shellfish 2.4.1 EPA	Shellfish Strategic Initiative funding to reduce fecal pathogens and upgrade harvestable shellfish beds	**Outcomes:** Net increase in harvestable shellfish acres in Puget Sound. Reduced fecal pathogens draining to shellfish beds. Puget Sound shellfish beds are safe, open, and approved for commercial, recreational, tribal, and subsistence uses. Achieve Puget Sound Action Agenda shellfish goals. **Outputs:** • Support effective and sustainable local nonpoint pollution programs; improved farm waste management; improved control of boater's waste; strengthened on-site sewage system management and repair programs; better managed wastewater treatment plant outfalls to Puget Sound. • Agricultural BMPs and technical assistance to landowners to assist with long term manure management strategies and solutions; outreach and education campaigns to maintain septic systems, clean up pet waste, shoreline surveys and windshield surveys to support water quality monitoring efforts. Convene Pollution Identification and Correction programs to share best practices and lessons learned, and work towards sustainable funding. • Award and manage subawards to support the implementation of the Puget Sound Action Agenda with a focus on operationalizing the Shellfish Implementation Strategy, and maintain a Shellfish Strategic Initiative Advisory Team to advise in investment-related decision-making • Serve as Implementation Strategy Lead for the Shellfish Vital Sign and form technical and/or policy workgroups to develop, refine, adaptively manage, and operationalize the Shellfish Implementation Strategy • Participate in PSP and National Estuary Program Management Conference processes and work groups as well as proactively coordinate with Local Integrating Organizations and tribal partners to accomplish shellfish

		recovery work. See https://pugetsoundestuary.wa.gov/what-we-do/funded-projects/ for a list of projects funded by EPA's Shellfish Strategic Initiative to date. **Resources:** • Approximately $5 million per year in EPA Puget Sound Geographic funds awarded to the Washington Department of Health's Shellfish Strategic Initiative 2.0 (most of this funding is distributed as subawards for on the ground actions throughout Puget Sound).
Shellfish 2.4.2 NOAA	Implement ESA and EFH aquaculture regulatory framework	**Outcomes:** Streamlined, transparent, resilient, and predictable administration of the Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act consultation **Outputs:** • Timely processing of individual ESA/EFH consultation and Conservation Planning under the jurisdiction of NOAA Fisheries • Individual ESA Section 7(a)(2) and EFH consultations, and support for developing and processing Conservation Plans under ESA Section 10 (a)1(B) of the ESA **Resources**: $150,000 annually (Not all funds secured at this time)
Shellfish 2.4.3 NOAA	Ocean Acidification Monitoring	**Outcomes:** Improved understanding of inorganic carbon chemistry of Puget Sound waters **Outputs** • Maintain existing ocean acidification monitoring within Puget Sound and boundary waters • Advance the adoption of new subsurface ocean acidification monitoring technologies to better assess changes in the oceanic source waters feeding into Puget Sound as suitable technologies are available • Promote modeling capabilities for seasonal forecasting of corrosive conditions within Puget Sound • Provide technical expertise to Washington entities and tribes to support ongoing monitoring of ocean acidification in various habitats throughout Puget Sound • Data on inorganic carbon chemistry of source waters to Puget Sound provided to modelers of Puget Sound chemistry, to improve forecasts and projections of ocean acidification conditions in Puget Sound shellfish habitat • Data from Puget Sound and boundary waters provided to state and federal entities for assessing water quality conditions

		• Publications describing ocean acidification conditions and variability within Puget Sound for government and academic audiences • Sustained monitoring, data quality assurance and synthesis, and advanced OA technology development specific to the California Current Large Marine Ecosystem • Develop and deploy assessment (i.e., in situ measurements) and modeling tools to field-test OA mitigation potential (e.g., growing seaweed alongside shellfish or restoration of natural eelgrass beds) **Resources:** • NOAA financial and technical support for the development of the J-SCOPE forecast system for Washington and Oregon coastal waters • Sustained--and for some activities additional--funding is needed to maintain and continue improving existing observing and modeling capabilities. • (The Washington State legislature supports all parallel ocean acidification modeling and observing within Puget Sound via funding to the Washington Ocean Acidification Center and the Washington State Department of Ecology.)
Shellfish 2.4.4 NOAA	Harmful Algal Bloom Detection and Prediction	**Outcomes:** • Forecasting shellfish harvest closures and shellfish mortality due to increasing and high levels of HABs, including phytoplankton that impact shellfish health are facilitated by community monitoring that conducts siting of advanced technologies. • Early warning of events that cause closures of shellfish harvest and shellfish mortalities will optimize commercial, recreational, and tribal management along the 2500 miles of Puget Sound shoreline. **Outputs** • Real-time identification of HABs in Puget Sound through the SoundToxins partnership, managed by Washington Sea Grant. SoundToxins is a partnership that provides real-time seawater sample collection and analysis to allow mapping of HAB occurrence throughout Puget Sound and is critical to understanding the environmental factors that play a role in HAB initiation, development, and decline. • Continue SoundToxins partnership management, a collaboration of shellfish growers, environmental learning centers, researchers, and the public. • Conduct in-situ monitoring of phytoplankton and environmental variables to validate IFCB data • Collaborate with IFCB deployment sites across the US to compare data. • Report findings at national and international meetings.

		• The SoundToxins, a partnership between tribal and local entities, is an early warning system that enables shellfish to be harvested in advance of closures protecting shellfish and human health, thereby reducing economic loss. **Resources:** • SoundToxins is managed by WA Sea Grant but is unfunded (FY22) but requires ~100k annually for project management and supplies. • IFCB non-NOAA labor aspects currently funded by NCCOS at $100-200k/year (through Aug 2024), NOAA labor support: ~$600K annually through FY24. Funding beyond 2024 TBD.
EPA	Harmful Algal Bloom Response	**Outcomes:** • Work with Region 10 state and tribal water quality programs on cyanotoxins methods development including fish tissue analytical methods • Support states and tribes in identifying and responding to Harmful Algal Blooms, such as sharing information on the latest science, and developing identification, training, and response materials for HABs in estuaries, together with our partners at NOAA • Supporting state and tribal water quality programs with technical assistance in developing and implementing their CWA programs to address HABs and stressors that result in HABs (such as nutrients) **Outputs:** This approach could include: • Production of datasets to inform the development of fish tissue analytical methods for cyanotoxins • Sharing information via webinars on the latest science on HABs toxins in fish and shellfish and connection to environmental stressors • Summarizing datasets for further development of health effects support documents for HABs toxins. • Data analysis and technical assistance to support state and tribal development of thresholds related to excess nutrients and other potential stressors/effects associated with HABs issues • Enhanced coordination including annual or more frequent calls among federal staff on HABs preparation and response • Conducting research on and/or summarizing water quality improvement technology innovations, such as BMPs for nonpoint sources, and stormwater and wastewater removal effectiveness, and how their application on the landscape can help mitigate the potential effects of nutrients and other stressors on HABs and aquatic life **Resources:** EPA Staff Time

Shellfish 2.4.5 NOAA	Pathogenic Vibrio Detection and Prediction	**Outcomes:** Reduction in shellfish bed closures and illnesses due to pathogenic Vibrios **Outputs:** • Primary research and Predictive models of post-harvest vibrio growth aligned with WDOH vibrio management plans. https://products.coastalscience.noaa.gov/vibrioforecast/pacificnw/default.aspx • Annual update of products to reflect changes in Washington DOH growing area risk characterization. • Daily provision and maintenance of products via NCCOS web. These tools are priority needs identified by the Food and Drug Administration and the Interstate Shellfish Sanitation Conference for the Pacific Northwest. • Primary research related to improved understanding of vibrio ecology and management. **Resources:** NOAA NWS and NCCOS staff and IT services in collaboration with Washington Department of Health
Shellfish 2.4.6 NOAA	Conservation Genetic Risk Assessment	**Outcomes:** Evaluation of genetic risks to wild populations from native shellfish aquaculture. **Outputs:** • Decision support and strategic guidance for native shellfish species • Science advice to Puget Sound Restoration Fund on genetics of native shellfish species • Technical support for various genetic analyses for native shellfish species **Resources:** $150K/year is needed to support research and laboratory operations
Shellfish 2.4.7 NOAA	Habitat Value of Shellfish	**Outcomes:** 1) Improved quantification of habitat value, both in the field and via tools used to assess habitat value for shellfish aquaculture. 2) Improved understanding of eelgrass populations. 3) Potential carbon monitoring in shellfish aquaculture habitats in nearshore areas (pending funding) **Outputs:** • Host a workshop with scientific experts and regulators to share study results and state of the science resulting in the development of consistent management strategies. 1) Strengthen tools used to inform decisions in nearshore habitats. Documentation of fish and invertebrate use of shellfish aquaculture habitat compared to eelgrass habitat, including feeding behavior. 2) Manuscript describing the dynamic nature of eelgrass in space and time. Preliminary information on genetic structure of eelgrass in Puget Sound and along the west coast. 3) Partnership with shellfish growers and Tribes to monitor carbon sequestration and mitigation of ocean acidification in nearshore areas associated with shellfish aquaculture practices (pending funding).

		• Accurately quantifying the habitat value of shellfish and associated gear in the marine environment compared to existing habitats is required for proper management. Currently multiple studies are underway comparing shellfish aquaculture and eelgrass habitats. • Support research in technologies to efficiently and accurately survey and map eelgrass such as drone, underwater ROV, sonar, and satellite technology • Assess ecosystem services provided by shellfish that potentially provide benefits to eelgrass such as improved water clarity, reduced epiphytic loading on eelgrass blades, reduction in eelgrass wasting disease **Resources:** $250K/year for five years (not all funds secured at this time)
Shellfish 2.4.8 NOAA	Native Shellfish Hatchery	**Outcomes:** Rebuilt populations of native shellfish, including Olympia oysters and pinto abalone. **Outputs:** • 2,500 bags of Olympia oyster spat-on-shell seed to accelerate Olympia oyster recovery at priority sites. Produce 10,000 juvenile abalone and 4 million larval abalone for out planting. • NOAA and the Puget Sound Restoration Fund are working with state, tribal and industry partners in Washington to restore 50 acres of oyster habitat by 2025 and rebuild sustainable populations of pinto abalone. The Kenneth K. Chew Center for Shellfish Research and Restoration produces the science and juvenile shellfish required for this restoration. **Resources**: $525K/year (funding for full time FTEs at $350K/year; continued operations and maintenance at $175K/year). Northwest Fisheries Science Center needs $100K/year to support ongoing maintenance of seawater infrastructure and $150K/year to support monitoring required for NPDES permit.
Shellfish 2.4.9 NRCS	Native Oyster Restoration Projects	**Outcomes:** Habitat restoration and native Olympia Oyster fisheries improvements. **Outputs:** • Continue to expand a collaborative effort with the Tribes, NGO Puget Sound Restoration Fund, WDFW, WSCC, and the shellfish industry, Washington Shellfish Growers Association to implement the native Olympia Oyster Restoration Plan. • Work with partners to further expand program to address additional concerns (i.e., Blue Crab, Ghost Shrimp, eel grass restoration, etc.) **Resources:** Annual request of ~$200k/year for funding of this program has been supported by NRCS through the EQIP program and will continue

Shellfish 2.4.10 NOAA	Support Shellfish Aquaculture Readiness	**Outcomes:** Advancing shellfish aquaculture for both commercial and restoration applications, and enhance resiliency of shellfish aquaculture industry to impacts of climate change **Outputs:** Implement elements of the Washington State Shellfish Initiative, Phase II goals, including Embracing strategies to address ocean acidification's effects on shellfish, advancing shellfish research topics, restoring native shellfish, Educating the next generation about shellfish. Additional outputs: Building resilience to impacts of multiple environmental stressors due to climate change. Mitigate genetic risks to native species. Presentations at regional and national shellfish aquaculture meetings, peer-reviewed publications, and training of graduate students and post docs. 1. Education, outreach & engagement 2. Environmental and species interactions 3. Develop co-culture system designs for seaweed and shellfish to optimize culture conditions. 4. Advance precision aquaculture practices and consider opportunities for species diversification (of native species) in commercial aquaculture 5. Identify mechanisms associated with differential performance of diploids and triploid Pacific oyster in response to multiple environmental stressors (Northwest Fisheries Science Center) 6. Develop non-GMO methods to induce sterility in cultured shellfish to enhance performance of cultured shellfish and mitigate genetic risks to native species (Northwest Fisheries Science Center) 7. Assess sensitivity of native and commercially important shellfish species to ocean acidification and parental carryover effects (Northwest Fisheries Science Center) 8. Support the development of a 'restoration marketplace' where shellfish growers raise genetically appropriate native shellfish species for commercial purposes and for restoration efforts **Resources:** • $125k/year to support an existing grant with the Pacific Shellfish Institute and the Puget Sound Restoration Fund. The grant is effective through FY 2024. $210k/year to support Northwest Fisheries Science Center NOAA FTE research staff and one NRC postdoctoral associate through 2022. • $100K/year from NOAA Ocean Acidification Program 2021-2023.
Shellfish 2.4.11 EPA	Microbial Source Tracking of Fecal Pathogen Pollutions (Laboratory Support)	**Outcomes:** Better informed Puget Sound Pollution Identification and Correction (PIC) programs **Outputs:** EPA Region 10's Manchester Environmental Laboratory provides analytical support through microbial source tracking for Puget Sound counties' Pollution Identification and Correction programs. Local water quality teams sample streams and ditches and use DNA analysis (Microbial Source Tracking) methods to help determine whether the fecal bacteria are more likely from dogs, humans, cattle, or other animals.

		This information sheds light on trouble spots, and helps the local governments hone their management actions (e.g., whether to focus on onsite sewage systems or pet waste). **Resources:** • 1.5 laboratory FTE • Increased resources for source tracking requested (e.g., 10 samples/year for WQ districts)
Shellfish 2.4.12 EPA (NOAA, USFWS?)	Washington Sea Grant European Green Crab Monitoring	**Outcomes** • Early detection and monitoring of European green crab in the Salish Sea • Scientific information to support management and reduction of populations of European green crab in the Salish Sea **Outputs** • Washington Sea Grant Crab Team - volunteer and partner-based early detection and monitoring at more than 50 sites in the Salish Sea from April - September • Scientific advice and technical assistance to WDFW, tribes and partners to support assessment and response **Resources:** • Funding from EPA's Puget Sound Habitat Strategic Initiative through December 2022, and potentially other federal funding • (Proposed short-term funding from Washington State Legislature through WDFW through June 2023) • Long-term federal and/or state funding needed
Shellfish 2.4.13 NOAA, USFWS	European Green Crab Control – in field	**Outcomes:** Control and reduce populations of European green crab in north Puget Sound **Outputs** • NOAA WDVA Veterans Conservation Corps Fisheries Internship Program is a Washington-based internship focused on marine science and stewardship of coastal resources. Through this program, NOAA supports the Northwest Straits Commission to trap and remove green crab in partnership with the Washington Department of Fish and Wildlife and Sea Grant from locations in North Puget Sound. • USFWS staff, interns, and volunteers trap and remove green crab on Service lands. Trapping and removal activities, protocols, and data are coordinated and shared with partners including WDFW and Washington Sea Grant.

		Resources • 25 - 50k/year - NOAA Restoration Center • 1-2 Veterans Conservation Corps personnel for seasonal field work support • Standardized trapping and removal protocols and data
Science and Monitoring 2.5.1 USGS, NOAA, EPA (Navy, USFWS, USACE, others)	Federal Puget Sound Science Coordination	**Outcomes:** Improved Federal inter-agency and intra-agency science planning, coordination, and resource allocation in support of the implementation of the Puget Sound Federal Task Force Action Plan, the Puget Sound Partnership Action Agenda, and salmon recovery plans. **Outputs:** • Description of Federal science priorities for supporting Puget Sound Recovery and Tribal Treaty Rights at Risk • Regular engagement through the Puget Sound Federal Task Force Science and Monitoring Work Group • Engagement with the Puget Sound Ecosystem Monitoring Program, the Puget Sound Partnership Science Panel, Action Agenda Implementation Strategy Teams, Tribal agencies, and other Puget Sound recovery science partners • Support implementation of the Partnership's Science Work Plan for 2020-2024 (and its update for 2025-2028) **Resources:** • Support for USGS and USFWS/NOAA through Interagency Agreement with EPA Region 10 • Agency participation by EPA, NOAA, USGS, USACE, USFWS, US Navy, and other interested Federal agencies
Science and Monitoring 2.5.2 USFWS, NOAA, EPA	Stormwater Toxics Studies	**Outcomes:** Improved understanding of the occurrence, fate, and transport, toxicity of tire degradation products (6ppd-quinone) and other stormwater toxics to salmonids and other freshwater and marine aquatic life in Puget Sound. **Outputs:** • Scientific papers and technical memoranda that guide development of more effective management and control strategies to reduce or eliminate toxic compounds or constituent elements. • Continue research, collaboration with agencies, scientists, and Ecology, and the Washington Stormwater Center lab • Training for implementing agencies • Coordination with industry on alternatives • Studies and modeling of green stormwater infrastructure geographic priorities, best practices, and design (e.g., EPA VELMA model, 6PPD, and other toxics issues)

		• Issues like source control, prevention, elimination, and treatment will be considered when designing and funding relevant studies. **Resources:** Support for USFWS, NOAA, and non-Federal partners through Interagency Agreement with EPA Region 10. Potential for collaboration with USGS. EPA staff time.
Science and Monitoring 2.5.3 EPA	6PPD-quinone and 6PPD Toxicology Research	**Outcome:** Learn more about which exposure pathways and biological modes of action result in harm to species, and which species are harmed by 6PPD-quinone and 6PPD. If data allow potential development of species-specific benchmarks for implementation. **Outputs:** Test 6PPD and 6PPD-quinone in high throughput assay formats including fathead minnow larvae (to identify mode of action information via transcriptomics and provide interim points of departure (e.g., LC10)), zebrafish (for behavioral and developmental effects), and rat and human nervous cells (for developmental neurotoxic effects in mammals). **Resources:** EPA staff time, laboratory supplies.
Science and Monitoring 2.5.4 EPA	Convene stakeholders and researchers about mitigating tire particle pollution	**Outcome:** Support mitigation of tire particle pollution as a microplastic, including as a component of stormwater. **Output:** EPA's Trash Free Waters program will convene stakeholders and researchers to explore: • What barriers, opportunities, and needs are there to address the issue of tire particles and associated toxicants more comprehensively and adequately in waterways? • What informational resources already address one or more of the needs? • Brainstorm products for needs not adequately addressed by existing resources Summary report available to all stakeholders/public; including informational resources that will include the input from the stakeholders. **Resources:** EPA staff time, funding for contractor support.
Science and Monitoring 2.5.5 USGS, EPA	Coupled Monitoring and Modeling of Sediment Fluxes in Puget Sound Estuaries	**Outcomes:** Improved understanding of sediment fluxes in the Snohomish Estuary, implications of sediment flux dynamics and habitat responses for restoration project success, and importance of anticipated changes in sediment fluxes and habitat responses due to future climate change and sea-level rise. **Outputs:** Published sediment monitoring data and interpretation, calibrated sediment transport models for use by partners, model outputs under sea level rise and climate change scenarios.

		• Flow and sediment flux, transport, and dynamics studies in Snohomish Estuary • Compound (integrated river and storm-driven coastal) flooding model framework will be used to simulate the processes that drive flow, sediment transport and extreme water levels across the estuarine/floodplain systems. • Linkage to USGS Puget Sound CoSMoS model for marine-side boundary constraints **Resources:** $900K over FY21-FY23 from Interagency Agreement between USGS and USEPA Region 10.
Science and Monitoring 2.5.6 USGS, EPA	Puget Sound Coastal Storm Modeling System (PS-CoSMoS)	**Outcomes:** Ability to predict and visualize impacts of coastal flooding scenarios under scenarios of sea-level rise and climate change through 2100 for Puget Sound shorelines at meter-scale resolution. **Outputs:** • Model outputs for flood extent, depth, duration, and coastal wave energy • Model viewer for flood impact scenarios • High-resolution model development projects with local partners • Model development and use outreach through collaboration with Washington Sea Grant • Linkages to flood impact models on habitat, expected property damages, and other impacts **Resources:** • Multiple funding sources for high resolution model development (King County, City of Bellingham, Whatcom County, Tulalip Tribe, and others) for project-specific shorelines, in progress. • EPA Region 10 Interagency Agreement to support WA Sea Grant collaboration, FY19 – 22 • Support for full implementation of CoSMoS to all remaining Puget Sound shorelines by USGS supported by Interagency Agreement with EPA Region 10, FY22 – 24
Science and Monitoring 2.5.5 USGS, NOAA, EPA	Puget Sound Herring Research Program to Support Recovery	**Outcomes:** Improved understanding of the status of herring populations and the drivers of herring survival, informing how recovery tools could address those drivers. **Outputs:** • Herring Recovery Program information base, assessment of present and future climate impacts to herring survival, open water ecosystem sampling platform instituted, and on-going assessment of herring recovery strategies. • USGS will establish a multidisciplinary Puget Sound Herring research program to support the recovery of Puget Sound forage fish/herring, potentially in collaboration with NOAA, Tribes, WDFW, EPA, and PSP. • Collaborators will refine and implement a multi-party research approach and plan to for recovering pacific herring. Integrate with Canadian First Nation and government efforts.

		• With collaborators, establish a much-needed Puget Sound open water sampling platform for comprehensive ecosystem monitoring. Use it to conduct annual herring surveys to obtain age distribution, life-history, and mortality data to assess population trends. Leverage platform to perform juvenile salmon research and many other ecosystem studies with partners. • Assess potential drivers of herring population abundance and distribution, including infectious and parasitic diseases, predation, prey field shifts, and contaminants. • Perform an early study to determine the extent to which climate change and higher water temperatures increase disease transmission rates and declines in herring survival. Results will improve our understanding of climate>disease dynamics and their impacts on population stability for many species of Pacific Coast fish and wildlife. • Partner with USGS Pacific Coast and Marine Science Center to predict the impacts of climate change-driven coastal flooding on Puget Sound kelp and eelgrass habitat that is vital to forage fish survival (using CoSMoS). • Work with Puget Sound Tribes, First Nations, and others to assess the efficacy of transplanting herring to healthy spawning habitats. **Resources:** • Additional USGS funding of $400K needed annually over five years • Anticipated resources needed for partners, $1.25M annually over five years • USGS Fisheries Program will contribute $250K annually over five years
Science and Monitoring 2.5.6 USGS, EPA	Puget Sound Salmon Habitat Scenarios: Future Stream Temperatures, Stream Flows, and Salmon Habitat Suitability Under Climate Change	**Outcomes:** Improved understanding of potential climate change impacts to Pacific salmon populations in freshwater from the reach to watershed scale by linking predictions of water temperature and flow changes with detailed descriptions of salmon movements and habitat use. **Outputs:** • Predictive models, mapped model outputs, scenario visualizations, and interpretive reports • Establish collaborative group for input to scenarios and to facilitate information exchange. • Track juvenile and adult salmon thermal habitat use and survival using active telemetry for multi-scale monitoring of fish movement and survival. • Monitor and model water temperature and flow at required scales and times. • Using monitoring information and models, predict impacts to fish across habitat scales, seasons, species, and life stages. • Develop a regional Toolkit for conducting assessments across all of Puget Sound. • Support management and protection of cold-water features. **Resources:** Anticipated funding needed

Science and Monitoring 2.5.7 EPA, PNNL	Estuarine Pathogens Modelling	**Outcomes:** Improved understanding of sources, transport, and fate of pathogens in Puget Sound estuaries through modeling, with a focus on Portage Bay, Drayton Harbor, and Samish Bay. **Outputs:** Predictive models, model outputs, and interpretive information **Resources:** Support for the Pacific Northwest National Laboratory (PNNL) Salish Sea Model through Interagency Agreement with EPA Region 10
Science and Monitoring 2.5.8 USGS, EPA, PNNL	Updating and improving nutrient loading and source predictions of Puget Sound Rivers	**Outcomes:** Improved fresh, estuarine, and marine nutrient-related water quality using an updated compilation of available data and new continuous nutrient load monitoring data at targeted key locations in rivers and streams throughout Puget Sound. **Outputs:** • Compile post-2012 water quality data, apply quality assurance procedures, assemble calibration database • Conduct model error assessments for newly calibrated USGS SPARROW and EPA VELMA models to identify major contributors to prediction error • Use error assessment to determine optimal locations for new data collection • Conduct continuous nutrient/loading monitoring at selected sites • Re-calibrate SPARROW and VELMA to generate best available nutrient loading predictions for Puget Sound rivers • Link to PNNL Salish Sea model for Puget Sound estuary predictions • Summarize management implications **Resources:** Anticipated additional resources required
Science and Monitoring 2.5.9 EPA, NOAA, USGS	Address the Health of Puget Sound Species by Understanding the Distinct and Interacting Effects of Contaminants and Pathogens (Salmon and tire dust; Orca and PCBs)	**Outcomes:** Established cell lines for endangered Orca and other untestable species for current and future assessments of chemical bioactivity in laboratory settings. Understanding of how PCBs or other high priority contaminants (e.g., 6PPD) may result in immunosuppression in Orca and increased risk to local pathogens. Contribute data toward the development of adverse outcome pathway for immunomodulation. **Outputs:** • Preserved cell lines, benchmarks for management, potential immunological interventions • USGS has lab facilities with the needed levels of biosafety, enabling researchers to: • Determine the levels of toxicity of 6PPD that result in immunosuppression in salmon and other marine and freshwater species to help EPA develop water quality benchmarks for monitoring, source control, etc. • Develop orca and other species cell lines to examine bioactivity in a laboratory setting

		• Pilot use of the cell line to study the potential immunosuppressing effects of PCBs on orcas' skin, their primary line of defense against many pathogens. **Resources:** USGS will receive support through an Interagency Agreement with EPA Region 10 and will contribute in-kind matching funds. NOAA is providing technical advice, in collaboration through the Storm Water science action (Action 2.5.2).
Science and Monitoring 2.5.10 EPA, NOAA, and USGS	Development of toxicity benchmarks to support protection and recovery of endangered Puget Sound species	**Outcomes**: Development of a framework to establish toxicity benchmarks for untestable charismatic species of the Puget Sound through the integration of New Approach Methods. These methods include but are not limited to immortalized or primary cell lines for endangered Orca and other untestable species that can be used to examine the bioactivity of legacy or emerging contaminants. Linkages between chemical concentrations in orca tissues, such as feces and plasma. **Outputs:** • Preserved cell lines, benchmarks for management • USGS and EPA have lab facilities with the needed levels of biosafety, enabling researchers to determine interim *in vitro* points of departure for 6PPD and other legacy or emerging contaminants to support the development of water quality benchmarks for monitoring, source control, etc. • Compare responses of cell lines in untestable species to points of departure and benchmark values to ascertain the protectiveness of benchmarks established in testable surrogate species • Determine how concentrations in tissues (e.g., feces) that can be safely sampled in wild species (e.g., orca) compare to points of departure determined in vitro or calculated in plasma to enhance the use of in vitro work toward practical monitoring tools. **Resources:** EPA will provide in-kind staff expertise toward benchmark development. NOAA will provide technical advice and support acquisition of samples from protected species. USGS will receive support through an Interagency Agreement with EPA Region 10 and will contribute in-kind matching funds.
Science and Monitoring 2.5.11 EPA	Develop Analytical Method for 6PPD-quinone	**Outcome:** EPA published method for 6PPD-quinone allows states, tribes, and others to measure 6PPD-quinone surface water and storm waters in their watersheds. **Outputs:** • Develop and coordinate a multiagency analytical method development and validation study for 6PPD-quinone (EPA 1600 series surface water/stormwater method).

		• EPA Region 10 convenes monthly roundtable calls to coordinate on 6PPD-quinone analytical methods development and information sharing meetings with federal, state, and tribal laboratories and programs. **Resources:** 0.5 FTE
Science and Monitoring 2.5.12 EPA	6PPD Pollution Prevention and Alternatives Analysis	**Outcome:** Help to remove 6PPD from the supply chain by evaluating alternatives to 6PPD (once known) for toxicological effects. Leverage Washington State's GreenScreen work on 6PPD alternatives. **Outputs:** • Evaluate new compounds via new approach methodologies (NAMs) with supporting *in vivo* testing when warranted of model aquatic species. • Convene conversations across EPA programs, including EPA's Office of Chemical Safety and Pollution Prevention, Office of Research and Development, and Office of Water to discuss opportunities for source reduction. **Resources:** TBD, EPA staff time
Science and Monitoring 2.5.13 USGS, USFWS	Adapting to Climate Change with an Aquatic Disease Rapid Response Program	**Outcomes:** An aquatic disease rapid response program using innovative, cost-effective, pathogen bio-surveillance tools and high throughput screening strategies. The program will also leverage data produced to improve disease intervention strategies, predict the future trajectory of disease, and ultimately build decision support tools for managers. This Puget Sound program builds on a USGS national effort to catalog aquatic diseases and assess how disease patterns are shifting in response to climate change (e.g., recently funded AquaDePTH project). Finally, as a subcomponent, we will train tribal students to become part of the next generation of fish health professionals. **Outputs:** • New program for disease management with new field and laboratory screening tools, improved disease intervention strategies and tribal students trained as fish health professionals. • Establish a cost-effective, rapid pathogen bio-surveillance and screening program using eDNA and next generation equipment to improve the region's ability to identify, monitor and quickly address diseases of concern in fish. • Develop collaboration with non-Federal partners, potentially including specific Tribes, NWIFC, and WDFW. • Pilot the program with a study of Myxozoan parasites that may be leading to high mortality of ESA-listed Chinook, Coho, and Sockeye in the Lake Washington/Lake Sammamish basin. • Assess disease ecology and transmission from warmwater fish and other invasive species to salmonids and other species of concern and develop predictive decision support tools.

		• Refine disease intervention strategies. Expand our suite of treatment options and account for the rise in antimicrobial resistance in pathogens. • Establish a 3-year fish training program for interested tribal students to become certified fish health inspectors. This would include an M.S. at the University of Washington with the thesis completed at WFRC and internships occurring at the fish health programs at NWIFC and WDFW. It is anticipated that this person will be the logical next hire for a fish pathologist position at these institutions. **Resources:** USGS Western Fisheries Research Center would require $400k/year in additional funding over four years. USGS would provide $400k/year to this program from base funding.
Science and Monitoring 2.5.14 EPA, USFWS, BIA, NOAA, USGS, PNNL	Improved Early Detection and Monitoring of European Green Crab in Puget Sound	**Outcomes:** Controlling the impact of the invasive European green crab population beginning to take hold in Puget Sound/Salish through an improved, collaborative science, monitoring, prevention, and eradication strategy. **Outputs:** • Convene interagency work group including Federal, State, tribal, and other partners to coordinate relevant science activities to support the early detection, monitoring, modeling, forecasting, and control of European Green Crab in Puget Sound (EPA) • EPA has funded, and potentially could continue to support, WDFW, Lummi Nation, SeaGrant, etc. green crab monitoring, planning, trapping, etc. • EPA, and other federal agencies, will work with the Lummi Nation and other tribes as appropriate to identify and address invasive species like European Green Crab. • Develop a EGC larval dispersal model for the Salish Sea, with simulation of management scenarios (PNNL Salish Sea Model with EPA funding) • Use bioenergetic models for green and Dungeness crabs to assess invasion potential and vulnerabilities now and under projected climate change and sea-level rise scenarios (USGS) • Contribute to collaborative efforts to refine the approach to incorporating eDNA sampling with traditional sampling (USGS in collaboration with State-led partners) • The convened work group will attempt to secure and leverage long-term resources across multiple agencies to develop and implement a robust integrated monitoring, prevention, and eradication strategy for controlling European Green Crab in Puget Sound, building on the stated Outputs. **Resources:** EPA Region 10 is supporting PNNL and USGS through Interagency Agreements, with USGS providing matching funds for preliminary model and monitoring work. USGS, USFWS, and BIA are exploring potential resources from DOI. Funding to WDFW from EPA's Puget Sound Habitat Strategic Initiative through December 2022. Support for NOAA Fisheries at 250k annually (funds not secured at this time).

Science and Monitoring 2.5.15 NOAA, USGS	Population Effects of Freshwater Restoration	**Outcomes:** Improved understanding of the benefits of large-scale restoration actions at the watershed-scale with the monitoring of the Elwha dam removals. Funding for salmonid monitoring, including SONAR for adult enumeration and screw traps for juvenile outmigration. Current funding cycle of monitoring ceases 2022. **Outputs:** Estimates of listed species including returning adult Chinook salmon and steelhead as well as Coho salmon with the SONAR. Estimate of out-migrating Chinook salmon, steelhead, chum salmon, pink salmon, coho salmon, and steelhead with the screw traps. **Resources:** National Park Service and Lower Elwha Klallam Tribe currently funding fish-in/fish-out in the Elwha River. Funding ceases in 2022. ~$200K per year maintaining two SONARS and three screw traps.
Science and Monitoring 2.5.16 USGS, USFWS	Aquatic Visual Ecology and Artificial Light at Night	**Outcomes:** Improved understanding of the implications of recent and significant increases in artificial light at night on the aquatic visual ecology (e.g., survival and growth of aquatic species and the function of aquatic food webs), an area of study that has been largely ignored. **Outputs:** • Visual foraging models (VFMs) for key predators and other consumers (controlled experiments, e.g., Northern Pikeminnow, Walleye, Basses, Salmonids). • Assessment of visual predation mortality and significant shifts in movement, distribution, behavior by sensitive species, diagnose impediments to migration (field sampling, measurement, and modeling) • Measurements of the dynamic visual environment via in situ instrumentation and remote sensing (e.g., satellite and aerial imagery). • Estimates of species and community responses to changes in light, water transparency/turbidity, and mediating effects of climate change, sea level rise, and other environmental on stratification (thermal, salinity, hypoxia) that affect growth, movement, and interactions of species. **Resources:** The USGS Western Fisheries Research Center would require $75k/year over four years. USGS would provide $50k/year to this program from base funding. USFWS would collaborate, TBD.
Science and Monitoring 2.5.17 USGS	Modeling and Monitoring to Support Instream Flow and Water Availability Assessments in	**Outcomes:** Ability to assess instream flows within the Puget Sound basin, using models and monitoring approaches appropriate to the support of the protection of Treaty Rights. **Outputs:** • Application of a Soil-Water-Balance (SWB) model to Puget Sound to assess vulnerability to stream depletion. • Model-based vulnerability assessment and consultation with tribes to identify areas where tribal treaty rights, including water rights and the right to fish at usual and accustomed areas, are at greatest risk.

	Support of Tribal Treaty Rights	• Prioritization of vulnerable areas to determine where to deploy additional water gaging and deployment of gages. • Assessment and publication of assessment of the state of instream flow conditions in the context of Treaty Rights. **Resources:** Leverages existing USGS models, assessments, programs, and Puget Sound stream gage network. The additional resources needed by USGS for new assessments, model use, and stream gage infrastructure and deployment will be supported by EPA Region 10 through Interagency Agreement.
Science and Monitoring 2.5.18 NOAA	Salmon Life Cycle Models to Identify Priority Habitat Restoration Actions and Climate Resilience Strategies	**Outcomes:** Implement existing Habitat Assessment and Restoration Planning Model to (1) identify high priority habitat restoration actions for ESA-listed salmon and steelhead in Puget Sound river basins, and (2) evaluate alternative habitat restoration scenarios to provide resilience to climate change. Goal is to implement the HARP Model sequentially for major salmon and steelhead populations in Puget Sound. Stillaguamish and Snohomish River basin analyses are in progress. **Outputs:** ● Modeled restoration potential for alternative salmon habitat restoration actions (e.g., barrier removal, riparian restoration, wood augmentation, floodplain reconnection, beaver pond habitat, etc.) at basin and subbasin scales, for identifying the most important restoration actions for Chinook salmon, steelhead, and coho salmon. ● Modeled future effectiveness of restoration actions under climate change. ● Comparison of alternative restoration scenarios (suites of actions and locations), with or without climate change, to identify strategies to increase salmon resilience to climate change. ● Maps of restoration potential by subbasin, action type, restoration strategy, and climate period (current, mid-century, late-century). **Resources:** NOAA NWFSC requires $250,000/year (one river basin per year). NWFSC will complement these funds by directing appropriations internally to this effort.
Science and Monitoring 2.5.19 NOAA	5-Year Biological Review of Yelloweye and Bocaccio Rockfishes in Puget Sound/Georgia Basin	**Outcomes:** ESA-required 5-year update on the stock status of yelloweye and bocaccio rockfishes **Outputs:** ● A new catch reconstruction in Puget Sound for each of the above listed rockfishes ● A new population dynamics model based on catch history and limited length data that updates the stock status of yelloweye rockfish ● Bocaccio remains too difficult to sample, and thus data-limited, to provide a stock status update

		Resources: This is a collaboration with NOAA/NMFS West Coast Region and the Washington Department of Fish and Wildlife. Additional resources such as ongoing data collection and funding to support analyses of the data may be required.
Science and Monitoring 2.5.20 USGS	Improved Framework to Determine how ESA-Listed Species are Responding to Climate Change and other Stressors	**Outcomes:** Develop and implement improved models of the thermal and foraging niche of ESA-listed or other threatened species to identify and quantify the vulnerability or resilience of these species to climate change, invasive species, emerging diseases, contaminant bioaccumulations, urbanization and changing land and water demands. Also, implement bioenergetics models to assess the spread and impact of invasive species in the face of climate change. Use Lake Washington as a test bed for models, then expand use throughout Puget Sound and beyond. Provide results to managers to direct efforts. **Outputs:** • New models and results that inform recovery decision making • Establish collaborative partner group, including WRIA 8, Muckleshoot Tribe, King County, and WDFW, and others. • Using WFRCs state-of-the-art experimental wet lab facilities, parametrize models and corroborate species metabolic and growth responses to stressors (e.g., temperature, food supply, salinity, dissolved oxygen, turbidity, pH, pathogens, etc.) • Quantify current and predicted impacts of climate change and urbanization stressors on ESA-listed salmon and other species of concern. • Quantify predicted impacts of climate change and urbanization stressors on the spread of invasive species and their risks posed to other species via food web interactions. • Work with managers to incorporate results into decision-making frameworks. Consider new ecosystem management frameworks such as RAD (Resist, Adapt, Direct) that is becoming more prominent when considering climate adaptation. **Resources:** USGS WFRC requires $150,000/year for four years (FY22-FY25). WFRC will match these funds by directing appropriations internally to this effort.
Science and Monitoring 2.5.21 USGS	Puget Sound Fish Disease Ecology Program	**Outcomes:** Improved understanding of impacts of infectious disease, contaminants, and other environmental stressors on the health of Puget Sound forage fish and steelhead populations. **Outputs:** Collaborations with partners involving assets at the USGS Marrowstone Marine Fisheries Laboratory - the only federal, state, or private marine biocontainment laboratory facility in the Puget Sound focused on wild fish health

		Resources: USGS Fisheries Program funding of $ annually; (Reimbursable partner funding of $ annually).
Science and Monitoring 2.5.22 NOAA	Puget Sound Habitat Status and Trends Monitoring	**Outcomes:** Update monitoring metrics for large river, floodplain, delta, and nearshore salmon habitats, based on monitoring protocols developed by NOAA NWFSC. These metrics should be updated every five years to assess trends in salmon habitat conditions for the 5-year status reviews for salmon and steelhead listed under the endangered species act. All monitoring protocols are based on aerial imagery interpretation and development/updating of geospatial data sets. **Outputs:** Updated GIS habitat data layers for comparison to baseline data, including ● Updated delta habitat maps (distributary channels, tidal channels, tidal marshes) ● Updated nearshore condition maps (shoreline riparian conditions, overwater structures) ● Updated large river wood jam and riparian condition maps ● Updated floodplain habitat maps (side channels, braids, backwaters) **Resources:** NOAA NWFSC requires $180,000 to support GIS staff for aerial imagery interpretation and updating geospatial data sets for the next five-year status review.
Science and Monitoring 2.5.23 NOAA	Estuarine Habitat Equivalency Analysis (HEA) Science Development	**Outcomes:** Refine data inputs to estuary and nearshore HEA model based on best available science in the region. Data inputs include improvements to fish-habitat relationships as well as effects of habitat impacts and benefits of mitigation. Revise inputs based on existing science, compiled via meetings of science experts. **Outputs:** Accurate model outputs evaluating proposed nearshore and estuarine habitat modifications and mitigation actions. Completed app to facilitate accessibility with users. **Resources:** $75K per year is requested to update model inputs and improve model accessibility.
Science and Monitoring 2.5.24 NOAA	Evaluating Benefits of Estuary Restoration	**Outcomes:** Improved science on how Puget Sound estuary wetland projects have facilitated juvenile growth, survival and productivity for Chinook salmon and other species. Evaluation of cumulative effects of estuary restoration, and causal modeling of benefits of estuary and nearshore restoration for Whidbey Basin stocks (Cumulative Effects Evaluation). **Outputs:** ● Reports, publications, and information sharing of science findings from long-term monitoring studies ● Data to parameterize HARP and HEA models (see above) on estuary-salmon habitat relationships and responses to restoration. ● Data to inform causal model of cumulative effects of restoration.

		• Causal model that can be applied to other basins of Puget Sound. • NOAA work in close coordination with Tribes. **Resources:** $100K per year is requested for CEE model development, data collection.
Science and Monitoring 2.5.25 USGS, USFWS, NOAA, USFS	Puget Sound Culvert and Forest Road Science and Monitoring	**Outcomes:** This action will provide guidance for identification, prioritization, design, and broad scale assessments of the effectiveness of culvert removal and replacement throughout the Puget Sound region. This action will also help identify culverts that indirectly affect fish and aquatic organisms by reducing flood plain connectivity, increasing water temperatures, and affecting channel form and stream geomorphology. Finally, this action works to contextualize and help prioritize culvert and forest road corrective actions based upon their aggregate impact to entire watersheds. This action will inform several implementation activities within this plan, including: Habitat>Crosscutting>2.2.3 = Pacific Coastal Salmon Recovery Fund; Habitat>Fish Passage>2.2.4.4 = National Culvert Removal, Replacement, and Restoration Grant Program; Habitat>Fish Passage>2.2.4.8 = Correct salmon and steelhead culvert fish passage barriers on National Forest System roads; Habitat>Fish Passage>2.2.4.9 = Correct salmon and steelhead culvert fish passage barriers on National Park Service roads; Habitat>Fish Passage>2.2.4.10> Correct salmon and steelhead culvert fish passage barriers on U.S. Navy property. **Outputs:** • Guidance for updates to Washington State water crossing guidelines that are planned for completion in 2024. This includes but is not limited to: guidance for large culvert thalweg design to emulate natural habitat and ensure functional fish passage; for design to be more climate resilient, accounting for increased flow variability and peak magnitude, and changes to sediment dynamics associated with climate change; support for ongoing hydrodynamic modeling that USGS is providing to Washington Department of Fish Wildlife to access scenarios and threshold effects; and results of a 10 yr and ongoing monitoring program evaluating in- and near-culvert stream characteristics. • Guidance to help prioritize proposed culvert removal and replacement activities based on resiliency and likelihood of long-term success for supporting fish passage, stream function, and transportation infrastructure. • Guidance for considering and prioritizing specific culvert replacement and road service actions in the context of entire watersheds, accounting for aggregate impacts to floodplain connectivity, stream geomorphology, sediment runoff, and broader impacts to a watershed's hydrologic regime. • Regional implementation of low-cost, culvert identification and assessment tools for federal lands, including "FLOwPER" and "RoadStr". This activity will collect data for a broader assessment of culvert impacts, beyond fish passage.

		• Development and implementation of key parameters for assessing culvert performance and low-cost tools (e.g., eDNA, tiered gaging, etc.) to broadly monitor and assess the status of road-stream crossings, and efficacy of culvert removal and replacement activities to determine at a regional scale whether significant investments in culvert replacement are paying off. **Resources:** Funding for federal personnel staff time and field operations.
Science and Monitoring 2.5.26 NOAA, USGS	Science Centers and Facilities – Infrastructure	**Outcomes:** Sufficient science infrastructure to support cutting edge Fisheries science efforts to support the protection and restoration of Puget Sound, addressing on-going facilities concerns at the listed Centers. **Outputs:** • Leases for facilities • Communication of specific infrastructure/capability needs to all partners. Targeted messaging around specific Fisheries science facilities issues. • Improvements and maintenance to address specific important needs. • The NOAA Northwest Fisheries Science Center is currently working with GSA on a potential lease of a new Seattle-based laboratory because of the impending SR 520 reconstruction project. This, along with hoped for investments in NWFSC research facilities at the NOAA Western Regional Center and the Manchester Research Station will provide cutting edge science to support the protection and restoration of Puget Sound. • USGS Marrowstone Laboratory requires improvements and maintenance to continue to provide its unique role as a marine biocontainment laboratory facility in the Puget Sound focused supporting wild fish health research. **Resources:** Contingent on Congressional appropriations.
Governance 4.1 PSP	Puget Sound Partnership and the Action Agenda	**Outcomes:** Improved conditions necessary for restoration, conservation, or protection efforts to take place or succeed. **Outputs** • Invite PSP Executive Director to PSFTF meeting annually • PSP and PSFTF staff regular meetings • PSP-PSFTF coordination aligns federal activities to support Action Agenda **Resources:** PSFTF staff time

Governance 4.2 Tribes	Treaty Rights at Risk	**Outcomes:** Improved consistency between federal action and honoring reserved treaty rights. **Outputs** • Integrate and implement federal actions that are responsive to Tribal requests • Consult with tribes on the development and implementation of the Action Plan • Review federal priorities and receive input from the Tribal Management Conference annually • Support and manage the established national Treaty Rights at Risk CEQ/Federal issue elevation resolution process **Resources:** PSFTF staff time
Governance 4.3 ECB	Puget Sound Ecosystem Coordination Board (ECB)	**Outcomes:** Improved conditions necessary for restoration, conservation, or protection efforts to take place or succeed. **Outputs** • EPA, USACE, NOAA regular ECB attendance • Provide updates to the ECB on PSFTF activities as well as raise ECB matters at PSFTF meetings • PSFTF/federal agency participation in development of ECB workplans **Resources:** PSFTF staff and member agency staff time
Governance 4.4 Leadership Council	Puget Sound Leadership Council	**Outcomes:** Improved conditions necessary for restoration, conservation, or protection efforts to take place or succeed. **Outputs** • Coordinate with the Puget Sound Partnership as needed on Puget Sound Leadership Council business • PSFTF/federal agency participation in development of Leadership Council workplans **Resources:** PSFTF staff time
Governance 4.5 PSSRC	Puget Sound Salmon Recovery Council (PSSRC)	**Outcomes:** Increased assurance of appropriate federal agency policy, funding, and program alignment to support salmon, steelhead and habitat protection and restoration. **Outputs** • PSFTF/federal agency participation in development and implementation of PSSRC workplans **Resources:** PSFTF member agency staff time

Governance 4.6 Local, Non-profits, and Universities	Local Governments, Non-profit Organizations, and Universities	**Outcomes:** Improved conditions necessary for restoration, conservation, or protection efforts to take place or succeed. **Outputs** • PSFTF coordinate with local governments, non-profit organizations, and universities on the implementation of this Action Plan. • PSFTF coordinate federal actions to support local government, non-profit organizations, and universities' work to recover Puget Sound. **Resources:** PSFTF staff time

Acronyms

Action Agenda	Puget Sound Action Agenda
Action Plan	Puget Sound Federal Task Force Action Plan
ACEP	Agricultural Conservation Easement Program
AIS	Automatic Identification System
ALE	Agricultural Land Easements
AOP	Aquatic Organism Passage
AREMP	Aquatic and Riparian Effectiveness Monitoring Program
B-IBI	Benthic Index of Biotic Integrity
BIA	Bureau of Indian Affairs
BiOp	Biological Opinion
BMP	Best Management Practices
CAP	Continuing Authorities Program (§206)
CEC	Contaminant of Emerging Concern
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CFV	Commercial Fishing Vessel
CGP	Construction General Permit
CGVTS	Coast Guard Vessel Traffic System
CANUSPAC	Canada – U.S. Joint Marine Pollution Contingency Plan Pacific Geographical Annex
CEAP	Conservation Effects Assessment Project
CoSMoS	Coastal Storm Modeling System
CRP	NOAA Community Based Restoration Program
CRS	Community Rating System
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund

CWISA	Clean Water Indian Set-Aside
CZARA	Coastal Zone Act Reauthorization Amendments
DoD	United States Department of Defense
DOH	Washington State Department of Health
DOI	United States Department of Interior
ECB	Ecosystem Coordination Board
ECY	Washington State Department of Ecology
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ERFO	Emergency Relief for Federally Owned Roads
ESA	Endangered Species Act
ESRP	Estuary and Salmon Restoration Program
FbD	Floodplains by Design
FDA	United States Food and Drug Administration
FEMA	Federal Emergency Management Agency
FFFPP	Family Forest Fish Passage Program
FHWA	Federal Highway Administration
FLAP	Federal lands Access Program
FLTP	Federal Lands Transportation Program
FPRB	Fish Passage Removal Board
FTA	Federal Transit Administration
FTE	Full Time Equivalent
FY	Fiscal Year
GMO	Genetically Modified Organism
GRP	Geographic Response Plan

HAB	Harmful Algal Bloom
HARP	Habitat Assessment and Restoration Planning Model
HEA	Habitat Equivalency Analysis
HGMP	Hatchery and Genetic Management Plan
HHC	Human Health Criteria
HPA	Hydraulic Project Approval
HQ	Headquarters
IFCB	Imaging Flow Cytobot
LO	NEP Watershed Lead Organization
LCC	Landscape Conservation Cooperatives
LIO	Local Integrating Organization
MART	Multi-Agency Review Team
MBSNF / MBS	Mount-Bake Snoqualmie National Forest
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-Sector General Permit
MORA	Mount Rainier National Park
MOU	Memorandum of Understanding
MRC	Marine Resources Committee
NAMs	New Approach Methodologies
NCCOS/NOS	National Centers for Coastal Ocean Science/National Ocean Service
NCF	Nisqually Community Forest
NCWCGP	National Coastal Wetland Conservation Grant Program
NDZ	No Discharge Zone
NEP	National Estuary Program
NERR	National Estuarine Research Reserve
NF	National Forest

NFIP	National Flood Insurance Program
NFPP	National Fish Passage Program
NGO	Non-governmental organization
NOAA	National Oceanic and Atmospheric Administration
NOAA MDP	National Oceanic and Atmospheric Administration Marine Debris Program
NOCA	North Cascades National Park
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRDA	Natural Resource Damage Assessment
NWAC	Northwest Area Committee
NWFSC	NOAA Northwest Fisheries Science Center
NWIFC	Northwest Indian Fish Commission
NWP	Nationwide Permit
OA	Ocean Acidification
OCNMS	Olympic Coast National Marine Sanctuary
OLY	Olympic National Park
ORD	EPA Office of Research and Development
OSG	Sewer Overflow and Stormwater Reuse Municipal Grants
PAWSS	Ports and Waterways Safety System
PCSGA	Pacific Coast Shellfish Growers Association
PIC	Pollution identification and correction
PNNL	Pacific Northwest National Laboratory
PSAW	Puget Sound and Adjacent Waters (§544)
PSEMP	Puget Sound Ecosystem Monitoring Program

PSFTF	Puget Sound Federal Task Force
PSNERP	Puget Sound Nearshore Ecosystem Restoration Project
PSP	Puget Sound Partnership
PSRF	Puget Sound Restoration Fund
PSSST	Puget Sound Stormwater Science Team
PSSRC	Puget Sound Salmon Recovery Council
PSVTS	Puget Sound Vessel Traffic Service
RAD	Restriction-site Associated DNA sequencing
RCPP	Resource Conservation Partnership Program
REPI	Readiness and Environmental Protection Integration Program
ROV	Remote Operated Vehicle
RSMP	Regional Stormwater Monitoring Program
RRT	Regional Response Team
SAM	Stormwater Action Monitoring
SIAT	Strategic Initiative Advisory Team
SLS	Sustainable Lands Strategy
SMA	Shoreline Management Act
STIP	State Transportation Improvement Program
SW	Stormwater
SRFB	Salmon Recovery Funding Board
TNC	The Nature Conservancy
TRAR	Treaty Rights at Risk
TTP	Tribal Transportation Program
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture

USDOT	United States Department of Transportation
USFS / FS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UW	University of Washington
VELMA	Visualizing Ecosystem Land Management Assessments
VTRA	Vessel Traffic Risk Assessment
VTS	Vessel Traffic Service
WA	Washington State
WAC	Washington Administrative Code
WDOH	Washington Department of Health
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOL	Washington Department of Licensing
WFLHD	Western Federal Lands Highway Division
WFRC	USGS Western Fisheries Research Center
WFWO	USFWS Washington Fish and Wildlife Office
WRE	Wetlands Reserve Easements
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation
WDVA	Washington State Department of Veterans Affairs
WSU	Washington State University