USGS
science for a changing world

Western Fisheries Research Center 2023-2027 Strategic Plan

Science is the compass
that will help us navigate our changing world.

Updated February 2025

Message from the Director

It's been nearly 90 years since the Western Fisheries Research Center (WFRC) was formed. Since the 1930s, we have evolved from a U.S. Fish and Wildlife Service center for managing disease in Pacific Coast fish hatcheries to a major force in aquatic ecology within the Ecosystem Mission Area of the U.S. Geological Survey.[1]

We are now internationally known for our work to understand and address aquatic diseases; a critical player in science and cutting-edge decision support model development to improve water infrastructure management for safe fish passage, expanding critical habitat, and improving water quality; an untangler of complex food webs to isolate primary impacts to threatened fish; and a dot connector between a variety of human stressors and the processes driving aquatic ecosystem health.

Now more than ever society needs strong science to guide decision making. The combined impacts of rapid climate change and unwavering human population growth are threatening our natural resources and humanity. We must implement a robust ecological science strategy, one that is focused on supporting agile management that can adjust to a changing ecosystem, protects our water and the critical species that call it home (many of which we rely on for food), and prevents public health and economic crises.

Our strategic plan establishes a framework for WFRC over the next five years. Working with national leadership and our broad suite of partners, we have identified the following goals to **provide the science and innovation needed** to recover, maintain, and sustainably utilize our fish and their aquatic ecosystems:

- Understand, detect, and reduce the impacts of disease and invasive species
- Provide the science to improve water management for fish and people
- Integrate food web ecology into species management
- Understand the effects of human population growth on aquatic ecosystems in our region

Our success depends on stronger partnerships, increased recognition of our role in providing the science needed for ecosystem management, new skills and technologies, well-operating facilities, and a robust science support team. We must also meet the needs of our workforce: improving our financial position; providing contemporary job flexibility; and ensuring a collaborative work environment.

We are up to the task, and we are confident that our work will make a difference.

Michael Schmidt
Western Fisheries Research Center Director

1 Seventy-five years of science—The U.S. Geological Survey's Western Fisheries Research Center. 2013. General Information Product 149. https://doi.org/10.3133/gip149

Who we are

The U.S. Geological Survey (USGS) has been a source of independent science about the Earth and its processes since 1879. We don't regulate resources. Instead, our role is a trusted resource for unbiased, policy-neutral information within the Department of the Interior. Western Fisheries Research Center (WFRC) is one of 17 ecosystem-focused USGS Science Centers across the United States. We are one of only two USGS science centers focused exclusively on fisheries and aquatic science.

Our mission at WFRC is to provide the science and tools needed to recover, maintain, and sustainably utilize our fish and their aquatic ecosystems in the Western United States. As a Center of the USGS, we monitor, analyze, and predict the evolving dynamics between humans and nature. Through collaborative, multi-disciplinary science, we help resource managers make informed, timely decisions in fish and aquatic species management.

Figure 1. Word cloud created by WFRC staff explaining how we would like our partners to view us.

Where we work

While we work throughout a broad geographic range of the Western United States, our efforts primarily focus on specific riverine, lake and coastal aquatic ecosystems considered high priority for conservation. From North to South, these areas currently include Prince William Sound (Alaska), the Puget Sound Basin and Olympic Peninsula, and mountain lake systems (Washington), the Columbia River and its many tributaries (Washington, Oregon, and Idaho), the Klamath Basin (Oregon and California), and the San Francisco Bay/Delta Basin (California). We also continue some research on desert fish ecology in the Great Basin (Nevada, Utah, California), and we conduct research at regional and national scales. Overall, many of our efforts are integrated with USGS national endeavors.

Over the next five years, we will focus on increasing our science role in the regions we currently work, with a broader emphasis on the river, lake and coastal ecosystems in the western portions of Washington, Oregon and California. We will also strive to increase our focus on drought-stricken rivers and lakes, warming fresh and marine waters, and the rapidly changing Arctic, seeking to develop predictive information to help managers deal with current challenges and imminent change.

Puget Sound

USGS Priority Landscape

ESA-listed Species: Chinook & summer chum salmon, steelhead, eulachon, yelloweye rockfish, bocaccio, bull trout, abalone

Tribal First Foods: salmon, steelhead, herring, lamprey, shellfish, crab

Columbia River Basin

USGS Priority Landscape

ESA-listed Species: Chinook, chum, coho & sockeye salmon; steelhead; eulachon; bull trout

Tribal First Foods: salmon, steelhead, lamprey, sturgeon, shellfish, crab

Klamath River Basin

USGS Priority Landscape

ESA-listed Species: Shortnose, lost river, & warner suckers; Chinook & coho salmon; hutton tui chub; tidewater golbi

Tribal First Foods: salmon, steelhead, lamprey, suckers

San Francisco Bay-Delta

USGS Priority Landscape

ESA-listed Species: Chinook salmon, steelhead, delta smelt, eulachon, tidewater goby, abalone, fairy shrimp

Tribal First Foods: salmon, steelhead, lamprey, shellfish, sturgeon

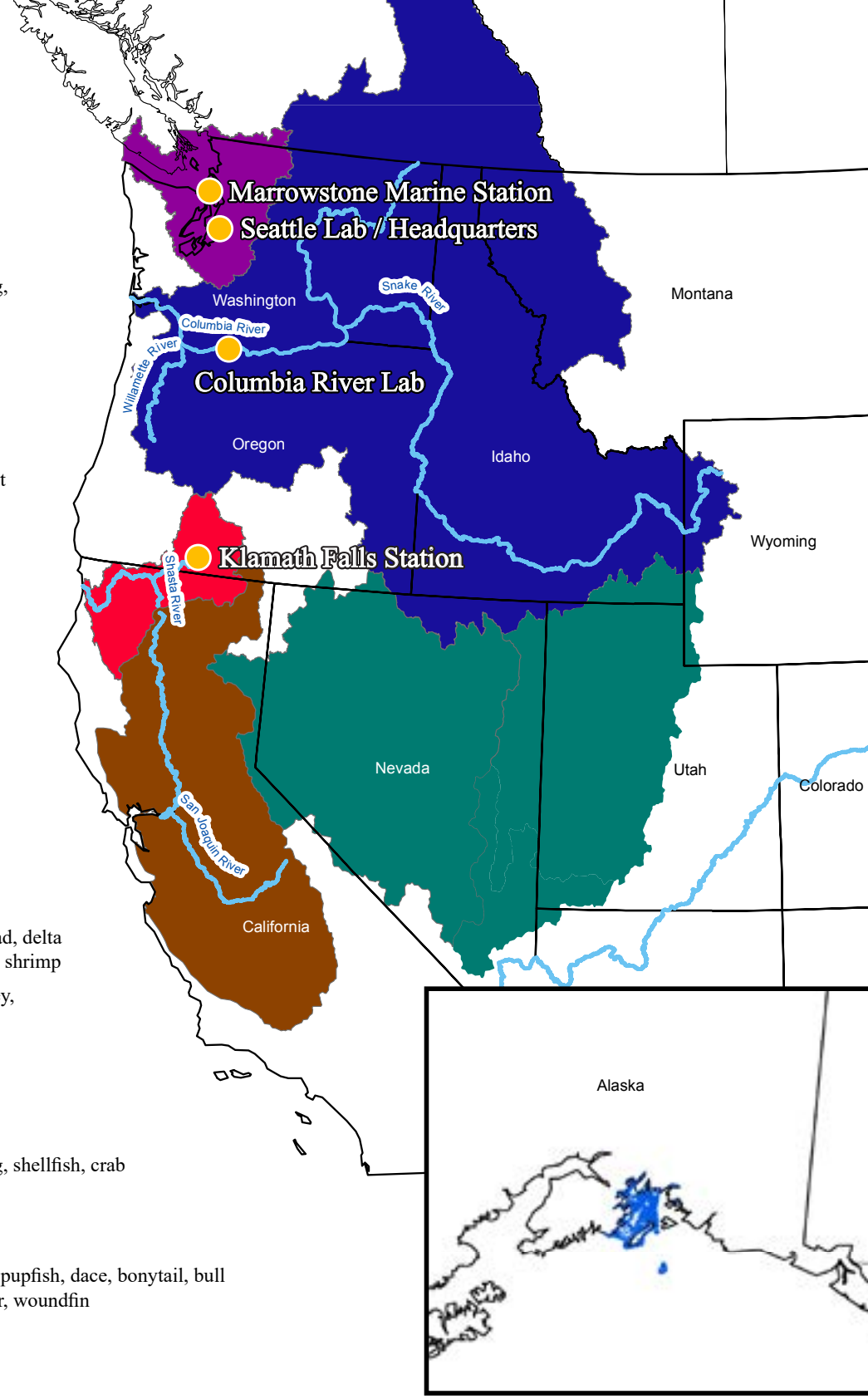
Prince William Sound

WFRC Focal Species: Herring

Tribal First Foods: salmon, steelhead, herring, shellfish, crab

Great Basin

ESA-listed Species: Lahontan cutthroat trout, pupfish, dace, bonytail, bull trout, cui-cui, chub, springfish, poolfish, sucker, woundfin



● Facilities

USGS Priority Landscapes = Priority Landscapes | U.S. Geological Survey (usgs.gov)

ESA-listed Species = Source is USFWS and NOAA endangered and threatened species online lists. ECOS: Home (fws.gov), Threatened and Endangered Species Directory Page | NOAA Fisheries

Tribal First Foods = In this case, fish of historical, cultural, and dietary importance to west coast tribes and First Nations.

Today's challenges

Our Earth and society face unprecedented challenges from climate change. Covering 71% of the earth's surface, water is our lifeblood. Not only do we drink it, we rely on it for clean energy, transportation, recreation, to grow food, and for the wild bounty aquatic ecosystems provide. With climate change, we are facing longer droughts, less freshwater, more dramatic flood events, changes to the timing and magnitude of river flows, and rising sea levels. And, our waters are warming, holding less oxygen, and becoming more acidic.

These impacts are fundamentally changing our aquatic ecosystems. Fish and other aquatic species die, redistribute, or change their behavior to cope; invasive species spread further and faster into new, now more habitable environments; food webs change altering predators and prey; physical habitat diminishes; and disease and toxic algae become more prevalent. Further, our demand for water for clean energy, drinking, and growing food only exacerbates these effects.

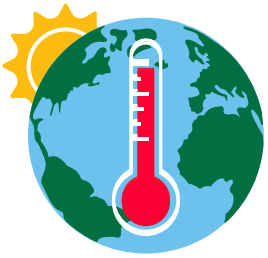
Beyond climate change, our human footprint in aquatic ecosystems is substantial. For example:

- Dams provide critical clean energy, water, flood control, transportation and agriculture but affect water quality and fish survival, migration, and distribution.
- Shoreline development alters fragile estuary and coastal habitats.
- Aquaculture (hatchery and farmed organisms) and the need for sustainable fisheries will increase with demands of national food security and meeting tribal treaty and other obligations.
- Contaminants from stormwater, sewage or industrial activities weaken or kill fish, or the fish pass them on to humans or other species like endangered orca whales. This is of great concern to western tribes who consume a larger proportion of fish relative to the general population.
- Artificial light at night (ALAN) has increased rapidly across the globe in a very short period. ALAN can severely affect the physiology, foraging and migratory behavior, predation risk and reproduction of many aquatic organisms.

These dynamic and growing challenges reflect an urgent need for science to support more accurate, agile, and responsive natural resource management.

71%

OF THE EARTH'S SURFACE IS WATER



With climate change, we are facing longer droughts, less freshwater, more dramatic flood events, changes to the timing and magnitude of river flows, and rising sea levels. And, our waters are warming, holding less oxygen, and becoming more acidic.

HUMAN POPULATION GROWTH

Beyond climate change, our human footprint in aquatic ecosystems is substantial.

How we operate

WFRC staff conduct comprehensive, innovative, collaborative[2], interdisciplinary science at the level needed to inform the management of complex nature of ecosystems. We do this through extensive data collection and thorough analyses, and by providing results and developing tools for resource management. While publishing results is critical to distributing our science, our primary goal is to ensure that our research actively guides natural resource decision making. We support the "learning" element of adaptive management and strongly value long-term monitoring and evaluation to provide constant feedback to managers regarding how to be agile in our dynamic natural world.

We are experts in fish and aquatic species behavior, life history and population dynamics; bioenergetics and food web ecology; habitat utilization; and disease and invasive species ecology. We apply this expertise to understanding a variety of ecological impacts, many of which are listed in the "Challenges" section above. We also recognize that human health is intrinsically tied to the health of animals and our shared environment, and we align our work and expertise to support USGS' role in the Center for Disease Control's One Health initiative[3].

Our work occurs within 4 programs of the Ecosystem Mission Area:

- Biological Threats and Invasive Species Research Program
- Environmental Health Program
- Species Management Research Program
- Land Management Research Program

2 See "Critical to Success, Our Partners" section below.
3 https://www.cdc.gov/onehealth/basics/index.html.

We apply a multitude of

skillsets, tools and techniques

within our fields of expertise. They include:

> Innovative quantitative analyses, statistical modeling, big data utilization, and decision support tool development accounting for: behavior, epidemiology, habitat, bioenergetics, visual ecology, foraging, health, genomics, and population dynamics

> Histopathology, Virology, Bacteriology, Parasitology, Immunology

> Fish tagging (PIT, radio and acoustic telemetry), and behavior and survival analyses

> eDNA collection and analysis

> gene transcription

> Hydroacoustics, midwater trawling and other data collection strategies across aquatic habitats, species and life stages

> Age, growth and elemental analysis using scales, otoliths and other bony structures

Our facilities

Our success is supported by our unique and strategically located laboratories and field stations. WFRC has three sites in Washington and one in Oregon (reference previous map).

Our headquarters and **main fish and aquatic animal health and ecology laboratory** is in Seattle, Washington. This large facility features state-of-the-art equipment with clean, pathogen-free and temperature-controlled freshwater and the capacity to simultaneously perform dozens of studies.

Along the eastern shores of Puget Sound, our **Marrowstone Marine Field Station** is the only saltwater disease and ecology laboratory of the Department of the Interior. Our facility utilizes cold, clean saltwater from the depths of Puget Sound to support numerous studies of marine fish, shellfish, and other organisms.

Our second largest facility, the **Columbia River Research Laboratory** in Cook, Washington is the hub for our fish and aquatic ecology work in the Columbia Basin and beyond. This field station provides a central location for field work and data analytics, as well as a small freshwater lab for field equipment trials and ecology experiments.

Finally, our **Klamath Falls Field Station** is located along the upper portion of the Klamath Basin, where water is increasingly scarce and in high demand by both people and fish. Here, our scientists assess the population dynamics, behavior and impacts to endangered suckers and threatened salmon, with the goal of providing guidance to managers with the difficult task of allocating water.

Our goals for 2023-2027

Over the next five years, we aim to provide critical science and innovation in support of the following goals:

Understand, detect, and reduce the impacts of disease and invasive species

Disease and invasive species are a persistent and growing threat to western ecosystems. Climate change, aquaculture, global trade, habitat alterations and other human stressors such as contaminants all contribute to the severity of disease and invasive species impacts on our native plants and animals. WFRC staff will contribute to managing these impacts through the following actions:

- Collaborate with others to develop and sustain invasive species and disease bio-surveillance programs in the West. Support USGS efforts to establish a national **Early Detection Rapid Response** infrastructure.
- Understand and forecast the role of climate change: on the prevalence and intensity of disease, and on the distribution of invasive species and how they alter habitats and food webs.
- Collaborate with USGS scientists across the country to create the Aquatic Disease and Pathogen (AquaDePTH) database and assess how disease patterns shift in response to climate change.
- Determine levels of disease and invasive species suppression required to prevent damage to our native species and help develop approaches to reduce their impacts.
- Optimize methods for incorporating eDNA sampling and other next generation approaches into pathogen and invasive species bio-surveillance and screening to identify, monitor and quickly address diseases and invasive species of concern.
- Assess disease ecology and transmission from warmwater fish and other invasive species to salmon and other species of concern and develop risk-based decision support tools.
- Determine the impact of contaminants on the disease resistance of aquatic species of concern. Use this to broadly inform our understanding of the impact of these stressors to levels of immunity in vertebrates.
- Refine disease intervention strategies to mitigate risks. Expand our suite of treatment options and reduce risks of antimicrobial resistance in pathogens.
- Continue to support our federal, state, tribal, and industry partners to manage disease in hatcheries and aquaculture.
- Study and develop statistical models to forecast and help mitigate disease impacts in wild herring populations along the Pacific Coast.
- Focal invasive species include: European green crab, northern pike and other warmwater invasive fish, shad, zebra/quagga mussels, and African clawed frog.

WFRC scientists work to identify how 6ppd—a chemical in tire dust that washes into local streams—may compromise the immune systems of some threatened salmon populations of the Pacific Northwest. Results inform water quality benchmarks for managing this toxic threat.

Improve water management for fish and people

Dams and other water diversions are a source of clean energy, water, transportation and agriculture but affect water quality and fish survival, migration, and distribution. They are a focus of the 2021 Infrastructure Investment and Jobs Act and vital to achieving President Biden's goal of a carbon-free power grid by 2035. Further, nearly 300 hydroelectric dams are up for federal relicensing between 2020 and 2030, three times the number in the previous decade. Built before the Clean Water Act and salmon protections via the Endangered Species Act, these older dams must increase their mitigation responsibilities to comply with modern environmental laws.

The struggle to meet the water demands of both fish and people is only increasing as climate change takes its toll. WFRC scientists will continue to play a crucial role in improving water management through the following actions:

- Collect pertinent data, apply innovative statistical analyses, and develop novel models that connect habitat, flows, water quality, and ecosystem effects to fish outcomes as tools for ongoing water and fish management. Expand upon work in Klamath, Bay Delta and Columbia River.
- Continue to inform Columbia River, Puget Sound and coastal water and fish management, fish passage improvements, and habitat restoration, via: fish passage, fish survival, bioenergetics, food web ecology, and water quality studies.
- Increase our understanding of ways to mitigate climate change impacts. Increase efforts in areas with dramatic changes in water availability and quality due to heavy drought or warming temperatures.
- Assess the feasibility of salmon and other native species introductions upstream of currently impassable barriers to: provide access to cold water and quality rearing habitat in the face of climate change, and restore historic tribal and First Nation access to fish (see inset).
- Advance the use of fish tracking and remote sensing, machine learning, data management and quantitative analyses to improve our understanding of riverine ecology, the impacts of dams and other water diversions, the outcomes of dam removal, and other fish recovery actions.
- Grow the USGS Dam Removal Information Portal for river restoration practitioners and decision makers.
- Maximize the value of sucker and salmon recovery actions in the Klamath basin. Help evaluate efforts to supplement and boost the sucker population, assess outcomes of actions to improve lake water quality, and monitor and evaluate salmon recovery and interactions with suckers during and following dam removal.
- Assess the impacts of water management on pacific lamprey survival with partners in the Pacific Lamprey Conservation Initiative.
- [Emerging] Foster the sustainability of coastal communities by working with developers of wind, tidal energy, desalination, and other new climate change-driven technologies to mitigate impacts to aquatic resources.

WFRC is collaborating with Upper Columbia United Tribes to assess the viability of salmon reintroduction above the currently impassable Chief Joseph and Grand Coulee dams.

Integrate thermal impacts and food web ecology into species management

The complex nature of food webs, metabolism, and their sensitive relationship with temperature and other aspects of the physical environment has proven a challenge for the management and recovery of individual species of concern. The effects of changes to prey availability and the foraging efficacy of predators (e.g., influence of turbidity and artificial lighting on salmon predation); the impacts to a species' metabolism or consumption rates; and the underlying mechanisms that cause these impacts, can be difficult to identify without comprehensive studies.

WFRC staff expect to continue our work to develop and apply strategies to understand and address impacts of a changing food web into species management. We will:

- Develop and apply bioenergetics models to predict thermal responses and quantify growth potential or consumption demand by native and invasive species under current and future conditions. Also apply these models to estimate stress or habitat suitability related to changes in temperature, pH, hypoxia; quantify predation impacts to species of concern; assess bioaccumulation of contaminants; evaluate the impacts of sea level rise.
- Further integrate our bioenergetics and food web ecology expertise across our study areas (invasives, disease, water management, species introductions, human impacts) to identify, quantify, and address survival bottlenecks for species of concern.
- Assess the effects of kelp and seagrass communities on species interactions, foraging success, and productivity using experimental arenas at Marrowstone Field Station, and use the station to develop supplementation methods for key marine community species (e.g. sunflower sea stars, pinto abalone, kelp).
- Work with Puget Sound collaborators to define impacts to herring and other forage fish survival and assess recovery strategies. Herring are fundamental to a healthy marine ecosystem, including the survival of threatened Chinook salmon and their top predator, the endangered southern resident orca.
- Evaluate the role of increasingly present anchovy populations in Puget Sound and their impact as alternative prey or competitors to salmon.
- Support the creation of a Puget Sound open water sampling platform to perform comprehensive ecosystem studies of herring, forage fish and juvenile salmon.

WFRC is working with Seattle City Light and the National Park Service to investigate factors limiting the growth and survival of native rainbow, bull, and dolly varden trout, given the proliferation of the non-native redside shiner, brook and brown trout in Ross Lake. Results will inform reservoir and water management decisions.

- Assess the occurrence and outcomes of changes to species abundance and distribution due to climate change and other human disturbances. This includes the predation and competition impacts of the growing number of warmwater fish in western states on threatened, native coldwater fish populations.

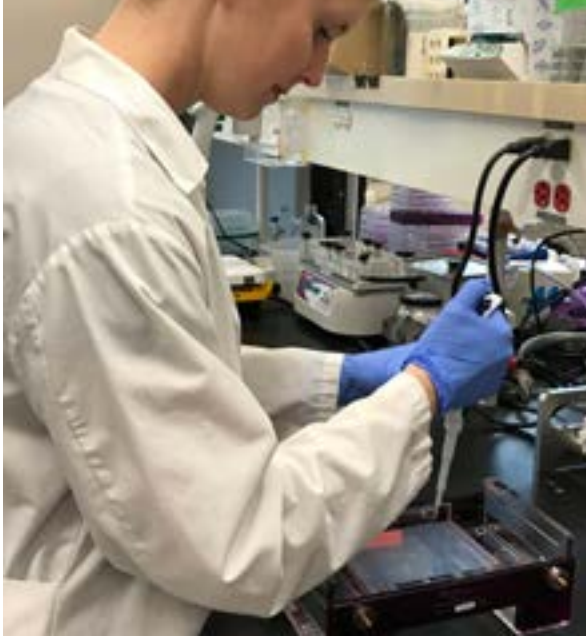
Western states continue to experience significant population growth. With more people come a greater range of stressors. Urban development, transportation, and concentrated demands for food, water, and building materials combine with the global influence of climate change to put extreme pressure on our local ecosystems. To address these issues, WFRC staff will:

- Assess the impacts of dramatic increases in Artificial Light at Night in Lake Washington (see box to the right).
- Work with the University of Washington and others to establish Lake Washington as a natural laboratory for assessing the cumulative impacts of urbanization and climate change. Use Lake Washington as a case study for urban aquatic ecosystems around the globe.
- Work with USGS Centers and the Northwest-Pacific Islands Regional Office to establish a collaborative, unified Columbia River Basin contaminant monitoring program to identify areas of greatest risk to fish and the tribal and other communities who consume them. Partners include the tribes, state, EPA and others.
- Identify how contaminants of concern affect the health and survival of fish and the endangered southern resident orca that consume them.

A night photo of Lake Washington, where we focus on determining the impacts of Artificial Light at Night on the physiology, foraging and migratory behavior, predation risk and reproductivity of salmon and other high valued species. Results can help city planners regulate the locations, quantity and types of lighting allowed.

- [Emerging] Perform vulnerability assessments for ecosystems threatened by oil spills, development, contaminants, and other pressures.
- [Emerging] Work with USGS Centers and other federal, state and tribal partners to provide science that guides the identification, prioritization, design and efficacy of culvert replacement work, supporting local efforts to improve water connectivity and increase fish habitat.

How we will get there



Evolving our science capacity

Meeting these goals will take strategic adjustments to our science capacity. We plan to:

- Strengthen collaboration among our Center's sections, USGS Science Centers, other USGS divisions, and other partners to ensure the science is being done at appropriate ecological scale.
- Bring our science closer to management by increasing our capacity to perform or contribute directly to decision science & decision support tool development.
- Build upon our data management, data visualization, and analytical capacity through staffing and technology (modeling, statistics, AI/ machine learning, coding, GIS, remote sensing).
- Account for climate change impacts in all our science sections.
- Build stronger collaborations with social science to improve the impact of our work on human behavior.
- Grow our aquatic invasive species and environmental health programs to meet the science demands along the Pacific Coast.
- Continue our history of technological innovation to advance acoustic telemetry for fish tracking and increase the use of visual imagery for assessing physical and biological processes.
- Refine the use of eDNA and incorporate high throughput screening for aquatic disease and invasive species surveillance.

Science support

Our administrative, facilities, information technology, communications and data management staff play a fundamental role in the success of our Center and its science. We will ensure our science support teams are adequately staffed and resourced so they can: improve process efficiencies and coordination with science staff; organize and centralize our data to increase coordination, transparency and use; and increase the recognition of the role of the Western Fisheries Research Center in science through targeted communications and partnerships.

We must also strategically invest in our facilities given the critical role they play in supporting our types of science. Priority facility improvements include:

- Completing water temperature control, automation, alarm notification, system redundancy, and effluent management upgrades to our Seattle laboratory.
- Protecting our Marrowstone Marine Field Station from rising high tides by completing the construction of a new berm around the facility.
- Moving the Columbia River Research Laboratory to a new facility. The building is antiquated and too expensive to update.

- Rehabilitating our currently inactivated Biosafety Level-3 laboratory in Seattle by replacing outdated equipment, repairing ventilation, improving maintenance protocol, and integrating controls into the laboratory facilities mainframe.
- Finally, we will continue to make our operations more environmentally friendly. This includes reviewing our waste management practices and implementing the Department of the Interior policy to phase out single-use plastics by 2032.

Workforce and culture needs post COVID-19

The Covid-19 pandemic had a dramatic impact on the global workforce. Baby boomer retirements and a massive drop in immigration have contributed to a high supply of jobs relative to jobseekers. Further, remote or telework is now broadly accepted as a successful method of operation. Over the next five years, we will:

- Aggressively promote job vacancies
- Target the next generation of research grade scientists to lead our science.
- Improve our succession plan in response to WFRC's aging workforce.
- Provide incentives to attract new and retain existing employees.
- Increase flexibility in work location, supporting telework and remote work when feasible.
- Diversify staff types (employees, contractors, interns) to be more agile and responsive.
- Promote collocating with other USGS Centers or partners at our owned facilities to maximize their use.
- Implement workplace culture actions focused on camaraderie, collaboration, optimism, and good mental health in a distributed work environment.

Financial Strategy

About 60% of WFRC's funding currently comes from collaborative and technical assistance agreements with partners and competitive grants, while the other 40% is appropriated to the USGS by Congress. While a reliance on contracts and grants is not unusual among the 17 USGS Ecosystem Mission Area Science Centers, we are one of only 3 Centers where appropriations make up less than half of their funding. Inflation combined with a highly competitive job market is dramatically increasing operations costs. There is also an increased need for science to support agile management in the face of climate change. Therefore, we are targeting increasing our budget by 20% over the next five years. To achieve this, we aim to:

- Increase recognition of our work and our value at regional and national levels with the goal of increasing internally allocated funds so that they make up over 50% of our funding.
- Continue to build and maintain collaborative relationships and fulfill the science needs of our partners.

60%

of WFRC's funding currently comes from agreements with partners and competitive grants

40%

is appropriated to the USGS by Congress

Partners are critical to our success

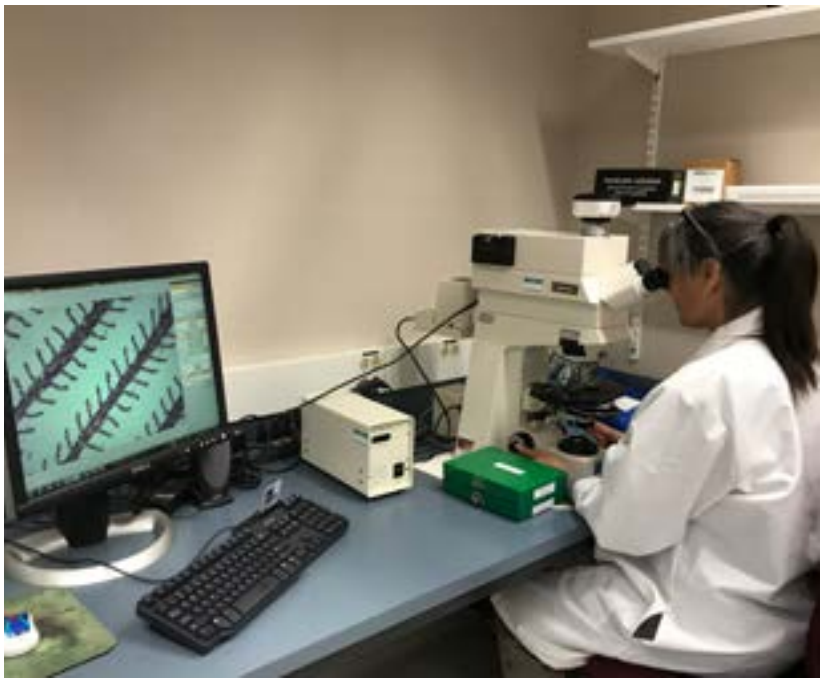
We can't do meaningful science alone. Our diverse partnerships are fundamental to the success of our research at every level: collaborating to identify priorities, execute the work, support our efforts, and ensure our results influence management. WFRC currently has over 80 federal, tribal, state, local government, academic, nonprofit and private partners. Over the next five years, we will strengthen and grow our partner relations by:

- Establishing a partnerships coordinator position for WFRC.
- Increasing general communications with partners from ground to administrative level.
- Continuously updating joint priorities with collaborators, aligning them with our national priorities, and actively seeking mechanisms for performing the needed science.
- Growing our relationship with the Pacific States Marine Fish Commission.
- Improving the recognition of our partners in our communications.
- Working with the USGS Science Publishing Network to reduce the time it takes to distribute our research results to partners.

Key partner call out

Over 20% of WFRCs partners are west coast tribal nations. These tribal nations have treaty rights to—and are heavily dependent on—local fishery resources for food, culture and their economies. In many places, the tribes actively co-manage resources with federal, state and local governments. For decades, WFRC scientists have worked closely with tribal scientists and managers to develop and execute the science needed to recover fish populations and improve their management. Over the next five years, we will focus on strengthening our tribal relations. In addition to the partner actions listed above, we will:

- Establish a tribal liaison position at WFRC to improve our level of communications and strength of partnerships with the tribal community
- Jointly develop programs to share knowledge and expertise between USGS WFRC and partner tribes (see example in inset).
- Help establish pathways into federal service for young tribal biologists via recruitment-oriented internships with WFRC.



A strong fish health workforce is needed to sustain local hatchery operations and keep up with the growing impacts of disease on our aquatic ecosystem. WFRC is working with the Northwest Indian Fisheries Commission, Washington Department of Fish and Wildlife and the University of Washington to establish a program that targets tribal students interested in becoming 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.

Western Fisheries Research Center partners

Federal

U.S. Geological Survey: Ecosystem and Water Divisions and Centers, Climate Adaptation Science Centers, and Cooperative Research Units

U.S. Fish and Wildlife Service

National Park Service

Bureau of Reclamation

National Oceanic and Atmospheric Administration—National Marine Fisheries Service

Department of Agriculture Animal and Plant Health Inspection Service (APHIS)

Forest Service

U.S. Army Corps of Engineers

Environmental Protection Agency

Bureau of Land Management

Bonneville Power Administration

Bureau of Indian Affairs

State

Pacific States Marine Fisheries Commission

Washington Department of Fish and Wildlife

Washington Gov Salmon Recovery Office

Puget Sound Partnership

Oregon Department of Fish and Wildlife

Idaho Fish and game

California Department of Water Resources

California Department of Fish and Game

Local and Municipal

County Soil and Water Conservation Districts

King County—WRIA 8

Seattle City Light

Seattle Public Utilities

Academic

University of Washington

Oregon State University

Washington State University

Virginia Institute of Marine Sciences (VIMS)

Federally Recognized Tribes

Tulalip Tribes of Washington

Nisqually Indian Tribe

Muckleshoot Indian Tribe

Lummi Tribe of the Lummi Reservation

Makah Indian Tribe of the Makah Indian Reservation

Confederated Tribes and Bands of the Yakama Nation

Coeur d'Alene Tribe

Spokane Tribe of the Spokane Reservation

Confederated Tribes of the Umatilla Indian Reservation

Confederate Tribes of the Colville Reservation

Upper Skagit Indian Tribe

Swinomish Indian Tribal Community

Port Gamble S'Klallam Tribe

Klamath Tribes

Kootenai Tribe of Idaho

Kalispel Indian Community of the Kalispel Reservation

Other Tribal Parties

Winnemem Wintu Tribe

Skagit River System Cooperative

Columbia River Inter-Tribal Fish Commission

Northwest Indian Fisheries Commission

Upper Columbia United Tribes

Nonprofits

Long Live the Kings

Trout Unlimited

Delta Stewardship Council

Exxon Valdez Oil Spill Trustee Council

High Desert Partnership

National Science Foundation

North Pacific Research Board

Northwest Power and Conservation council

Bonneville Environmental Foundation

Pacific Salmon Commission

Puget Sound Restoration Fund

Kenebec Biosciences

International

University of Waterloo Canada

Fisheries and Ocean Canada

Centre for Environment, Fisheries and Aquaculture Science, United Kingdom

Pacific Salmon Foundation, Canada

World Organization of Animal Health (OIE), France

Shenzhen Technology University, China

Shenzhen Academy of Inspection and Quarantine Sciences, China

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