Northwest **Power** and **Conservation** Council

November 5, 2024

MEMORANDUM

TO: **Council Members**

FROM: **Erik Merrill, Independent Science Manager, and Kris Homel, Biologist for Program Performance and ISAB Ex Officio Representative**

SUBJECT: **Independent Scientific Advisory Board (ISAB) 2024 Review of the Columbia River Basin Fish and Wildlife Program**

BACKGROUND:

Presenters: Stan Gregory, ISAB ad hoc member, Tom Quinn, ISAB Chair, and John Epifanio, ISAB Executive Committee member

Summary: The ISAB has a basic responsibility to evaluate the Columbia River Basin Fish and Wildlife Program (Program) of the Northwest Power and Conservation Council (Council) on its scientific merits in time to inform amendments to the Program. After 40 years of implementation, the Program has guided significant improvements to fish passage, habitat protection and restoration, hatchery operations, and research, monitoring, and evaluation. At the same time, the Basin is challenged by declining native fish populations, threats to biodiversity, and ongoing ecosystem degradation. The Program's scientific framework, goals, and objectives are critical to guiding the Program's actions and evaluating their performance to improve fish and wildlife populations and their habitats and meet mitigation responsibilities.

This ISAB report reviews the 2014 Fish and Wildlife Program and its 2020 Addendum, updating findings from the ISAB's 2018 Review of the 2014 Program. In the 2020 Addendum, the Council amended the 2014 Program

to 1) further define Program goals and objectives, 2) develop indicators to measure Program performance, and 3) establish implementation priorities.

The 2018 ISAB Review of the 2014 Fish and Wildlife Program found many strengths: mainstem passage research, Protected Areas, reestablishing anadromous fish in the blocked areas, life cycle models, and public engagement. The ISAB's 2018 review also identified areas for improvement. The 2020 Addendum focused primarily on addressing ISAB and regional recommendations to refine and further develop the Program's Goals and Objectives; consequently, many of the ISAB's recommendations for other sections of the 2014 Fish and Wildlife Program remain relevant and important to address in future revisions.

In this 2024 review, the ISAB highlights several valuable improvements made after the 2018 review that strengthen the scientific basis of the Program.

Important Accomplishments

- Development of more quantitative Program Objectives
- Strategy Performance Indicators that will track progress continuously for selected key metrics on the Council's online Program Tracker
- Progress of the Upper Columbia United Tribes and support by the Council and BPA to develop plans to reintroduce anadromous fish above Grand Coulee and Chief Joseph dams.

The ISAB also identifies several areas that could be strengthened and recommends approaches to track progress toward achieving the mitigation goals of the Program.

Major Recommendations for Improvement

- Develop a standard analytical process and annually report the total run size of salmon and steelhead to track progress toward the goal of 5 million salmon and steelhead by 2025.
- Establish Strategy Performance Indicators to be tracked for each salmon and steelhead stock for the major subbasins.
- Establish a process to identify the multiple M&E activities within geographic areas, describe what is being monitored, and how the monitoring is being evaluated and reported.
- Assess how climate-related changes in temperature and flow variability could affect natural production, habitat conditions, and likely ranges of species, which could reduce the effectiveness of Program measures and investments. Develop anticipatory approaches to evaluate options for adaptation to climate change.
- Design an eDNA monitoring program for the Columbia River Basin and develop performance indicators based on the resulting monitoring information.

The ISAB emphasizes that a primary accomplishment of the 2020 Addendum was the development of more quantitative Program Objectives and new Strategy Performance Indicators that track progress continuously for selected key metrics. Several Program objectives relate to contributing to achieving various abundance and distribution targets. Tracking these targets is hampered by data availability and funding for monitoring; thus, new cost-effective methods, such as eDNA, and collaborations with other sources of data and information will be important additions to the Program. In addition, the ISAB's 2024 review emphasizes increased support for assessments and testing of feasibility of reintroductions of salmon and steelhead in the blocked areas, new methods for climate assessment and monitoring non-native species, improvements in strategies for RM&E, and other actions to strengthen the Program.

The ISAB's presentation will highlight the report's conclusions and recommendations.

Relevance: The Program and ISAB Terms of Reference call for the ISAB's review of the Program on its scientific merits in time to inform the Program amendments. Council staff are currently drafting a request for recommendations to amend the Program, and the ISAB review is intended to inform the region when developing recommendations for the 2025 Program amendment process.

Workplan: Scientific reviews are an integral part of the Fish and Wildlife Program's work plan.

More Info: The report is posted (link) and available as a Word document (link) in BOX.

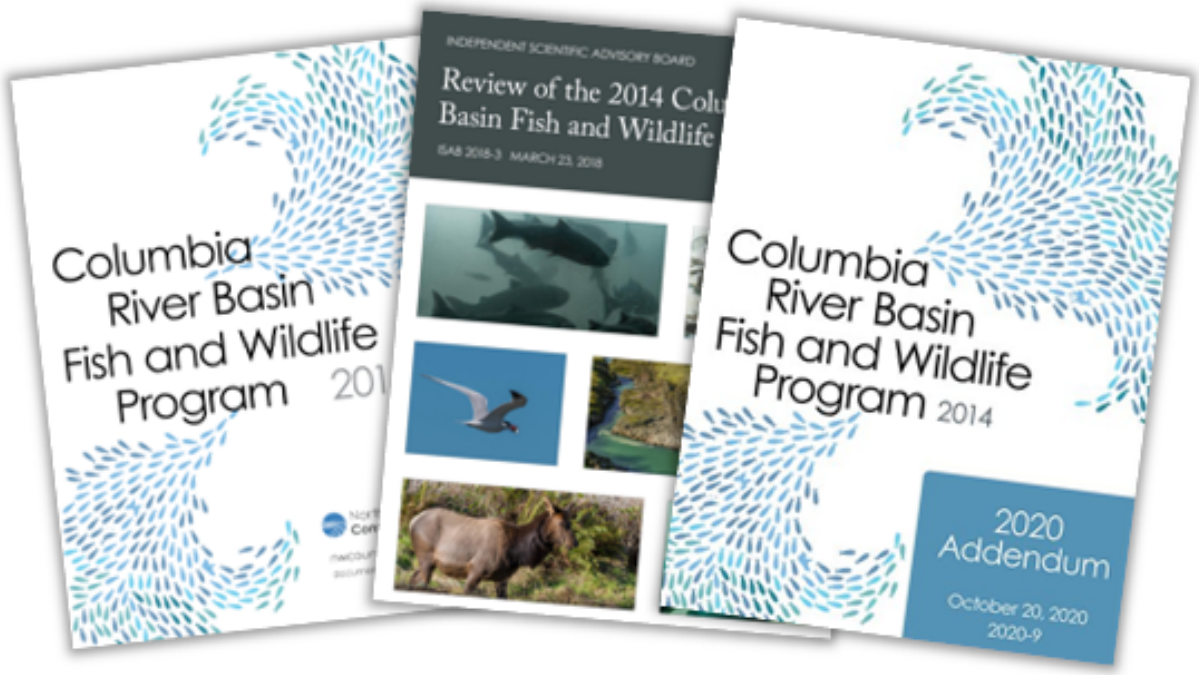
Evaluate scientific merits of the Fish and Wildlife Program to inform 2025 Program amendments

Northwest Power & Conservation Council
November 14, 2024

ISAB INDEPENDENT SCIENTIFIC ADVISORY BOARD

ISAB 2024 REVIEW OF THE COLUMBIA RIVER BASIN FISH AND WILDLIFE PROGRAM

Update of ISAB 2018 Report Findings on Review of 2014 Program and New Comments on 2020 Addendums



ISAB 2024-2
September 16, 2024

ISAB Members

- **Courtney Carothers, Ph.D.,** University of Alaska, Fairbanks, Alaska
- **Patrick Connolly, Ph.D.,** US Geological Survey (Emeritus), Cook Lab, Washington
- **John Epifanio, Ph.D.,** University of Illinois (Retired), Portland, Oregon
- **Dana Infante, Ph.D.,** Michigan State University, East Lansing, Michigan
- **James Irvine, Ph.D.,** Pacific Biological Station (Emeritus), Nanaimo, British Columbia, Canada
- **Yolanda Morbey, Ph.D.,** Western University, Ontario, Canada
- **Thomas P. Quinn, Ph.D.,** University of Washington, Seattle, Washington
- **Kenneth Rose, Ph.D.,** University of Maryland Center for Environmental Science, Horn Point, Maryland
- **Desiree Tullos, Ph.D.,** Oregon State University, Corvallis, Oregon
- **Ellen Wohl, Ph.D.,** Colorado State University, Fort Collins, Colorado
- **Michael Young, Ph.D.,** US Forest Service (Emeritus), Rocky Mountain Research Station, Missoula, Montana

- **Stanley Gregory, Ph.D.,** Oregon State University (Emeritus), Corvallis, Oregon (Ad Hoc Member)

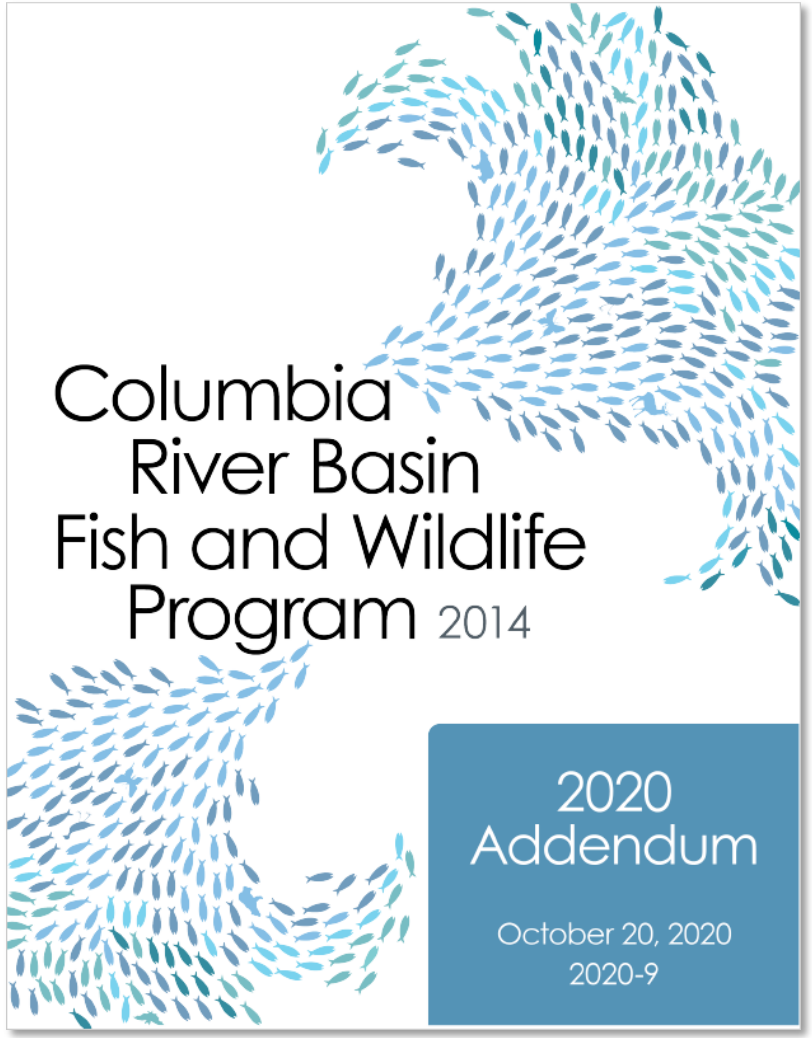
ISAB Ex Officios and Manager

- **Kris Homel, Ph.D.,** Northwest Power and Conservation Council, Portland, Oregon
- **Michael Ford, Ph.D.,** Northwest Fisheries Science Center, Seattle, Washington
- **Robert Lessard, Ph.D.,** Columbia River Inter-Tribal Fish Commission, Portland, Oregon
- **Erik Merrill, J.D.,** Northwest Power and Conservation Council, Portland, Oregon

Evaluate scientific merits of 2014 Fish and Wildlife Program to inform 2018 Program amendments

Northwest Power & Conservation Council
April 11, 2018

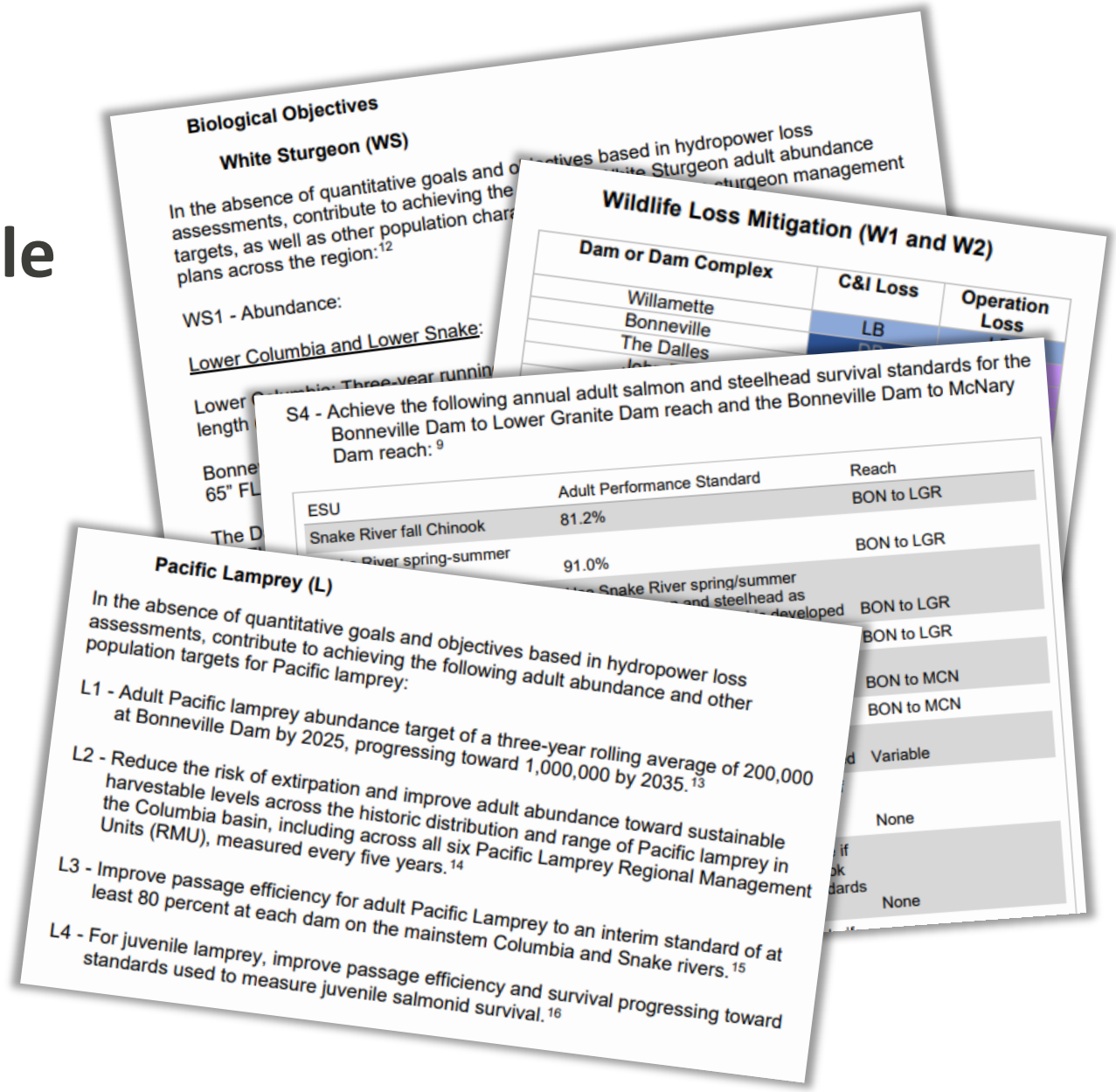
Major Accomplishments and Recommendations for Improvement



Major Accomplishments

- Better and **more measurable**

  Program Objectives



Biological Objectives

White Sturgeon (WS)

In the absence of quantitative goals and objectives based in hydropower loss assessments, contribute to achieving the Sturgeon adult abundance targets, as well as other population chara sturgeon management plans across the region:[12]

WS1 - Abundance:

Lower Columbia and Lower Snake:

Lower Three-year runnin length

Bonne 65" FL

The D

Wildlife Loss Mitigation (W1 and W2)

Dam or Dam Complex	C&I Loss	Operation Loss
Willamette		
Bonneville	LB	
The Dalles		

S4 - Achieve the following annual adult salmon and steelhead survival standards for the Bonneville Dam to Lower Granite Dam reach and the Bonneville Dam to McNary Dam reach: [9]

ESU	Adult Performance Standard	Reach
Snake River fall Chinook	81.2%	BON to LGR
River spring-summer	91.0%	BON to LGR
Snake River spring/summer and steelhead as developed		BON to LGR
		BON to LGR
		BON to MCN
		BON to MCN
		Variable
		None
		None

Pacific Lamprey (L)

In the absence of quantitative goals and objectives based in hydropower loss assessments, contribute to achieving the following adult abundance and other population targets for Pacific lamprey:

L1 - Adult Pacific lamprey abundance target of a three-year rolling average of 200,000 at Bonneville Dam by 2025, progressing toward 1,000,000 by 2035.[13]

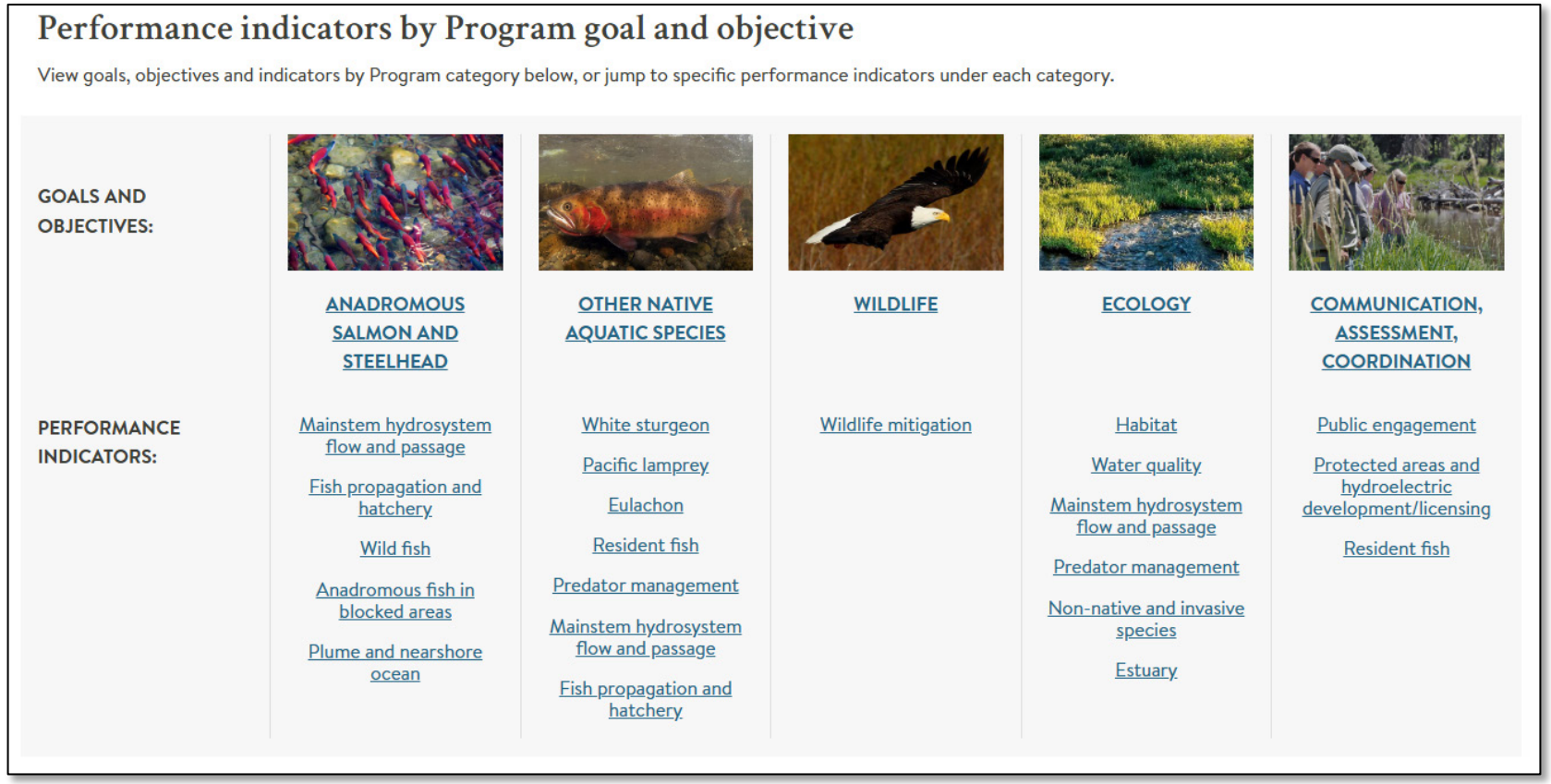
L2 - Reduce the risk of extirpation and improve adult abundance toward sustainable harvestable levels across the historic distribution and range of Pacific lamprey in the Columbia basin, including across all six Pacific Lamprey Regional Management Units (RMU), measured every five years.[14]

L3 - Improve passage efficiency for adult Pacific Lamprey to an interim standard of at least 80 percent at each dam on the mainstem Columbia and Snake rivers.[15]

L4 - For juvenile lamprey, improve passage efficiency and survival progressing toward standards used to measure juvenile salmonid survival.[16]

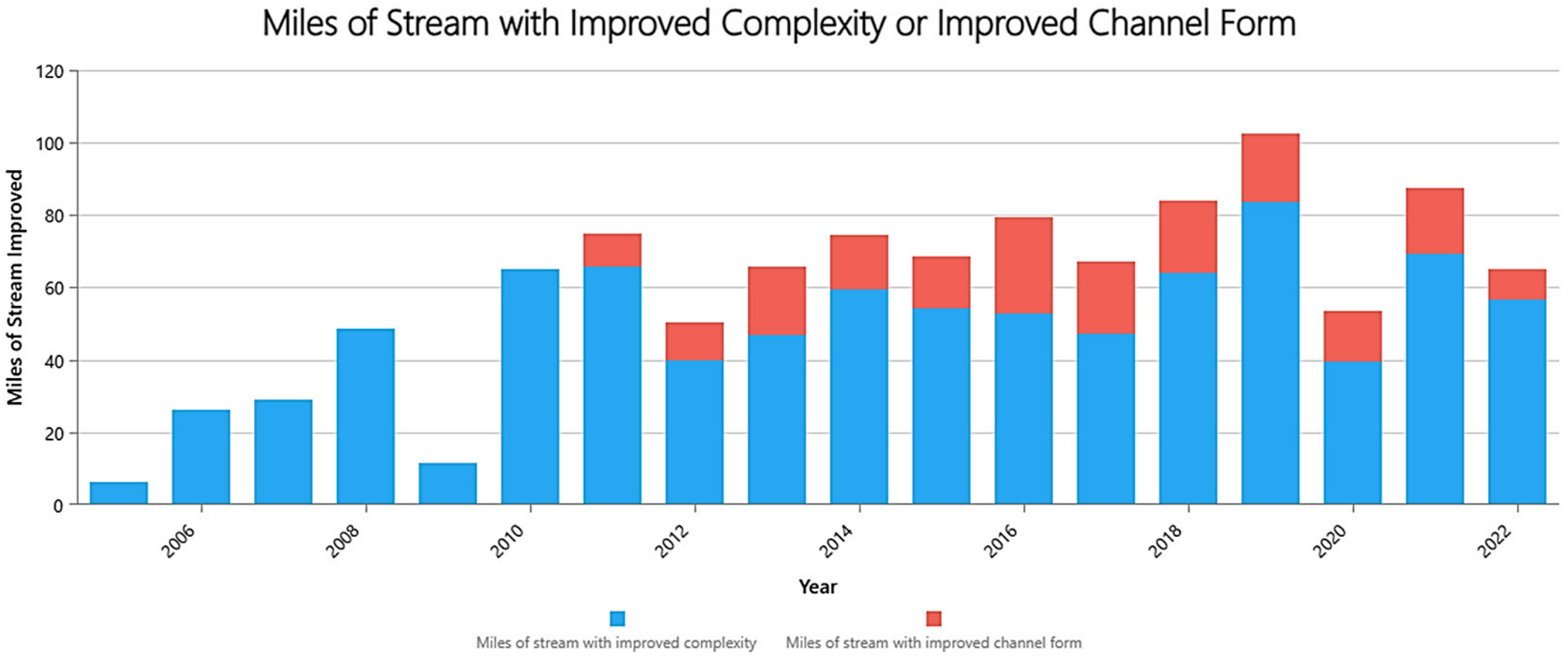
Major Accomplishments

- Strategy Performance Indicators that **track progress continuously** for key metrics on the Council's online [Program Tracker]



Major Accomplishments

- Strategy Performance Indicators that **track progress continuously**



Major Accomplishments

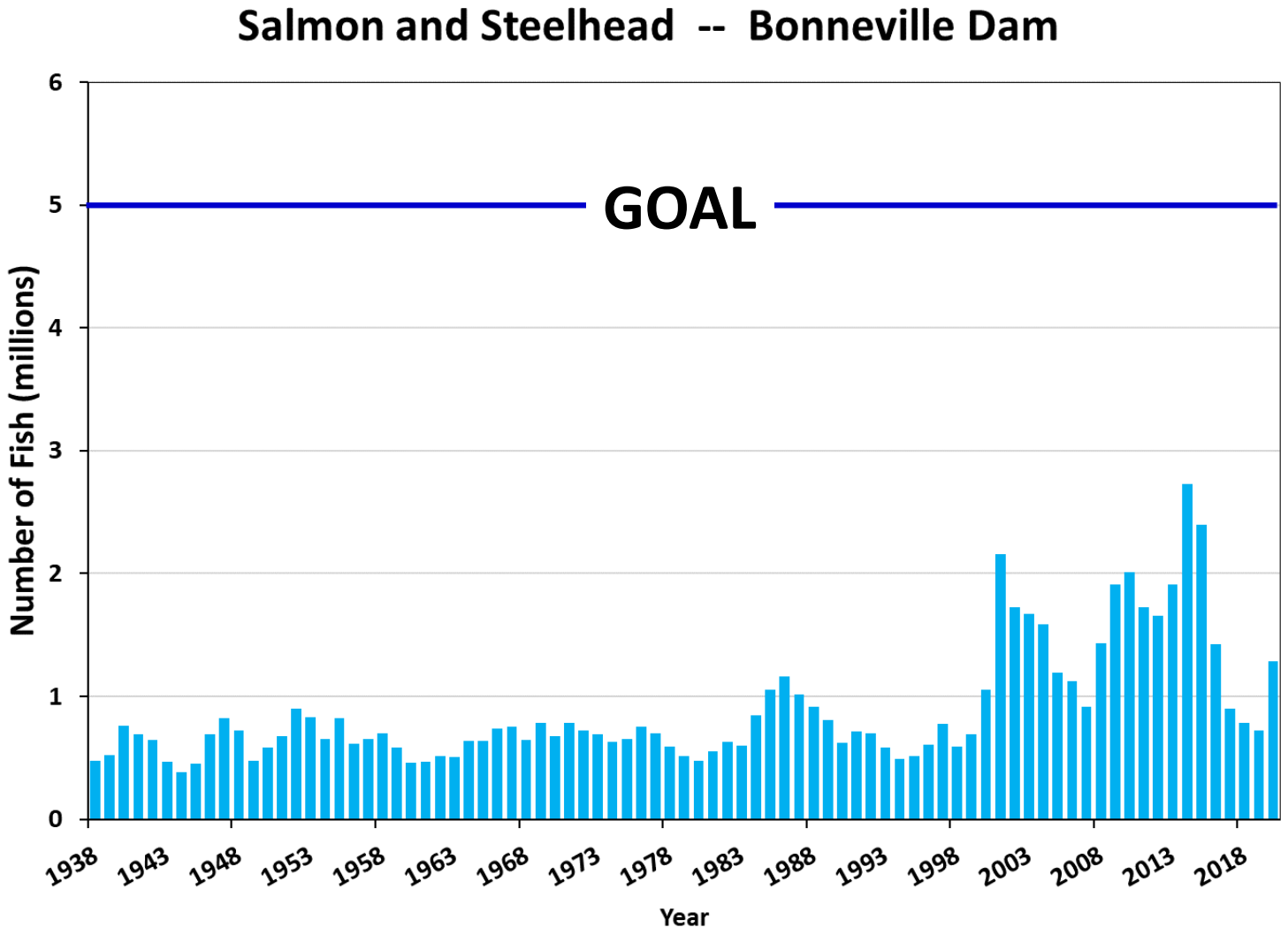
- Progress of Upper Columbia United Tribes to assess feasibility and develop plans to **reintroduce anadromous fish** above Grand Coulee and Chief Joseph dams

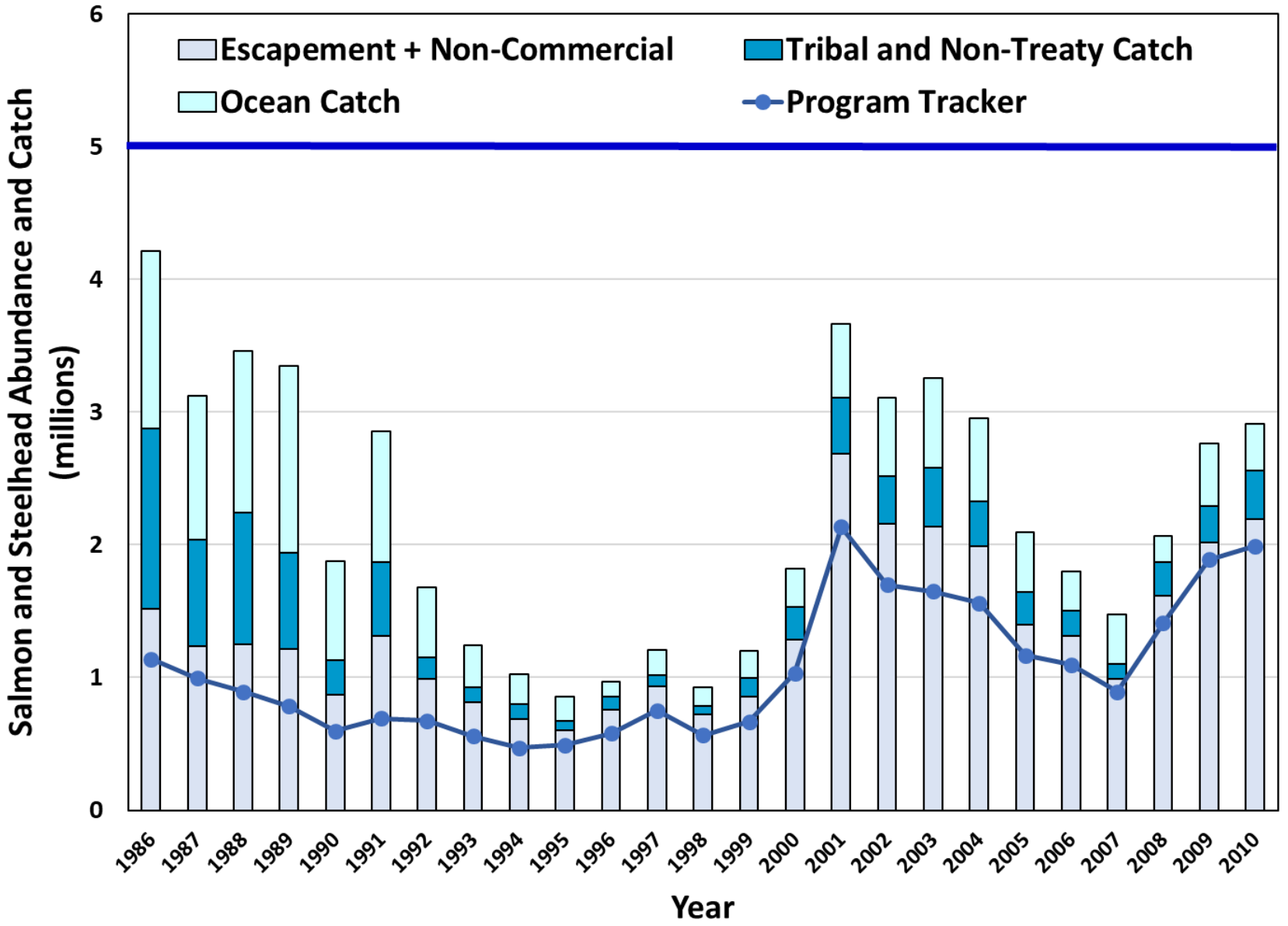
Major Accomplishments

- Plans for science to guide reintroductions and achieve important cultural values

Recommendations for Improvement

- Standard analytical process to annually report the total run size of salmon and steelhead to track progress toward the goal of **5 million** by 2025




Escapement + Non-Commercial
Tribal and Non-Treaty Catch
Ocean Catch
Program Tracker
Salmon and Steelhead Abundance and Catch (millions)
0
1
2
3
4
5
6
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
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2006
2007
2008
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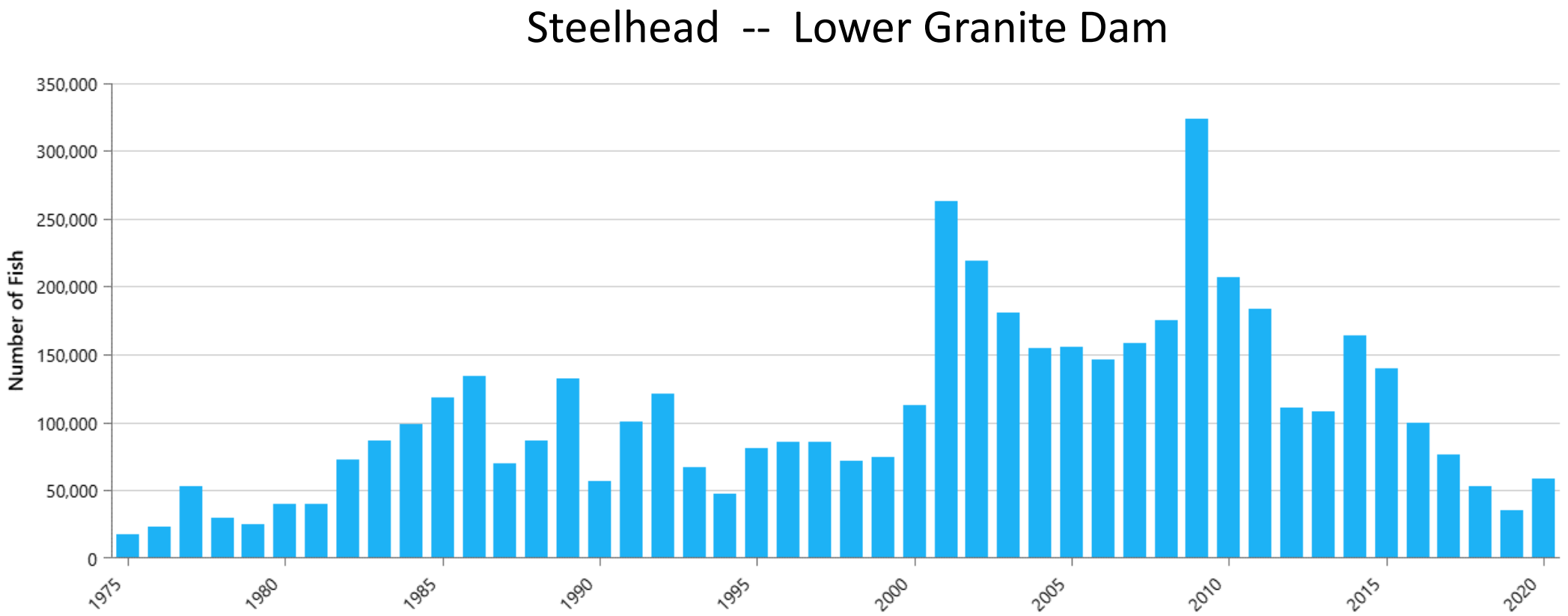
2010
Year

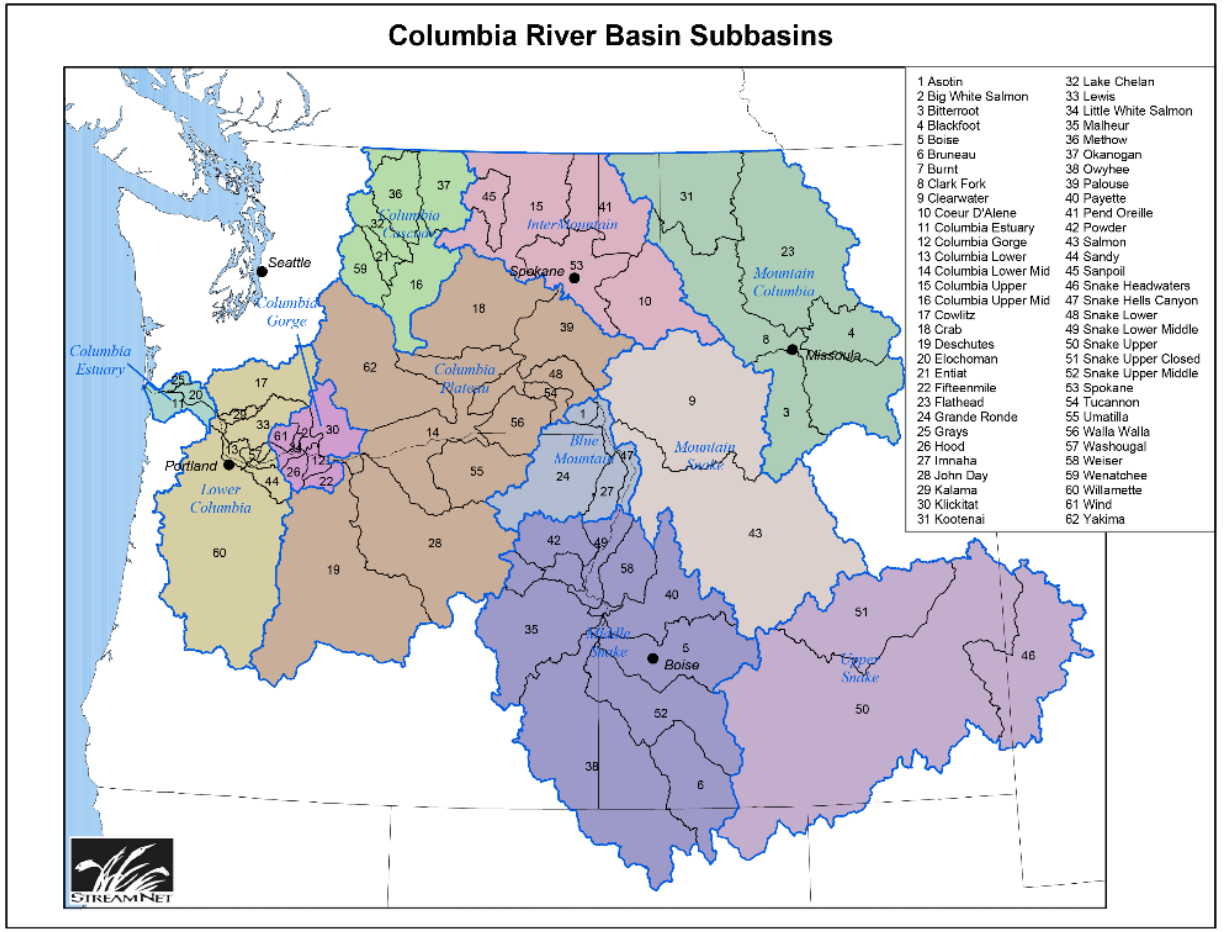
Recommendations for Improvement

- Strategy Performance Indicators to be tracked for **each salmon and steelhead stock** for the major subbasins



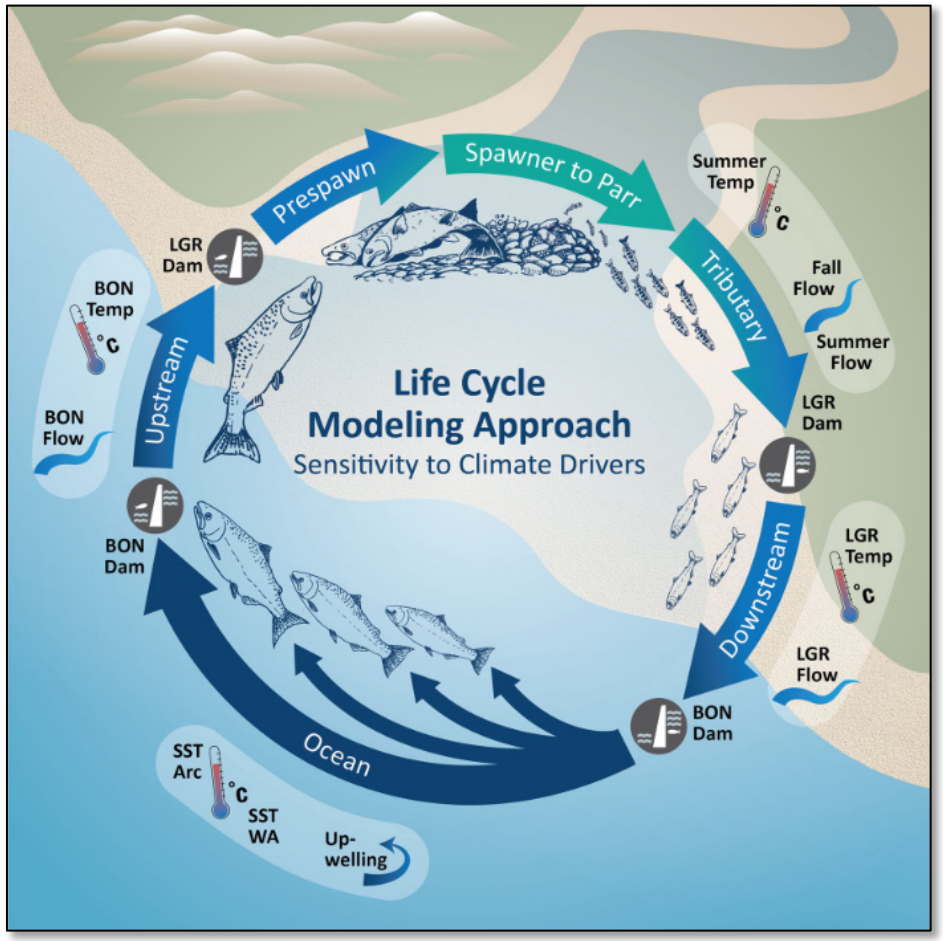
Recommendations for Improvement

- Process to identify multiple activities for **M&E within geographic areas**
  - What is being monitored
  - How is monitoring being evaluated and reported



Recommendations for Improvement

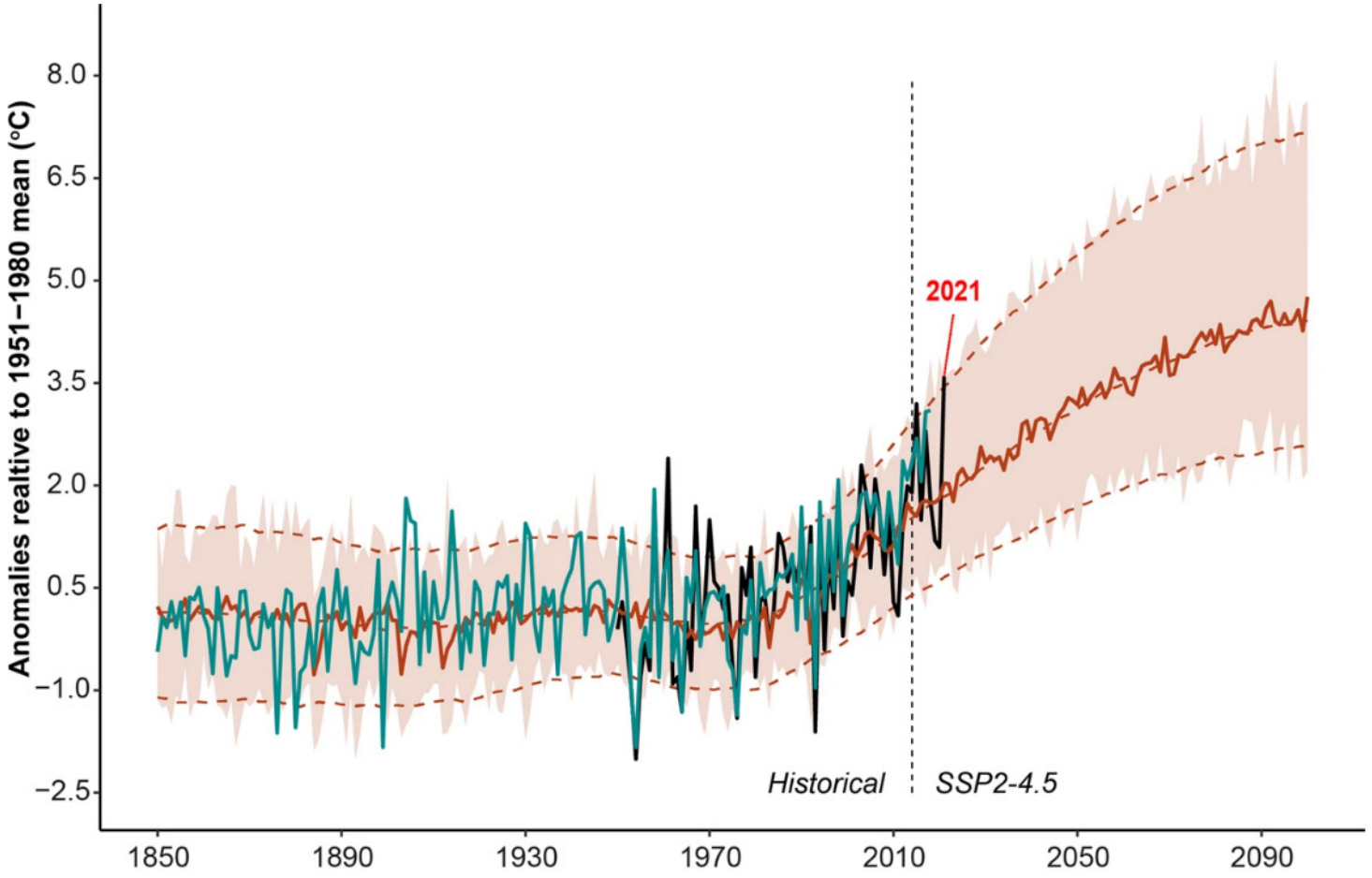
- Assess **effects of climate-related changes** in temperature and flow
  - Natural production
  - Habitat conditions
  - Ranges of species



Crozier et al. 2021

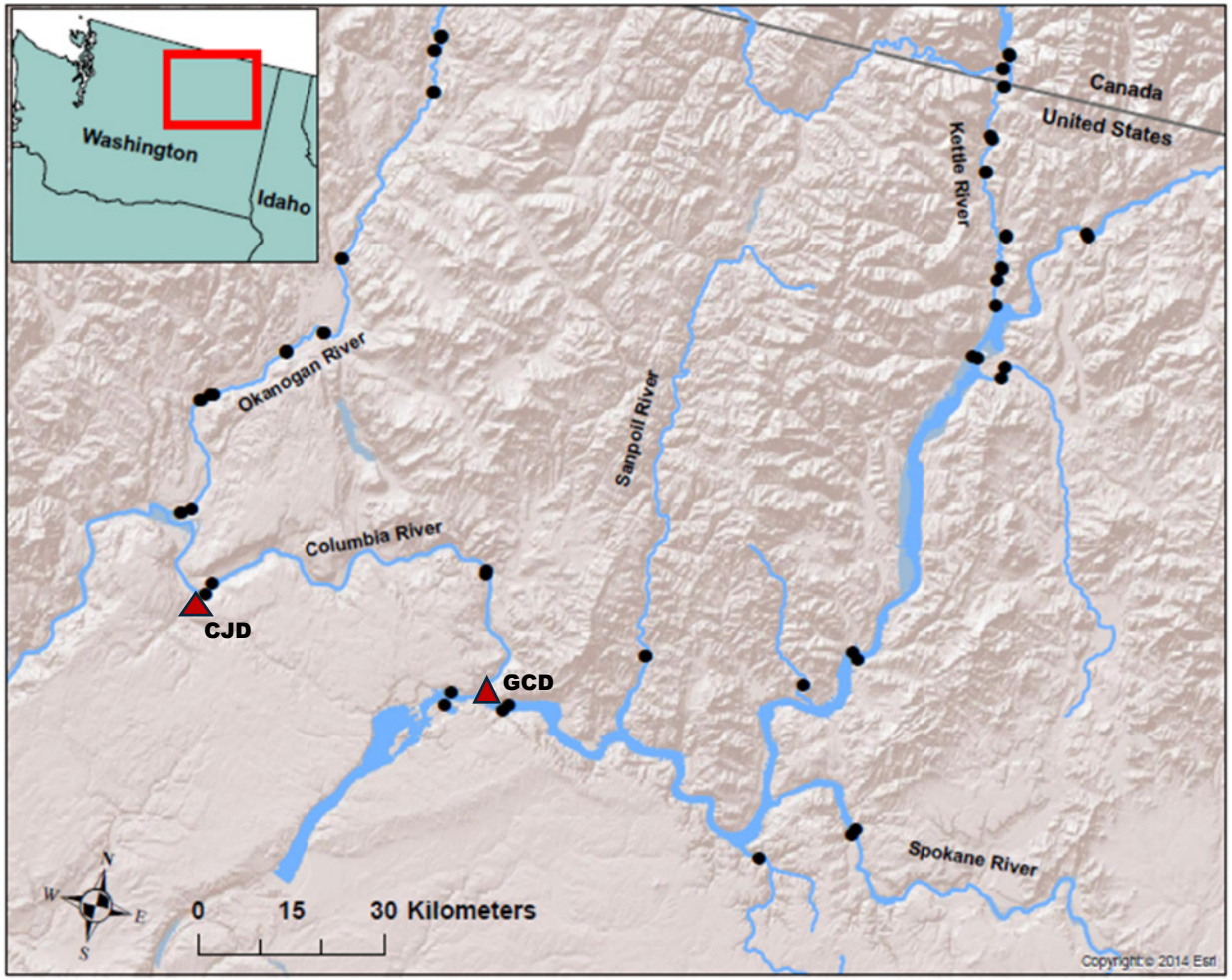
Recommendations for Improvement

- **Anticipatory approaches** for adaptation to climate change



Recommendations for Improvement

- eDNA monitoring program for the **Columbia River Basin**
- eDNA-based performance indicators



eDNA Monitoring Sites for Northern Pike

Other Recommendations

- **Assessment of breaching** the Snake River dams

Ice Harbor

Lower Monumental

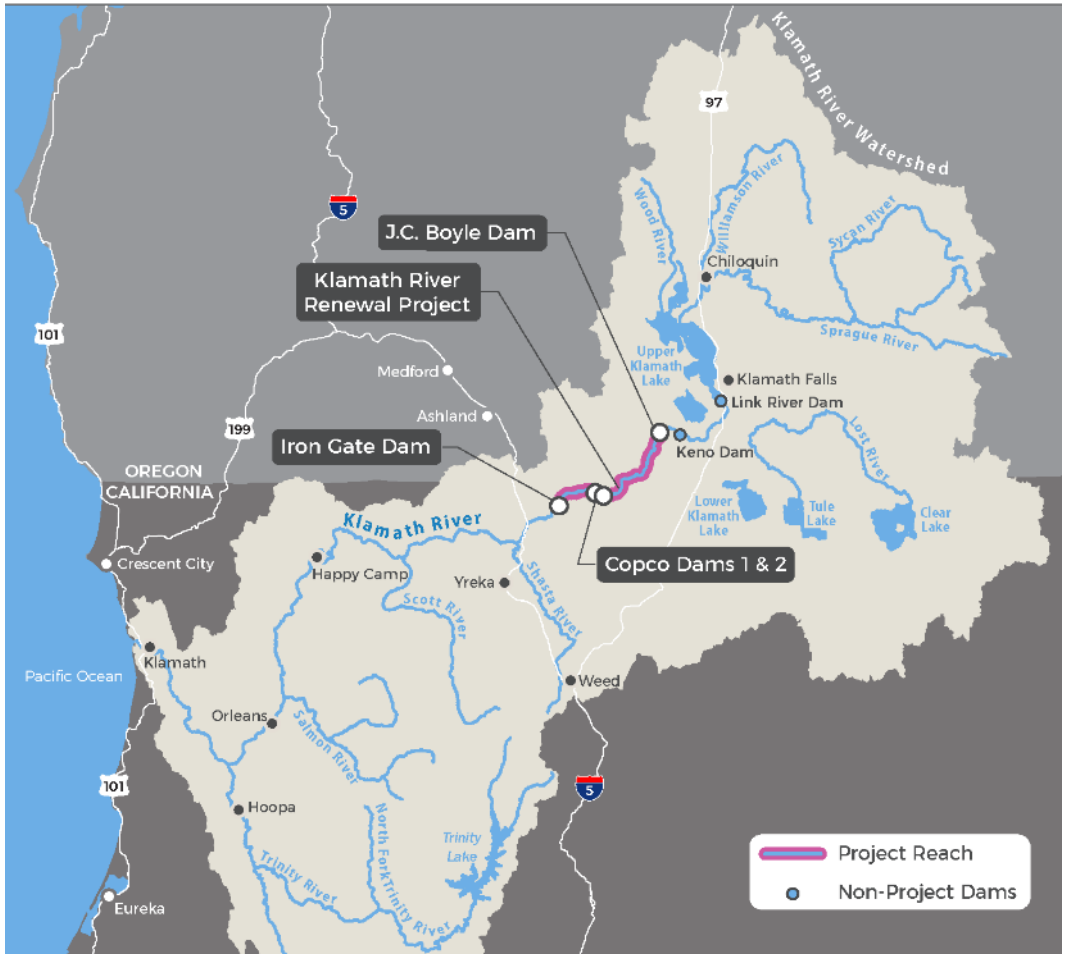
Little Goose

Lower Granite

(U. S. Army Corps of Engineers photos)

Other Recommendations

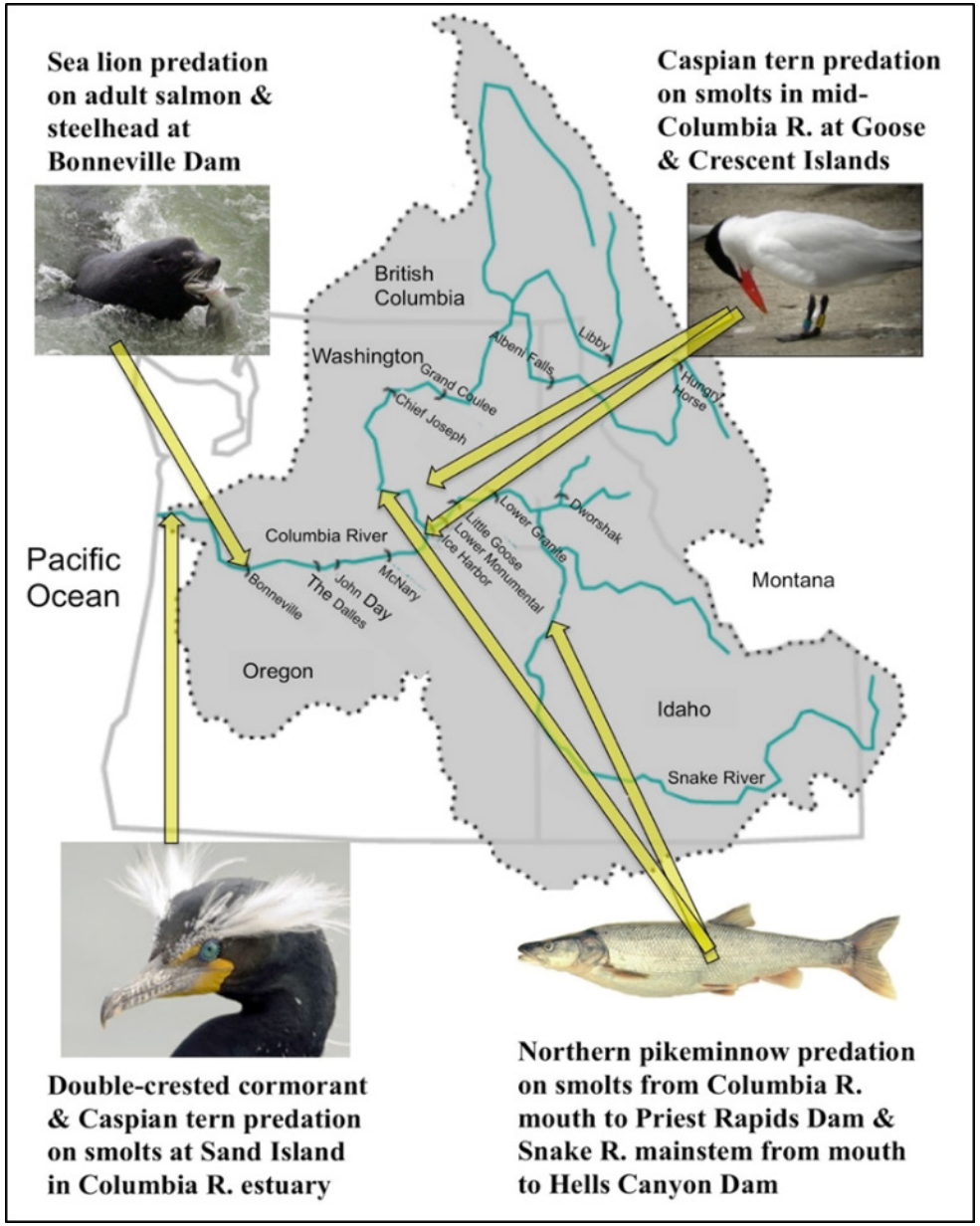
- Lessons from **Klamath River dams**



Images: CNN, Oregon Public Broadcasting

Other Recommendations

- Predation



Future Changes in the Fish and Wildlife Program

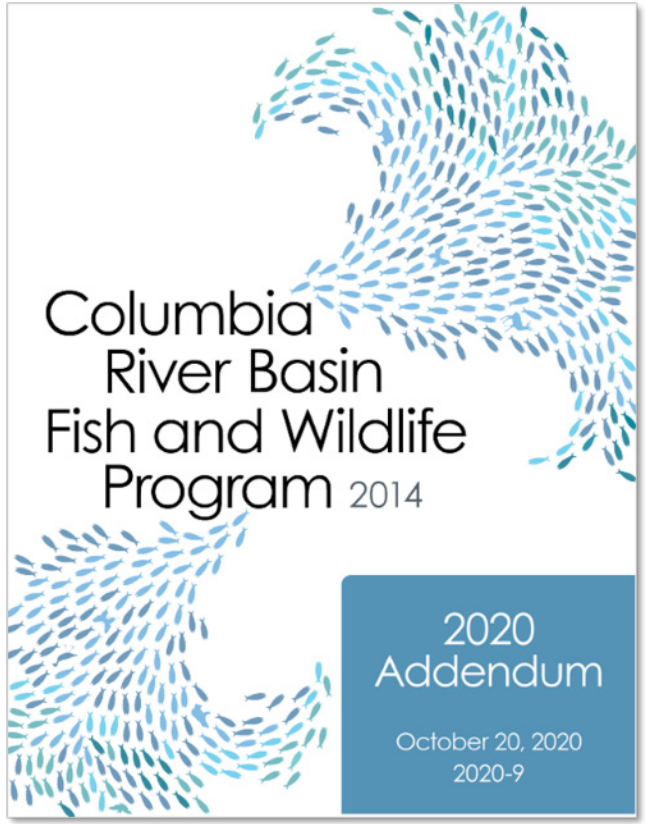
- **BPA** MOU and Settlement Agreement
- **White House** Memorandum on Restoring Healthy and Abundant Salmon, Steelhead, and Other Native Fish Populations in the Columbia River Basin
- **Columbia River Treaty** agreement

Future Challenges for the Fish and Wildlife Program

- While much progress has been achieved, much of the biodiversity remains **stressed**, native fish populations continue to **decline**, and healthy, functioning ecosystems are **imperiled** by habitat degradation, fragmentation, and water scarcity.
- More effective approaches and strategies will be required to address **constantly emerging threats and stressors**.

Our Review of the Fish and Wildlife Program Emphasizes

- Major **accomplishments** of the current Program
- Improvements in **strategies and actions** to strengthen the Program
- Support for **science to guide reintroductions** of salmon and steelhead in the blocked areas
- New methods for **climate assessment and monitoring native and non-native species**



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for the Northwest Power and Conservation Council,
Columbia River Basin Indian Tribes,
and National Marine Fisheries Service