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Agenda Item E.1.b
REVISED Supplemental NMFS Report 1
April 2024

Inflation Reduction Act: Pacific Salmon Science

Fisheries Science Center Activities
Agenda Item E.1.b
April 6, 2024

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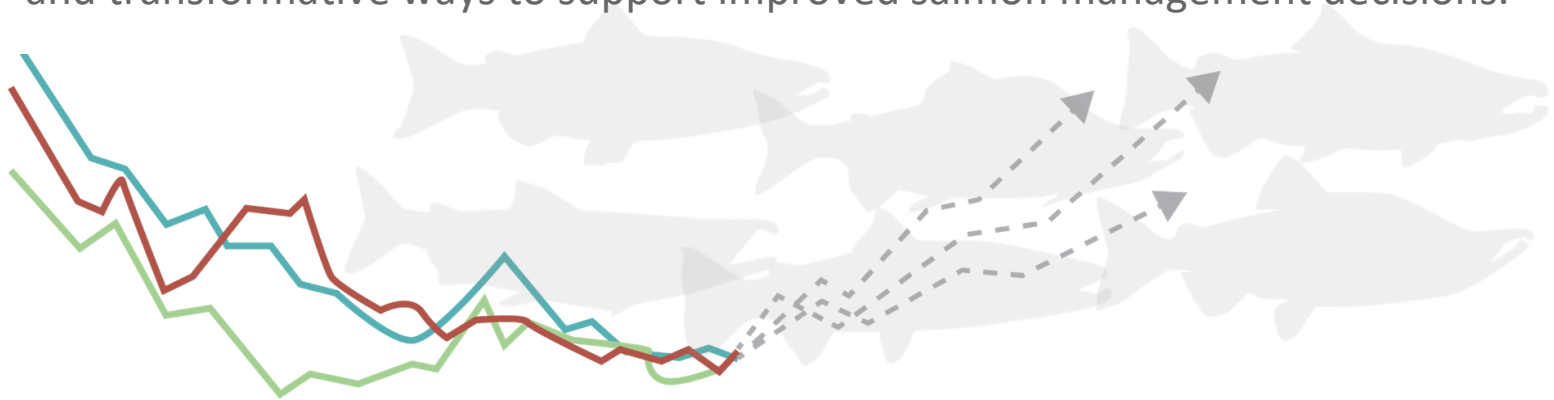
Pacific Salmon Overview

Why is this important?

Pacific salmon are at risk from various complex, interconnected factors. Recovering populations will yield a wealth of social, cultural, and ecosystem benefits.

We know a lot about salmon already because of our decades of previous science and recovery work.

IRA funding provides an opportunity to **leverage our knowledge and expertise** in new and transformative ways to support improved salmon management decisions.



What is the purpose?

Invest in science that will meaningfully advance salmon recovery in a changing climate.



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IRA Enables Transformative Investments

Implementing science and research prioritized in the *NWFSC Strategy for Salmon Recovery Science* and *SWFSC Strategy for Pacific Salmon Recovery*.

(<https://media.fisheries.noaa.gov/2023-05/SRSS-Public-FINAL-508-1-.pdf>)

(<https://swfsc-publications.fisheries.noaa.gov/publications/CR/2023/2023SWFSC2.pdf>)

- **Utilize advanced technologies** to measure salmon predators and environmental conditions
- **Develop robust population models** to support informed salmon management decisions in a changing climate
- **Partner** with Tribes, Federal and State Agencies, and Universities
- **Fund scientific research and analyses** at the NWFSC and SWFSC that will produce tools to inform salmon management
- **Boost** salmon habitat restoration actions managed by the WCRO's PCSRF program

Science investments to hasten Pacific Salmon recovery



- **Restoration / Reintroduction / Recovery Techniques**
- **Habitat Stressors in Freshwater / Estuary**
- **Ocean / Nearshore Ecology**
- **Integrated Model Development**
- **Protect and restore habitat**
- **Fish passage**
- **Fisheries management**
- **Conservation hatcheries**
- **Reintroduction**
- **Disease and pollution prevention**
- **Predator management**
- **Determinations of genetic variability necessary to accommodate recovery efforts**
- **Incorporation of quantitative thresholds (toxicity, thiamine, water temperature) into recovery planning**
- **Indicators of primary producers and measures of predation**
- **Generalized life cycle modeling framework**



Major Initiatives

Pacific Salmon IRA Funds: \$42M Total (\$15M WCR, \$16.2M NWFSC, \$10.8M SWFSC)			
Salmon Habitat Restoration	Pacific Coastal Salmon Recovery Fund (PCSRF)	Salmon habitat restoration and reconnection actions by State and Tribal partners	\$15M
West Coast Salmon Science and Research	Restoration, Reintroduction, and Recovery Techniques	Present and future habitat quality, reintroduction effectiveness, adaptive capacity of salmonids	\$6M
	Habitat Stressors in Freshwater and Estuary Environments	Urban stormwater effects, resilience under climate change, habitat stressors	\$3M
	Ocean and Nearshore Ecology	Indicators of marine survival, predation rates, coastal ecology, lower trophic level energetics	\$7M
	Integrated Model Development and Application	Life cycle model development, generalized models, integrative modeling, recovery strategy evaluation	\$8M
	Cross-project support	FTE labor, supplies & equipment, and travel across projects and research themes	\$3M

Restoration, Reintroduction, & Recovery Techniques (\$6M)

Goal: Build the understanding and tools needed to make decisions related to salmon habitat and hatcheries as the climate changes.

Expected Impact: Science-based indicators that facilitate sound conservation and management decisions; strategies to enhance success of reintroductions and improve conservation and traditional hatcheries.

Execution Progress: Finalizing contract with Washington Department of Fish and Wildlife (\$100K, salmon genotyping). Grant application from UCSC received.

Planned Funding				
FY23	FY24	FY25	FY26	Total
\$2.1	\$3.5M	\$0.2M	\$0.2M	\$6M

Habitat Stressors in Freshwater and Estuary Environments (\$3M)

Goal: Improved understanding of water quality threats to salmon in freshwater and estuarine habitats. Expanded use of water quality data in salmon management decisions.

Expected Impact: Use of toxicity thresholds in salmon management decisions; Better understanding of the impacts of combined habitat stressors (e.g., thiamine deficiency, elevated water temperature) on salmon.

Execution Progress: CI grant to UCSC (\$1.4M with CIMEAS) in review. Funds obligated to equipment purchases (\$250K), postdocs through ORISE, new research partnership with Western WA University.

Planned Funding				
FY23	FY24	FY25	FY26	Total
\$1.5	\$1.1M	\$0.2M	\$0.2M	\$3M



Ocean and Nearshore Ecology (\$7M)

Goal: Provide more accurate measurements of both ocean conditions and predation rates of outmigrating salmonids. Updated rates will improve model accuracy and confidence in management decisions.

Expected Impact: Ocean productivity indicators that improve predictions of salmon survival and growth; Quantification of pinniped and avian predation rates; New indicators of primary production and lower trophic level energetics that improve ecosystem assessments.

Execution Progress: Funds obligated/committed to WDFW grant (\$1M) and equipment purchases (\$200K). CI grant to CINAR passed NEPA review. CI grants (CIMEAS, CIMERS) in review. Purchasing advanced tech for measuring ocean conditions and salmon predation.

Planned Funding				
FY23	FY24	FY25	FY26	Total
\$2.1	\$4.2M	\$0.4M	\$0.3M	\$7M



Integrated Model Development and Application (\$8M)

Goal: Develop a generalized modeling framework that will help us understand environmental interactions and alternative management strategies.

Expected Impacts: Improved confidence in management decisions supported by life cycle models; Robust recovery strategy evaluations; Modeling tools transferable to multiple salmon species and for use by tribal, state, and federal managers.

Execution Progress: Cooperative Institute (CI) grants (\$3.3M to CIMEAS, \$275K to CICOES) in review. Cross-center modeling workshop scheduled for late April.

Planned Funding				
FY23	FY24	FY25	FY26	Total
\$2.1	\$4.1M	\$1.6M	\$0.2M	\$8M



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COEQWAL

COLLABORATORY FOR EQUITY IN WATER ALLOCATION

COEQWAL Project Goals

1. Produce an extensive **library of water allocation scenarios** that emerge from a wide range of projected future climates and alternative water management decisions, developed through inclusive processes.
2. Explore the consequences of alternative scenarios for people, the economy, and the environment. Will specifically consider how scenarios will affect Delta salinity management, **salmon population recovery**, and drinking water access for disadvantaged communities through focal use cases.
3. Co-develop state-of-the-art data visualization tools designed for accessibility, transparency, and longevity.
4. Employ participatory methods that build and strengthen social and professional networks among researchers and community partners and to promote shared learning and trust.

<https://live-coeqwal-ca.pantheon.berkeley.edu/>



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Major Initiative, in a nutshell

We're using the Pacific Salmon IRA funds to advance:

- Science that puts salmon and their recovery in the context of their ecosystem
 - food web
 - chemical milieu
 - habitats they find themselves in
 - climate status
 - intersections with people, including tribal peoples

- New and existing analytical tools that
 - integrate, *in repeatable ways*, data and information
 - deliver output that can feed into management systems
 - help managers make hard decisions

