Columbia Estuary Ecosystem Restoration Program



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Presentation to the Science Work Group November 5, 2024 TOPICS

- 5 Ws of CEERP
- Potpourri of What's Happening & What's Next

WHAT IS CEERP?

The Columbia Estuary Ecosystem Restoration Program was established to mitigate for the impacts of the Columbia River Dams on ESA-listed fish.

The overall goal of the Columbia Estuary Ecosystem Restoration Program (CEERP) is to understand, conserve, and restore ecosystems in the Lower Columbia River Estuary, primarily to help recover ESA-listed salmonids.

Primary CEERP <u>actions</u> include restoring hydrologic connections between the mainstem and floodplain, enhancing shallow-water habitat, and reestablishing native vegetation communities.



Key Principles:

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- Frequently engage partners on Restoration and Monitoring priorities
- Seek lessons learned, especially failures
- Foster collaborative, iterative approaches to complex challenges
- Provide and attend multiple forums to exchange ideas
- Document everything prioritize primary literature publications, capture institutional knowledge, increase regional visibility



Learning

- Science Seminars
- Synthesis Memos
- Master Matrix of Learning
- Site Revisits
- CREC and Sponsor Workshop



Restoration

- Landscape Planning
 Framework
- Implementation Forecaster
- Landscape Principles
- Restoration Design
 Challenges



Monitoring

- Critical Uncertainties Research
- Action Effectiveness Monitoring & Research
- Status and Trends Monitoring
- Compliance Monitoring

WHO IS CEERP?





BPA

- Action Agency
- Power Marketing Agency (DOI)
- Restoration work authorized/required by the Northwest Power Act
- Funds most restoration projects implemented by program partners
- Member of the Expert Regional Technical Group Steering Committee





USACE

- Action Agency
- Dam Owner and Operator
- Mission Areas: Navigation, Flood Risk Management, Hydropower, Recreation, Ecosystem Restoration
- Several restoration authorities: Sections 536, 206, 1135
- Restoration projects include Steamboat Slough and Woodland Island
- Traditionally funds scientific research in the estuary (Section 582)
- Member of the Expert Regional Technical Group Steering Committee



US Army Corps of Engineers®

Portland District

NOAA

- Regulator
- Contributes significantly to the scientific body of work
- Writes Biological Opinions
- Member of the Expert Regional Technical Group Steering Committee





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NOAA

RTMENT OF

PARTNERS!

- Project Implementation (Design, Construction) •
- Scientific Study Design and Completion •
- Monitoring, Learning, Reporting •

WHEN IS CEERP?...





Jeopardy Opinion

NMFS concludes that the hydropower system is likely to endanger the survival of ESA-listed fish species. RPA is to include habitat restoration in the lower 146 miles of the river along with other mitigation efforts.

Action Agencies commit to restoring 10,000 acres of habitat to benefit steelhead and salmon







BUDM Modeling

 Working to distill feedback from stakeholders – Sept workshop

WHAT'S NEXT

- Draft causal graphs depicting relationships between functions and indicators
- Identify useful existing data
- Determine data or research needs to address large uncertainties

ERTG Work Products

- Climate Resiliency
- Conceptual Foundations

CEERP Website

- Going LIVE Summer 2025 Addressing Key Uncertainties

- Flux Study
- Tag Study

Synthesis Memorandum #3

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Synthesis Memorandum #3

- Where and when: Portland, OR, June 24-25, 2024
 - Format: Highly interactive small-group exercises progressing through each aim to synthesis
- Goal: Collaboratively understand the state of the science around the CRE, identify knowledge gaps, and prioritize future research and monitoring.
- Organizations present (26 Attendees):
 - BPA

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- CREST
- Coastal Oceans, LLC
- Columbia Land Trust
- ERTG
- LCEP
- NOAA Fisheries
- OHSU
- PNNL
- U.S. Army Corps of Engineers
- WDFW







Goal: Build on the status of knowledge on ecosystem science and restoration in the CRE.

- *Examples* of existing knowledge in each domain group:
 - Fish and Food Webs:
 - Fish (of many species) use and benefit from an array of habitats in the estuary. While diet data suggests salmon and steelhead foraging occurs near the water surface, prey resources are tightly coupled with benthic habitats.
 - Physical Processes:
 - Almost all tributaries are significantly cooler than the mainstem, many have better sediment and temperature regimes, and are very dynamic.
 - Programmatic Planning:
 - Regular check-ins between sponsors and restoration practitioners would add value
 - There are opportunities to broaden the focus and impact of the ERTG
 - Wetland Ecosystem Monitoring:
 - Restoration scientists have learned how to control reed canary grass through spraying of herbicide and conversion of mid and high marsh back to native species.



Goal: Identify knowledge gaps critical for advancing CEERP program objectives.

- Example questions and knowledge gaps from each domain group include:
- Fish and Food Webs:
 - Is predation random of selected based on certain factors, such as size, condition, etc.?
 - How do we prepare for climate change and make the habitats successful in the future?
- Physical Processes:
 - How much sediment from the mainstem makes it onto the wetlands?
 - Is dredged material more persistent in shallow or deep water?
- Programmatic Planning:
 - Need for understanding short vs long-term BUDM benefits
 - How can we make it easier to better support complex restoration projects, and how do we build more support for pilot projects?
- Wetland Ecosystem Monitoring:
 - Need for understanding changes in wetland productivity and distribution of vegetation and marsh types
 - Need vegetation, organic matter, prey, design features, and temperature data to inform predictive models



Goal: participants to individually create a vision of the future of Estuary





Goal: To evaluate the level of knowledge and impact associated with monitored indicators.

- Takeaways:
 - Participants found the indicators we know the least about seemed to be the most important.
 - Specific research questions will help to inform importance of indicators.
 - Indicators generally high on knowledge and importance were latitude/longitude, temperature, salinity, and WSE.
 - Fish indicators (growth, condition, survival, stock) were generally placed in high importance but low knowledge.



Goal: Gather participant conclusions on key findings and relevance to CEERP based on professional experience and workshop participation.

• While this was an individual exercise, it was followed by sharing and discussion and some common themes were found within domain groups in their synthesis activities



Goal: Identify and prioritize research questions to advance CEERP decision making.

• Research questions were prioritized by ranking them in order from the most to the least votes from workshop participants, and then discussed, with participants reaching a general consensus.

Synthesis Memorandum #3



Will the climate and flow related temperature trends restrict habitat availability for juvenile salmon thus impacting the utility of restored sites? How will the interplay between flow changes SLR and changes to sediment dynamics affect wetland inundation? What is the current status of the food web in the lower estuary, exotic species and competition? Are juvenile salmonids present in restored sites?-How does prey quality vary by species, location, Next Steps: season (includes flux)? Refine details of What info is needed to design projects resilient to climate change? journal article. How do we expand CEERP to incorporate broader Goal: publish in 2025 benefits to ecosystem function and services? What are the key uncertainties with regards to BUDM benefits and tradeoffs? Hypothesis: Increase in vegetation diversity from restoration contributes to increase in preyconsumption size and weight in juvenile salmon Category Climate change How are the vegetation and prey communities linked? Ecosystem services Sediment dynamics and inundation Will sediment accretion keep up with sea level System biology (food web, prey quality, flux, predation) rise? Salmon predation risk and links to habitat restoration ź 1 ່3 11 12 13 14 15 16 17 10

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9 Votes

Columbia Estuary Ecosystem Restoration Program

US Army Corps of Engineers ® Portland District

Bonneville POWER ADMINISTRATION

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Thank You!

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