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March 10, 2020

### MEMORANDUM

**TO:** Fish and Wildlife Committee members

**FROM:** Leslie Bach

**SUBJECT:** Columbia River Estuary: overview and update on ongoing efforts and expected future direction.

### BACKGROUND:

**Presenter:** Jason Karnezis, Bonneville Power Administration; and Michael Turaski, US Army Corps of Engineers.

**Summary:** The presenters will report on ongoing restoration, research, monitoring and evaluation efforts in the estuary and lower Columbia River. They will provide an update on the Columbia Estuary Ecosystem Restoration Program (CEERP), project implementation, the Expert Regional Technical Group (ERTG), and other ongoing processes. They will also provide some general information on future direction for the estuary program.

**Relevance:** The estuary is a strategy in the 2014 Fish and Wildlife Program. The strategy calls for implementation, monitoring and evaluation of habitat actions in the estuary.

**Background:** The Bonneville Power Administration (BPA) and the U.S. Army Corps of Engineers, Portland District (Corps) developed the Columbia Estuary Ecosystem Restoration Program (CEERP) to understand, conserve, and restore ecosystems in the lower Columbia River and estuary. The agencies developed the CEERP in response to three main drivers: the Northwest Power and Conservation Council's Fish and Wildlife Program, the Water Resources Development Acts (Sections 206, 536, and 1135),

and the Biological Opinions (BiOps) for operation of the Federal Columbia River Power System (FCRPS) (e.g., NMFS 2000, 2004, 2008a).

The program's objectives are to 1) increase the capacity (quality) of estuarine and tidal-fluvial ecosystems; 2) increase the opportunity for access by aquatic organisms to and for export of materials from shallow-water habitats; and 3) improve ecosystem functions for juvenile salmonids. Primary approaches to restoration are to restore hydrologic connections between the mainstem and floodplain, create and/or enhance shallow-water habitat, and reestablish native vegetation.

**More Info:** [CEERP 2018 Synthesis Memo](#)



# The Columbia Estuary Ecosystem Restoration Program



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# The Columbia Estuary Ecosystem Restoration Program (CEERP)



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- Joint effort by the Bonneville Power Administration (BPA) and U.S. Army Corps of Engineers (Corps) with guidance from NOAA Fisheries
- Goal
  - Understand, conserve, and restore ecosystems in the Lower Columbia River Estuary



# Habitat restoration drivers



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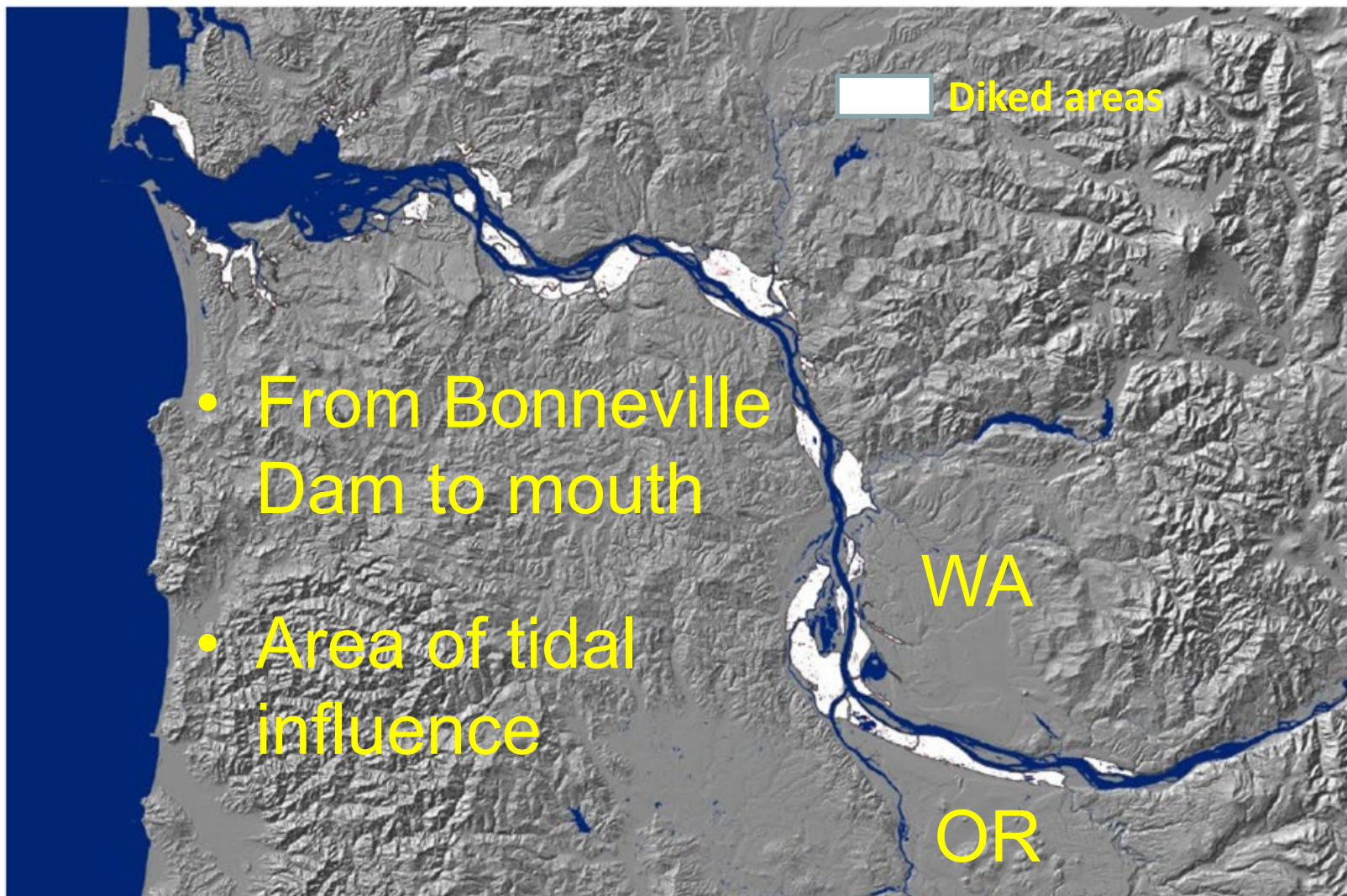
- **NOAA Biological Opinions (BiOps)**
- **Northwest Power Act**
- **Water Resources Development Acts**



# CEERP Location



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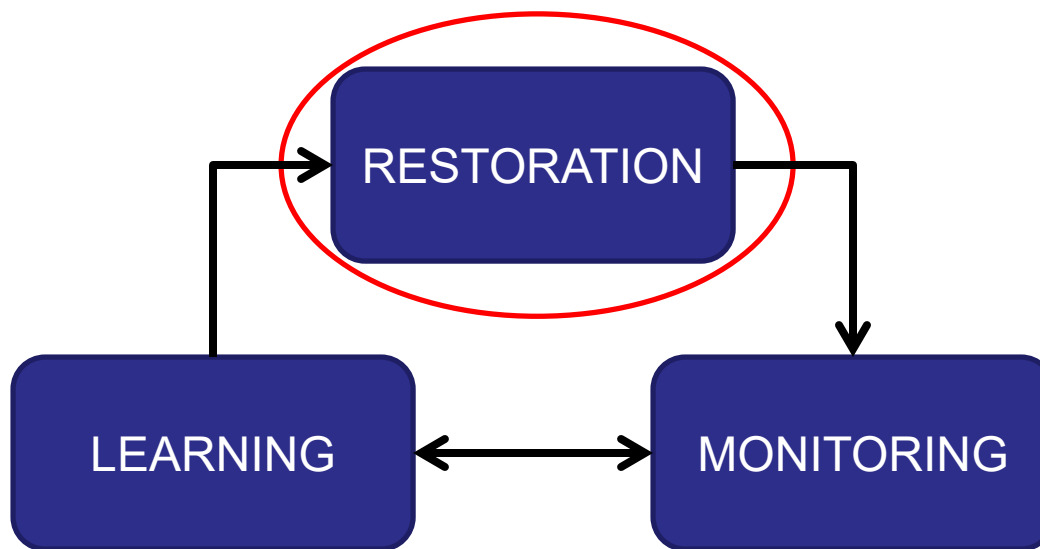




# Adaptive Management Framework



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*How do you make it operational?*



# CEERP Objectives and Strategy



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- Objectives

- Increase the opportunity for access by aquatic organisms to and for export of materials from shallow-water habitats
- Increase the capacity and quality of estuarine and tidal-fluvial ecosystems
- Improve ecosystem realized functions (growth, condition, fitness of juvenile salmonids)

- Strategy

Floodplain reconnections close to the mainstem





# 163 acres restored, Kandoll Farm



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Increase access –  
remove structure

Thanks to Columbia Land Trust

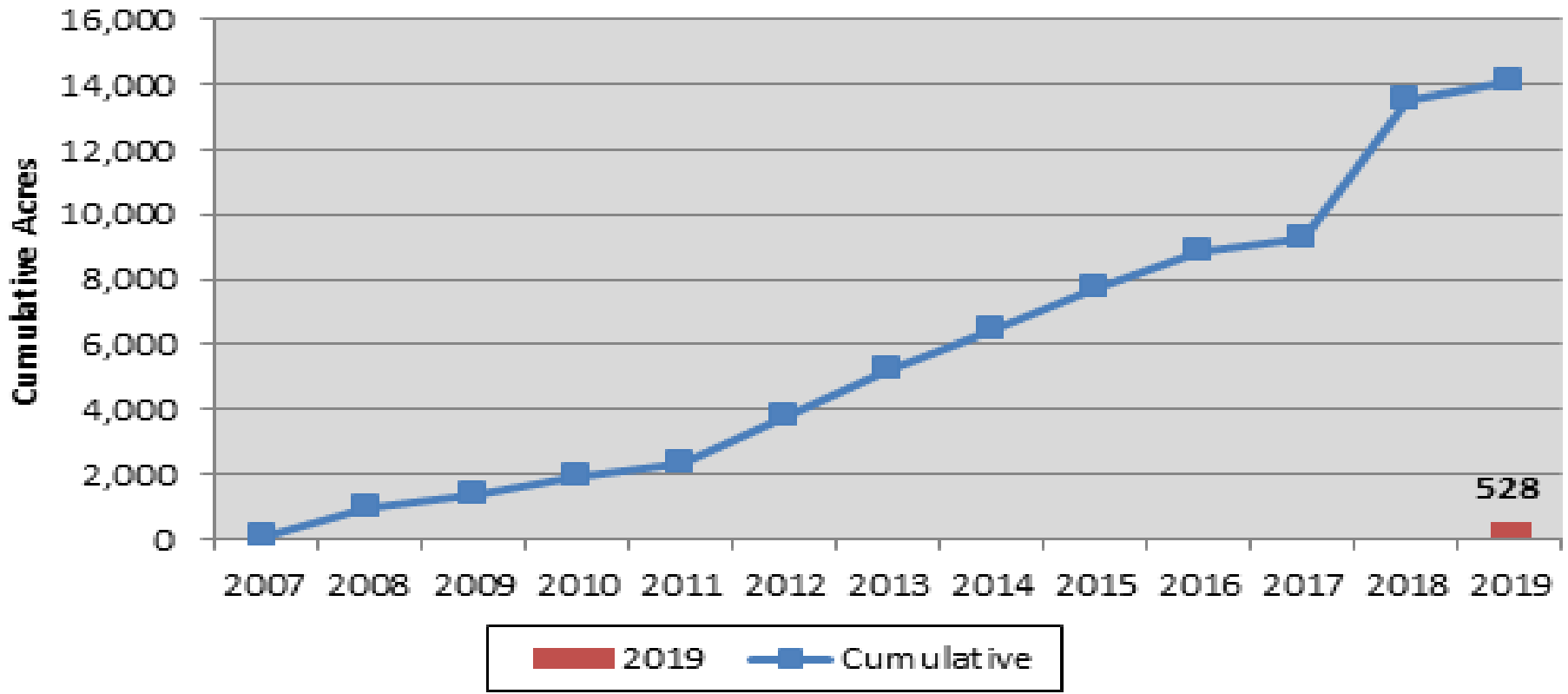


# Quantity of Habitat Restored



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## Cumulative Acres of Estuary Floodplain Improved 2007 - 2019

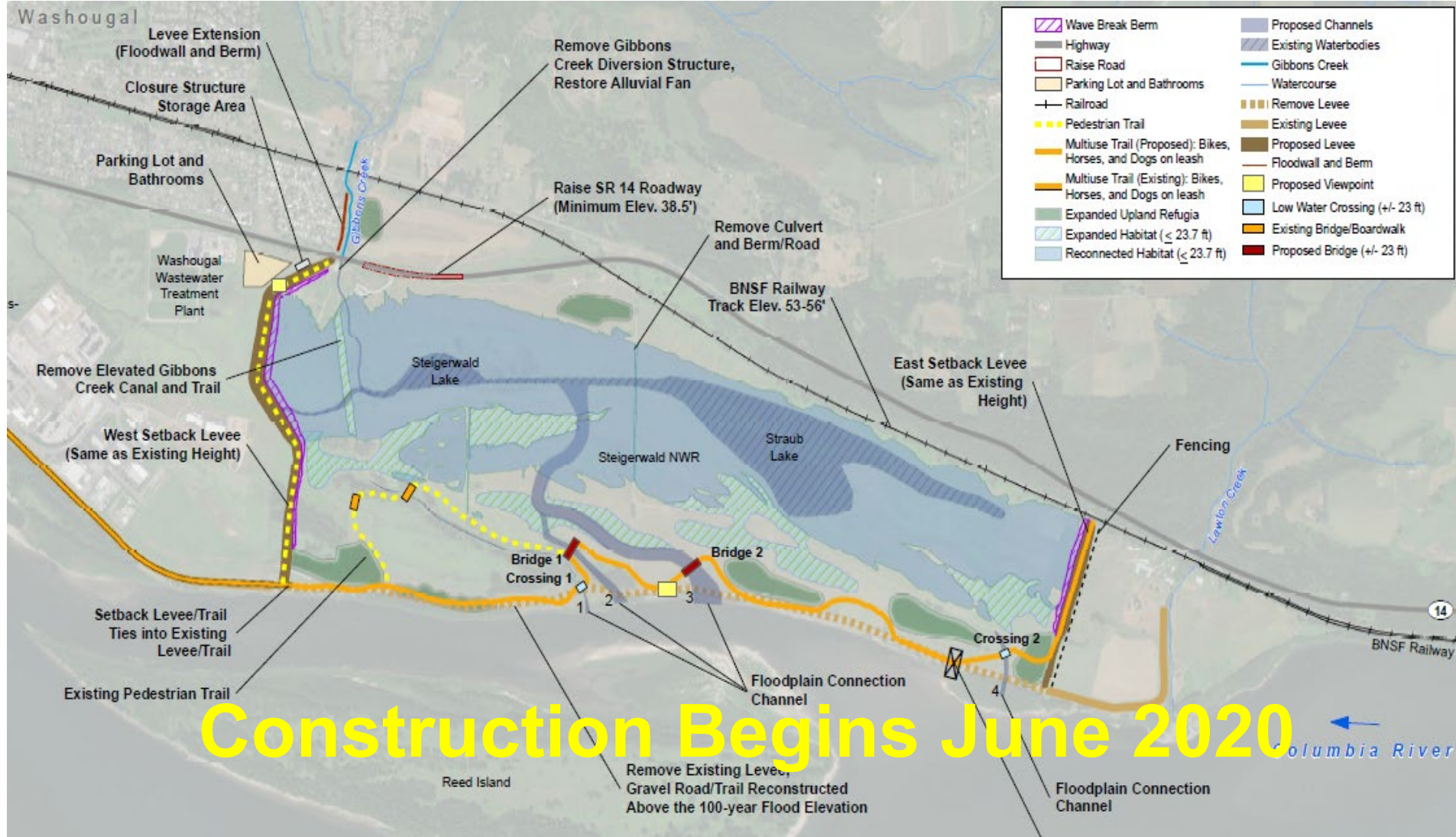




# Steigerwald Nat'l Wildlife Refuge



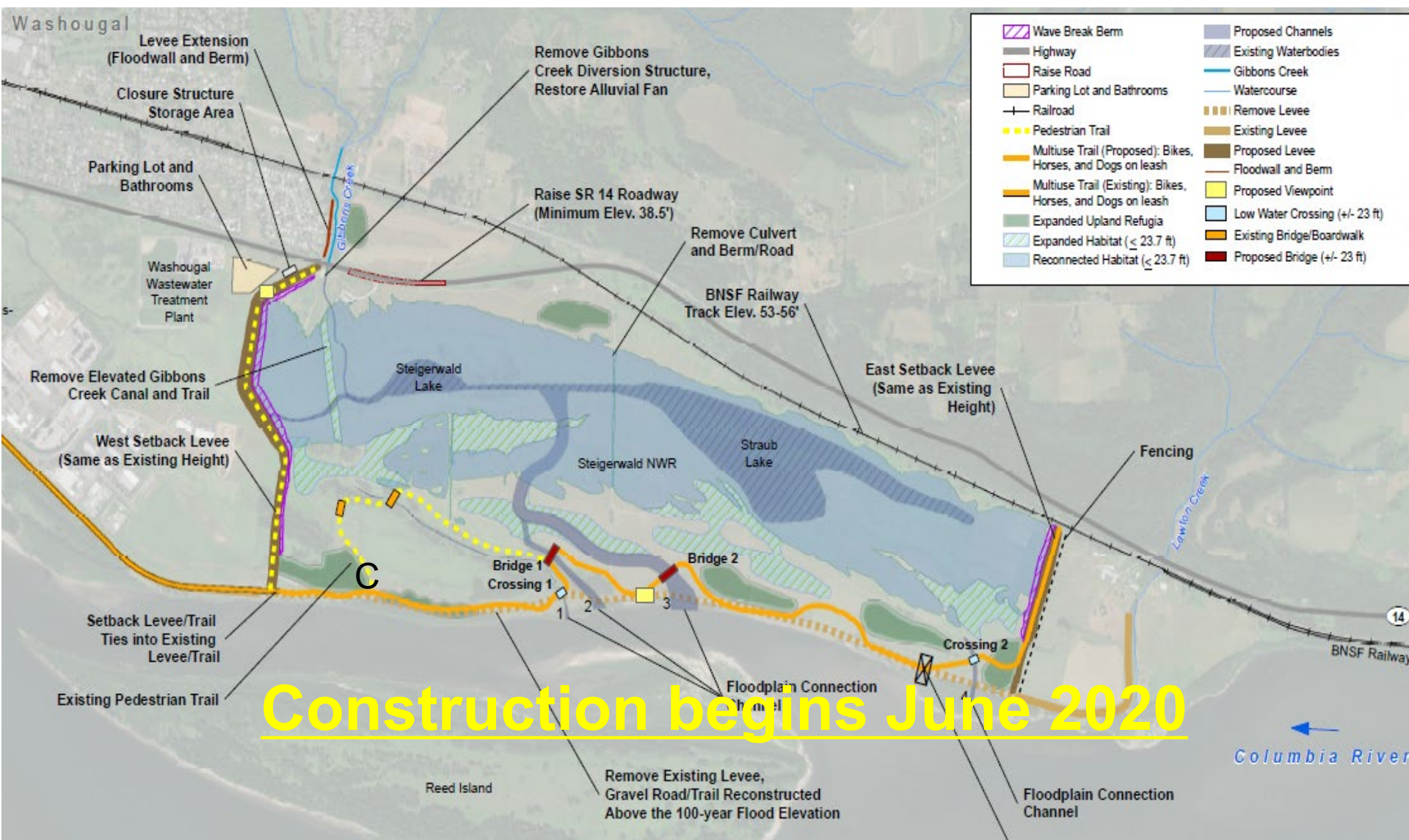
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	Wave Break Berm		Proposed Channels
	Highway		Existing Waterbodies
	Raise Road		Gibbons Creek
	Parking Lot and Bathrooms		Watercourse
	Railroad		Remove Levee
	Pedestrian Trail		Existing Levee
	Multiuse Trail (Proposed): Bikes, Horses, and Dogs on leash		Proposed Levee
	Multiuse Trail (Existing): Bikes, Horses, and Dogs on leash		Floodwall and Berm
	Expanded Upland Refugia		Proposed Viewpoint
	Expanded Habitat ( $\leq 23.7$ ft)		Low Water Crossing (+/- 23 ft)
	Reconnected Habitat ( $\leq 23.7$ ft)		Existing Bridge/Boardwalk
			Proposed Bridge (+/- 23 ft)



# Steigerwald Nat'l Wildlife Refuge





# CEERP Partners



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- Columbia River Estuary Study Taskforce
- Columbia Land Trust
- Lower Columbia Estuary Partnership
- Cowlitz Indian Tribe
- Washington Dept. of Fish and Wildlife
- NOAA Fisheries – West Coast
- PC Trask – Technical services
- PNNL – Technical services



# Bear-Mary's-Ferris: 65 Acres



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# Government Island– 289 acres



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# Bachelor Island – 45 acres, WDFW



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# Year 0 vs. Year 5, post-construction



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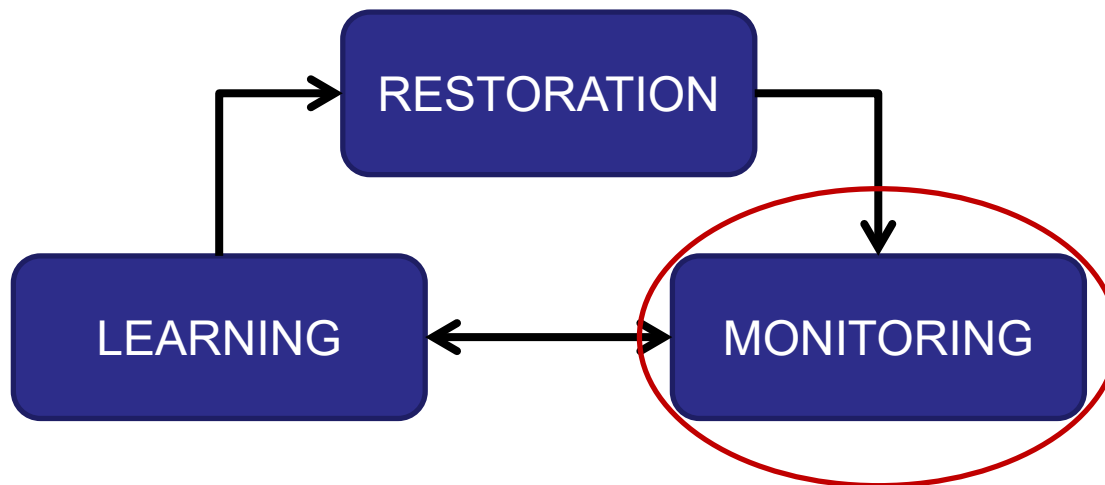




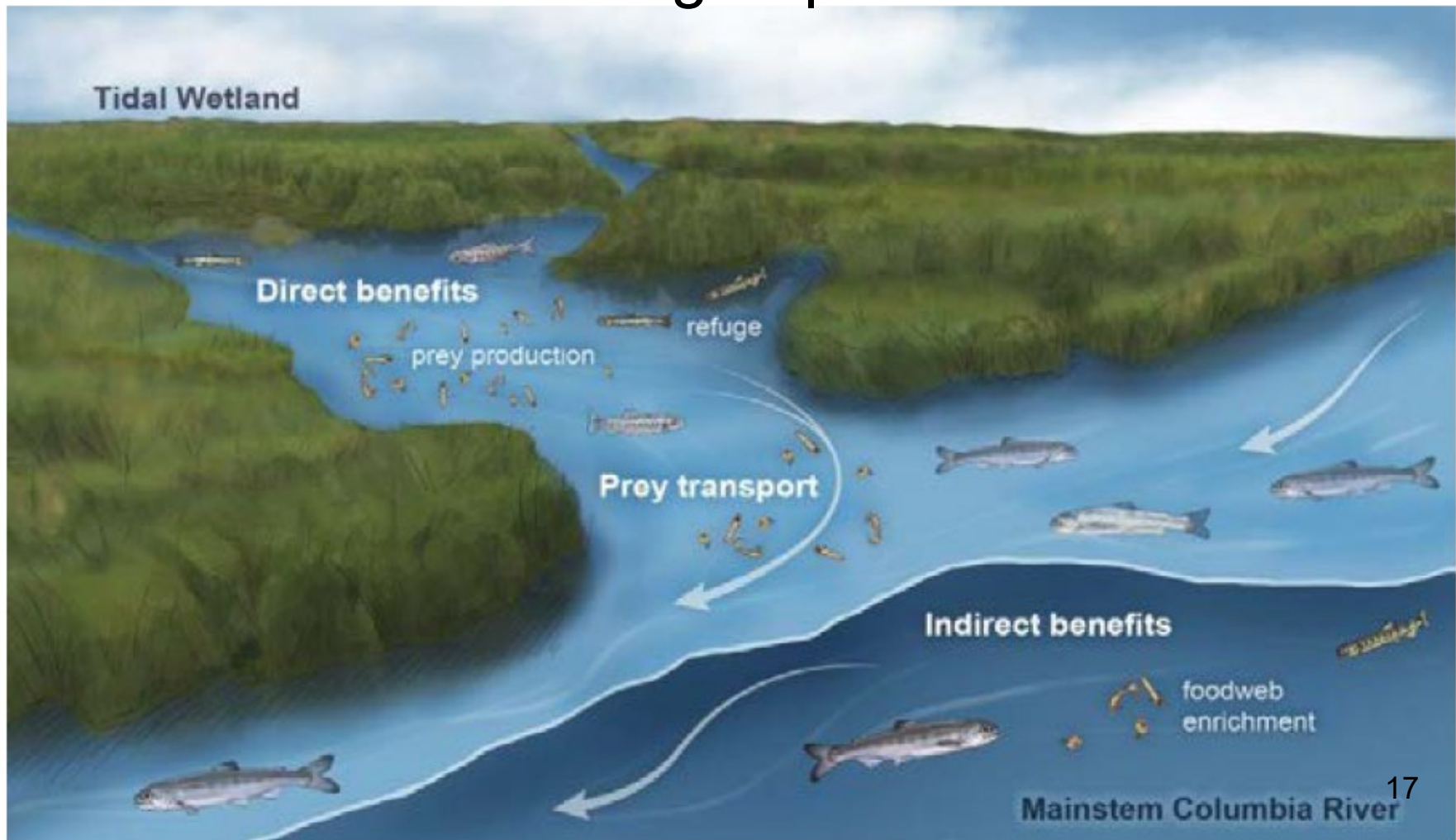
# Monitoring efforts



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# How does floodplain reconnection in the LCRE benefit juvenile salmon, especially interior basin stock groups?

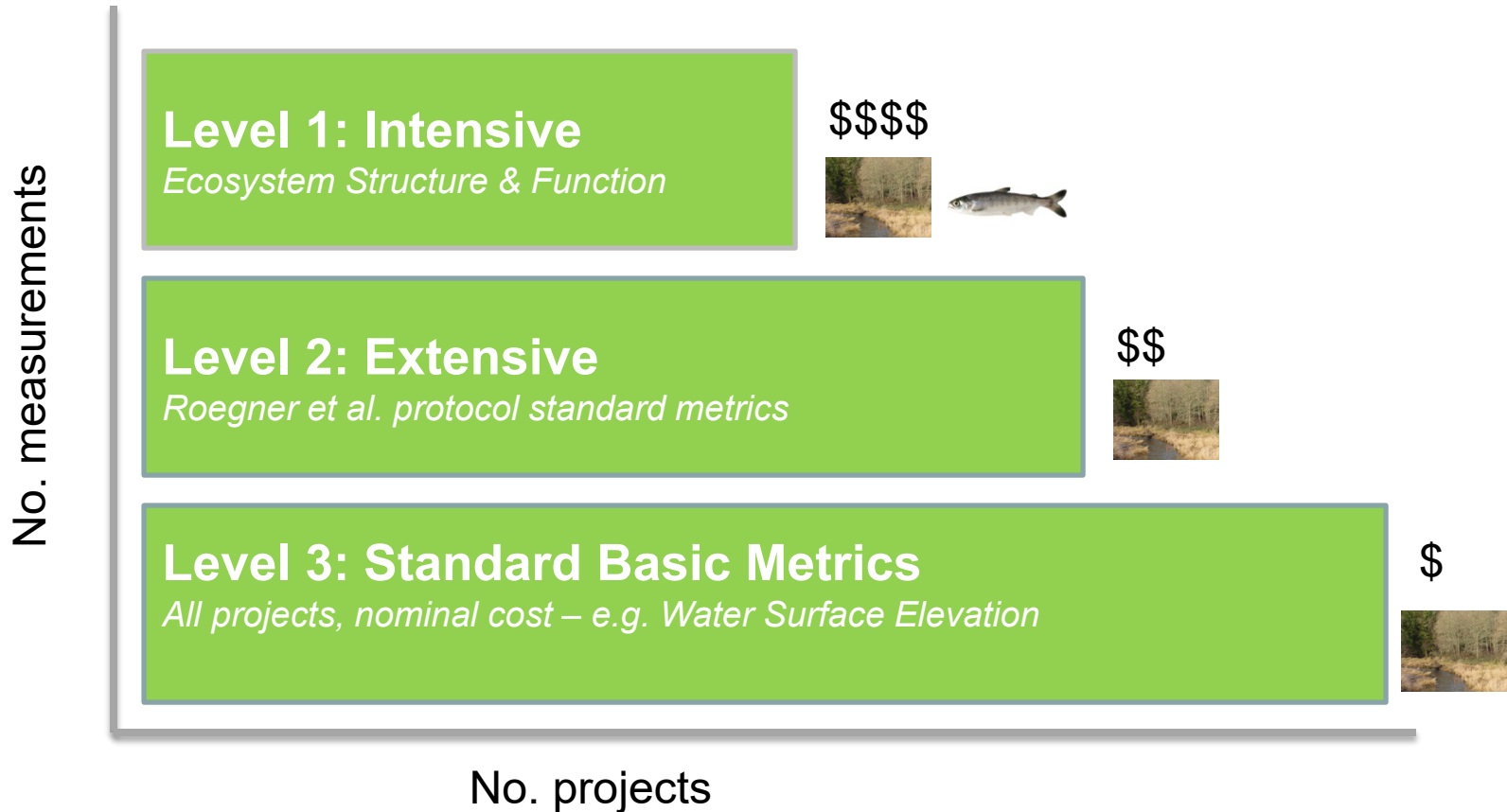




# Action Effectiveness



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The top priority for our RME program is to evaluate the effectiveness of our restoration actions - informs prioritization



# Field based Monitoring



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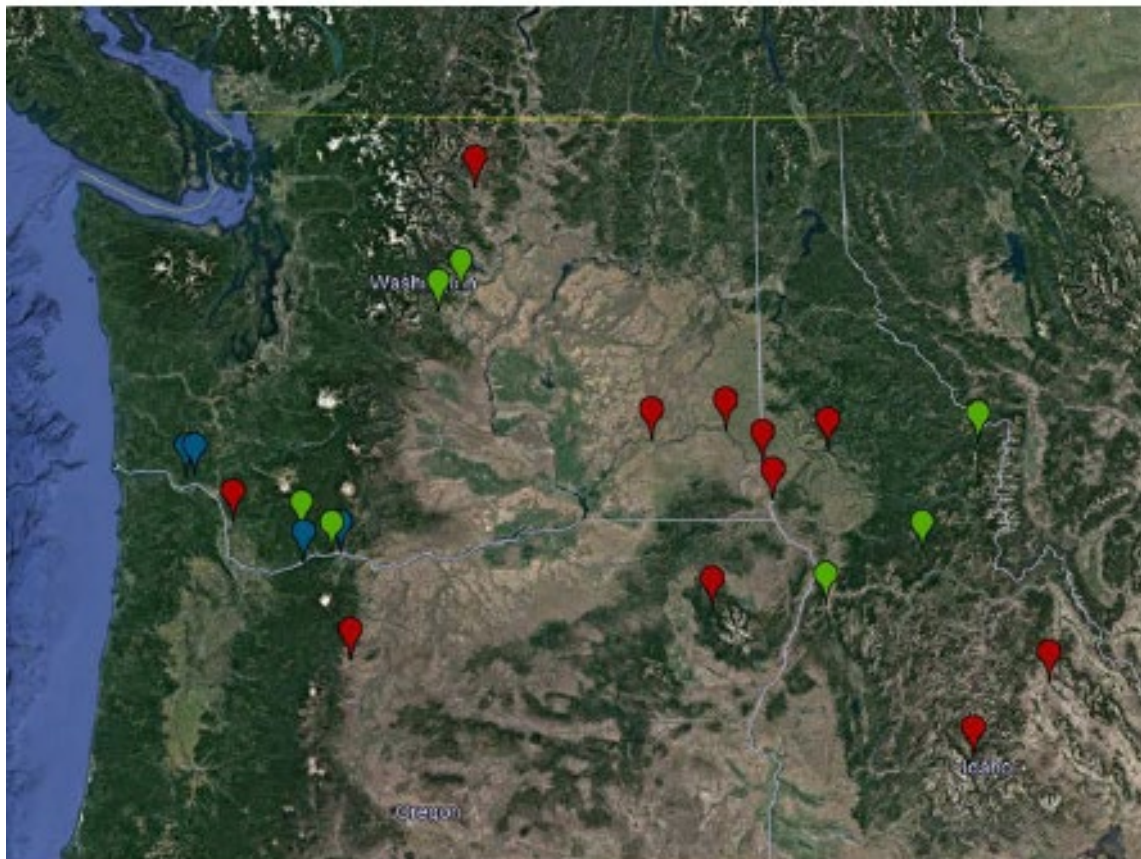




# Monitoring results



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Origins of juvenile steelhead and coho, and Chinook salmon detected at Steamboat Slough, 2017-2019. Blue markers indicate lower river stocks, red markers indicate ESA listed stocks, and green markers indicate unlisted interior stocks.

McNatt, 2020 (draft)



# Evidence Based Evaluation



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- Existing evidence-based approaches were rigidly embedded in published literature; time lags make this unacceptable for active large-scale ecosystem restoration programs.
- Need for program-level evaluations to support adaptive management, decision-making and accountability to stakeholders and taxpayers.
- Synthesis Memo #2: "all lines of evidence from the LCRE indicated positive habitat-based and salmon-based responses to the restoration performed under the CEERP, although tide gate replacements on small sloughs were an exception."



# Practicing Adaptive Mgm't



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**Restoration Ecology**  
THE JOURNAL OF THE SOCIETY FOR ECOLOGICAL RESTORATION

RESEARCH ARTICLE

## Estuary ecosystem restoration: implementing and institutionalizing adaptive management

Blaine D. Ebberts<sup>1,2</sup>, Ben D. Zelinsky<sup>3</sup>, Jason P. Karnezis<sup>3</sup>, Cynthia A. Studebaker<sup>1</sup>,  
Siena Lopez-Johnston<sup>3</sup>, Anne M. Creason<sup>3</sup>, Lynne Krasnow<sup>4</sup>, Gary E. Johnson<sup>5,6</sup>, Ronald M. Thom<sup>7</sup>

We implemented and institutionalized an adaptive management (AM) process for the Columbia Estuary Ecosystem Restoration Program, which is a large-scale restoration program focused on improving ecosystem conditions in the 234-km lower Columbia River and estuary. For our purpose, “institutionalized” means the AM process and restoration programs are embedded in the work flow of the implementing agencies and affected parties. While plans outlining frameworks, processes, or approaches to AM of ecosystem restoration programs are commonplace, their establishment for the long-term is not. This article presents the basic AM process and explains how AM was implemented and institutionalized. Starting with a common goal, we pursued a well-understood governance and decision-making structure, routine coordination and communication activities, data and information sharing, commitment from partners and upper agency management to the AM process, and meaningful cooperation among program managers and partners. The overall approach and steps to implement and institutionalize AM for ecosystem restoration explained here are applicable to situations in which it has been incomplete or, as in our case, the restoration program is just getting started.

**Key words:** collaboration, habitat restoration, learning, monitoring



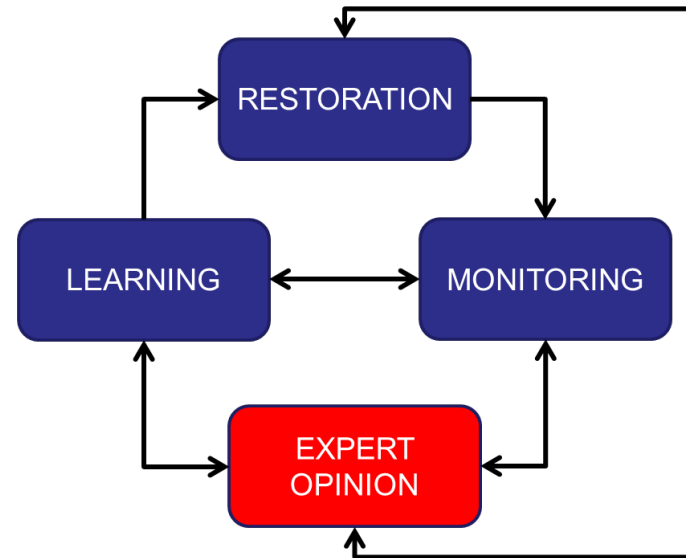


# Formally Designate Experts



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- Expert Regional Technical Group (ERTG) – a panel of scientists with estuary expertise
  - Evaluate and assign benefits to restoration projects
  - Define and prioritize scientific uncertainties
  - Focused work products e.g analysis of floodplain lake restoration
  - Stay abreast of emerging science
  - Regular interaction with restoration practitioners and program managers





# ERTG work products



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**Project scoring**

**Identifying key uncertainties**

**Peer reviewed publications**

**Managed by AA+NOAA Steering Committee**





# Exchange Between Scientists and Restoration Practitioners



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## Formal

- Columbia River Estuary Conference
- National Conferences
- CEERP documents
  - i.e. Synthesis Memo
- Journal articles
- Technical Studies

## Informal

- Monthly ERTG meetings
- Site visits
- Annual canoe trip
- Focused workshops
- Annual ERTG/Sponsor meeting
- Monthly RME meetings with LCEP

# Proposed Action (NOAA BiOP)



- 2019 BA Submitted January 2020
- Average 300 acres/year
- Continued AEMR/RME
- 5 year rolling review of accomplishments

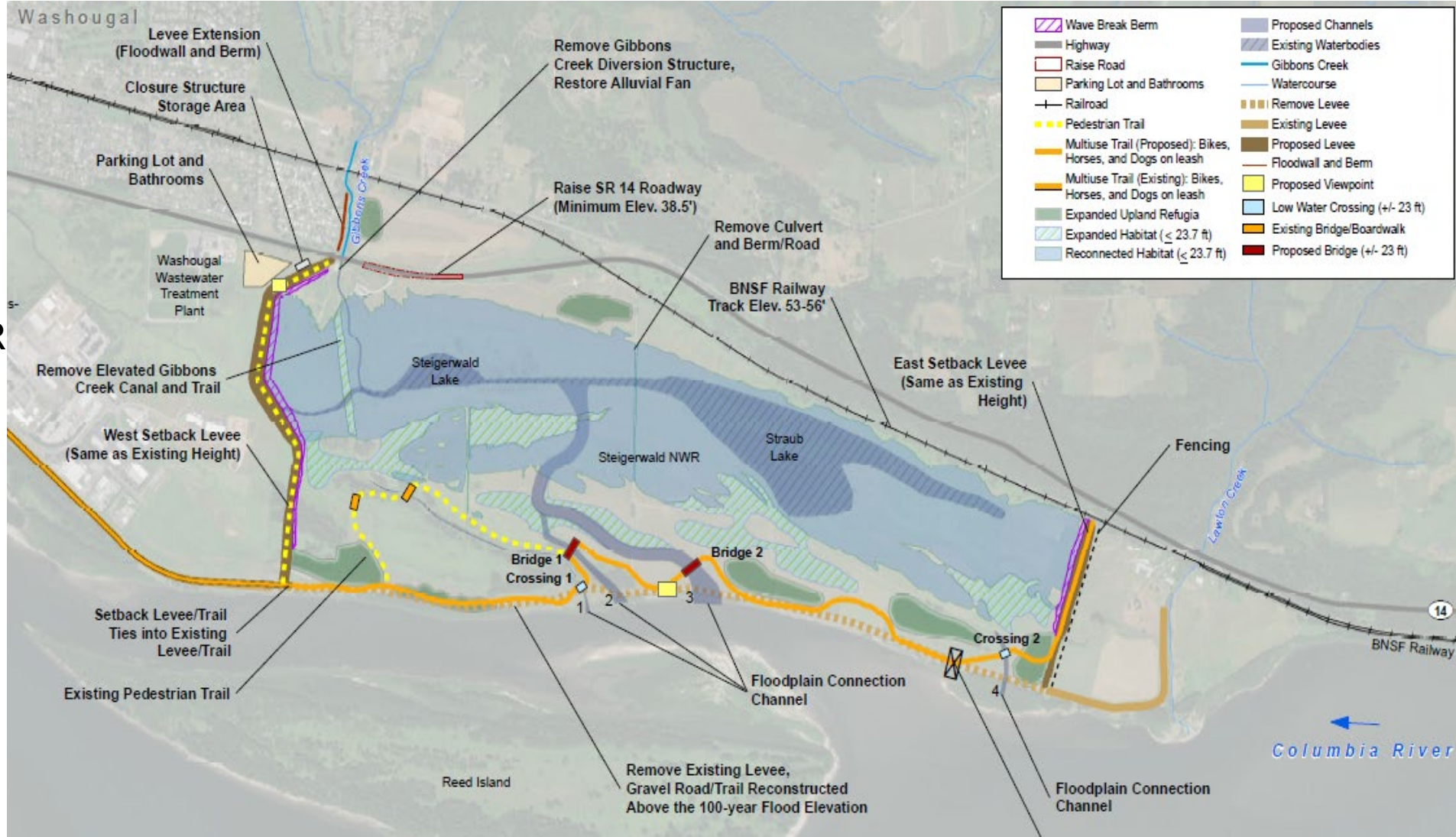




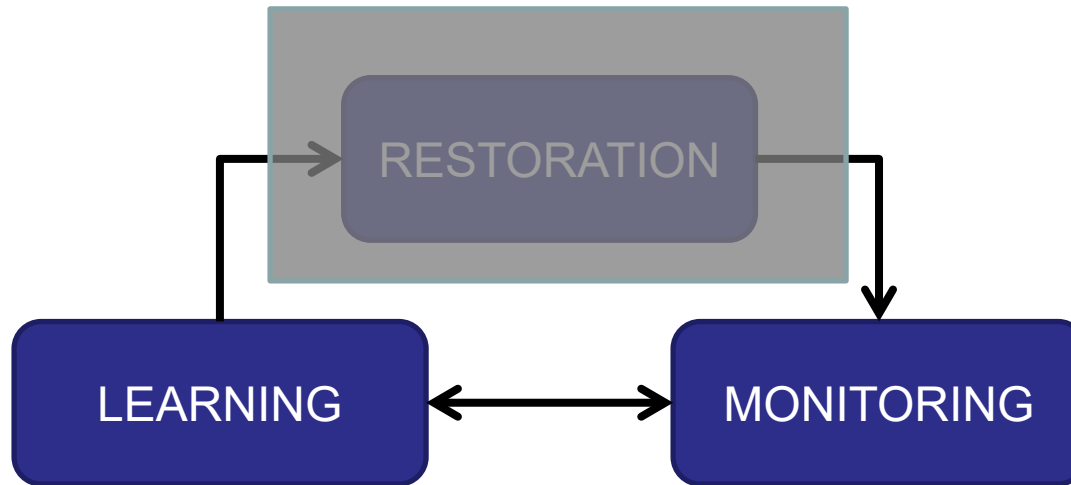
# Future efforts in the Estuary



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# Future efforts in the Estuary



- Annual updates to CEERP
- NCER conference
- Landscape Principals
- Coordination between agencies and NOAA
- Implementation Forecasting
- Continued, pertinent AEMR
- Re-evaluate Key MQ's
- Uncertainties ERTG



# Questions/Discussion



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