



## Dam Good: Small Dam Removals for Mitigation

Peter Wurden-Foster, PE, Natural Resources Practice Lead, Osborn Consulting Jason Neibergs, PE, Civil Engineer, Osborn Consulting

## Introductions

# Peter Wurden-Foster, PE



**Objective 1:** How small dam removal projects can be used for mitigation.

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**Objective 2:** Permitting requirements.

**Objective 3:** Review challenges associated with site access and constructability.

## Introduction

Small, abandoned dams can be found nestled within rural areas across Washington State. Removal of these facilities, historically used for drinking water or standby fire protection storage, offers **a unique opportunity to use mitigation funds**.



# **Small Dam Inventory Resources**



 Washington Department of Fish and Wildlife Fish passage Inventory

- Washington State Fish Passage
- Washington Department of Ecology
  - <u>Report\_DamInventory (wa.gov)</u>
- United States Army Corps National Inventory of Dams
  - National Inventory of Dams (army.mil)
- Local agency historical records
  - Many rural inactive or abandoned dams may not be included in State or Federal inventories

Dams by Height: Greater Than 100 Ft 61 50-100 Ft 48 25-49 Ft 156 Less Than 25 Ft 562 Undetermined 6

# **Mitigation Opportunities**



- Many cities have mitigation funds that are set aside to help offset habitat loss or other environmental impacts within a watershed.
- If you have mitigation funding and are looking for stream or watershed specific projects:
  - Floodplain reconnection is a common use of funding to offset habitat loss or stream impacts.
    - Can be more cost effective and feasible for smaller scale mitigation offset efforts.
    - Works well in watersheds with space for floodplain connectivity.
  - Wetland restoration, vegetative management and other ecosystem improvements may be other feasible alternatives.
  - Small dam removal is a unique alternative to other types of mitigation projects.









Source: Trout Unlimited, 2024

Source: Urban Water Co. UK, 2024

# **Benefits of Small Dam Removal**

- Small Dam removals specifically can be used as a mitigation tool for lost aquatic habitat:
  - Removals often result in large amounts of habitat gain upstream of the removed structures.
- Advantages of removing small dams include:
  - No new structures are needed.
  - Cheaper construction and design cost than culvert/bridge replacement projects.
  - Little to no maintenance required in comparison to bridge/culvert replacement project.
  - WDFW and Tribes are supportive and are happy to see these projects occurring.



# **First Steps**



#### • How to determine if a small dam removal is right for you:

- Address the mitigation needs.
- Identify the potential structure for removal.
- Perform Feasibility Study.
- Determine if the project fits your needs and budget.
- Identify funding.
- Move forward beyond the initial study phase into design phase.

# **Permitting Requirements**



Local	
SEPA	
Critical Areas	
Grading	
State	
Fish Habitat Enhancement Program (WDFW)	Mitigation projects not eligible
Forest Practices (DNR)	
HPA (WDFW)	
Federal	
JARPA (USACE)	
ESA Compliance (NMFS)	Certification for dams over 10 ft tall

# **Permitting Process**

- Long review timelines.
- Agency coordination:
  - USACE
  - NMFS
  - Dept. of Archaeology and Historic Preservation
- Co-manager coordination:
  - WDFW
  - Tribes



# Challenges

#### **City of Bremerton – Anderson Creek Dam Removals:**

- Site Access and Staging
- Sediment
- Uncertainties
- Dewatering
- Restoration







## Site Access and Staging





## Site Access and Staging



- Material coming in. •
- Material going out.

# Sediment

- Impacts to fish habitat.
- Impacts to downstream infrastructure.





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# Sediment

• Other examples.



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Aggraded sediment

# Uncertainties

• Challenges with assessing existing conditions.



## Uncertainties



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# Dewatering

- Site topography:
  - Generally steep and confined.
- Aggraded material:
  - Loose and permeable.





# Restoration



• Availability of large woody material.

# Restoration

- Minimize impacts.
- Maintain existing slopes.





