# Diversity in Life History Movement and Survival of Juvenile Steelhead in Idaho



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#### **Steelhead Life History Diversity**



#### **Migration Pathways**



# Objectives

- 1. Describe life history diversity in movement and freshwater rearing of juvenile steelhead
- 2. Examine age-based and brood-year-based survival of smolts to Lower Granite Dam
- 3. Estimate abundance of smolts at Lower Granite Dam



## Big Bear Creek and East Fork Potlatch River



#### Fish Creek



## Hayden Creek



## Methods

Sampling at rotary screw traps

- Juvenile abundances
- Ages from scales
- PIT tagging

Assign ages to unaged PIT-tagged fish

- Seasonal age-length keys
- Age composition







n=j

Mean Length at Age Trends



## **Migration Pathways**



## Survival by Age and Migration Pathways





➡ Direct migrant ➡ Holdover (1 winter) ➡ Holdover (2 winters) ➡ Holdover (3 winters)

## Trends in Brood Year Abundance and Survival



Screw trap in natal stream



Lower Granite Dam



## Conclusions

- 1. Information is lacking for juvenile steelhead movement and survival
- 2. Evaluating effectiveness of restoration actions is challenging
- 3. Monitoring and comparing early life history diversity and success is important





# Challenges

- 1. Need age data to assign ages to all unaged PIT-tagged juveniles using agelength keys
  - Site-specific modifications might be needed
  - Missing ages in one year affects more than one brood year cohort
- 2. Many fish get excluded due to lack of PIT tag detections for certain pathways
- 3. BasinTribPIT tool
  - Useful but modifications could improve ease of use
  - Doesn't know how to deal with fish that return as an adult without being detected as a juvenile smolt
- 4. Lower Granite spillway array and flex spill program now complicates survival estimates in some situations

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