MOUNT HOOD ENVIRONMENTAL

Salmon and steelhead effectiveness monitoring in the Upper Salmon River Basin

Advisory Committee Meeting
December 2025

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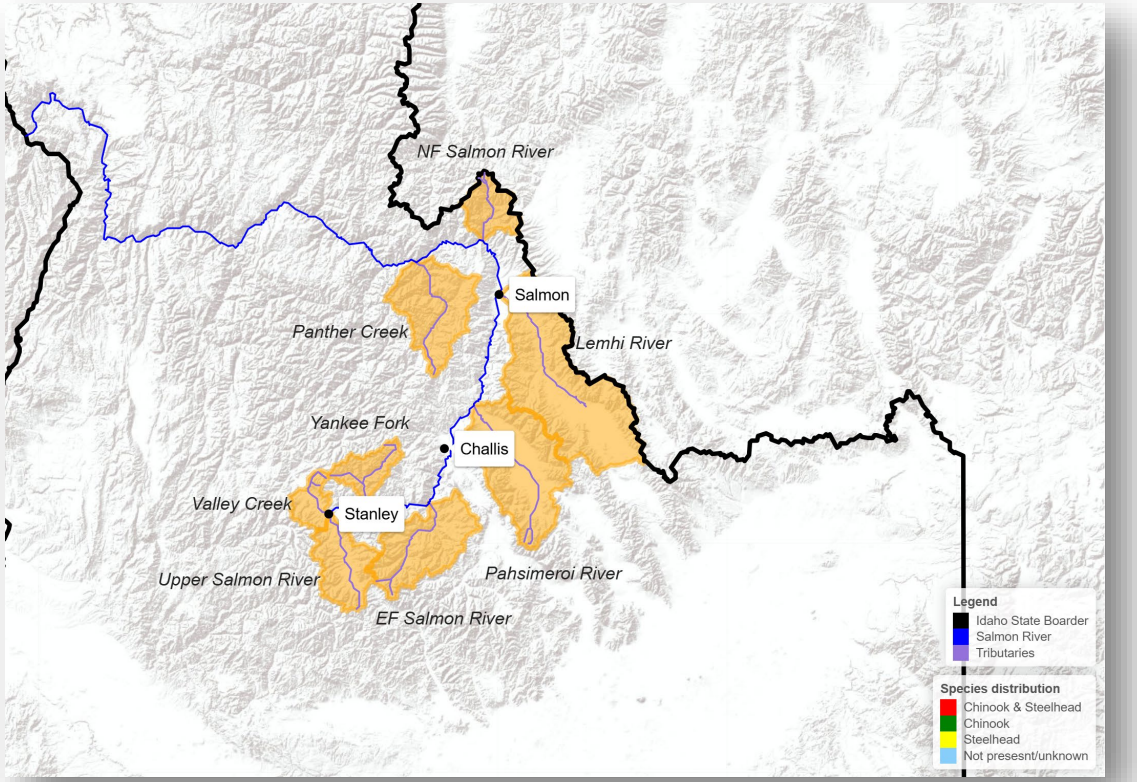
Overview

- Brief background on salmon and steelhead populations in the Upper Salmon River Basin
- Fish-in/Fish-out monitoring (population-level monitoring)
- Site-specific monitoring
- On-going monitoring, restoration, and conservation efforts



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Population status

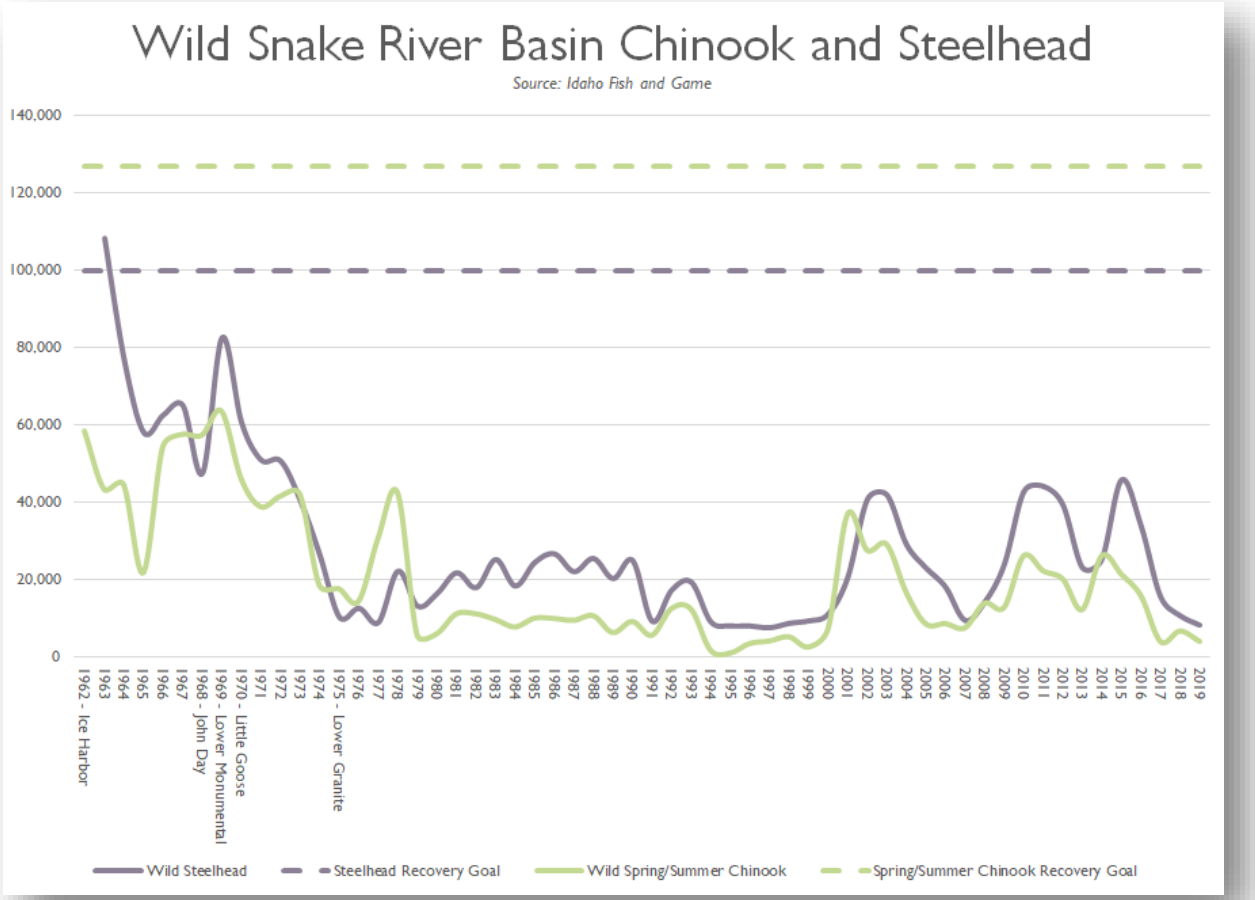
Major declines in salmon, steelhead, and other cold-water species in Columbia River basin.

Federally listed populations in Idaho.

- Chinook salmon – 1992
- Steelhead – 1997
- Bull trout – 1998

Several compounding factors.

It’s tough to effectively manage something if you don’t monitor it.



Idaho Conservation League. Salmon and Steelhead. Available: https://www.idahoconservation.org/our-work/salmon-and-steelhead/ [accessed 16 April 2024].

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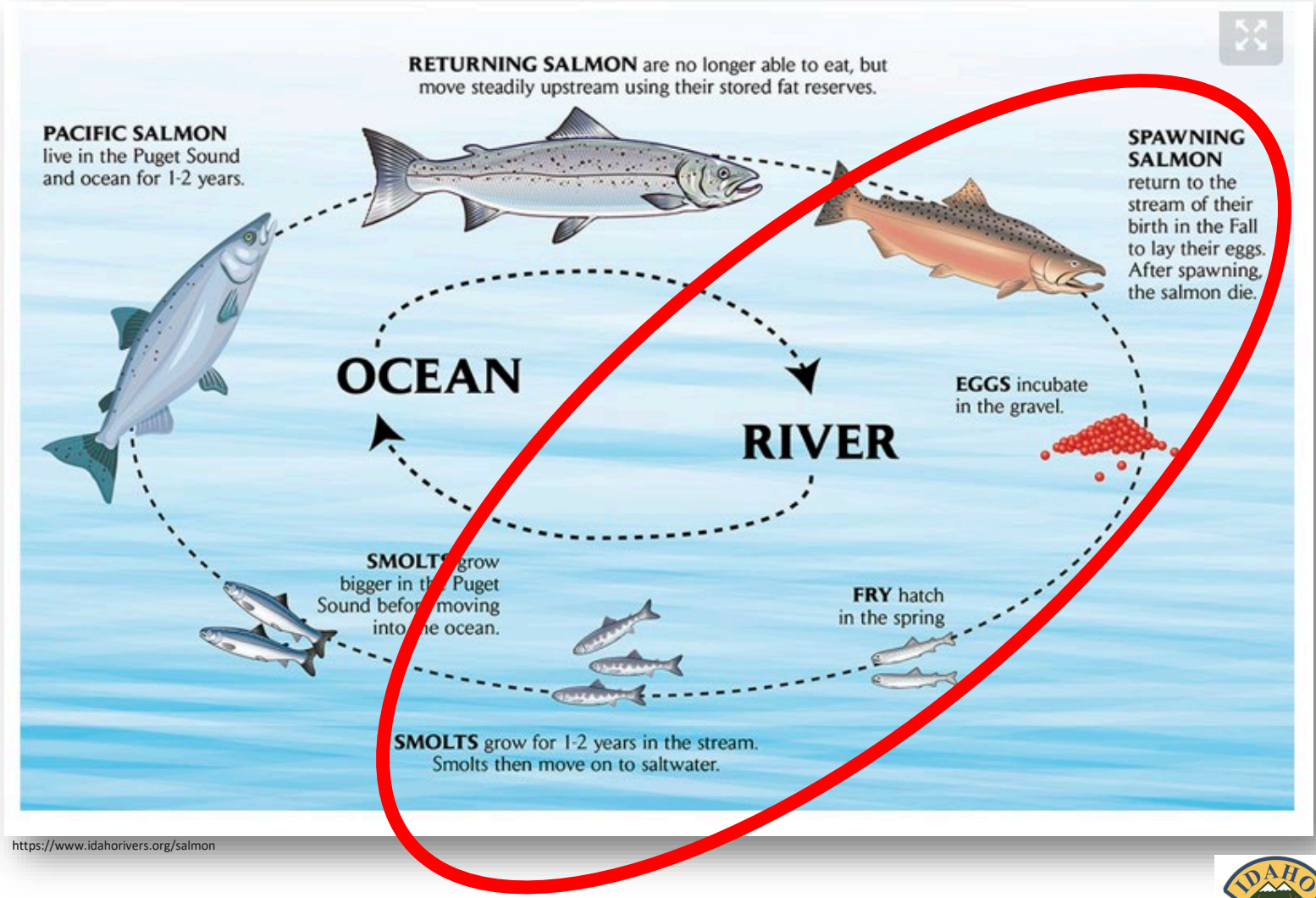
Salmon and steelhead life histories



https://www.idahorivers.org/salmon

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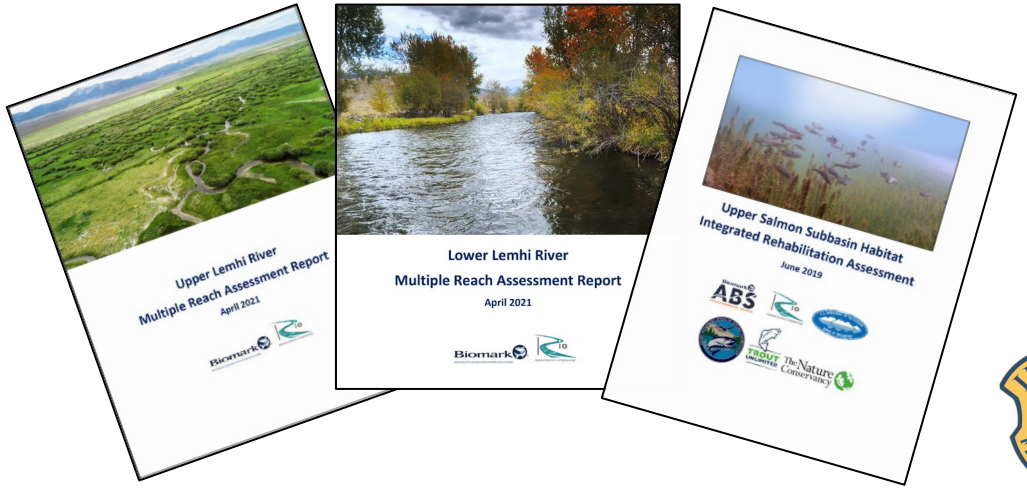
Habitat conservation efforts

- Connectivity
  - Barrier removal
  - Increased flows
  - Fish screens
- Small scale restoration
  - Beaver dam analogs
  - Large wood treatments
  - Fencing enclosures
- Large scale restoration
  - Floodplain rebuild projects
- Easements



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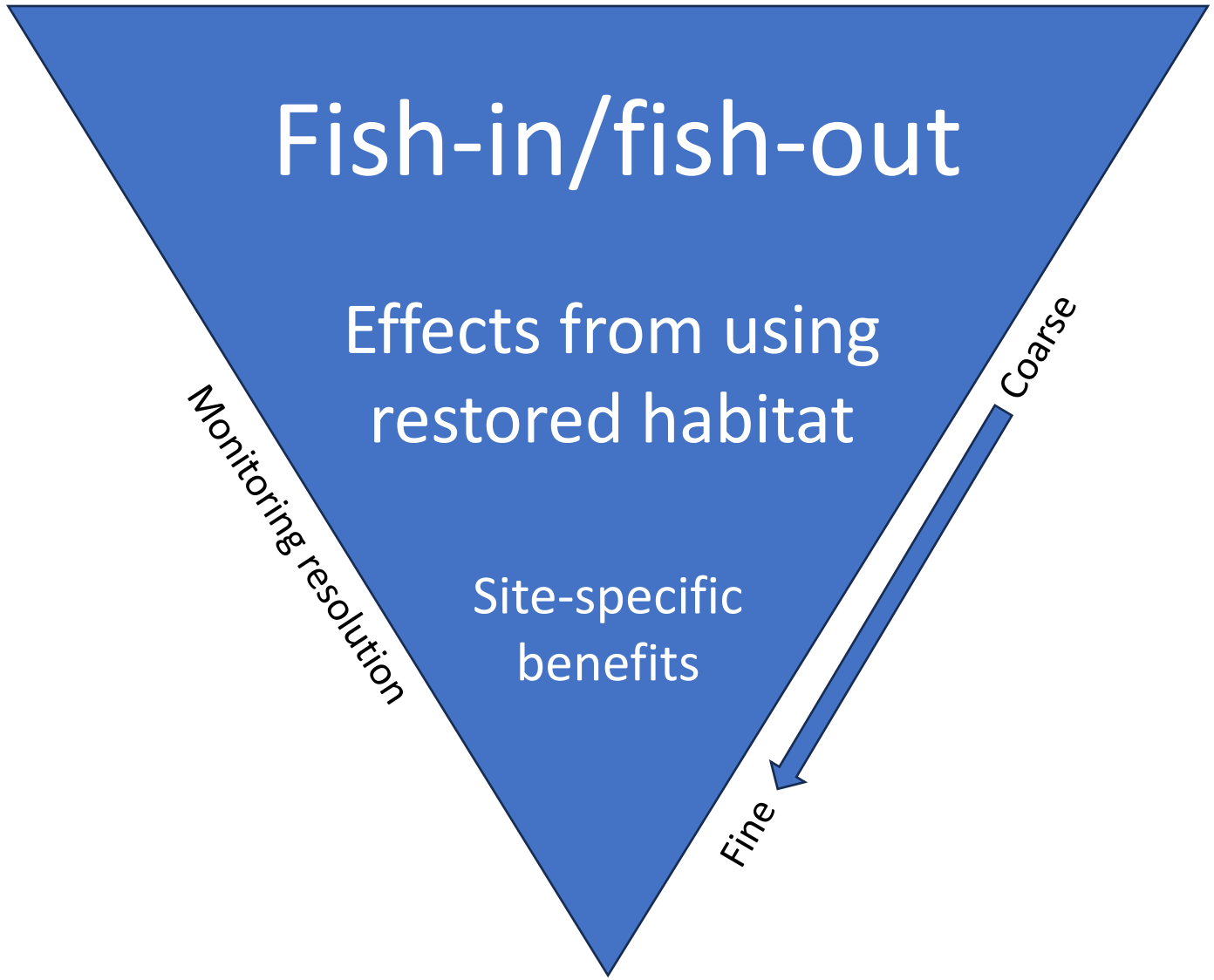
Research, monitoring, & evaluation



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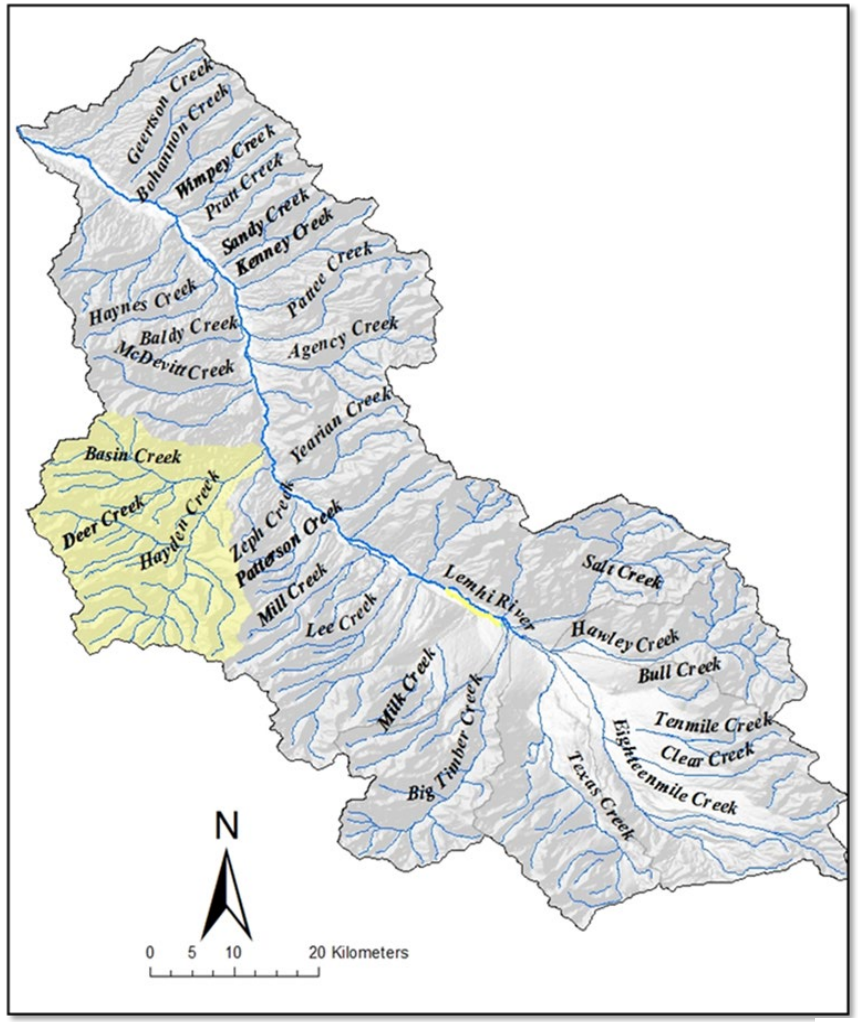
Lemhi River

- Historical perspective
  - One of the most important spawning areas for migratory salmonids
  - 2 of 31 tributaries maintained functional connectivity



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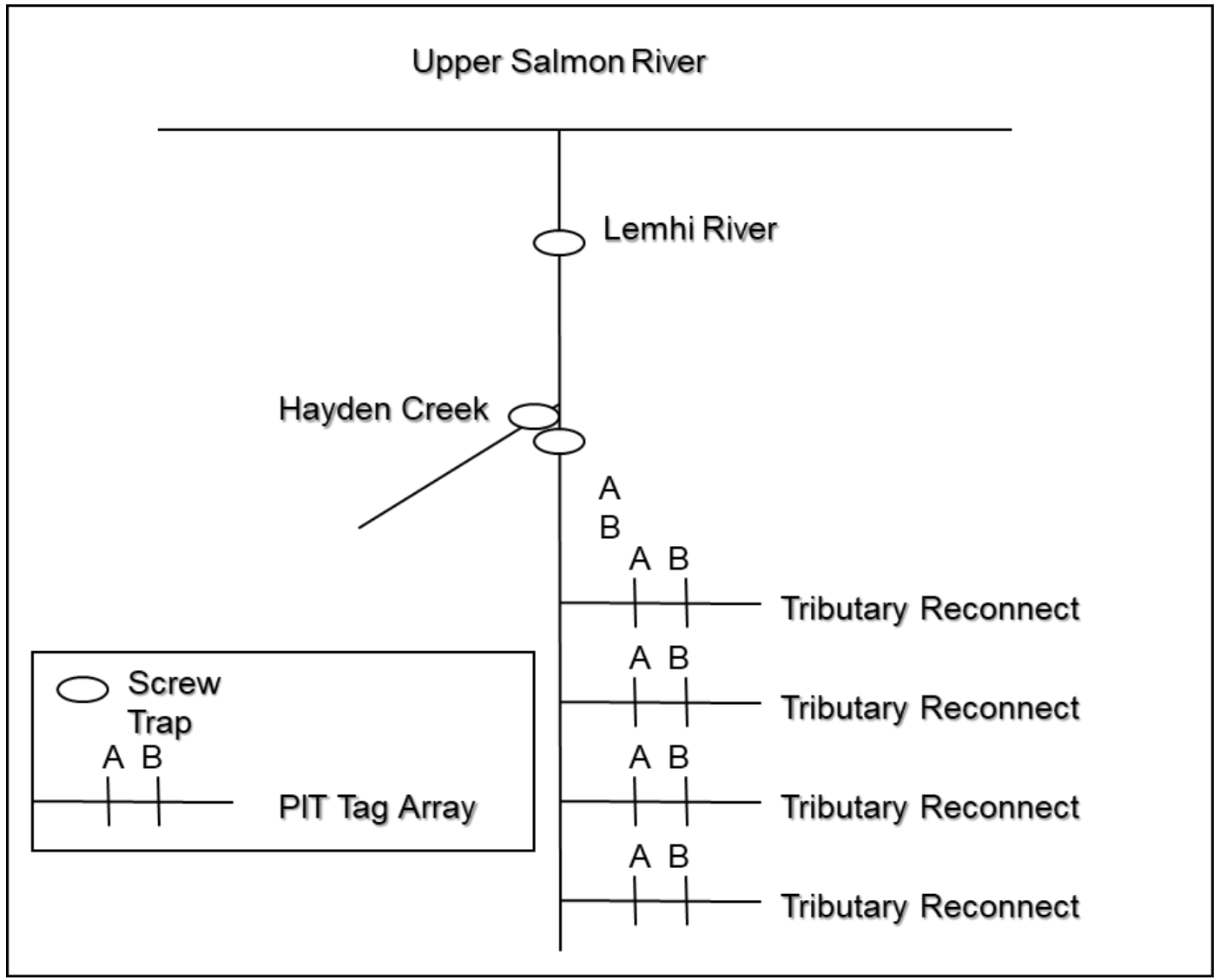
Monitoring Framework: Fish-in and Fish-out



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Fish-in and fish-out monitoring

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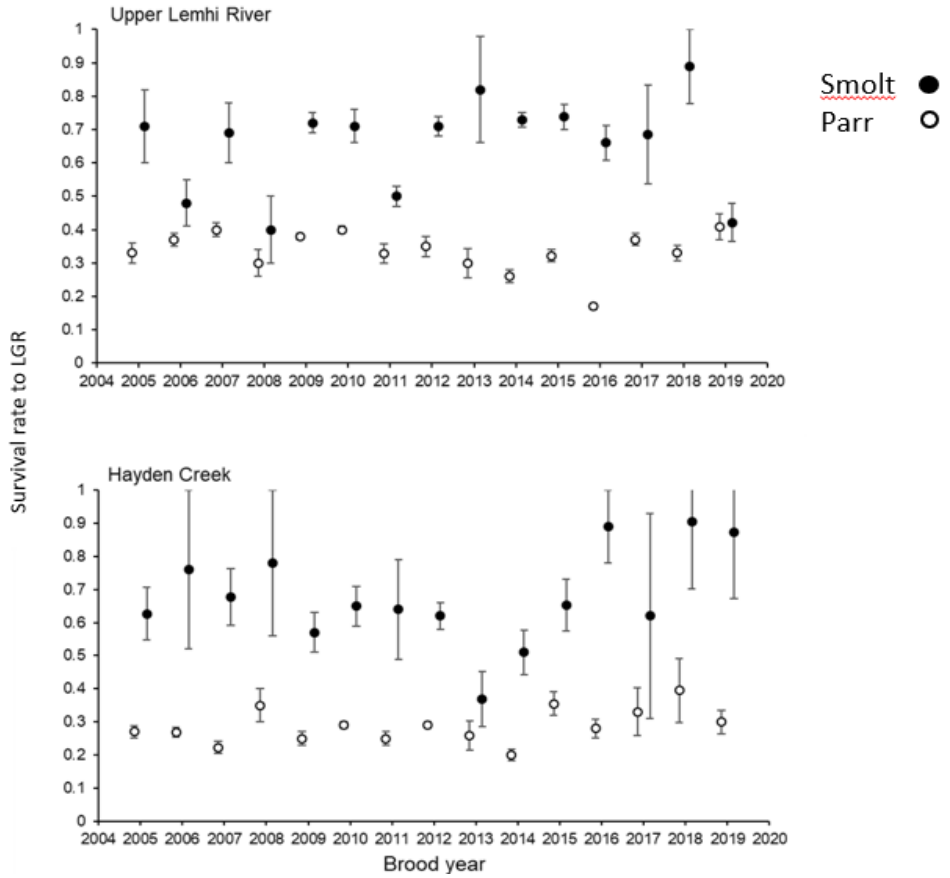
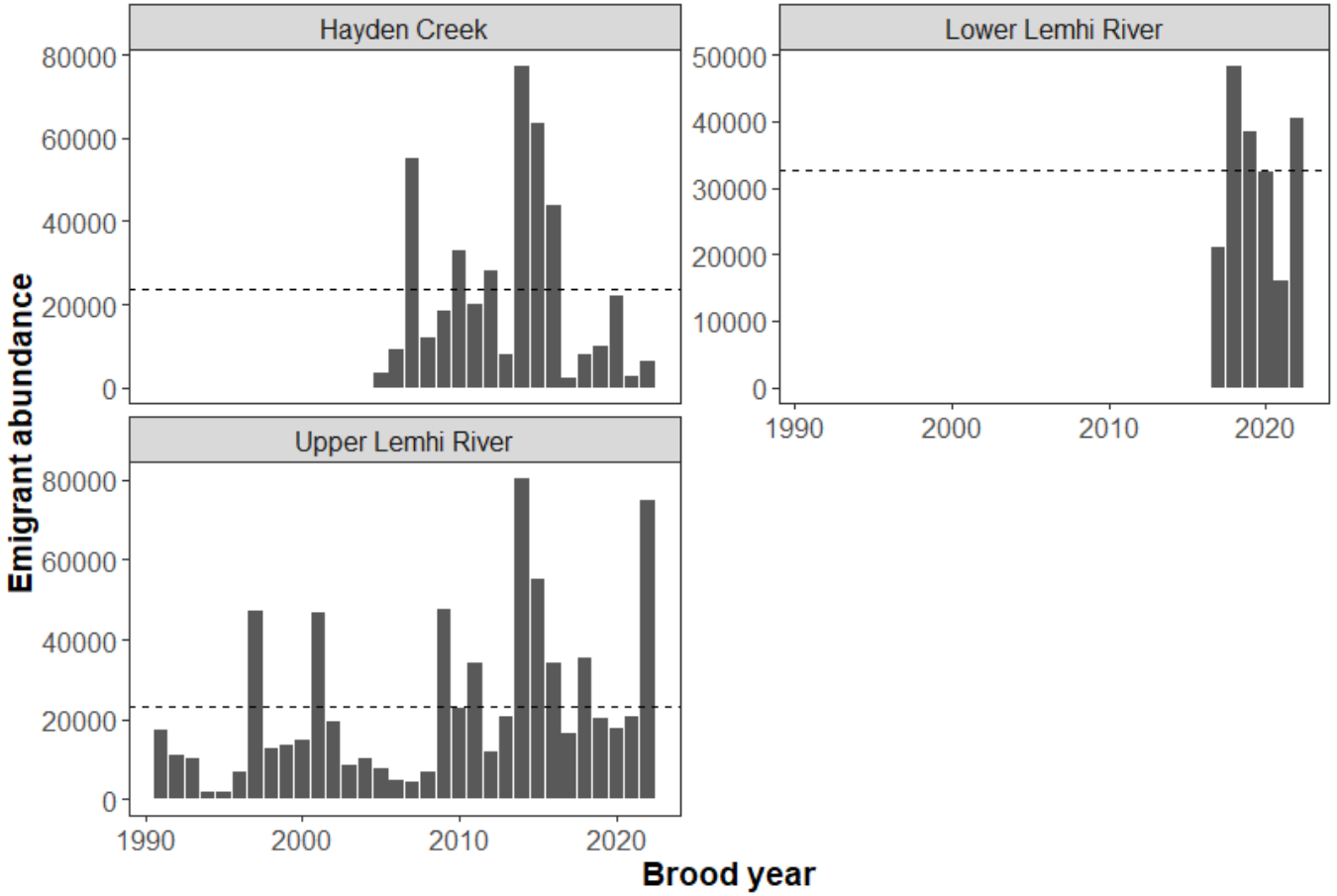
Fish-in and fish-out monitoring

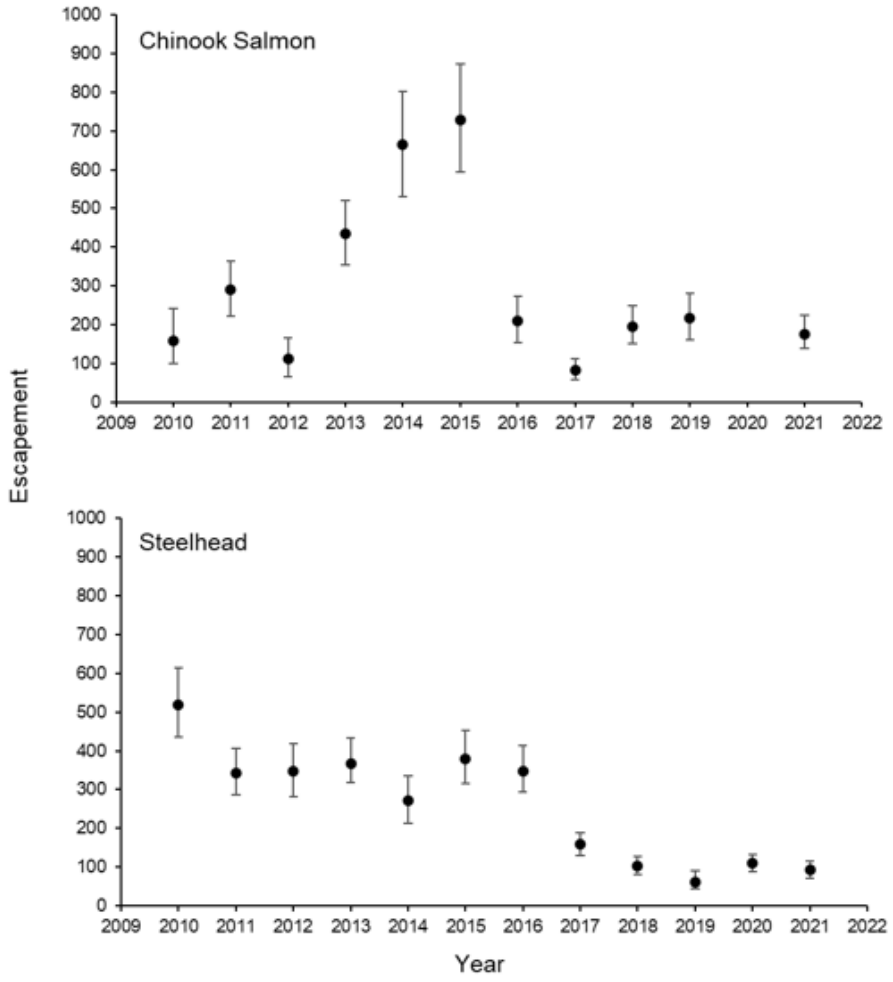
- Screw traps
  - Juvenile data





Fish-in and fish-out monitoring

- Arrays
  - Juvenile and adult data



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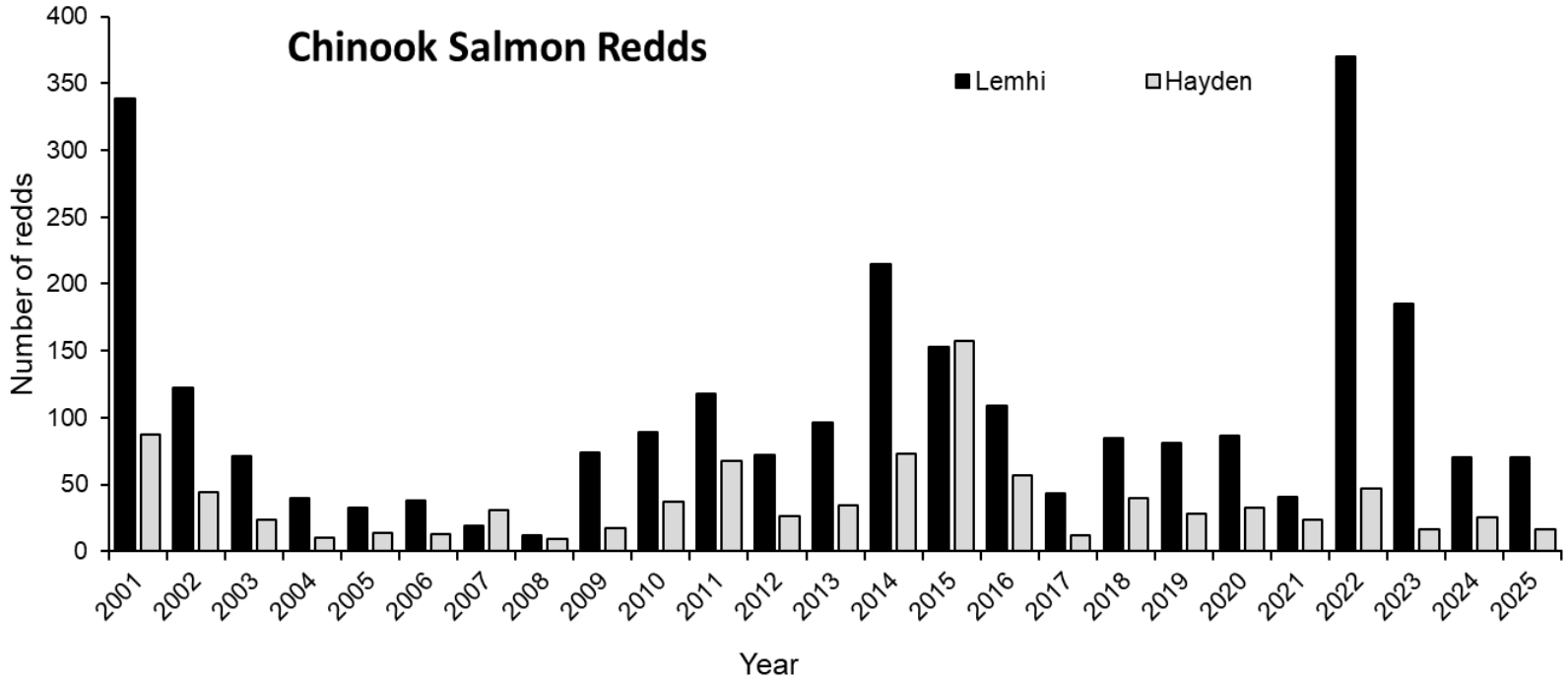
Fish-in and fish-out monitoring

- Spawning surveys
  - Redds (Chinook and steelhead)
  - Productivity



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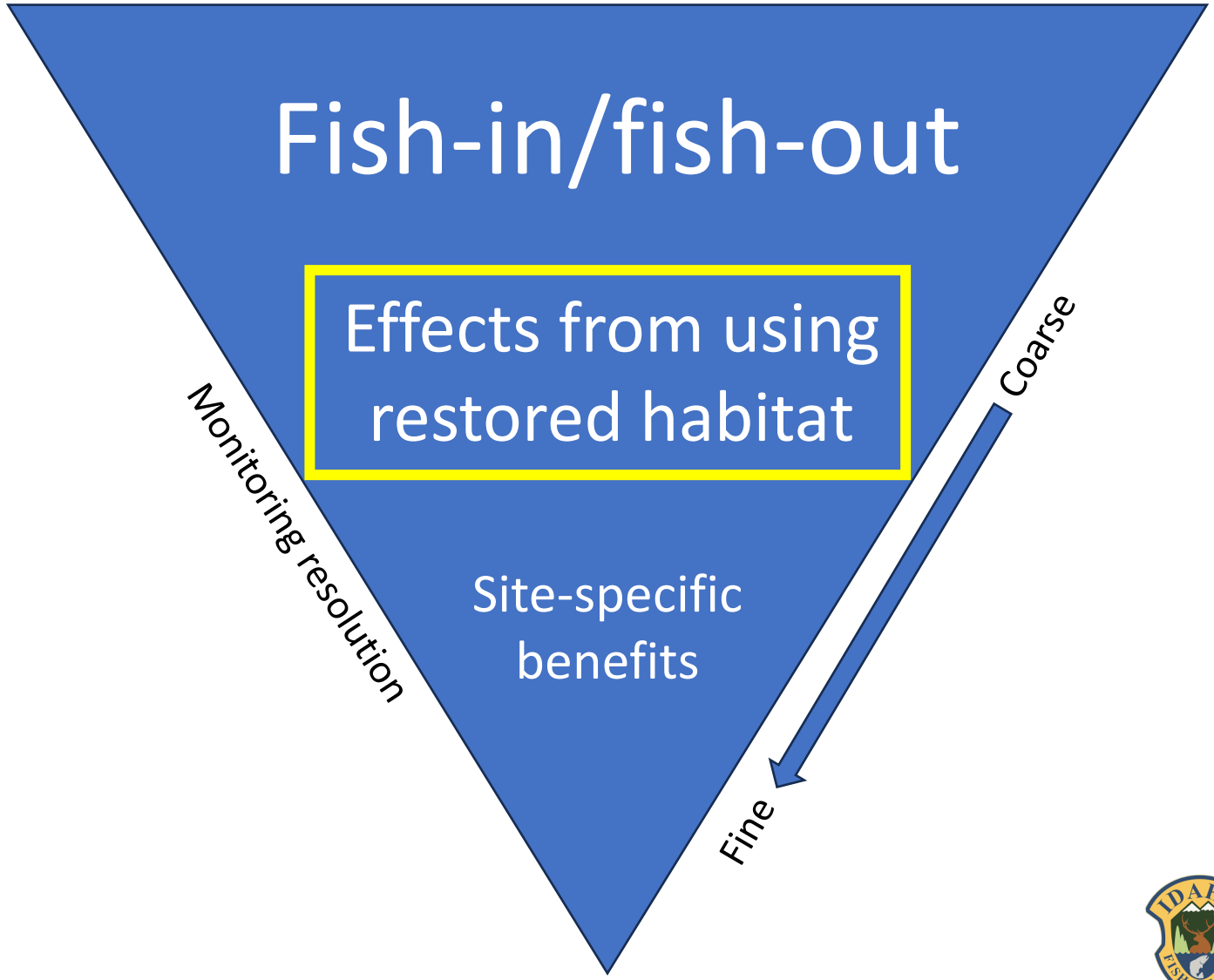
Fish-in and fish-out monitoring

- Future direction of fish-in/fish-out monitoring
  - Critical for population-level monitoring

- Improvements in juvenile abundance estimates
  - Address issues with sparse/missing data
  - Include environmental covariates in models (where possible/appropriate)
  - Try to account for “noise” in the data to better detect effects of conservation efforts

- Continued long-term monitoring efforts

Effects from using restored habitat



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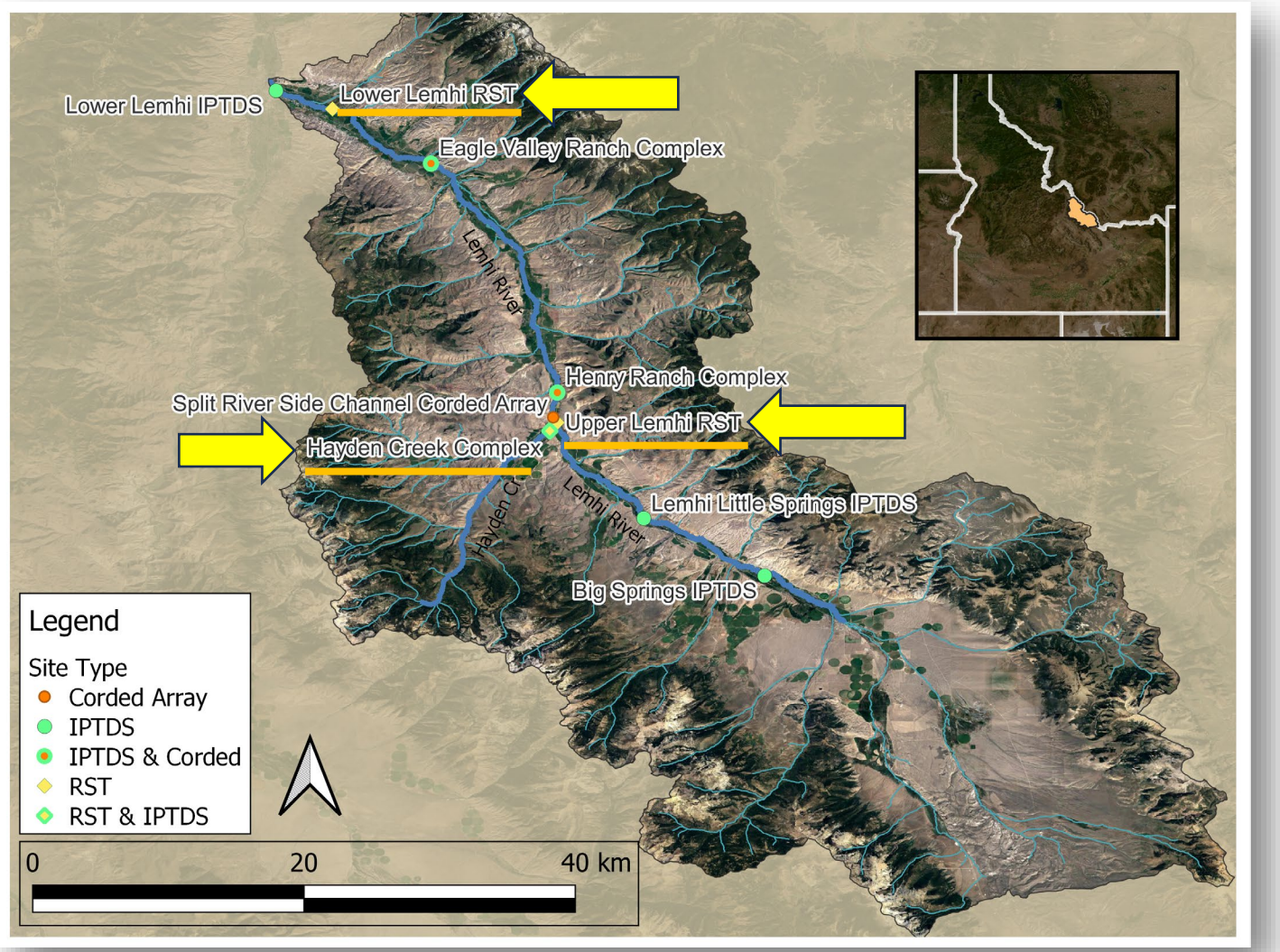

Thousands of fish tagged at Upper Lemhi, Lower Lemhi, and Hayden Creek RSTs annually.

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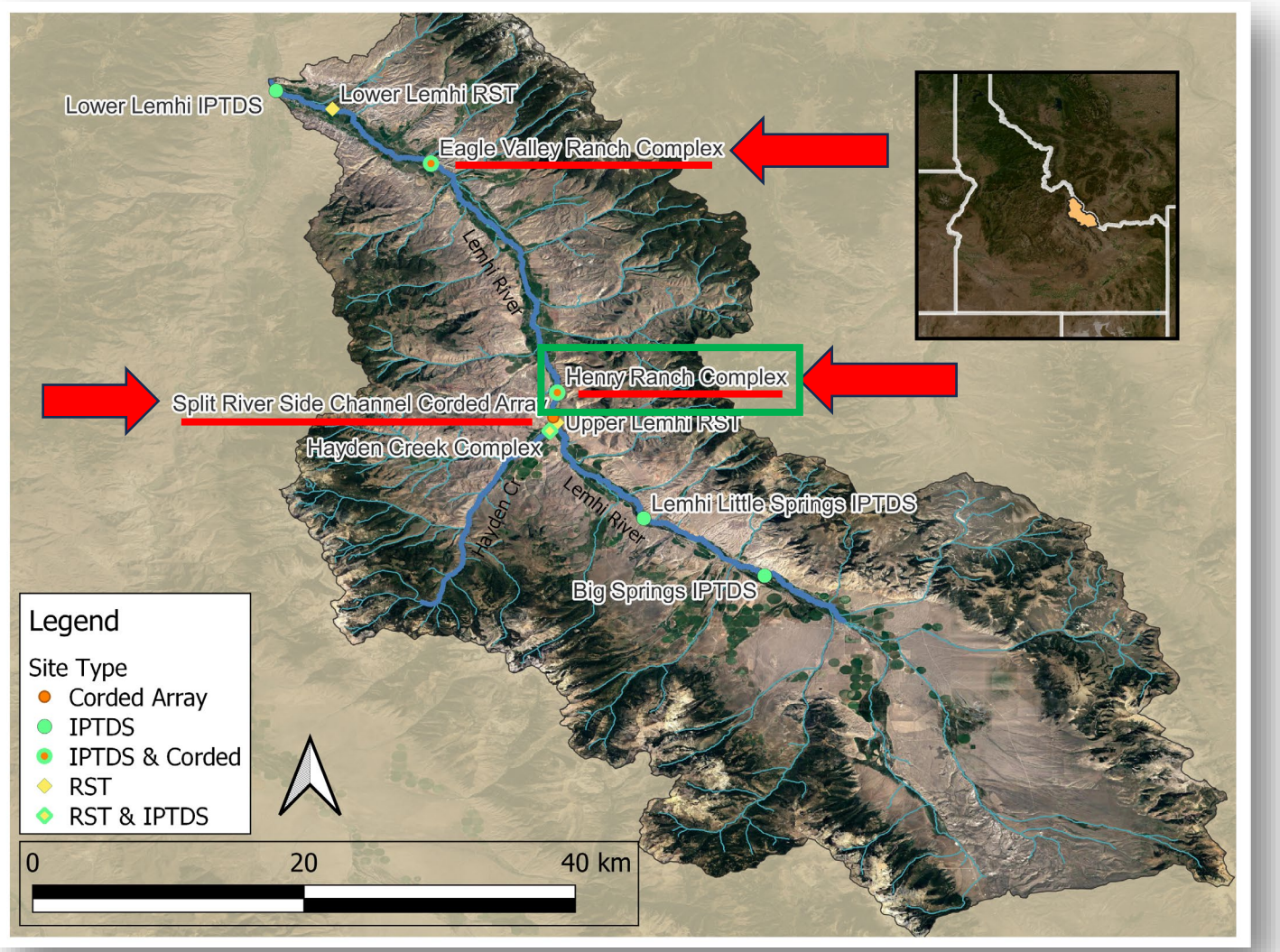
Effects from using restored habitat



Thousands of fish tagged at Upper Lemhi, Lower Lemhi, and Hayden Creek RSTs annually.

Leverage instream and corded arrays (litz cords) to answer:

- How many fish use restored habitats?
- How long do fish occupy habitat?
- **What effect does using restored habitat have on growth, outmigration timing, and survival to Lower Granite Dam?**

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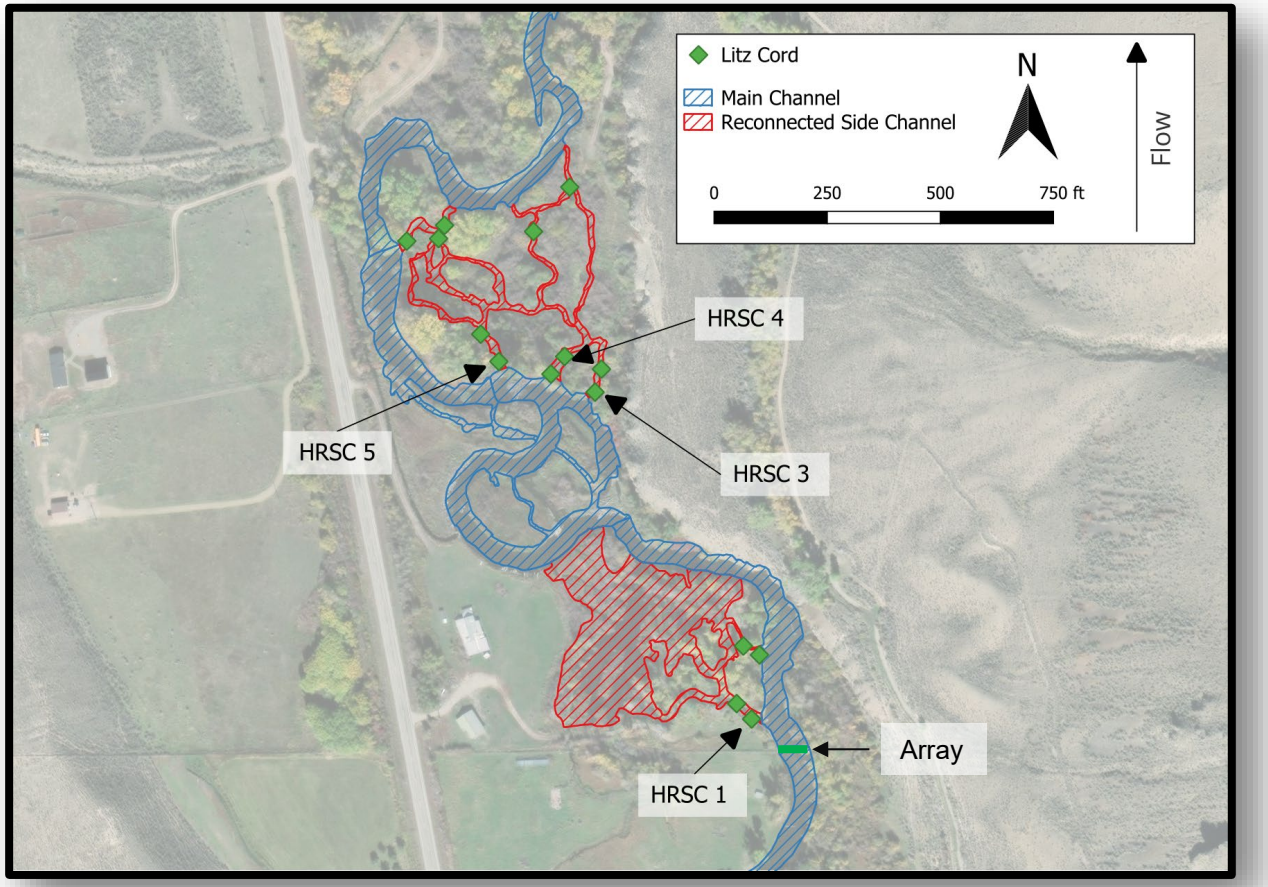
What does this look like?



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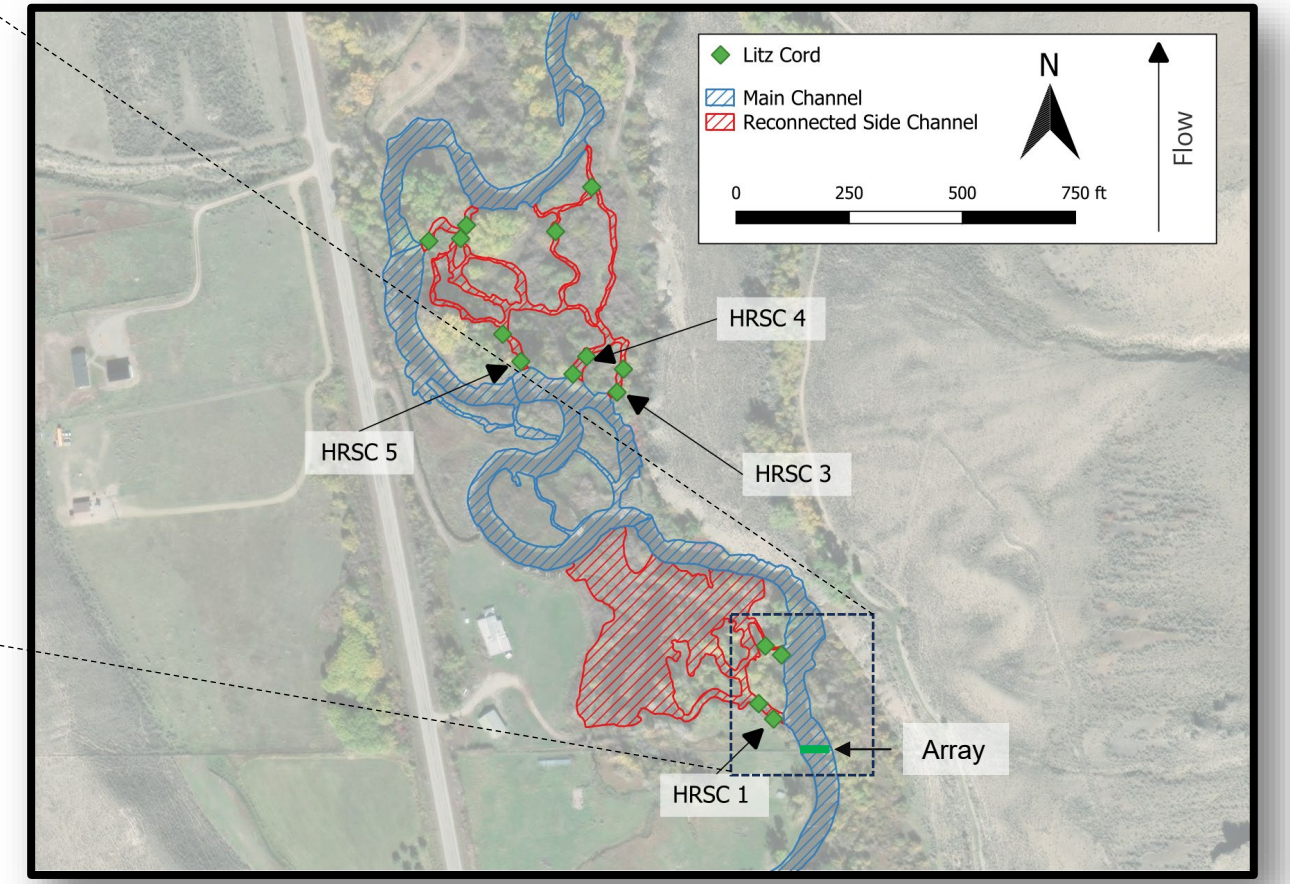

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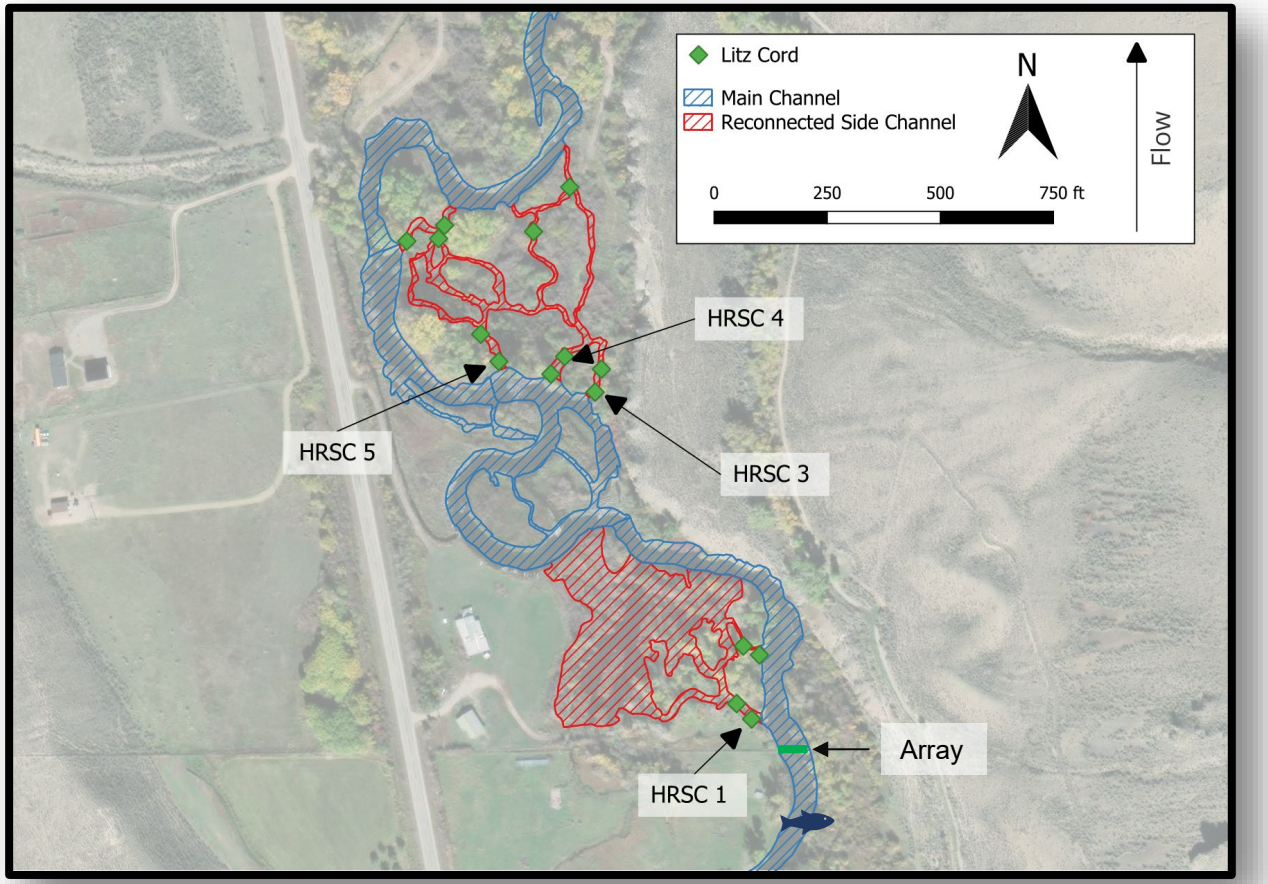

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Characteristics at side channel entrances

What are the microhabitat characteristics that “catch” more fish?

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Characteristics at side channel entrances

What are the microhabitat characteristics that “catch” more fish?

- Angle to thalweg
- Proportion of river going into side channel
- Approach velocities
- Sweeping velocities
- Depth
- Etc.

How long do fish stay in the side channels and when?

What does this mean for survival & growth?

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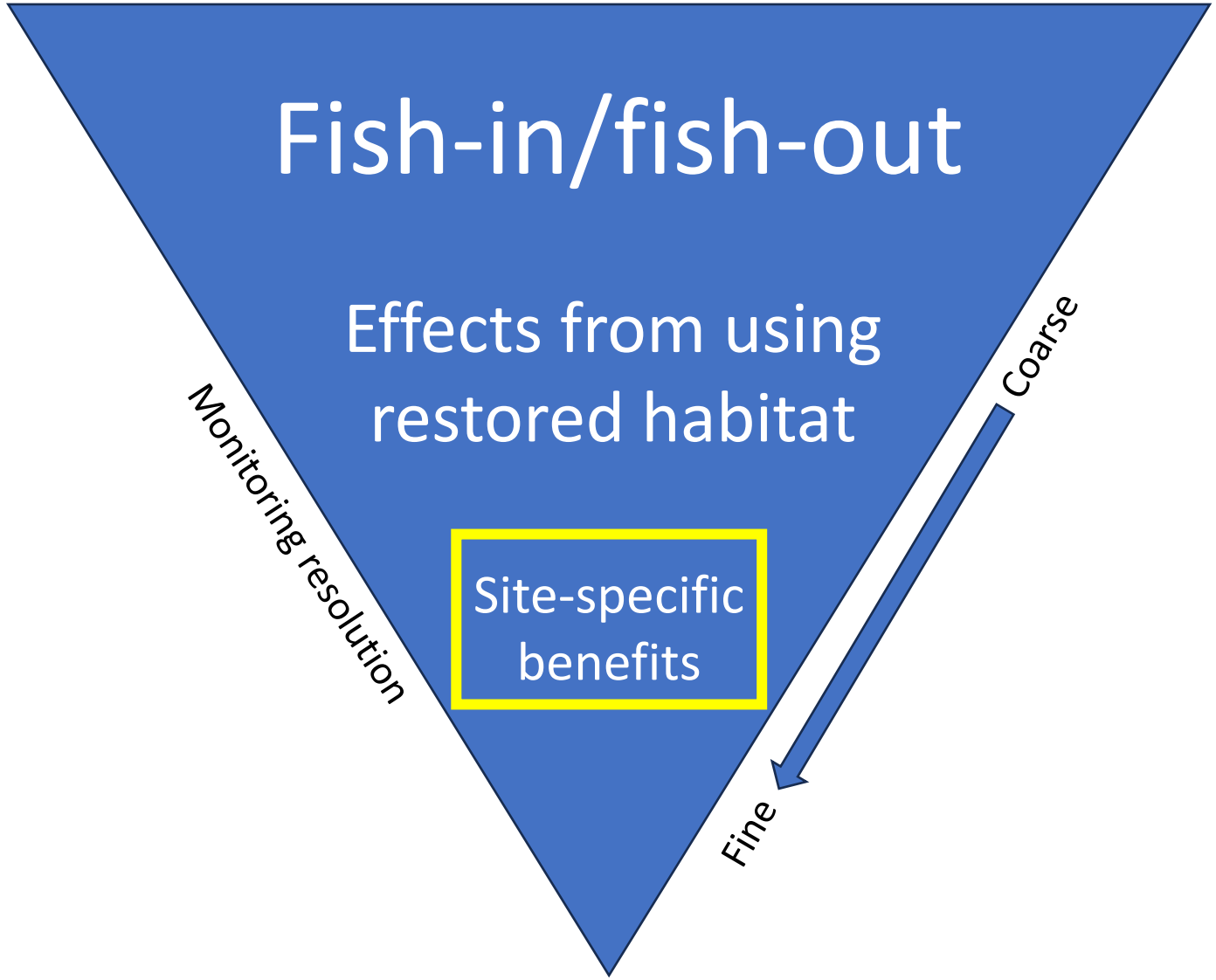
Site-specific benefits



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Empirical data

https://idfg.idaho.gov/blog/2017/08/fish-snorkel-surveys-steelhead-and-chinook-salmon

- Sampling can be a challenge
- Observed fish use can be confounded by other factors
- Can get expensive

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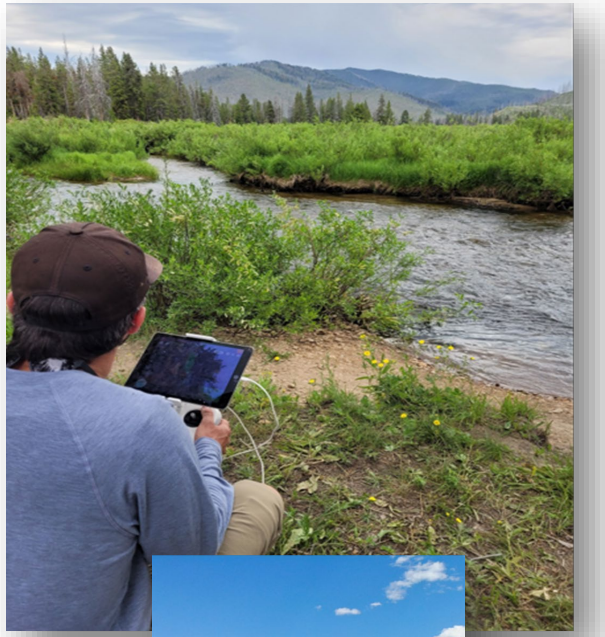
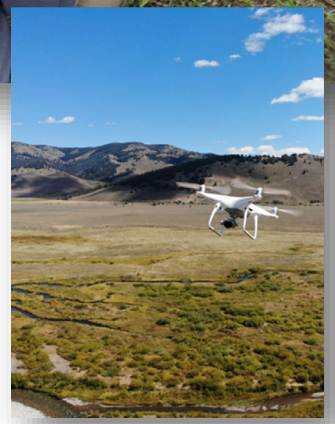
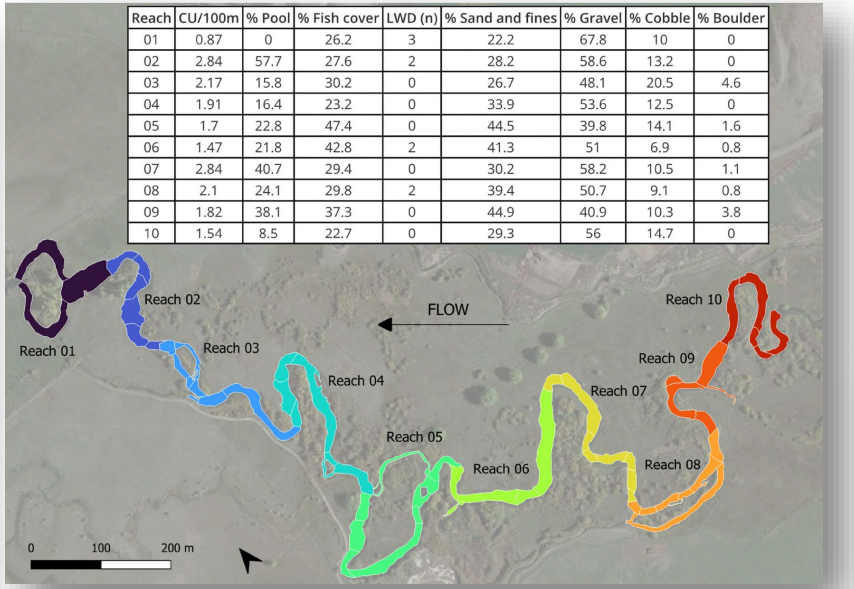
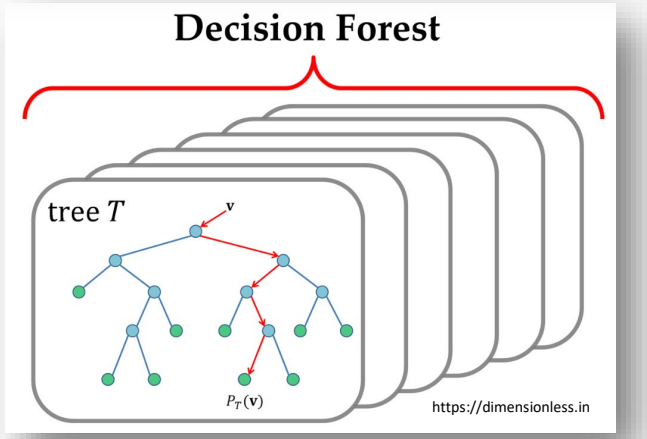
Modeled benefits



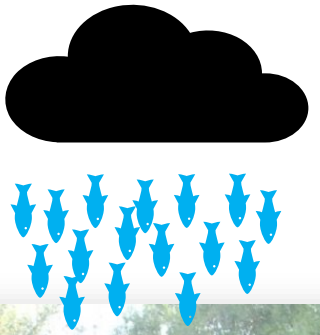


Reach	CU/100m	% Pool	% Fish cover	LWD (n)	% Sand and fines	% Gravel	% Cobble	% Boulder
01	0.87	0	26.2	3	22.2	67.8	10	0
02	2.84	57.7	27.6	2	28.2	58.6	13.2	0
03	2.17	15.8	30.2	0	26.7	48.1	20.5	4.6
04	1.91	16.4	23.2	0	33.9	53.6	12.5	0
05	1.7	22.8	47.4	0	44.5	39.8	14.1	1.6
06	1.47	21.8	42.8	2	41.3	51	6.9	0.8
07	2.84	40.7	29.4	0	30.2	58.2	10.5	1.1
08	2.1	24.1	29.8	2	39.4	50.7	9.1	0.8
09	1.82	38.1	37.3	0	44.9	40.9	10.3	3.8
10	1.54	8.5	22.7	0	29.3	56	14.7	0





Estimated Habitat Capacity



Credit: Rio ASE

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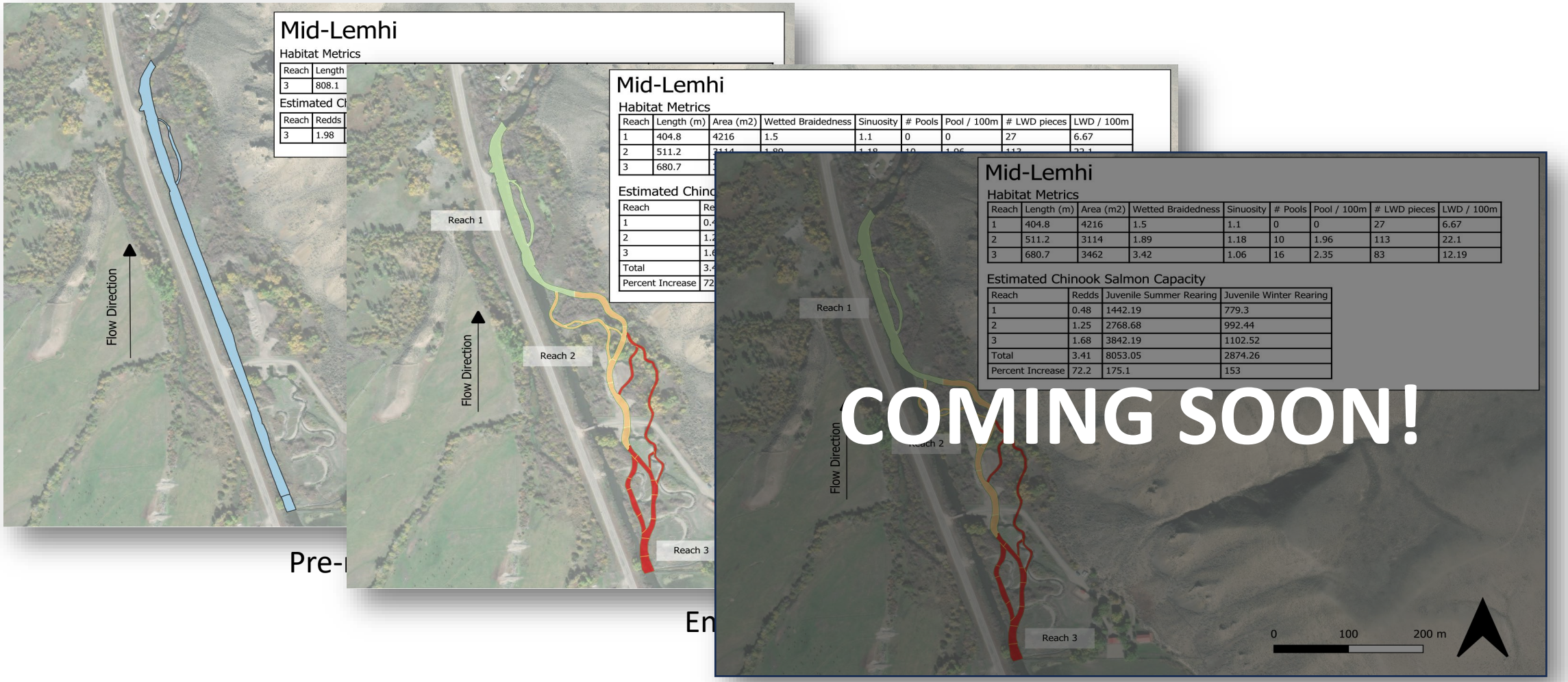
Modeled benefits



Post-restoration

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Summary

- Tons of work going on in the Upper Salmon that is highly collaborative.
- Multiple, complimentary RM&E efforts occurring simultaneously to answer questions of various scales and scopes.
- Continually trying to increase our understanding of each watershed, and populations within them, to optimize and prioritize restoration and conservation efforts.
- RME and conservation efforts over the last 20 years have significantly increased our knowledge of these systems and have helped sustain populations in the Upper Salmon Basin.

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Questions?

Please reach out if you're interested in documents, reports, publications, proposals, etc. related to any of the items discussed during the presentation!

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