



RECONDITIONING SNAKE RIVER B-RUN STEELHEAD KELTS

A RESEARCH REPORT

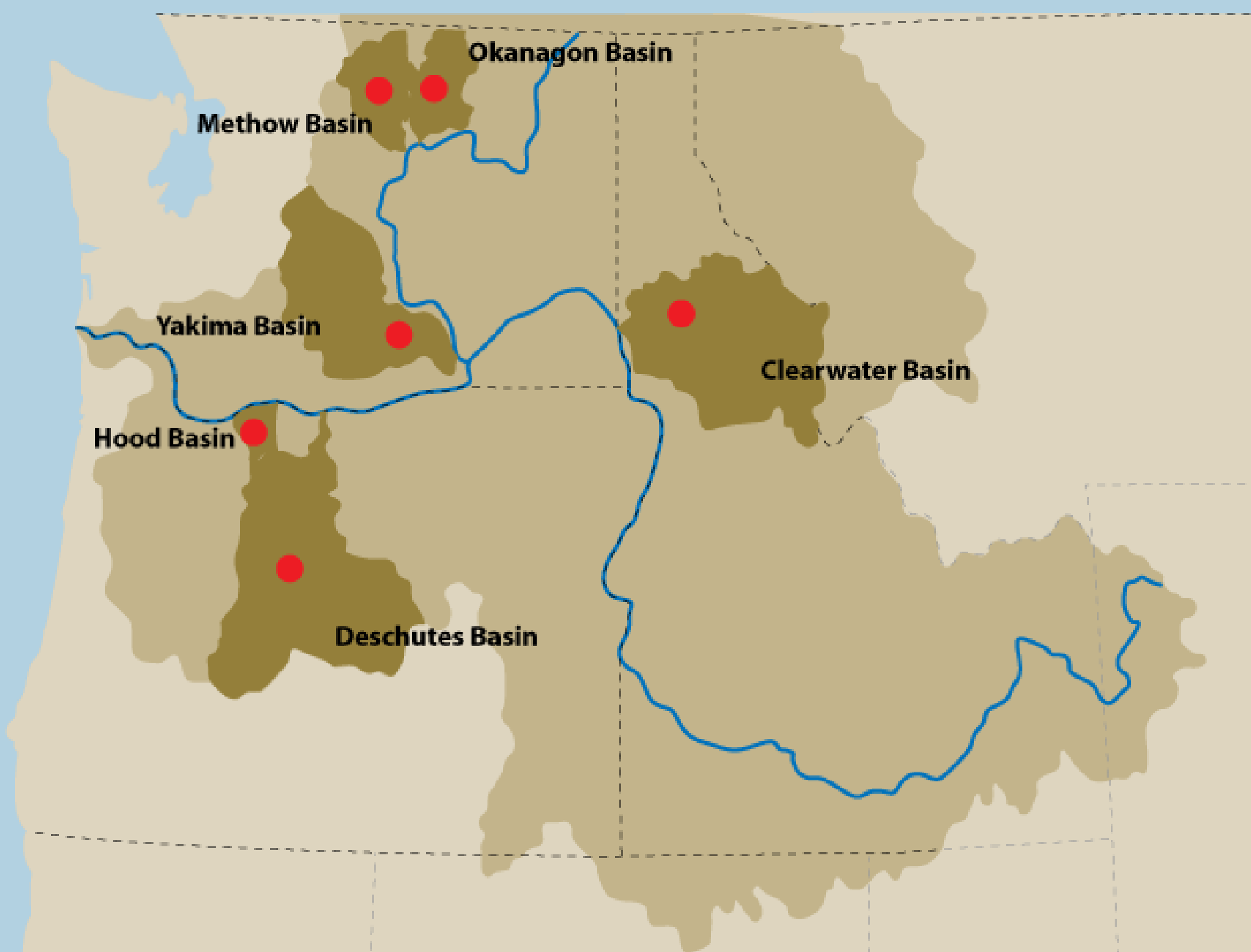
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Introduction

- All steelhead above Bonneville dam are ESA listed
- Kelt Reconditioning is a recovery tool being implemented throughout the Columbia River Basin (CRB)
- Kelt Reconditioning consists of Collection, Fish Culture, and Release



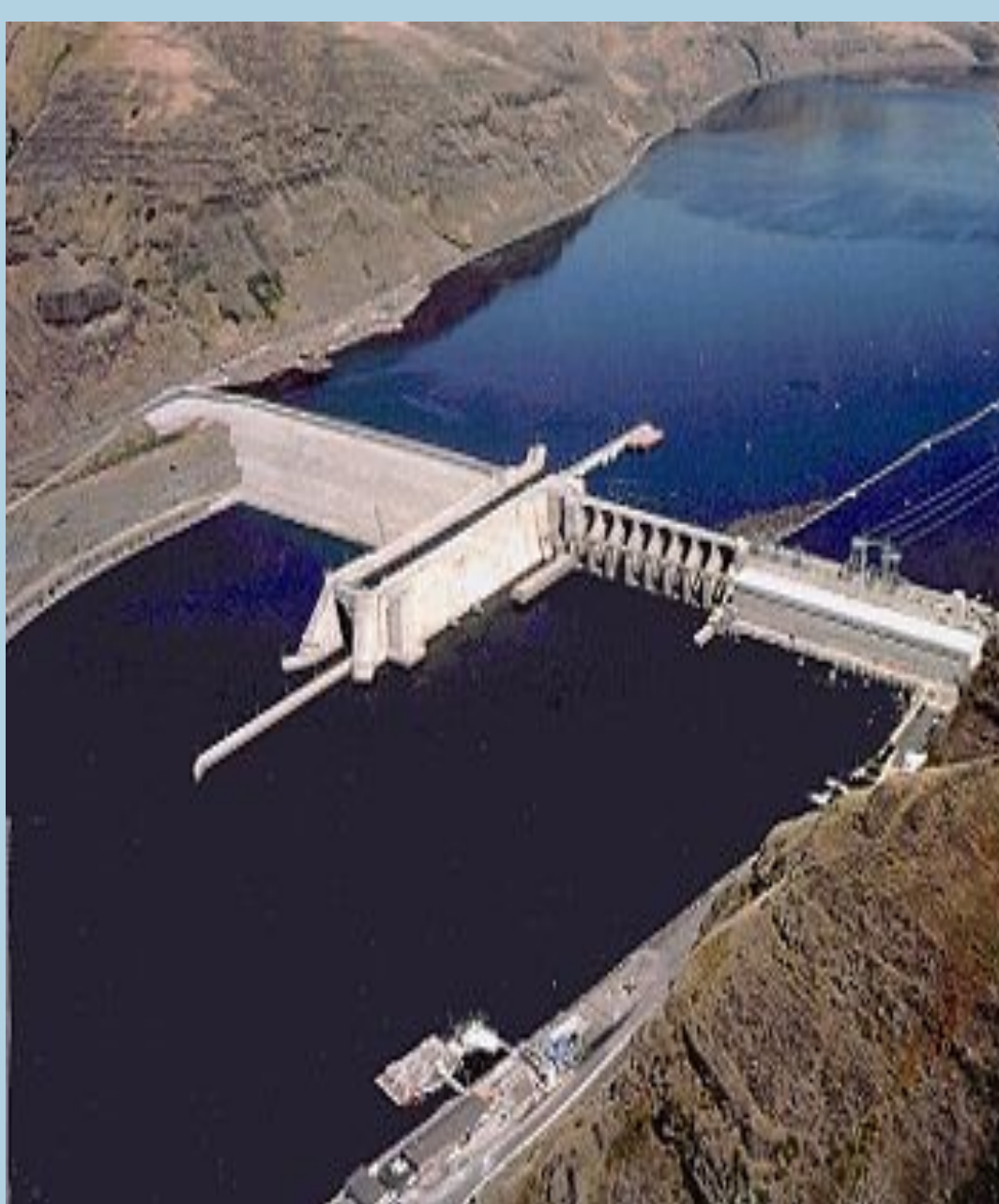
Map of the Columbia River subbasins where Kelt Reconditioning work has been done.

Objectives

- Increase abundance, productivity, and diversity of natural origin (NOR) Snake River steelhead
- Utilize hatchery origin (HOR) Snake River steelhead to create a model population and conduct further studies that can not be done with ESA listed fish

Collection

- Natural origin post-spawn fish were collected at
 - Lower Granite Dam (LGR)
 - Fish Creek weir on the Lochsa River in 2014 and 2015
- Post-spawn fish were transported to Dworshak National Fish Hatchery (DNFH) and Nez Perce Tribal Hatchery (NPTH)



Lower Granite Dam, WA



Fish Creek weir
Lochsa River, ID



NOR steelhead kelts
prior to reconditioning



Fish Culture Methods

- Fish were transferred into 4.6m diameter circular tanks
- Fish were started on a krill diet during the 1st week
- Pellets were gradually mixed in to enhance nutrition
- Formalin treatments were administered to control fungus
- Mortalities were recorded daily and necropsied
- Mature NOR fish were released in the fall to spawn naturally
- HOR fish were retained until second spawning



Culture tank at DNFH

Hatchery Model



Air Spawning

- Ladder-returning hatchery steelhead were collected at DNFH
- Females were spawned (“airspawned”) and then reconditioned
- Samples were collected throughout reconditioning to measure:
 - Growth
 - Fat stores
 - Maturation status
- Fish were spawned 1-2 years later when ripe again
- Reproductive measures were taken to estimate the reproductive contribution of kelts

Results

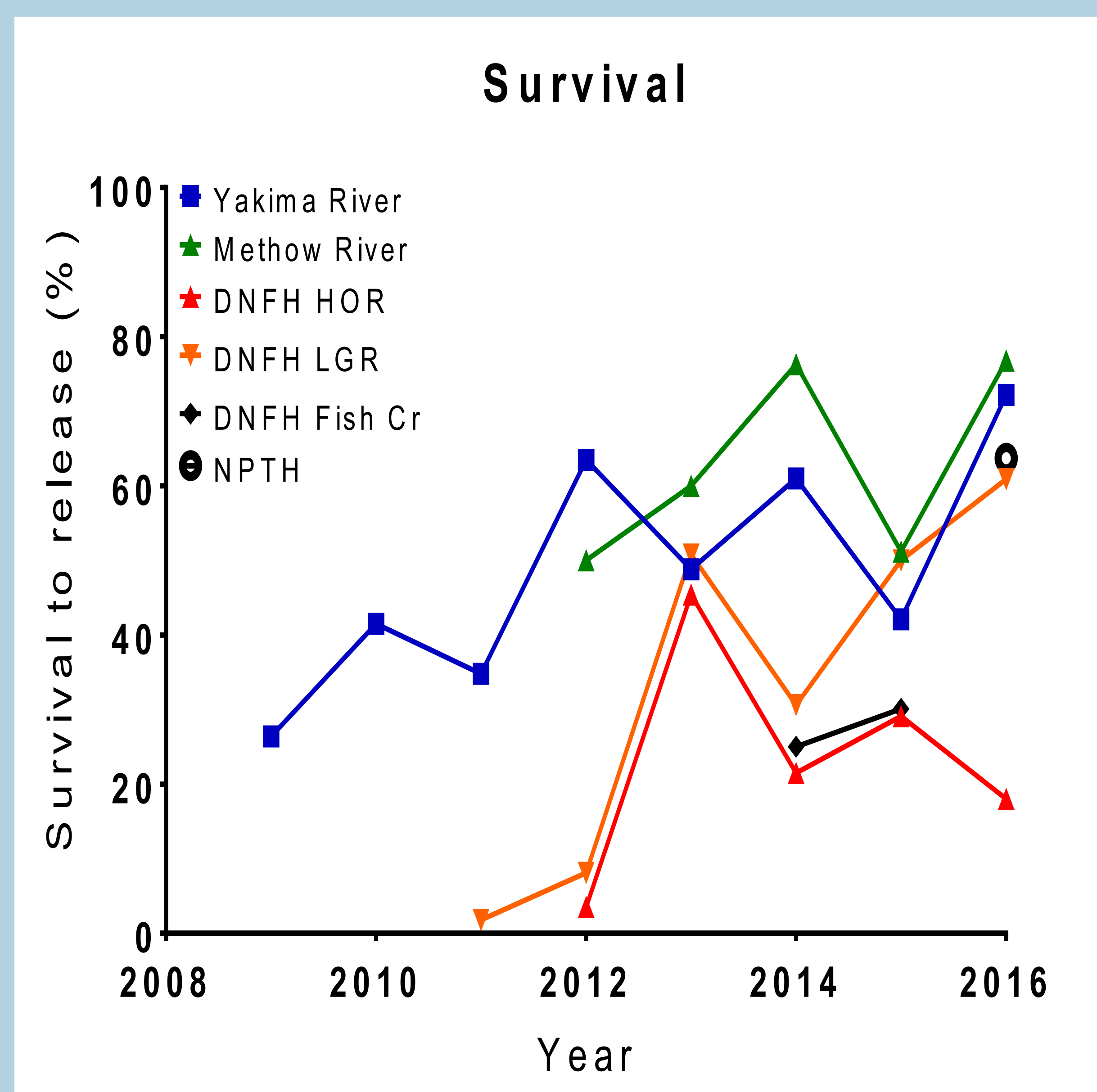


Figure 1. Survival comparison between current kelt reconditioning projects. NOR fish collected at Lower Granite Dam (LGR) were held both at Dworshak Hatchery (DNFH) and Nez Perce Tribal Hatchery (NPTH) in 2016.

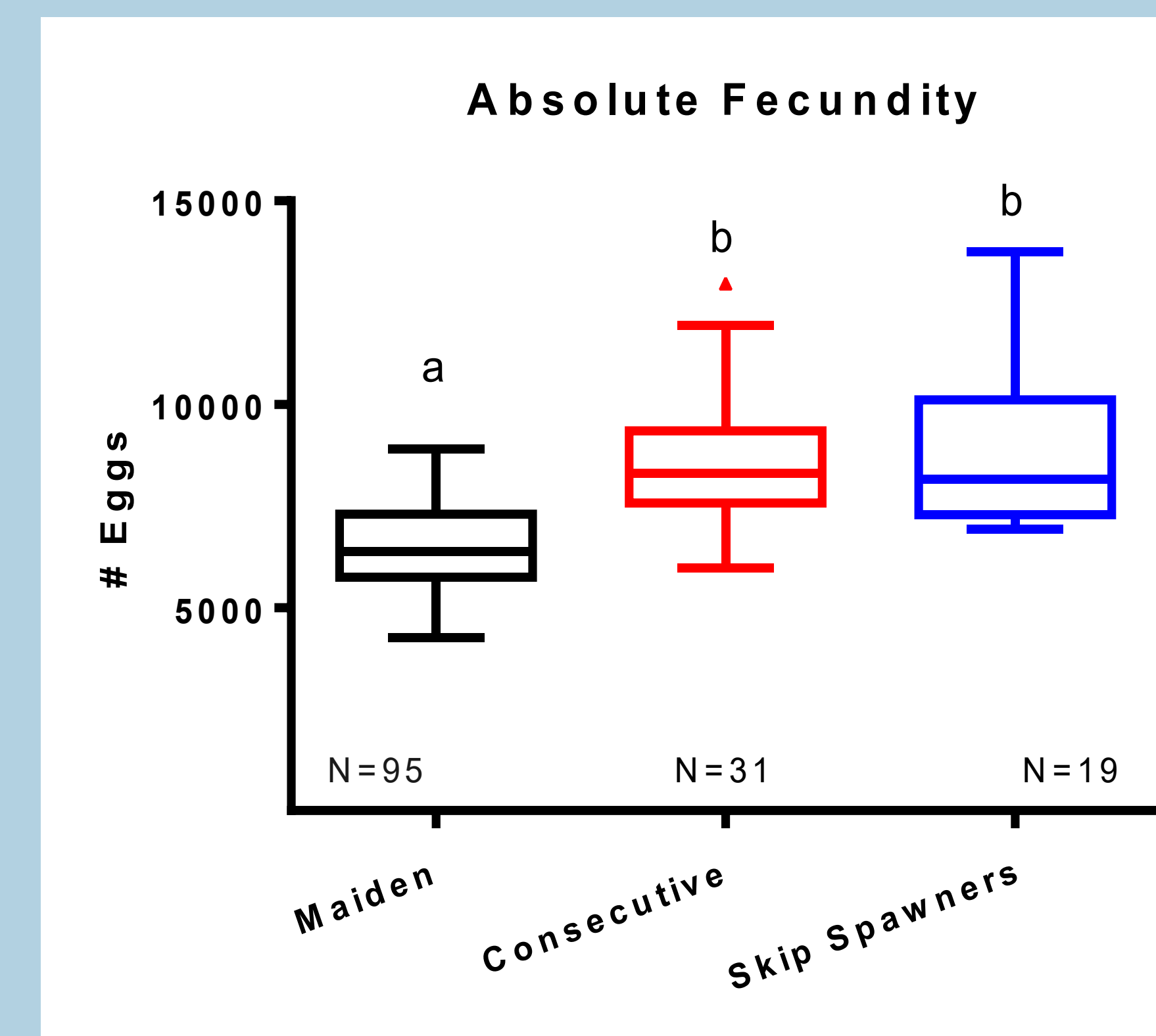


Figure 2. Fecundity of HOR fish. First time (maiden) and repeat spawning fish are compared. Repeat spawning can occur 1 (consecutive) or 2 (skip) years after initial spawning.

Maiden spawning
HOR fish
post-spawn



Reconditioned
HOR fish
pre-spawn



NOR fish are released near the peak of the run to migrate up river and spawn naturally again



Conclusions

- Recent survival rates of NOR kelts are similar at reconditioning projects throughout the CRB
- High survival rates suggest Kelt Reconditioning is a viable recovery tool
- Reconditioned repeat spawning fish have significantly higher fecundities than maiden spawning fish

Acknowledgements

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