

Population Study of North Umpqua Steelhead



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It is important to study the North Umpqua Steelhead

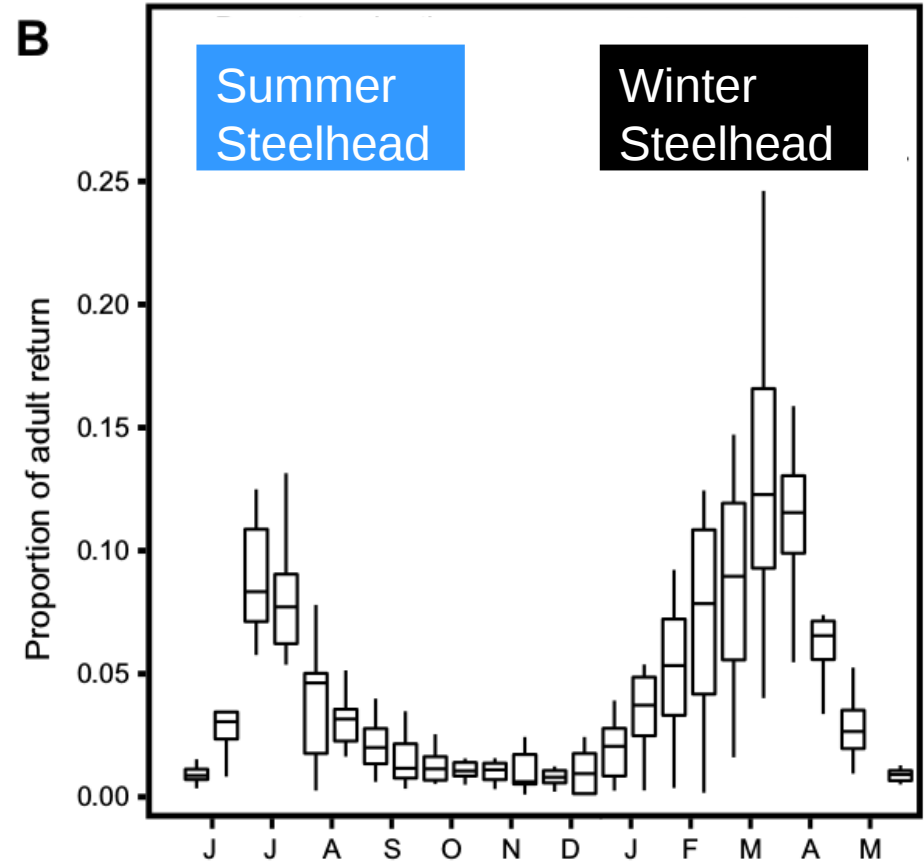
- Wild summer and winter run
- Hatchery summer run
- World famous fly fishing
- Complex geology



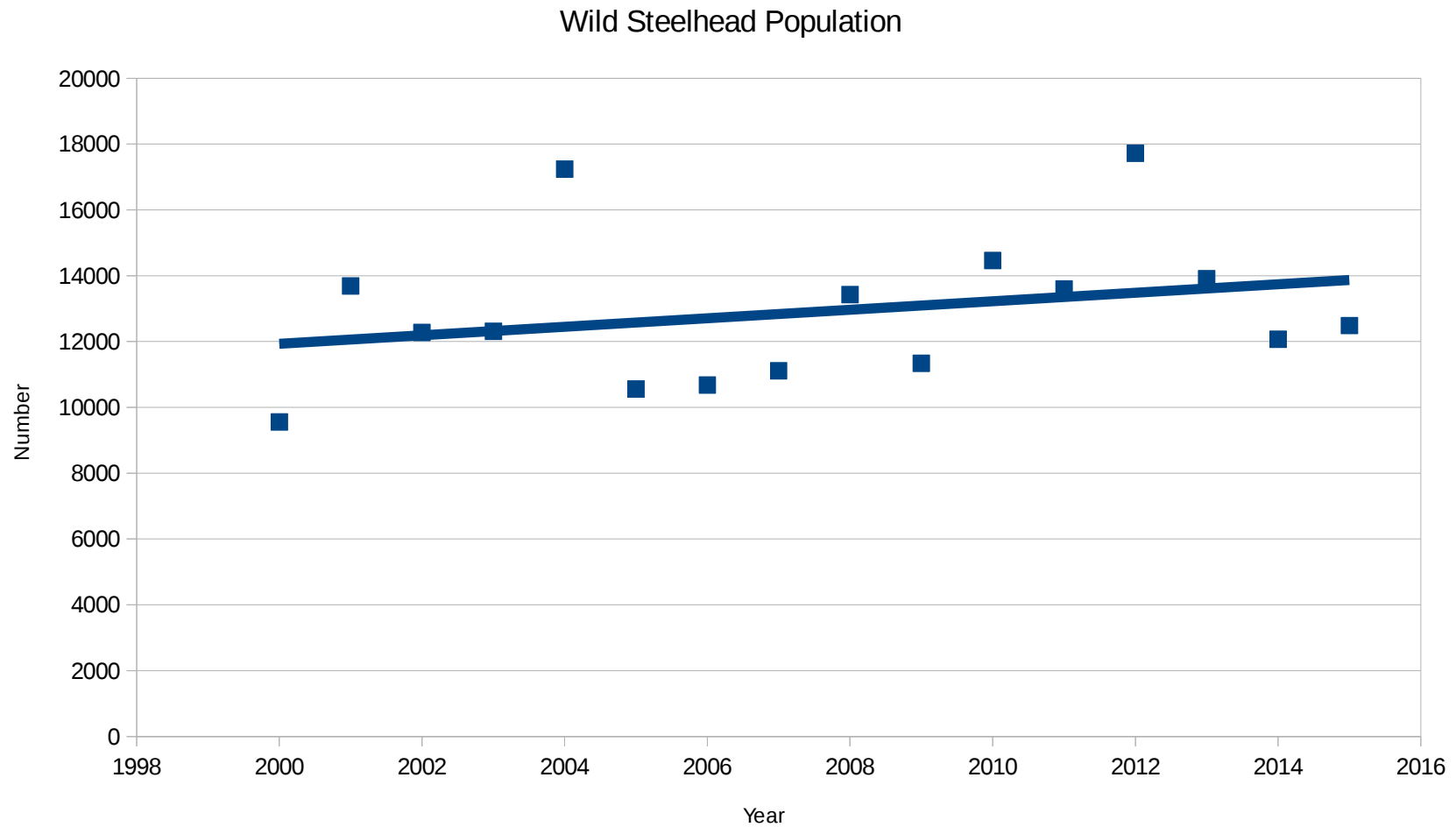
<http://www.steamboaters.org/river-today.html>

<http://oregonflyfishingblog.com>

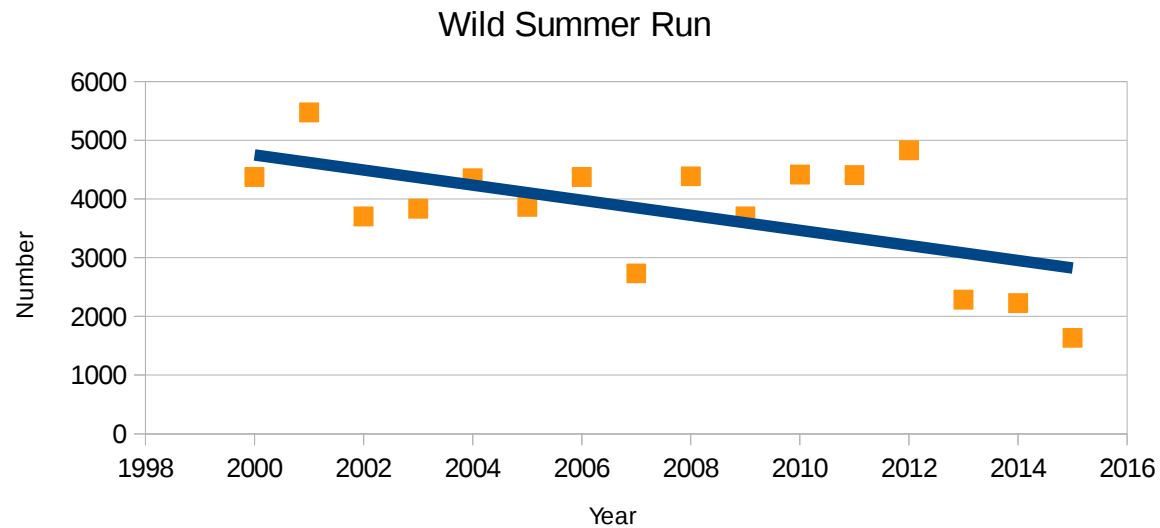
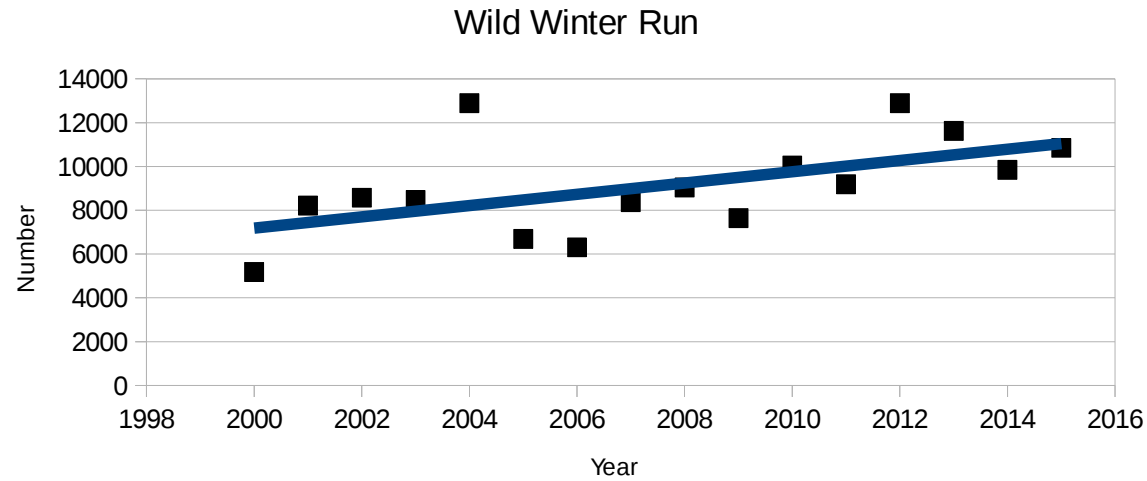
There is variation of adult migration timing



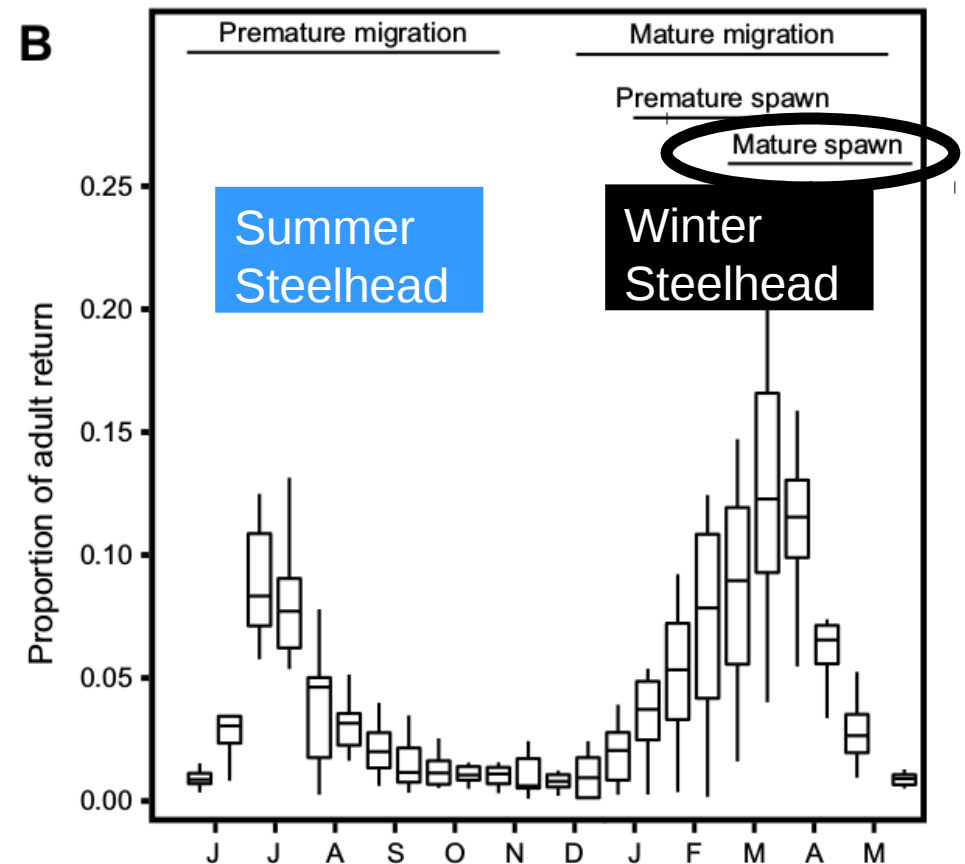
The NU has a stable population of steelhead



The winter run is increasing while the summer run is in decline

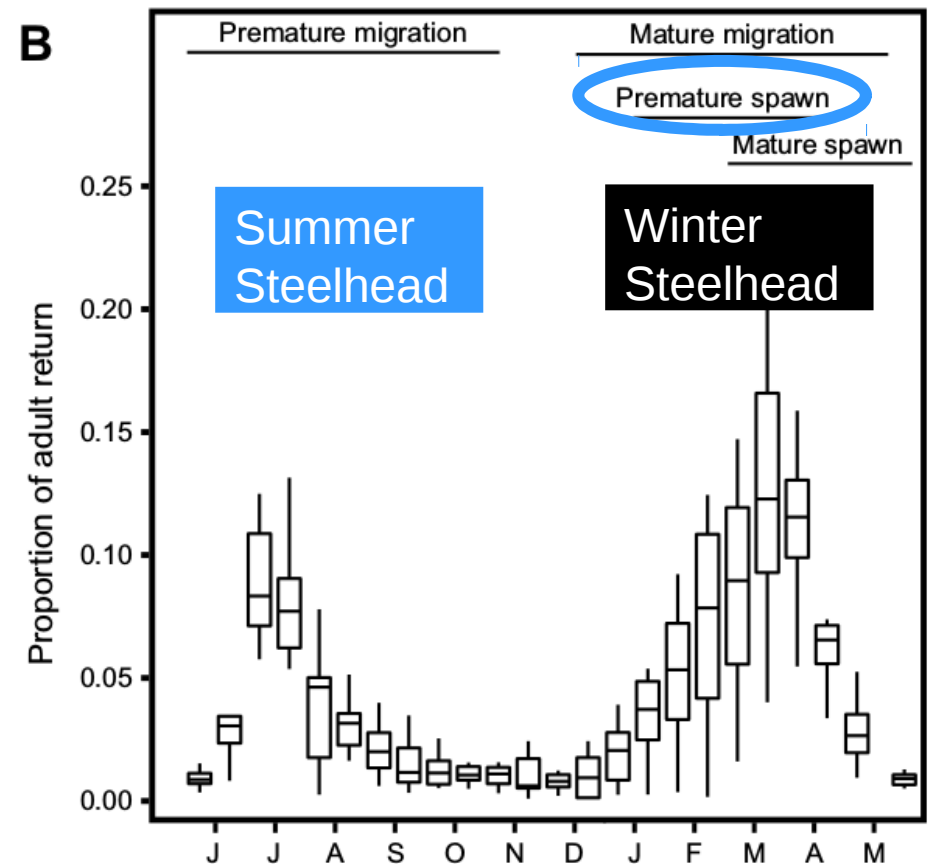


Winter steelhead spawn soon after migration



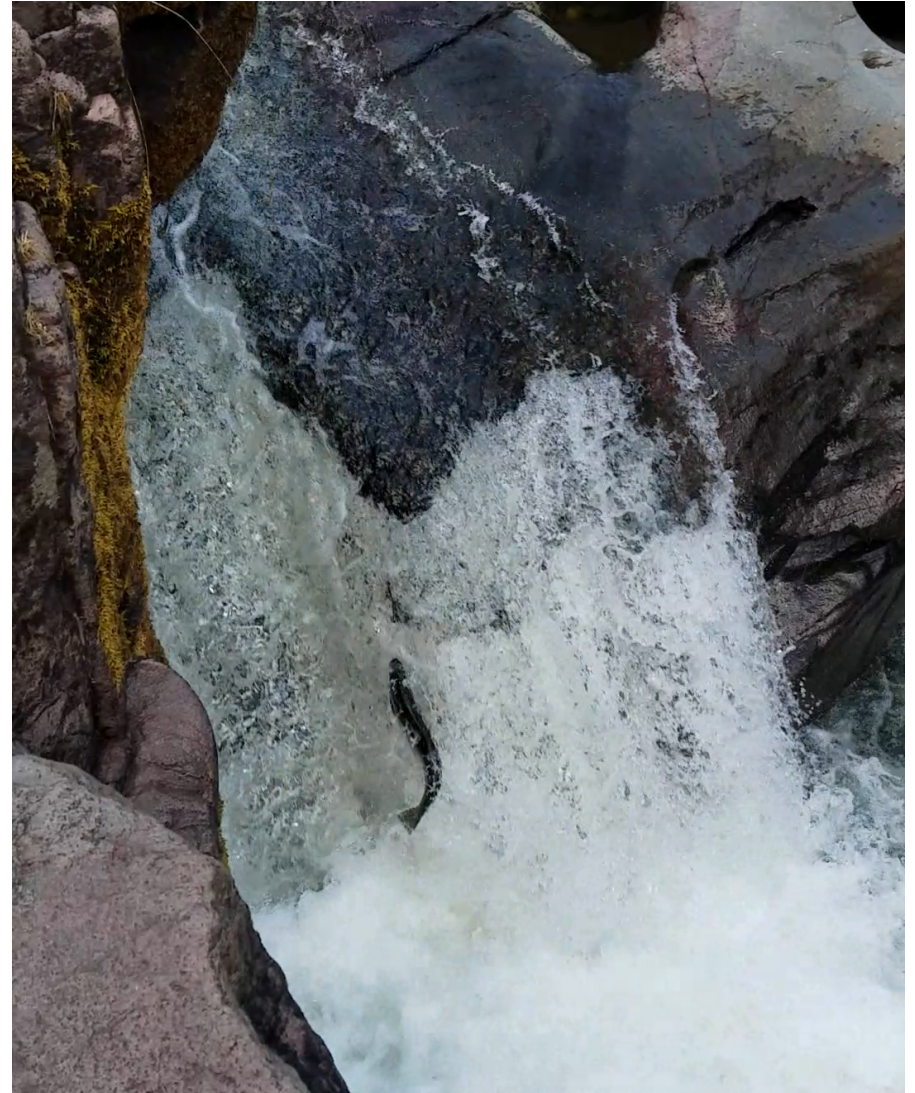
There are many disadvantages for summer steelhead

- Challenges of early migration:
 - Hot water
 - Low water
 - Predation /fishing
 - Habitat degradation



This study had two main objectives

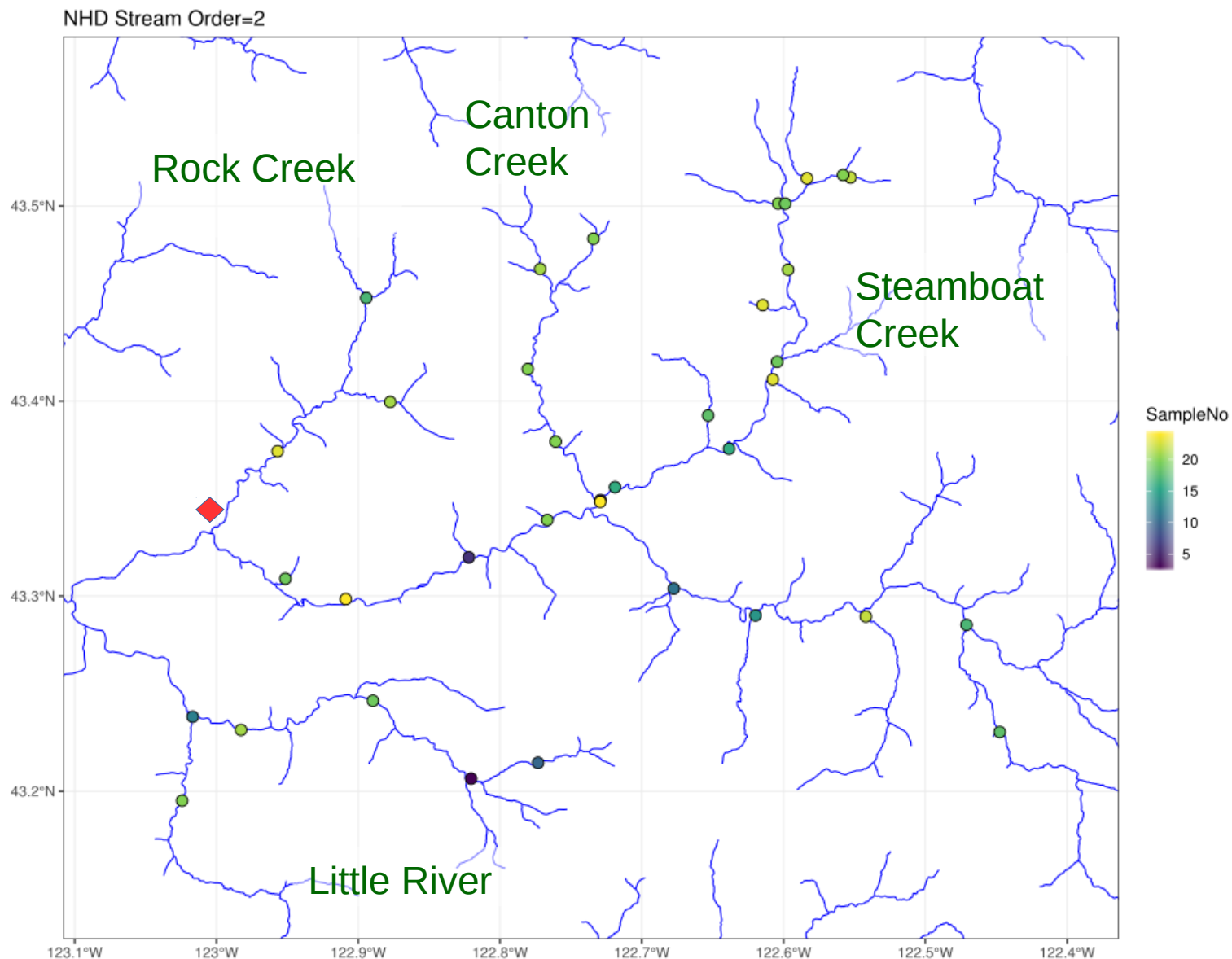
1. Determine spawning and rearing habitat utilized by summers to prioritize for conservation
2. Begin to understand historic evolutionary advantages to summer run timing



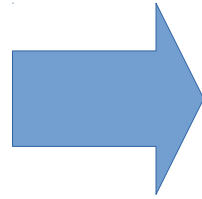
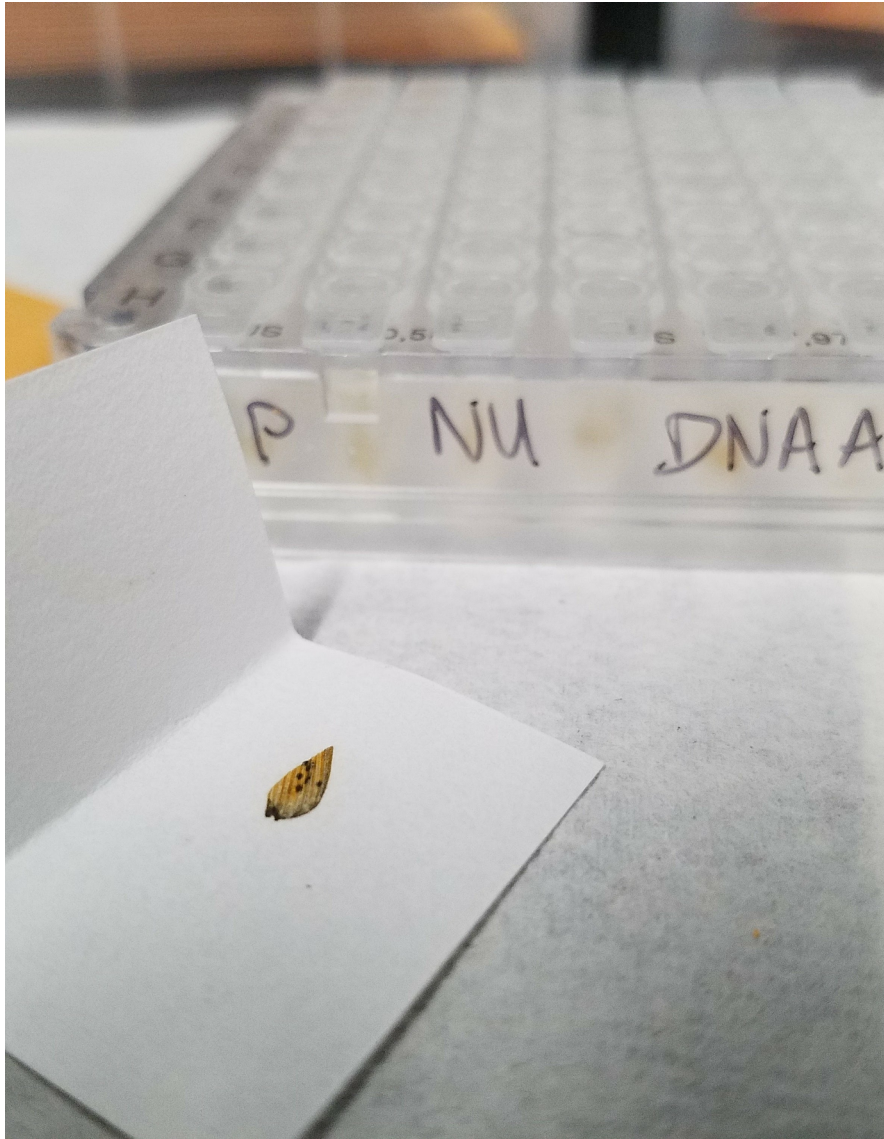
Removal of potential high flow barrier



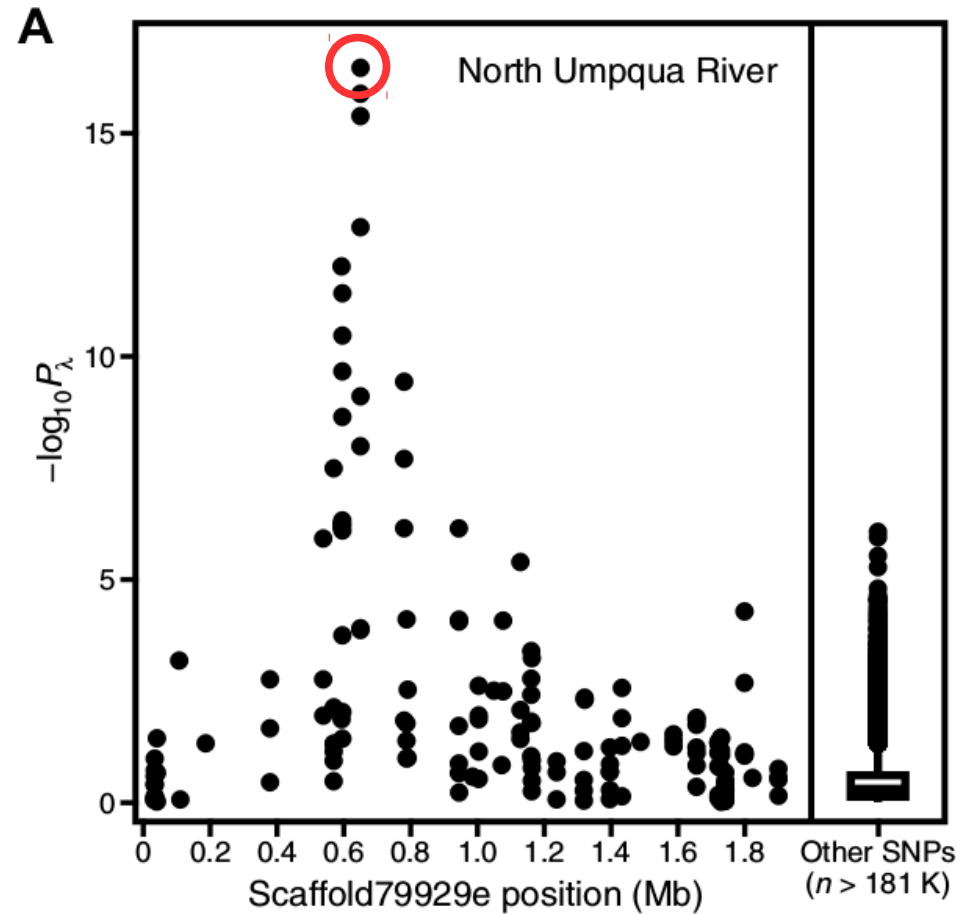
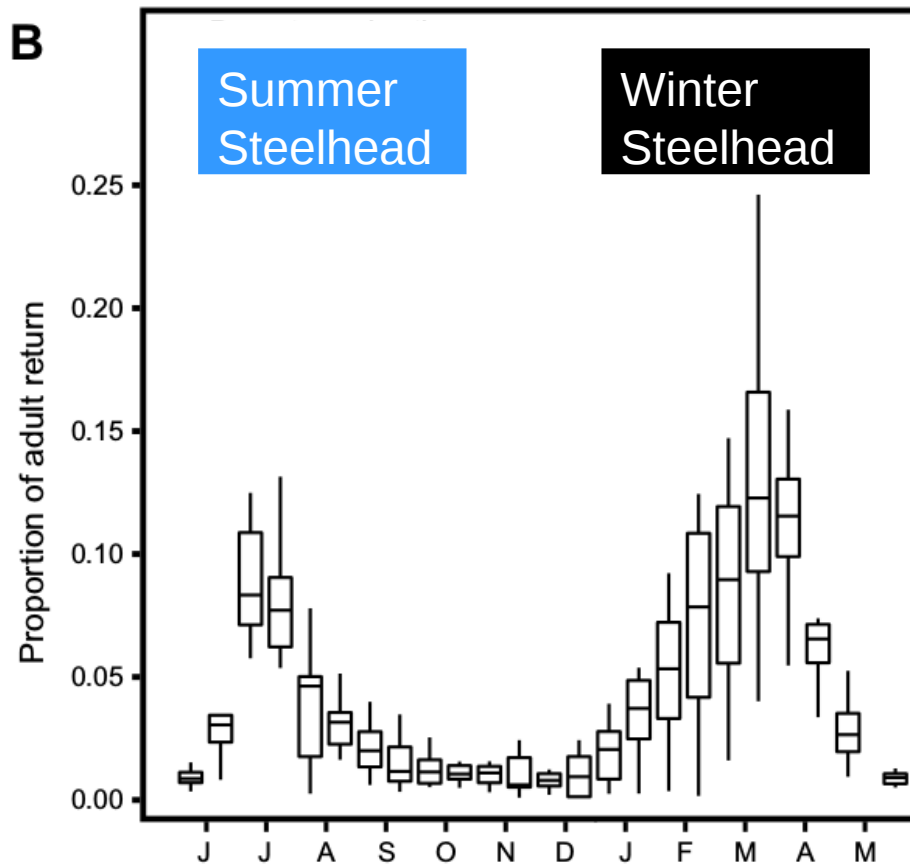
Samples were collected in tributaries throughout the North Umpqua basin



Rapture sequencing gives us genomic data from fin clips



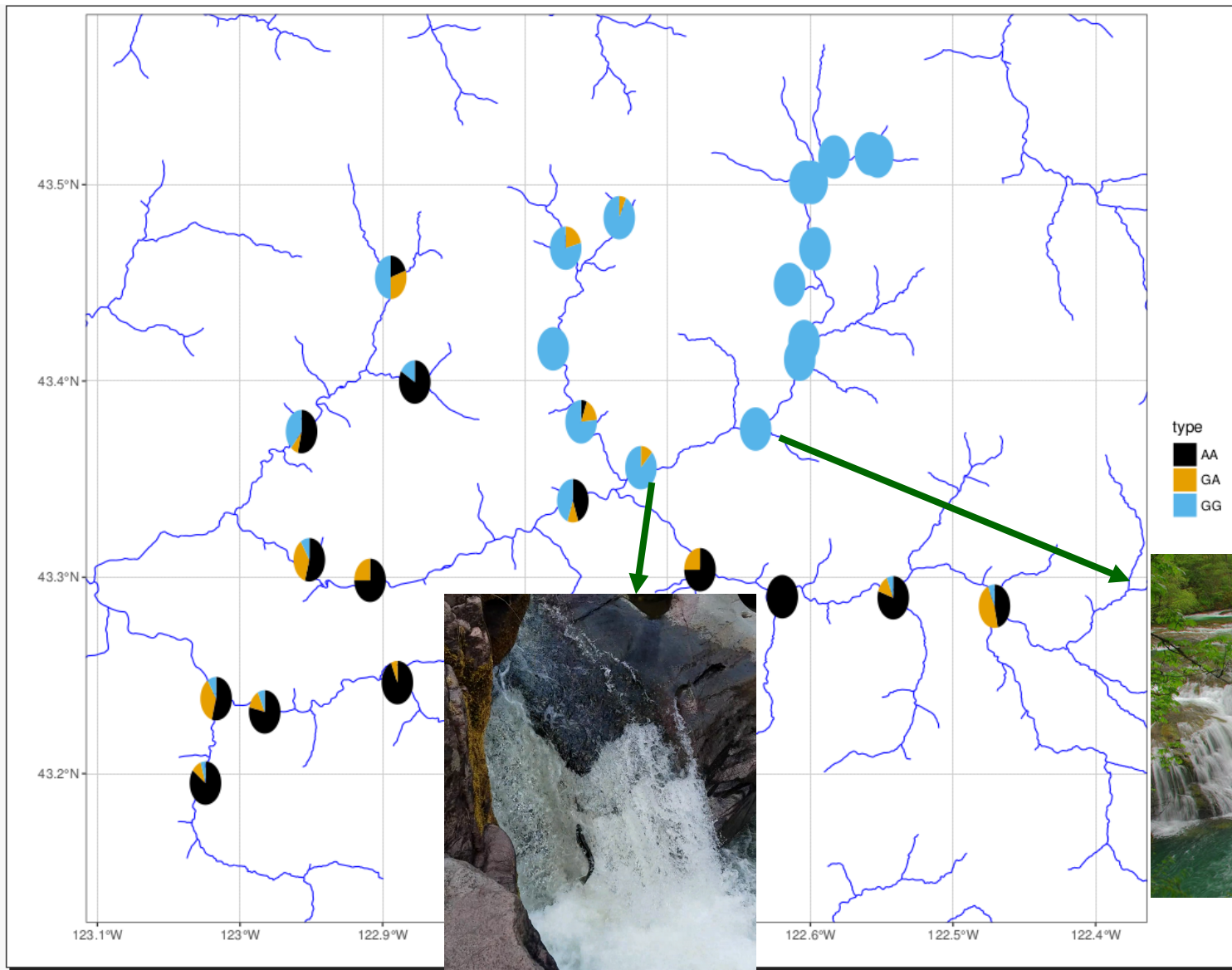
GWAS identified strong association between Greb1L and migration timing



Run timing populations do not have random mating

	Number of Samples	Observed Proportion	Expected Proportion (HWE)
Total Samples	573		
Clarkii	38		
Hybrid	9		
Mykiss	526 (92%)		
Mykiss Genotyped at Greb1L	479 (91%)		
Winters	118	0.246	0.09
Hybrids (heterozygotes)	51	0.106	0.42
Summers	310	0.647	0.49

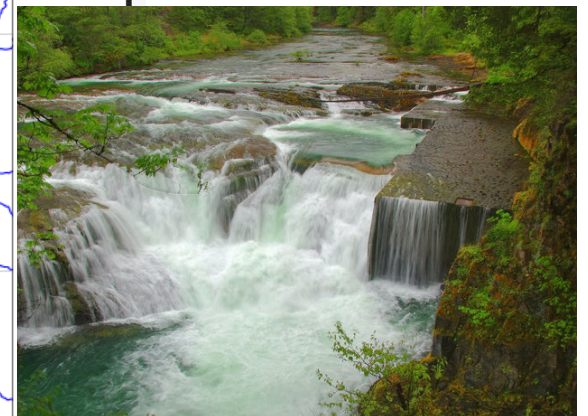
Distribution of Juvenile Steelhead



Homozygous
Summer

Heterozygous

Homozygous
Winter



We hope to answer more questions with this year and future year's data.

- How consistent are results across time?
- What is the run timing of juveniles in the main stem?
- What proportion hybrids are from hatchery summers?
- Are there size differences between the runs?
- Approximately how many spawning individuals are at each sampling location?

Thank you!

- Michael Miller
- Sean O'Rourke
- Connie Huang
- Jeff Dose
- ODFW – Roseburg
- NOAA
- The North Umpqua Foundation

