Ecological differences of juvenile steelhead produced by natural origin and hatchery origin adults spawning in the wild

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Captive Breeding

- Recover declining and extirpated populations
- Switch from segregated to integrated
- Low hatchery reproductive success

Objectives

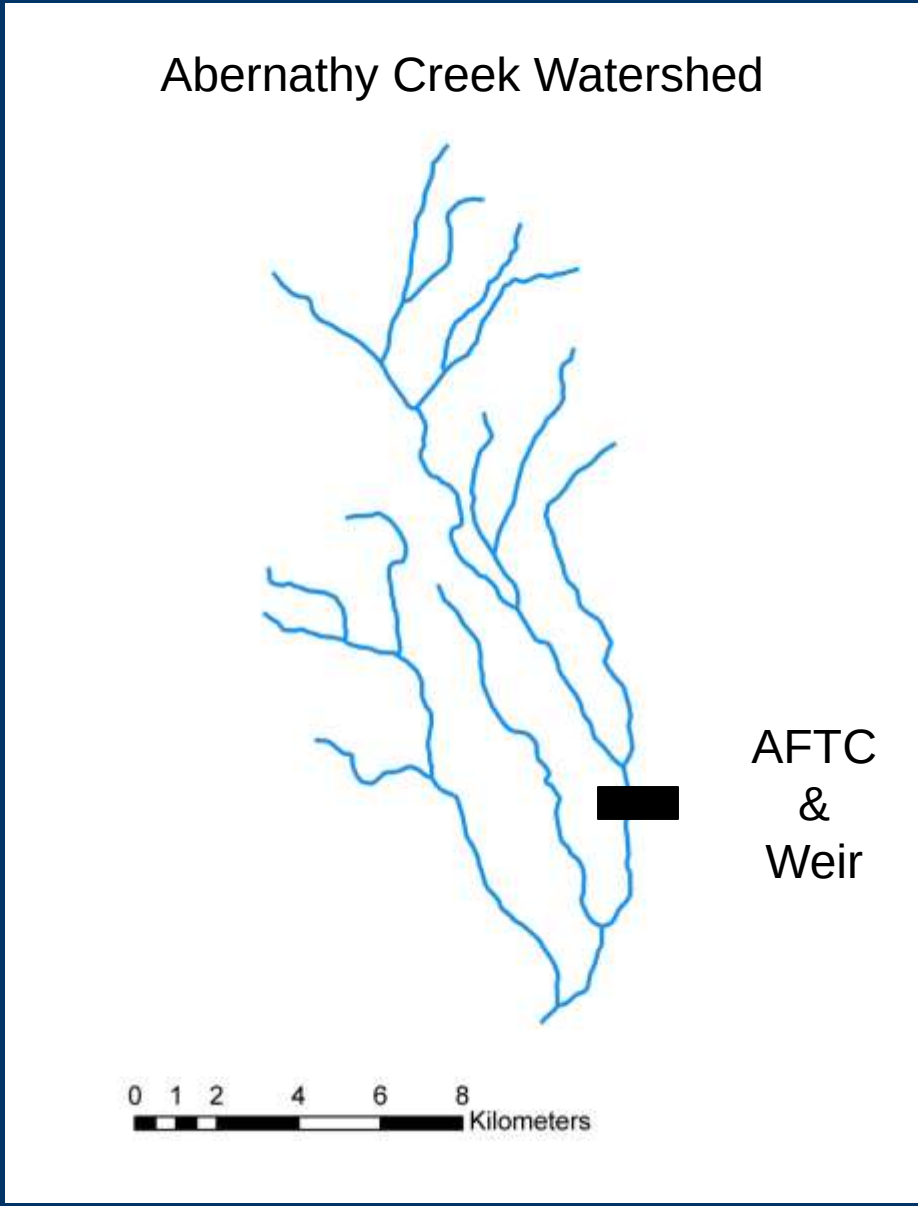
- Do parr with hatchery parents differ from parr with mixed or wild parents?
  - Fish length
  - Fish weight
  - Condition
  - Spatial distribution
  - Downstream migration timing

Study Site

- 3rd order trib to lower Columbia River
- 87 river km from ocean
- Local integrated broodstock

Methods

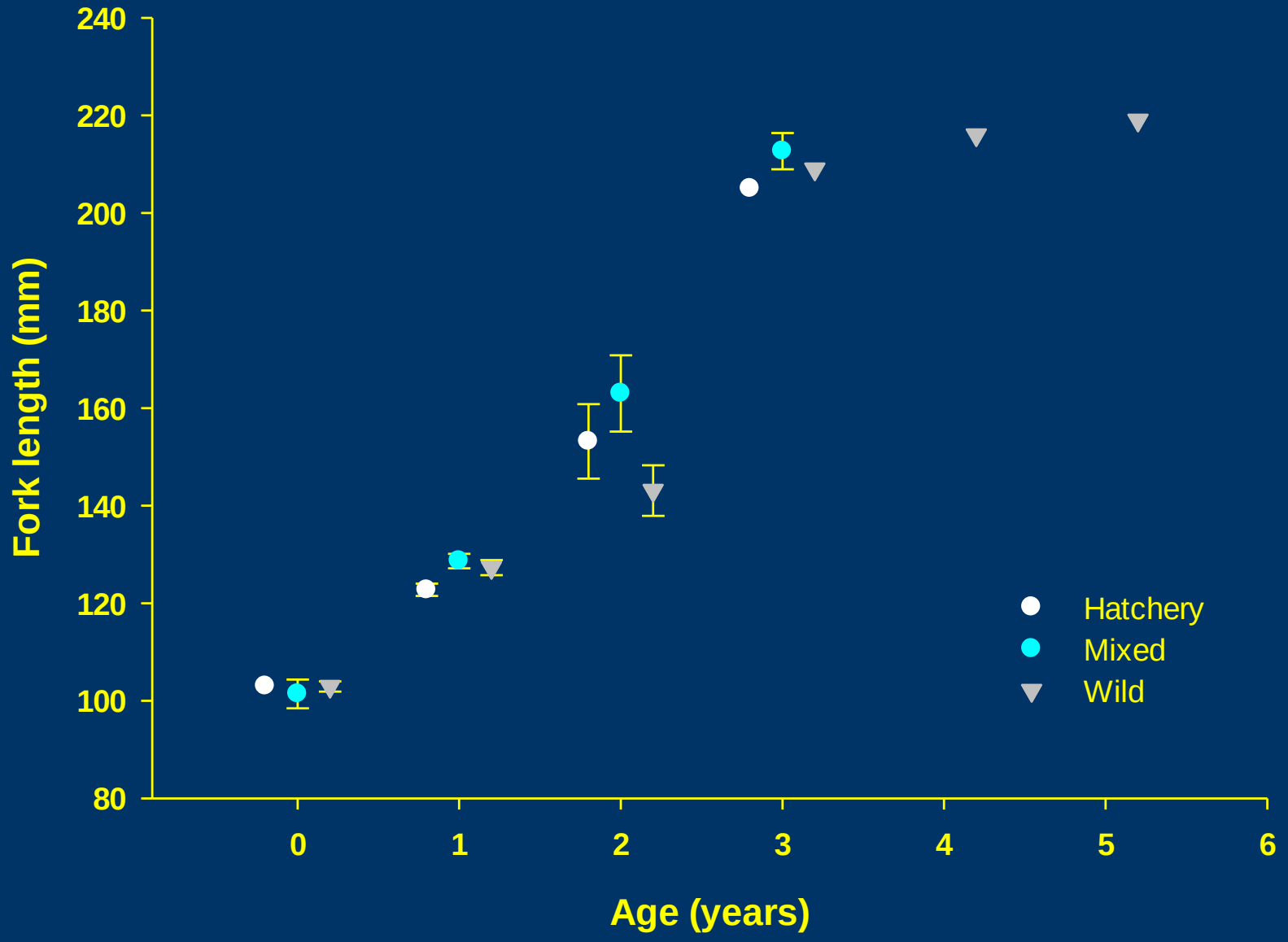
- Release 2/3 wild 1/3 hatchery adults above hatchery
  - 2007-2015
- Block upstream migration of excess hatchery fish
- Collect parr each year
  - 2009-2016



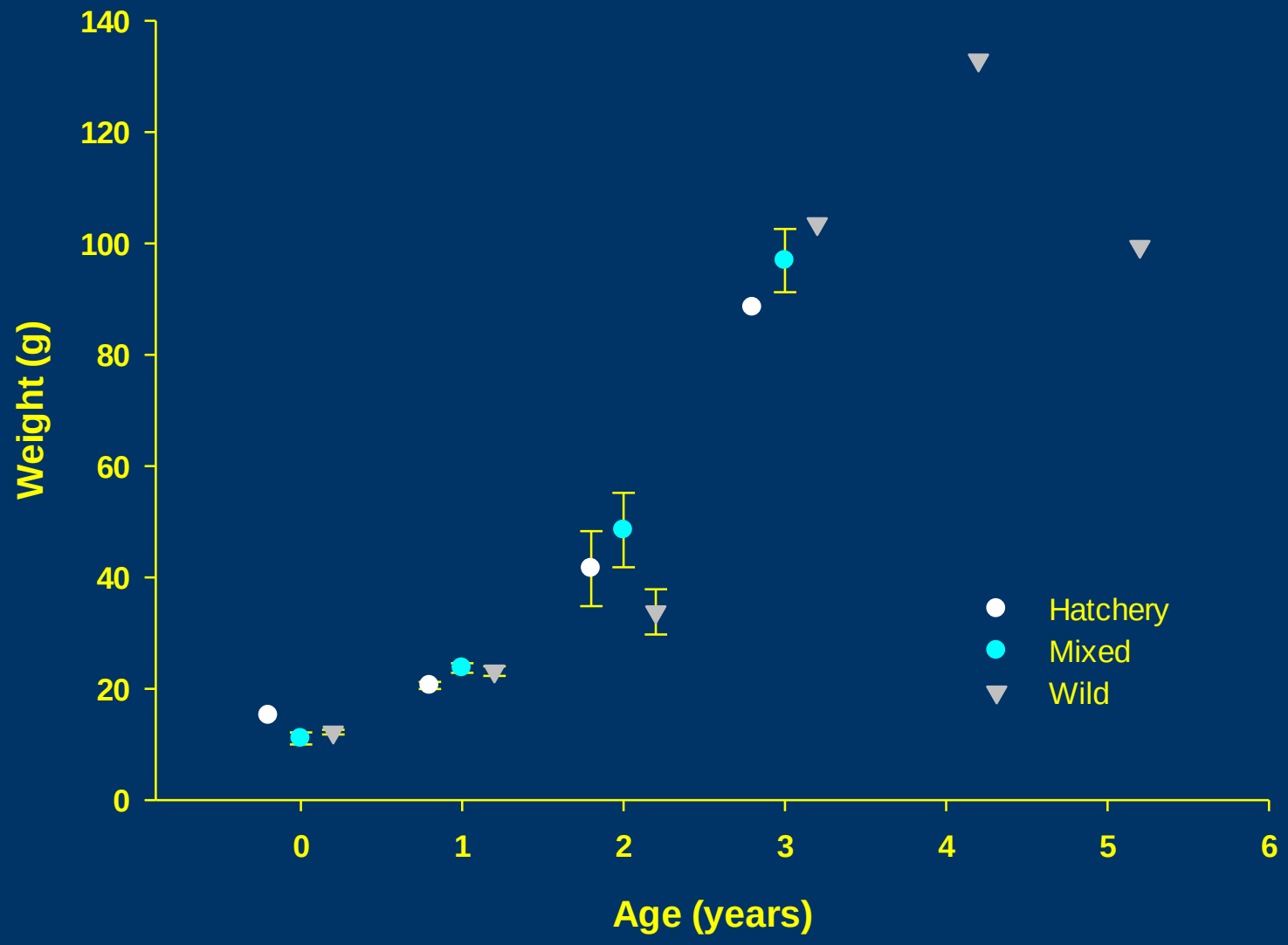
- Variables
  - length, weight, condition
  - spatial distribution
  - migration timing

- Genetic parentage
  - match juvenile parr to released adult fish

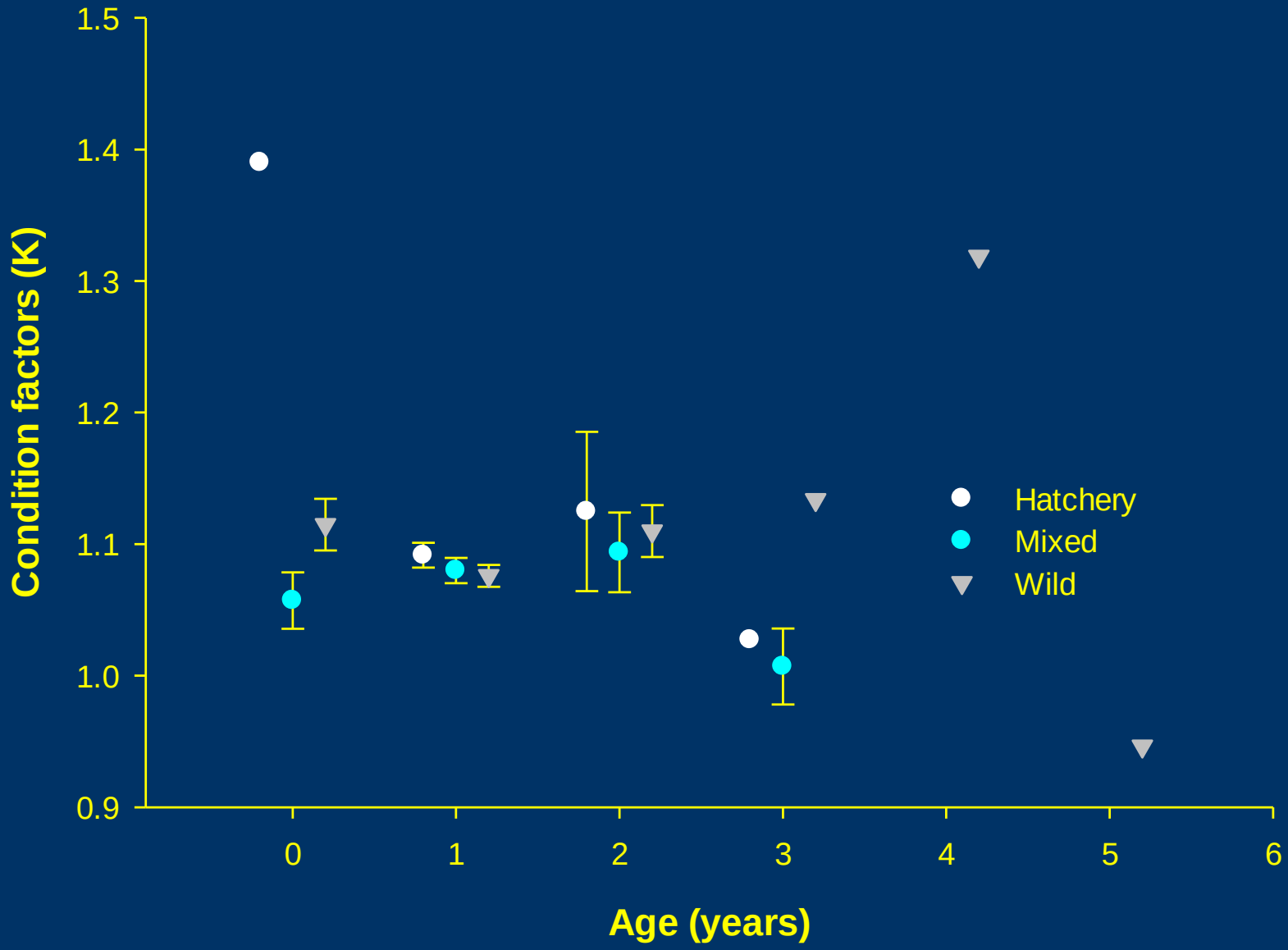
Steelhead Parr Length



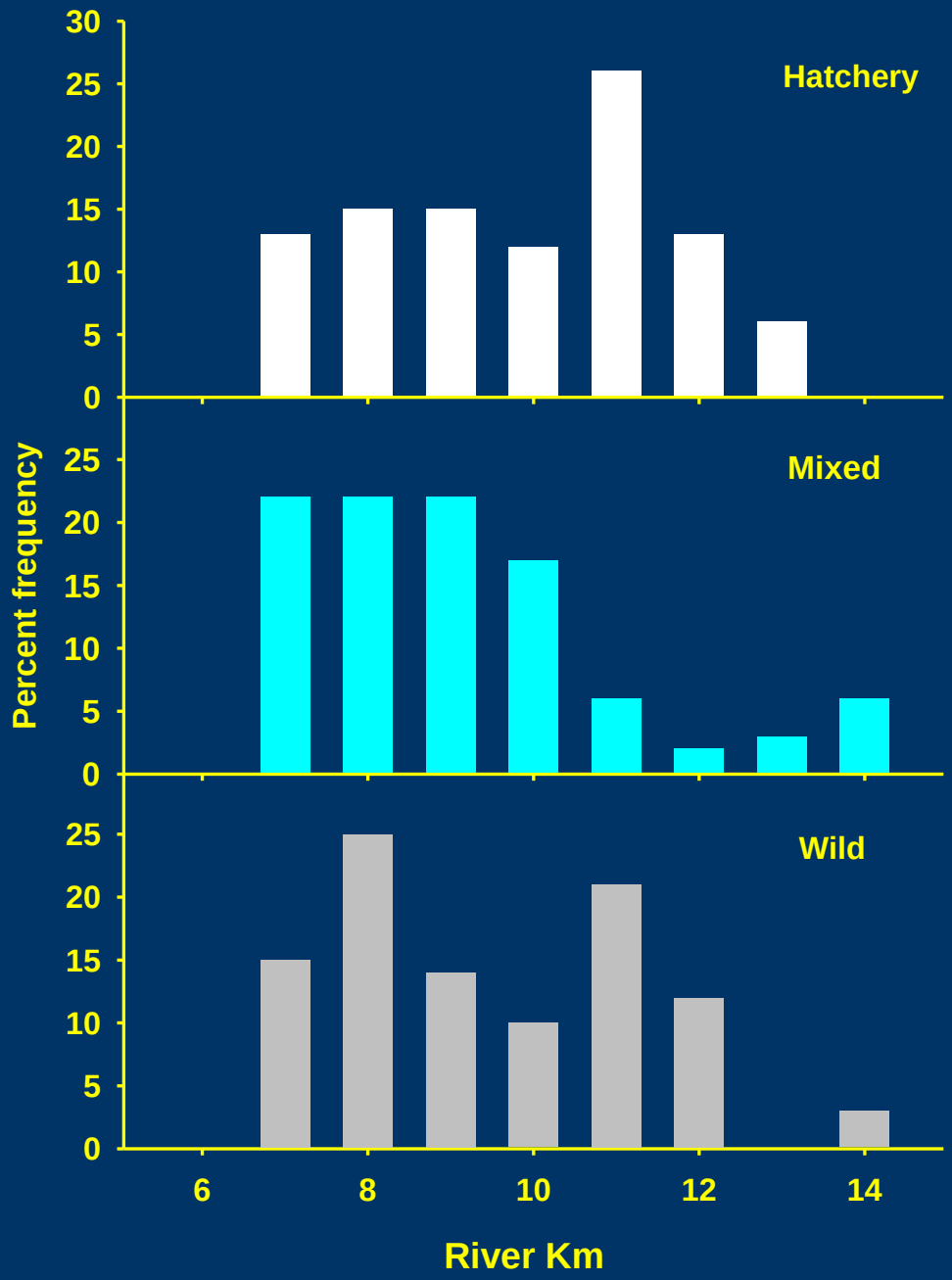
Steelhead Parr Weight



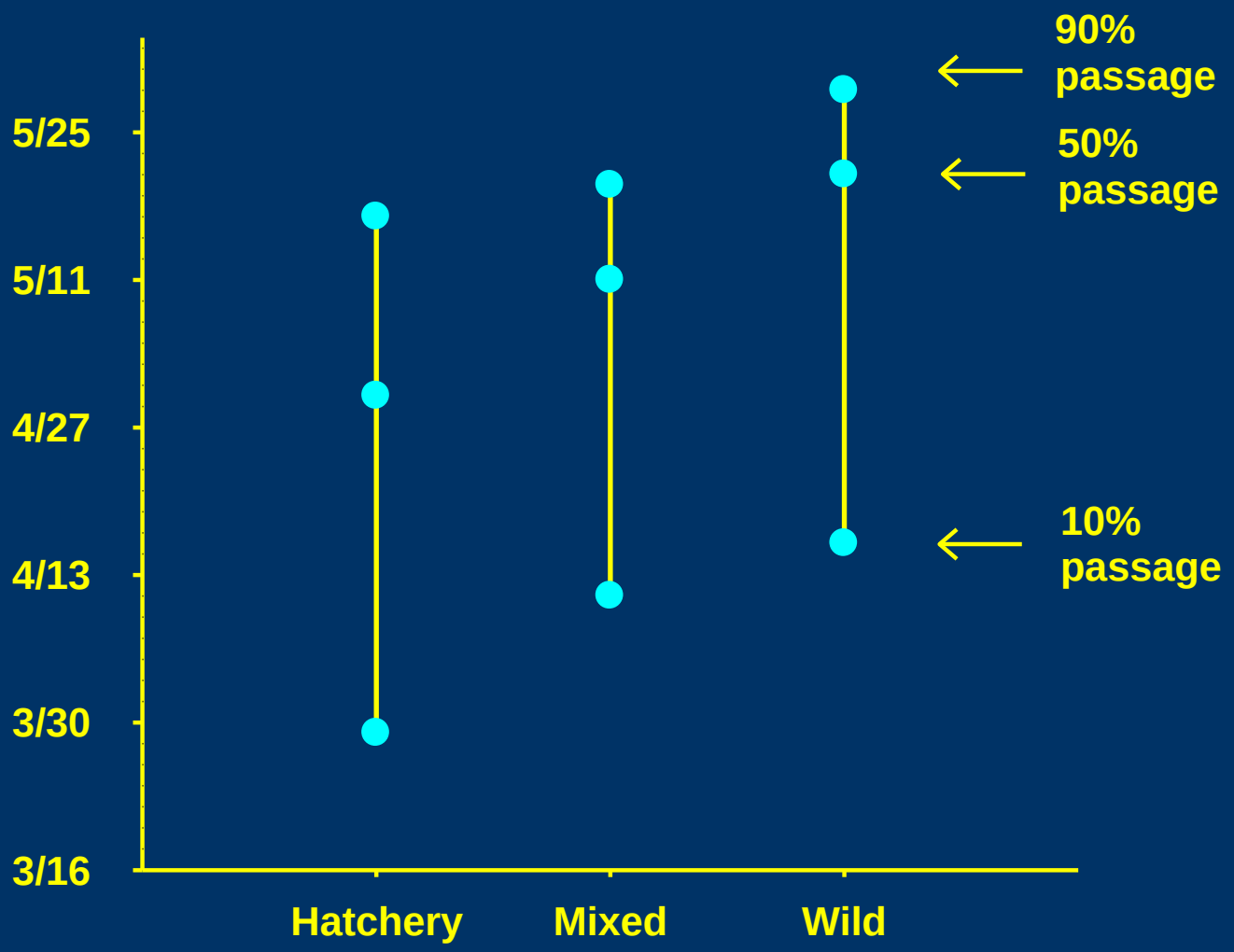
Steelhead Parr Condition



Spatial Distribution



Downstream Migration



Summary

- Similar length, weight, and condition
- Hatchery and wild similar spatial distribution, mixed tend to be lower
- Hatchery fish earlier downstream migration

Conclusions

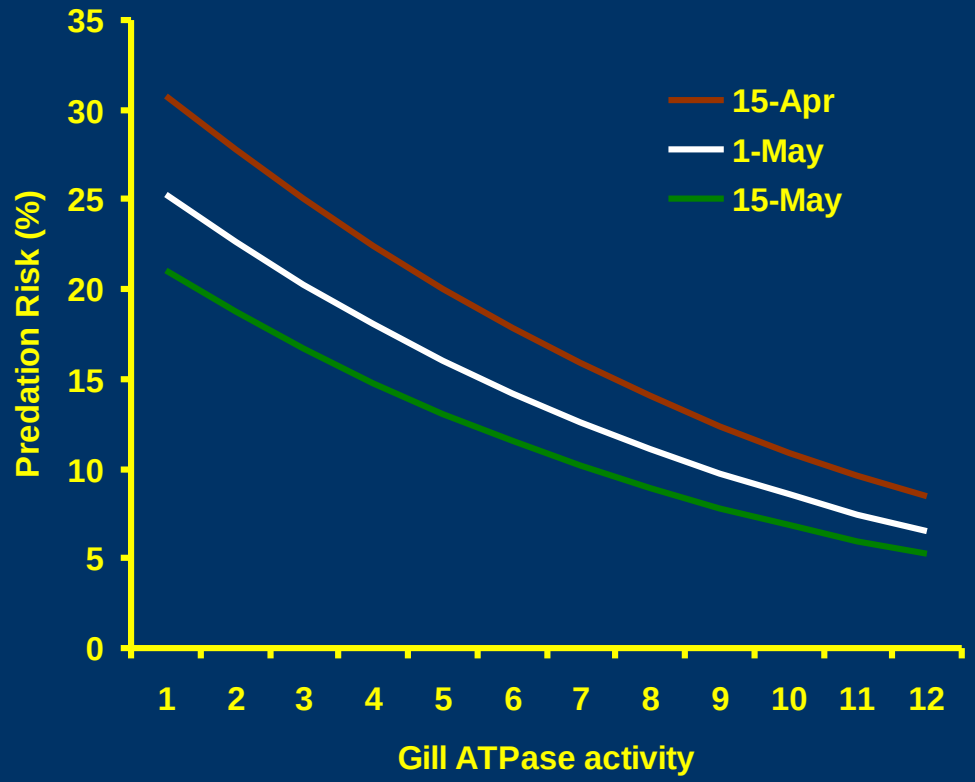
- Hatchery downstream migration
  - Result of hatchery juvenile release timing?

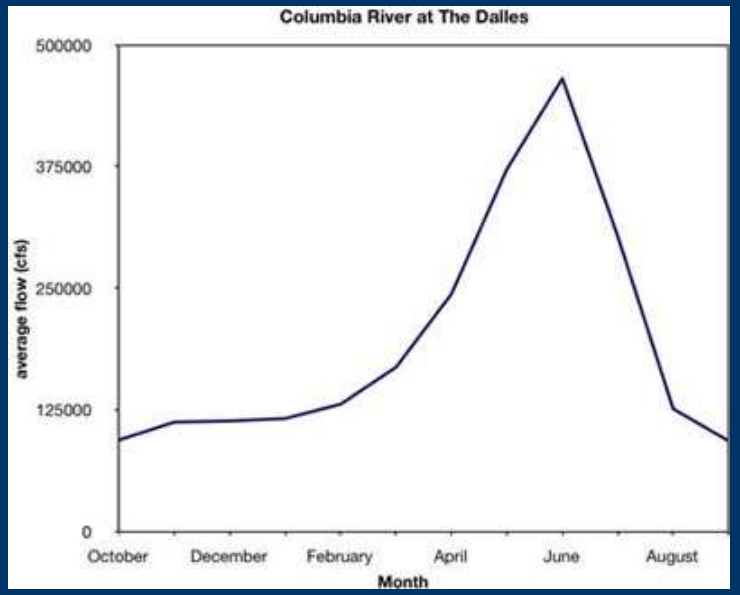
May result in reduced, survival, and future reproductive success

- Prepared for sea water?
- Bird predation?
- Columbia River flows?

Avian Predation Risk

- ATPase and migration date important
- Length not important





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