

Relaxed Sexual Selection: Worthy of a P.h.D dissertation?



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Presentation Outline

- Relative Reproductive Success
- Potential mechanisms for difference in RRS
- Relaxed selection and consequences
- Dissertation goal
- Series of proposed experiments

Relative Reproductive Success of Hatchery and Wild Salmonids

- Hood River Winter Run, Mike Blouin, OSU
- Little Sheep Creek, Imnaha Basin, Ewann Berntson, NOAA
- Umpqua River, Coho, Veronique Theriault, OSU

Relative Reproductive Success of Hatchery and Wild Salmonids

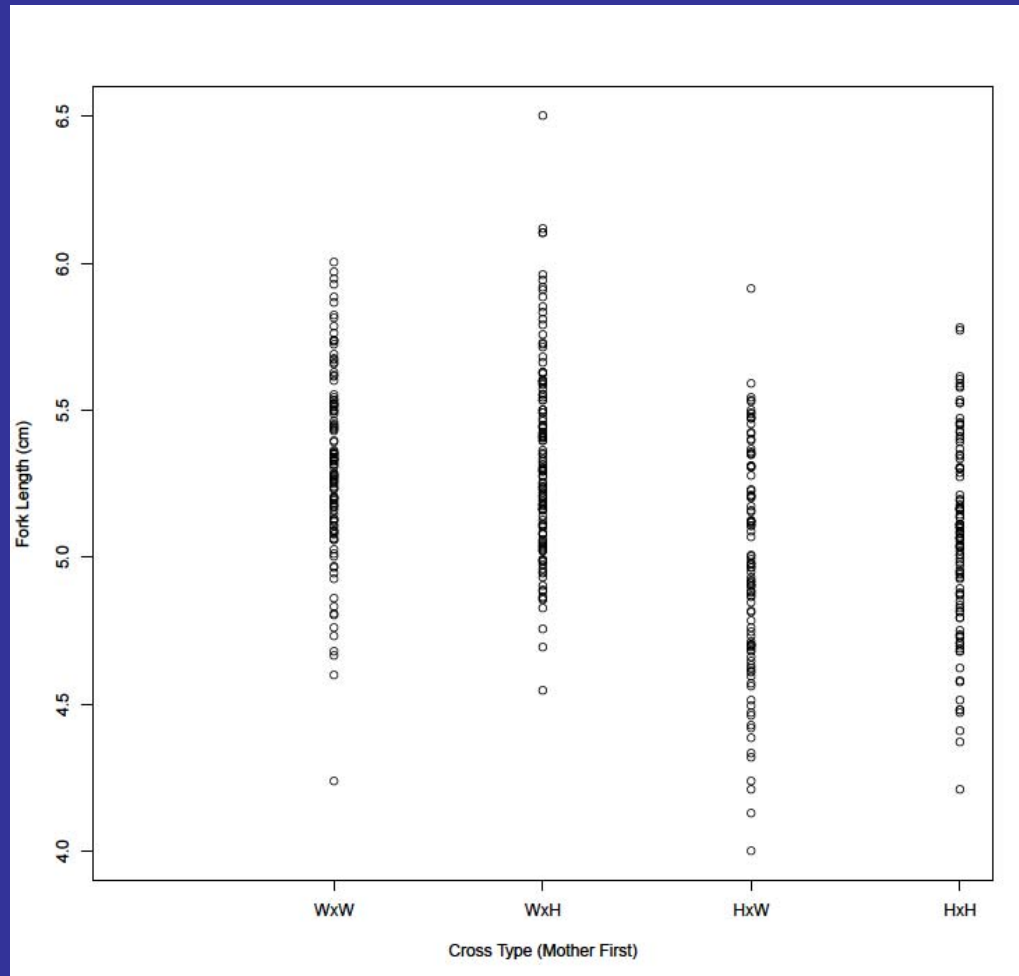
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Documented differences in reproductive success over the past decade.

The critical question...WHY?

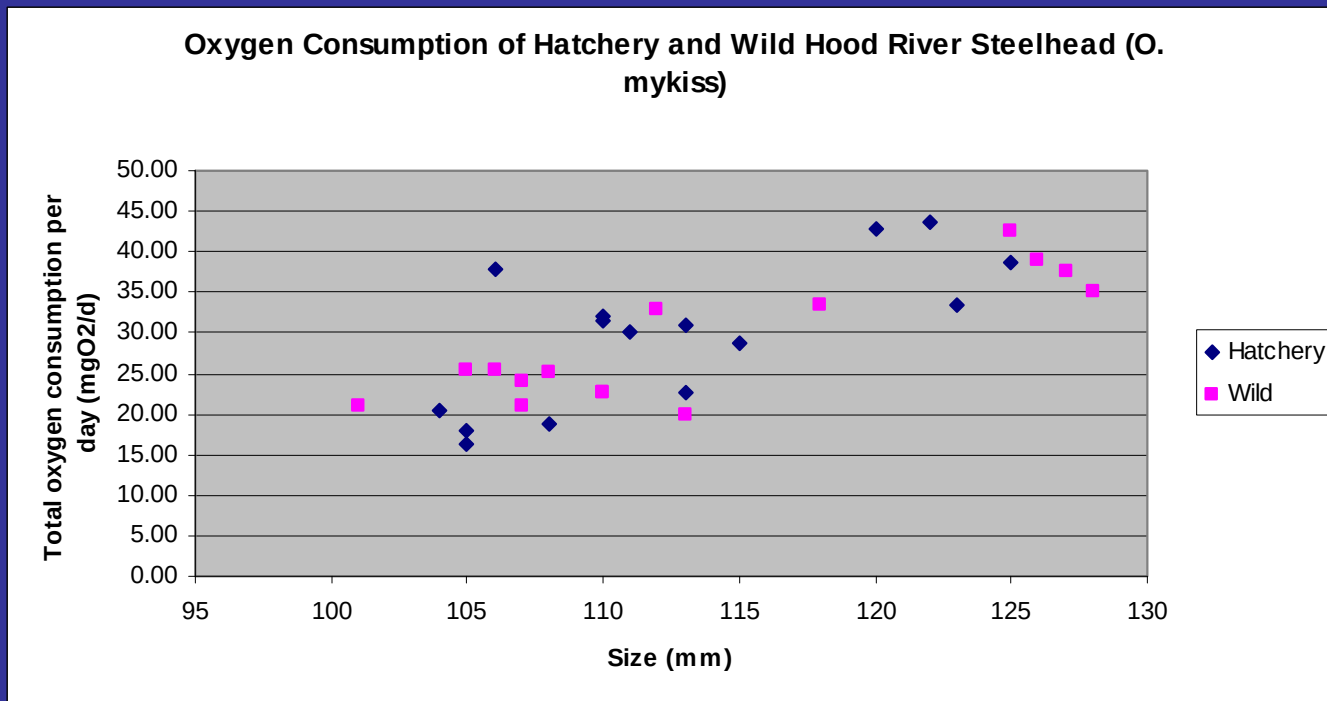
Hatchery changes something in the fish

- Selection for:
 - Growth Rate?



Hatchery changes something in the fish

- Selection for:
 - Growth Rate? → **Negative Result**
 - Metabolic Rate?



No difference between hatchery and wild individuals

Other explanations?

- Relaxed selection



Other explanations?

- Relaxed selection at spawning?

Artificial (hatchery) spawning



Natural spawning



Other explanations?

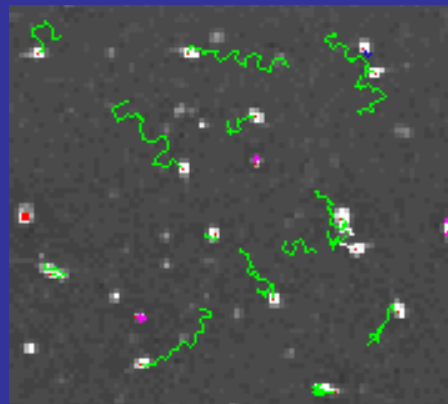
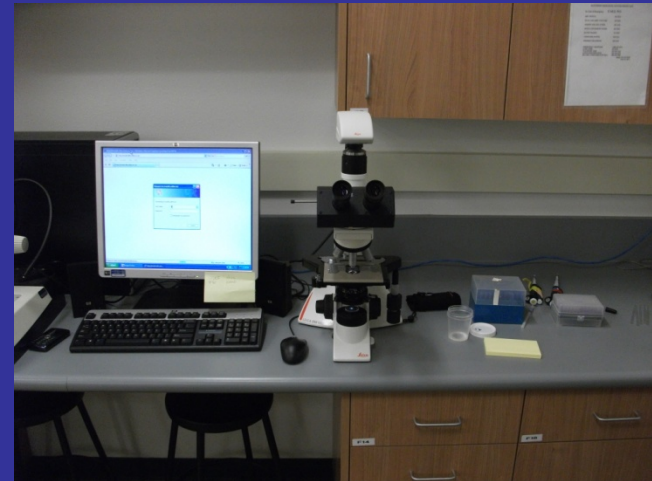
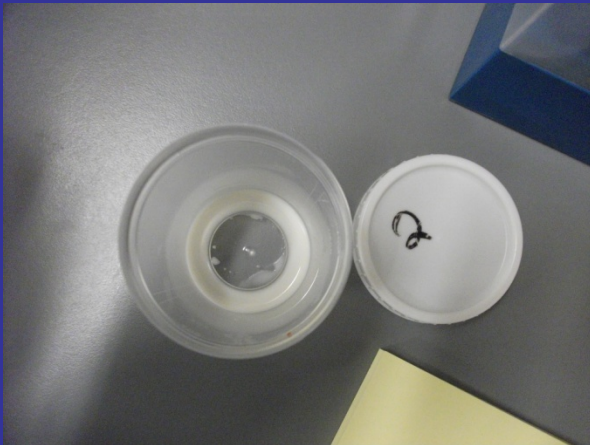
- Relaxed selection
- Why?
 - Skjaeraasen 2009. Farmed vs. Wild Cod
 - Gage 2004. Atlantic salmon sperm
 - Casselman 2006. Walleye sperm

My Goal

- Dissect the artificial spawning methods currently used into individual parts and determine if they are having an affect on the fitness of hatchery fish.

How?

- Quantify sperm fitness between artificially bred and naturally bred individuals. Velocity, linearity, density, aneuploidy and ATP levels.



How?

- Quantify sperm quality between artificially bred and naturally bred individuals. Velocity, linearity, density, aneuploidy and ATP levels.
- Within an individual does spawning method affect offspring fitness? Dry fertilization vs. modified wet fertilization.



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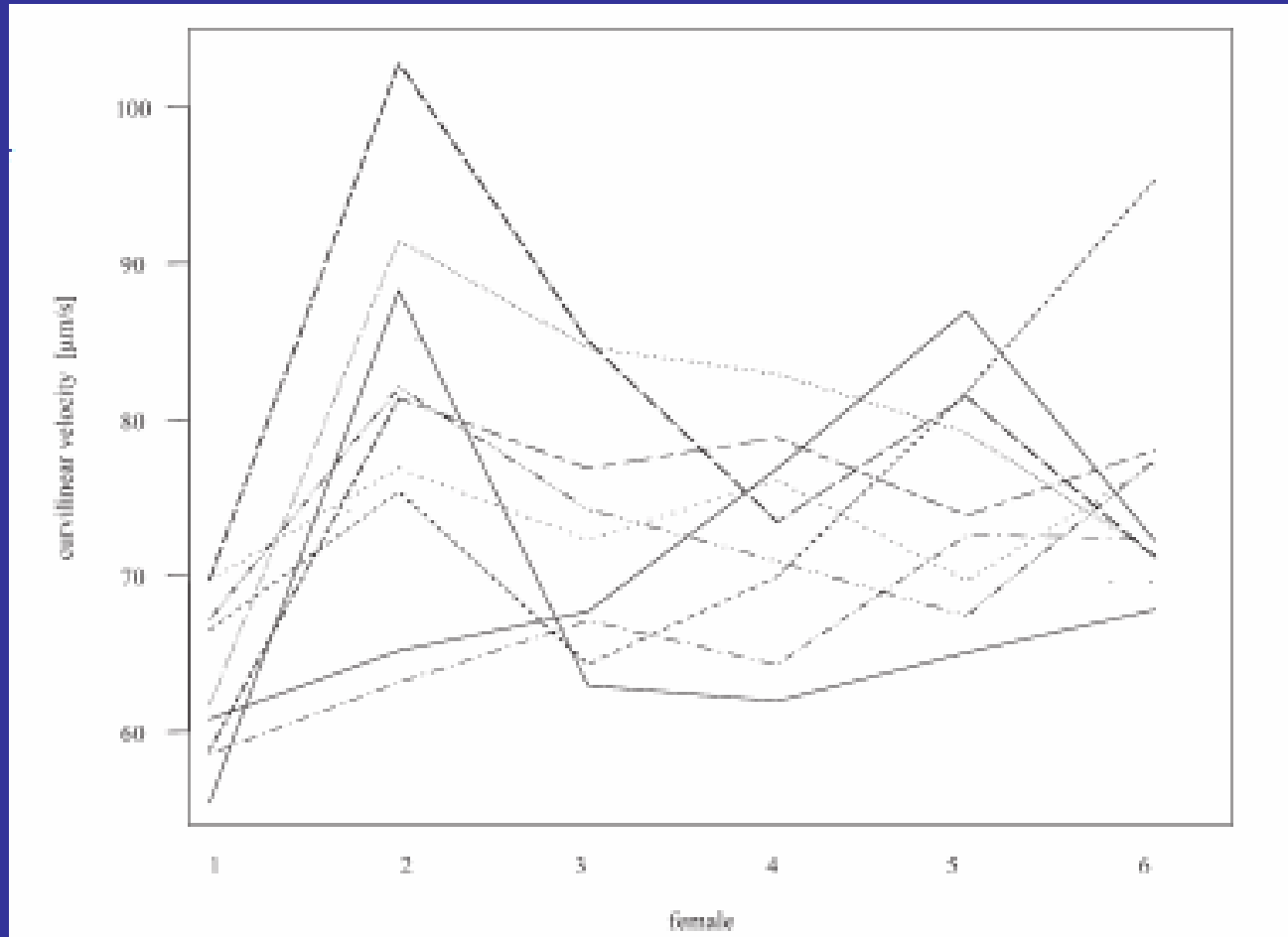
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X



Arctic Charr (*Salvelinus alpinus*)



Urbach et al. 2004

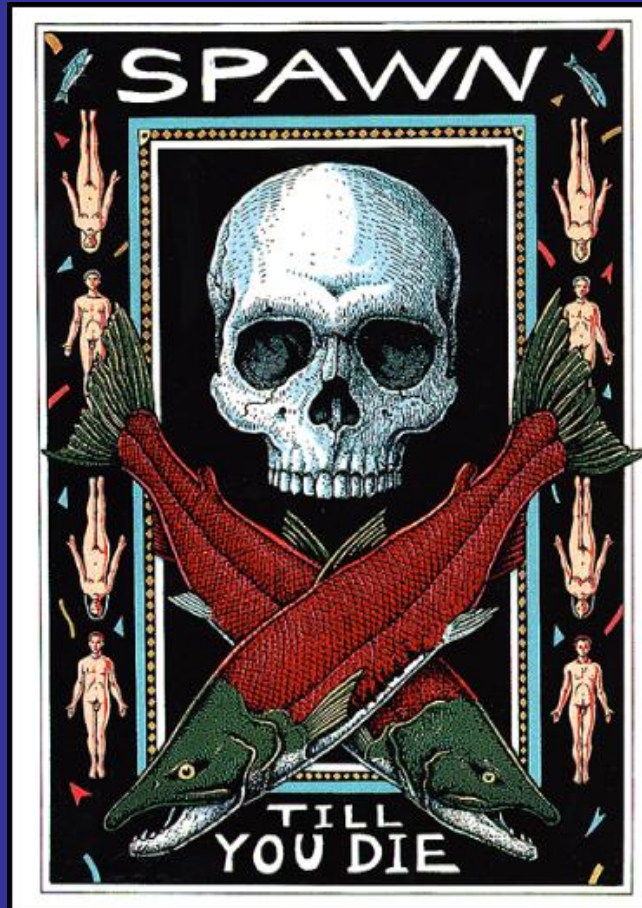
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- Within an individual does spawning method affect offspring fitness? Dry fertilization vs. modified wet fertilization.
- Using multiple males with one female. Does one male with highest sperm fitness gain the majority of fertilizations?
 - Can we predict the best pairings using CASA prior to spawning?
- Can we predict natural fertilization success with CASA? Take sperm and ovf samples to perform CASA. Allow fish to spawn naturally then sample all offspring for genetic parentage.

Questions?



Thank You!