

Goal

Achieve the mission of the
OHRC

Objective

Develop a framework to address the OHRC mission

- Encourage research
- Judge proposals
- Visualise links

- **Understand mechanisms that may create differences between hatchery and wild fish**
- **Develop approaches to manage hatchery fish that conserve and protect native fish.**
- **Educate the public on the relationship between hatchery and wild fish, the connection between fish and watershed, estuarine and ocean systems, and the implications for fish management and stewardship.**

Five years on...

Are the mission statements still relevant?

- Understand mechanisms that may create differences between hatchery and wild fish

We knew that H and W fish were different

Category	Wild	Hatchery
Survival		
egg-smolt survival	lower	higher
smolt-adult survival	higher	lower
Behavior ^a		
foraging ability	efficient	inefficient
aggression	lower	higher
social density	lower	higher
territorial fidelity	higher	lower
migratory behavior	disperse	congregate
habitat preference	bottom	surface
predator response	flee	approach
Morphology		
juvenile shape	more variable	less variable
nuptial coloration	brighter	duller
kype size	larger	smaller
Reproductive potential		
egg size	smaller	larger
egg number	lower	higher

- **Understand mechanisms that may create differences between hatchery and wild fish**

If you understand the mechanisms controlling the physiological and behavioral differences



Produce a hatchery fish that mimics the attributes of a wild fish

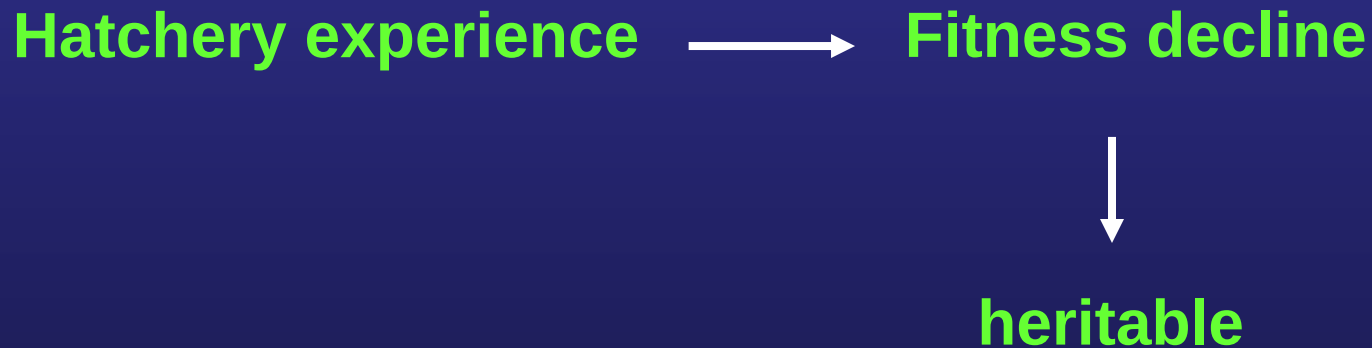
- **Understand mechanisms that may create differences between hatchery and wild fish**

Even though we knew that H and W fish were different

We didn't 'know' that the hatchery experience influenced the fitness of individuals breeding in the wild

- Understand mechanisms that may create differences between hatchery and wild fish

Growing body of literature showing that:



- **Understand mechanisms that may create differences between hatchery and wild fish**

Fitness decline may be explained by a number of factors:

Genetic (mate choice)

Environmental (food availability)

Exceptionally complicated combination of factors that is difficult to address in a hatchery setting



Likelihood of adjusting hatchery practices to eliminate the effect is low

Management implications of this reasoning:

Harvest program

Segregate H and W fish on spawning grounds

- Release strategies
- Minimize stray rates

Conservation program

Does seed stock matter (integrated vs segregated broodstock)?

Conclusion:

Yes, it is worthwhile trying to understand the mechanisms

But it may not be a priority given the likely outcome

- Understand mechanisms that may create differences between hatchery and wild fish
- Develop approaches to manage hatchery fish that conserve and protect native fish.

Focus Areas

- **Methods to maintain temporal or spatial separation**
 - Minimize juvenile overlap
 - Minimize stray rates
- **Evaluation of appropriate broodstocks for harvest and conservation programs**
 - Chum
 - Willamette reintroductions
 - Coastal steelhead programs
- **Evaluation of ODFW's trout program**
 - Triploid trout
 - Stocking practices

How to address these topics

The mechanisms that create differences between hatchery and wild fish may be divided into three categories.

Broodstock

Environment

Feeding

Broodstock

- Collection
- Holding
- Mate Choice
- Spawning

Environment

- Incubation
- Ponding
- Release
- Conditioning

Feeding

- Feeding rate
- Feed types
- Food Presentation

Mission Statement 2: Develop approaches to manage hatchery fish that conserve and protect native fish.

Studies that address the 2nd mission statement at the OHRC should examine whether the hatchery rearing environment can be manipulated to achieve a desired management goal.

Research should address the effects of manipulating any of the 3 factors (broodstock, environment, feeding) to produce a desired outcome. For harvest programs researchers should consider the benefits/costs of using both integrated and segregated stocks to achieve the desired goal within the context of the native fish conservation policy.

Framework

Supplementation

Integrated

Brood Environ Feed

Harvest

Integrated

Brood Environ Feed

Segregated

Reproductively
Isolated Reproductive
interaction

Brood Environ Feed

Triploid trout program

Supplementation

Integrated

Brood Environ Feed

Harvest

Integrated

Brood Environ Feed

Segregated

Reproductively
Isolated

Reproductive
interaction

Brood Environ Feed

Triploid trout program

Harvest

Segregated

Reproductively
Isolated

Brood Environ Feed



Harvest rate

Growth/Survival in hatchery

Growth/Survival in wild

Effect on wild populations
-competition for food

Effect on wild spawners

Progress in focus areas

Triploid trout:

- Improve efficacy of induction (Ryan)
- Evaluate high lakes program (Ryan/Shawn et al.)

Broodstocks:

- Willamette system: Mate Choice, Rearing, and Release Strategies (Shawn et al.)
- Coastal Steelhead: Research Plan

Separation:

- Workshop on straying (All)
- Determine the mechanisms underlying straying behavior (David et al.)