

The effects of domestication on predation vulnerability



Background

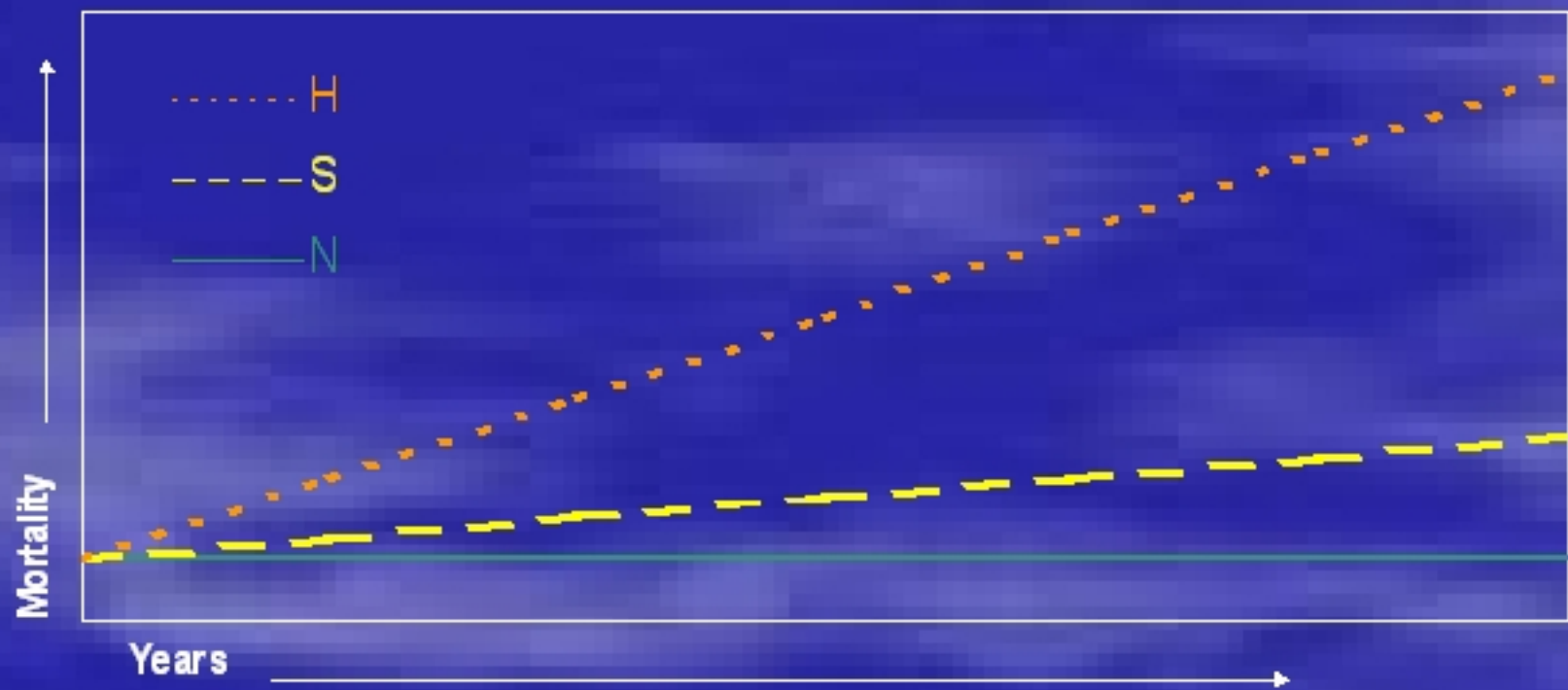
- Hatcheries may increase survival of fish with certain traits that are useful in the hatchery environment but not in the natural environment (relaxation of natural selection)
- Survivors can pass on these traits to their offspring and reduce the productivity of the naturally reproducing population

Literature

Citation	Species	Comparison
Johnsson and Abrahams (1991)	steelhead	Wild vs. wild/farmed rainbow trout hybrid
Eimum and Fleming (1997)	Atlantic salmon	Wild vs. farmed
Fleming and Eimum (1997)	Atlantic salmon	Wild vs. farmed
Vincent (1960)	brook trout	Wild vs. hatchery
Yanamoto and Reinhardt (2003)	masu salmon	Wild vs. hatchery vs. farmed
Johnsson et al. (1996)	brown trout	Wild vs. hatchery/wild hybrid
Johnsson et al. (2001)	Atlantic salmon	Wild vs. farmed
Berejikian (1995)	steelhead	Wild vs. hatchery

- Berejikian (1995): Offspring of wild parents had 12% higher survival than offspring of 1st to 7th generation hatchery steelhead fry when faced with sculpin predators.

- Is there differential predation mortality between offspring of conventional hatchery and supplementation origin spring chinook salmon caused by domestication?





- Used juvenile offspring of returning Hatchery, Supplementation, and Naches origin parents that were reared identically in the hatchery



Naches



- Serve as a baseline for domestication
- Adults collected and spawned in September 2004, incubated to eyed stage in mister boxes, transferred to CESRF after pathogen screening



- 8 - 3m x 2.4m x 1.5m 3mm mesh net pens in a raceway were stocked with 2 rainbow trout and 2 torrent sculpins
- Size matched 50 fry of each origin, marked them, and released into each of the net pens

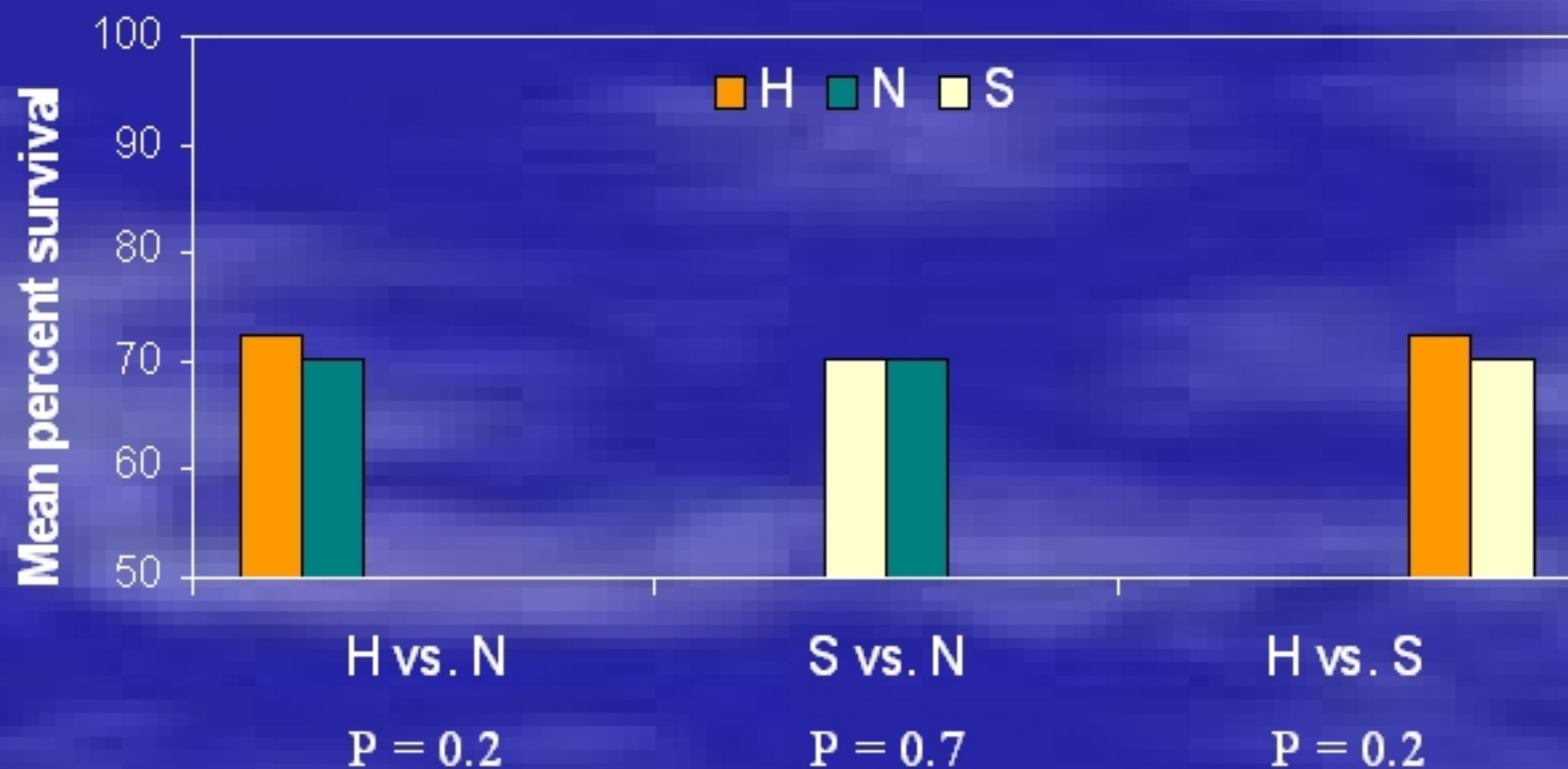




- At end of each trail survivors were recovered and enumerated
- Used the Wilcoxon matched pairs test for survival between origins (H vs. N, S vs. N, H vs. S)

Results

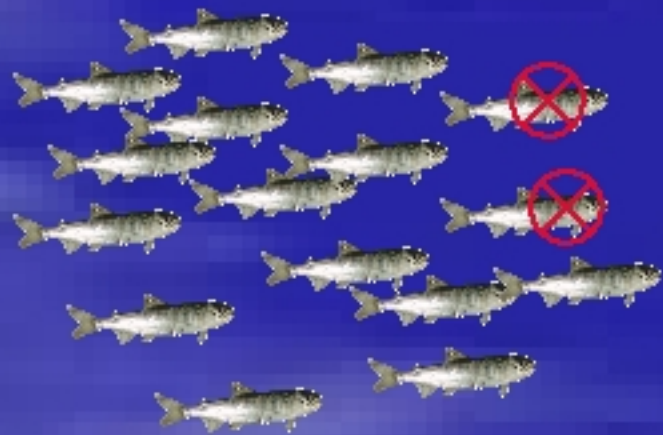
- We found no significant difference in survival between the three groups



What does this mean?

- A departure from previous years where we found higher survival in the offspring of wild origin (pre-supplementation) fry
- Why the change?

- Supplementation and Naches fish may vary in predator vulnerability depending on the selection pressures faced by their parents as naturally spawned offspring



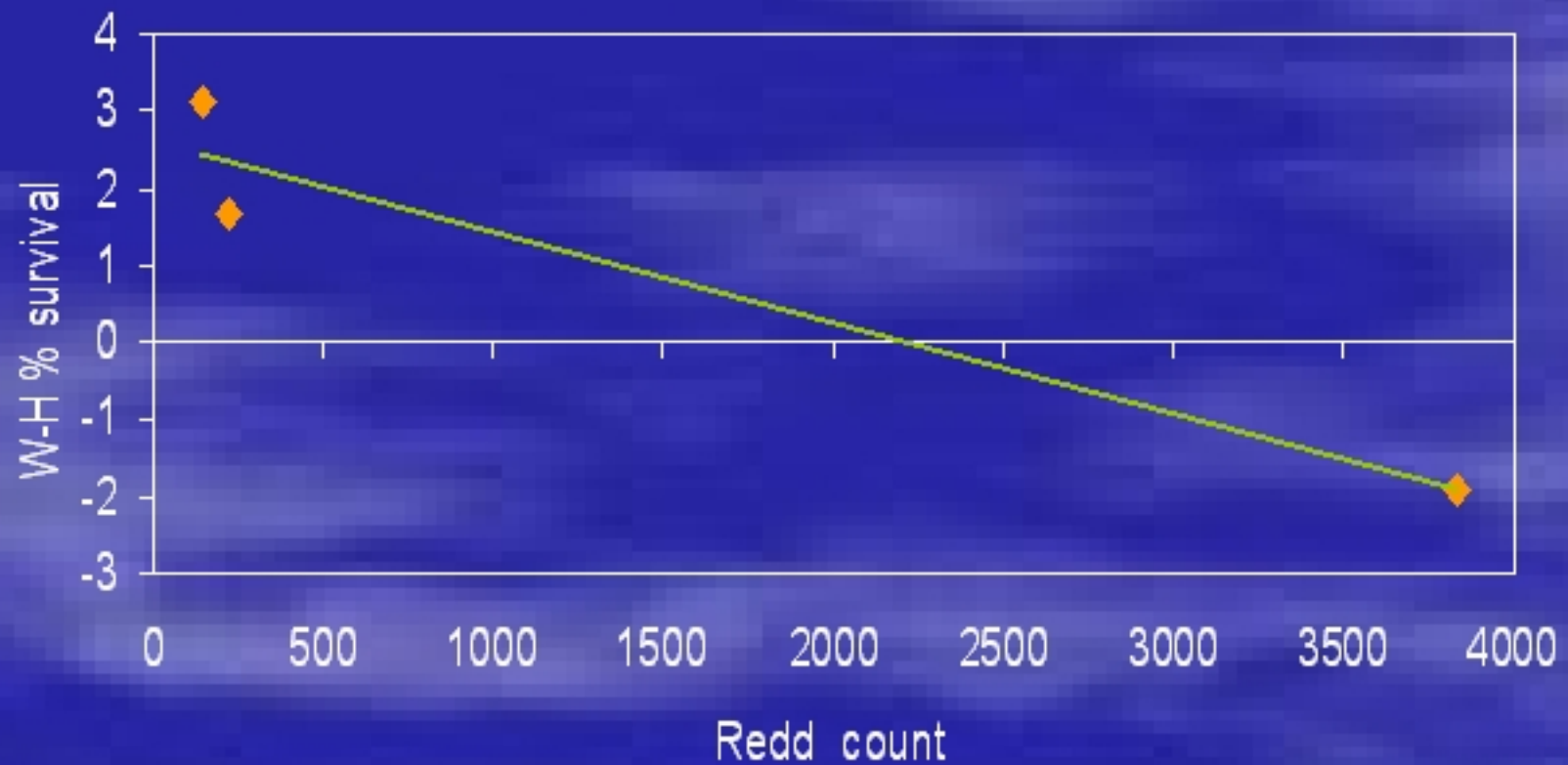
Strong run

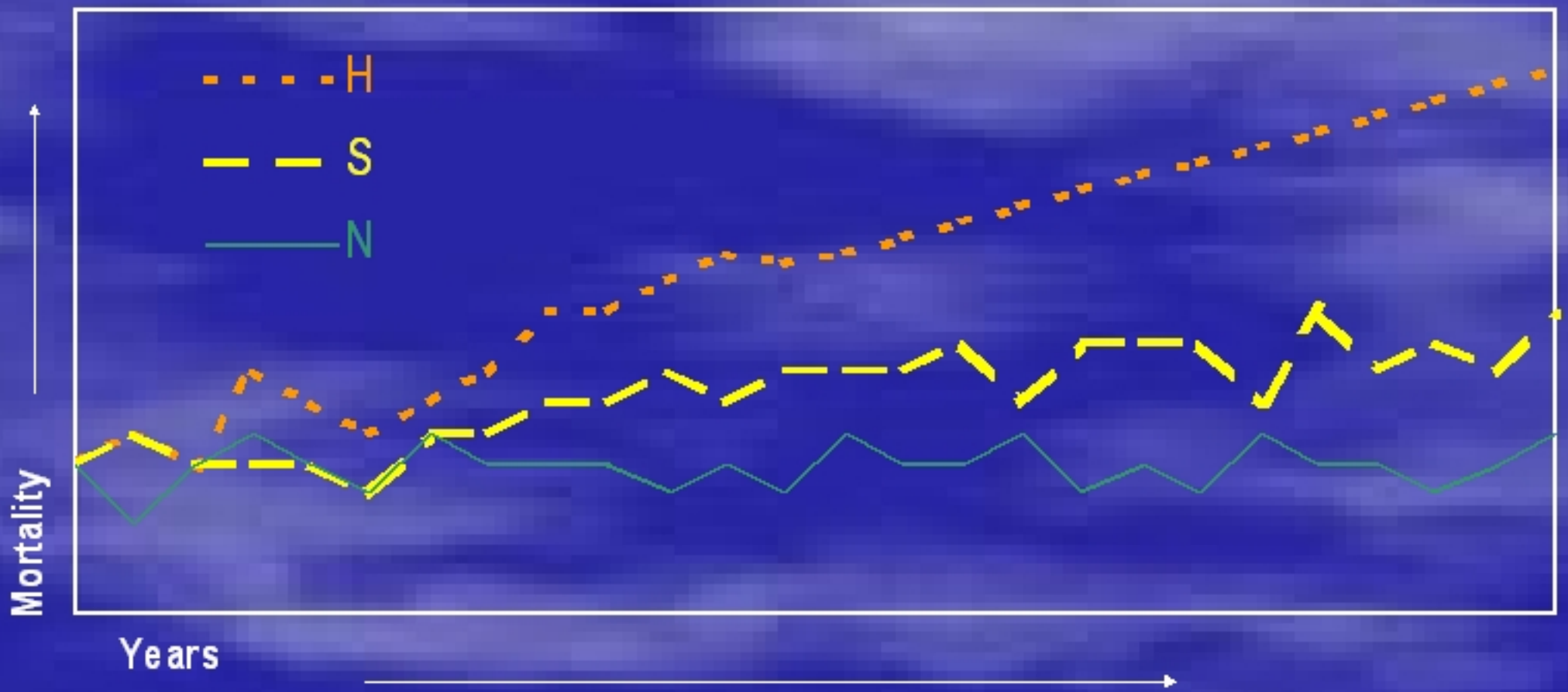
13% eaten

Weaker run

50% eaten

Preliminary Evidence?





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