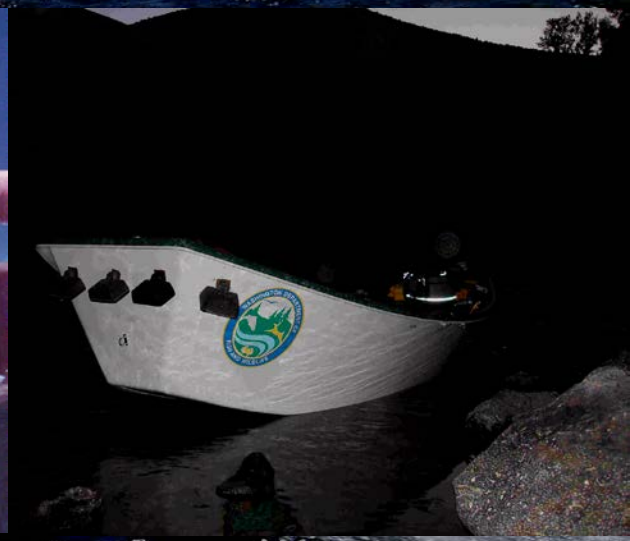
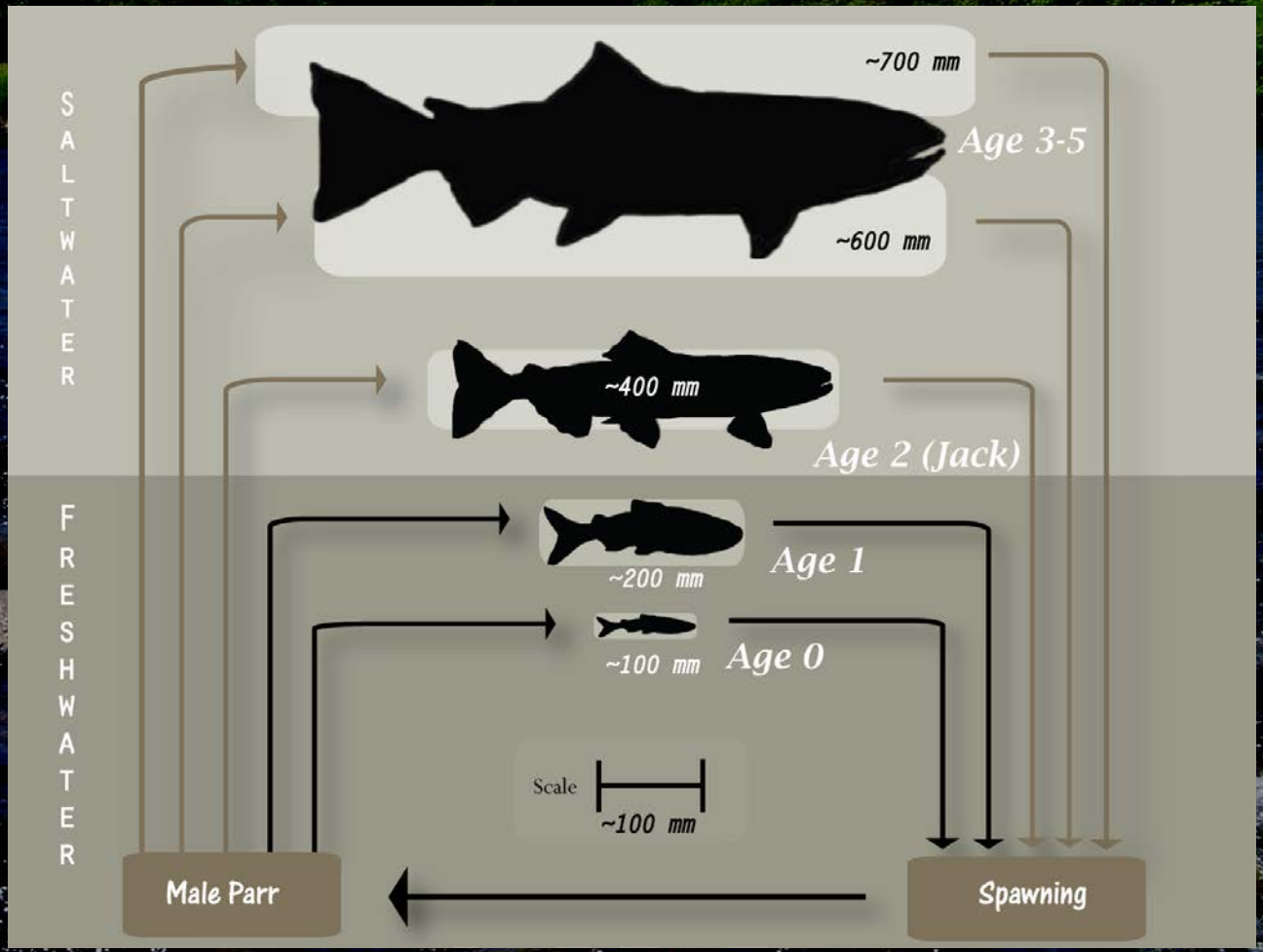
Precocious Wild and Hatchery Spring Chinook on the Spawning Grounds

Christopher Johnson , Todd Pearsons, Brenda James, and Gabriel Temple



Spring Chinook
Precocious Male Life-History



Background

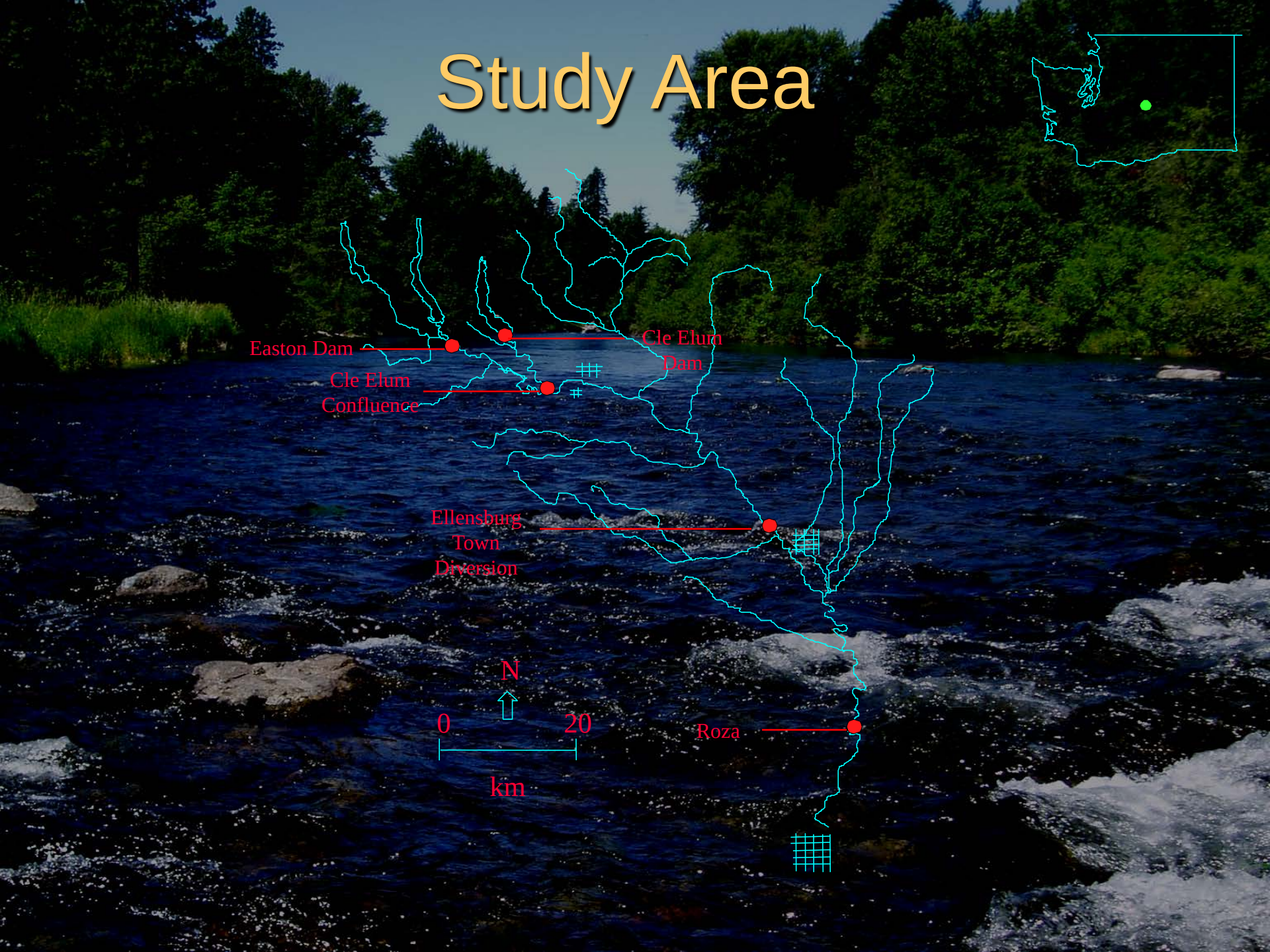
Hatcheries have the potential to unintentionally produce high or low numbers of precocious males relative to the natural environment

- Abundance: Artificially high or low numbers of precocious males may harm wild populations through either competitive or genetic mechanisms.
- Distribution: the impact hatchery precocious males have upon the wild population is influenced by proximity to spawning females, affecting reproductive success.
- Size and Behavior: differences in size and behavior (dominance) between hatchery and wild precocious males may also influence proximity to female spawners, and reproductive success.

Study Objectives

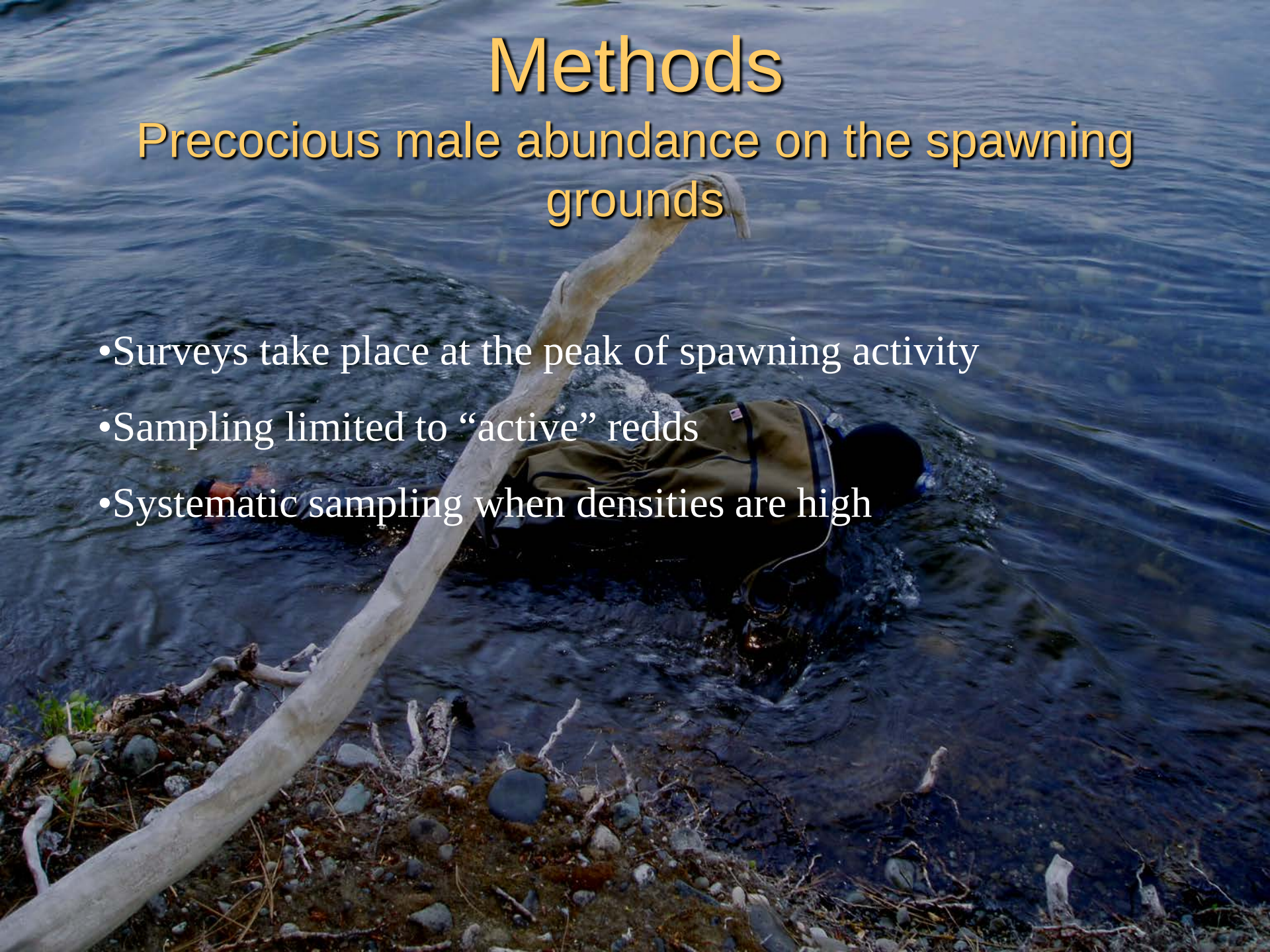
- Determine if the Cle Elum Supplementation and Research Facility alters the abundance, distribution, age/size, or behavior of precociously maturing males in the natural environment.

Study Area


Easton Dam
Cle Elum Dam
Cle Elum Confluence
Ellensburg Town Diversion
Roza
N
0
20
km

Methods

Precocious male abundance on the spawning grounds

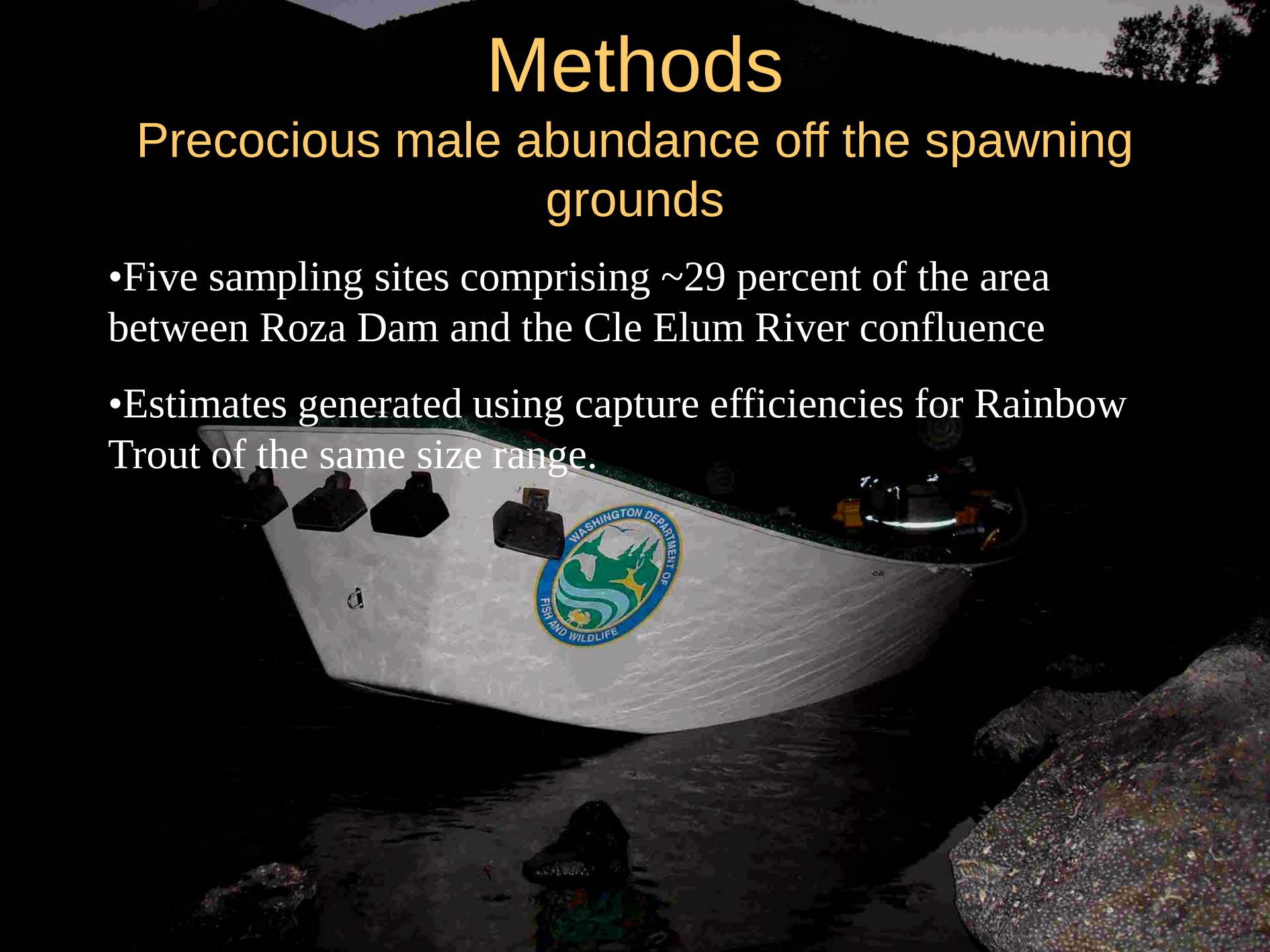


- Surveys take place at the peak of spawning activity
- Sampling limited to “active” redds
- Systematic sampling when densities are high

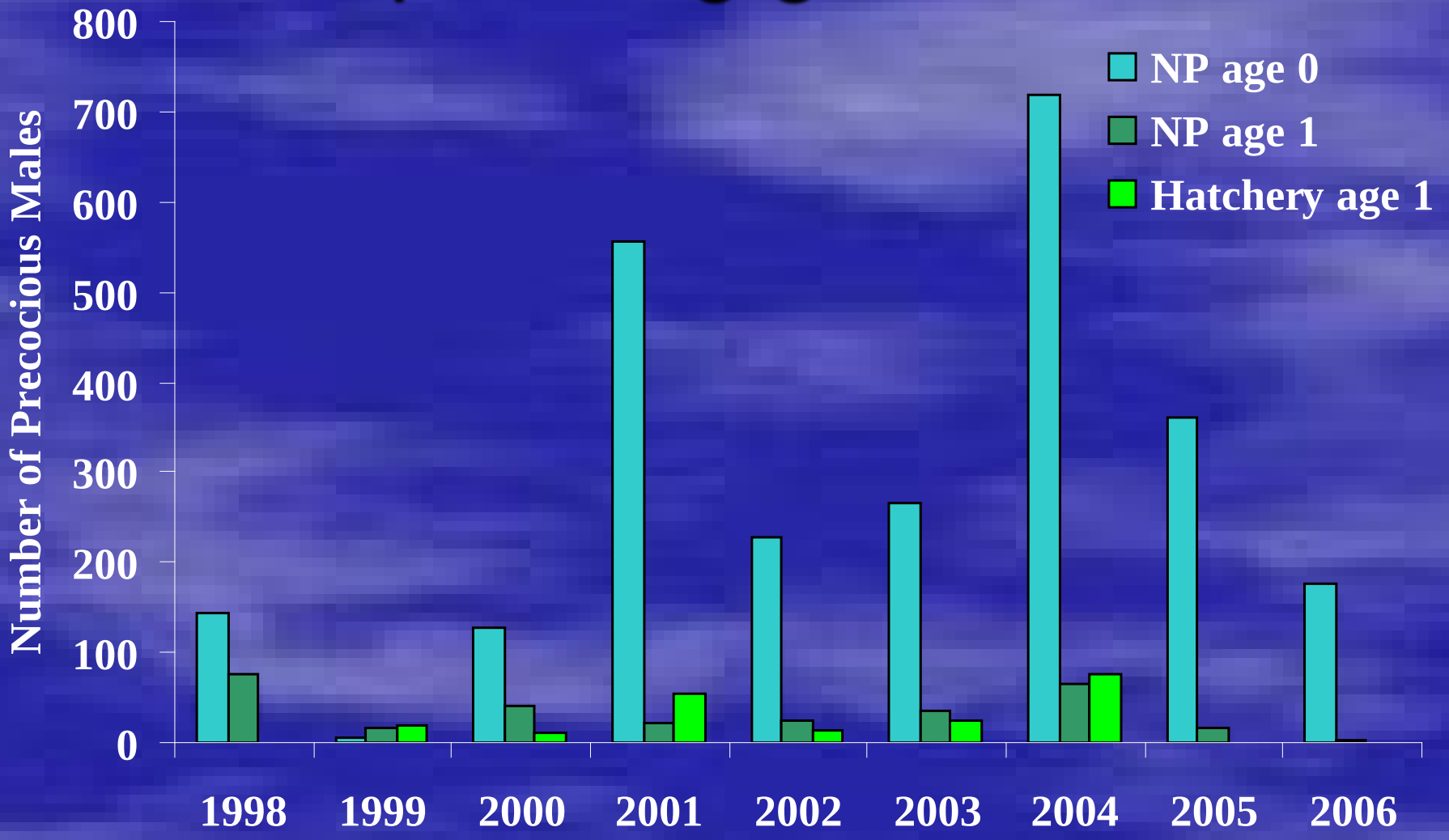
Methods

Precocious male abundance off the spawning grounds

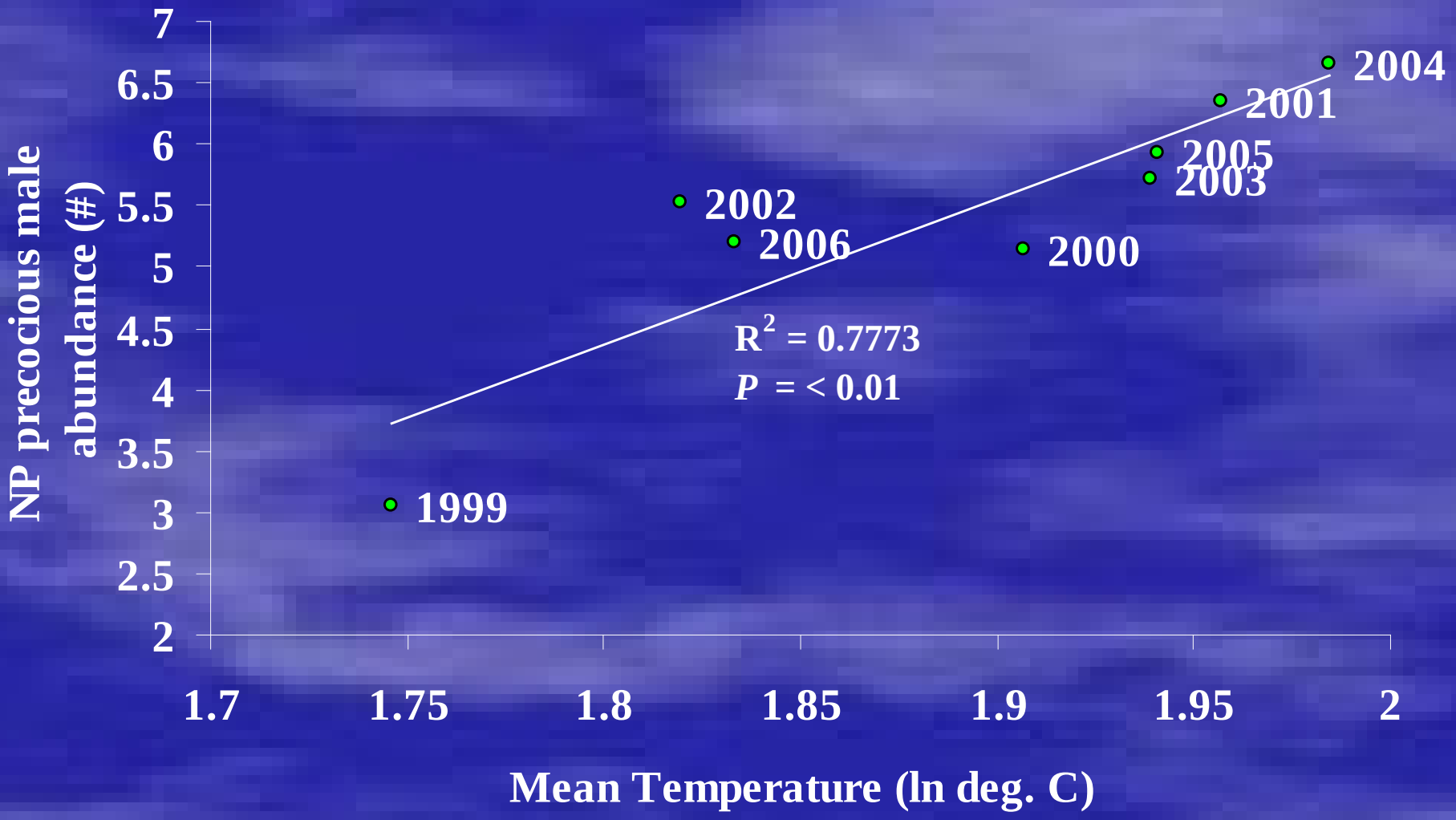
- Five sampling sites comprising ~29 percent of the area between Roza Dam and the Cle Elum River confluence
- Estimates generated using capture efficiencies for Rainbow Trout of the same size range.



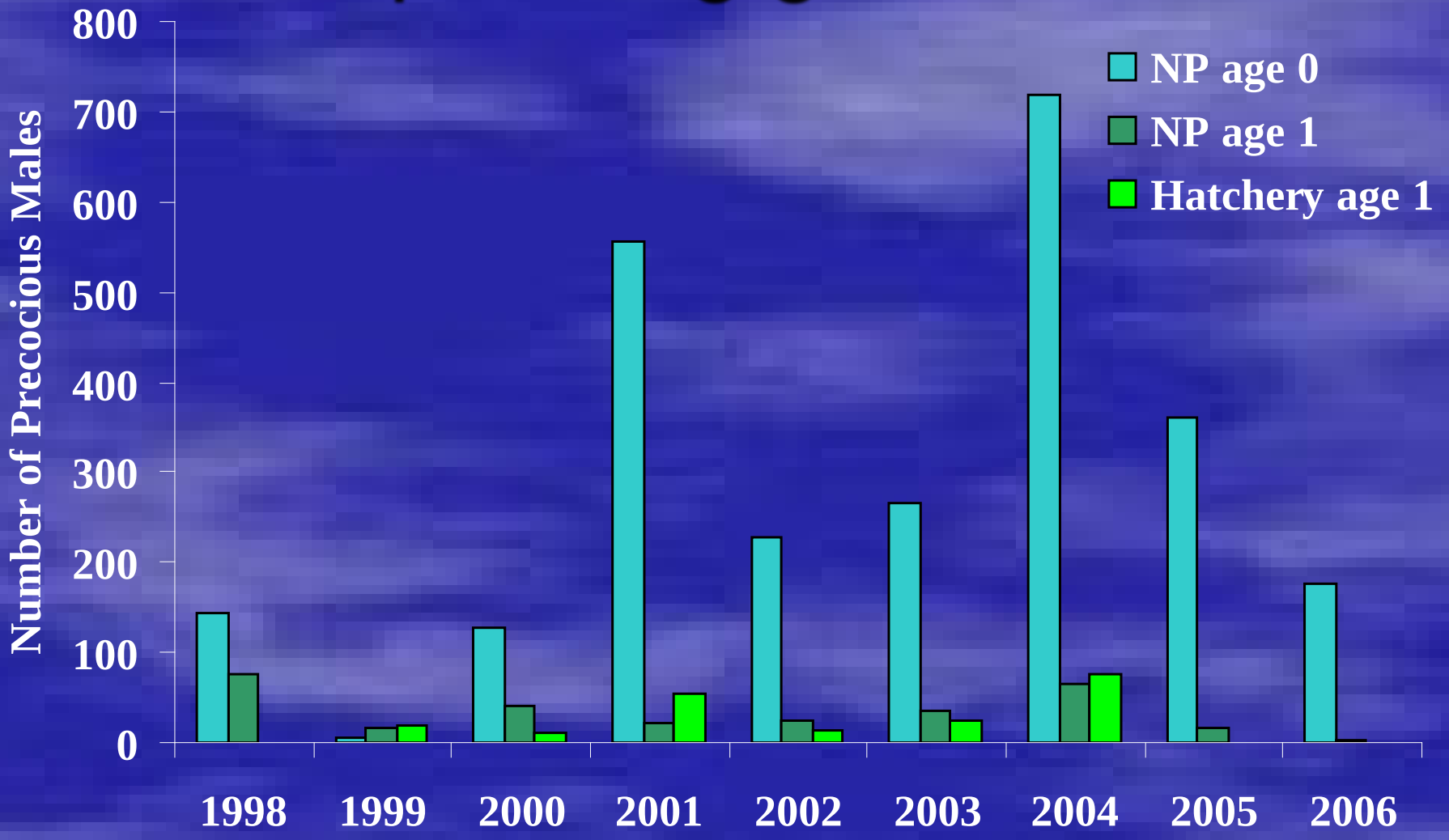
Index of abundance on the spawning grounds



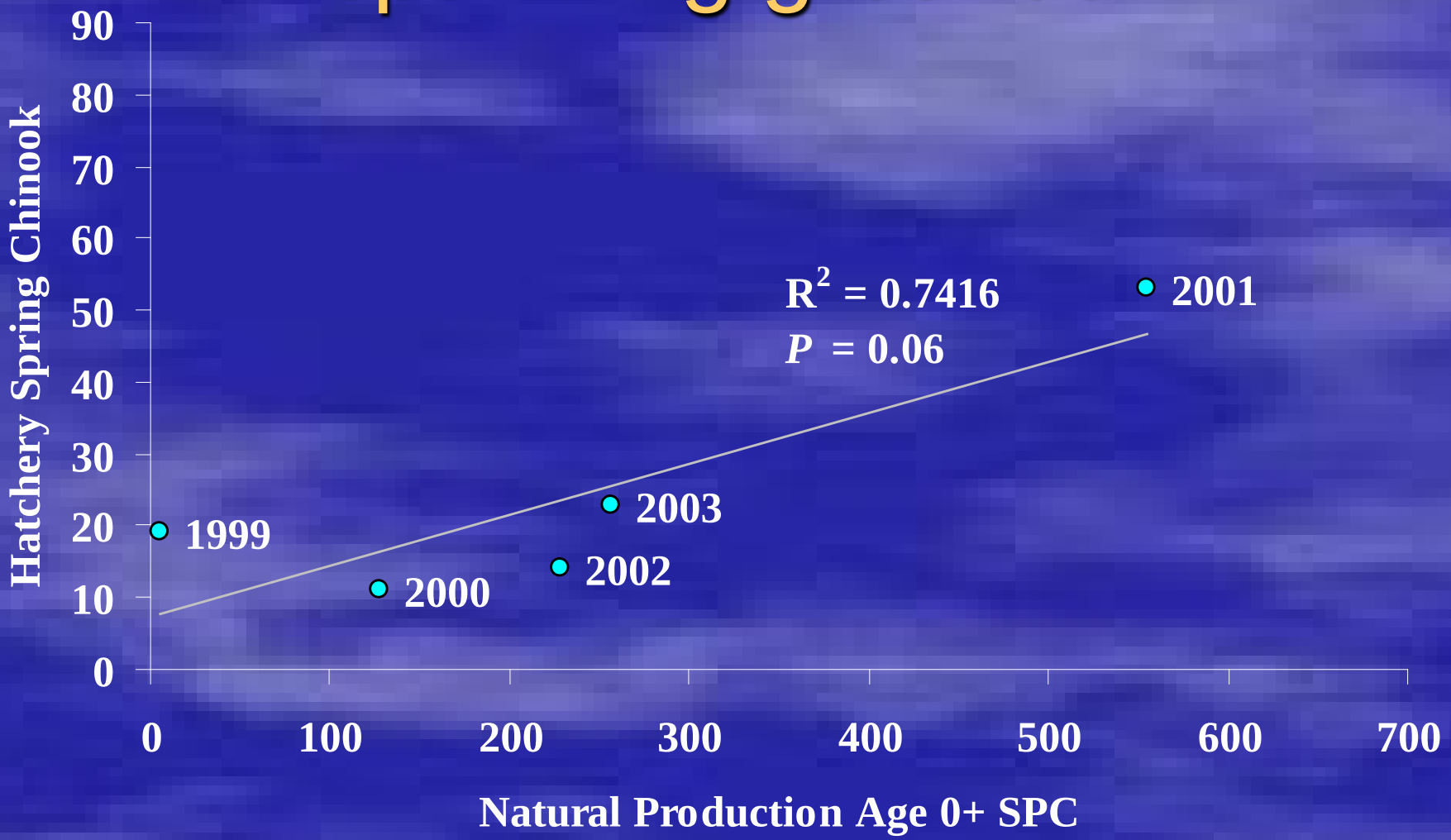
Spring Temperature



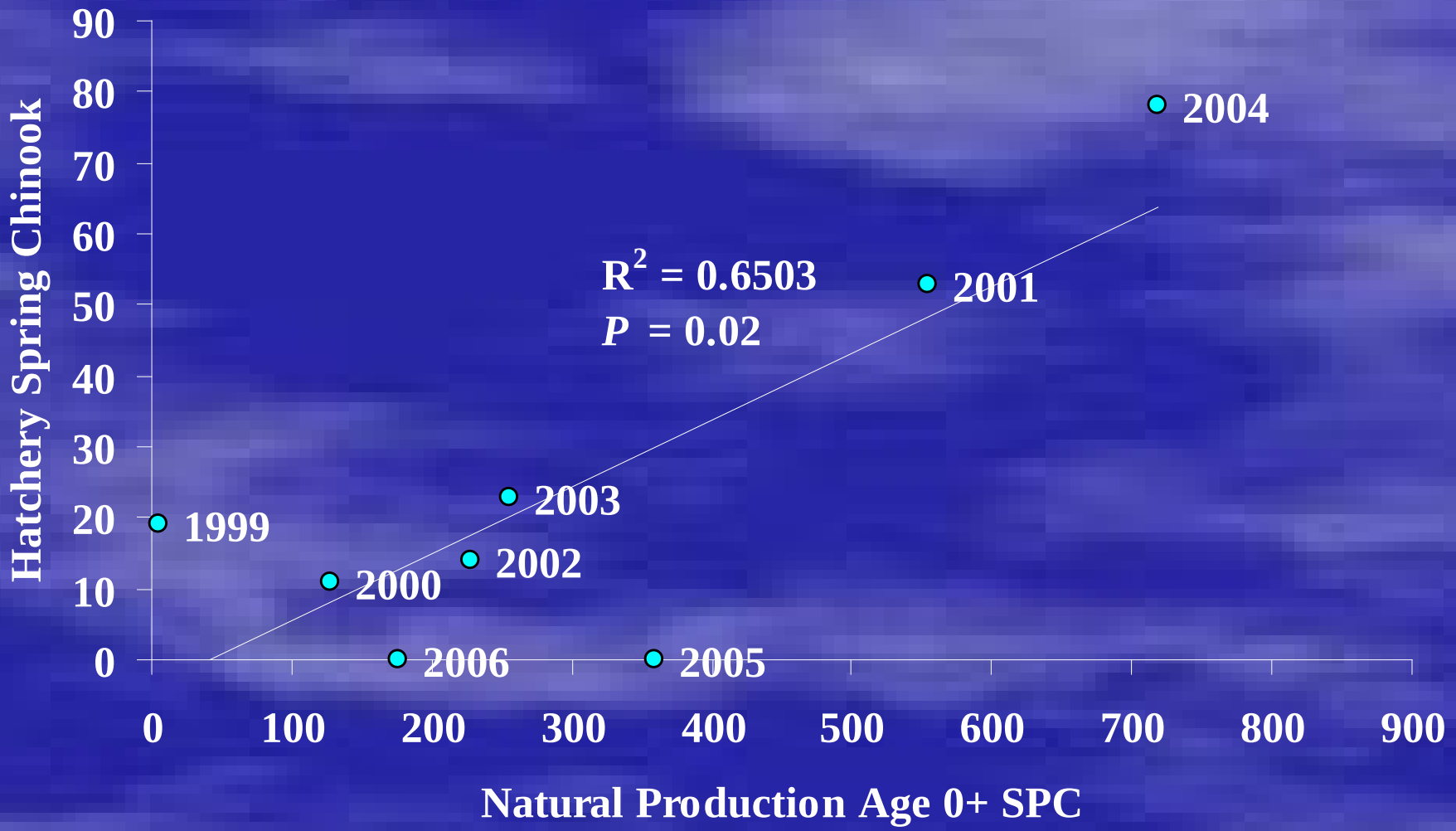
Index of abundance on the spawning grounds



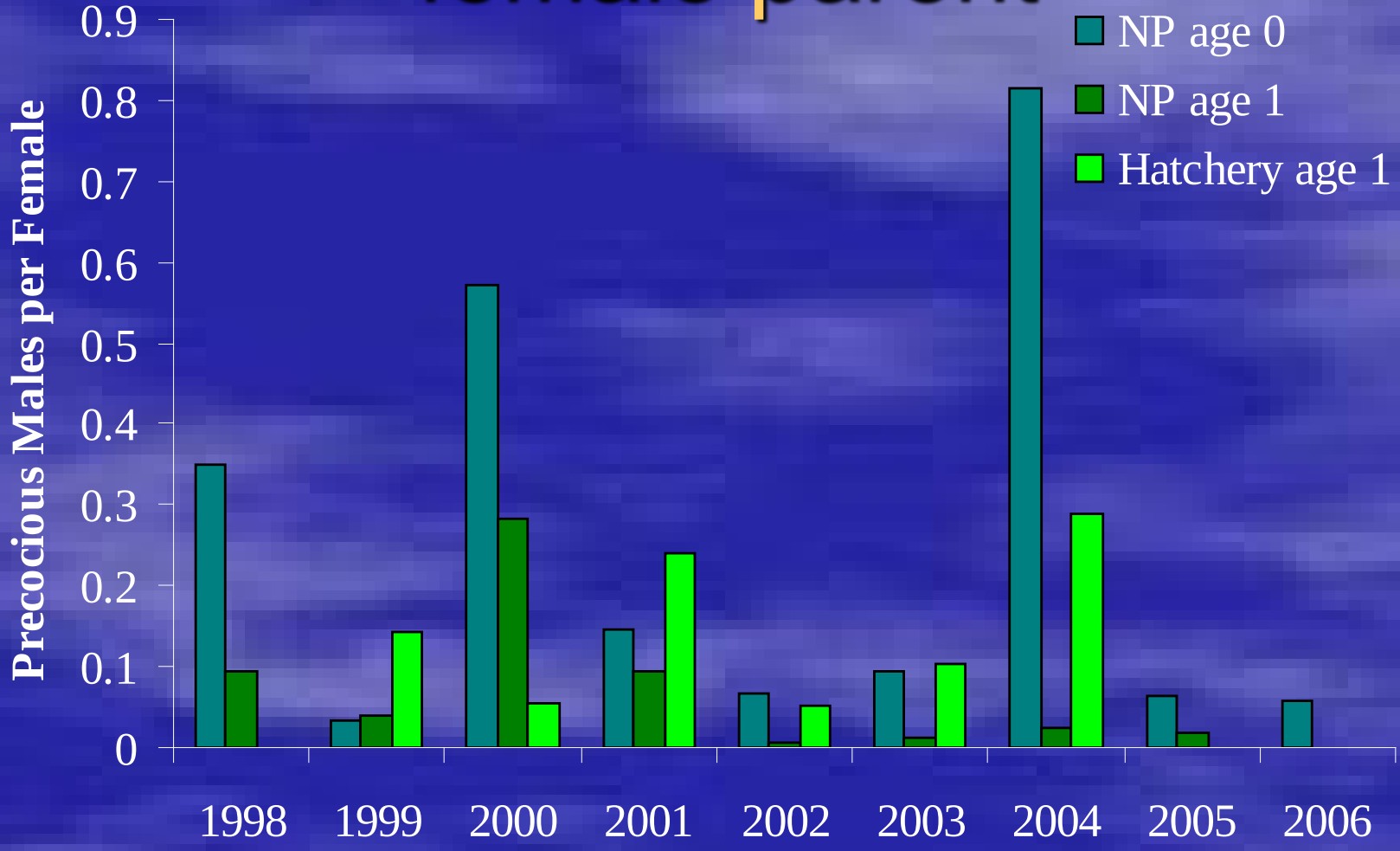
Hatchery and NP spc on the spawning grounds



Hatchery and NP spc on the spawning grounds

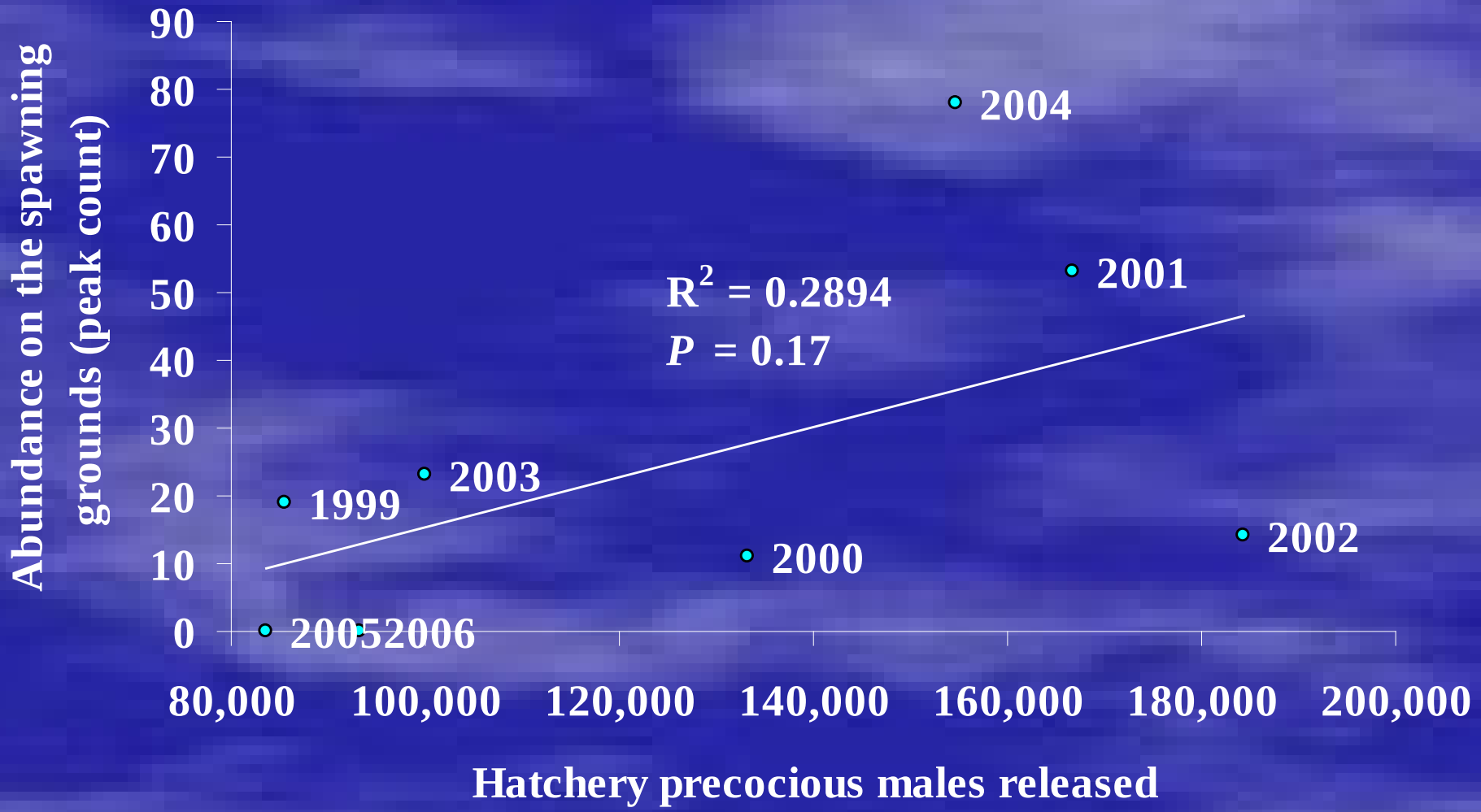


Index of precocious males per female parent



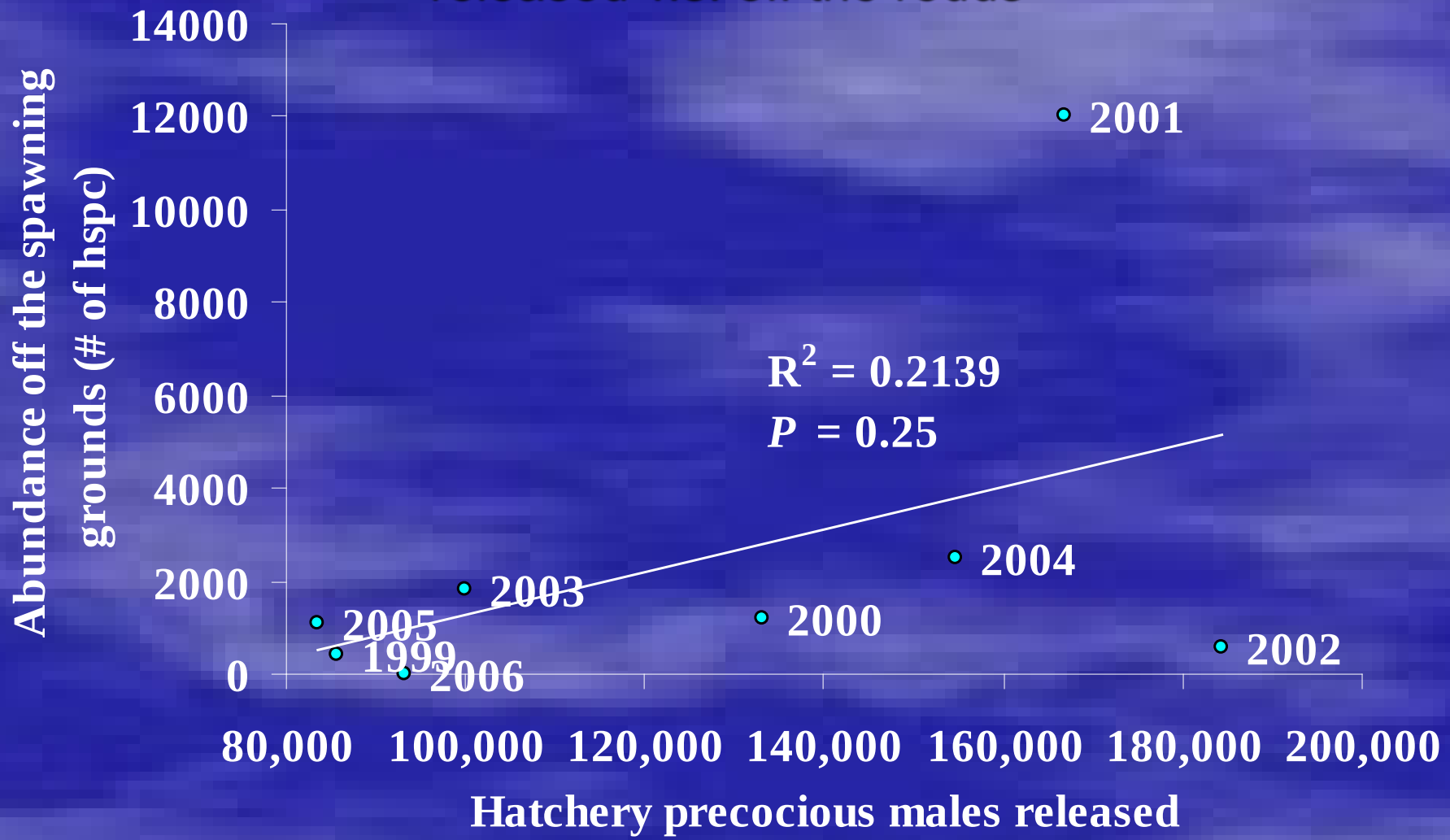
Hatchery Spring Chinook

released v.s. on the redds



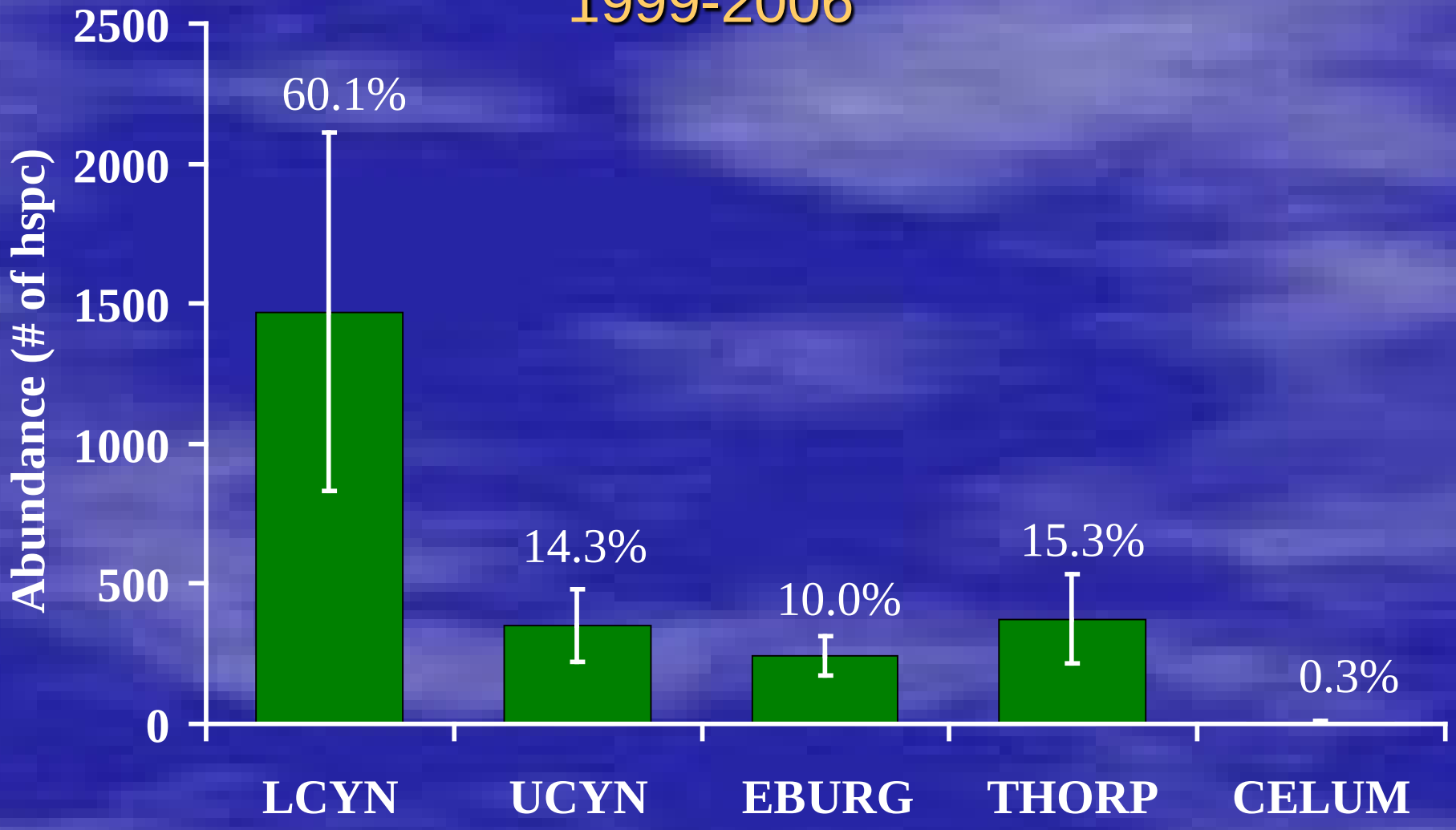
Hatchery Spring Chinook

released v.s. off the redds



Distribution off the redds

1999-2006



Summary

- Age 0+ spring Chinook continue to make up the largest proportion of precocious males on the spawning grounds.
- Environmental conditions appear to play a large role in determining the abundance of hatchery precocious males on the spawning grounds
- No detectable difference between natural production and hatchery precocious males per female on the spawning grounds
- Hatchery precocious males continued to be most abundant in areas downstream of spawning locations.

Acknowledgements

- BPA – Patty Smith, David Byrnes
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