Precocious Wild and Hatchery Spring Chinook on the Spawning Grounds

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Background

Hatcheries have the potential to unintentionally produce high or low numbers of precocious males
Artificially high or low number of precocious males may harm wild populations



Study Objectives

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

Focus on potential differences in observations between 1999-2003 and the first two release years of precocious males subjected to growth modulation, 2004-2005.

Study Area

Easton Dam

Cle Elum Confluence

Ellensburg.

• E1

Diversion

km

Methods

• Peak of spawning snorkeling surveys

• Fall abundance estimate of HSPC (drift boat electrofishing)

Backpack electrofishing / hook and line sampling
Behavioral interactions on redds (snorkeling)

1999-2003

Low numbers of hatchery spring Chinook observed on the spawning grounds relative to wild
Hatchery precocious males where most abundant in areas of low spawner density
Hatchery spring Chinook were significantly larger than both wild age classes



Index of abundance on the spawning grounds

Wild age 0Wild age 1Hatchery age 1

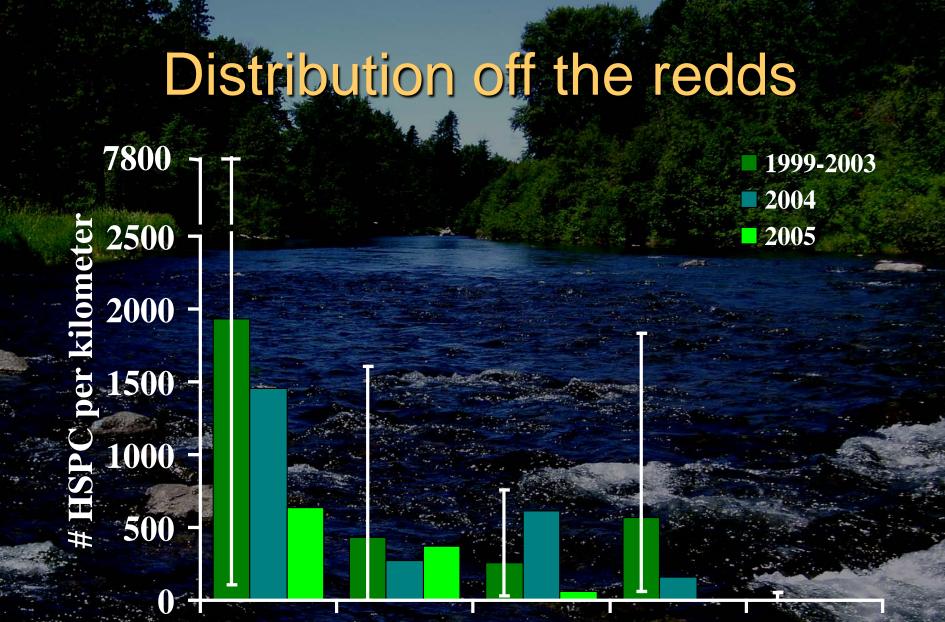
0 1999 2000 2001 2002 2003 2004 2005 Year

Index of precocious males per female parent

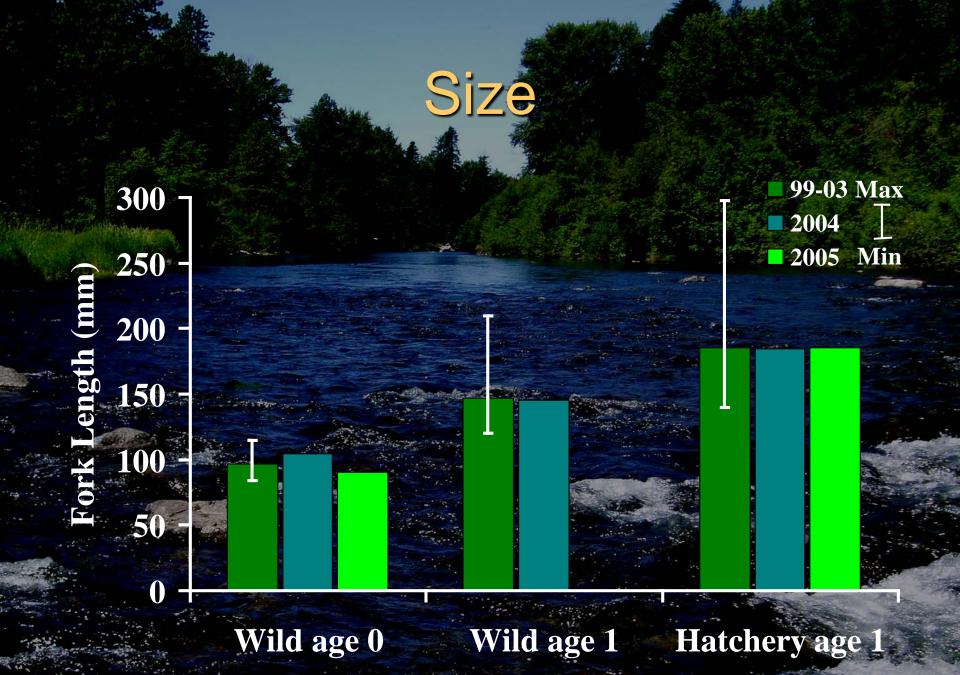
0.9 8.0 ber female 8.0 alle males 0.5 0.4 0.3 0.2 0.1

Wild age 0
Wild age 1
Hatchery age 1

1999 2000 2001 2002 2003 2004 2005 Year



LCYN UCYN EBURG THORP CELUM



Length Frequency

10

8

6

2

4

0

6420

<u>requen</u>

Frequency

2005 Wild Spring ChinookHatchery Spring Chinook

 65
 80
 95
 110
 125
 140
 155
 170
 185
 200

 Fork Length

2004

65 80 95 110 125 140 155 170 185 200 Fork Length

Dominance by Size 03-04

20

10

Wild age 0 x Hatchery age 1 P =.01
Wild age 0 x Wild age 1 P =.01
Wild age 1 x Hatchery age 1

Small > Large

Large > Small

Preliminary Findings

Growth modulation reduces the number of precocious males released. (Larsen et al.)
Inter-annual variation in environmental conditions appear to play a large role in determining the abundance of hatchery precocious males on the spawning grounds.

Preliminary Findings

Hatchery precocious males continued to be most abundant in areas downstream of spawning locations. Hatchery precocious males were larger than those observed in the wild. Larger Chinook dominated smaller ones in the majority of interactions.

