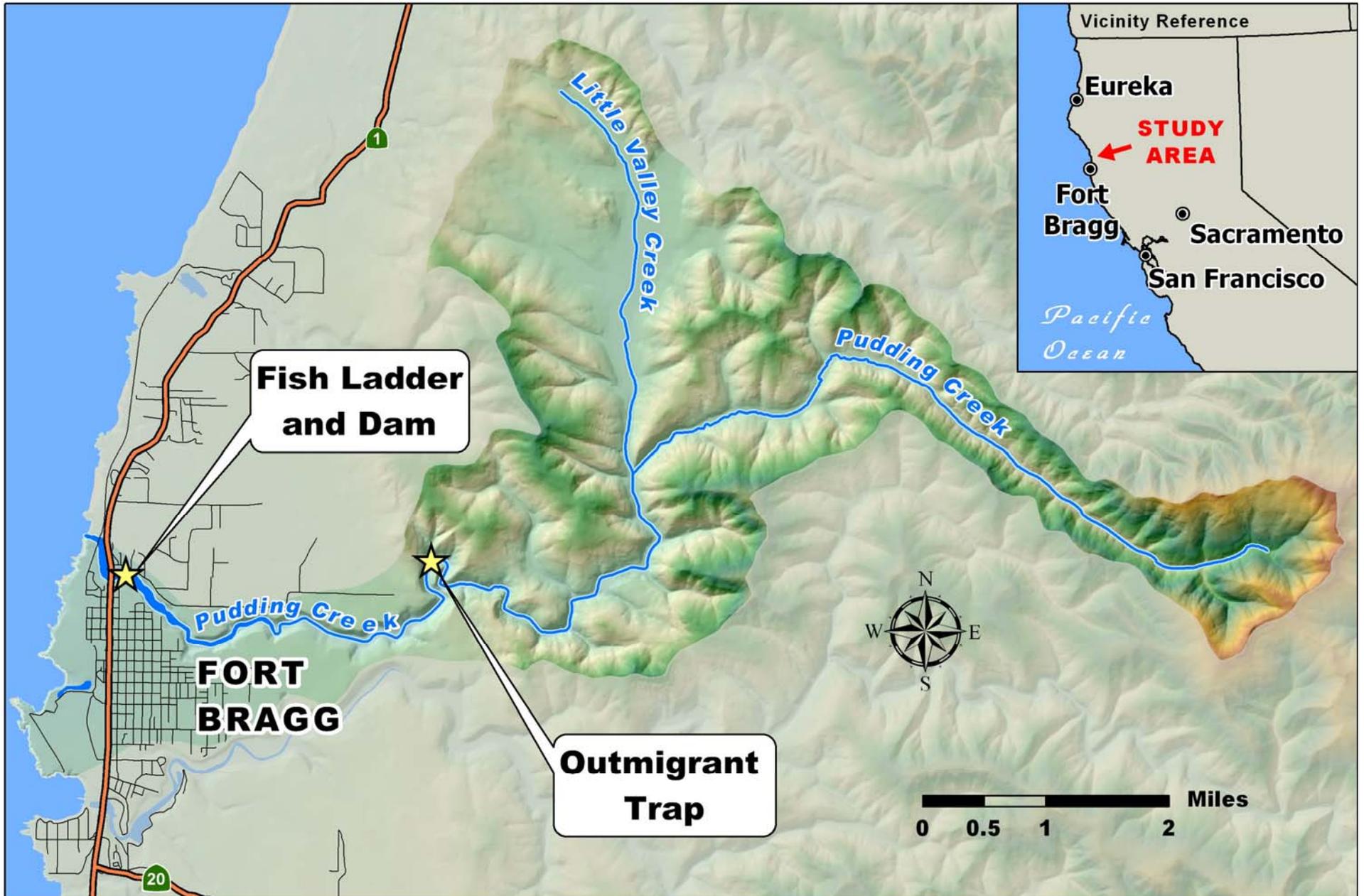


Pudding Creek Study (2006 – 2008)



Report to MSG

Location of Study

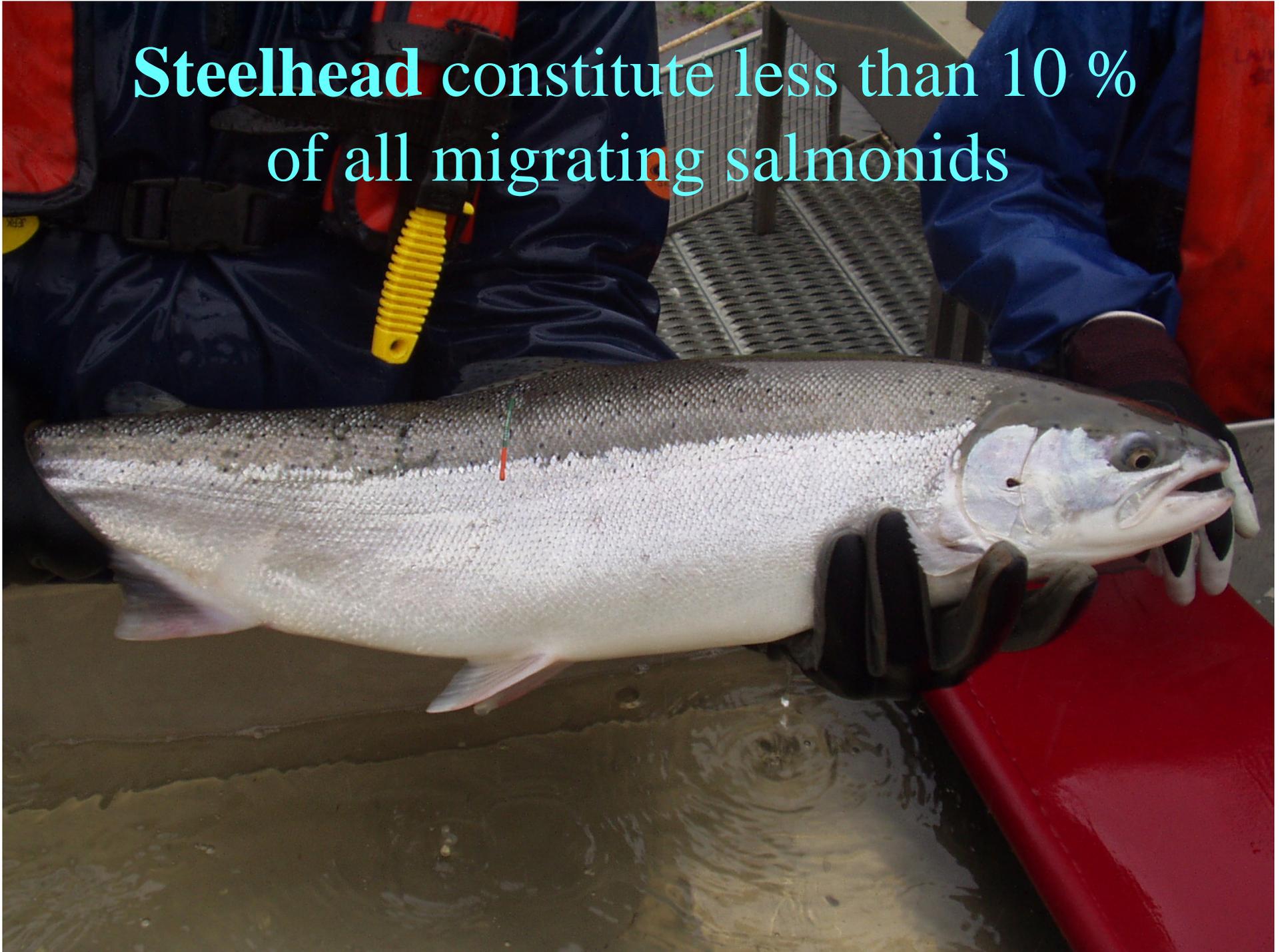


Coho comprise 90 % of spawning salmonid population in Pudding Creek

Likewise for the outmigrant population (smolt)



Steelhead constitute less than 10 %
of all migrating salmonids

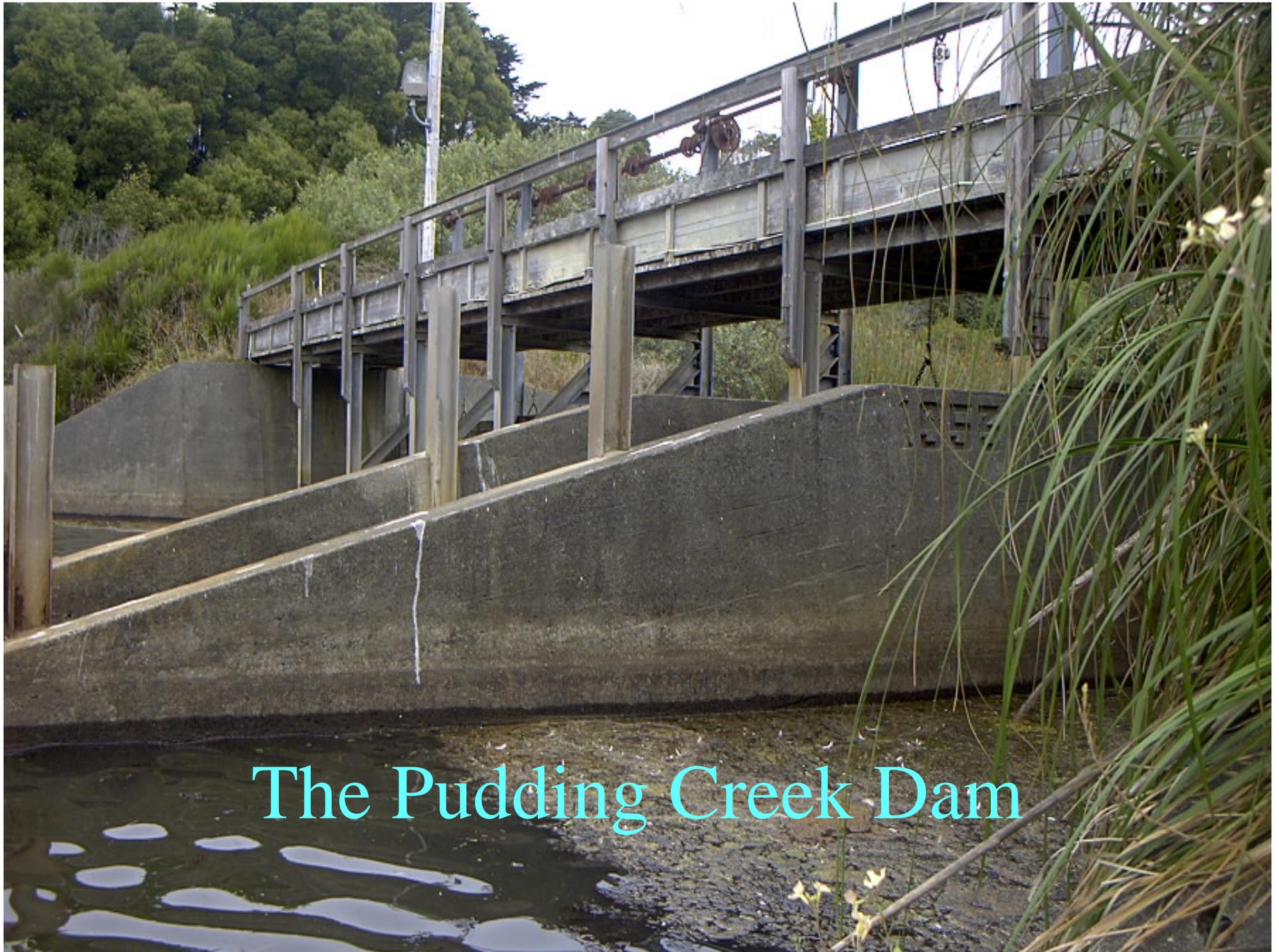


Optimal Coho Habitat

A photograph of a stream in a forest. The stream is the central focus, with a large log jam in the middle. The water is dark and reflects the surrounding trees. The forest is dense with many trees, some with bare branches and some with green leaves. The overall scene is a typical Pacific Northwest stream habitat.

- Low gradient with abundant pool habitat
- Marshy and cool
- Dense canopy
- Good Shelter Conditions

More typical of a Pacific Northwest Stream



The Pudding Creek Dam

Components of the Study



- Adult Trapping
- Spawning Surveys
- Downstream Migrant Trapping
- Over-Summer Surveys

Life History Patterns in Pudding Creek

- Timing of life history stages
- Run timing
- Spawning locations
- Instream relative abundance
- Coho growth and residency
- Over-winter survival
- Escapement and marine survival

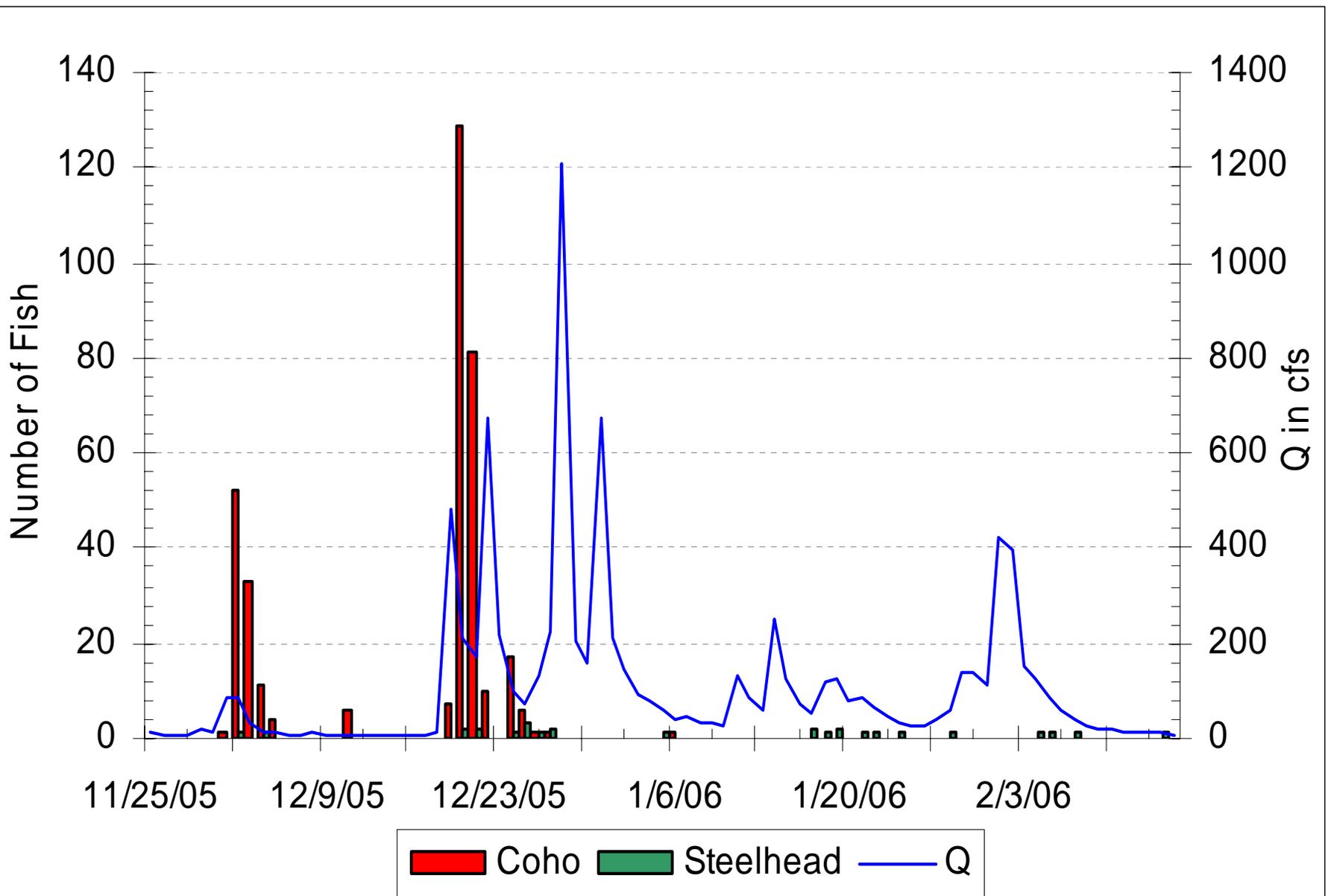
Life-history timing of coho salmon in Pudding Creek, California (2006–2007)

Life Stage	Location	Month												Source							
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec								
Adult migration into the estuary	Pudding Creek Dam	■	■													■	■	■	Based on observations at the adult trapping station		
Adults present in upstream reaches and spawning	Stream reaches between dam impoundment and headwaters	■	■	■	■												■	■	■	Based on spawning surveys	
Emergence of fry	Outmigrant trapping location					■	■	■												Based on outmigrant trapping	
Juvenile rearing	Entire stream							■	■	■	■	■	■	■	■	■	■	■	■	Based on outmigrant trapping, snorkel surveys and assumed	
Juvenile outmigration	Entire stream	■	■	■	■	■	■	■	■	■								■	■	■	Based on observations at the outmigrant and adult trapping stations

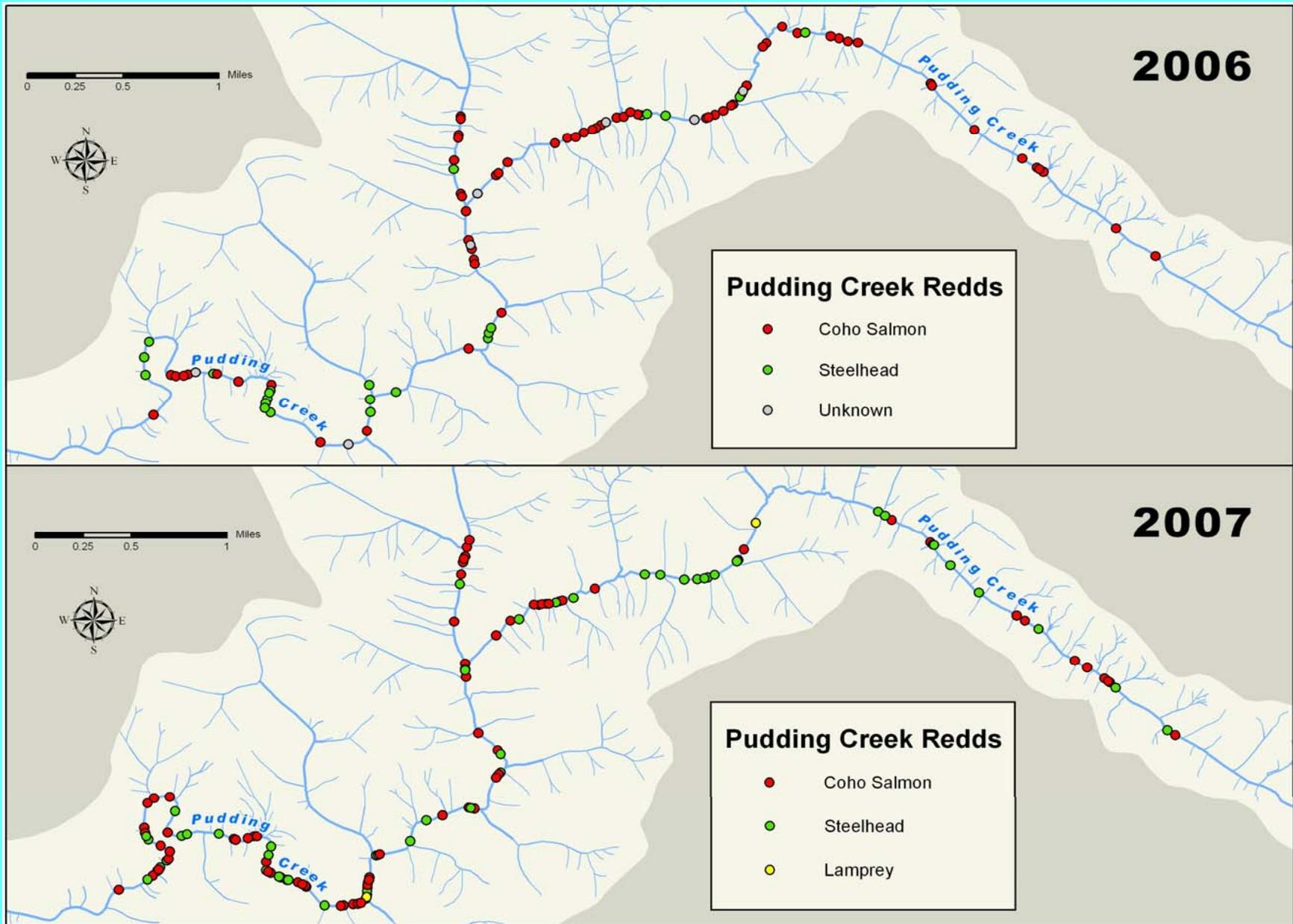
Life-history stage timing of steelhead in Pudding Creek, California (2006–2007).

Life Stage	Location	Month												Source						
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec							
Adult migration into the estuary	Pudding Creek Dam	■	■	■	■												■	■	Based on observations at the adult trapping station	
Adults present in upstream reaches and spawning	Stream reaches between dam impoundment and headwaters	■	■	■	■	■	■											■	■	Based on spawning surveys
Emergence of fry	Outmigrant trapping location					■	■	■	■											Based on outmigrant trapping
Juvenile rearing and residency	Entire stream	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	Based on outmigrant trapping, snorkel surveys and assumed
Juvenile outmigration	Entire stream	■	■	■	■	■	■	■	■									■	■	Based on observations at the outmigrant and adult trapping stations

Run Timing (WY-2006)

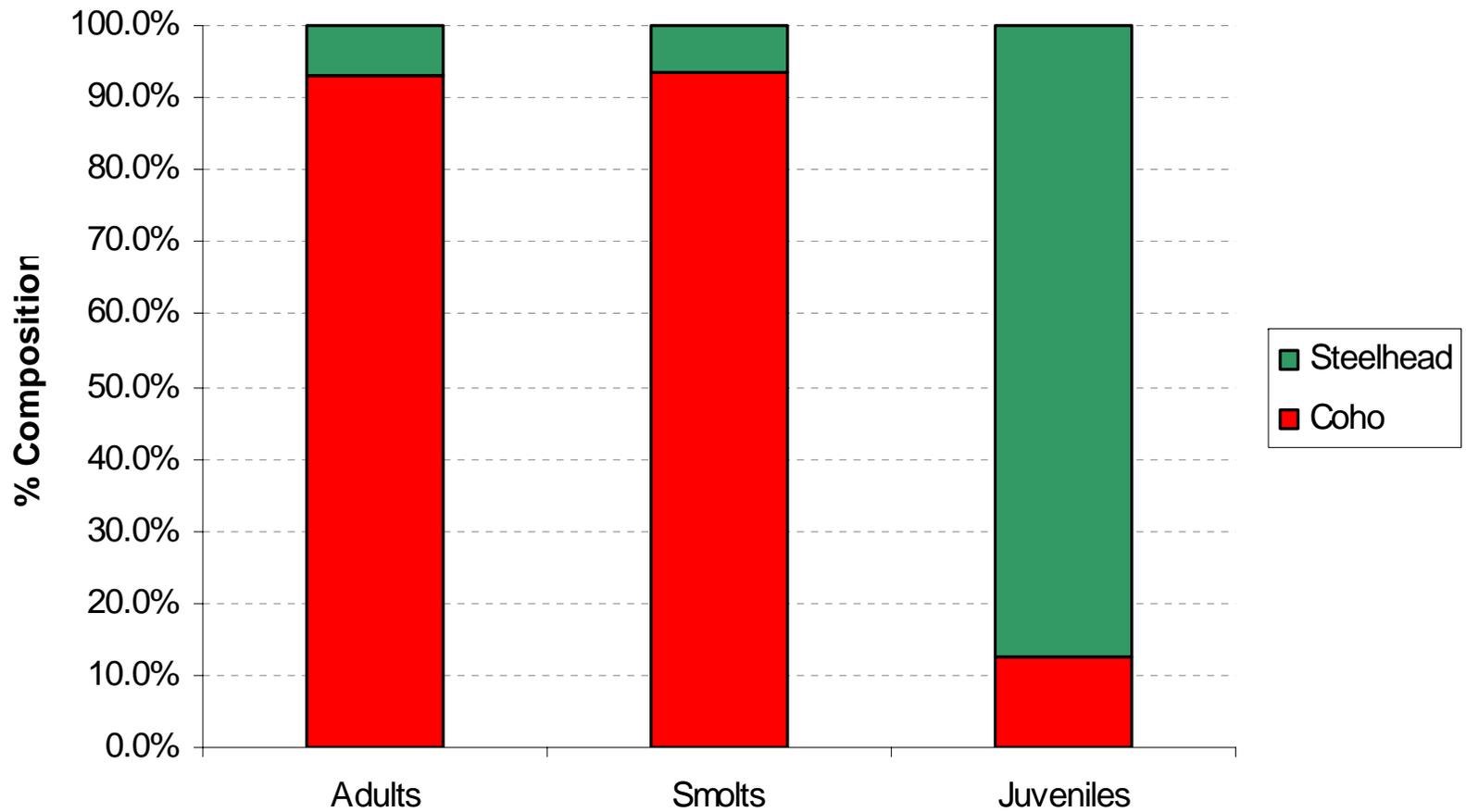


Spawning

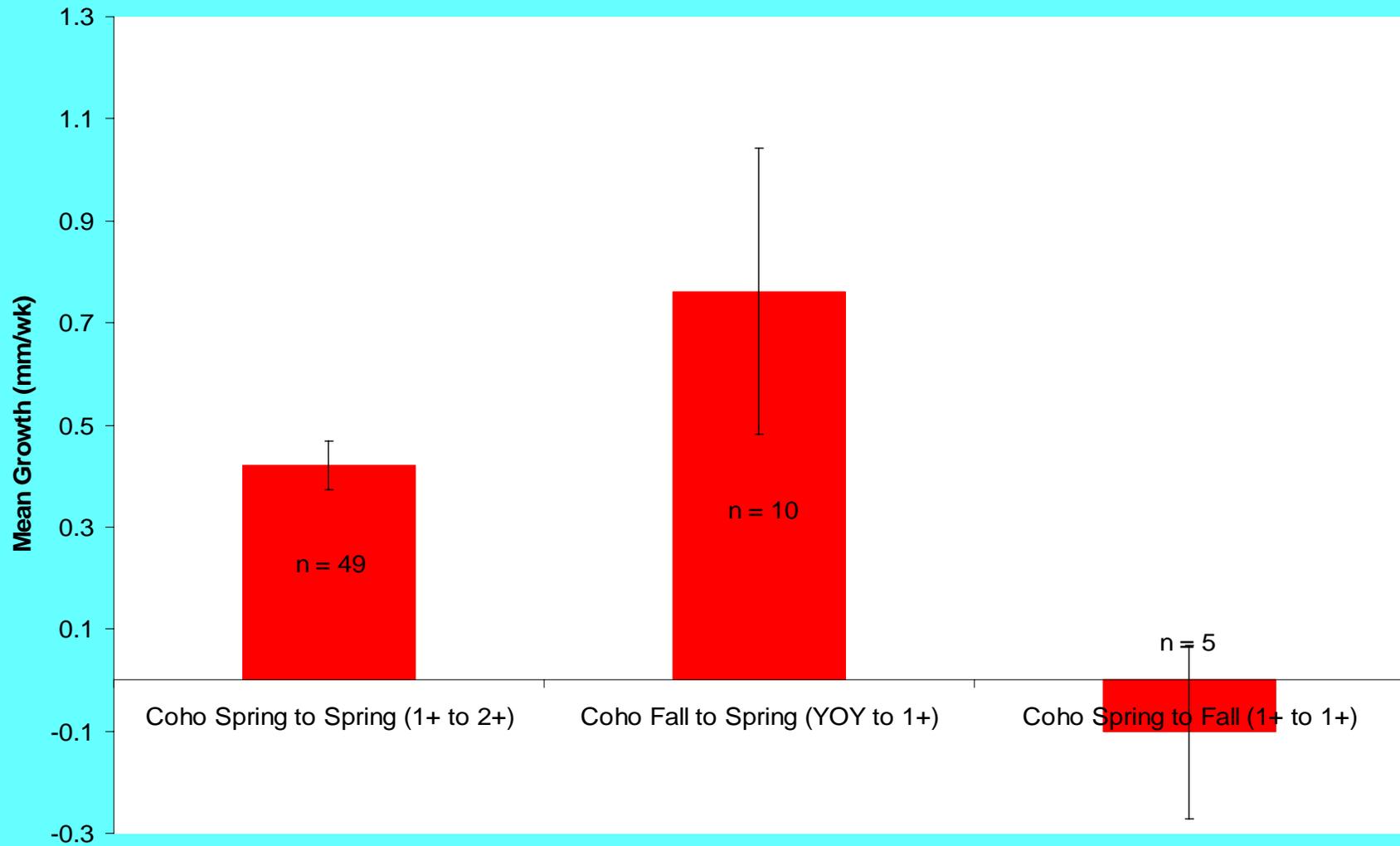


Relative Abundance

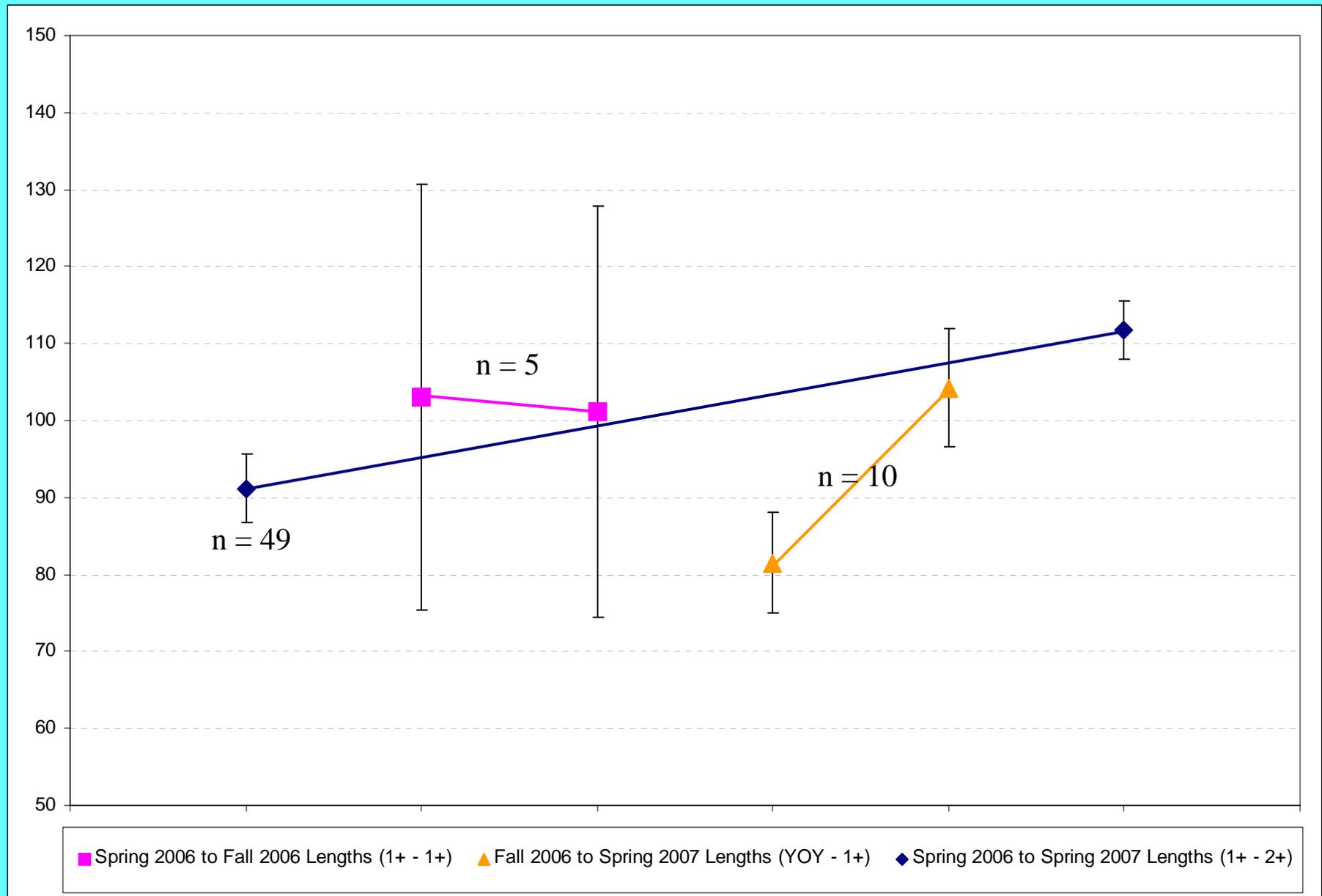
**Species Composition for Pudding Creek in 2005/2006
Spawning, Trapping, and Efish Season**



Coho Growth (2006-2007)



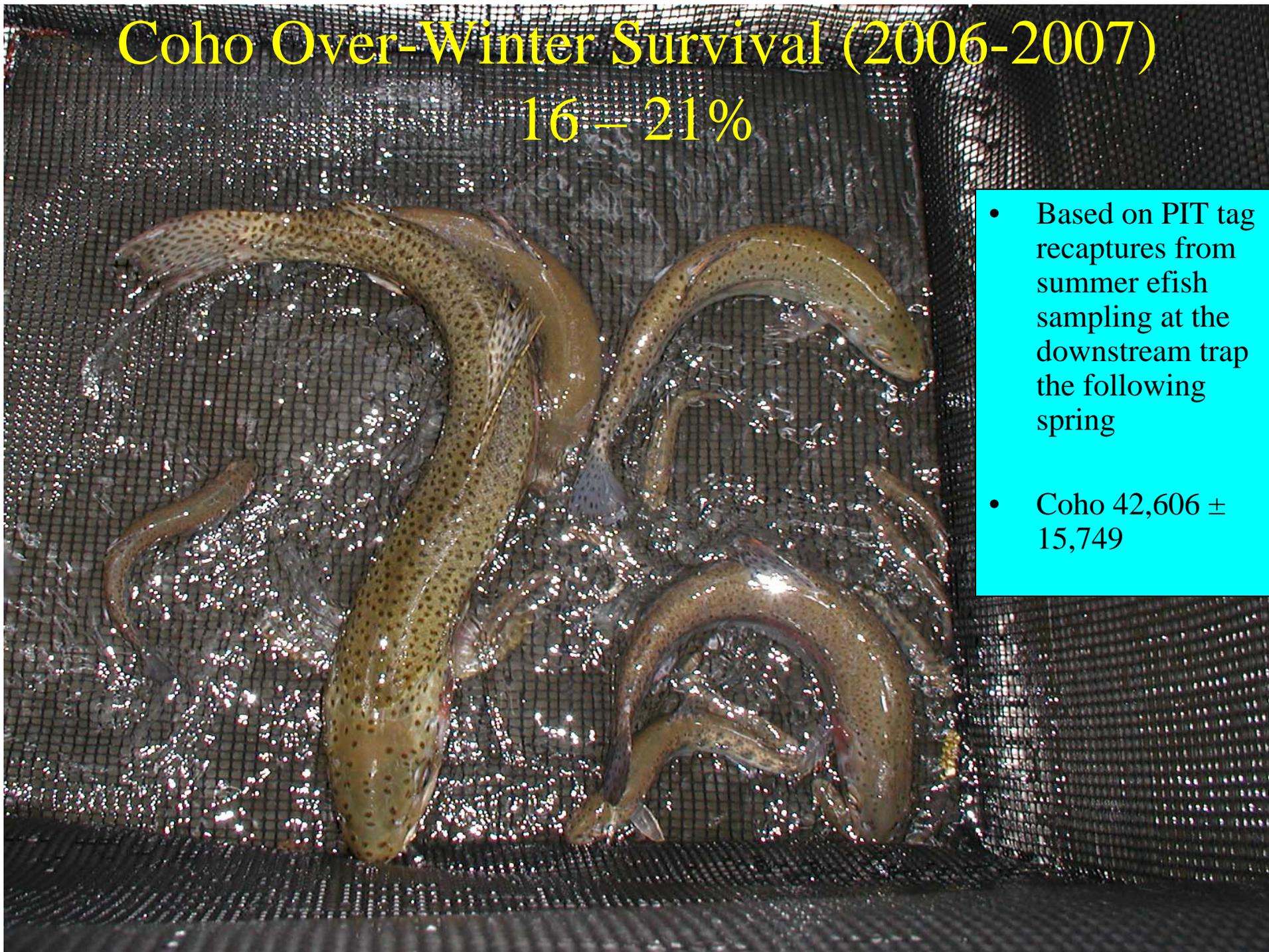
Coho Instream Growth and Residency (2006-2007)



Coho Over-Winter Survival (2006-2007)

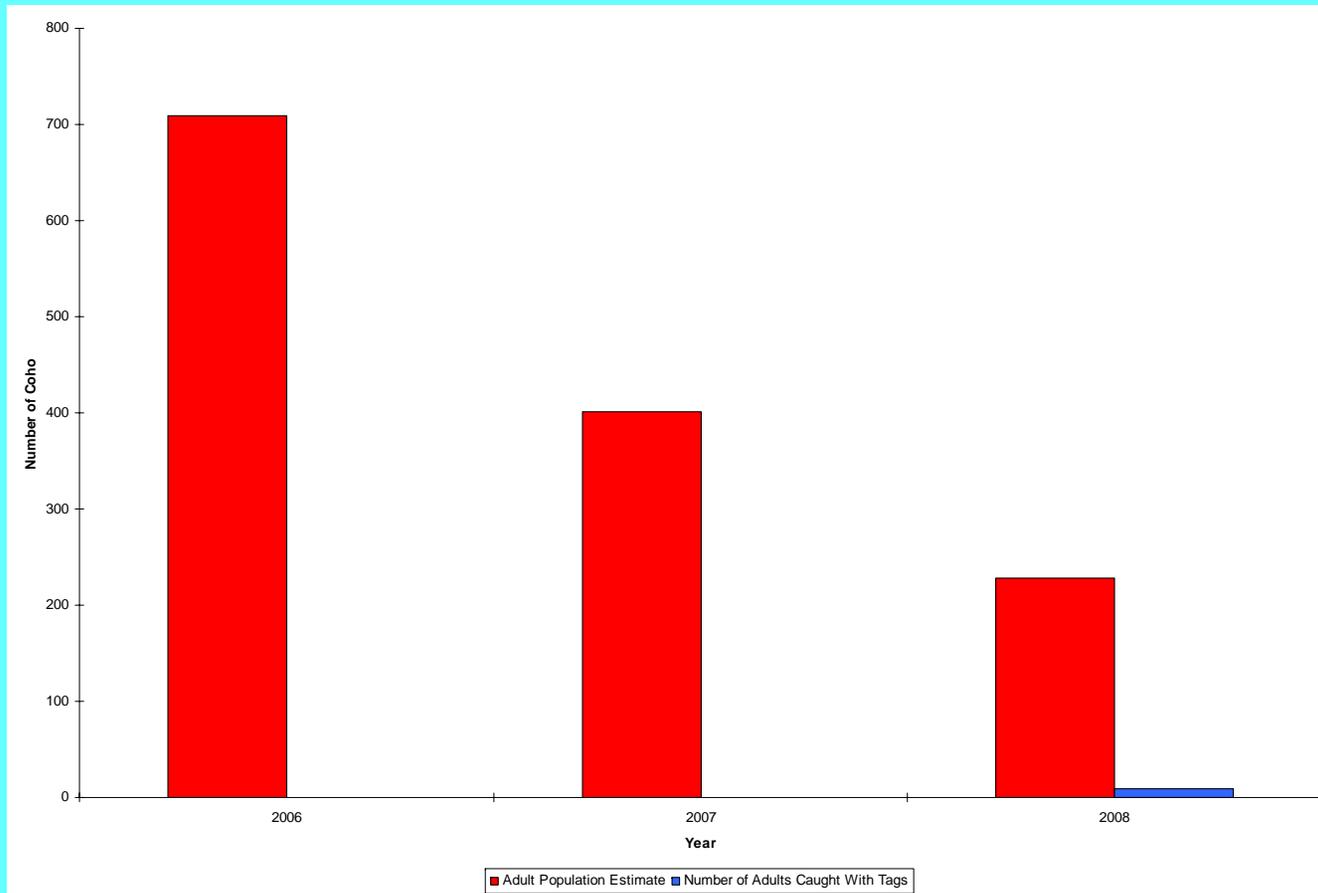
16 – 21%

- Based on PIT tag recaptures from summer efish sampling at the downstream trap the following spring
- Coho $42,606 \pm 15,749$



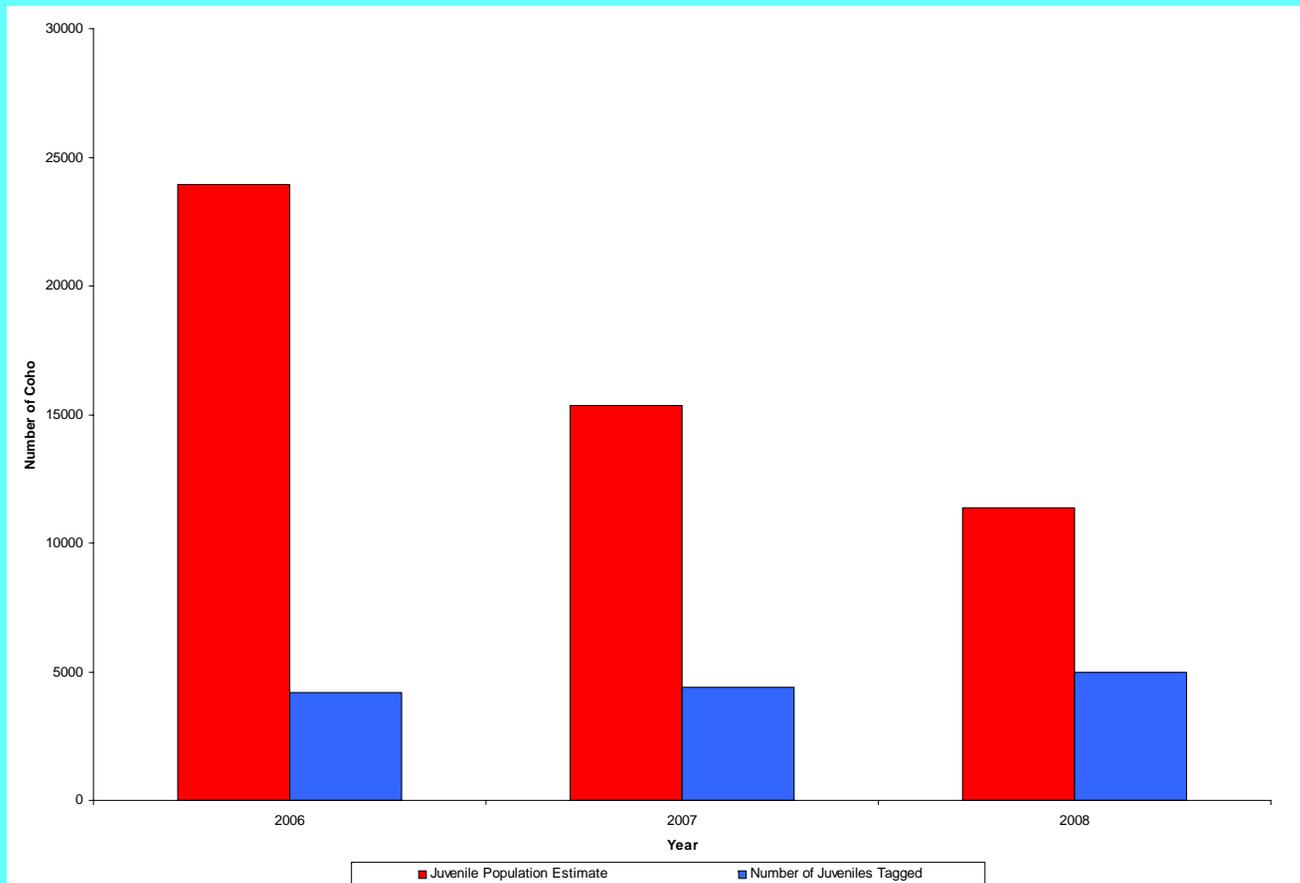
Coho Escapement (2006-2008)

- 2006 – 709 ± (588-888)
- 2007 – 401 ± (295-601)
- 2008 – 228 ± (153-450)



Coho Outmigration (2006-2008)

- 2006 – 23,927 ± 1,342
- 2007 – 15,364 ± 437
- 2008 – 11,390 ± 273



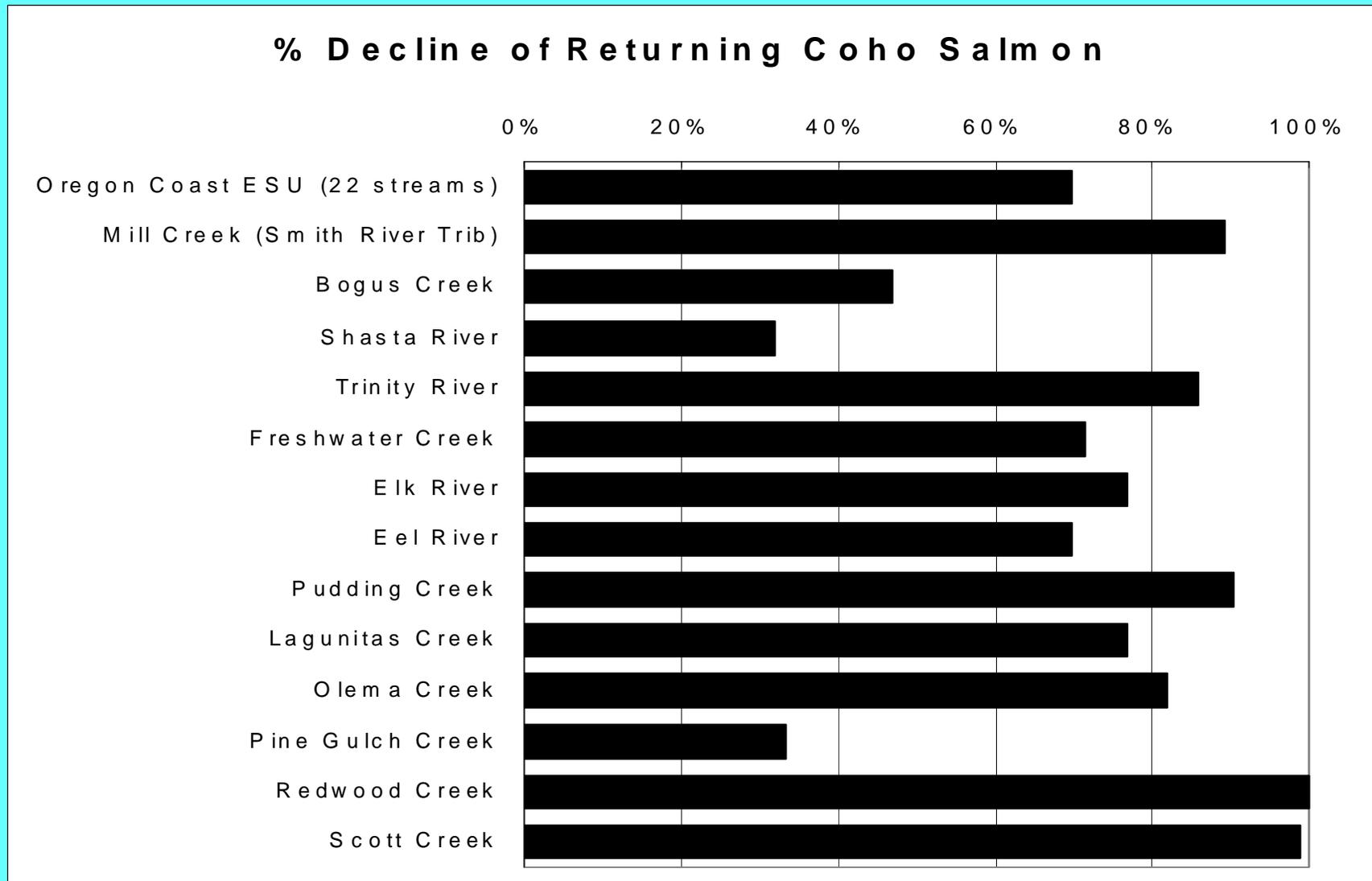
Coho Ocean Survival

2006 Juvenile Population Estimate	2008 Adult Return Population Estimate
23,927	228
2006 Juvenile Tags Deployed	2008 Adult Tag Returns
4,176	9
Percent of Population Estimate Returned	Percent Returns by Tag Numbers
0.95%	0.04%

Percent Survival in Other Studies

Stream	Survival (%)	Reference	Years
Columbia River	2.52 (A V G)	Climate Impacts Group. no date.	2002 - 2007
Waddell Creek, CA	4.95 (A V G)	Shapovalov and Taft 1954	1933-1937
OPI	2.68 (A V G)	Lewis 2004	1984 -2003
Chilkat River, AK	11.00 %	Alaska Department of Fish & Game 2008	1999-2006
Not stated	10.00 %	Bradford 1995	1991
Not stated	8.00 %	House and Crispin 1990	
Minter Creek, WA	4.00 %	Salo and Bayliff 1958	
Oregon Coastal Streams	3.00 %	Nickelson 1998	
Big Qualicum, B.C.	11.00 %	Fraser and Lightly 1983	
Nile Creek, B.C.	6.00 %	Foerster 1955	
Port John, B.C.	9.00 %		
Cultus Lake, B.C.	8.00 %		

Yearclass Lineage Returns from Other Streams (2008)



Conclusions for Pudding Creek (2006-2008)

- The anadromous fish in PC are primarily coho
- Summer rearing appears to be a period of low growth
- First-year coho (instream) are often the same size as second-year coho
- Marine survival was unusually low this year.

