

Preliminary Results of an Effort to Re-Introduce Coho Salmon in the Yakima River, Washington

By:

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Acknowledgements

Coho Aquaculture and Data Collection

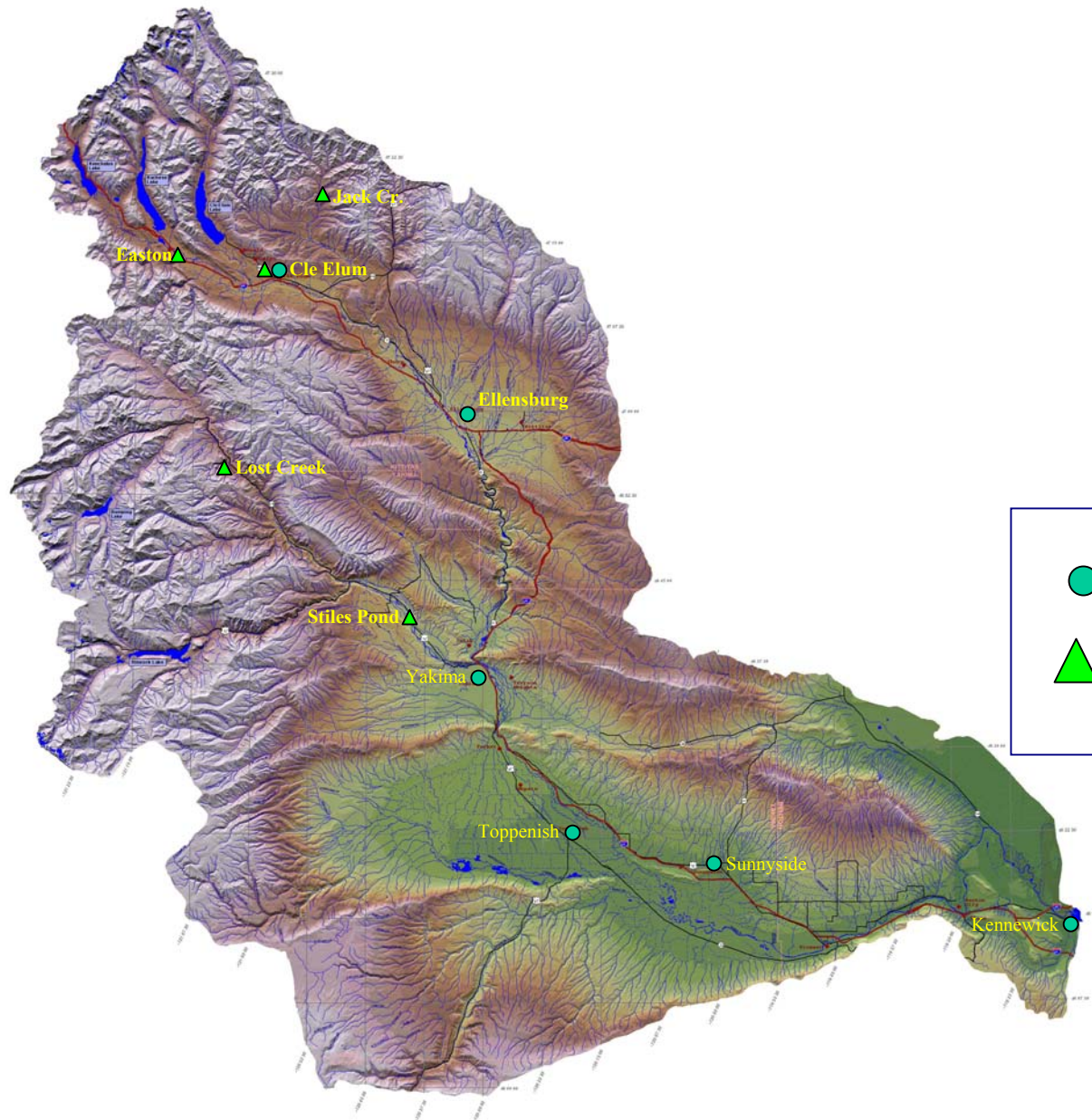
YN Joe Blodgett
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Yakima Klickitat Fisheries Project

YN Melvin Sampson (PG)
 David Fast (STAC)
WDFW Todd Pearsons (STAC)
 John Easterbrooks (PG)

USFWS

Yakima Basin

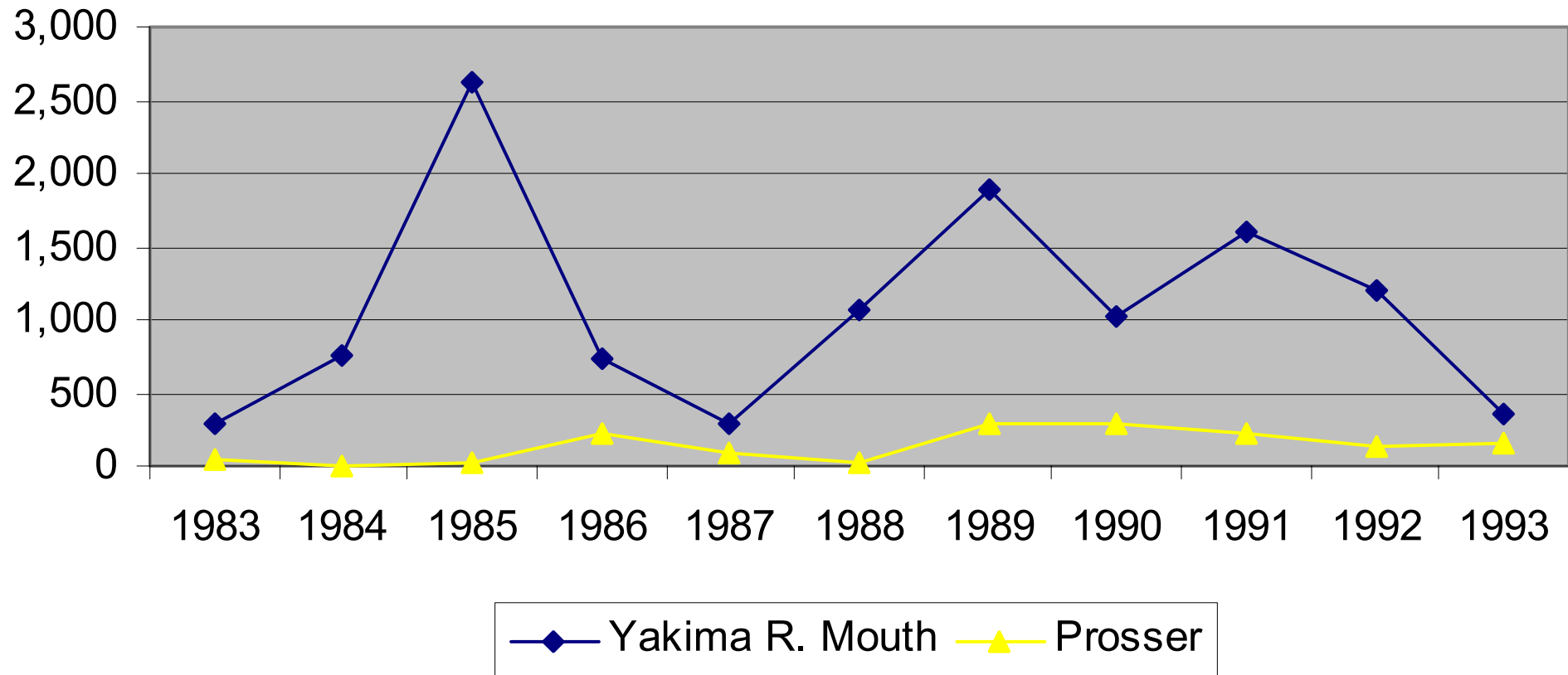


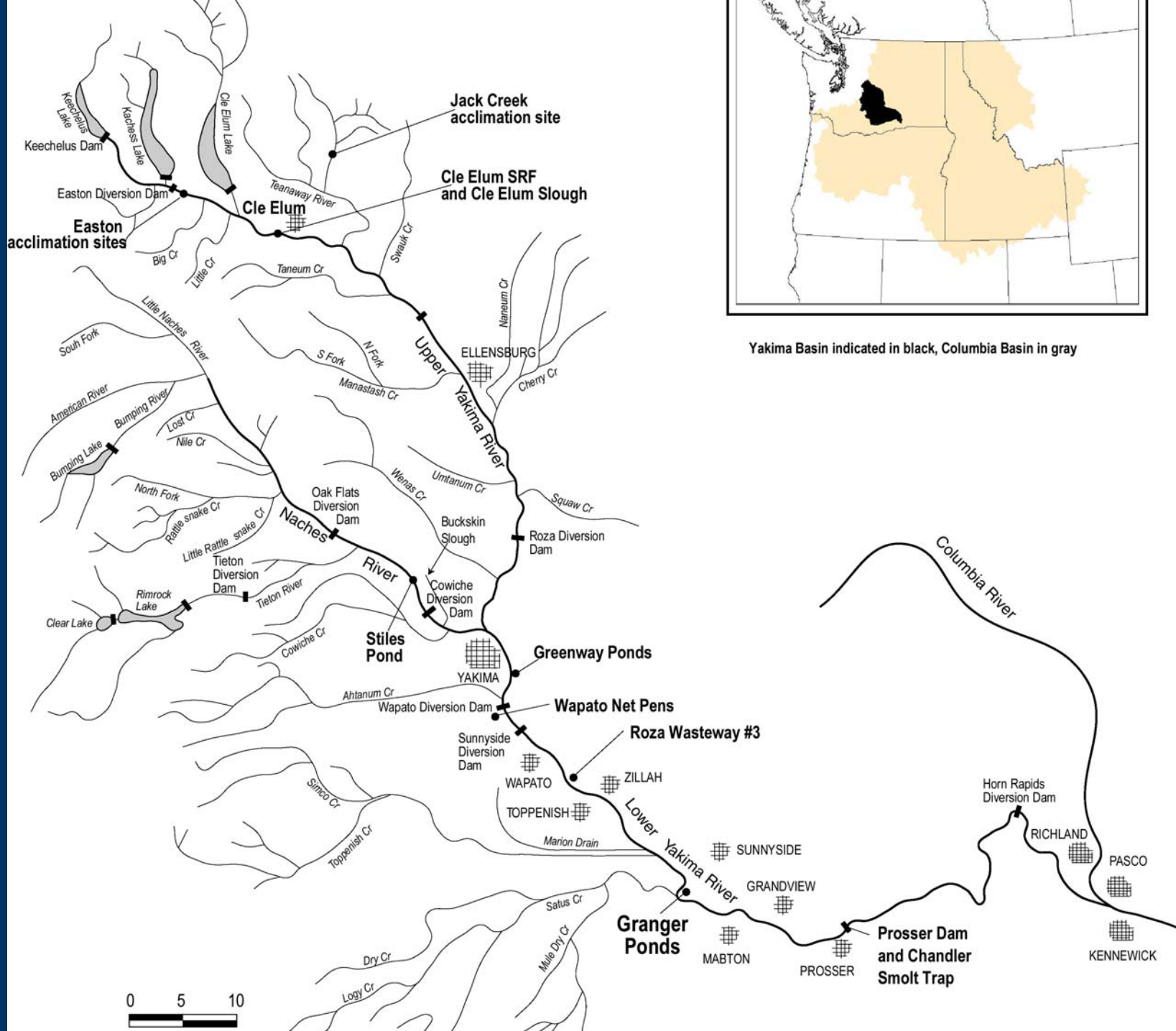
Key

- City
- Coho Acclimation Site

Yakima River Coho Counts

1983 - 1993





1996 EIS
YKFP Objective

**Test the feasibility of re-establishing a
naturally producing and sustainable
population of coho salmon in the
Yakima River**

Feasibility of Coho Re-introduction

Scientific Uncertainties



Suitability of donor stock and development of localized broodstock



Survival and associated monitoring



Life history information gathering (spawning and rearing dist'n, migration timing, etc.)



Ecological interactions with other species

Donor Stock History

From NMFS 1991 Status Review

- **Lower Columbia River aggregate**
- **“Unfortunately, coho salmon outplanted into the LCR are the progeny of numerous previous stock transfers over multiple generations and may carry the genetic material of a broad spectrum of ancestral stocks, often from different watersheds; some were not even of Columbia River origin.”**
- **In culture dating back to 1890s**

Donor Stock

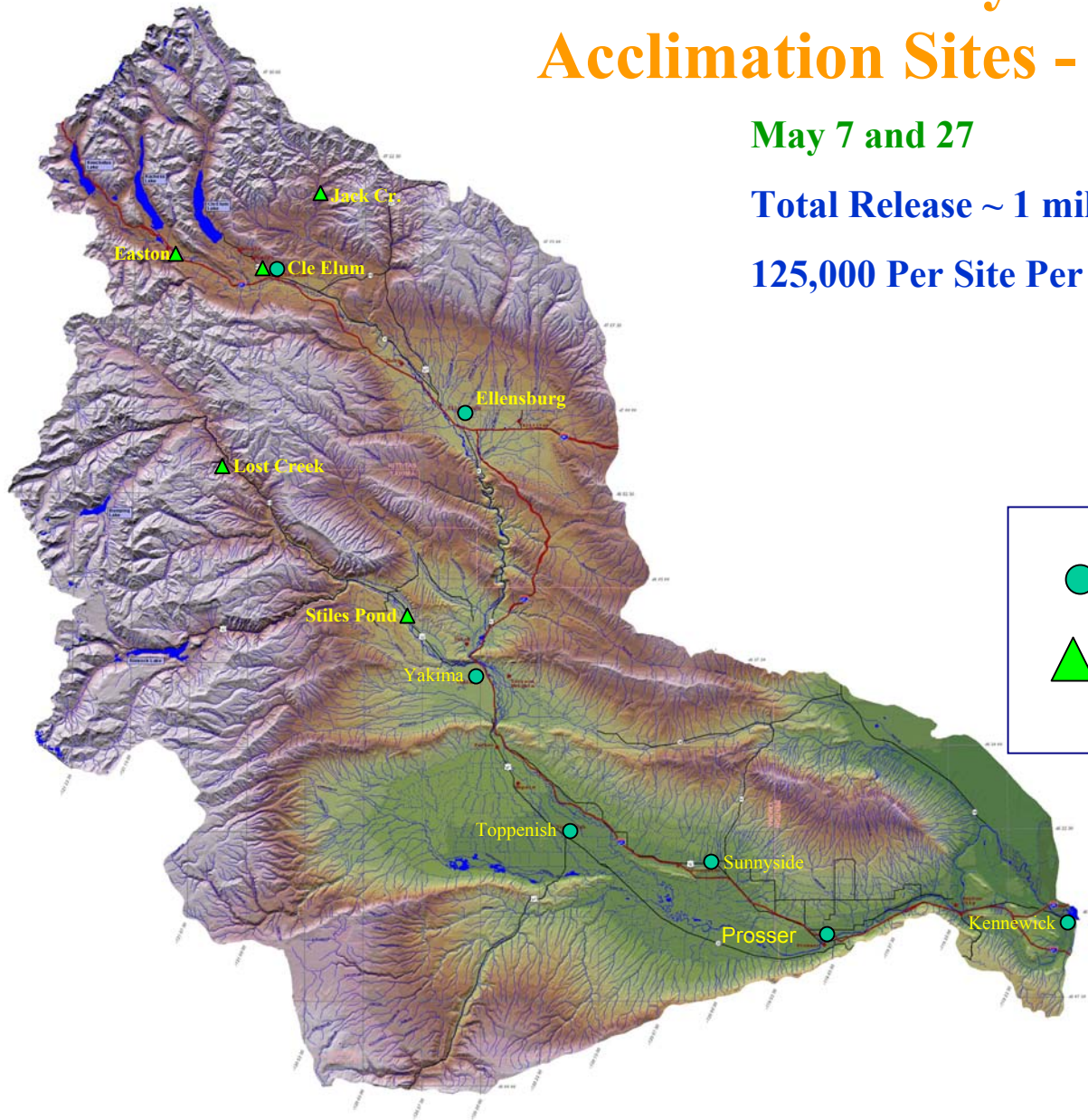
- **Do lower river transplants have sufficient phenotypic plasticity to adapt to local conditions in Yakima River?**
- **Monitoring Program: Intends to track through time run timing, stamina, emigration timing, sexual maturation, fecundity, genetic differentiation, and age structure**
- **Marking program in place to differentiate Yakima progeny and lower river returns (CWT and PIT) and to quantify natural production**

2000 Hatchery Coho Juvenile Acclimation Sites - Yakima Basin

May 7 and 27

Total Release ~ 1 million

125,000 Per Site Per Date



Key



City

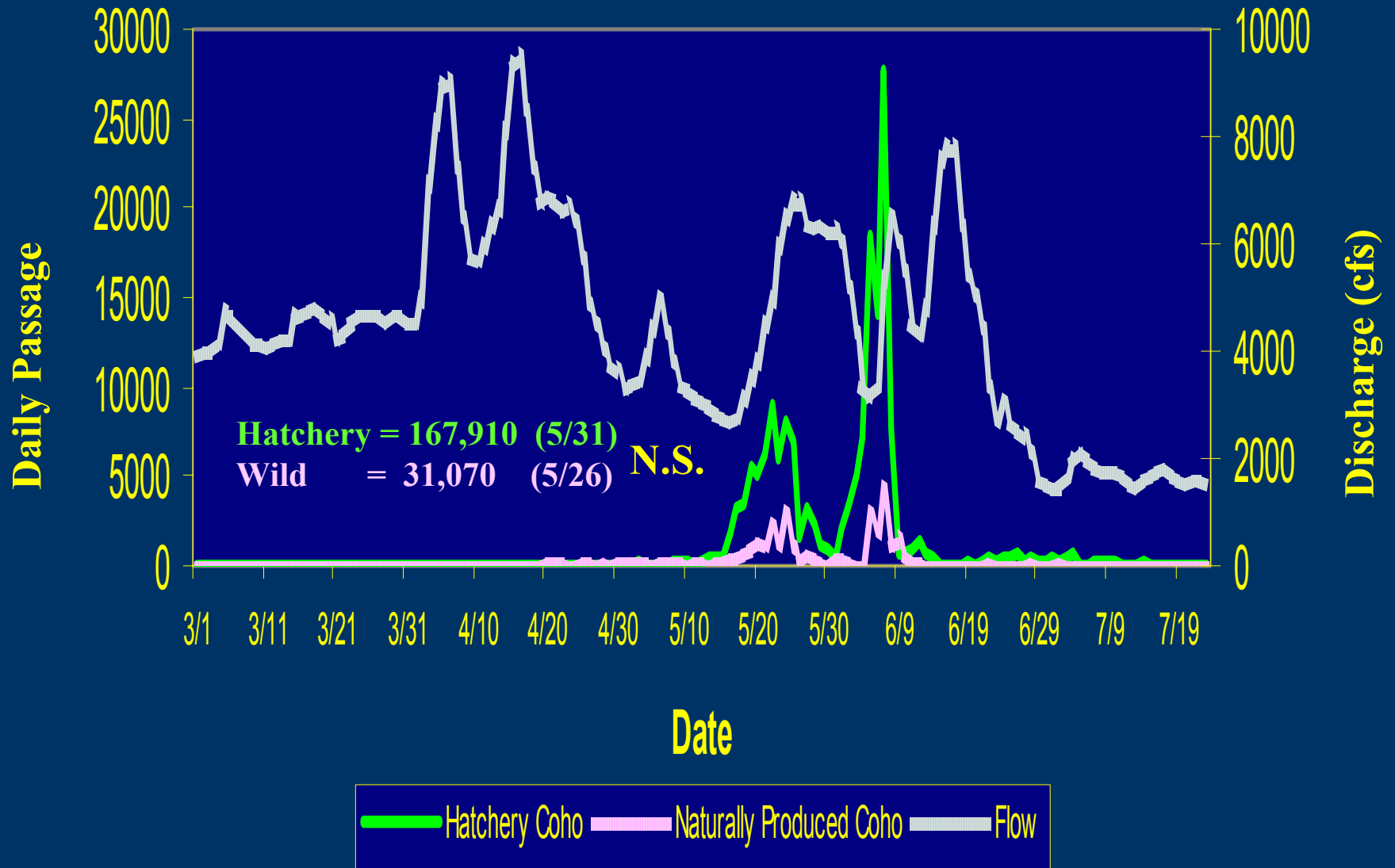


Coho Acclimation
Site

Prosser Dam



Coho Passage Chandler Juvenile Facility 2000



Who's coming back?





~44% Coho Utilization



Survival Estimates for 1998 Brood / 2000 Release

- **Egg-to-Smolt: 0.46% (Natural)**
- **Release to Chandler: ~17% (Hatchery)**
- **Smolt-to-Adult (Prosser based):**

Hatchery Coho: $3,464/167,910 = 2.06\%$

Wild Coho: $1,502/31,070 = 4.83\%$

Spawning Distribution

Spawners above Naches Confluence

1999: 8.2%

2000: 10.9%

2001: 26.7%

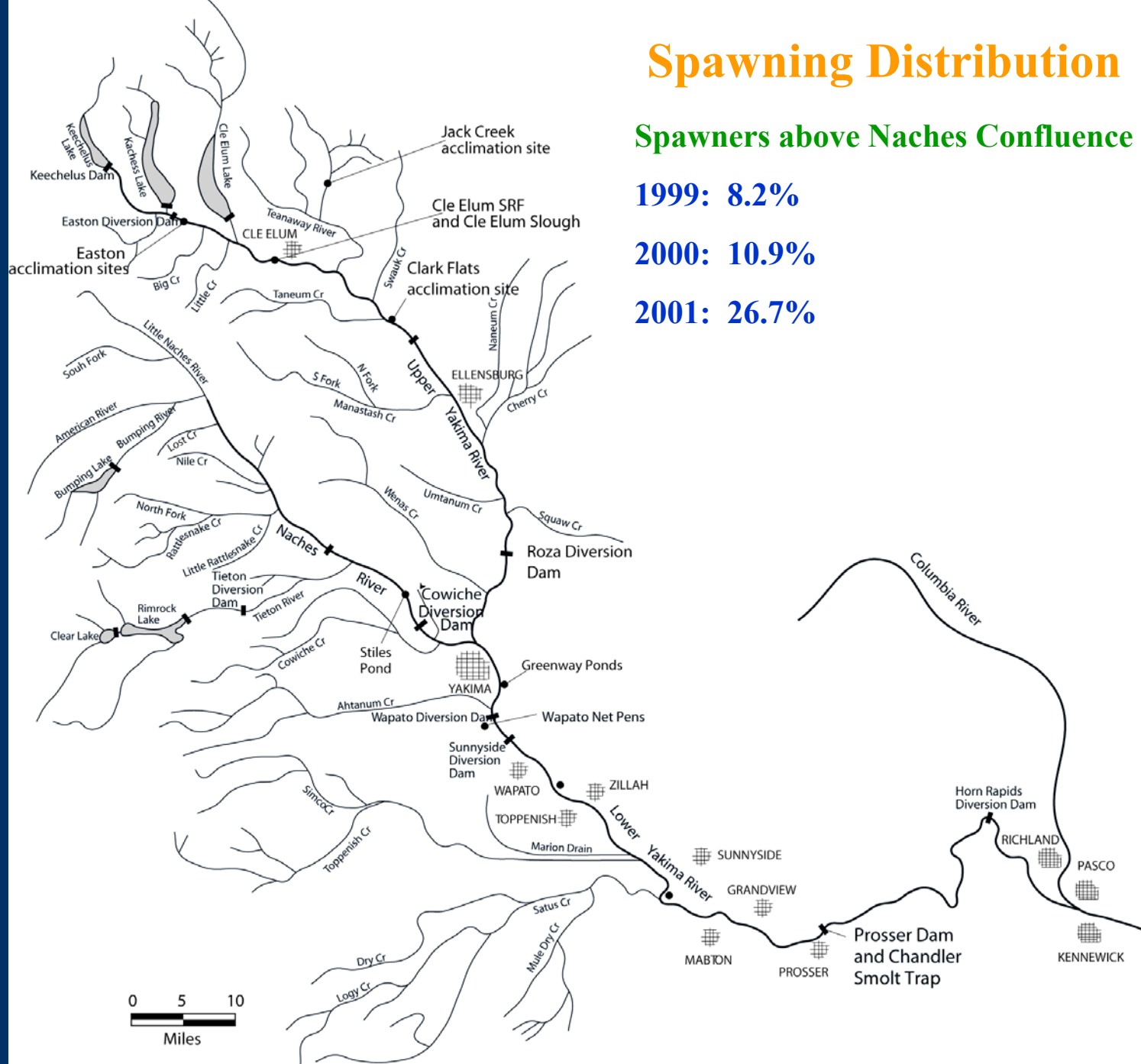


Figure 2. Yakima River Adult Coho Returns, 1983-2001.

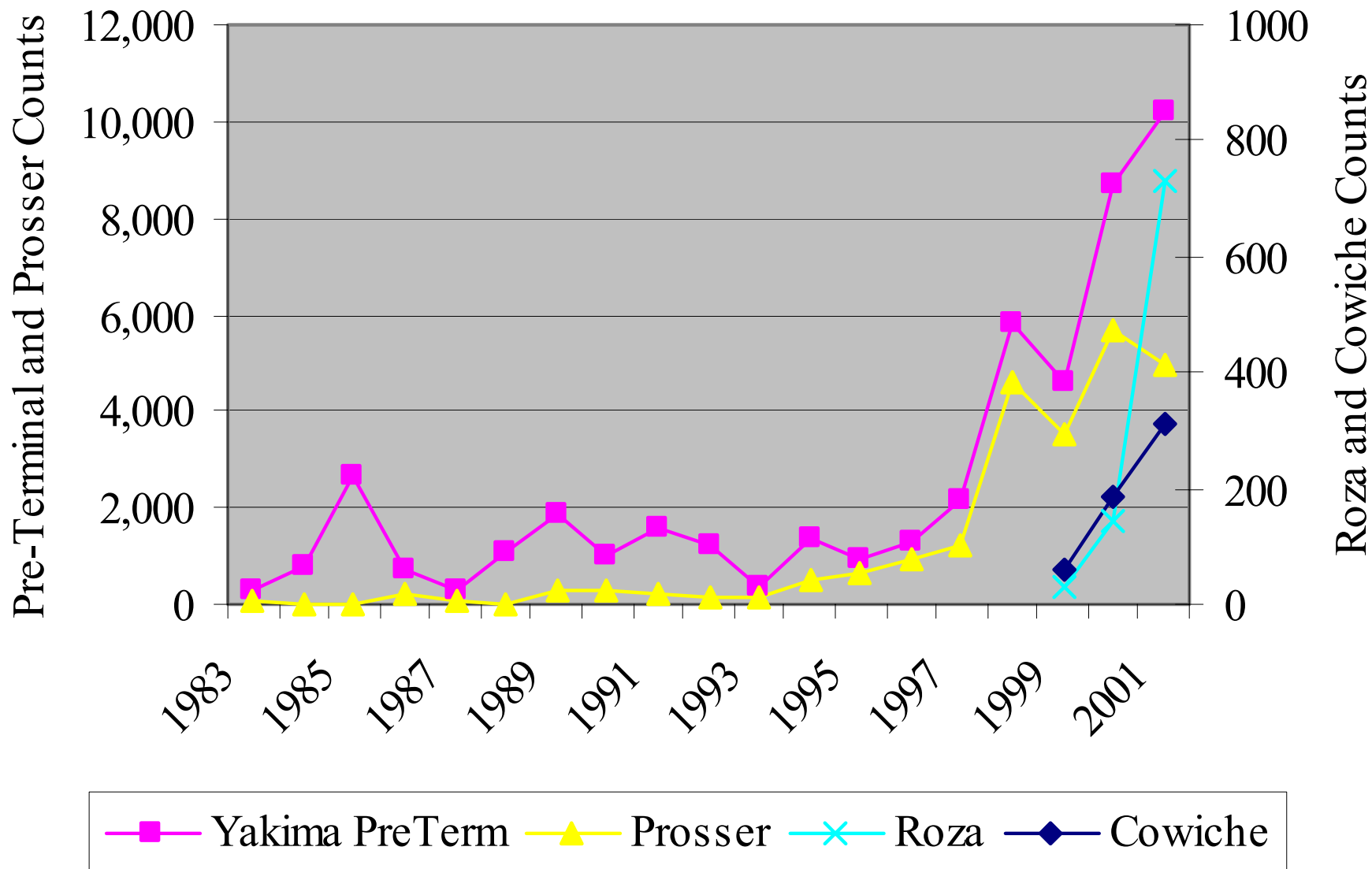


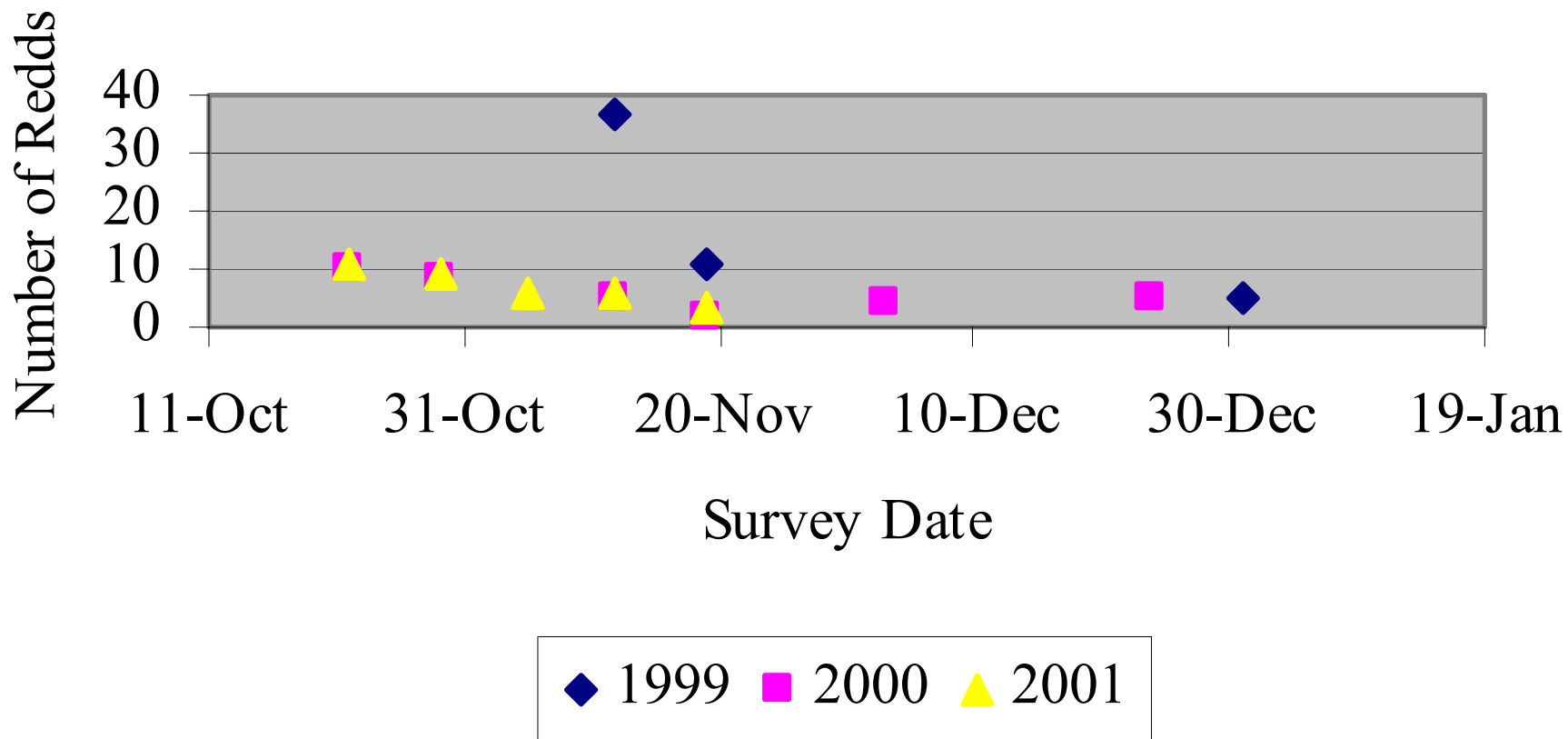
Table 5. Adult and Jack coho counts, observed sex ratios, and estimated rate of loss (dropout) between projects at locations in the Columbia Basin upstream from The Dalles Dam in 2001.

Location	River km	Coho count	Sex Ratio % F	Number of coho 'lost'	Dropout Percent	Dropout per Rkm
The Dalles	309.0	64,671	41%			
John Day	347.6	50,706		13,965	21.6%	0.9%
McNary + Umatilla	469.9	46,110		4,596	9.1%	0.1%
Preist Rapids + Yakima + Ice Harbor	638.9	17,400	50%	28,710	62.3%	0.6%
Rock Island	729.0	10,124		7,276	41.8%	0.7%
Rocky Reach + Wenatchee (Dryden)	762.8	3,342	46% / 17%	6,782	67.0%	3.2%
Wells	830.4	541		2,801	83.8%	2.0%
Winthrop Hatchery	923.8	337	29%	204	37.7%	0.7%

Methow River November 27, 1910



Figure 3. Weekly Redd Counts in Buckskin Slough, 1999-2001.



Summary



Solid monitoring program with sound performance indicators is essential to determine whether program achieving stated objectives



Ability to differentiate between hatchery and NOR fish is critical



Large proportion of adult coho “disappear” the further up they are expected to return to, suggesting stamina, homing, and/or maturation timing are not optimal for release locations



Ecological Interactions are minimal based on results from 1999-2001 studies of residualism, predation, and competition

Summary (continued)



Naturally-produced coho have higher smolt-to-adult survival than hatchery coho



Local adaptation may be possible within a few generations



Ongoing Analysis / Future Work

- **Local versus out-of-basin broodstock**
- **Survival differences between various accl. sites**
- **Differences in hatchery/wild passage timing, spawn timing, size, sex ratios, fecundity, egg size, genetic differentiation, age structure, etc.**
- **Ecological Interactions**

