

# 2003 Chinook Surveys in Water Resource Inventory Area 8

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# Objectives

1. Enumerate naturally spawning Chinook salmon (*Oncorhynchus tshawytscha*) in WRIA 8 streams
2. Document the timing and distribution of Chinook spawning
3. Evaluate spawning success of female Chinook using biological characteristics
4. Investigate the relationship between natural and hatchery origin Chinook

# WRIA 8 CHINOOK SURVEYS



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## Live Counts

Count the number of live and dead fish at least once per week to be used in AUC escapement estimate



# Area Under the Curve (AUC)

$$\text{AUC} = \Sigma \text{Fish Days} / \text{Stream Life}$$

Fish Days = average of two consecutive live counts divided by the time between the two surveys

Stream Life = the number of days a fish can be counted by surveyors, for WRIA 8 it is assumed to be 10 days for Chinook

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# Redd Surveys

Count the number of active Chinook redds at least twice a week to determine the temporal and spatial distribution of spawning Chinook



# Using Redds as an Escapement Estimate

Escapement = Total # of redds \* 2.5 adults/redd



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# Spawning Success

Sample carcasses to determine spawning success  
Simple for females, more difficult for males



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# Hatchery/“Wild” Interactions on Spawning Grounds

Sample carcasses for presence of adipose fin (hatchery fish are now marked) and coded wire tags



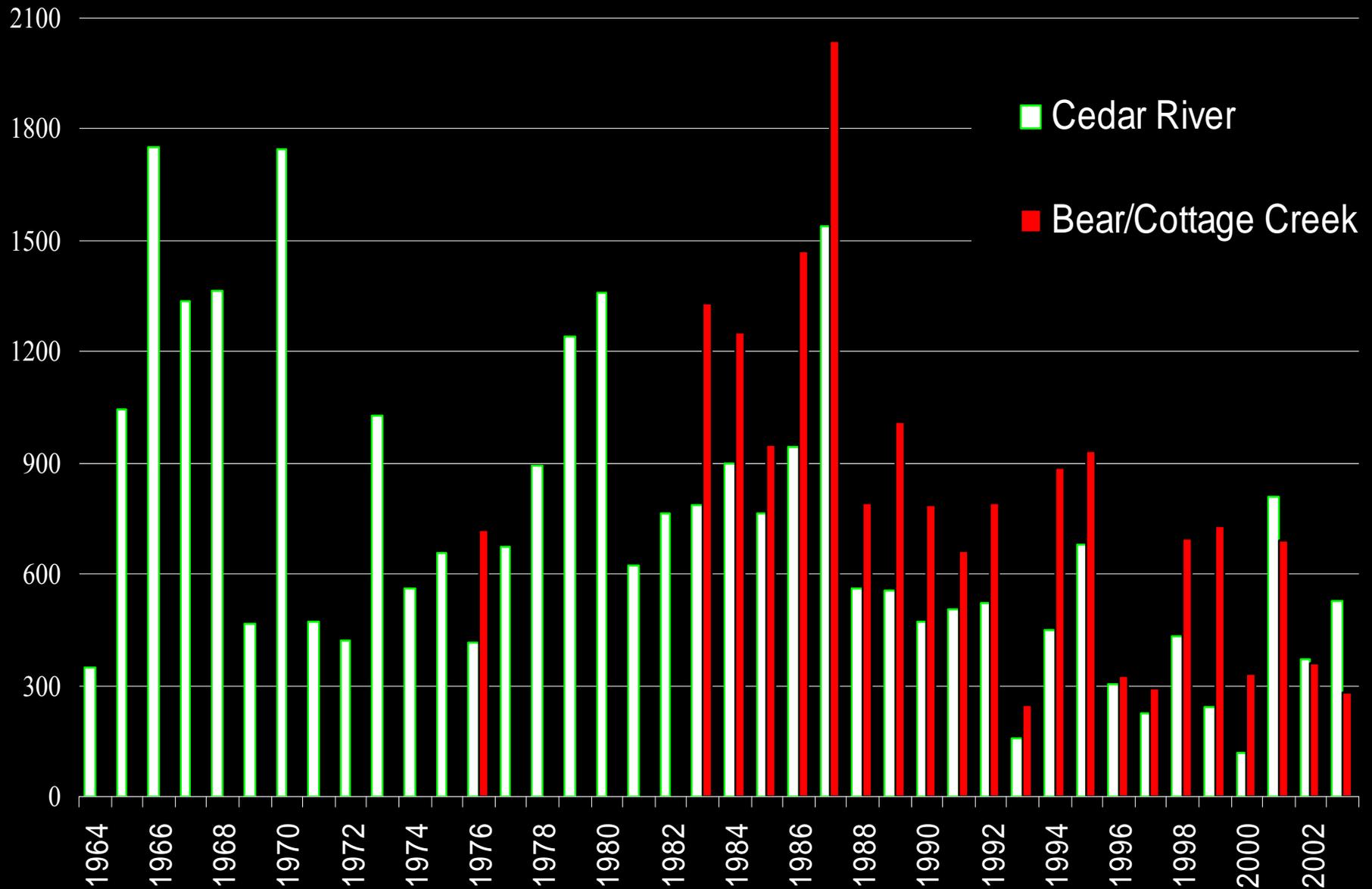
Adipose Fin

Live Chinook are sampled on the Cedar River at the Sockeye Broodstock Collection Facility (weir) and at SPU’s fish passage facility at Landsburg

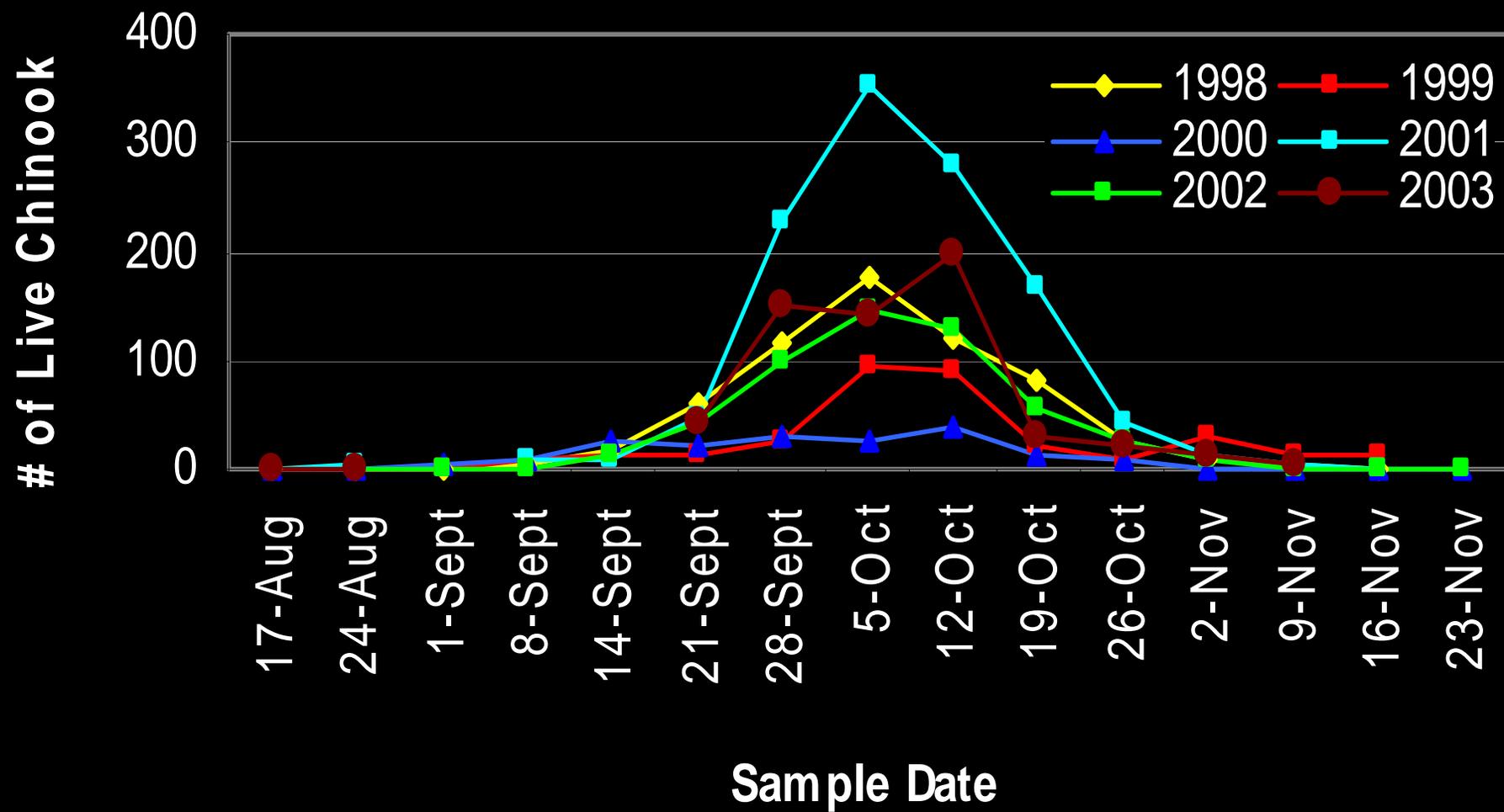
# Results



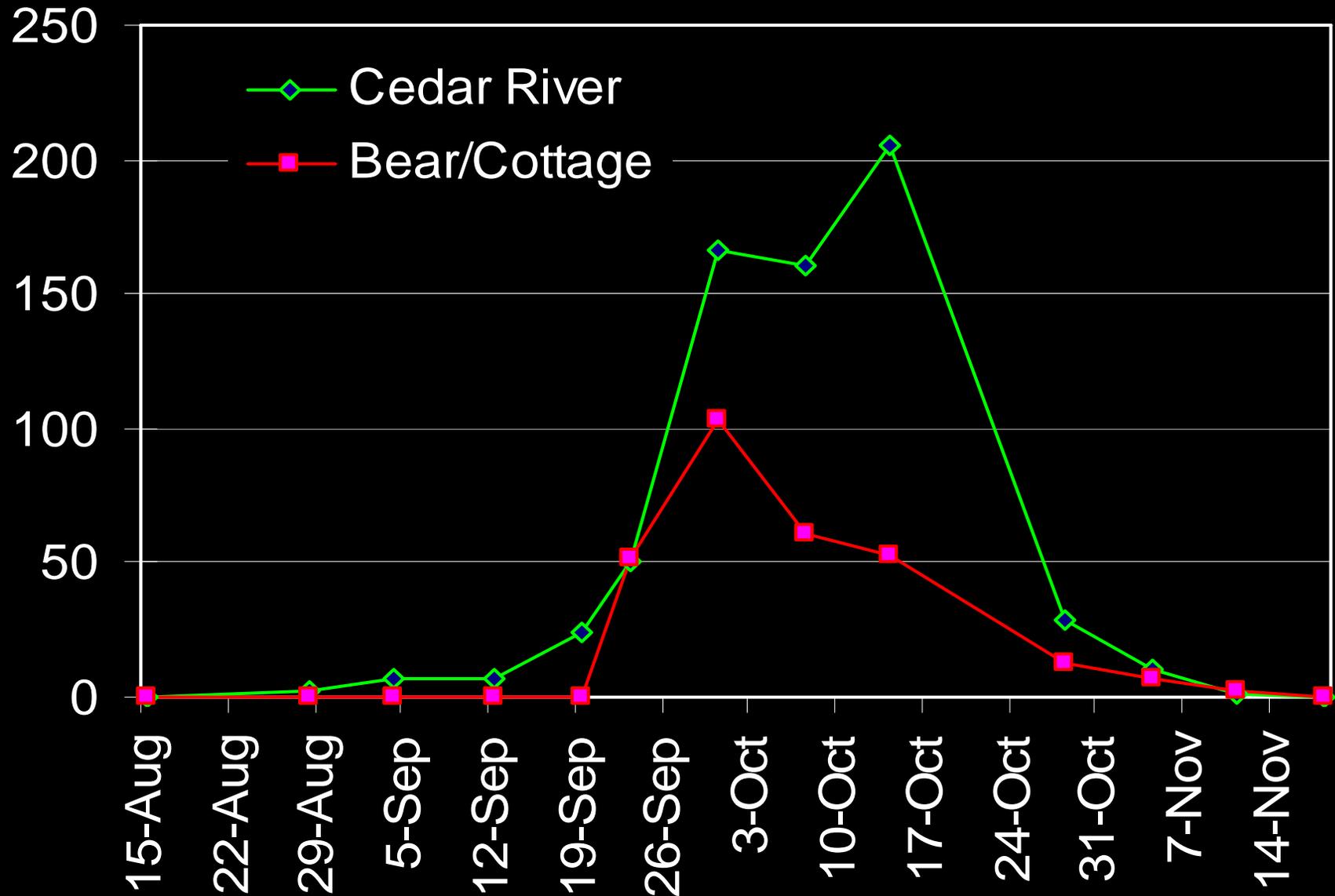
# Chinook Escapement in the Cedar River and Bear/Cottage Creeks (1964-2003)



# Cedar River Chinook Trends



# 2003 Chinook Live Counts



## Results: Survey Streams 2003\*

Stream	AUC Estimate
Taylor Ck	25
Peterson Ck	2
Walsh Ck	18
May Ck	25
EF Issaquah	35
Little Bear	5
Bear/Cottage	280
Cedar River	527

\*Other streams surveyed in 2003 did not contain spawning Chinook (Rock Ck and North Ck)

## Results: Spawning Success\*

<b>Stream</b>	<b>2002 PSM</b>
Taylor Ck	13% (n=18)
Walsh Ck	0% (n=2)
North Ck	10% (n=13)
EF Issaquah Ck	12% (n=31)
Little Bear Ck	10% (n=10)
Bear/Cottage Ck	12.5% (n=130)
Cedar River	3.5% (n=260)

*\*2003 data is not ready at this time*

## Results: Hatchery vs. “Wild” Interactions\*

Stream	Percent Hatchery
Taylor Ck	58% (n=24)
Peterson Ck	100% (n=2)
Walsh Ck	70% (n=10)
May Ck	80% (n=20)
EF Issaquah Ck	65% (n=18)
Little Bear Ck	25% (n=4)
Bear/Cottage Ck	45% (n=100)
Cedar River	SPU’s Pescalator: 69% (n=79) Weir: 60% (unknown) Carcasses: 10% (n=150)

*\*Preliminary 2003 data*

# Discussion

## ■ Escapement and Redd Surveys

- Monitoring trends in spawning populations
- Document the spatial and temporal distribution of Chinook throughout WRIA 8
- Critical in VSP and EDT modeling in WRIA 8

## ■ Spawning Success

- Important to track fish kills that may be less obvious
- Helps to explain potential “sink” areas

# Discussion (Continued)

- Life History Traits

- Important in understanding the life-history diversity of naturally produced Chinook

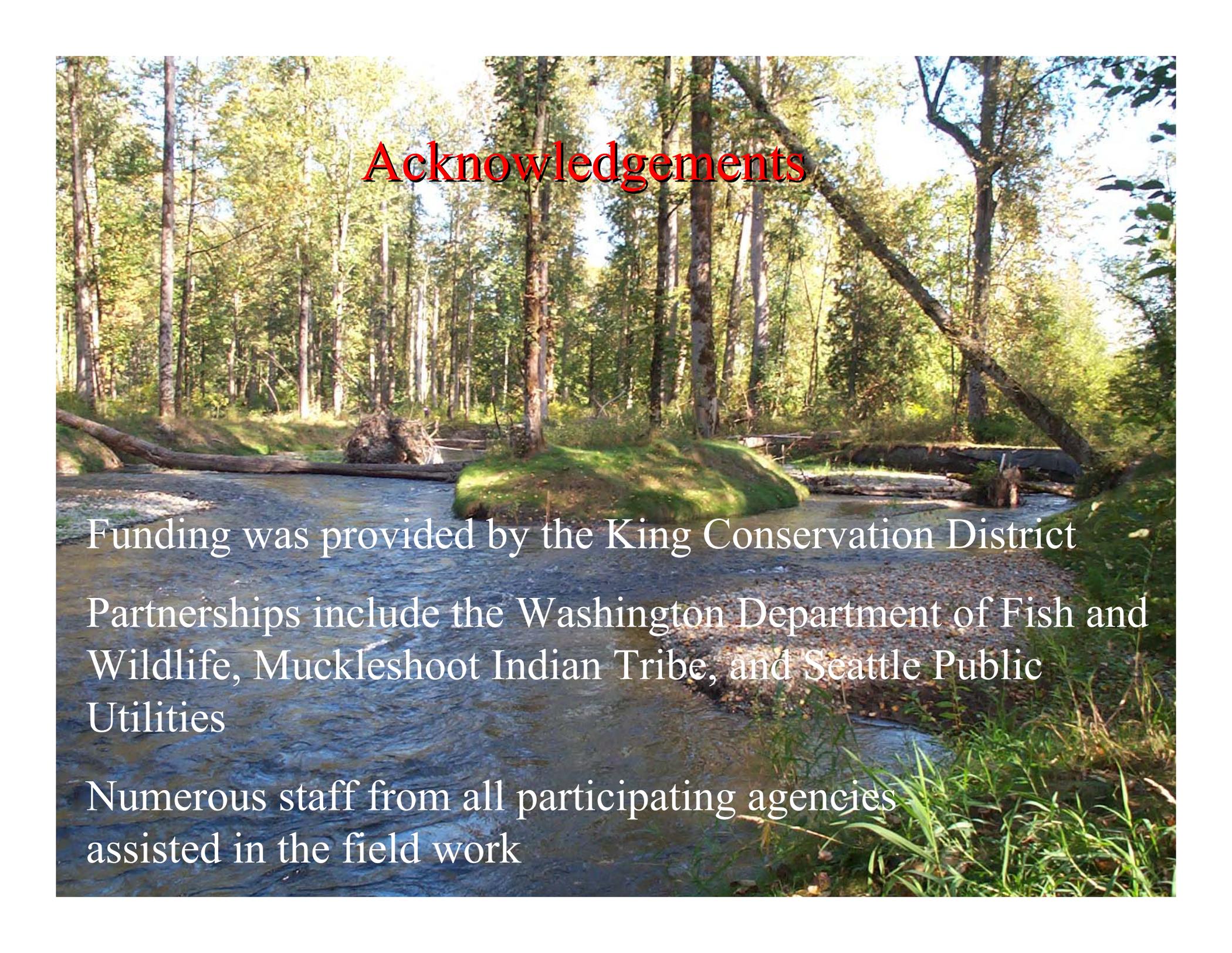
- Hatchery vs. “Wild” Interactions

- Look at direct effects of hatchery produced adults on the spawning grounds

- Target research questions to Chinook of known origin

# Future Work

- Comparison between AUC and alternative methods for escapement
- Continued biological sampling for age, sex ratios, and spawning success
- More specific studies designed to understand differences between natural and hatchery Chinook
- Data incorporated into VSP and EDT models



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