



*Yakima River Basin  
Coho Reintroduction  
Feasibility Study*





# Yakima Klickitat Fisheries Project Goals and Mission

- **The purposes of the YKFP are to:**
  - enhance existing stocks of anadromous fish in the Yakima and Klickitat river basins while maintaining genetic resources;
  - reintroduce stocks formerly present in the basins; and
  - apply knowledge gained about supplementation throughout the Columbia River Basin.

**The YKFP is a supplementation project designed to use artificial propagation in an attempt to:**

maintain or increase natural production while maintaining long-term fitness of the target population and keeping ecological and genetic impacts to non-target species within specified limits. The Project is also designed to provide harvest opportunities. The framework developed by the Regional Assessment of Supplementation Project (RASP 1991) guides the planning, implementation, and evaluation of the Project.

# Yakima River Coho History

- Historical Abundance
  - 44,000 to 150,000 (est. Mullan 1983 and other references)
- Extinct in the early 1980's
- Yakama Nation began reintroduction of coho salmon in 1985
- 1985 to 1997 Coho release for harvest purposes
- 1997 to present, monitoring strategies for full reintroduction

# Yakima River Coho

- Coho returns primarily as two year old jacks or 3 year old adults.
- The main Columbia Basin Run of Coho is broken into two parts, Early and Late
- The early-run group with a southerly marine distribution from the Columbia River mouth which returns in August and September, and a 'late-run' group with a northerly marine distribution returning in October and November (Johnson et al., 1991).
- The Yakima River is primarily an early run coho, however, there is some later spawning occurring, indicating a late component.
- Late run coho (December spawners) were tested in the Yakima Basin with only moderate undocumented success.

# Accomplishments and Results of Phase I

- Established a Naturally Spawning Population of Coho Salmon, (Currently not self sustaining, it is stable).
- Established an In basin Hatchery Brood stock.
- Increased average adult returns from 0 in 1985 to:

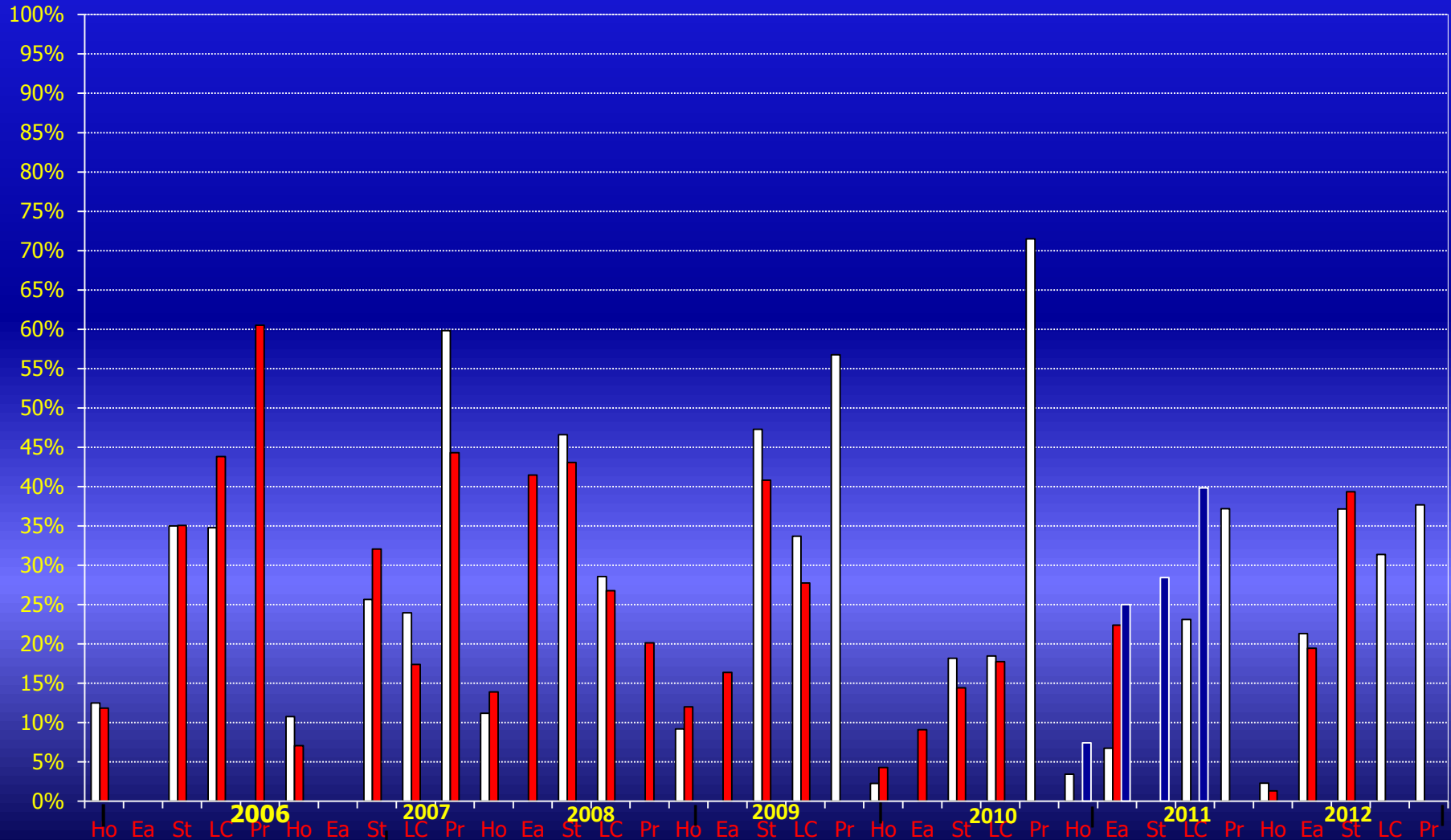
1985-1995	261
1996-2006	2,940
2007-2012	6,780
- During Phase I the Naches River seemed to provide the most opportunity for rearing and spawning, however it was discovered during Phase II that the Upper Yakima River's potential may be far greater than the Naches River.
- Studies indicate that in nearly every paired experimental release of juvenile coho, in-basin smolts survive at higher rates than out of basin smolts.
- Radio tracking surveys have identified spatial distribution of adult coho spawning areas. Primary spawning areas include, the Lower Naches and the mainstem Yakima below Sunnyside Dam, and the Upper Yakima River near Ellensburg.
- Identified and addressed critical concerns over predation by Coho Salmon on other salmonid species.

# Outmigration-Year Coho 2006-2012 (2004-2010 Brood)

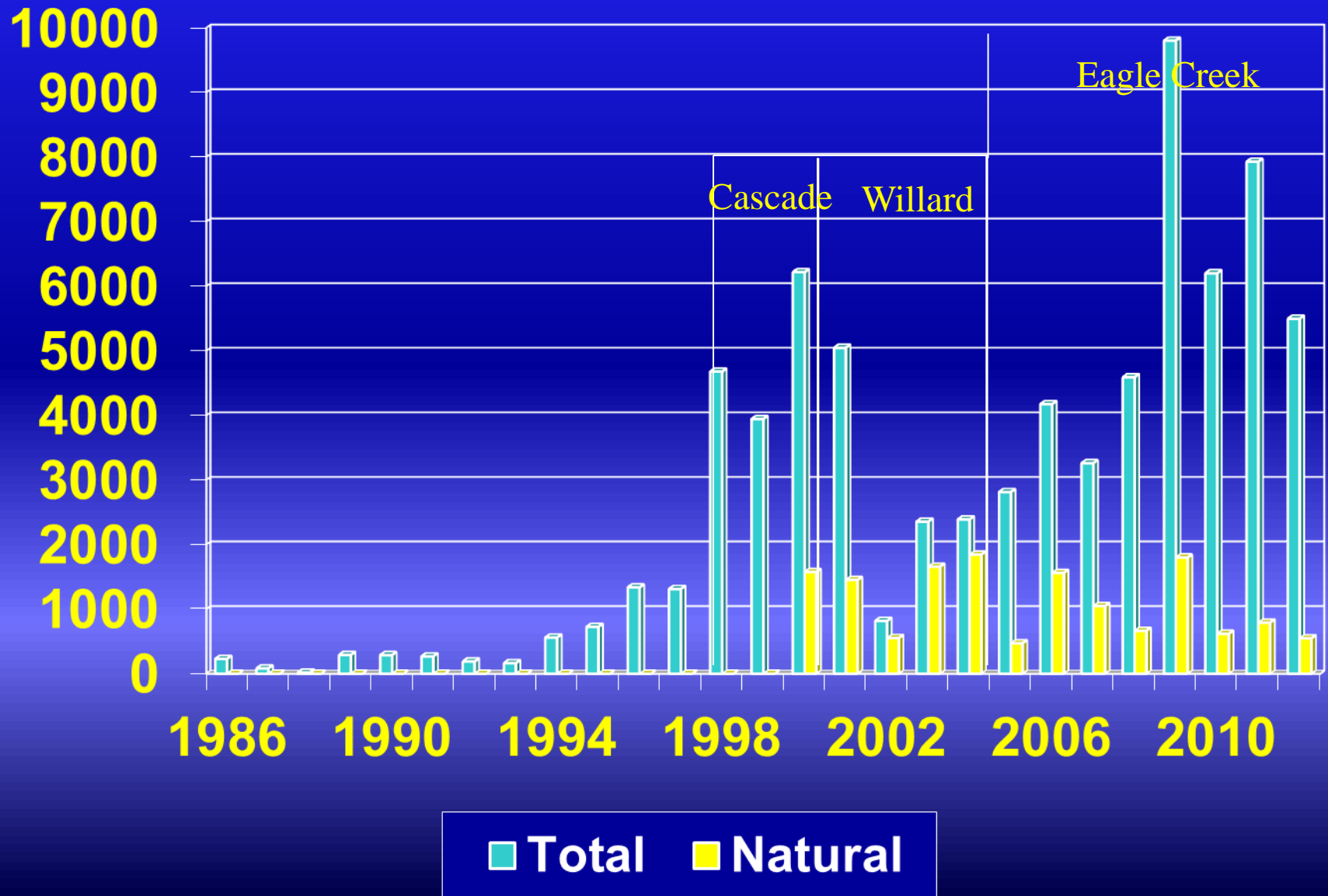
## Time-of-Tagging-to- McNary Smolt Survival

2006-2012 Tagging-to-McNary Smolt-to-Smolt Survival for Yakima Stock (red),Eagle Creek Stock (gray), Yakima x Eagle Creek (white)

Acclimation Sites within Release Year in Order (left to right): Holmes (Ho), Stiles (St), Lost Creek (LC), Prosser (Pr)



# Upper Yakima Coho Returns, 1986 – 2012



## Phase II

### **Tributaries**

```
graph TD; A[Tributaries] --> B[Summer Parr Releases into Tributaries]; A --> C[Adult Coho out plants]; A --> D[Stream Seeding]; B --> E[Identify quality habitat for Reintroduction, & ID Poor habitat for possible restoration]; C --> F[Monitor effects of reintroduction of adult coho into stream on Resident Fish Spp.]; D --> G[Test mobile Acclimation Facilities];
```

The diagram is a flowchart titled 'Phase II'. At the top is a light blue rounded rectangle labeled 'Tributaries'. A horizontal yellow line connects three vertical yellow lines that lead down to three separate light blue rounded rectangles. The first rectangle on the left is labeled 'Summer Parr Releases into Tributaries'. Below it is another light blue rounded rectangle containing the text 'Identify quality habitat for Reintroduction, & ID Poor habitat for possible restoration'. The middle rectangle is labeled 'Adult Coho out plants'. Below it is another light blue rounded rectangle containing the text 'Monitor effects of reintroduction of adult coho into stream on Resident Fish Spp.'. The third rectangle on the right is labeled 'Stream Seeding'. Below it is another light blue rounded rectangle containing the text 'Test mobile Acclimation Facilities'.

### **Summer Parr Releases into Tributaries**

Identify quality  
habitat for  
Reintroduction, & ID  
Poor habitat for possible  
restoration

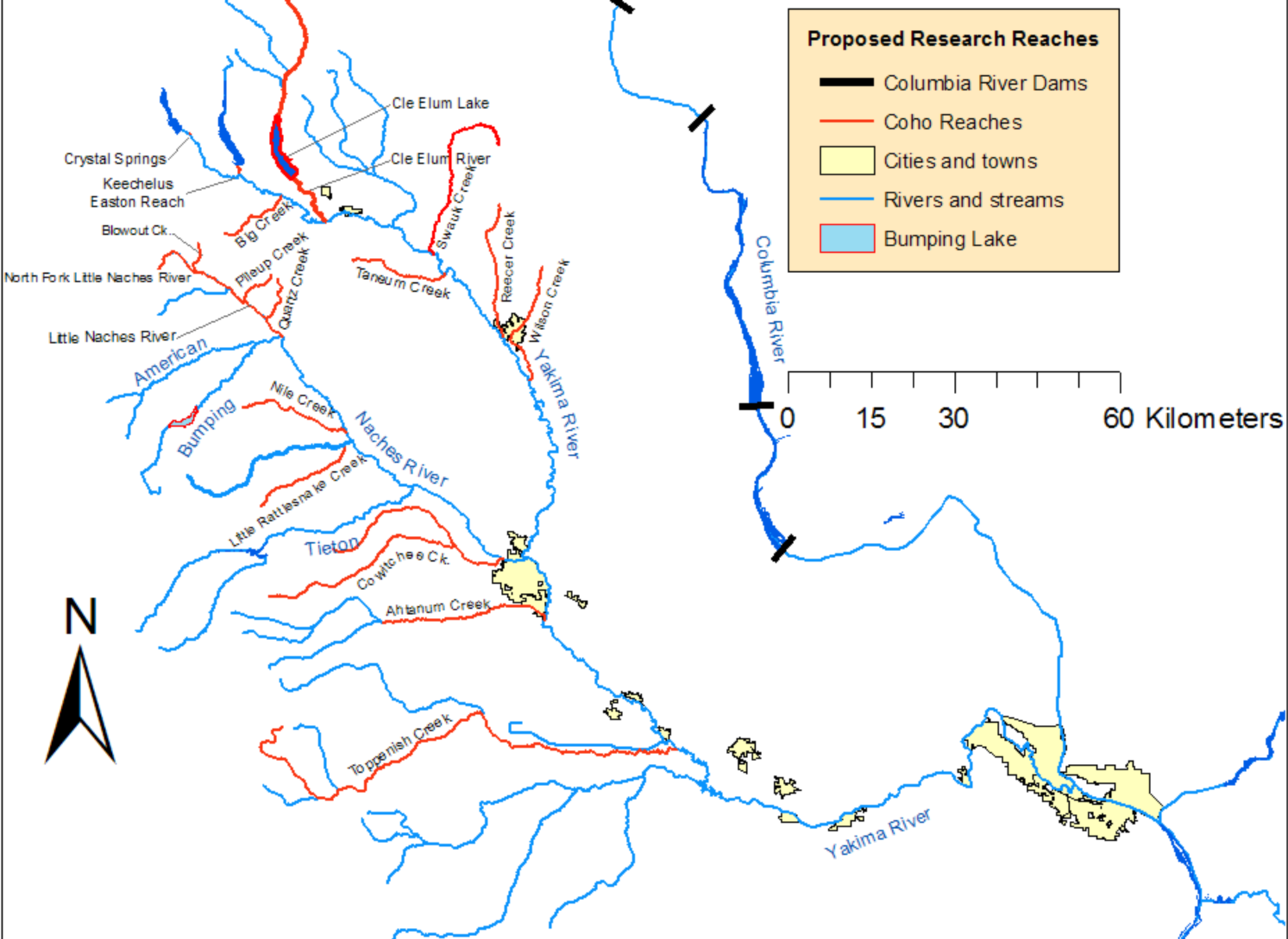
### **Adult Coho out plants**

Monitor effects of  
reintroduction  
of adult coho into stream on  
Resident Fish Spp.

### **Stream Seeding**

Test mobile  
Acclimation Facilities







# Continuing Coho Work

- Egg to Fry
- Parr Planting
- Mobile Acclimation
- Adult Planting





# Egg To Fry



Good (60)



Bad (1)

# Method

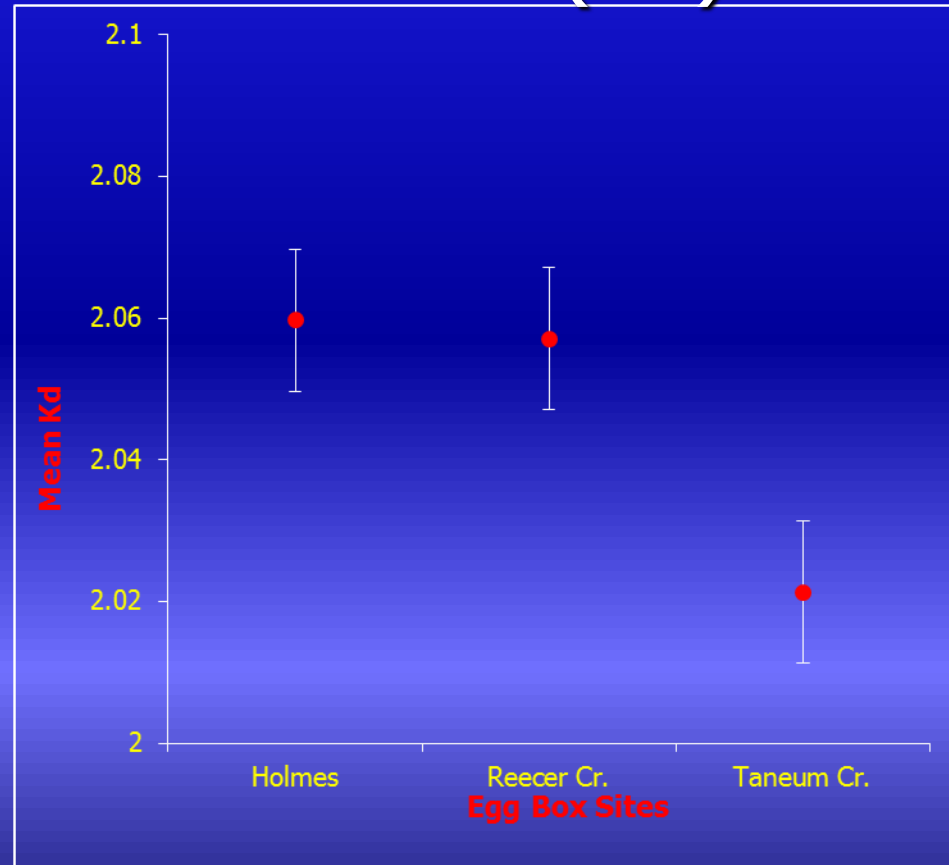
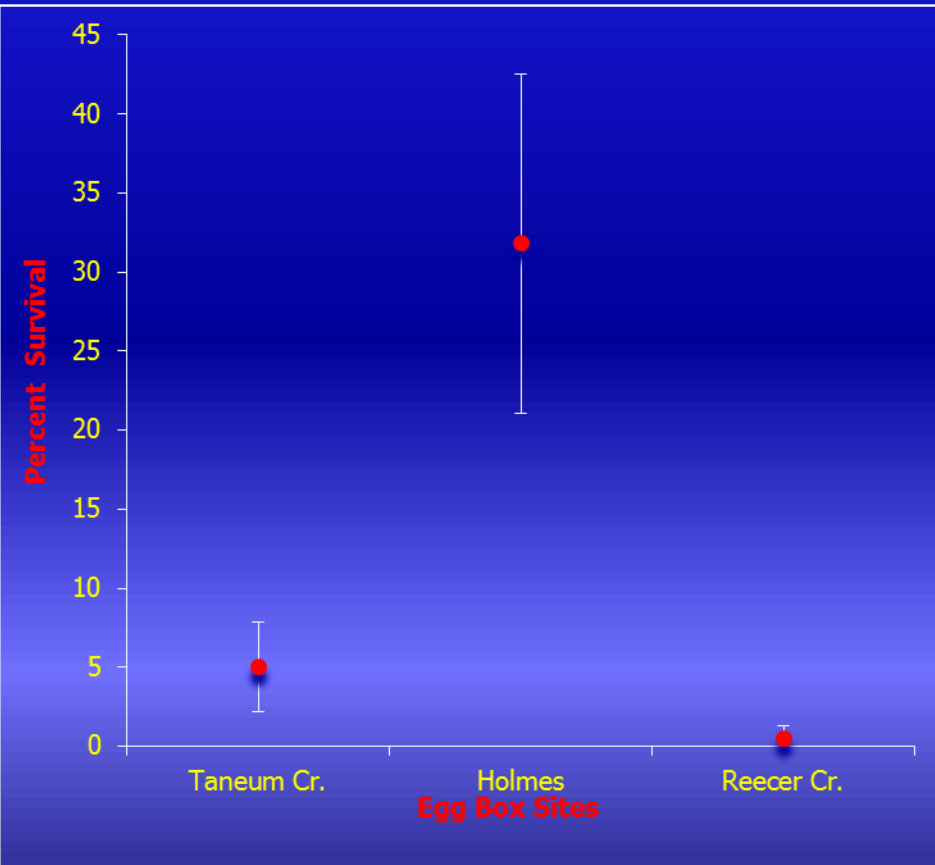




# Egg to Fry Survival

Survival

Condition  
Factor (Kd)



Data Provided by: Trenton DeBoer (WDFW)



# Summer Parr Plants



Pit Tag Parr Survivals to McNary Dam				
	5 Year Average Parr	4 Year Average	Proposed	Estimated
Tributary	Survival	SAR	Release	Adults
Cowiche Creek	28%	3%	50000	420
Nile Creek	10%	2%	20000	40
North Fork Little Naches	16%	1%	10000	16
Wilson Creek	28%	6%	70000	1176
Reecer Creek	29%	4%	100000	1160
Big Creek	13%	2%	30000	78
Ahtanum Creek	13%	1%	50000	65
Little Naches River	17%	3%	100000	510
Rattlesnake Creek	14%	1%	50000	70
Total			480000	3535

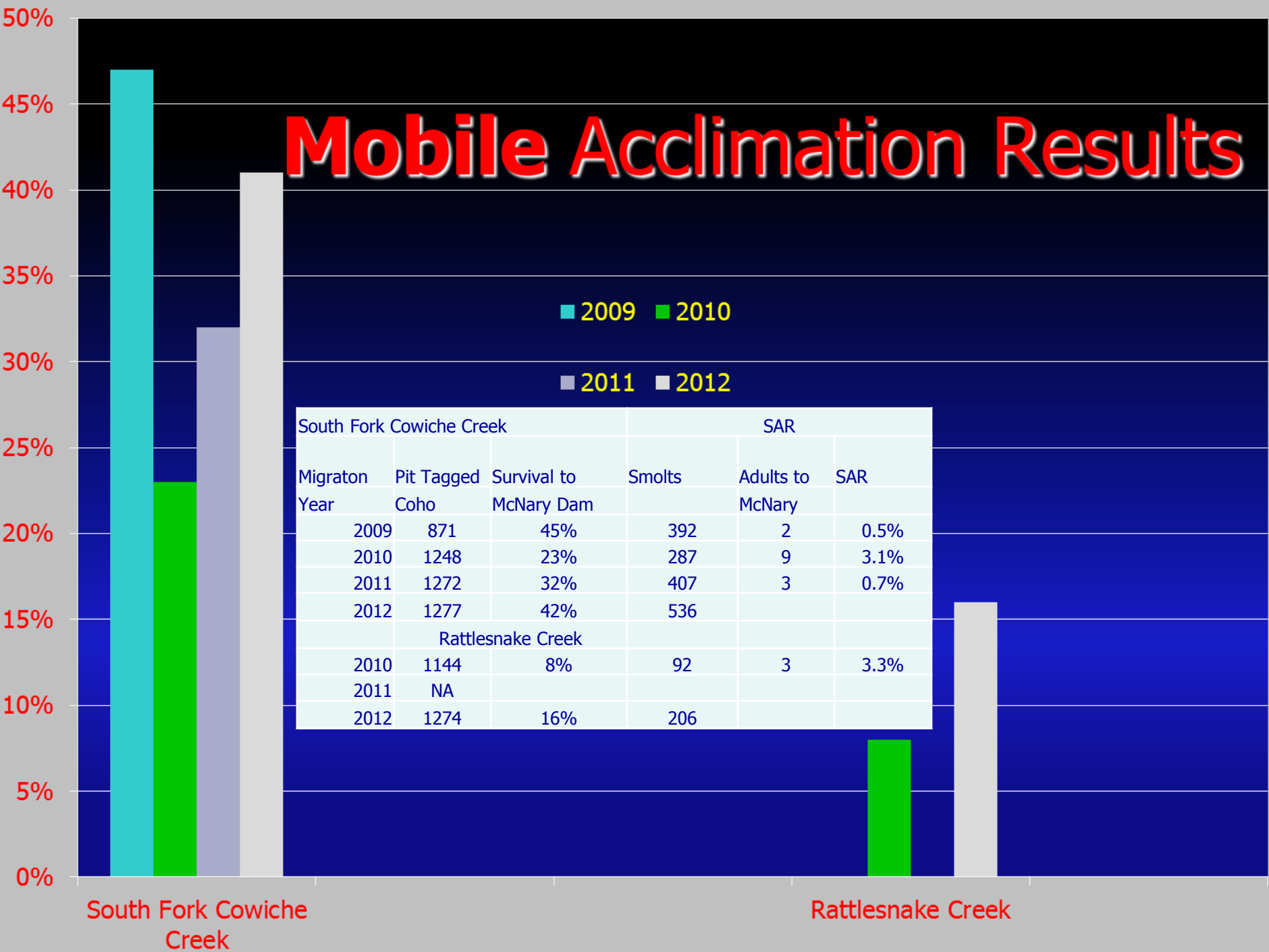


# Mobile Acclimation

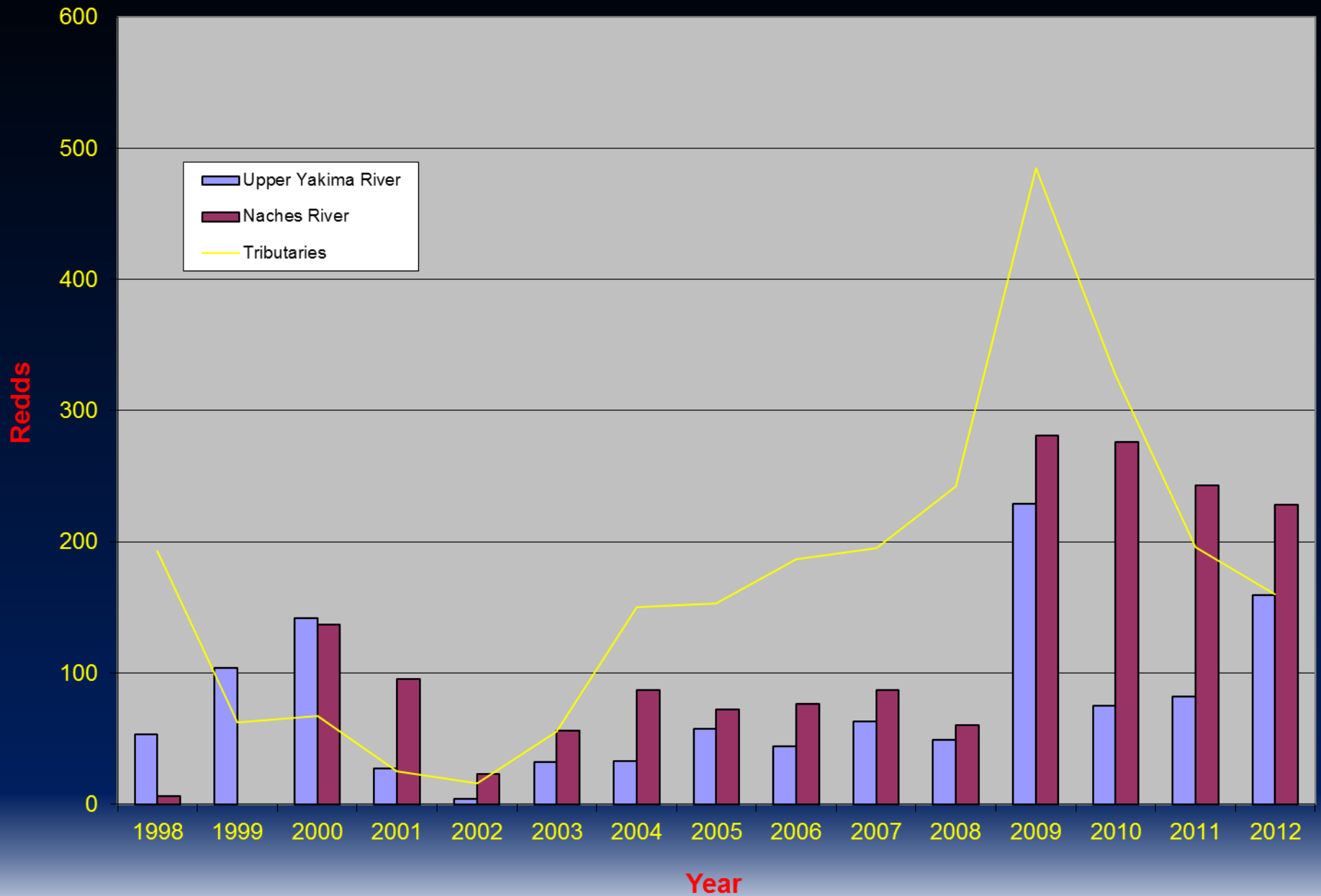
Rattlesnake Creek



# Mobile Acclimation Results



# Yakima Basin Redd Counts 1998-2012





# Taneum Creek Coho Reintroduction



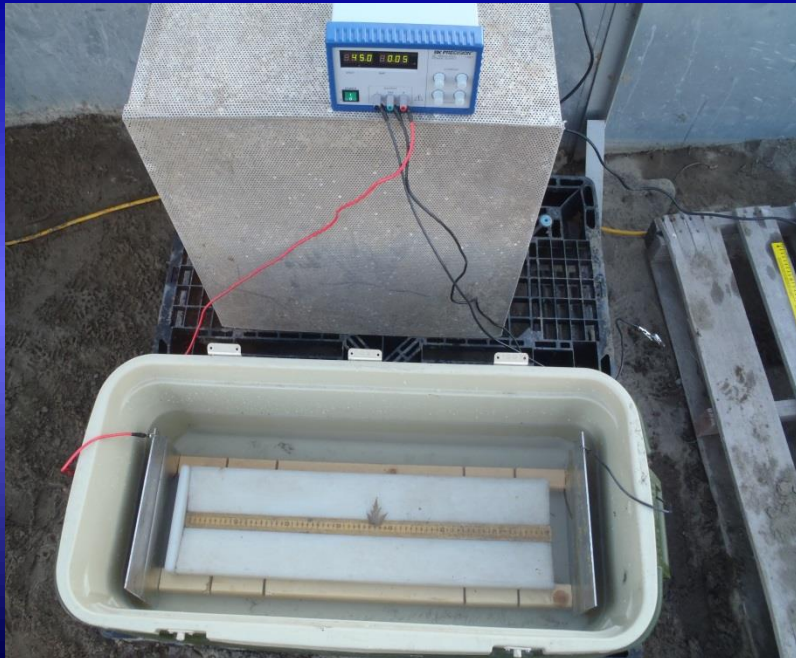
## YN and WDFW cooperative Project



Coho are planted the last week of October and the first week of November in 2 consecutive days (60 per day) Maintenance Plant

- **2012**

- 120 Coho (60 Males, 60 Females) were tagged with Floy tags to differentiate Males and Females. And to separate planted coho from wild coho.
- 54 Coho redds were located spread over a large area



# Taneum Creek Adult Returns 2012

- Bonneville- 24
- McNary- 13
- Prosser- 11
- Roza- 11
- Taneum Creek- 3
- McNary to McNary Smolt to Adult return  
2.1%

# Transferring Coho into Truck Using Electronarcosis

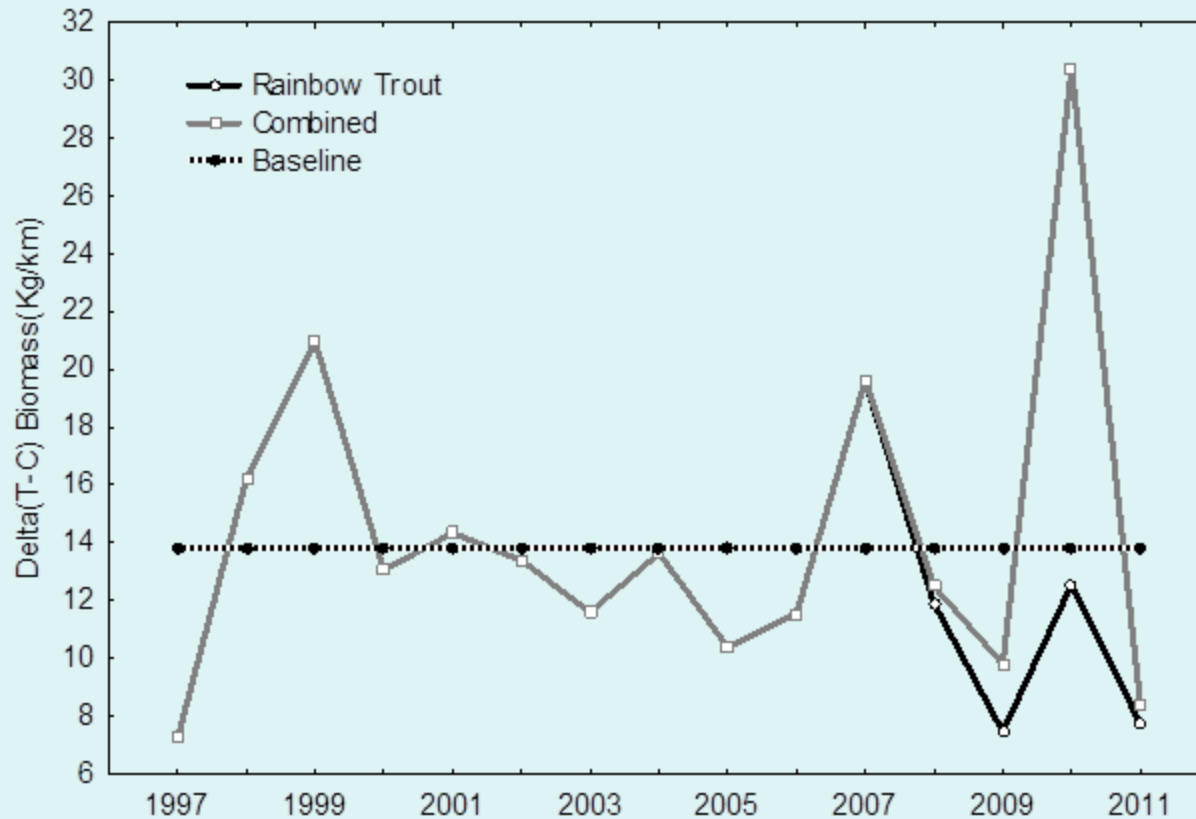


# Taneum Creek Adult Coho Salmon out-planting Results

Year	Adult Females	Redds	Number of	Migration	Survival to	
			coho Pit Tagged	Year	McNary Dam	
<b>2007</b>	<b>150</b>	<b>75</b>	<b>1300</b>	<b>2009</b>	<b>16%</b>	
<b>2008</b>	<b>150</b>	<b>50</b>	<b>1812</b>	<b>2010</b>	<b>10%</b>	
<b>2009</b>	<b>150</b>	<b>130</b>	<b>4515</b>	<b>2011</b>	<b>13%</b>	
<b>2010</b>	<b>150</b>	<b>134</b>	<b>1054</b>	<b>2012</b>	<b>26%</b>	
<b>2011</b>	<b>150</b>	<b>100</b>	<b>2416</b>	<b>2013</b>	<b>-</b>	
2012	60	54	-	2014		



# Interactions Summary



Delta values (Treatment-Control) for rainbow trout biomass (kg/km) and combined salmonid rearing biomass (sympatric rainbow trout and naturally produced coho salmon) relative to the baseline (1997-2007) biomass value.

Data Provided by Gabe Temple WDFW







# Conclusions/Discussions

Species of Concern: Spring Chinook, Steelhead, Bull Trout

- **Adult out-plants**- *Cheap*-Should be used in areas that either are sensitive or have species of concern living in the area.
- **Parr Plants**-*Cheap*-Could be used in concert with Mobile Acclimation or where there are little or no species of concern.
- **Mobile Acclimation**-*Expensive* and dangerous to smolts in some cases. However, higher survival and very little direct competition to other spp. Should be used with Parr Plants or Adult plants to jump start run.

Each one has advantages and disadvantages however, used in any combination could be used to jump start a tributary.



# FUTURE PLANS

Rear and release 500,000 Adipose Clipped Mitchell Act YN Origin Coho from Prosser Hatchery. Estimated annual returns of ~3,000 - 5000 hatchery adults annually.

Collect NOR brood-stock from Sunnyside and Roza Dams and raise offspring at the Ellensburg Coho Facility. Goal of 3500 NOR adults per year.

Approximately, 600,000 (CWT) NOR coho for use in reintroduction. Initial plants will be 400,000 parr plants and 200,000 smolt plants. Initially hatchery adults from Prosser will be used in tributaries, then NOR adults will be added.

# Proposed YKFP Coho Facility

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**EAST ELEVATION**  
3/32" = 1' - 0"

**WEST ELEVATION**  
3/32" = 1' - 0"

**REVISED NORTH ELEVATION**  
3/32" = 1' - 0"

**REVISED SOUTH ELEVATION**  
3/32" = 1' - 0"

Labels for East Elevation: METAL ROOFING, METAL SIDING, CONCRETE BASE

Labels for West Elevation: METAL ROOFING, METAL SIDING, CLERESTORY FOR DAYLIGHTING

Labels for North Elevation: SIGNAGE, TRANSLUCENT GLAZING, METAL ROOFING, METAL SIDING, CMU BLOCK

Labels for South Elevation: GABLE DAYLIGHTING, VENTILATION LOUVERS, CLERESTORY FOR DAYLIGHTING, CONCRETE OR BLOCK, METAL SIDING

REV	DATE	BY	DESCRIPTION

**McMILLEN, LLC**

1401 STEPHENSON DRIVE  
SUITE 100  
BOZEMAN, ID 83702  
PHONE: 208.342.4214  
FAX: 208.342.4219

**FISHERIES**  
YAKAMA NATION

YAKAMA NATION FISHERIES  
HOLMES RANCH HATCHERY CONCEPT DESIGN  
HATCHERY BUILDING ELEVATIONS

DESIGNED: M. HEDER  
DRAWN: D. LITA  
CHECKED:   
ISSUED DATE: 3/16/12

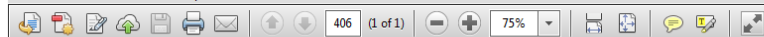
DRAWING: **AH-2**  
SCALE: AS NOTED



# Capacity: 600,000 Coho smolt equivalents

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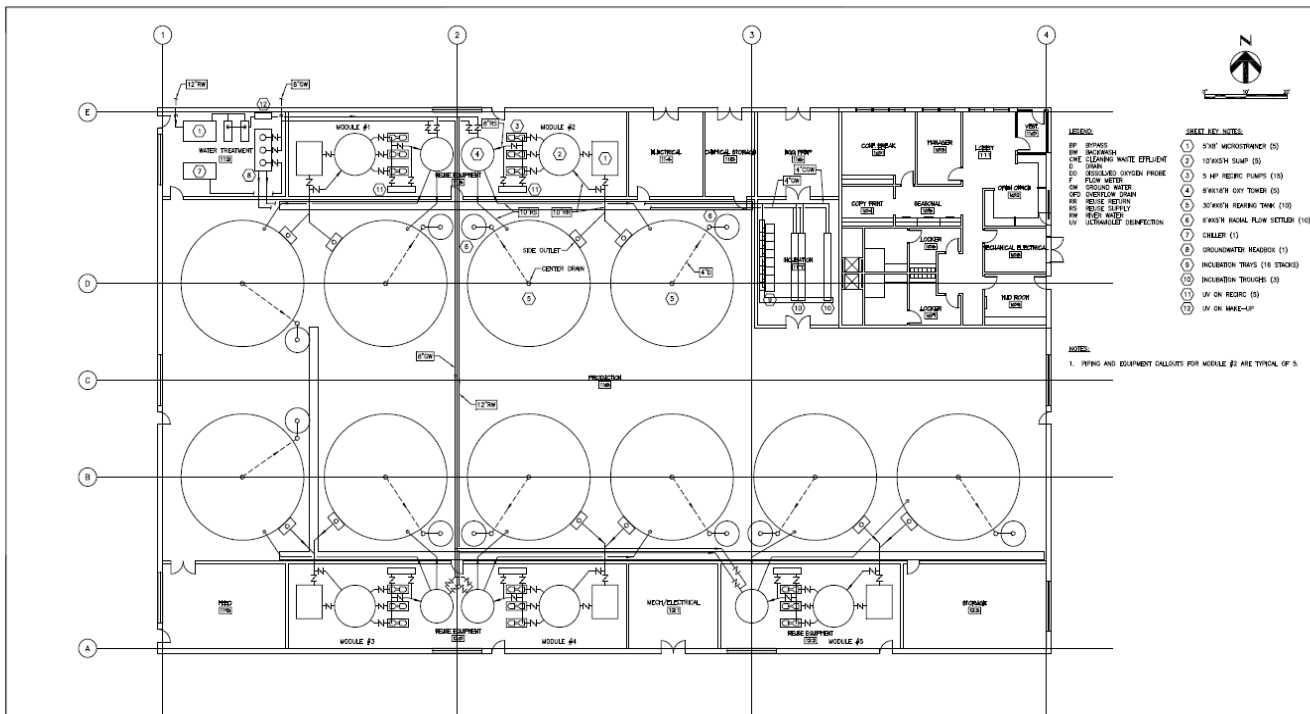
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REV	DATE	BY	DESCRIPTION

WARNING



**McMILLEN, LLC**

1401 BRIDLEWAY DRIVE  
SUITE 100  
BOISE, ID 83702

OFFICE: 208.342.4214  
FAX: 208.342.4210

YAKAMA NATION FISHERIES

HOLMES RANCH HATCHERY CONCEPT DESIGN

REUSE SYSTEM PIPING PLAN

DESIGNED: W. REISER

DRAWN: S. LITA

CHECKED:

ISSUED DATE: 3/15/11

DRAWING

**MH-2**

SCALE: AS NOTED

# Identified Tributaries for Reintroduction

- Naches River

- North Fork Little Naches
- Pile Up Creek
- Quartz Creek
- Blow Out Creek
- Rattlesnake Creek
- Nile Creek
- Cowiche Creek

- Upper Yakima River

- Crystal Spring
- Big Creek
- Cle Elum River
- Tanuam Creek
- Swauk Creek
- Reecer Creek
- Wilson Creek

## **Main-stem Yakima**

- Ahtanum Creek
- Umtanum Creek