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July 2, 2013

MEMORANDUM

TO: Council Members

FROM: Stacy Horton, Washington Policy Analyst/Biologist

SUBJECT: Efforts to Reintroduce Extirpated Coho, Sockeye, and Summer Chinook in the Yakima Basin

The Yakama Nation has been working to reintroduce coho, summer Chinook, and sockeye salmon into the Yakima Basin.

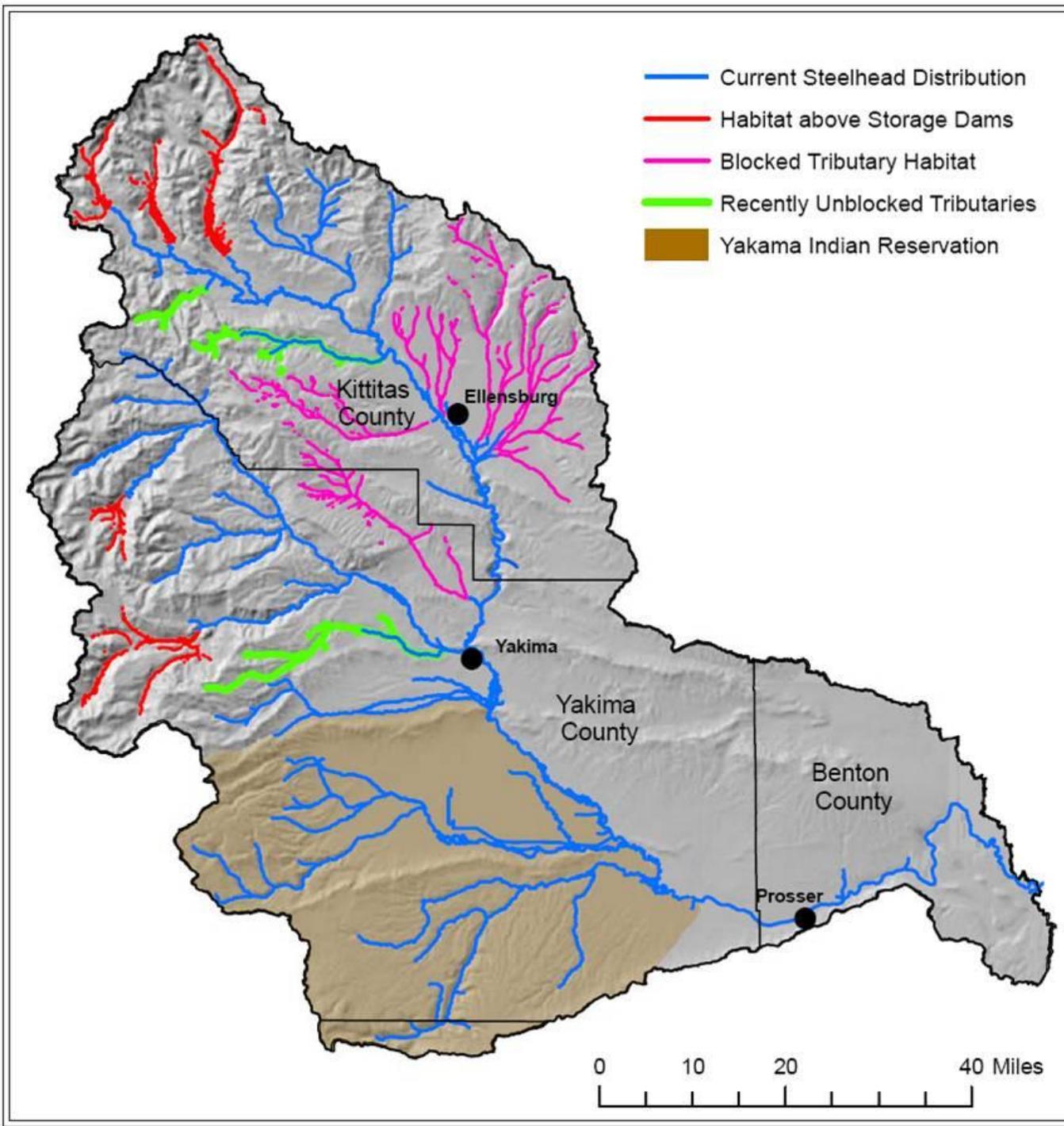
Historically there were six stocks of Pacific salmon produced in the Yakima Basin that had an annual return from 700,000 to one million adults. All of these populations were dramatically reduced by the late 1900s due to overfishing, logging, irrigation and hydropower dams and other anthropogenic causes. The spring Chinook, fall Chinook and steelhead stocks persisted, but with total returns of less than 10,000 adults in the 1980s and 90s. Sockeye went extinct in the early 1900s as each of the four natural lakes that produced them was dammed for irrigation water storage. The summer Chinook and coho went extinct in the 1980's. The Yakama Nation has worked to reintroduce each of these species back into the Yakima through the all-stock initiative of the Yakima/Klickitat Fisheries Project. Coho reintroduction began in the early 1980's as part of the US vs. Oregon program of moving salmon from the lower Columbia back to the watersheds where tribal fishing occurred. This has resulted in returns of over 5,000 adults each year since 2006. Summer Chinook and sockeye are in the early years of research to determine the feasibility of restoring self-sustaining populations. Different reintroduction strategies have been implemented for each of these species. Sockeye salmon adults that were naturally produced in the Cle Elum watershed are now returning to the Yakima basin for the first time in over 100 years.

David Fast, Senior Research Scientist, Yakima/Klickitat Fisheries Project, Yakama Nation, will present the efforts underway to reintroduce these extirpated stocks.

COHO, SUMMER CHINOOK AND SOCKEYE REINTRODUCTION INTO THE YAKIMA RIVER BASIN

Presented to Northwest Power & Conservation Council,
Dave Fast, Senior Research Scientist
Yakima/Klickitat Fisheries Project, YN
July 9, 2013





Salmon Extinction in the Yakima Basin

- “Not an Option!” or
- The Preferred Alternative?

Historic Salmon Runs Modified from Alex Conley

Species/Run	Estimates	Current Status	Low	Year	High	Year
Spring Chinook	200,000-500,000	Supplemented Population	666	1995	23,265	2001
Fall Chinook	38,000-100,000	Supplemented Population	523	1988	13,000	2002
Summer Chinook	??	Extirpated 1970'S Began Reintroduction 2008	-	till 12	250 to Bonneville	2012
Coho	40,000 150,000	Extirpated 1980'S Reintroduced 1997	-	till 93	10,248	2009
Sockeye	100,000 200,000	Extirpated Early 1900's Reintroduction 2009	-	Till 2009	10,000(+15)	2012
Steelhead	30,000 100,000	Wild Population (ESA) Kelt Reconditioning	505	1996	6,793	2010
Total	408,000-1,050,000		1,700		56,763	
Bull Trout	??	Wild Population (ESA)			2500 to 3000 adults	
Lamprey	??	Wild Population			0 to 87 adults	

2012 Yakima Basin Coho Reintroduction



Yakima River Coho History

Program Goal - Re-establish self-sustaining naturally spawning population of coho salmon in Yakima River

- 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

Tools in the Box

- **Adult Out plants**
 - To date, limited negative interactions on resident taxa. Could be used where interactions are a concern.
 - Inexpensive

- **Mobile Acclimation**
 - Small numbers of smolts acclimated to an individual tributary
 - Very little interaction, limited to out migration
 - Expensive

- **Parr Plants**
 - Scatter planting appropriate numbers of parr into small tributaries.
 - Inexpensive
 - Possible Interactions, larger hatchery coho interacting with smaller wild fish species.
 - Should be used were interaction are not a concern



Adult Out Planting



FISHERIES
YAKAMA NATION

**Study
In
Progress**

Please Do Not Disturb!

This is a research site designed to evaluate the spawning success of coho salmon and the future interactions of their offspring with other resident fish species. This research is being conducted by the Yakama Nation Fisheries (YN) and the Washington Department of Fish and Wildlife (WDFW).

Please do not disturb racks, site, or fish.

NOTE: FISH HAVE BEEN TREATED WITH CHEMICALS AND ARE NOT EDIBLE!

Please direct questions to:
YN: 509-865-6262 Todd Newsome
WDFW: 509-925-4467 ext#4

30 10:11PM



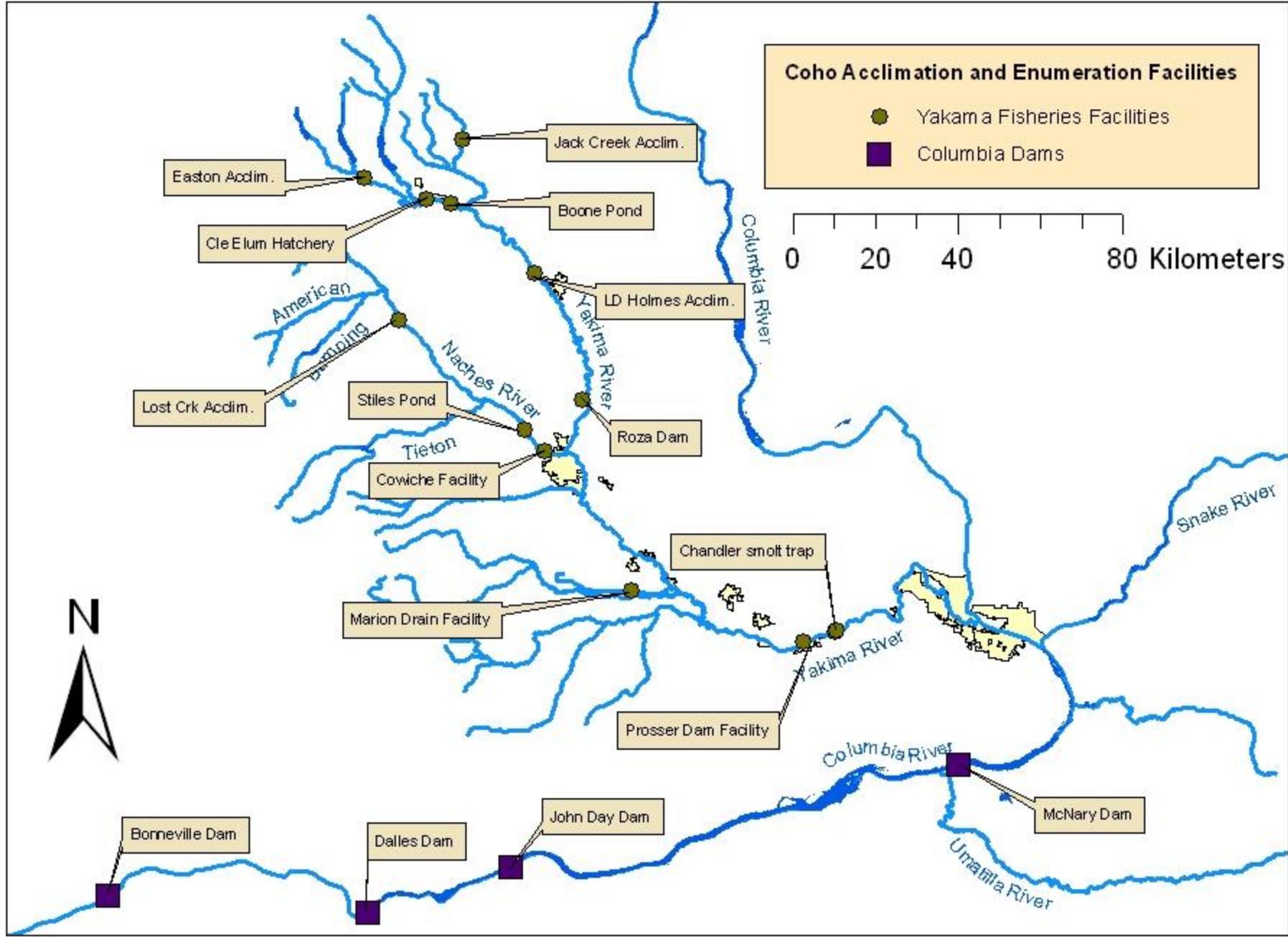
Adult Out-Plants

- Tanuem Creek: Up to 300 adults racked into 3 one hundred meter sections (100 per section)
 - 2007- 90 Redds
 - 2008- 70 Redds
 - 2009-130 Redds
- Redd caps, electrofishing and smolt traps are used to assess redd success.
 - 2008- Pit tagged 1200 Juvenile coho (Survival ~10%)
 - 2009- Pit tagged 1300 Juvenile coho
- Ultimately, success will be evaluated by juvenile surviving to the ocean and adults returning to the tributary.
 - Stream spanning pit tag detector will be constructed by fall 2010 into Tanuem Creek.



Taneum Creek Adult Coho Salmon out-planting Results

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



Stream Seeding Mobile Acclimation

- South Fork Cowiche Creek Off-Channel acclimation 10 thousand coho smolts.
- Acclimation March 16,2009 to April 3,2009. Coho were forced out and facility taken apart.
- 2009 Coho smolt survival to McNary 45%.
- 2010 Coho smolt survival to McNary 23%.
- Rattlesnake Creek Mobile Acclimation
- start up February 8, 2010

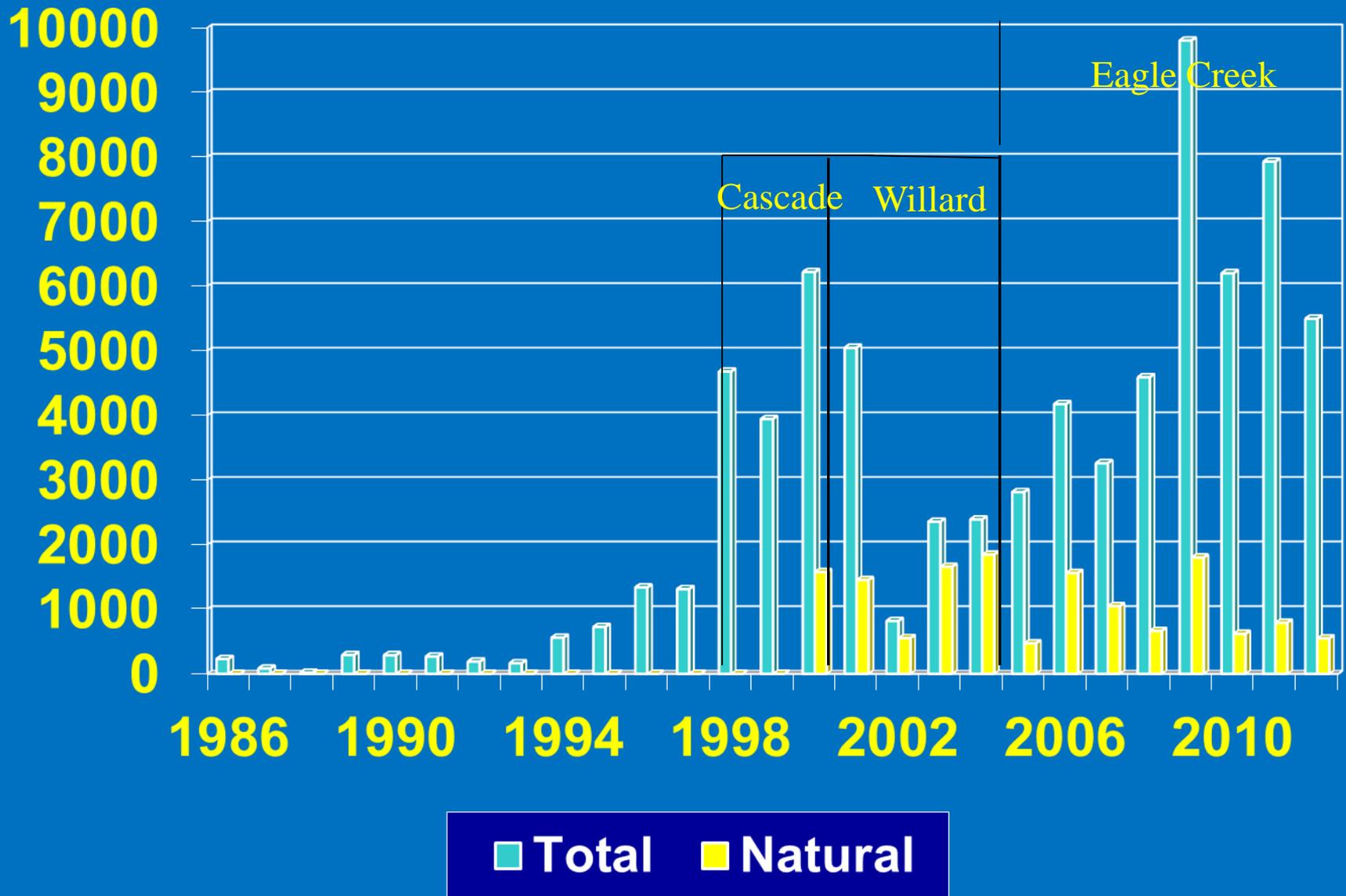




Monitoring Techniques

- Redd Surveys
- Electro-Fishing
- Snorkeling
- Pit Tag Detectors in stream and on Mainstem Dams
- Chandler Juvenile Enumeration Facility (Prosser WA.)

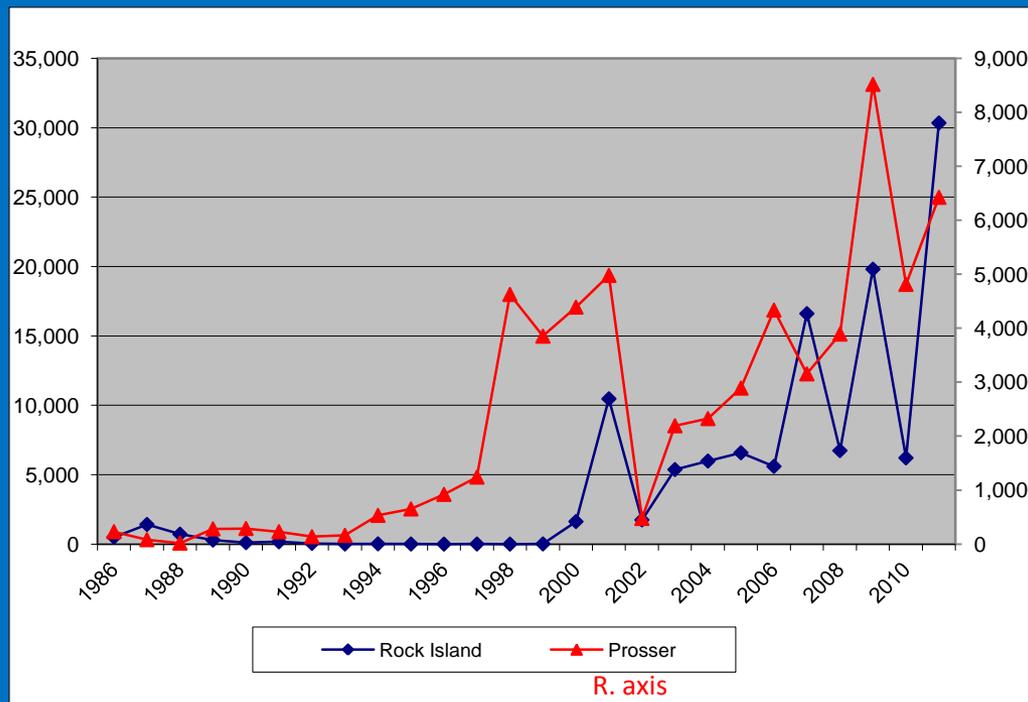
Upper Yakima Coho Returns, 1986 – 2012



Yakama Coho Reintroduction Programs

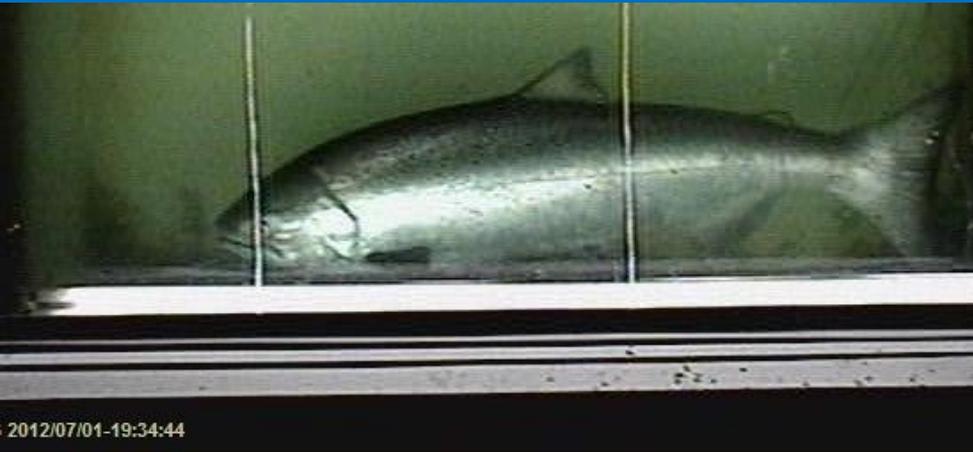
- Virtually extinct in the mid-1980s
- Started with out-of-basin transfers
- Demonstrated ability to reestablish a naturalized population after as few as 3 to 5 generations of outplanting in the wild
- Moving to local brood stocks
- Using combination of fry, smolt, and adult release strategies
- Adult returns are combination of natural- and hatchery-origin fish

Adult Coho counts at Rock Island and Prosser Dams, 1986- Present



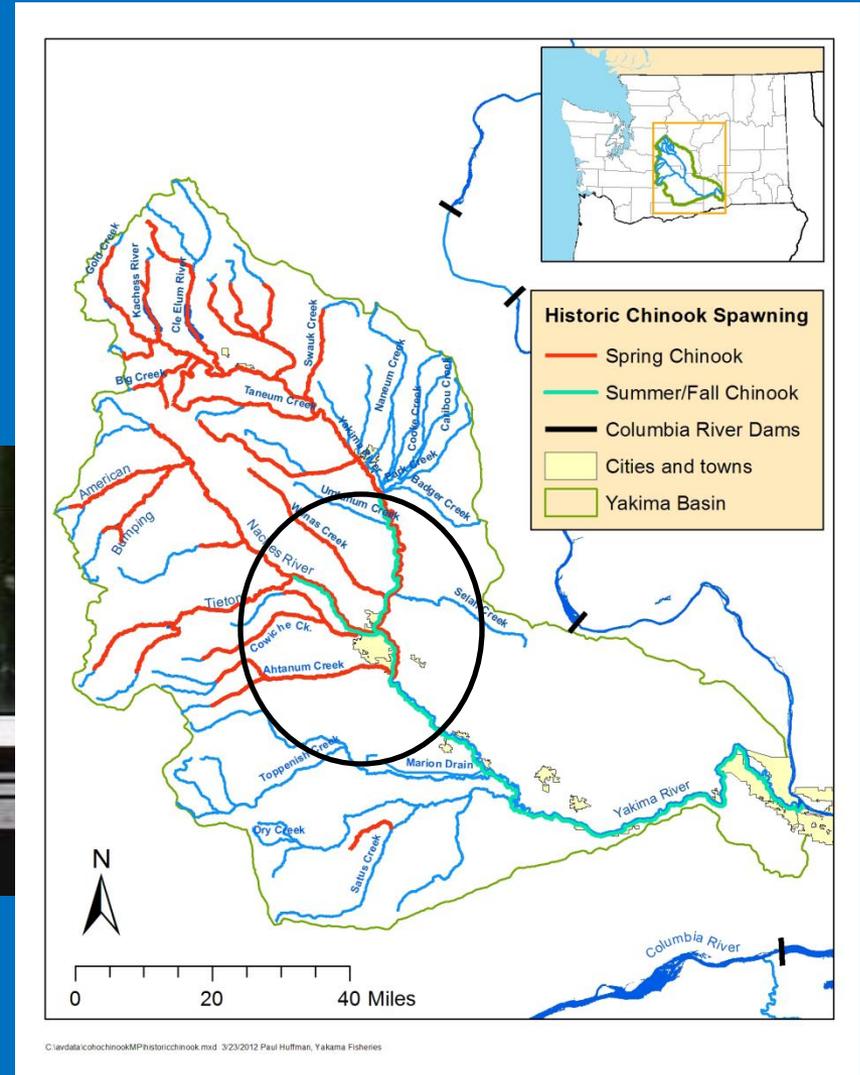
Yakima River Summer Run Chinook Reintroduction - Restoring Diversity

- Extirpated stock 1970's
- Started with Wells transfers
- Releasing both yearling and subyearling fish
- Intend to move to local stock once returns and infrastructure in place
- Several hundred adults returning now from three different age classes



2012/07/01-19:34:44

3-Ocean Adult Summer at Prosser,
7/1/2012



Re-Establishing Summer Chinook in the Yakima River

- **Objective:** To initiate investigation of the feasibility of establishing an early-run fall Chinook population in the Yakima River, with the goals being to:
 - Develop a naturally spawning adult population in the Yakima River between Sunnyside Dam and Roza Dam, and in the lower Naches River from the mouth to the Tieton River, and,
 - Increase the number of natural-origin returning summer-run adults in the lower Columbia, Zone 6, and the lower Yakima River contributing to harvest augmentation for both the tribal and sports fishery.

WDFW Wells Hatchery



YN Marion Drain Hatchery

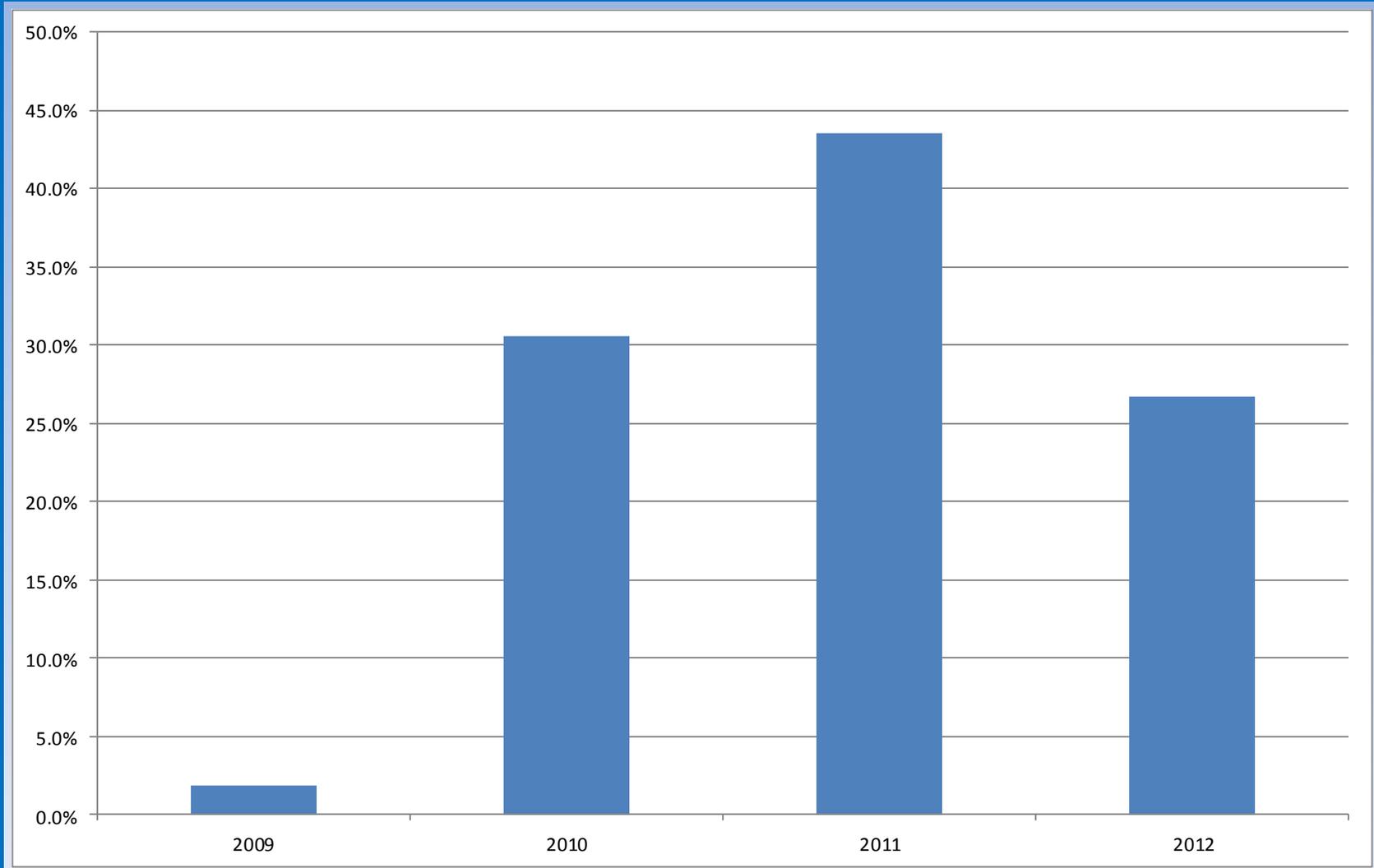


Summer Chinook Releases 2009-2013

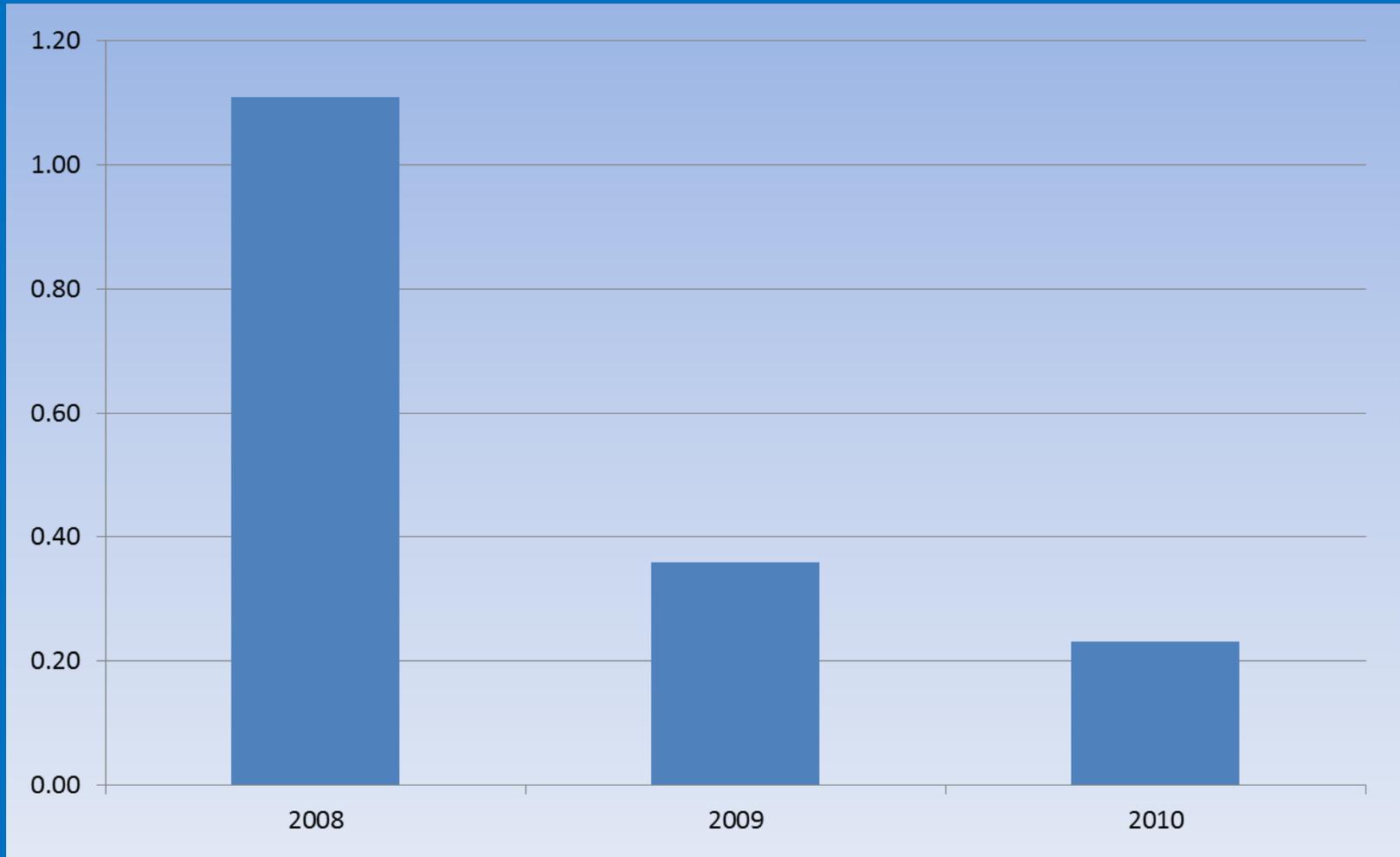
AcclimationSite	BY	N	Release	#PITs	SI
Stiles	2008	180,911	6/12/2009	30,045	0.018
Stiles	2009	200,747	5/14/2010	29,997	0.306
MarionD	2010	39,406	4/29/2011	29,893	0.435
Stiles(Wenn)		76,357	5/16/2011		
Stiles(Wenn)		101,000	5/16/2011		
Prosser	2011	98,300	5/14/2012	9,999	0.267
NelsonS		98,801	5/18/2012	9,998	0.370
MarionD		72,258	5/24/2012	9,999	0.357
NelsonS	2012	45,652	5/15/2013	15,063	
NelsonS		42,556	6/1/2013	10,053	
Roza		48,355	5/29/2013	15,087	

*Total Summers Released 2009-2013 1,004, 343

Smolt-to-Smolt SI to McNary



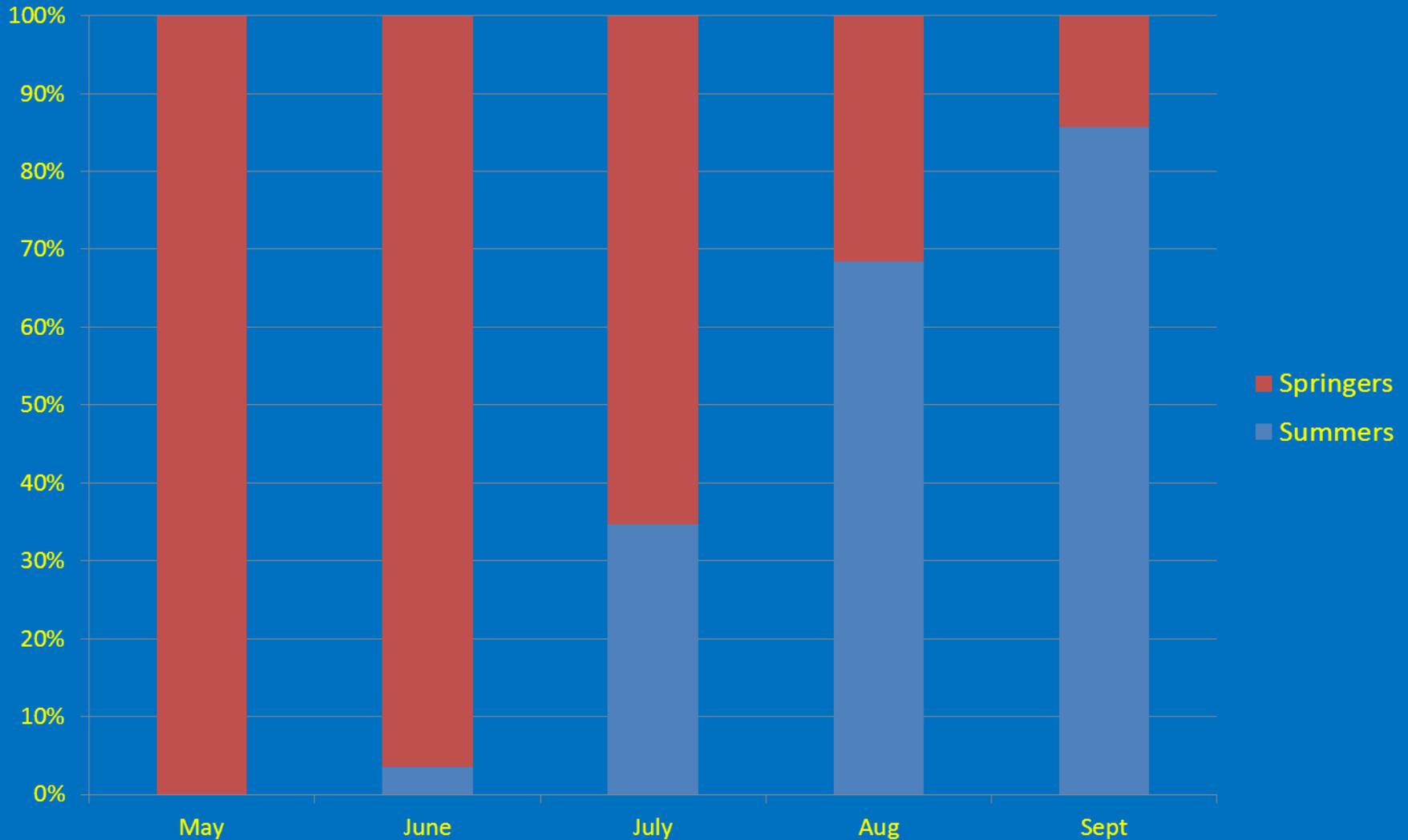
Summer Chinook BY2008-2010 adult SI to McNary



*2013 final adult counts pending run duration

BY2008 complete
BY2009 complete 2014
BY2010 complete 2015
*assumes upper age to 5 yrs as complete

Timing: Spring vs Summer 2011-12





Prosser Dam Left Ladder Window

SUMMER
observed 6/1/13
1:15pm



SPRINGER
observed 6/1/13
1:24pm

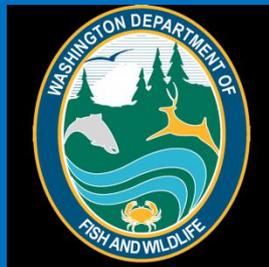
* Both Pit Tagged

2013-14 Plans on-going

- Bring in green eggs/milt from Wells Hatchery (MarionD); Final acclimation at Nelson and Roza.
- Continue In-basin Yearling vs. Subyearling comparison releases from Prosser Hatchery.
- Redd Surveys on the Yakima River between Prosser and Roza Dams and lower Naches River.



Lake Cle Elum Fish Passage Project Sockeye Reintroduction





Cle Elum Dam

Yakima Basin

Sockeye Nursery Lakes

Historically supported ~ 200,000 fish

Kittitas County
Yakima County

Naches
French Canyon Dam
Tieton







SOCKEYE REINTRODUCTION

- Historical runs of ~ 200,000 adults to Yakima
- Extirpated in early 1900's as lakes were impounded
- Two donor stocks Lake Wenatchee and Lake Osoyoos
- After escapement goals are reached at Bonneville Dam returning sockeye adults were collected at Priest Rapids Dam
- The Adult take number was increased from 1000 in 2009 to 2500 in 2010, 4100 in 2011 and 10,000 this past year 2012.
- YN transferred 9,000 sockeye to Lake Cle Elum and 1000 to Cooper Lake.
- 1000 DNA Samples were taken at PRD

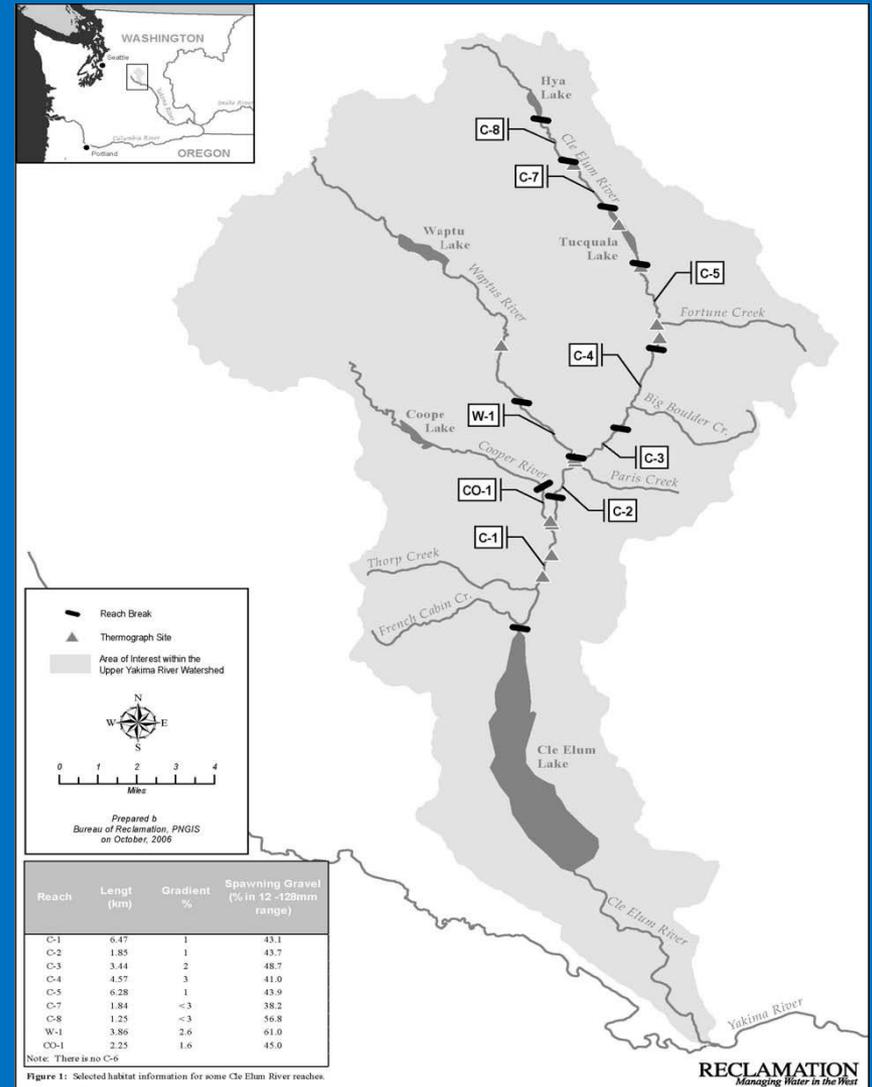


Lake Cle Elum Sockeye Reintroduction

Year	Adults Transported
2009	1,000
2010	2,500
2011	4,500
2012	10,000

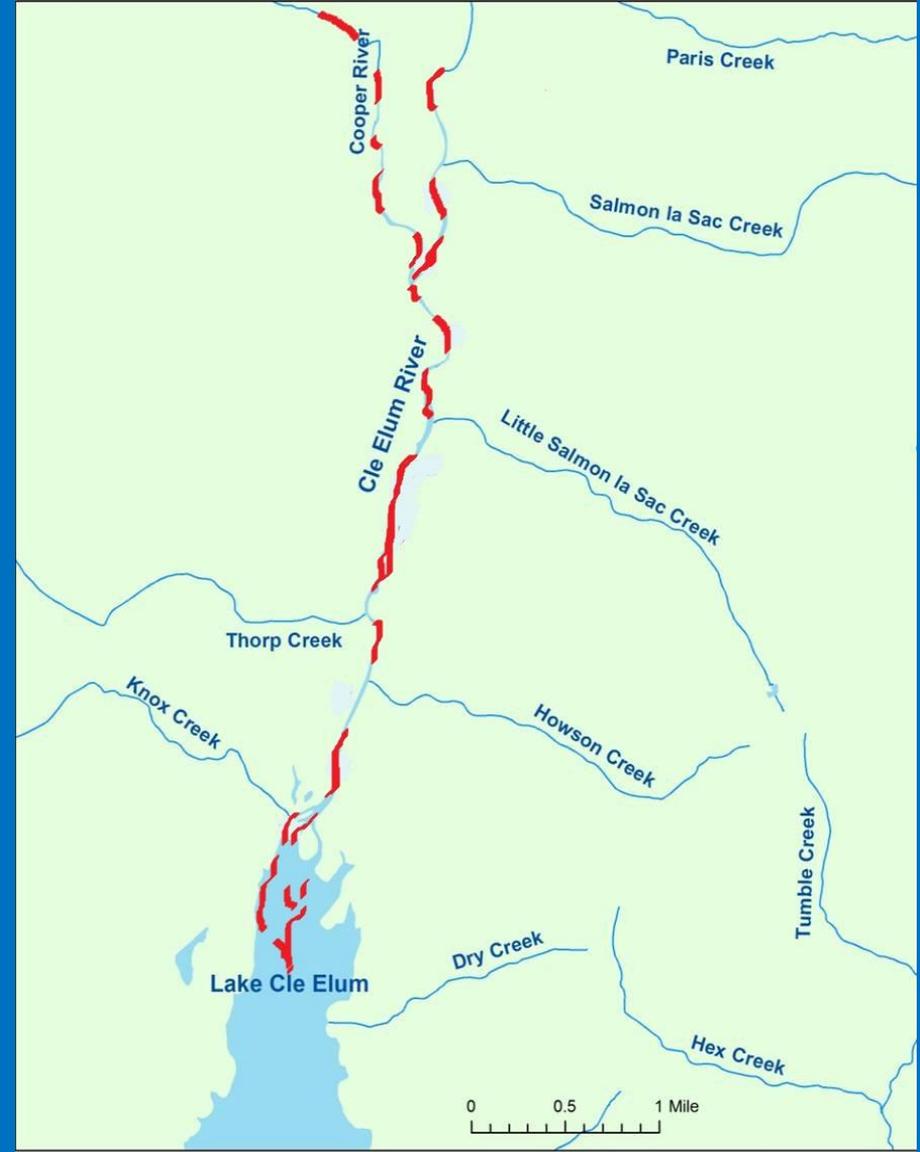
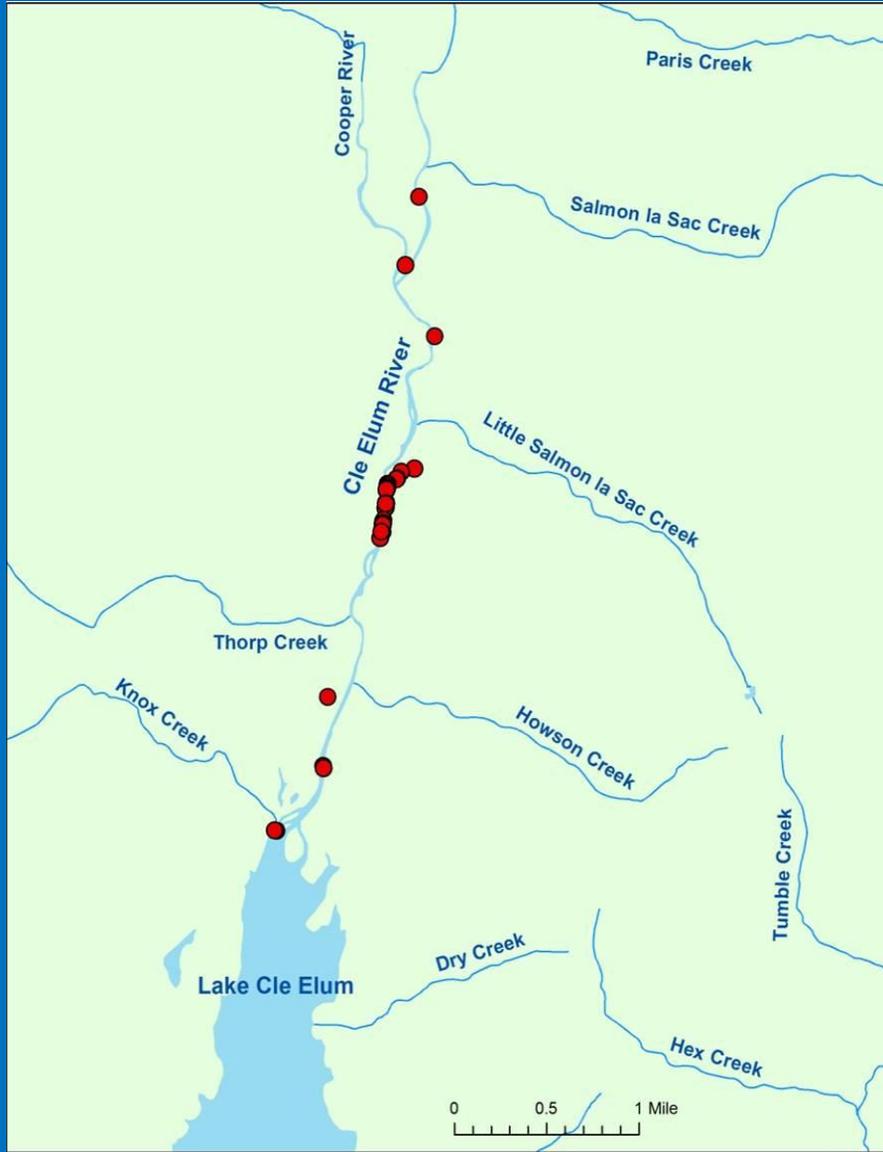


Some of the first sockeye to spawn in upper Cle Elum R. watershed in over 100 years





Spawning Activity 2012 vs. 2009



L. Cle Elum Sockeye Reintroduction

About 80,000 juveniles (progeny of 2009 adult plants) were estimated to have passed Prosser in 2011.



Wild smolt at Roza, 5/10/2011



First Return Sockeye Ceremony

Wednesday, July 10, 2013
10am - 1pm
Lake Cle Elum

20331 Salmon La Sac Road, Ronald, WA 98940

The Yakama Nation is hosting a sockeye celebration for Yakama members and the public that will entail a prayer service, traditional Yakama dancers, guest speakers and potluck lunch.*

**We ask that you bring side dishes, following this alphabet.*

A-H: Beverages, I-P: Fruits or Dessert, Q-Z: Salad/Casserole

Yakama tribal elders describe the value of kálux (blue backs/sockeye) to the people as a winter sustenance food to carry people until new spring food arrives. Historically, at least 200,000 sockeye would annually return to four lakes in the Yakima Basin. Sockeye are returning to the Yakima Basin for the first time in 100 years as a result of Yakama Nation reintroduction.

yakamafish-nsn.gov/restore/projects/yakima-basin-sockeye-reintroduction

Event sponsors include:

Yakama Nation Fisheries, Cascade Playtime Rentals, PCSRF, Suncadia Community Council, and Pyramid Communications.

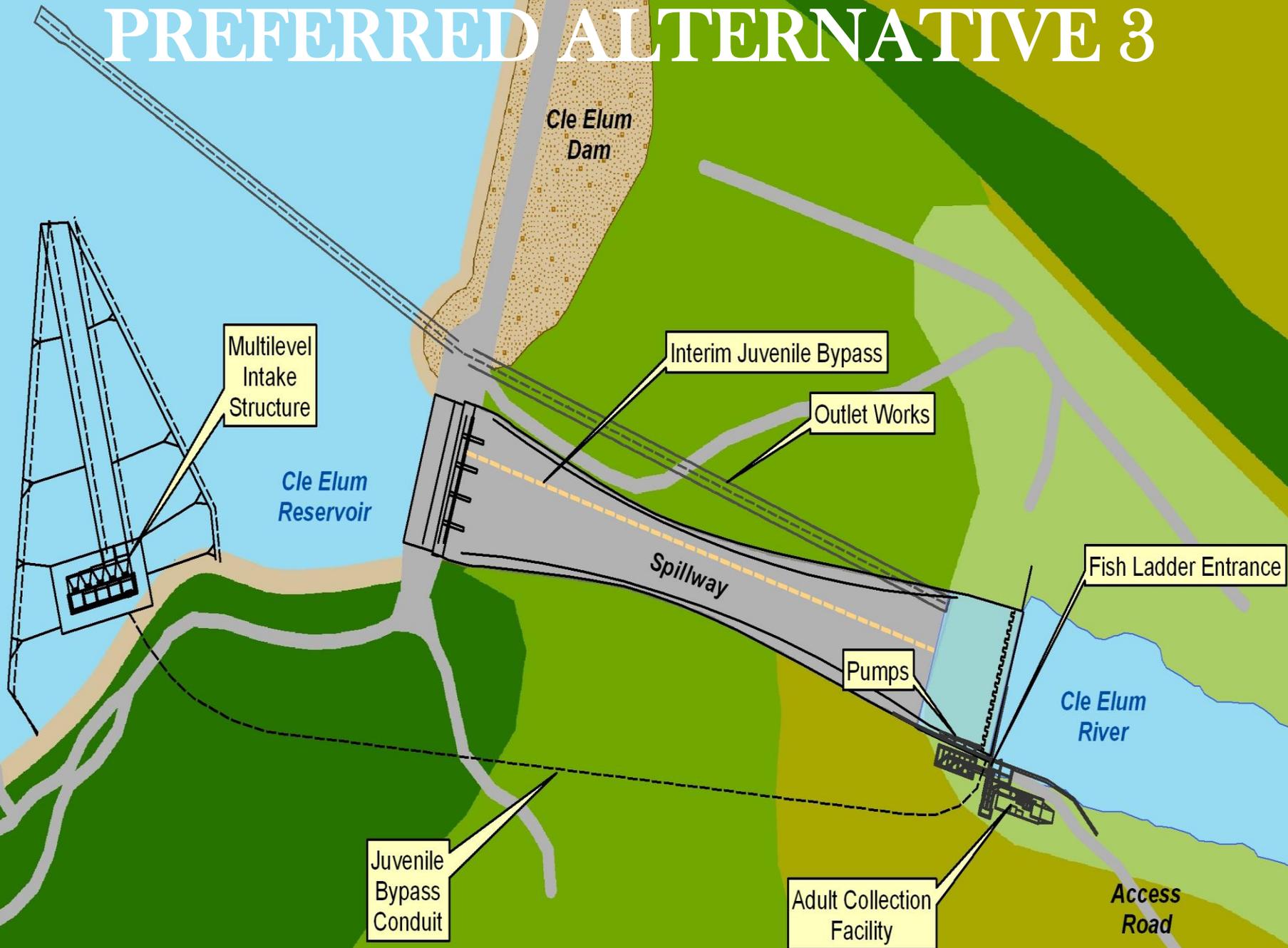
Media Contact:

Brian Saluskin, Fish Passage Biologist, passagebio@qwestoffice.net
Emily Washines, wase@yakamafish-nsn.gov 509-865-5121 ext.6315
or 509-853-8140

After 100 years, Sockeye return to the Yakima River.



PREFERRED ALTERNATIVE 3



Threatened Bull Trout

Courtesy Eric Anderson



Yakama Nation Lamprey Restoration

- Goal: restore throughout ceded lands
- Regional collaboration
- Habitat surveys – identify limiting factors, key habitats for spawning and rearing
- Document presence and abundance
- Research and develop lamprey culture techniques



Lamprey spawning at Prosser Hatchery,
4/25/2012





In 2009 the YN Reintroduced Sockeye back to Lake Cle Elum. Sockeye were extirpated from the Yakima Basin in the late 1800's. Returning Sockeye back to the basin in over 100 years was commemorated with an celebration and ceremony.



2009 Sockeye Reintroduction Ceremony