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September 4, 2013

## MEMORANDUM

**TO:** Fish and Wildlife Committee Members

**FROM:** Stacy Horton, Washington State Policy Analyst/Biologist

**SUBJECT:** Chief Joseph Hatchery: A New Hatchery Operating Under Hatchery Reform Principles From Day 1.

Representatives from the Colville Confederated Tribes would like to brief the Fish Committee on the Chief Joseph Hatchery. This new facility was built with hatchery reform as a central tenet, as a way to address conservation and harvest for both natural and hatchery populations. Randy Friedlander, Interim Fish and Wildlife Director for the Colville Confederated Tribes, Casey Baldwin, Senior Research Scientist, and Kirk Truscott, Anadromous Division Manager will share insights about how they plan to achieve success with this program. The tribe provided the following abstract.

### **Chief Joseph Hatchery: A New Hatchery Operating Under Hatchery Reform Principles From Day 1.**

The primary objective of the Chief Joseph Hatchery (CJH) program is to meet trust obligations to the Colville Confederated Tribes for ceremony, subsistence, health and cultural purposes in a manner consistent with conservation of the natural fish populations. However, CJH will increase harvest opportunity for all anglers throughout the Columbia River, estuary, and Ocean. Additionally, the Colville Tribes and other salmon co-managers have worked with the mid-Columbia Public Utility Districts to meet some of their hydro-system mitigation through hatchery production at CJH. CJH is the fourth hatchery obligated under the Grand Coulee Dam/Dry Falls project, originating in the 1940s. Leavenworth, Entiat, and Winthrop National Fish Hatcheries were built and operated as mitigation for salmon blockage at Grand Coulee Dam, but the fourth hatchery was not built and the obligation was nearly forgotten. Planning of the hatchery began in earnest in 2001, and it will be receiving its first broodstock in 2013. The Chief Joseph Hatchery is the first of its kind to be structured under integrated recommendations from the Congressional Hatchery Reform Act, the Northwest Power and Conservation Council's 3-Step Master Plan process and independent science review. Accordingly, the project has defined objectives; operations, data collection protocols and analytical and reporting processes that span

fish culture and research activities. These are being implemented in a manner that restores the characteristics of the historical Okanogan River population of naturally-spawning salmon while meeting related regional and tribal program objectives. At full program the facility will rear up to 2 million summer/fall Chinook and 900,000 spring Chinook. The summer/fall Chinook program will have an integrated component that meets high standards for natural origin broodstock and low hatchery fish composition on the spawning grounds. If the natural population cannot support the integrated hatchery program in a given year, then hatchery production will be reduced or eliminated to minimize effects to the natural origin spawners. The segregated program will be a “stepping stone” program, striving to only use first generation returns from the integrated program. The Spring Chinook program will also have two components, a segregated program at CJH and a reintroduction program in the Okanogan River. The segregated program will originate from unlisted Leavenworth stock spring Chinook. The reintroduction program will utilize within-ESU origin spring Chinook from the Methow River under the ESA 10j “non-essential experimental” population designation. Extensive monitoring, reporting, program review, and adaptive management are already underway and will be guiding the future actions and success of the CJH program.

# Chief Joseph Hatchery: A New Hatchery Operating Under Hatchery Reform Principles From Day 1.



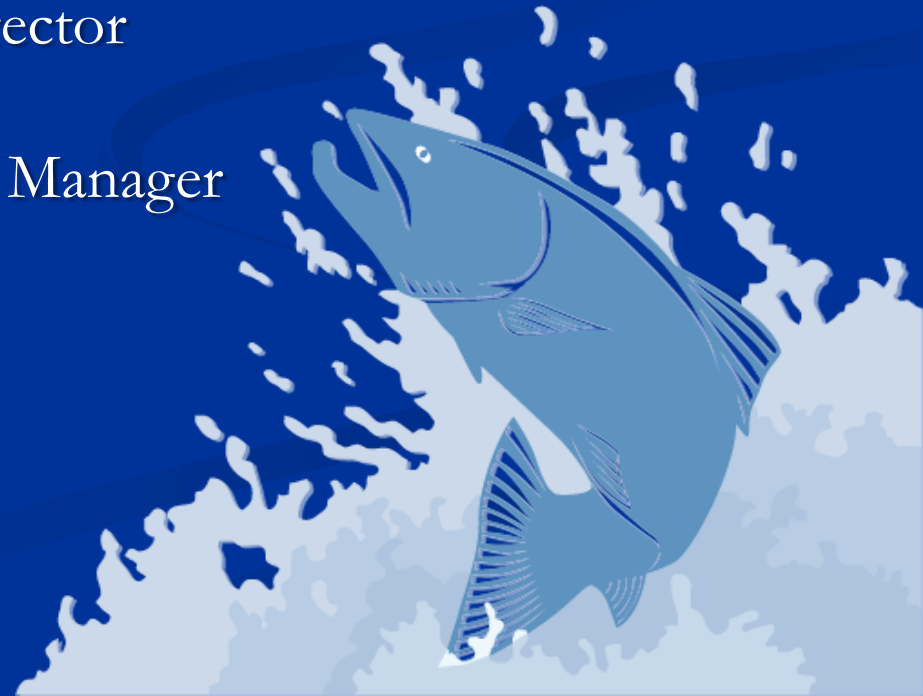
NPCC Meeting: 10 Sept 2013

## Colville Confederated Tribes

Randy Friedlander: Interim F&W Director

Casey Baldwin: Sr. Research Scientist

Kirk Truscott: Anadromous Division Manager



# Support, funding, and credit

## Presentation Co-authors:

Keith Wolf-CHJ Science Program Lead

Andrea Pearl- CJH Biologist



## Additional Credit to:

Pat Phillips- CJH Manager

Mike Rayton-Selective Harvest Subdivision Lead

Joe Peone- Former F&W Director

Jerry Marco- Retired Anadromous Div. Mngr.

Steve Smith- Consultant

Lars Moberand-Consultant

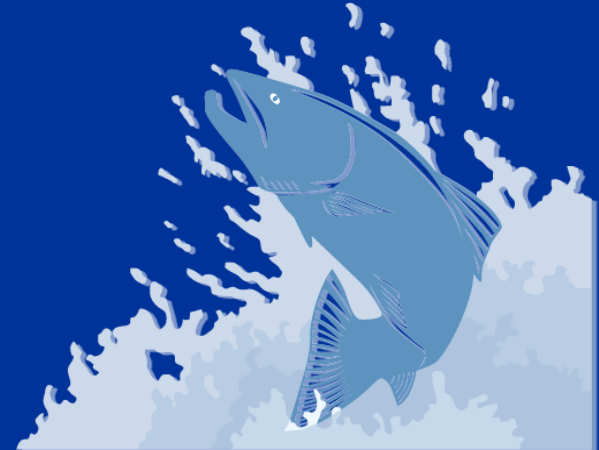


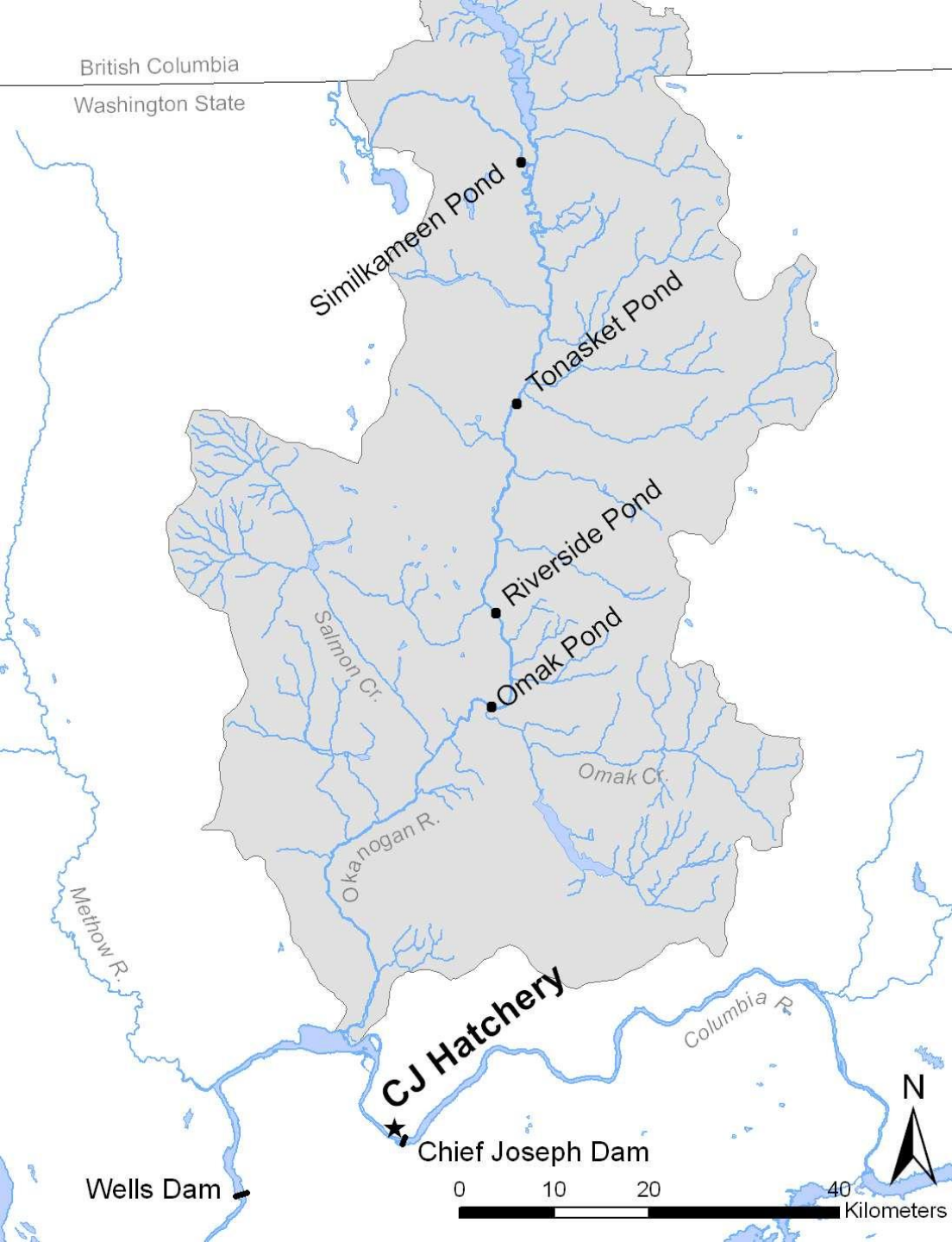
[www.colvilletribes.com/cjhp.php](http://www.colvilletribes.com/cjhp.php)



# Overview

- Chief Joseph Hatchery (CJH) Program Objectives
- CJH Production Details
- Integration With Harvest
- CJH M&E
- Hatchery Reform Principles





- The Purpose of the CJH Program is to:
  - Increase Chinook salmon harvest consistent with the natural production goals
  - Support re-colonization of habitat

- Summer/fall Chinook

- Spring Chinook



# CJH Program Commitments

- Achieve FCRPS and PUD mitigation production
- Consistent with NPCC F&W Program, Subbasin Plan
- Consistent with UCSRB/NOAA Salmon Recovery Plan
  
- Annually manage Program consistent with “Decision Rules” and “Biological Targets” by adjusting smolt production and broodstock management to meet targets for:
  - NOR escapement (Natural Origin Returns)
  - pHOS (proportion of Hatchery Origin Spawners)
  - pNOB (proportion of Natural Origin Broodstock)
  - PNI (Proportionate Natural Influence)
  - stray rates



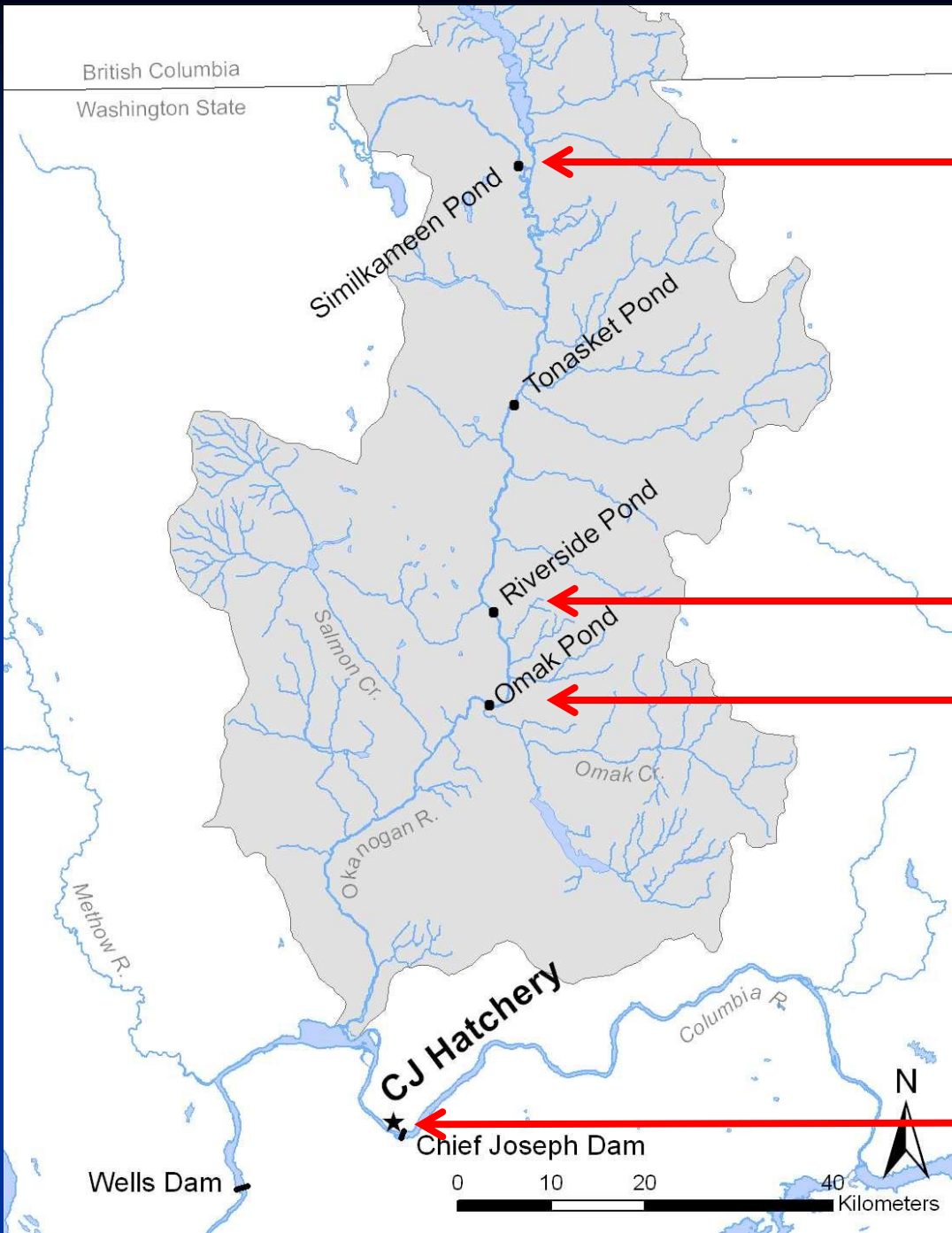
# The Goals for Okanogan Basin Summer-Fall Chinook are to:

- Increase harvest for all fishers
- Increase abundance, productivity, and temporal-spatial diversity and of naturally spawning Chinook in the Okanogan Basin
  - Improve fitness of population by maintaining high PNI
  - reduce redd superimposition
  - diversify run and spawn timing
  - seed underutilized lower river habitat
- Program size:
  - Segregated (up to 900k smolts)
  - Integrated (up to 1.1 M smolts)

# The Goals for Okanogan Basin Spring Chinook:

- Restore a harvestable, sustainable naturally spawning spring Chinook population in the Okanogan Basin
- Harvest for all fishers
- Contribute to recovery of the UCR ESU
  - 10j ESA designation for fish coming from Winthrop NFH
- Program Type and Size:
  - Segregated (700k smolts)
  - Reintroduction (200k smolts)
    - ESA section 10j “non-essential experimental” designation

# Summer / fall Chinook



250k yearlings

275k yearlings

275k yearlings &  
300k sub-yearlings

Segregated

500k yearlings &  
400k sub-yearlings



# The Dream Catcher





4/14/2012 10:32 am

Okanogan River

Columbia River  
(Wells Dam Pool)

Lake Pateros

© 2012 Google  
Image USDA Farm Service Agency

Google earth

Imagery Date: 9/13/2011

48° 05' 39.79" N, 119° 43' 06.63" W elev 784 ft

Eye alt 20304 ft

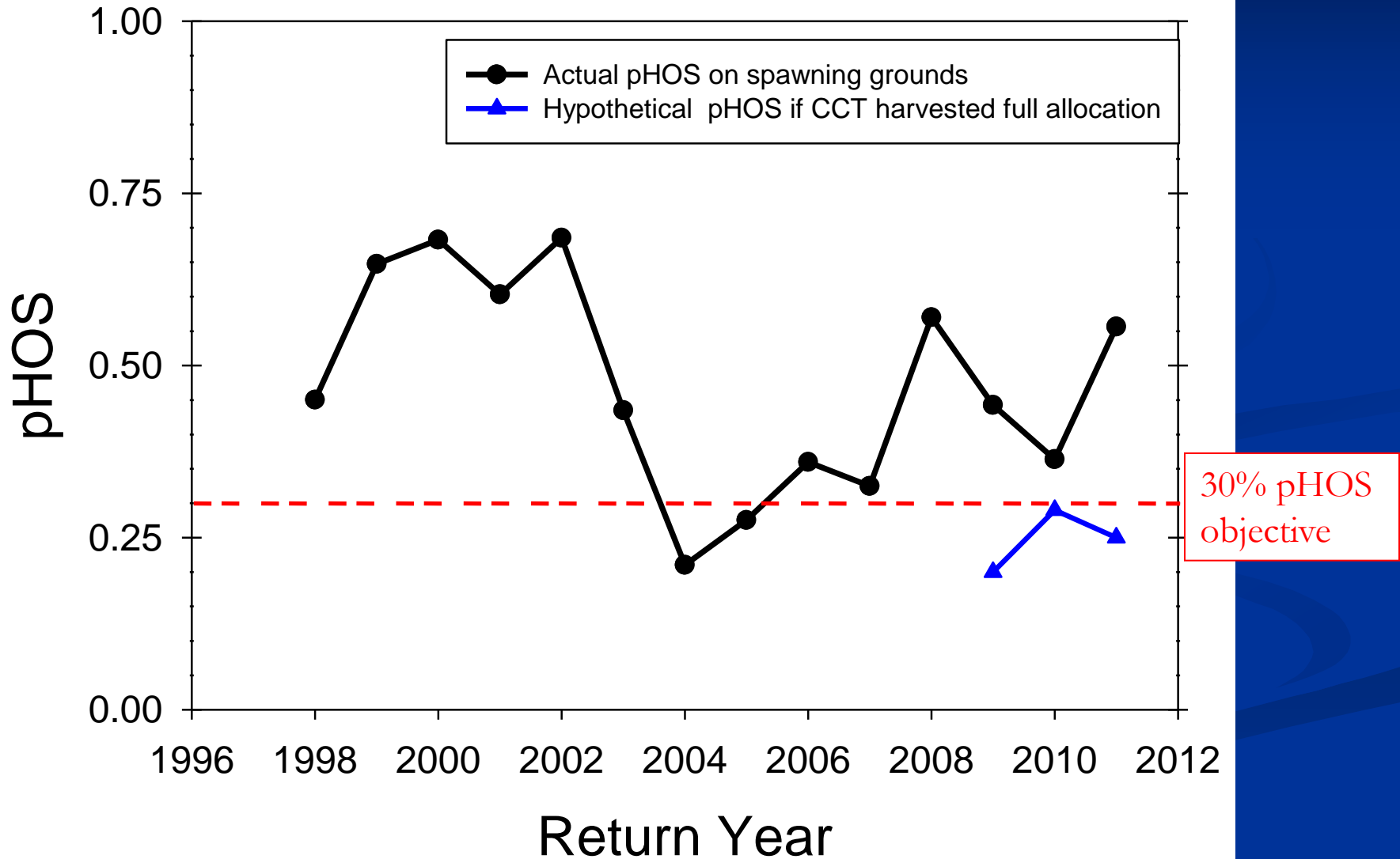


# Mark-Selective Fisheries



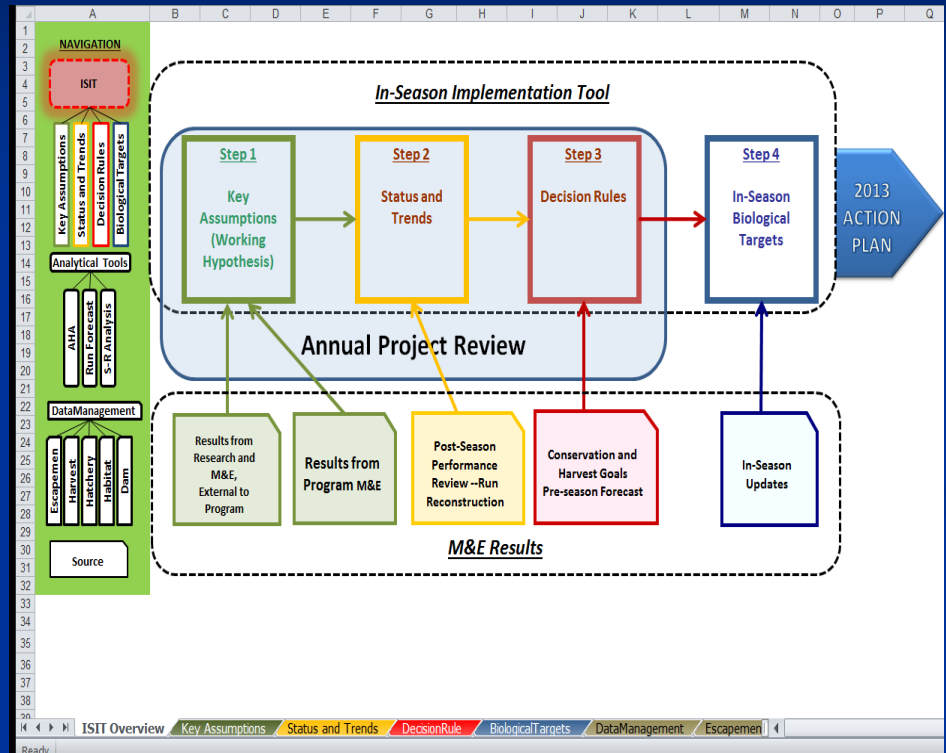


# Okanogon Summer/Fall Chinook



# CJH RM&E Data Collection

- Test key assumptions
- Implementation of decision rules
- Status and Trend



**ISIT** (In Season  
Implementation Tool)

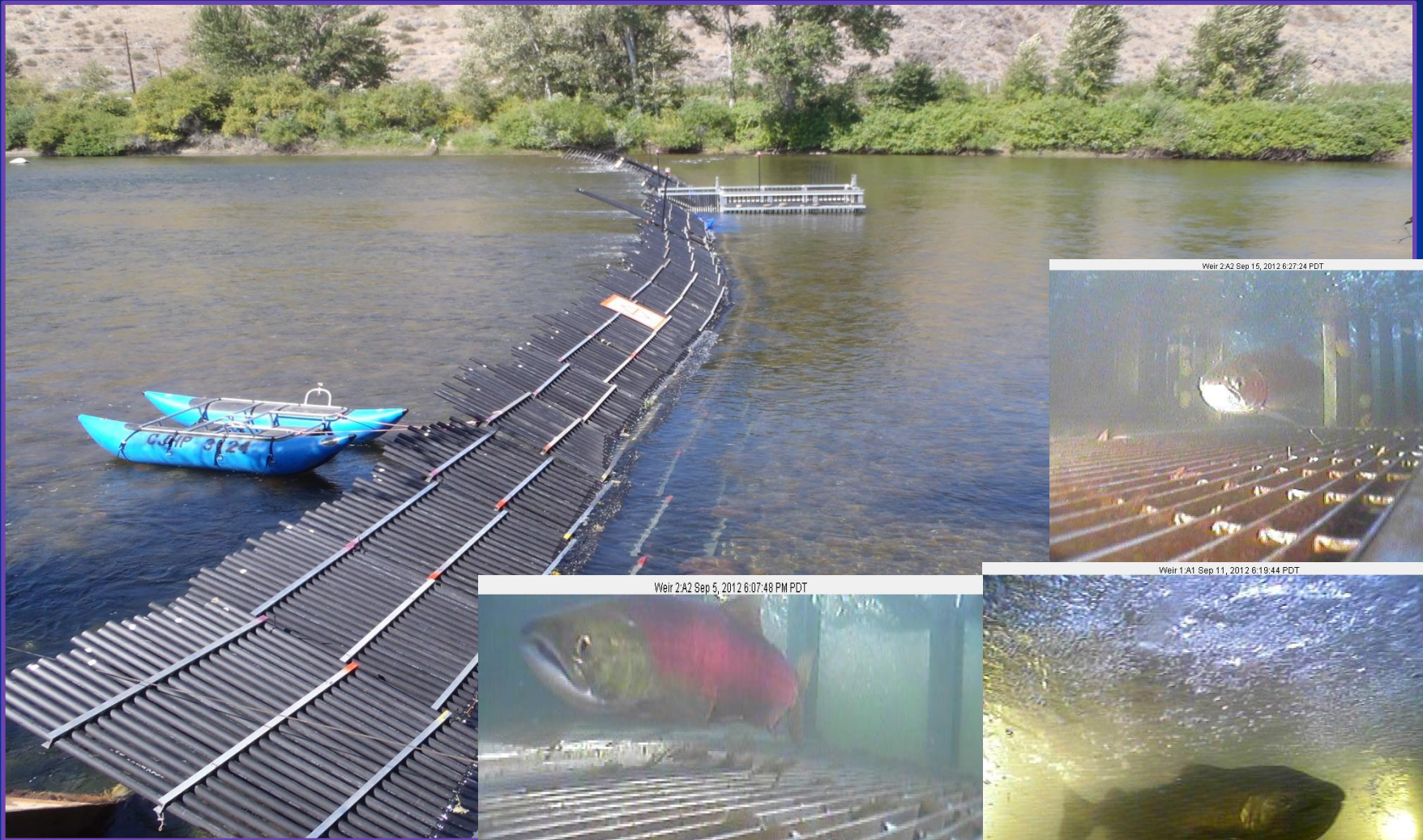
# Okanogan River Rotary Screw Traps

## Objectives

- Juvenile out migrant abundance estimates, run timing, size and survival
- Tagging natural origin summer Chinook
- Occurs from April-July



# Okanogan Adult Fish Weir



# Redds and Deads

Abundance



Distribution-  
Spatial Structure



Spawner composition  
(HvsW) = pHOS

Tag recovery, age structure, etc.

# Hatchery Reform Principles

Via the HSRG (Hatchery Scientific Review Group)

<http://hatcheryreform.us>

## ➤ Principles and Recommendations

- Develop clear, specific, quantifiable harvest and conservation goals for natural and hatchery populations within an "All H" (Hatcheries, Habitat, Harvest, Hydro) context;
- Design and operate hatchery programs in a scientifically defensible manner; and
- Monitor, evaluate and adaptively manage hatchery programs.

# Hatchery Reform Principles

Via the HSRG (Hatchery Scientific Review Group)

<http://hatcheryreform.us>

## ➤ HSRG Summary Conclusions:

- Manage hatchery broodstocks to achieve proper genetic integration with, or segregation from, natural populations;
- Promote local adaptation of natural and hatchery populations;
- Minimize adverse ecological interactions between hatchery- and natural-origin fish;
- Minimize effects of hatchery facilities on the ecosystem; and
- Maximize survival of hatchery fish.

# Conclusions: CJH-Hatchery Reform Principles

How will the CCT and co-managers achieve it?

## ■ Segregated program for harvest

- Physically and hydraulically segregated terminal location (Columbia River)
- Minimize stray rate to the natural population (< 5% of spawner composition)
- Uniquely marked (ad-clip, no wire)
- Minimal use of natural origin fish for broodstock
  - uses 1<sup>st</sup> generation returns from the integrated program

## ■ Integrated program for harvest and conservation

- There must be at least 2,000 NOR or the production will be reduced
- At less than 800 NOR the production is 0
- High pNOB (proportion of Natural Origin Broodstock) (>60%)
- Low pHOS (proportion of Hatchery Origin Spawners)(< 30%)
- PNI > 0.67 (Proportionate Natural Influence)



# Thank You



Extra slides....

## 2013

### ➤ Summer/fall Chinook:

- Segregated (900k smolts)
- Integrated (up to 1.1 M smolts)

60%

July-Oct 2013

Broodstock collected from  
Columbia and Okanogan R.

### ➤ Spring Chinook:

- Segregated (700k smolts)
- Reintroduction (200k smolts)

60%

May-June 2013

Broodstock transferred from Leavenworth NFH

Jan-Dec: NOAA: approval of HGMP,  
ESA Section 10(a)1(a) permit  
Section 10j designation

# PNI

(Proportionate Natural Influence)

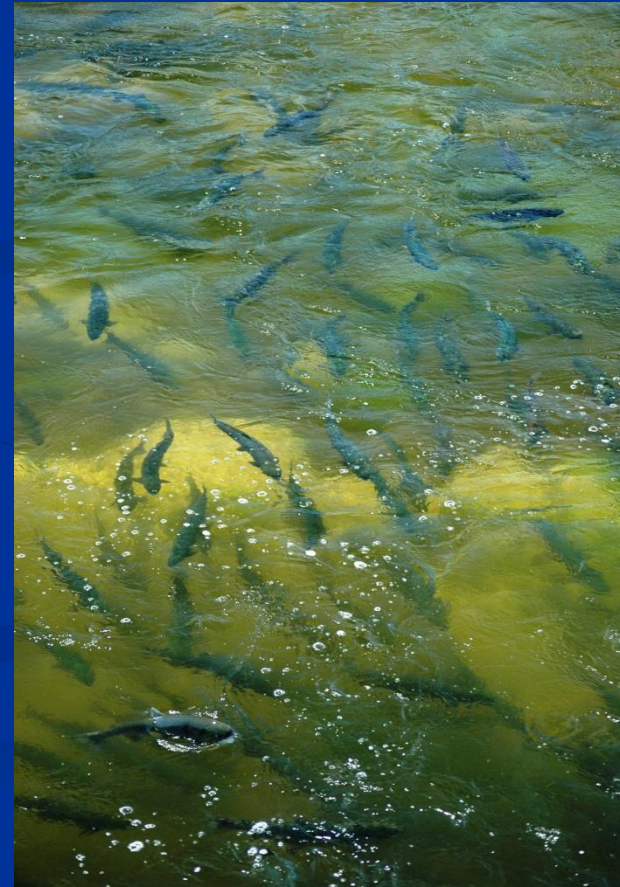
$$PNI = pNOB \div (pHOS + pNOB)$$

		pNOB (proportion of Natural Origin Broodstock)										
		1	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.0
pHOS (proportion of Hatchery Origin Spawners)	0.9	53%	50%	47%	44%	40%	36%	31%	25%	18%	10%	0%
	0.8	56%	53%	50%	47%	43%	38%	33%	27%	20%	11%	0%
	0.7	59%	56%	53%	50%	46%	42%	36%	30%	22%	13%	0%
	0.6	63%	60%	57%	54%	50%	45%	40%	33%	25%	14%	0%
	0.5	<b>67%</b>	64%	62%	58%	55%	50%	44%	38%	29%	17%	0%
	0.4	<b>71%</b>	<b>69%</b>	<b>67%</b>	64%	60%	56%	50%	43%	33%	20%	0%
	0.3	<b>77%</b>	<b>75%</b>	<b>73%</b>	<b>70%</b>	<b>67%</b>	63%	57%	50%	40%	25%	0%
	0.2	<b>83%</b>	<b>82%</b>	<b>80%</b>	<b>78%</b>	<b>75%</b>	<b>71%</b>	<b>67%</b>	60%	50%	33%	0%
	0.1	<b>91%</b>	<b>90%</b>	<b>89%</b>	<b>88%</b>	<b>86%</b>	<b>83%</b>	<b>80%</b>	<b>75%</b>	<b>67%</b>	50%	0%
	0.05	<b>95%</b>	<b>95%</b>	<b>94%</b>	<b>93%</b>	<b>92%</b>	<b>91%</b>	<b>89%</b>	<b>86%</b>	<b>80%</b>	<b>67%</b>	0%

# Current Program

(not part of CJH)

- 576k yearling smolts at Similkameen pond (PUD mitigation)
- Dropping to about 215k for BY 2012  
(Mid-C recalculation)
- Then CJH is online and we ramp up starting at about 60% year 1



# Mitigation Production Obligations

<u>Mitigation Entity</u>	<u>Spring Chinook</u>	<u>Summer Chinook</u>		<u>Total</u>
		<u>Yearling</u>	<u>Sub-yearling</u>	
Chelan PUD <sup>1/</sup>	115,000	166,569	94,570	376,139
Douglas PUD <sup>2/</sup>	33,300	48,100	49,000	130,400
Grant PUD <sup>3/</sup>	110,000	278,000	0	388,000
BPA	641,700	807,331	556,430	2,005,461
<b>Total</b>	<b>900,000</b>	<b>1,300,000</b>	<b>700,000</b>	<b>2,900,000</b>

<sup>1/</sup> - NNI Mitigation per Rock Island and Rocky Reach Hatchery Committee Statement of Agreement (12/14/11). CPUD/CCT/BPA cost-share agreement pending.

<sup>2/</sup> - NNI Mitigation Per Wells HCP Hatchery Committee Statement of Agreement (12/14/11) and DPUD/CCT/BPA cost-share agreement (11/18/11).

<sup>3/</sup> - NNI Mitigation per Priest Rapids Hatchery Sub-committee Statement of Agreement (1/25/12) and GPUD/CCT/BPA cost-share agreement (11/2/10).

# Release Locations and Tagging Plan; Long term

summer/fall Chinook full program

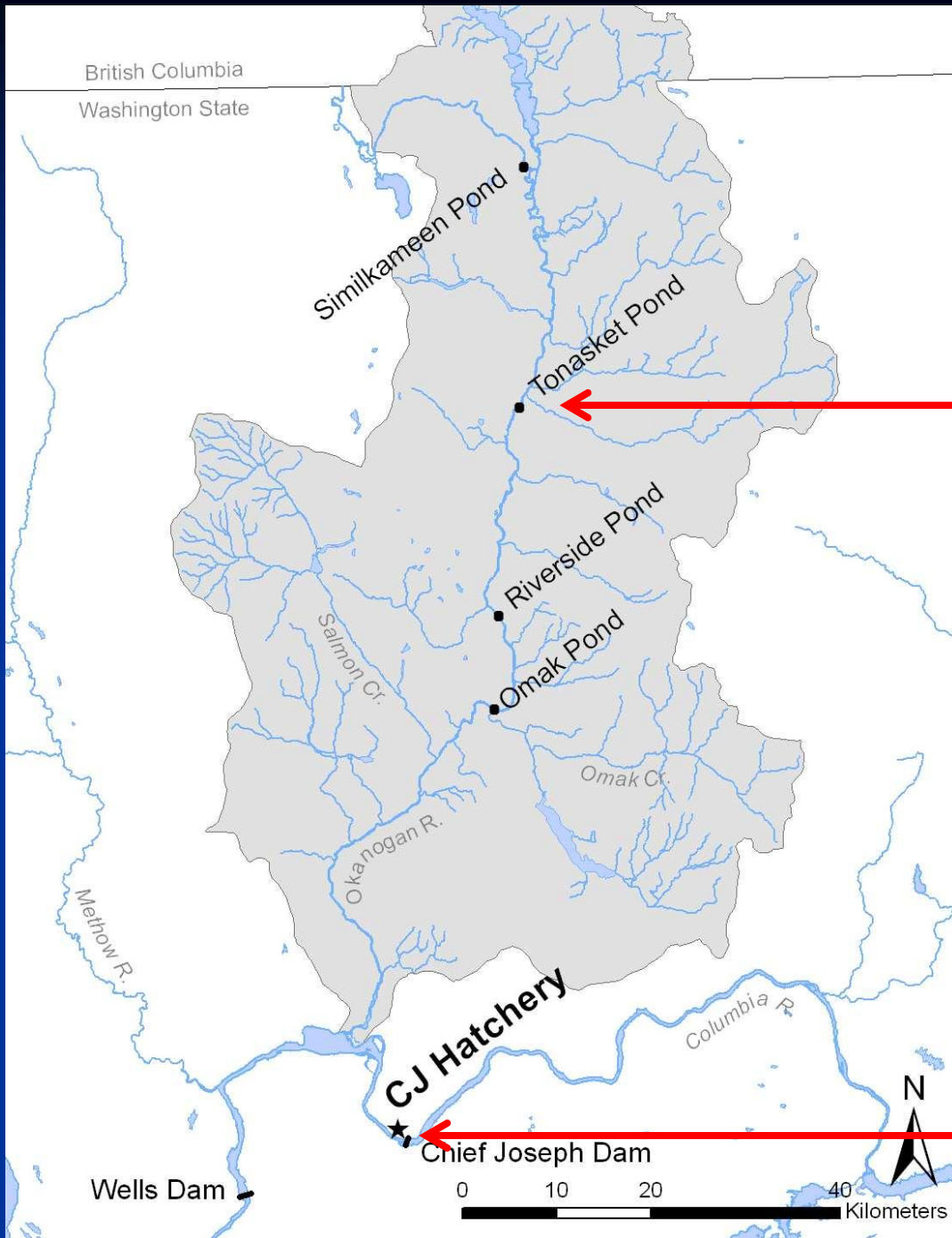
Mark Group	Target max smolt released	Life-stage released	% CWT	Adipose Fin-Clip	PIT tag
<b>Okanogan Integrated</b>	<b>1,100,000</b>				
<b>Similkameen</b>	250,000	Yearling	100%	100%	5,000
<b>Riverside Pond</b>	275,000	Yearling	100%	100%	5,000
<b>Omak Pond</b>	275,000	Yearling	100%	100%	0
	300,000	Sub-Yearling	100%	100%	5,000
<b>Chief Joseph Segregated</b>	500,000	Yearling	0%	100%	5,000
	400,000	Sub-Yearling	0%	100%	5,000
<b>Natural Origin</b>	Rotary Screw Trap and Confluence Beach Seine				up to 25,000

# Release Locations and Tagging Plan; Long term spring Chinook

<b>Mark Group</b>	<b>Target max smolt released</b>	<b>Life-stage released</b>	<b>% (#) CWT</b>	<b>Adipose Fin-Clip</b>	<b>PIT</b>
<b>Chief Joseph Segregated</b>	700,000	Yearling	29% (200k)	100%	5,000
<b>Reintroduction (10j fish from Winthrop)</b>					
Tonasket Pond	200,000	Yearling	100%	100%	5,000
<b>Natural Origin</b>	Rotary Screw Traps	Yearling	0%	0%	5,000



# Spring Chinook



Reintroduction (10j)  
200k yearlings

Segregated  
700k yearlings

# Okanogan Adult Fish Weir

- Long term it will be an adult management tool
  - Broodstock collection
  - pHOS reduction
- Current focus is on testing “pilot” weir
  - Deployment and operational logistics
  - River response
  - Fish response
    - Migration delay
    - Other species



# Conclusions...

- CCT is committed to implementing CJH consistent with hatchery reform principles.
- Purse seine is effective at collecting NOB and harvesting HOS under “normal” conditions
- CCT is still ramping up in ability to harvest using mark-selective techniques.
- Using MSF in terminal area can make a measureable difference to pHOS before CJH, however.....
- With CJH production, MSF only in terminal areas may not be enough without an efficient mainstem Okanogan weir.