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

WA/BC AFS: 20 March 2018

Colville Confederated Tribes

Casey Baldwin: Sr. Research Scientist

Support, funding, and credit

Additional credit to:

Kirk Truscott- Anadromous Division Mngr.

Pat Phillips- former CJH Manager

Mike Rayton-Selective Harvest Subdivision Lead

Andrea Pearl- CJH M&E Lead Biologist

Randy Friedlander-CCT F&W Director

Joe Peone- Former CCT F&W Director

Jerry Marco- Retired Anadromous Div. Mngr.

Steve Smith- Consultant

D.J. Warren and Associates, Inc.

Lars Mobrand-Consultant

Many others……

Bonneville Power Administration

Overview

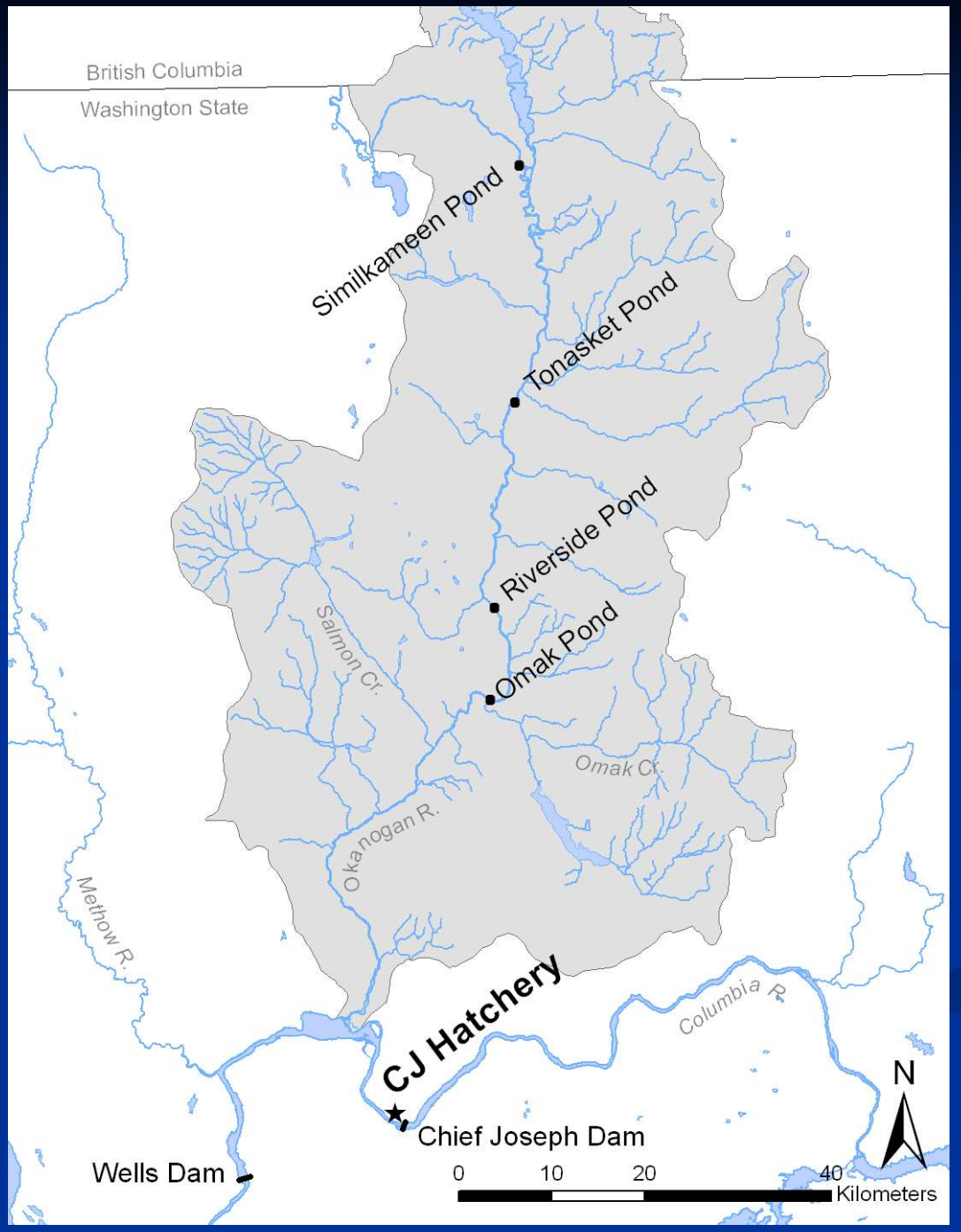
- Hatchery reform principles (general)
- CJH production details and approach
- Harvest and hatchery integration
- Population performance

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.


Washington State and
the Okanogan Basin


British Columbia
Washington State
Similkameen Pond
Tonasket Pond
Riverside Pond
Omak Pond
Salmon Cr.
Omak Cr.
Okanogan R.
Methow R.
Columbia R.
CJ Hatchery
Chief Joseph Dam
Wells Dam
N
0
10
20
40
Kilometers

- 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

The Goals for Okanogan Basin Summer-Fall Chinook Population:

Conservation or Natural Production Goals:

- At least 7,500 total spawners and 5,250 natural origin spawners
- Increase temporal and spatial diversity of spawning/rearing
- High PNI (>0.67), low pHOS (<0.3) so that the natural environment is driving adaptation

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

Timeline

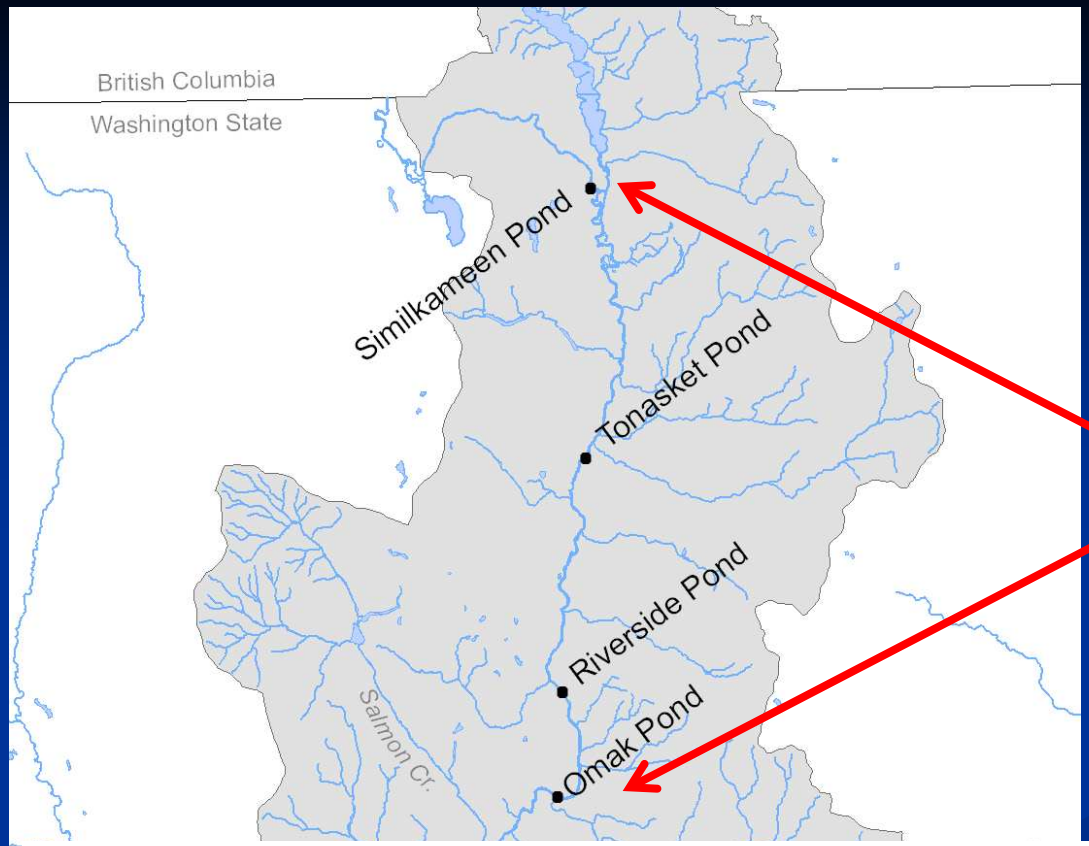
- 1989-present: (Similkameen Pond program)(PUD mitigation)
- 2001: Began planning and NPCC/BPA processes for CJH
  - Several HSRG members on the planning team
- 2008: Began testing purse seine MSF

  HGMP approved
- 2010: Testing 'local' brood collection (purse seine)

  NPCC/BPA 3 step process complete, began construction
- 2012: 100% local brood collection
- 2013: Construction complete/ribbon cutting

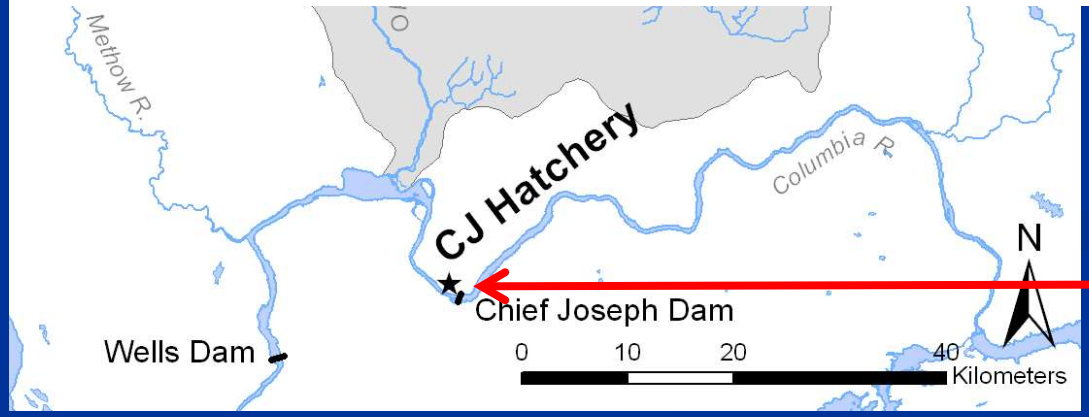
  First official CJH brood collection
- 2014: First release of segregated subyearlings from CJH
- 2017: First year of adult returns (4 yr olds)

Summer /fall Chinook



Integrated
800k yearlings
300k subyearlings

Mid-river acclimation sites added to spread out spawning and increase use of under-utilized potential habitat in lower reaches



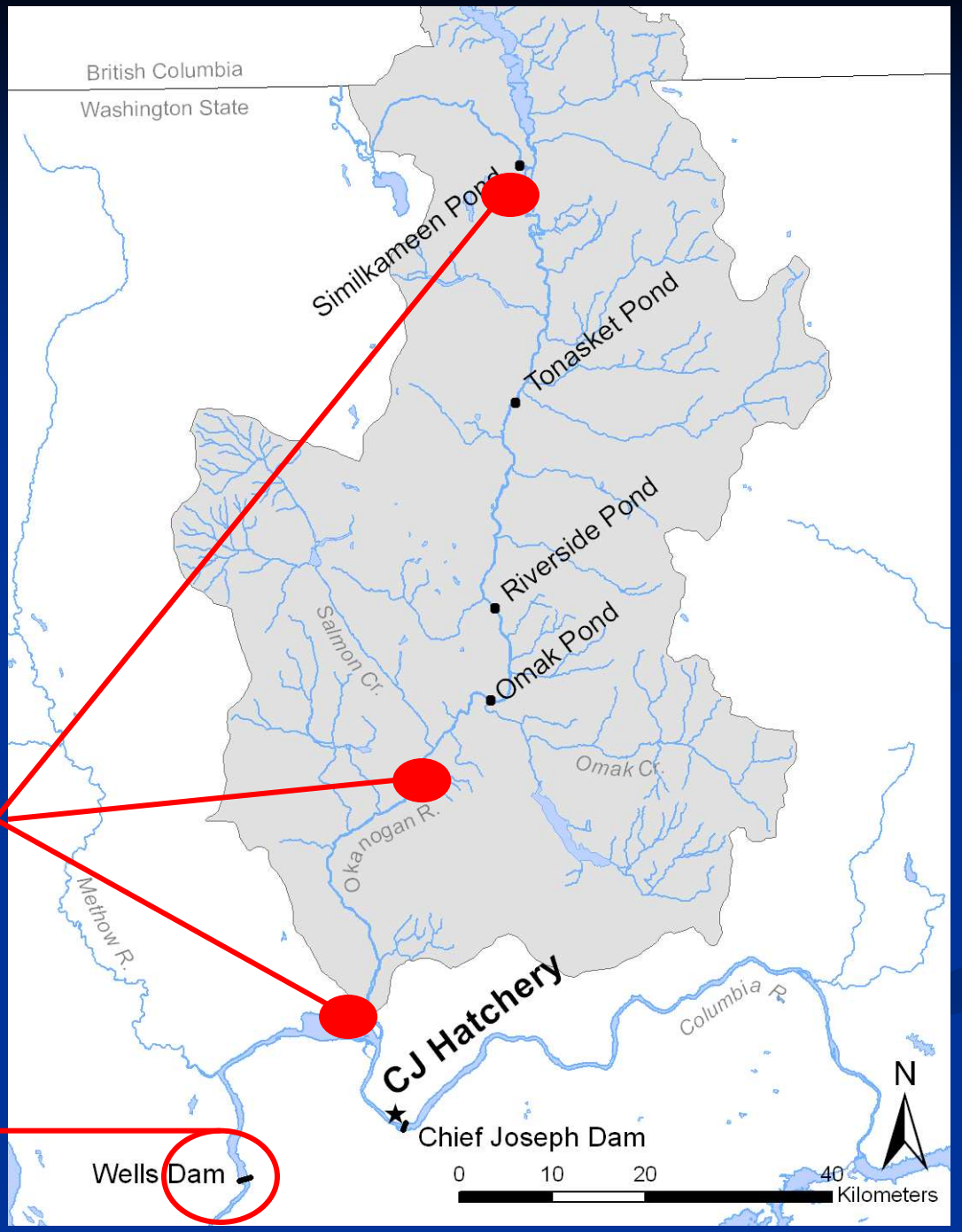
Segregated
500k yearlings &
400k sub-yearlings

Key program change:

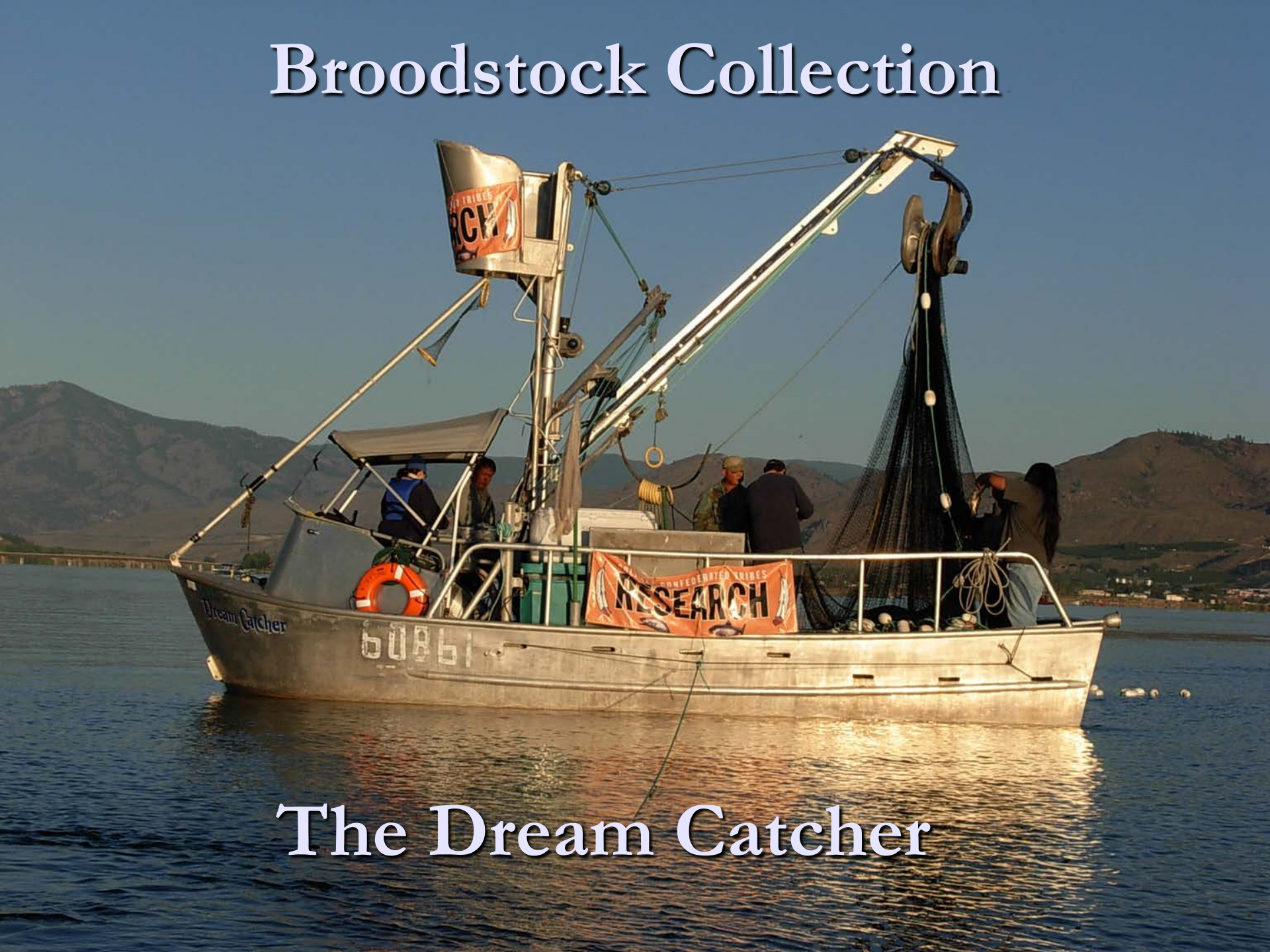
Broodstock collection location

New program collects fish at the mouth of the Okanogan and in the Okanogan

Old program used MeOk composite from Wells Dam



Broodstock Collection



The Dream Catcher

Brood collection and mark-selective fishing

Natural origin fish are collected for brood or released, hatchery origin fish are collected for brood or harvested

Okanogan Adult Fish Weir

Integrated Program

pNOB Goal: 30-100% ; 5 yr mean = 89%

Segregated Program

- Stepping stone, uses returns from the integrated program. (~75-80%)

Biological Targets

(5 yr running mean)

- > 0.67 PNI
- < 0.30 pHOS
- > 5,250 NOS (>7500 total spawners)

Or else?

- More aggressive/additional MSF
- The integrated program shrinks or ceases
  - < 2,000 NOS the brood collection is reduced
  - 800 NOS = no integrated program

Mark Selective Fisheries

Tribal purse seine, tangle nets, hoop and dip nets, hook and line

Adipose fin clip allows for release of natural origin fish and harvest of hatchery fish

Sport Fishing

Sport fishery transitioned into mark-selective as CJH came online

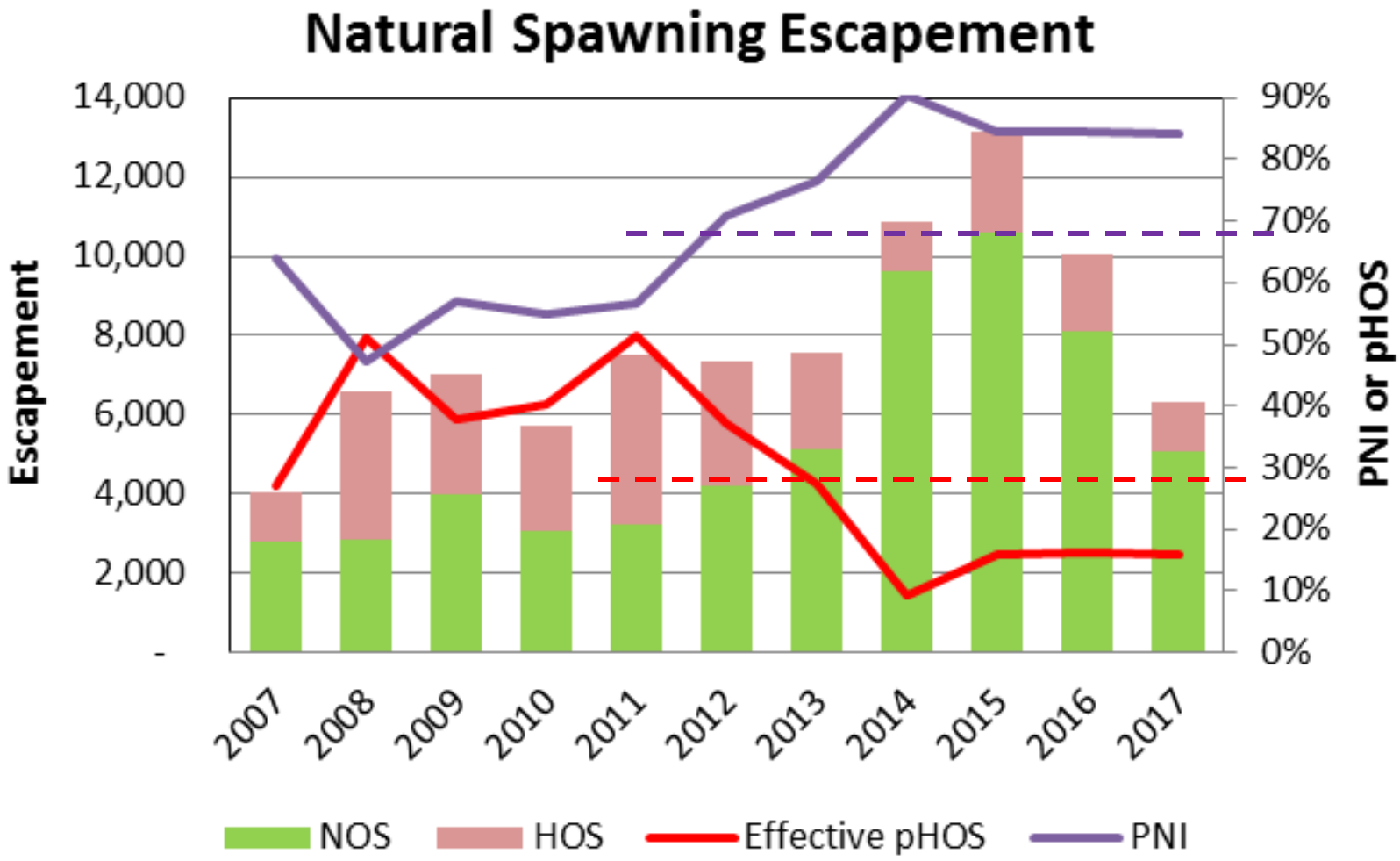
200?-2010 2 adult salmon per day
2011-2012 3 total, only 1 wild
2013-2016 3 hatchery only
2017 Started out hatchery only then added 1 wild mid-season

Combined Terminal Fisheries 2011-2017

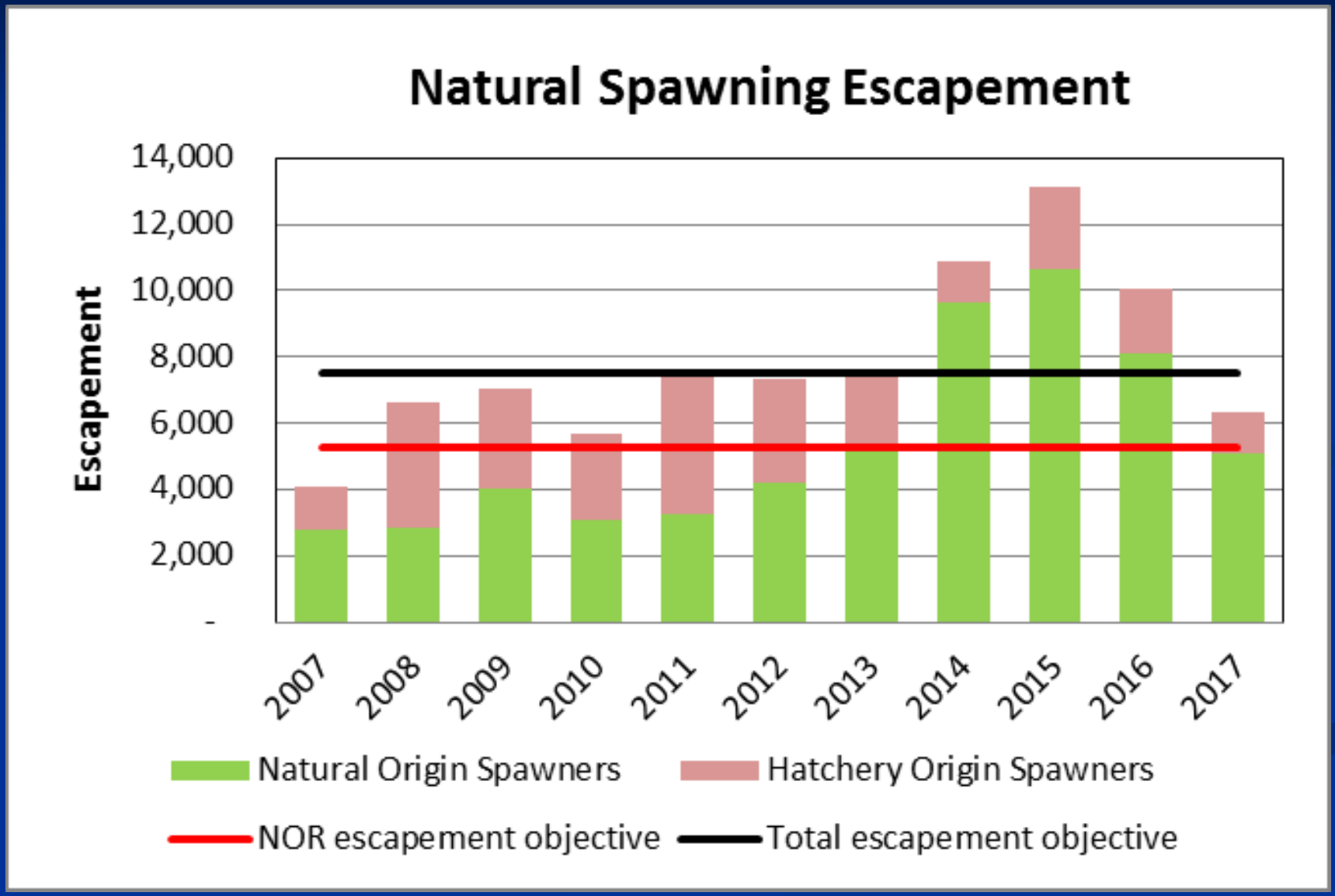
Released >25,000 wild Chinook for spawning

Harvested > 20,000 hatchery fish to reduce pHOS

Recent Performance
(abundance, diversity)

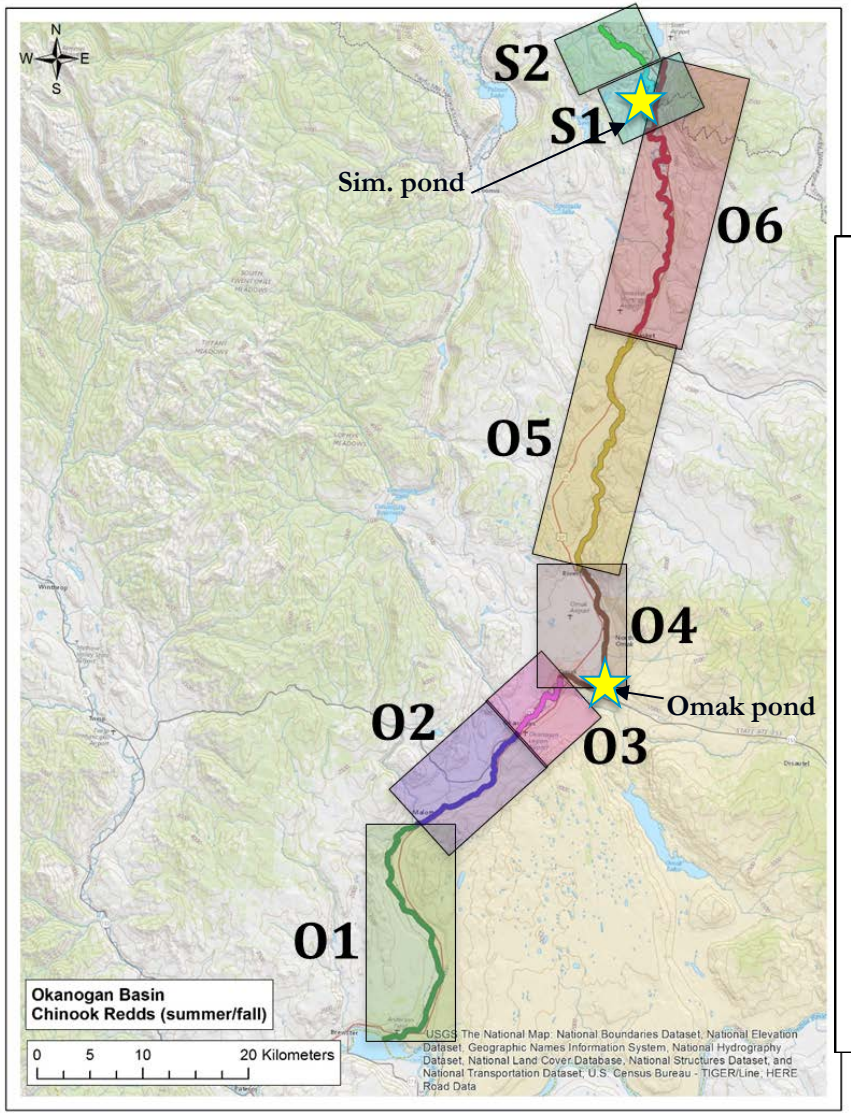


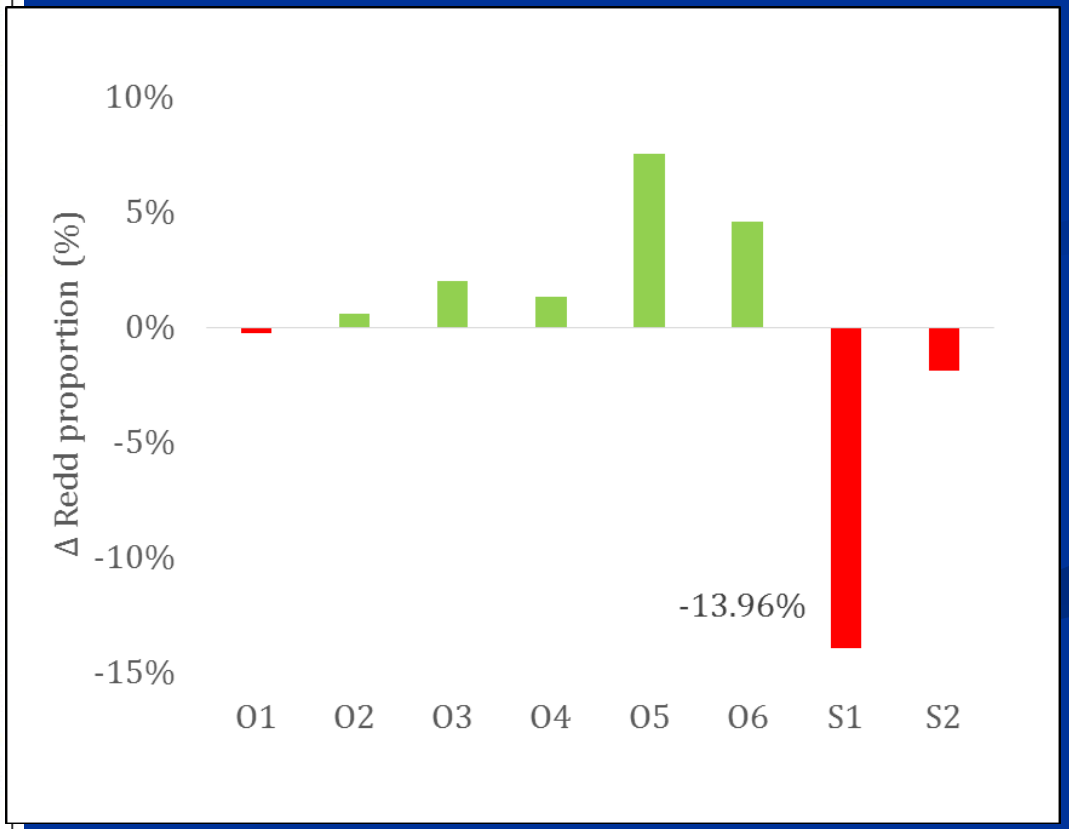
Population Performance



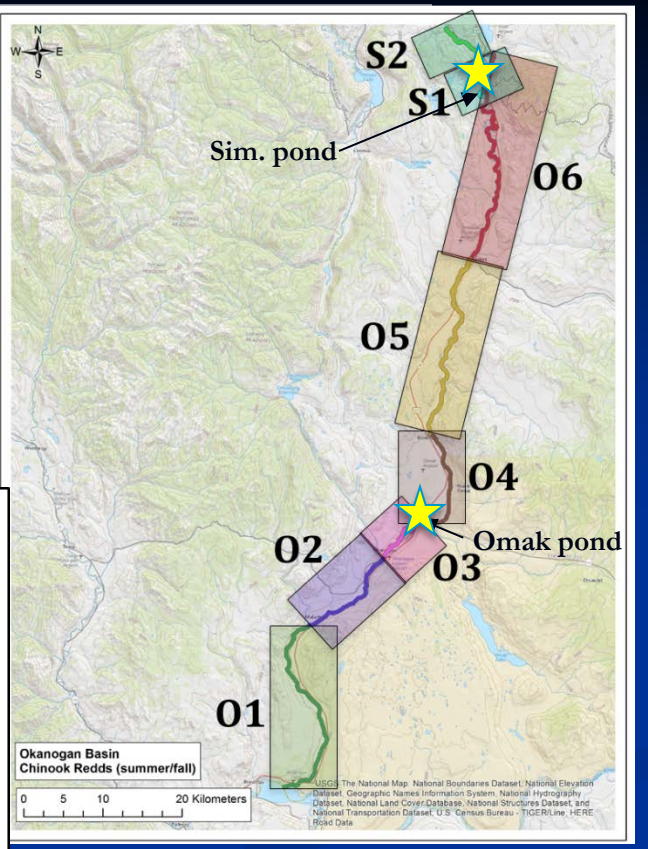
Spatial distribution,

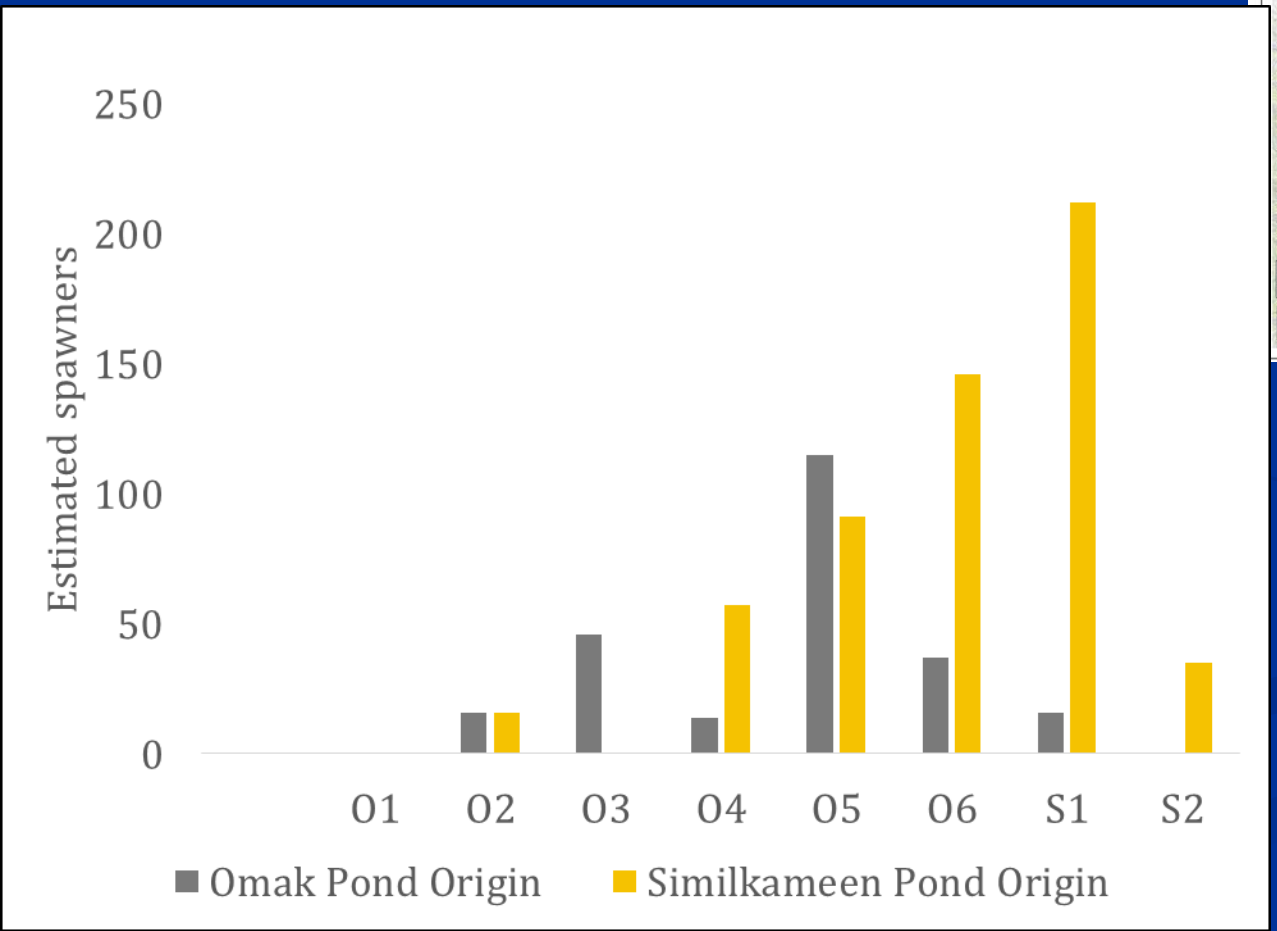
2017 compared to avg





Spatial Distribution (Omak pond) homing fidelity





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 1st generation returns from the integrated program
- Integrated program for harvest and conservation
  - There must be at least 2,000 wild spawners production will be reduced
  - At less than 800 wild spawners the production is 0
  - Change brood collection points and maintain high % wild fish in broodstock (89% pNOB)
  - Low % hatchery fish on spawning grounds (<20% pHOS)
  - The RIVER has the majority of influence on adaptation, NOT the HATCHERY

"The regulation of the times, methods, and apparatus of the fisheries should be such as to assure the largest opportunity practicable for reproduction under natural conditions."

"Artificial propagation should be invoked as an aid and not as a substitute for reproduction under natural conditions"

Marshall McDonald 1894
U.S. Commissioner of Fish and Fisheries

Thank you

https://www.cct-fnw.com/salmon-hatchery/

BONNEVILLE POWER ADMINISTRATION

P.U.D. CHELAN COUNTY

Grant County PUBLIC UTILITY DISTRICT

DOUGLAS COUNTY PUD

Extra slides

Terminal Sport Fishery
(Catch area 545 Wells Dam to CJD)

Year	Natural-origin fish released	Hatchery-origin fish harvested
2011	20	272
2012	557	1,265
2013	2,453	1,988
2014	2,258	1,000
2015	2,782	1,371
2016	2,017	1,468
2017	519	910
Total	10,606	8,274

Terminal Tribal Fisheries

Year	Natural-origin fish released	Hatchery-origin fish harvested
2011	133	648
2012	1,029	2,528
2013	1,483	2,344
2014	3,722	1,455
2015	5,941	3,472
2016	1,985	1,252
2017	1,563	651
Total	15,856	12,350