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November 10, 2020

### MEMORANDUM

**TO:** Fish and Wildlife Committee members

**FROM:** Mark Fritsch

**SUBJECT:** *Review of Revised Master Plan for Yakima Subbasin Summer- and Fall-run Chinook, Coho Salmon and Steelhead, associated with Project #1988-115-25, Yakima River Design and Construction- Yakima/Klickitat Fisheries Project (YKFP).*

**PROPOSED ACTION:** Council staff is seeking the Fish and Wildlife Committee's recommendation on the *Revised Master Plan for Yakima Subbasin Summer- and Fall-run Chinook, Coho Salmon and Steelhead* (Revised Master Plan). Staff recommends that the Fish and Wildlife Committee recommend the Council approve the Revised Master Plan subject to the requirement that the Yakama Nation provide an update to the Council on the segregated Coho program and the two Chinook programs (integrated summer/fall Chinook program and segregated upriver bright fall Chinook program) once funding, environmental compliance and permitting have been secured and prior to implementation. In addition, components of the transition phase of the integrated summer Chinook program are dependent on future reviews and Council recommendations.

**SIGNIFICANCE:** On October 24, 2019, the Yakama Nation (YN) submitted a *Revised Master Plan for Yakima Subbasin Summer- and Fall-run Chinook, Coho Salmon and Steelhead*, associated with Project #1988-115-25, *Yakima River Design and Construction- Yakima/Klickitat Fisheries Project (YKFP)* to the Council for

approval. The Revised Master Plan is a revision of the initial and previously reviewed 2012 Master Plan, addressing the proposed Coho and summer-and fall-run Chinook programs as well as proposed facility modifications to Prosser Hatchery to support the Coho and Chinook programs and the ongoing Wild Steelhead Kelt Reconditioning program.<sup>1</sup> This Revised Master Plan builds upon the elements and needs initially addressed in the 2012 Master Plan for the integrated<sup>2</sup> Coho program at the Melvin R. Sampson Hatchery.<sup>3</sup> The Yakama Nation's [October 2019 Cover Letter](#) provides a succinct summary of the ISRP and Council reviews since 2012 that led up to this Revised Master Plan.

### **BUDGETARY/ECONOMIC IMPACTS**

Capital funds totaling \$41,486,786 are identified in the Revised Master Plan for the proposed construction at Prosser Hatchery and the associated acclimation sites. Currently, \$4,525,632 is reserved to replace John Day Mitigation infrastructure to meet the Columbia River Inter-Tribal Fish Commission (CRITFC) Zone 6 Fisheries CRITFC Accord Project commitment under Project #2008-527-00, *John Day Reprogramming and Construction*.<sup>4</sup> This project, which is a subset of the larger Revised Master Plan, is in the pre-design planning phase. At this time, Bonneville Power Administration does not have a capital budget funding commitment for the remaining programming proposed in the Revised Master Plan.

### **BACKGROUND**

The Yakima River originates at the outlet of Lake Keechelus and runs for 214 miles in a southeasterly direction to its confluence with the Columbia River at Richland. With its tributaries, the Yakima River drains about 6,150 square miles or 4 million acres. The headwaters of the Yakima Subbasin originate in the high Cascade Mountains, with numerous tributaries draining subalpine regions within the Snoqualmie National Forest and the Alpine Lakes, Norse Peak, and William O. Douglas Wilderness areas. Major tributaries include the Kachess, Cle Elum and Teanaway rivers in the northern part of the subbasin. The Swauk, Taneum, Umtanum, Manastash, and Wenas creeks drain into the upper and middle Yakima River. The Naches River and Ahtanum, Toppenish, and Satus creeks join the Yakima in the middle subbasin from the west.

Major cities in the Yakima Basin include Ellensburg, Yakima, Prosser, and Toppenish. Important facilities to fish and wildlife projects in the subbasin include Prosser Hatchery on the mainstem Yakima River (RM 47), Marion Drain Hatchery (located 13.8 miles upstream of the mouth of a 20.3 mile-long irrigation drain that enters the Yakima River

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<sup>1</sup> The Kelt Reconditioning program was reviewed and supported in 2016 (Project #2007-401-00 and Project #2008-458-00).

<sup>2</sup> Integrated – returning fish intended to spawn in the wild to support restoration efforts (use appropriate, local, natural-origin brood source to maximum extent possible)

<sup>3</sup> As reviewed and supported 2013 – 2018.

<sup>4</sup> Project #2008-527-00, *John Day Reprogramming and Construction*. As reviewed and supported 2020.

at RM 77), Sunnyside Dam (RM 103.8), Roza Dam (RM 128), Melvin R. Sampson Hatchery (RM 163) and Levi George Hatchery (RM 184).

The Yakima subbasin supports at least 48 species of anadromous, resident native, and exotic fish. Historically, 500,000-900,000 adult salmon and steelhead returned to the Yakima Subbasin annually. This total was composed of spring, summer, and fall Chinook, coho, sockeye, and steelhead.

The National Marine Fisheries Service listed summer steelhead in the Mid-Columbia ESU, which includes the Yakima Subbasin, as threatened under the ESA. Endemic coho stocks were extirpated by 1980, although naturalized production resulting from hatchery releases has been documented since 1989. Endemic summer Chinook were last observed in the early 1970s and are now considered extirpated. Reintroduction of summer-run Chinook began in 2009, transferring Wells stock fish from facilities in the Upper Columbia. Sockeye were historically abundant but were extirpated following the completion of impassible storage dams below all-natural rearing lakes in the late teens and early 1920s. Reintroduction of sockeye began in 2009 by transporting adults from the Columbia to Lake Cle Elum.

The U.S. Fish and Wildlife Service is responsible for Bull trout, an ESA-threatened species, and Pacific lamprey, which is a category 2 candidate species, and both are present in the Yakima Basin. Efforts are underway to protect and recover these species.

The Marion Drain facility in the Yakima Basin supports a sturgeon enhancement effort targeting mid-Columbia reaches.

#### I. Major Project Review, Procedural Summary (The Three-Step Process)

On October 24, 2019 the Council received a *Revised Master Plan for Yakima Subbasin Summer- and Fall-run Chinook, Coho Salmon and Steelhead*, associated with Project #1988-115-25, *Yakima River Design and Construction-Yakima/Klickitat Fisheries Project (YKFP)*. As noted above, the Revised Master Plan is a revision of the 2012 Master Plan previously reviewed, addressing the proposed Coho and summer-and fall-run Chinook programs as well as proposed facility modifications to support the Coho and Chinook programs and the ongoing Wild Steelhead Kelt Reconditioning program. Further, this submittal addressed issues raised in previous ISRP reviews (see ISRP documents [2013-8](#) and [2018-6](#)).

On February 13, 2020 the ISRP provided their preliminary review of the Revised Master Plan ([ISRP document 2020-3](#)). The ISRP requested additional information (a "response request"), specifically seeking responses to 13 primary issues. On August 7, 2020 the Council received a [response from the Yakama Nation](#) addressing the 13 primary issues and on September 24, 2020 the ISRP provided its final review ([ISRP document 2020-9](#)).

## II. Revised Master Plan

The Revised Master Plan continues to build on the comprehensive nature of the original 2012 Master Plan, describing and addressing a segregated<sup>5</sup> Coho program and two Chinook hatchery programs (integrated<sup>6</sup> summer/fall Chinook program and segregated upriver bright program) in the Yakima Subbasin, and further addresses necessary upgrades to the existing Prosser Hatchery to support these programs. The Prosser Hatchery has been operating as an experimental facility with temporary structures since the initial operations began in the mid-1990's. The Revised Master Plan also addresses the proposed facility upgrades necessary for the Wild Steelhead Kelt Reconditioning program.

The primary purpose of the proposed Coho and Chinook programs is to increase harvest of Coho and Chinook salmon in both the mainstem Columbia River and Yakima River. These programs will also help meet the cultural objectives for ceremonial and subsistence use.

In addition, the summer/fall Chinook programs addressed in the Revised Master Plan are designed to meet the conservation objectives of reestablishing locally adapted populations upstream of Prosser Dam and increasing the spatial and temporal diversity of the naturally spawning populations.

The purpose of the Wild Steelhead Kelt Reconditioning program, which was previously reviewed and received a recommendation to proceed from the Council, is to increase the number of repeat spawners in the Yakima River and increase the overall number of naturally-spawning steelhead in the system.

### *Coho*

The emphasis of the Revised Master Plan is to implement a segregated harvest program downstream of Prosser Dam using facilities at Prosser Hatchery. The segregated Coho program will continue to reside at Prosser Hatchery and will have an on-station smolt release goal of 500,000 fish. Segregated program fish will be released into the hatchery outflow stream that flows into the Yakima River about ¼ mile below Prosser Dam. With the modifications being proposed at the Prosser Hatchery, the major change from the current program is that all fish culture activities will occur in-basin.

### *Summer/Fall Chinook*

The Revised Master Plan proposes two programs for Yakima summer/fall Chinook. The first program, the Yakima Integrated Summer/Fall Chinook Program, would release fish into the Yakima and Naches Rivers upstream of Prosser Dam. The integrated summer/fall Chinook program would be implemented in two phases, a transition phase

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<sup>5</sup> Segregated – returning fish intended for harvest (use local brood source if possible)

<sup>6</sup> Integrated – returning fish intended to spawn in the wild to support restoration efforts (use appropriate, local, natural-origin brood source to maximum extent possible)

and a long-term phase. The integrated summer Chinook program would initially be conducted at Prosser Hatchery during the transition phase, followed by the long-term phase at an upstream hatchery and new acclimation sites on the upper Yakima and Naches Rivers. While the Revised Master Plan includes preliminary design and cost estimates for these new facilities, components of the long-term phase will be described in more detail in future plans and reviews. The fall component of the integrated summer/fall Chinook program would be conducted at Prosser Hatchery.

The second program, the Yakima Segregated Upriver Bright (URB) Harvest Program will continue to release approximately 1.9 million URB fall Chinook juveniles from Prosser Hatchery.

As proposed, these programs would increase the number of summer-run Chinook subyearlings released from 200,000 up to 1,000,000 annually (long-term release goal). The integrated fall-run Chinook program is new and would release up to 500,000 subyearlings. The segregated URB fall Chinook program would continue to release up to 1.9 million juveniles (1.7 million subyearlings and 210,000 yearlings<sup>7</sup>). As a result, the total release of summer-run and fall-run Chinook juveniles will be up to 3.4 million fish. This is an increase from current juvenile releases, which have averaged 2.3 million since 2009.

#### *Facilities for Coho, Chinook and Kelt*

To support the proposed Chinook and Coho programs and achieve the production goals the Yakama Nation proposes to modernize the existing Prosser Hatchery. To achieve the fall Chinook production goals the proposed improvements include the following major elements, which will also be shared by the Coho program:

- New high capacity well to provide groundwater supply
- Modifications to the degassing head boxes for groundwater treatment and supply to incubation and adult holding
- Incubation isolation facility for out-of-basin eggs, with effluent disinfection
- New 25,600 sf fall Chinook rearing building to contain twelve 30 foot diameter circular tanks and six PRAS<sup>8</sup> modules
- New 17,200 sf Coho rearing building to contain eight 30-foot diameter circular tanks and four PRAS modules
- New concrete adult holding ponds and covered spawning area
- New 2,400 sf administration building and parking area
- Site paving and utility upgrades

The transition phase of the summer Chinook program at Prosser would not overlap with peak adult holding and rearing for the fall Chinook and Coho programs and would utilize

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<sup>7</sup> The 210,000 yearling program was added to Prosser as part of expanded production in 2017. These releases were designed to meet the Total Adult Production goal for the John Day Mitigation Program funded by the U.S. Army Corp of Engineers.

<sup>8</sup> partial recirculating aquaculture systems

available water supply and holding capacity except for incubation. The proposed fall Chinook building (identified above) has adequate capacity to accommodate the summer chinook transition program. However, a total of four additional double stacks of vertical tray incubators will need to be added to the existing Prosser incubation room, along with a small amount of associated supply and drain piping for the summer Chinook program transition phase. The remainder of the proposed improvements for the summer Chinook transition phase include the new portable acclimation facilities for 250,000 fish each, at release sites on the Naches and upper Yakima Rivers. Each acclimation site would have the following major components:

- A surface water intake with duplex pumps to deliver 416 gpm of surface water supply
- A 24-inch diameter degassing column and headbox
- Two 20-foot diameter dual drain circular tanks, each to be loaded with 125,000 sub-yearlings
- Drain piping and outfall to river, also configured for fish release
- Monitoring and alarm system
- Predator protection
- Feed storage
- A gravel pad for the tanks and site access improvements as needed

### *Kelt*

Implementation of the Revised Master Plan would also include upgrades to the existing kelt reconditioning facilities at Prosser Hatchery. As described in the Revised Master Plan, the proposed facility upgrades would also accommodate artificial reconditioning of up to 1,500 kelt (post-spawned) steelhead. The proposed improvements include:

- New 5,200 sf Kelt Reconditioning building to contain four 20-foot diameter circular tanks, three 10-foot quarantine tanks, and two 75% PRAS modules

### **ANALYSIS**

In its final review, the ISRP found that the Revised Master Plan, including the response information provided by the Yakama Nation, met scientific review criteria.<sup>9</sup>

The ISRP also stated in their review the following:

*The Yakama Nation prepared a comprehensive and fairly thorough Master Plan for its Yakima Subbasin summer/fall Chinook salmon and coho salmon hatchery programs and found that the proposal builds upon the existing hatchery system by improving the proposed hatchery infrastructure and modifying the program goals and objectives to better fit the needs of the Yakama Nation while also addressing the scientific principles in the Council's fish and wildlife program. The*

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<sup>9</sup>Because the Kelt Reconditioning program was reviewed previously and found to meet scientific review criteria, the ISRP did not again review that component of the Revised Master Plan. See ISRP documents 2014-9 and 2016-12 for previous reviews.

*goal of the proposed Yakama Nation program is to provide harvest opportunities for tribal members and others, while also developing sustainable natural populations of summer/fall Chinook salmon and coho salmon in the upper Yakima River Subbasin.*

The multifaceted and comprehensive nature of the Revised Master Plan is impressive. Not only did the Yakama Nation usher through the Melvin R. Sampson Coho hatchery, addressing previous science review issues as requested for that program, they pursued the development needs for both the segregated component of Coho and integrated/segregated summer-and-fall Chinook programs. Additionally, they incorporated facility upgrades necessary for the ongoing Wild Steelhead Kelt Reconditioning program.

The experimental nature of the efforts over the past 23 years does not conform to the norm for the development of an artificial production facility in the Columbia River Basin, but, in so doing, the Yakama Nation has used existing facilities and research and monitoring to demonstrate the scientific elements of the proposed action. This is exactly what was envisioned when the feasibility studies for these life histories were approved by the Council in 1996 as part of the 15 high priority supplementation/production projects.<sup>10</sup>

Based on the ISRP review, the Council staff recommends that the Fish and Wildlife Committee recommend the Council approve the *Revised Master Plan for Yakima Subbasin Summer- and Fall-run Chinook, Coho Salmon and Steelhead*. Staff further recommends this recommendation be conditioned on the understanding that the Yakama Nation provide an update to the Council on the segregated Coho program and two Chinook hatchery programs (integrated summer/fall Chinook program, and segregated upriver bright program) once funding, environmental compliance and permitting are secured and prior to implementation. In addition, aspects associated with the transitional phase of the integrated summer Chinook program to the upper Yakima and Naches rivers will depend on future reviews and Council recommendation.

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<sup>10</sup> High Priority Project #12 - *Evaluate The Feasibility & Potential Risks of Restoring Yakama River Coho*, and #13 - *Supplement & Enhance The Two Existing Stocks of Yakama River Fall Chinook*.

# Revised Master Plan for Yakima Subbasin

## Summer- and Fall-Run Chinook, Coho Salmon and Steelhead Kelts

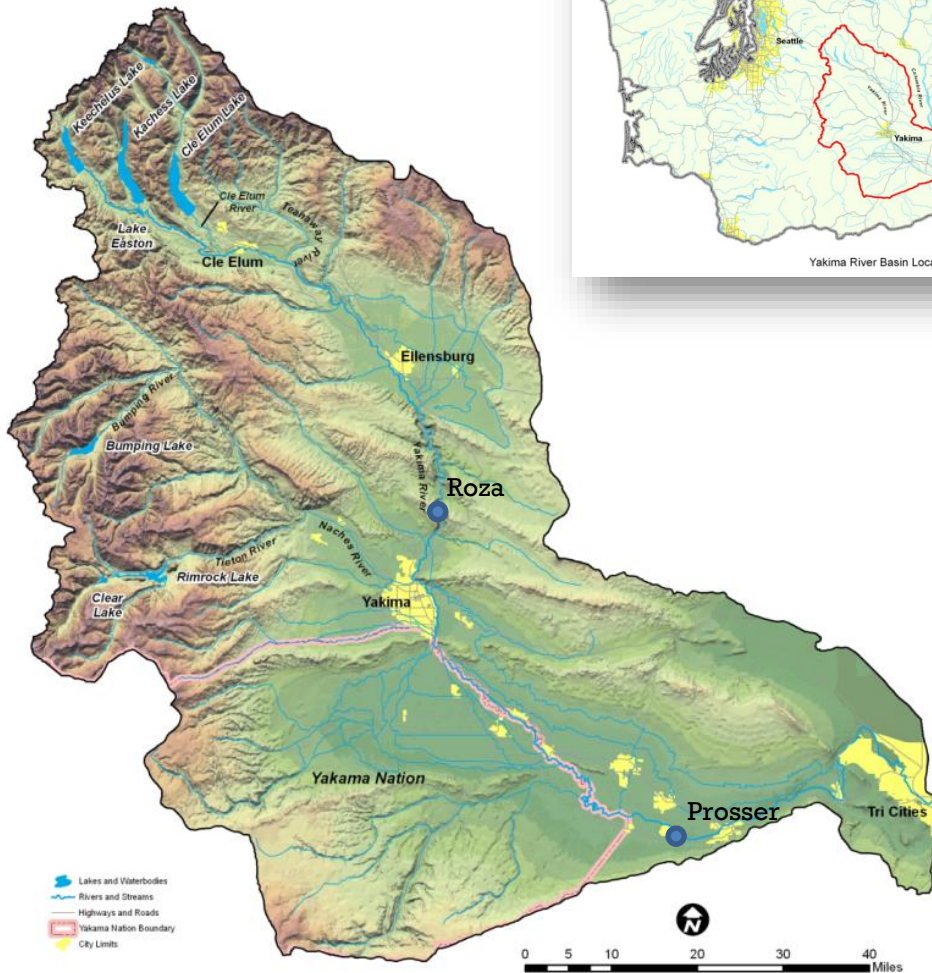
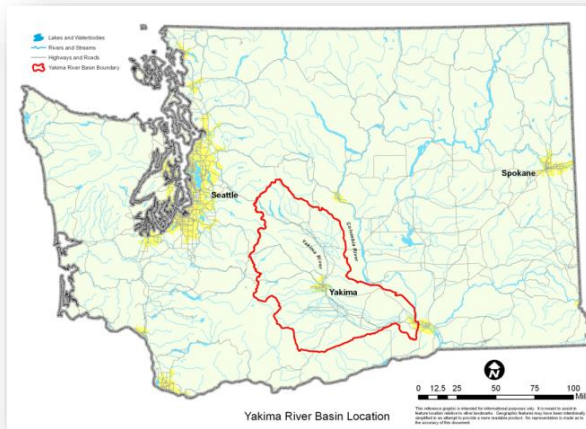
Presentation to  
Northwest  
Power and  
Conservation  
Council

Nov. 17, 2020





# Basin Overview



- Basin size = 6,155 sq. miles
- Population = 360,000
- Irrigated Area = 464,000 acres
- Economic Impacts (USDA 2012)
  - Food Processing Industry Benefits = \$1.4B
  - Agricultural Production = 1.8B
- Historically, second only to Snake River in supporting Columbia River salmon and steelhead runs

This reference graphic is intended for informational purposes only. It is meant to assist in feature location relative to other landmarks. Geographic features may have been intentionally simplified in an attempt to provide a more readable product. No representation is made as to the accuracy of this document.

# Comprehensive Yakima Restoration Strategy



## Yakima Basin Integrated Plan

- Fish Passage Improvements
- Instream Flow Enhancement
- Floodplain Enhancement
- Additional Habitat Restoration Actions

## BPA Projects

- Habitat Restoration – 1997-051-00
- Monitoring & Evaluation – 1995-063-25
- Production Facility O&M – 1997-013-25
- Capital Construction – 1988-115-25

## Harvest Management

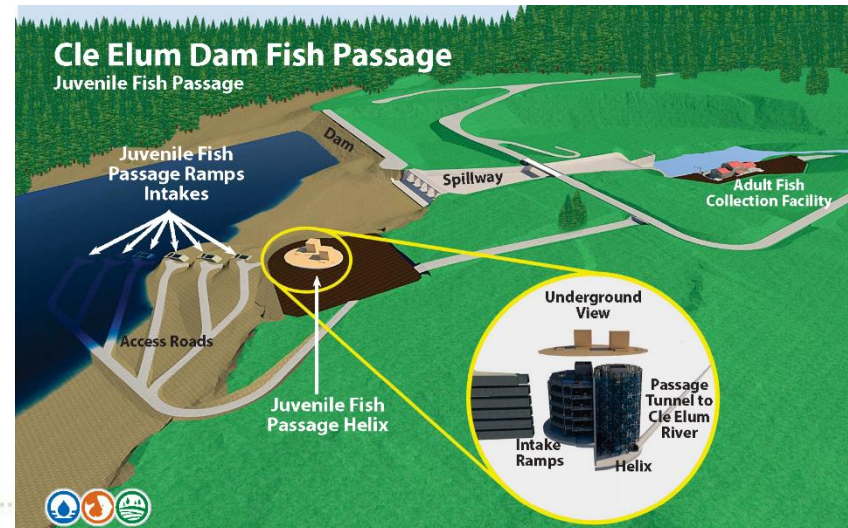
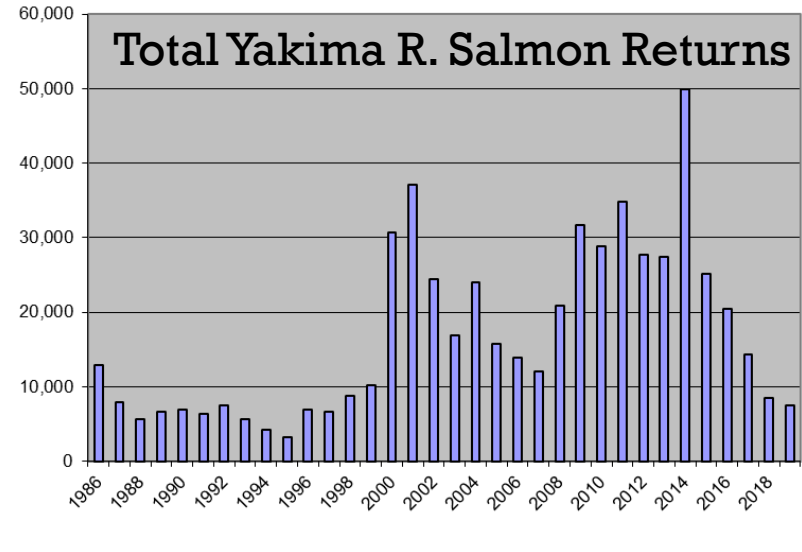
- Co-managed under *U.S. v Oregon*
- BIA, BPA, and State funding for monitors

# Goals: Regional – Double Salmon Returns Yakima – Double Smolt Survival to McN



## Actions

- Remove Bateman causeway
- Lower Yakima habitat focus
- Cold water refugia
- Predator mgmt./removal
- Isolate and fix passage issues
- Lake Cle Elum juvenile passage
- Basinwide habitat work
- Infrastructure upgrades



HONOR. PROTECT. RESTORE.

# Prosser Hatchery Project History

- **Summer-run Chinook and Coho extirpated by 1980s**
- **1980s and early 1990s – YN works with BOR to begin use and development of current site to support *U.S. v OR / Col. R. Management Plan* fall Chinook and Coho operations**
- **1994 Subbasin and Master Planning efforts begin - All Stock Initiative**
- **1996 Final EIS for “Yakima Fisheries Project”**
- **2012 Step 1-2 Master Plan submitted**
- **2018 MRS Coho Hatchery ready to proceed**
- **2019 Revised Master Plan submitted**

# Purpose and Need



- **Improve facilities** to increase survival and better meet harvest and restoration goals
- Respond to review of 2012 Plan and incorporate new ideas regarding program and facility needs
- NPCC and BPA require Master Plan for capital construction projects



# Primary Objectives



- Increase Zone 6 and terminal harvest
- Increase natural production
- Re-establish summer run Chinook & Coho
- Increase long-term population viability
- Stronger, healthier fish to boost juv. surv.



# Fall Chinook Summary

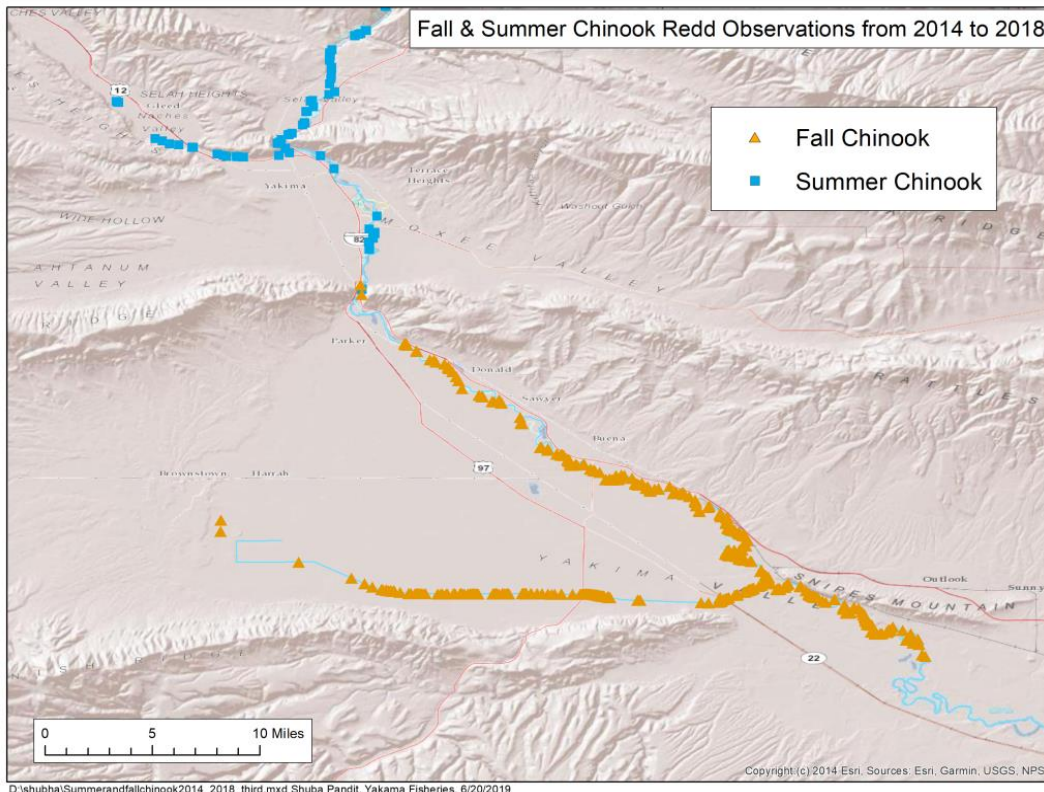
- Maintain U.S. v OR / John Day Mitigation release (1.7m subyearling, 210k yearling)
  - Support Zone 6 and Yakima R. harvest
- Maintain 500k Prosser (local brood) release
  - Support harvest and natural spawning



- Upgrade Prosser Hatchery
  - permanent circular raceways
  - PRAS technology
  - more well/chilling capacity
  - settling ponds

# Summer Chinook Summary

- Maintain 1.0m program at Prosser Hatchery
  - Release from acclimation sites near Naches confluence
  - Transition brood source from Wells stock to local over time

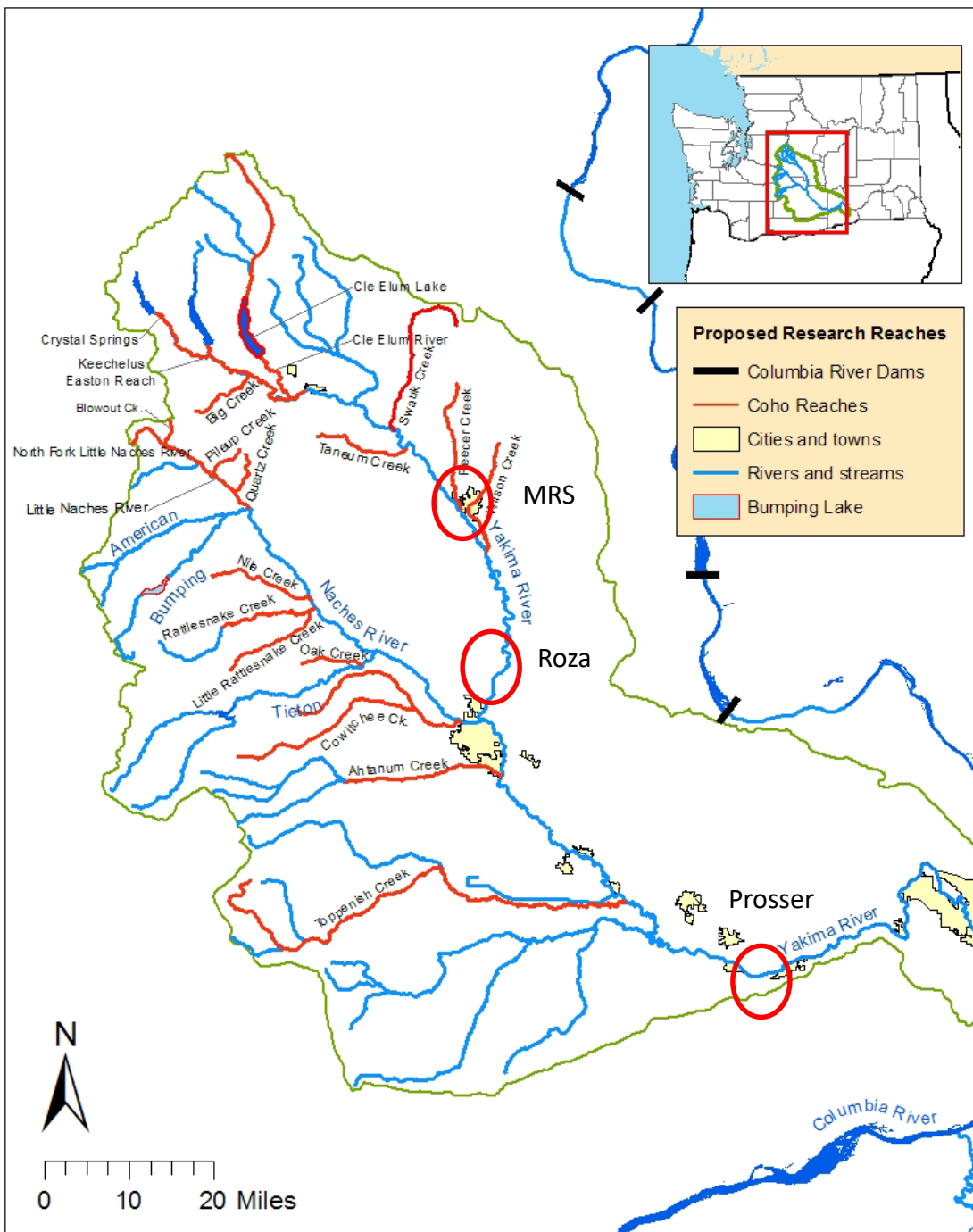


## Long-Term

- Construct new hatchery above Naches confluence
- Permanent accl. sites in both Naches and Yakima “arms”



# Coho Summary

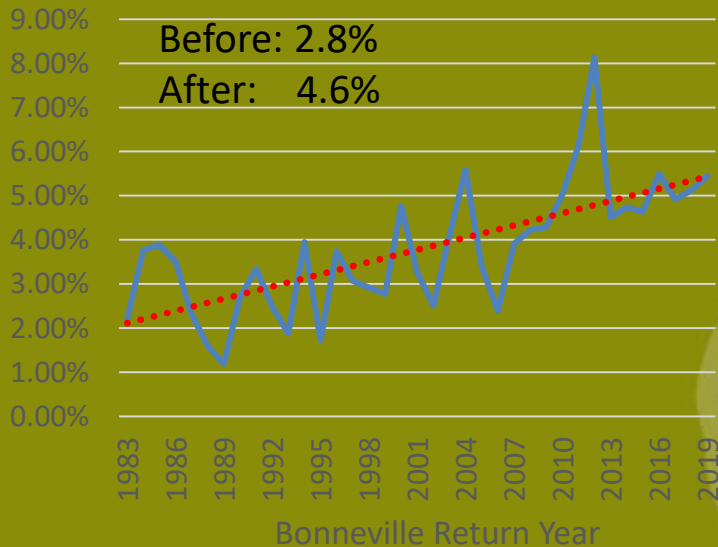


- MRS Integrated
  - Local brood at Roza
  - 500k parr / 200k smolts
  - Release from acclimation sites
  - Seed tributaries
- Prosser Segregated
  - 500k smolts
  - Support harvest
  - Backup brood source

# Steelhead Kelt Summary

- Consistent with Upper Columbia and Snake programs
- Post-spawned wild steelhead migrating downstream through Chandler diversion
- Collect up to 1,500 at Prosser Hatchery
- Recondition for about 6 months at Prosser Hatchery

Yakima proportion of  
Bonneville Group A Wild



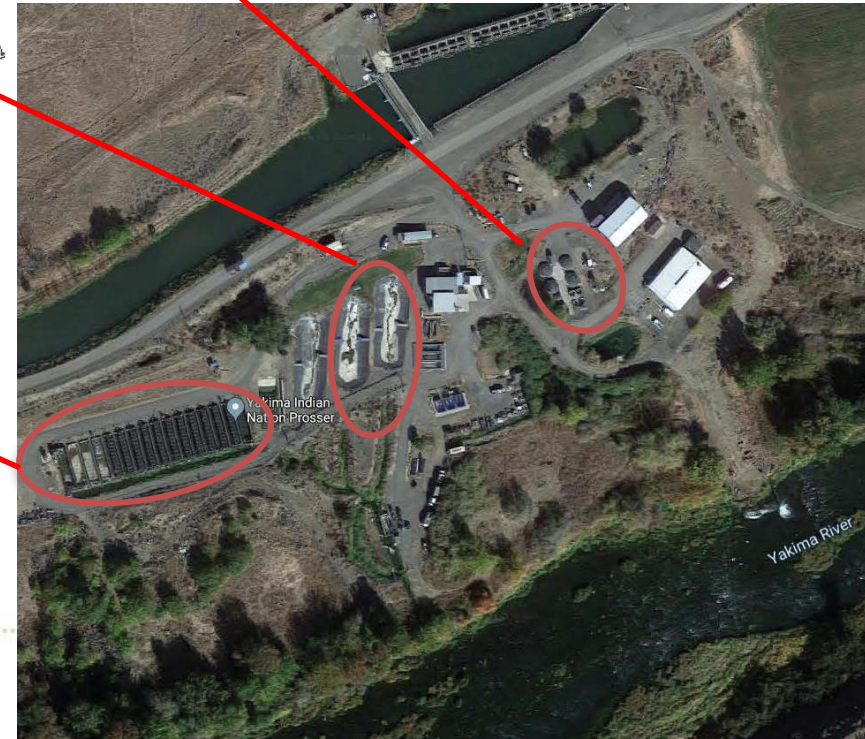
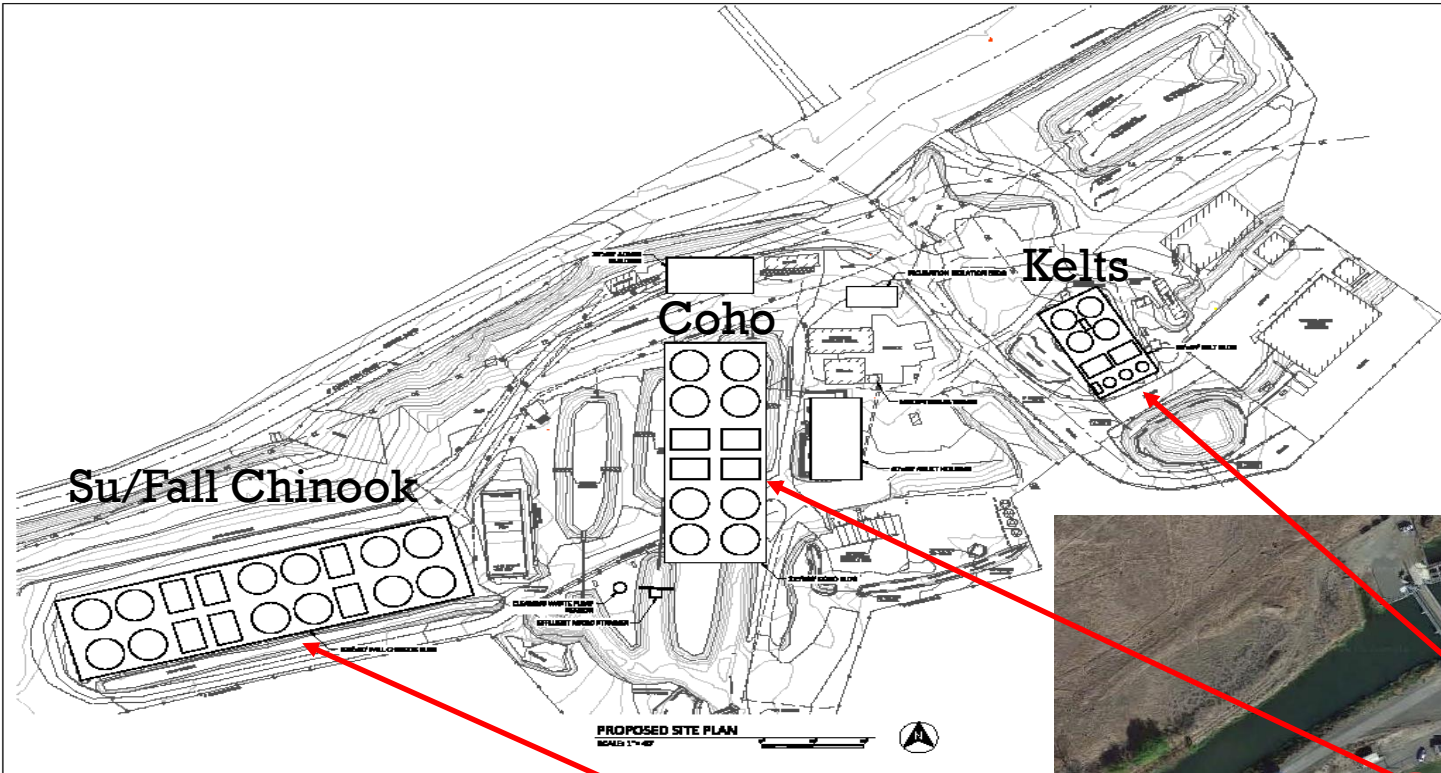
- Release in late Oct / early Nov
- Fish select own mates, spawn timing, and location





# Facilities Overview

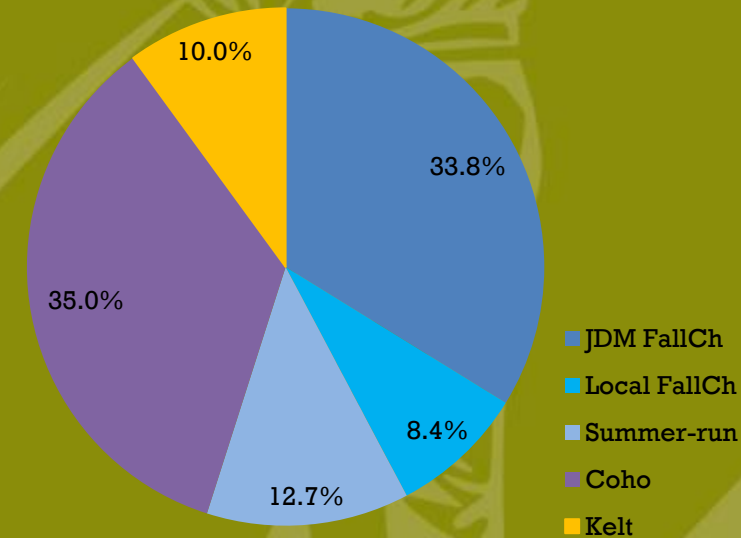
# Prosser Hatchery



# Prosser Hatchery

## Summary of Cost Estimates

Description	Costs
Process Water Supply and LOX to Head Boxes	\$381,120
Effluent and Drain System	\$304,080
Site Work and Utilities	\$969,600
Fall Chinook Hatchery Building	\$10,919,045
Fall Chinook Isolation / Incubation Building	\$466,570
Coho Hatchery Building	\$7,265,574
Kelt Building	\$2,134,758
Adult Holding	\$607,396
Admin Building	\$501,749
<b>Construction Cost Subtotal - 2019 \$</b>	<b>\$23,549,892</b>
<b>Mob/Demob, Bonding, General Conditions- 10%</b>	<b>\$2,354,989</b>
<b>Subtotal</b>	<b>\$25,904,881</b>
<b>Overhead and Profit - 16%</b>	<b>\$4,144,781</b>
<b>Taxes 8.2% on Permanent Materials</b>	<b>\$579,327</b>
<b>Probable Total Cost - 2019 Dollars</b>	<b>\$30,628,990</b>
<b>Probable Total Cost - 2022 Dollars</b>	<b>\$34,453,448</b>



# U.S. Army COE John Day Mitigation CRITFC Accords Project

- 2008 Accord - \$4.5m capital for JDM reprogramming
- CRITFC tribes support use of funds for Prosser upgrades

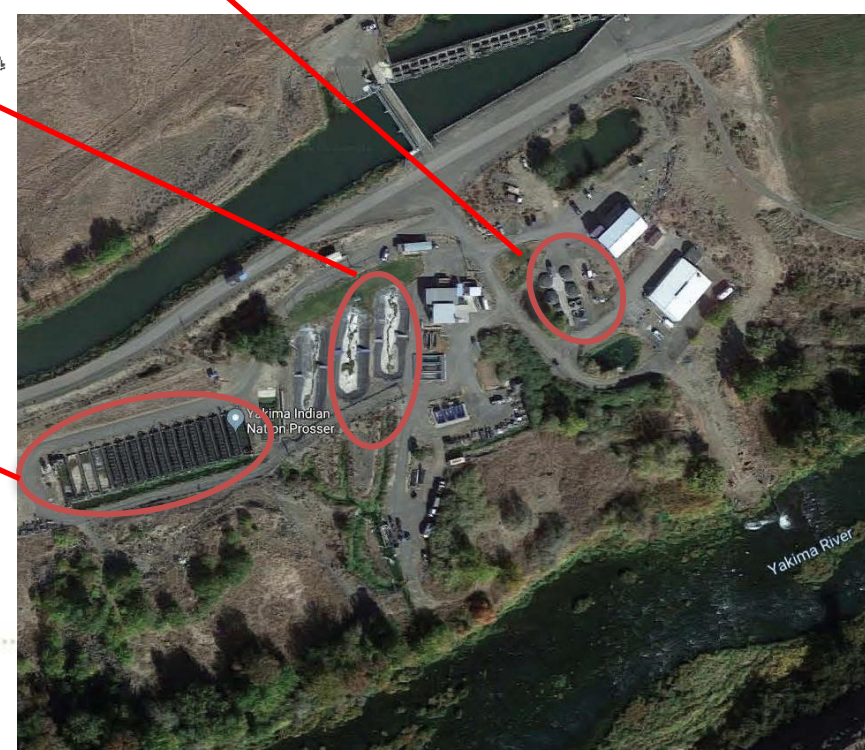
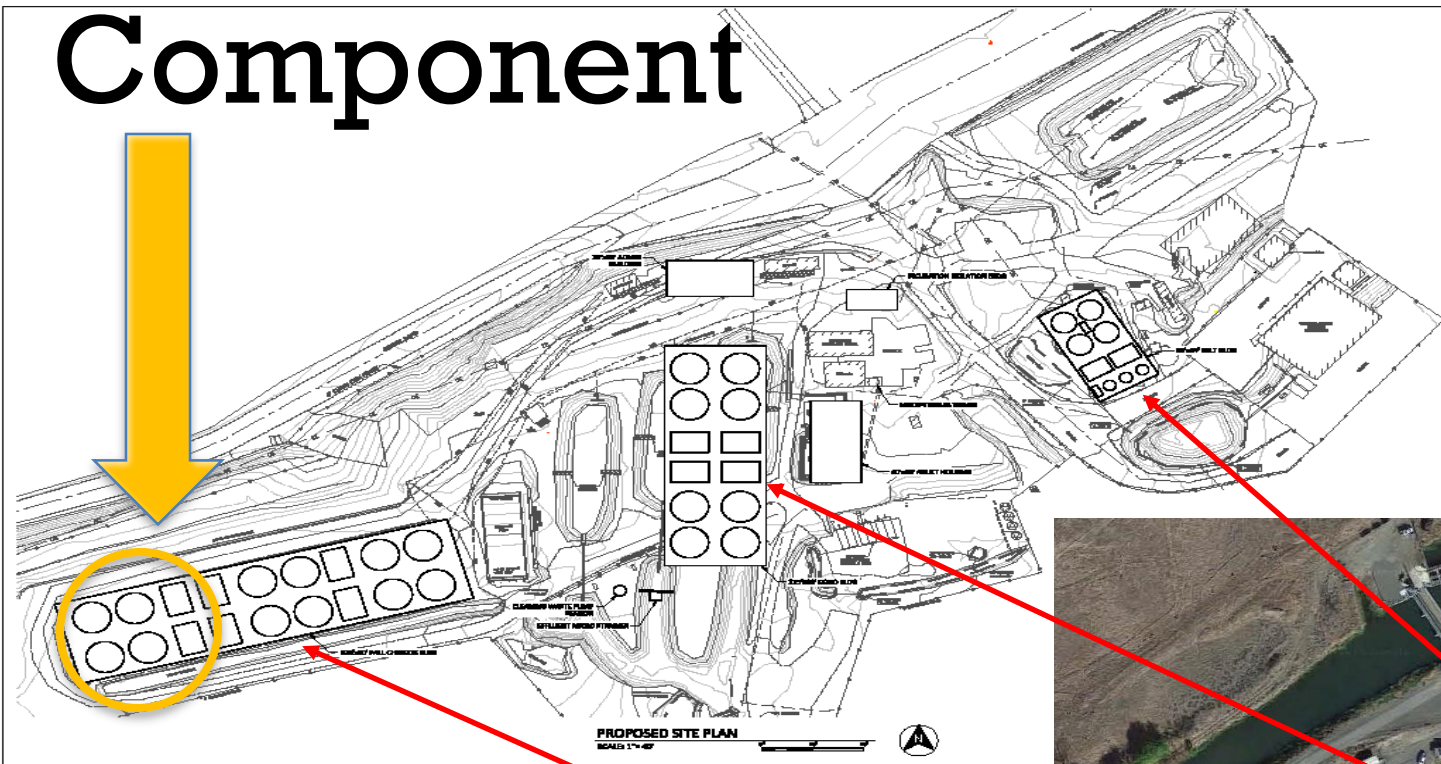


- Ongoing meetings with YN, BPA, COE, and CRITFC
- Consistent with Revised Master Plan

# CRITFC Accord



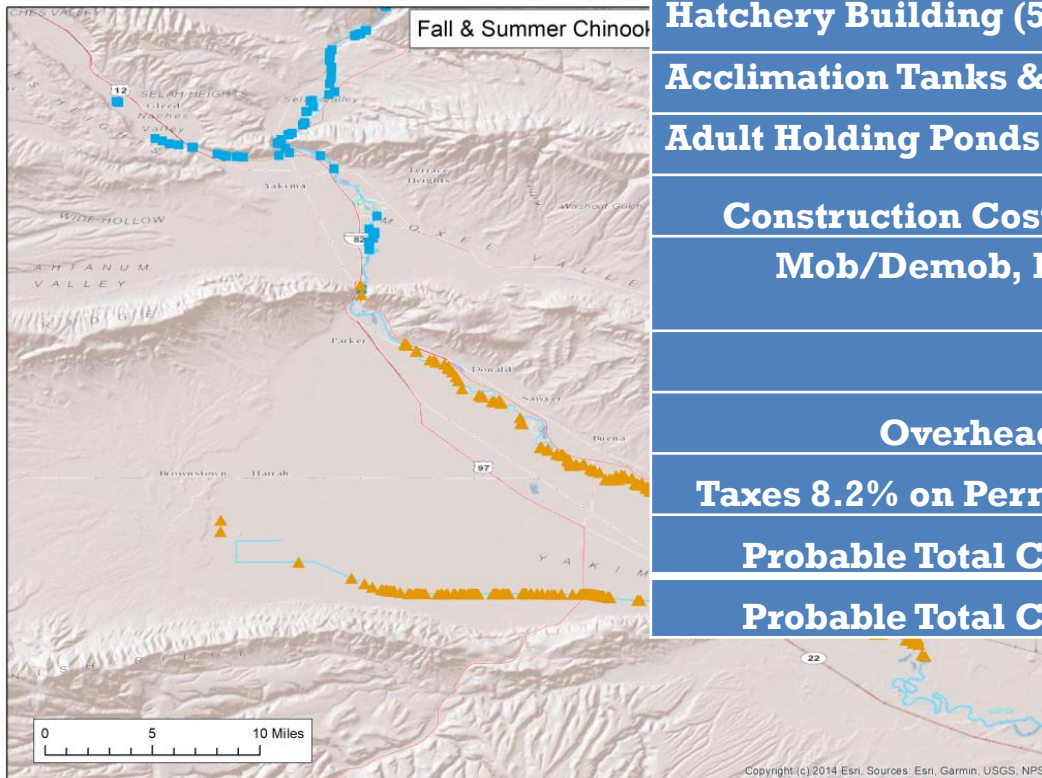
# Component



# Summer Chinook Facilities

## Future Costs

Description	Hatchery	Acclimation (2 sites)
<b>Water Supply Improvements</b>	\$627,600	\$1,687,200
<b>Effluent and Drain systems</b>	\$160,200	\$387,000
<b>Site Work and Utilities</b>	\$231,936	\$405,792
<b>Hatchery Building (5,000 SF)</b>	\$1,791,420	
<b>Acclimation Tanks &amp; Cover (2,940 SF)</b>		\$1,035,840
<b>Adult Holding Ponds</b>	\$238,410	
<b>Construction Cost Subtotal - 2019 \$</b>	<b>\$3,049,566</b>	<b>\$3,515,832</b>
<b>Mob/Demob, Bonding, General Conditions - 10%</b>	<b>\$304,957</b>	<b>\$351,584</b>
<b>Subtotal</b>	<b>\$3,354,523</b>	<b>\$3,867,416</b>
<b>Overhead and Profit - 16%</b>	<b>\$536,724</b>	<b>\$618,786</b>
<b>Taxes 8.2% on Permanent Materials</b>	<b>\$75,019</b>	<b>\$86,490</b>
<b>Probable Total Cost - 2019 Dollars</b>	<b>\$3,966,266</b>	<b>\$4,572,692</b>
<b>Probable Total Cost - 2022 Dollars</b>	<b>\$4,461,509</b>	<b>\$5,143,656</b>





MELVIN R. SAMPSON

A M A K A Y N A T I O N



COHO FACILITY



Google

# Yakima MRS Coho Hatchery Project



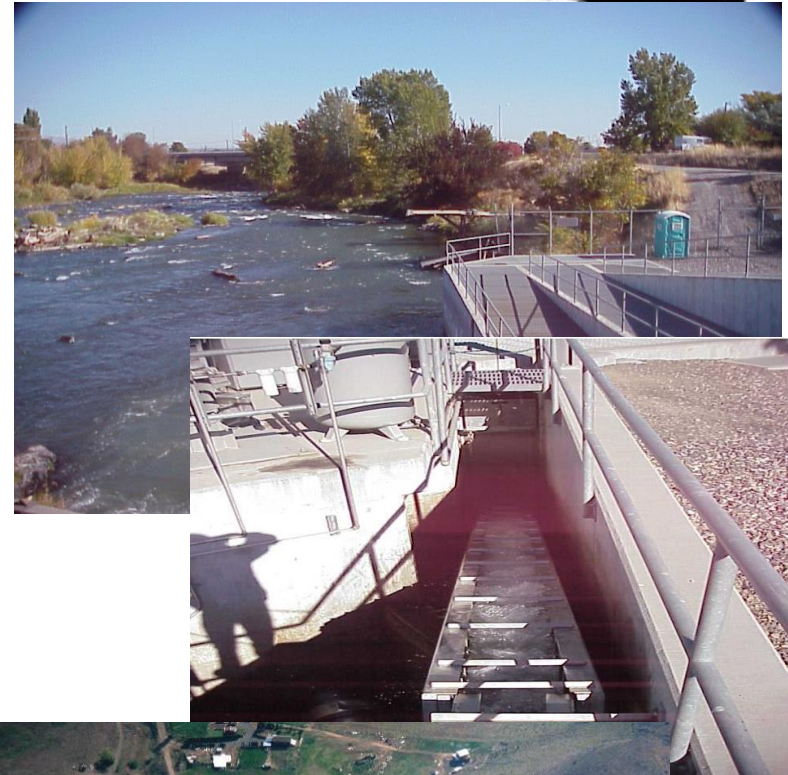
- Construction nearly complete
- 2020 will focus on fully testing facility operations with programming starting with brood year 2021
- 30k sf hatchery building
- Early rearing grow-out
- 10 circular rearing ponds
- 9 groundwater wells
- Effluent treatment
- Utilities



# Brood Collection and M&E



- Brood collection and adult return sampling at Prosser and Roza Dams
- Juvenile sampling at Prosser and Roza juvenile monitoring facilities and with screw traps (steelhead)
- Spawner surveys
- DNA analysis
- Hatchery brood composition, growth, and survival



# ISRP Review Summary

- **2012-13**: Review of 2012 MP submittal (qualified)
- **2013-8**: Response review of 2012 MP (qualified)
- **2014-9** and **2016-12**: Kelt Reconditioning (met scientific criteria and recommended to proceed)
- **2018-6**: Step 2/3 review of MRS coho (response request)
- **2020-3**: Review of 2019 Revised MP (response request)
- **2020-7**: Review of CRITFC Accord project (meets criteria)
- **2020-9**: Response review of 2019 MP (meets criteria)



# Questions?



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