

Clearwater Fish Hatchery Water Supply

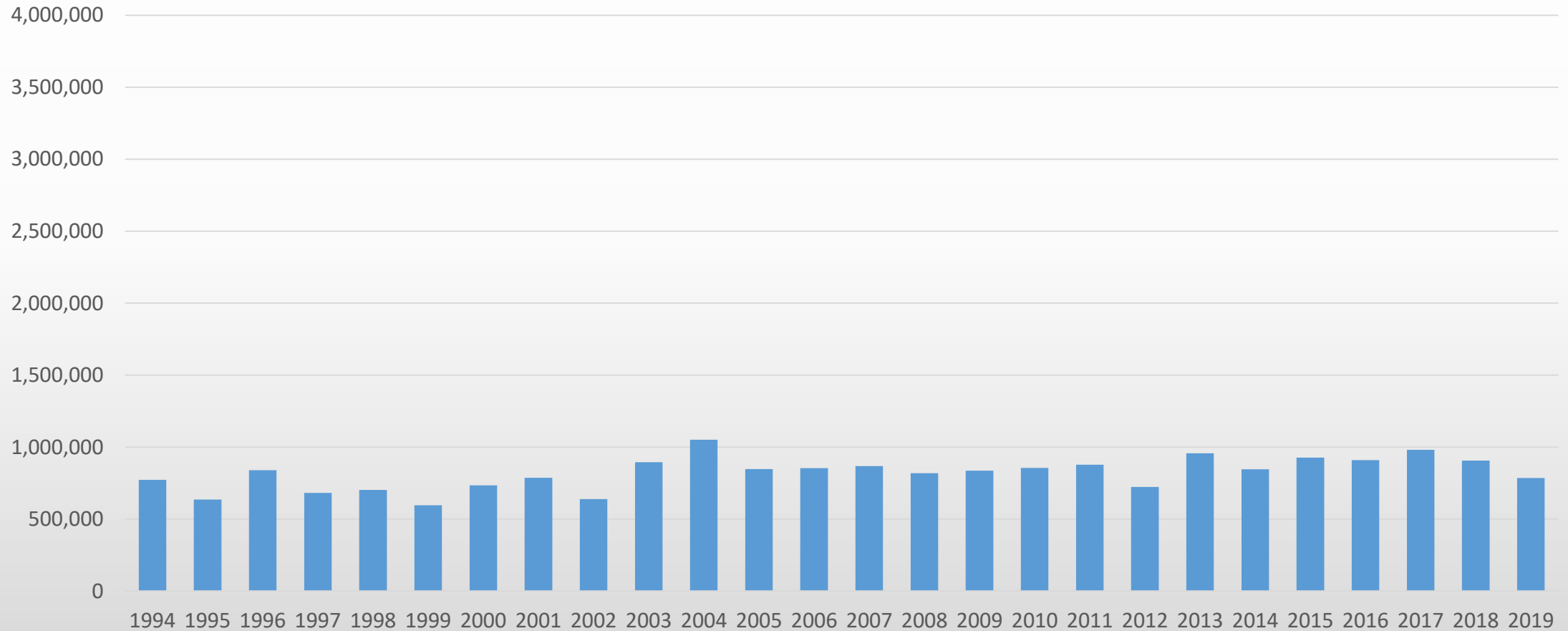
Potential to Increase Smolt Production and Adult Returns



Gary Byrne, Idaho Department of Fish and Game

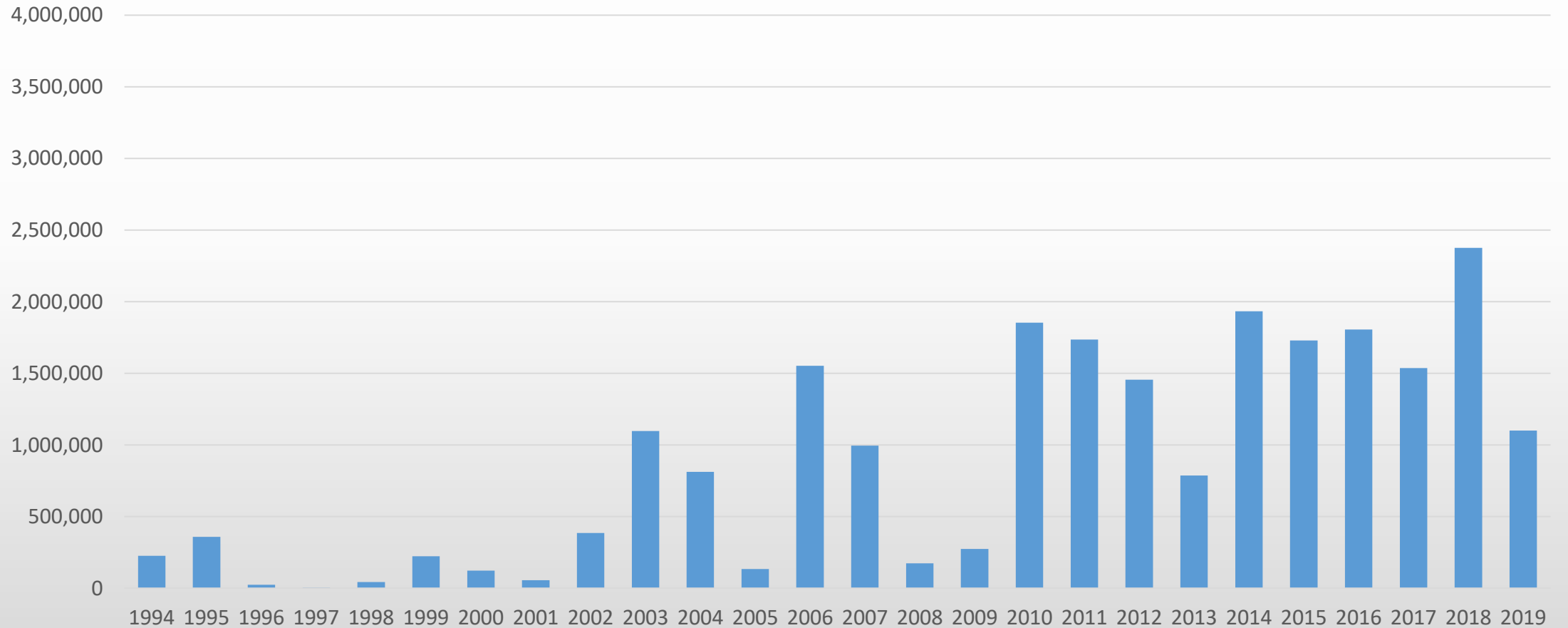
Clearwater Steelhead Smolt Releases

Release Years 1994-2019



Sawtooth Chinook Smolt Releases

Release Years 1994-2019



Slide 1

My talk today is primarily concerned with the water supply to the Clearwater Fish Hatchery, which is the largest hatchery operated by the Idaho Department of Fish and Game. Situated at the confluence of the North Fork and mainstem Clearwater rivers, the facility is owned by the US Fish and Wildlife Service and operated by IDFG under the USFWS Lower Snake River Compensation Plan office. It has played a large (and growing) role in the LSRCP fish production program.

Just to be clear, the Clearwater Fish Hatchery is not to be confused with the Dworshak National Fish Hatchery, which is just a stone's throw across the North Fork Clearwater. The Dworshak National Fish Hatchery is operated jointly by the Nez Perce Tribe and US Fish and Wildlife Service. Remember that, as I'll circle back to the National Fish Hatchery later in this presentation.

Slide 2

The Clearwater Fish Hatchery's annual production goal for steelhead is to release 843,000 smolts. Prior to the recent decline in adult returns, LSRCP adult return goals for steelhead have generally been met since 2000, and Clearwater Fish Hatchery production of steelhead smolts has therefore been stable over that time period.

Slide 3

LSRCP adult return goals for Chinook Salmon have not been met. Therefore, the IDFG has focused on increasing production of Chinook Salmon smolt where LSRCP facilities have had the capacity to do so. Those opportunities have been limited. Although the Sawtooth Fish Hatchery has capacity to rear 2.1 million Chinook smolts, generally low numbers of returning adult fish represent limitations to the number of available brood stock, and Sawtooth has rarely met its full production potential.

Slide 4

The McCall Fish Hatchery already has been operating at its full capacity of about 1.1 million smolts for decades.

Slide 5

In recent years, Clearwater Fish Hatchery increased Chinook Salmon smolt production capacity by rearing fish at higher densities and implementing water re-use. These strategies allowed smolt releases to climb from approximately 2.4 million in 2012 to 3.7 million in 2017, an increase of over 50%. The IDFG annual Chinook production goal for the facility is now 3.75 million smolts; pending sufficient adult broodstock availability. The limiting factor preventing further increases to Chinook smolt production at the Clearwater Fish Hatchery is the amount of water available to the facility.

Slide 6

The hatchery has a water right for 89 cfs, and clean, disease-free water is supplied to the facility via two pipelines that run from the Dworshak Dam down the south bank of the North Fork Clearwater River. Unfortunately, the segment of the line that runs beneath the North Fork Clearwater River to the hatchery is improperly sized to convey the full water right. As a result, existing infrastructure on the station cannot be watered up and utilized for rearing.

Slide 7

Here we have a google earth photo that gives a clear view of the Clearwater Fish Hatchery concrete raceways.

Slide 8

Adding a bit of color here, we'll identify by the color blue those raceways in which steelhead are reared.

Slide 9

Here we have green representing raceways used for Chinook rearing.

Slide 10

And here is where we can see the extent of the problem. Those raceways colored red are not used for rearing any fish at all. It is estimated that to adequately operate these raceways would require the facility water supply to be increased to 130 cfs. This would allow an additional 1.6 million Chinook Salmon smolts to be produced using current rearing standards.

Slide 11

Here we see the return numbers for hatchery Chinook Salmon over Lower Granite Dam. Based on current smolt to adult returns of Clearwater Hatchery releases, the production of an additional 1.6 million smolts would translate to an average of 6,000 additional adult Chinook Salmon returning over Lower Granite Dam annually.

Slide 12

Those who have considered a new pipeline system to convey water from the Dworshak Reservoir to Clearwater Fish Hatchery have envisioned an installation similar to the existing one. Currently, the primary line provides a maximum flow of 71 cfs that is collected near the reservoir surface. That intake is outfitted with a moveable snorkel that can be adjusted to pull water in a range from 10' to 60' feet deep. This allows the facility to select from a range of available water temperatures to best suit fish feeding and growth plans.

The secondary pipeline provides a maximum of 18 cfs to the hatchery. The intake for this line is at a fixed depth much deeper in the reservoir, and provides water at a relatively stable (42°F) temperature year round.

Slide 13

The existing system also includes a turbine that decelerates the water prior to its reaching the hatchery and generates power that is sold to BPA.

The hatchery has been well served by the ability to select from a range of temperatures using the shallow intake, and to blend water from the shallow and deep lines. And the hydroplant provides benefits both to the hatchery and in power generation. These elements would also be beneficial in a new system.

Slide 14

Some have suggested that a new pipeline might be different from the existing system in several ways. For one, the pipe could be run down north of the North Fork Clearwater River, which would eliminate the need to cross beneath it. At the dam, there is an unused penstock in which the pipelines could be installed. More importantly, rather than decommissioning the existing pipeline, it could be wholly dedicated to supplying water to the Dworshak National Fish Hatchery. Dworshak NFH already draws some water from the existing line seasonally, when the Clearwater Hatchery is not at maximum need. This allows Dworshak to provide clean, virus-free water to avoid fish diseases that are encountered when the facility pumps river water for its rearing needs; the reduced pumping also saves money. These benefits could be greatly expanded if the full flow of the existing line were committed to Dworshak.

Slide 15

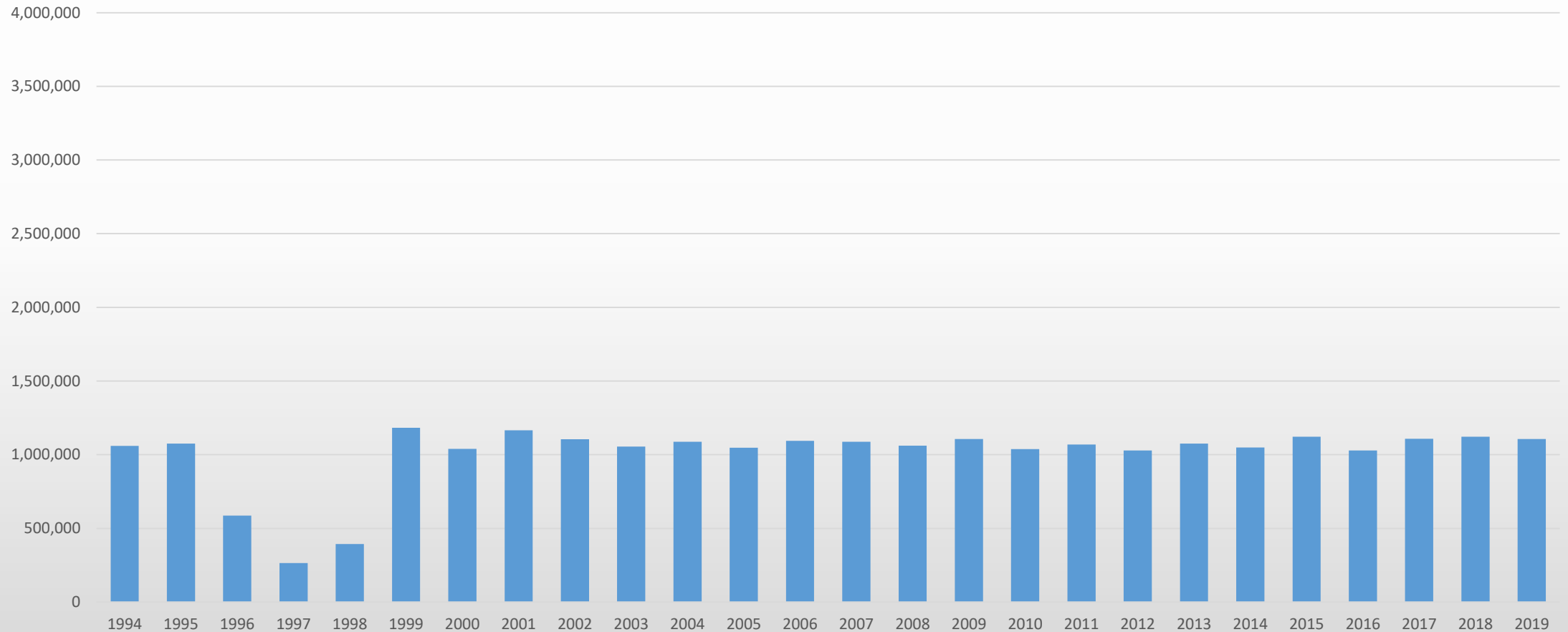
To pursue construction of a new water supply system to the Clearwater Fish Hatchery will require a significant financial investment. A 2012 analysis of such a project estimated its cost in the range of \$25-\$45 million; no funding was identified for the project at that time, and no action was taken. The support of a broad array of partners would be required to advance a new pipeline proposal, not only for the project itself, but also for subsequent operation of facilities at full capacity, including allocation of adequate brood stock and budgets.

Slide 16

I hope that this brief presentation has made clear the potential costs and benefits that could accrue to installation of a new water delivery system for Clearwater Fish Hatchery.
Questions?

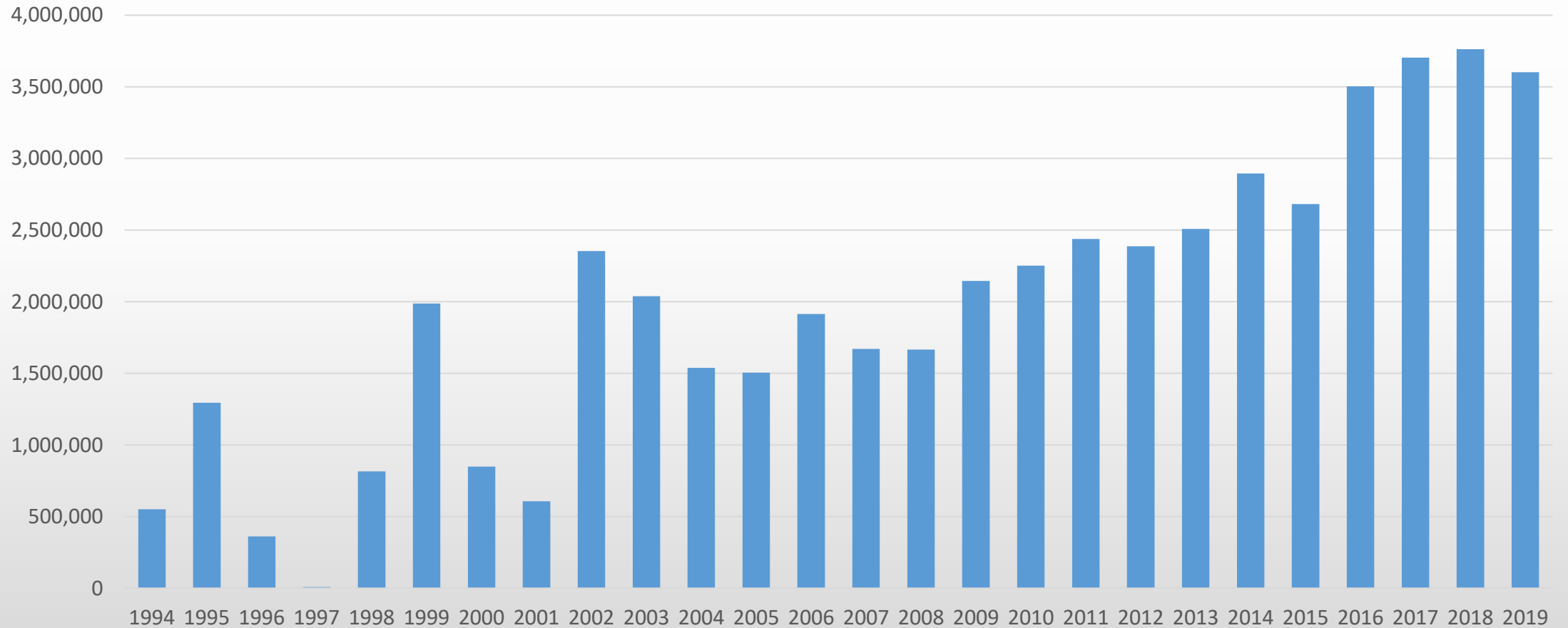
McCall Chinook Smolt Releases

Release Years 1994-2019



Clearwater Chinook Smolt Releases

Release Years 1994-2019



Clearwater Hatchery Water Supply Pipeline

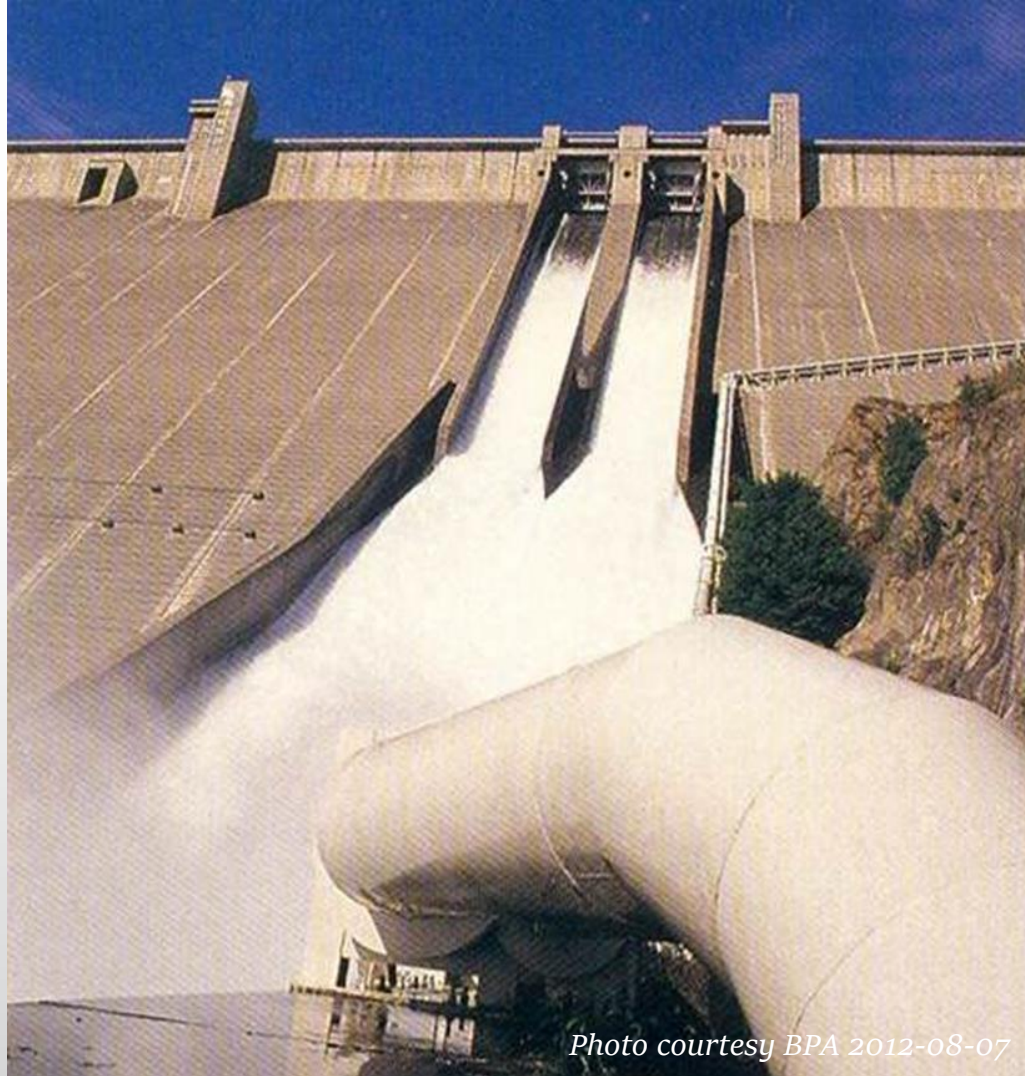
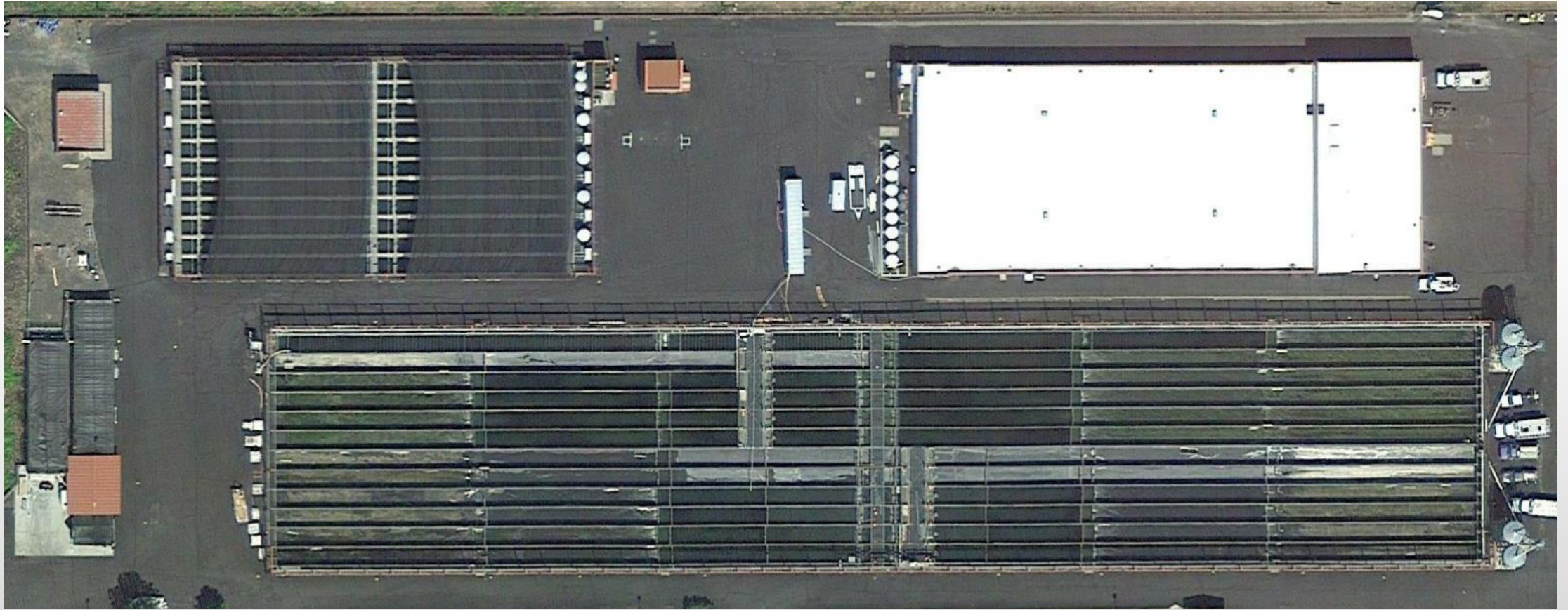


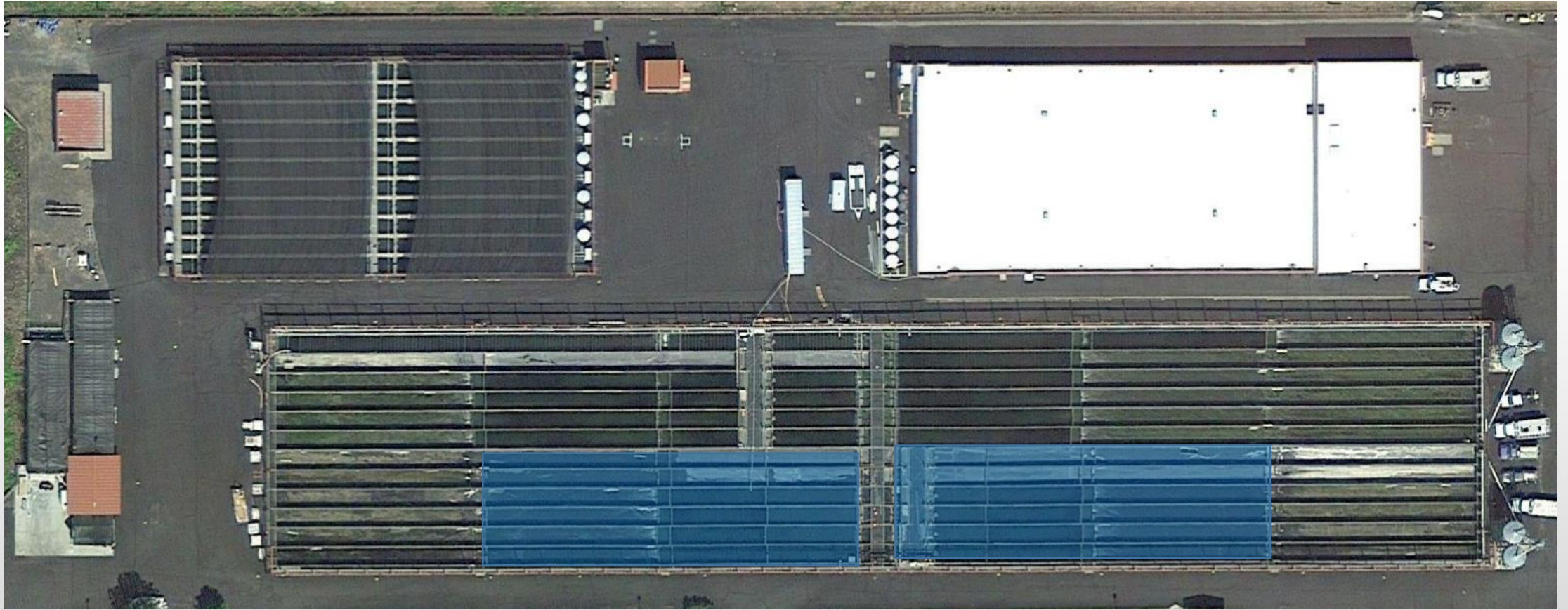
Photo courtesy BPA 2012-08-07

Clearwater Raceway Use



Clearwater Raceway Use

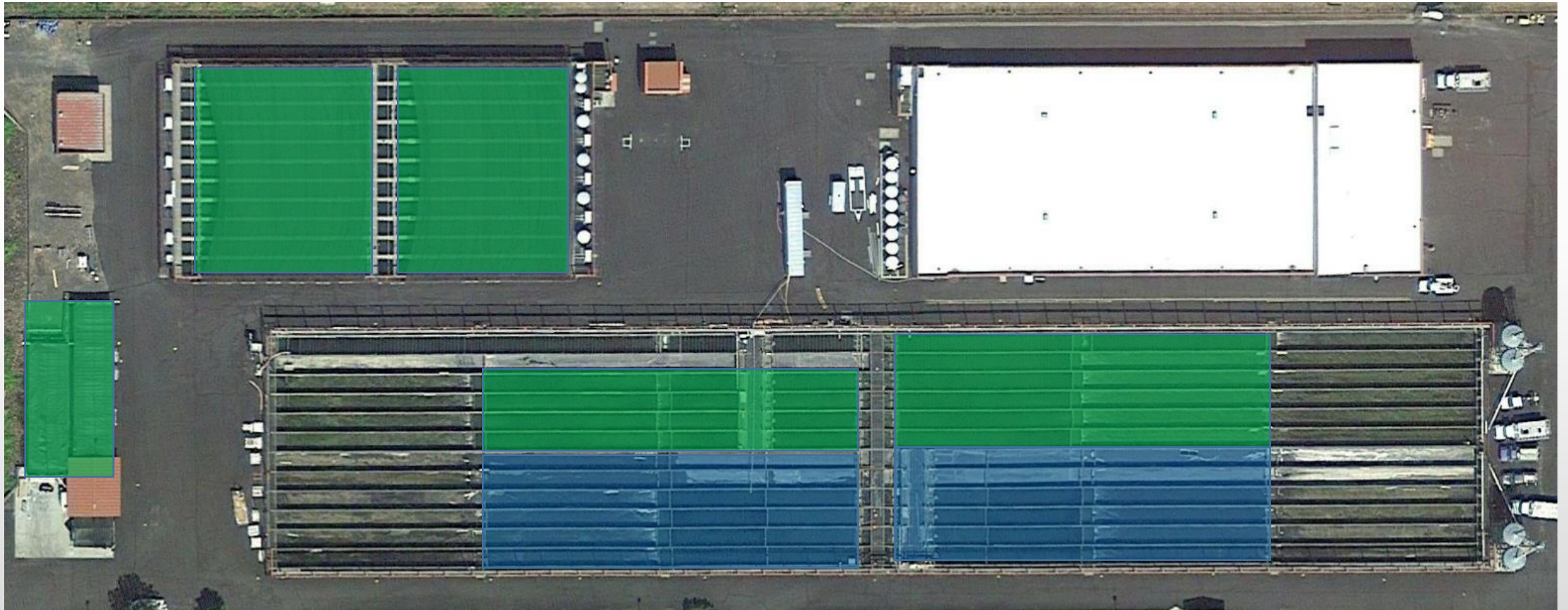
Blue = Steelhead



Clearwater Raceway Use

Blue = Steelhead

Green = Chinook Salmon

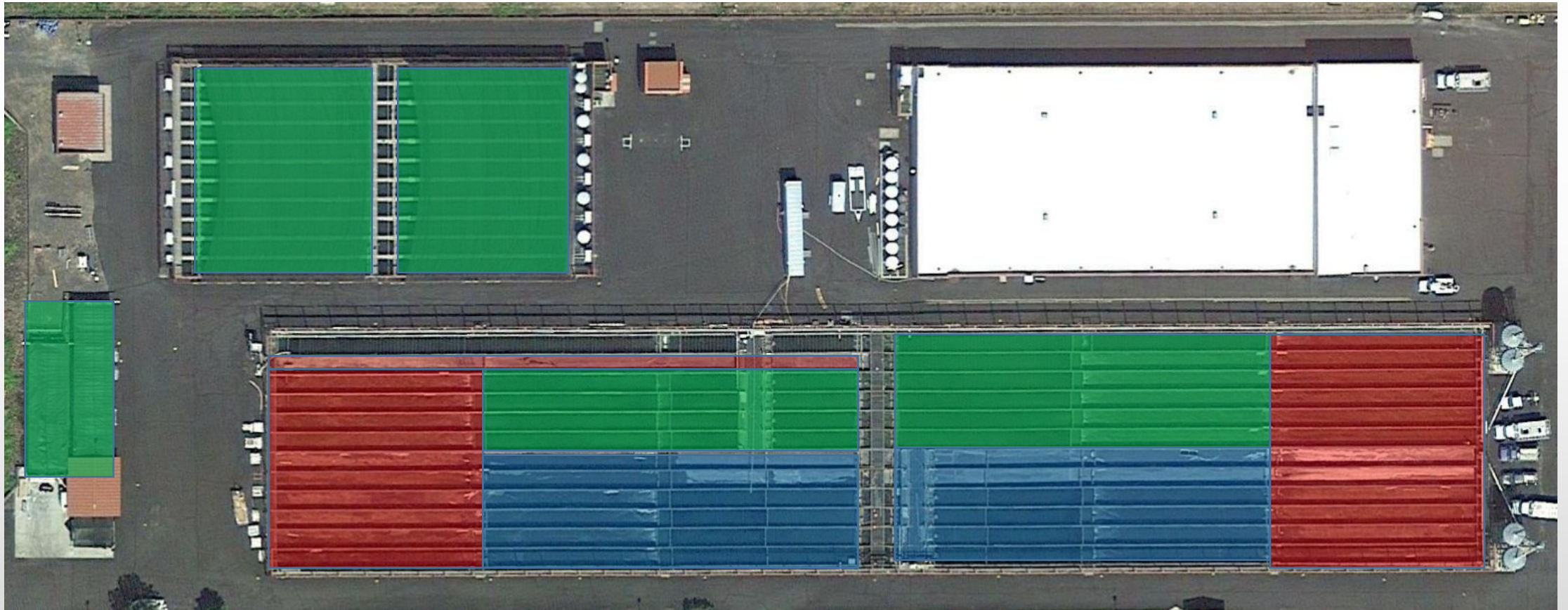


Clearwater Raceway Use

Blue = Steelhead

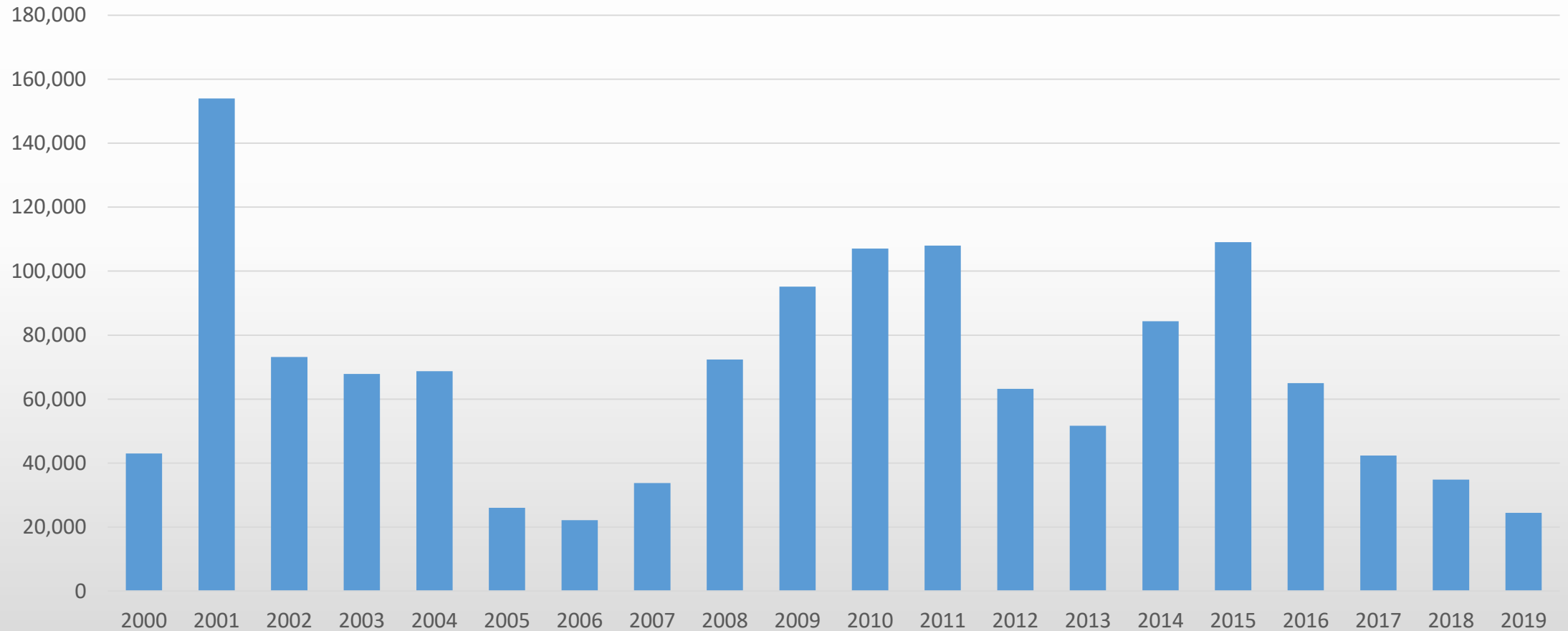
Green = Chinook Salmon

Red = Empty

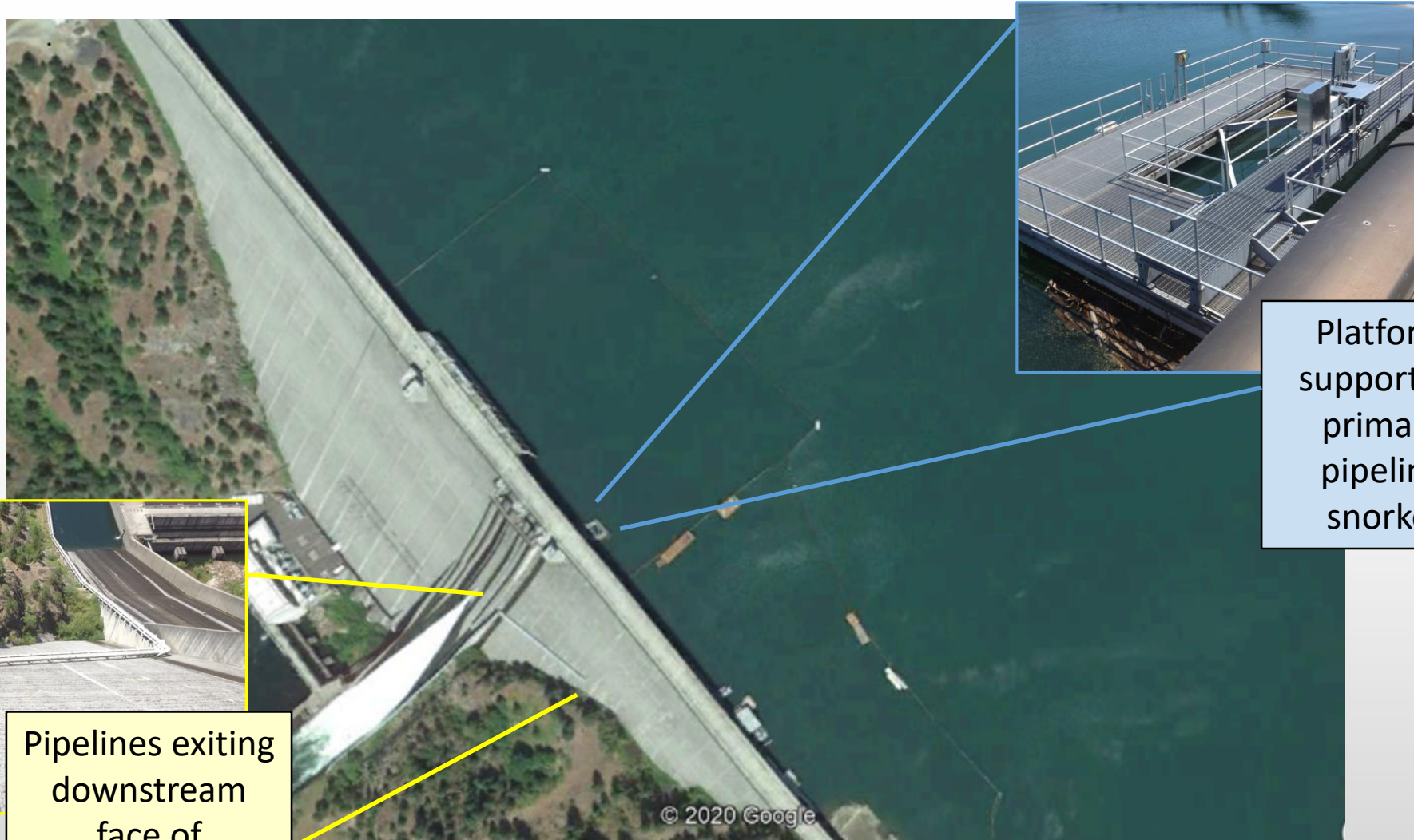


Hatchery Spring/Summer Chinook Returns

Return Years 1994-2019, Adults + Jacks over Lower Granite Dam



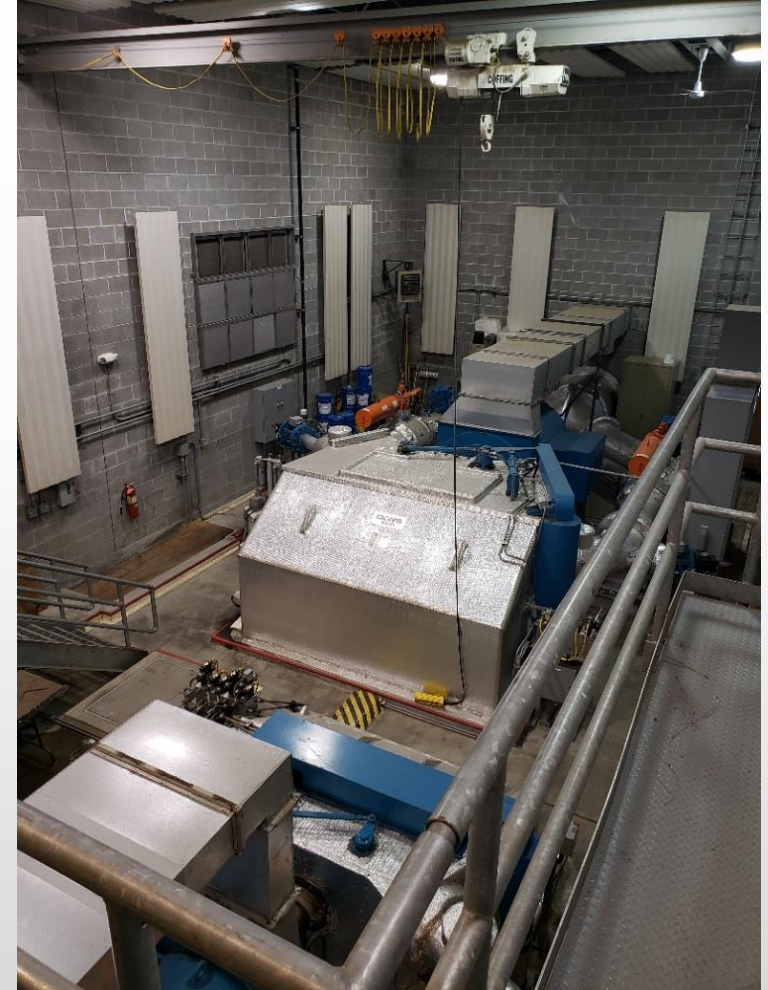
Water Conveyance



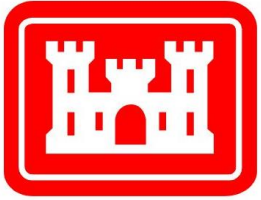
Platform
supporting
primary
pipeline
snorkel

Pipelines exiting
downstream
face of
Dworshak dam

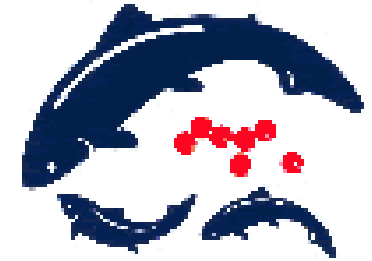
Power Generation



Potential Partners

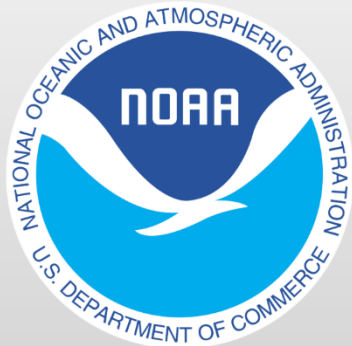


**US Army Corps
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LOWER SNAKE RIVER
COMPENSATION PLAN
Hatchery Program

B O N N E V I L L E
POWER ADMINISTRATION



**Northwest Power and
Conservation Council**

Questions?



Dworshak Dam construction, penstock tube, Clearwater Tribune, February 5, 1970