

The Cowlitz Trout Hatchery, which is owned by Tacoma Power and operated by the Washington Department of Fish and Wildlife (WDFW), must meet requirements for raising and releasing fish each year. In response to low fish counts in 2016, the organizations phased in additional protective measures against predators and had the hatchery's fish counter recalibrated by the manufacturer in 2017. WDFW released an estimated 1,441,000 cutthroat trout, summer-run steelhead and late winter-run steelhead over several months last winter into the hatchery's ponds and raceways. Reports indicate significant improvement in release numbers this year.

However, toward the end of the release period, WDFW staff discovered that the fish counter had recorded more fish than were originally put in the ponds. To account for this inaccuracy, the organizations estimated this year's releases by applying natural mortality and predation rates.

Using this methodology, hatchery managers estimate they released between 1.2 million and 1.4 million smolts into the Cowlitz River. The 2017 release goal was 1,362,500.

Tacoma Power and WDFW intend to improve accuracy of accounting for fish raised and released at the hatchery by next year. Additionally, Tacoma Power has budgeted \$8 million for trout hatchery improvements; construction is expected to begin in 2018. Improving the rearing ponds and counter system are key priorities. The organizations are also focused on improving internal processes, management and methodologies.

First, I would like to know the actual number of fish released by species. It says there were an estimated 1,441,000 cutthroat, winter and summer steelhead released, but how do those numbers break down for each of the three species?

The estimated release numbers into the river for each species are:

- Cutthroat: 105,000 - range of 85,000-110,000
- Summer-run steelhead: 600,000 - range of 485,000-635,000
- Late winter-run steelhead: 696,000 - range of 631,000-696,000

Additionally, does Tacoma Power/WDFW release an intended smolt release number earlier in the year? For instance, I'm curious how fish were put in the rearing ponds to begin with and what the intended release number was.

WDFW reported ponding an estimated 110,000 cutthroat trout, plus 635,000 summer-run steelhead and 340,000 late winter-run steelhead into four ponds: 1,085,000 total (1,441,000 total when you include the late winter-run steelhead from the raceways).

Our release goal was 1,362,500.

Can you please explain this statement to me?

-"However, toward the end of the release period, WDFW staff discovered that the fish counter had recorded more fish than were originally put in the ponds. To account for this inaccuracy, the organizations estimated this year's releases by applying natural mortality and predation rates."

The counter is not accurately counting fish; it counted more fish than were possible to be released. Instead of relying on the counter, we used an estimating system to determine a range of fish released.

- How does the application of natural mortality and predation rates this year differ from year's past? Does this refer to mortality and predation rates within the hatchery itself or after release?

It refers to predation and mortality within the hatchery itself. The natural mortality rate used for the estimate was 0.52%, and the predation rate used was 5.4%. If you remember, we believe predation was a significant factor in the release numbers. We did not estimate predation rates last year. We relied entirely on the counter to estimate the number of fish released last year.

We put in multiple protective measures this year, including extended hazing to all daylight hours throughout the season, installing duck-detering fencing, adding fishing line across the ponds to help prevent birds from landing, installing nets that blocked the perimeter of the ponds.

Can you be more precise about the statement, "Tacoma Power and WDFW intend to improve accuracy of accounting for fish raised and released at the hatchery by next year." What is the plan for achieving that goal?

For 2018, we are designing a study to test the counter accuracy and will be able apply a correction factor to obtain a more accurate estimate. We will also

complete upgrades that will improve the rearing ponds to help lower the predation and mortality rates.

For 2019 and beyond, we will be doing upgrades at the hatchery, and intend to fix the existing, or install a new, fish counter.

Lastly, it seems that the fish counter has now been blamed for over-counting and under-counting fish stocks. How often do the machines need to be recalibrate in order to ensure accuracy? Is accuracy even possible? Are the machines being recalibrated at the factory or in place at the hatchery? Does that make a difference in their performance?

Historically, the counters have been sent to the manufacturer every 2 to 3 years for calibration, system checks and repairs. It was calibrated by the manufacturer prior to installation this year. Accuracy is tested in place during the fish release period and has been tested once a year. A system check is performed daily as per manufacturer provided test button. The test confirms the counter is on and counting.

More accurate estimates can be made in the future by sending a known number of fish through the counter frequently (weekly) and comparing known to counted. These tests must be conducted frequently to account for changes occurring during the month-long release period.