

Unintended Consequences: Warming of the Deschutes River to Benefit Fall Chinook

Executive Summary

Portland General Electric (PGE) started discharging water from its Selective Water Withdrawal Tower, constructed in the forebay of Lake Billy Chinook (SWW) in late 2009. The \$110 million facility was ostensibly designed to facilitate the reintroduction of salmonids above PGE's three-dam Pelton Round Butte Project. Over the past 14 years, the SWW has failed to deliver salmon and steelhead in numbers significant enough to deem the reintroduction effort on a path to success.

However, the SWW has succeeded in changing the annual temperature regime in the lower 100 miles of the Deschutes below the dams that comprise the PRB complex. Compared to temperatures prior to SWW operations, the lower Deschutes is now significantly warmer in winter, spring and early summer, and slightly cooler for a short period in the fall.

The principal reason PGE offers to justify post-SWW temperature management of releasing warm, nutrient-laden surface water from LBC during winter, spring and summer is to save cold water in LBC throughout the year to benefit fall chinook. The nature of this benefit and how fall chinook will benefit has never been specified.

No compelling reason for saving water for fall release to benefit fall Chinook could be identified in this analysis. Claims to the contrary are not supported by the available data.

By contrast, a variety of unintended, negative consequences affecting the aquatic environment in the lower Deschutes, all occurring after the commencement of SWW operations, can be identified and quantified with available data. These consequences include:

- Changes to resident trout spawning timing
- Black spot disease on resident trout, a reflection of a large increase in the host snail
- An alarming increase in the presence of *C. shasta*, a parasite lethal to spring Chinook
- A report by ODFW <https://microbiology.oregonstate.edu/content/monitoring-studies> found densities of *C.shasta* at ten times higher than the threshold at which the parasite presents is presumptive for infection.
- Nutrient loading and subsequent algal growth
- Increases in non-native, invasive predators such as bass and walleye
- Changes in emergence timing, diversity and abundance of aquatic insect hatches
- Decrease in the effectiveness of the lower Deschutes as a thermal refuge for salmonids in the summer months

Claims that SWW operations have led to an increase in Deschutes fall chinook are not supported by available data. In fact, in the years 2017 to 2022, a slight decrease in numbers is apparent.

Statements made by personnel from state and tribal agencies reflect differing opinions on why cold water release in the fall might benefit fall chinook. These statements also reflect a stunning lack of coordination among agency scientists in designing and implementing a flow and temperature regime that provides a quantifiable biological benefit.

The cooling that now occurs in the fall is not timed to coincide with the peak holding or spawning period of returning adult fall chinook. Similarly, data do not exist to support the contention that current winter and spring warming provides any specific benefit to juvenile fall chinook.

Based on the available data, changes in SWW operations should take place that would optimize the benefits of cold water for a broad range of species of concern in the lower Deschutes River.