

# Technical and Programmatic Priorities Update

## *Lake Washington Ship Canal Temperature Issues*

July 2018

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### **Background**

Temperature is one of the most important environmental influences on salmonid biology. Data collected in the Lake Washington Ship Canal (LWSC) shows periods in most years during late spring and summer when high temperatures affect the behavior and survival of migrating salmon. These high temperatures are caused by solar energy heating the surface of Lake Washington. The heated water forms a layer in the upper part of the water column. The LWSC is only 30' deep in places, and because the thermally stratified layer is often 30' or more in thickness, salmon cannot swim into deeper, cooler waters while migrating to escape the high temperatures.

Because salmon need cold, well-oxygenated water for optimum health, high temperatures in the LWSC during key migration periods can block or delay passage, lead to reduced growth and increased susceptibility to predators, parasites and infectious diseases, affect reproduction, and sometimes directly result in fish kills.

Every salmon in WRIA 8 must pass through the LWSC twice in its life, both as a juvenile migrating out to sea and as an adult returning to spawn, and may encounter lethal or near-lethal temperatures that influence its behavior and reduce its chances of survival. This proposal will directly result in a recommended preferred alternative to reduce effects of high temperatures/low dissolved oxygen concentrations in the LWSC. Stakeholders will understand what technologies and engineering solutions are available to improve conditions during key migratory periods, at what costs.

### **Project outline**

The potential project, executed in three phases, would address elevated water temperatures in the LWSC by seeking and implementing a long-term solution to the problem.

- Phase 1: Develop concepts and feasibility-level proposals, in collaboration with key stakeholders, to produce lasting solutions to temperature and dissolved oxygen problems affecting salmon in the Lake Washington Ship Canal.
- Phase 2: Vet proposals, choose a preferred option, and develop funding sources.
- Phase 3: Construct and monitor the preferred option.

Potential stakeholders include the US Army Corps of Engineers (Corps), Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Salmon Recovery Council, City of Seattle, Washington Department of Fish and Wildlife, the Muckleshoot Indian Tribe, Washington Department of Ecology, the Puget Sound Partnership, US EPA, US Fish and Wildlife Service, US Geological Survey, University of Washington, local businesses and corporations, and non-profits.

As conceived, WRIA 8 would act as convener of the stakeholder group and oversee a consultant team that would organize and facilitate Phase 1 and 2. Recent discussions with the Corps suggest that the project would be most likely to advance if WRIA 8 provided initial funding to secure a consultant team as facilitator for the initial task of convening a stakeholder group and overseeing the development of

concepts and feasibility-level proposals. A Corps funding program could cost-share development of the feasibility analysis report as the product of Phase 1. Another Corps cost-share funding program is a likely candidate for implementing Phase 3.

### **Funding estimate**

Convening and facilitating the stakeholder process, including hiring a facilitator and convening up to three workshops/meetings, for Phase 1 and 2 is estimated to cost between \$15,000 - \$18,000, based on facilitation consultant costs from prior workshops. A more detailed and specific budget will be presented to the Salmon Recovery Council when the topic is prepared for decision.