

Fish Impact Mitigation Program

Information Sheet

We are committed to limiting the impact that the operation of our generation facilities and reservoirs has on fish and fish habitat by implementing the following strategies, as required:

- Fish Entrainment Strategy
- Total Dissolved Gas Strategy
- Fish Passage Decision Framework

FISH ENTRAINMENT STRATEGY

The Fish Entrainment Strategy was established in 2006 to:

- reduce the entrainment or involuntary movement of fish through water intakes, turbines and spillways at generation facilities
- meet the requirements of the federal *Fisheries Act*.

We participate in a technical committee with members Fisheries and Oceans Canada and the BC Ministry of Environment to implement the Strategy.

Fish entrainment is a site specific challenge depending on facility layout and operations as well as the types of fish in the water by dams and diversion structures.

Studies have identified the facilities at highest risk of having fish entrainment issues and Action Plans have been developed to address impacts at these facilities. The Plans include activities ranging from research to compensation depending on what is needed at each facility

We implemented the Fish Entrainment Strategy to review the impact of the John Hart Generating Station redevelopment on the Campbell River system. As a result of the review, cutthroat trout habitat on Fry Creek, a tributary to Lower Campbell Lake, was enhanced by increasing spawning habitat to reduce rainbow trout interaction with cutthroat trout.



Fry Creek before habitat enhancement



Fry Creek spawning platform after enhancement

The Fish & Wildlife Compensation Program is a partnership between BC Hydro, the BC Ministry of Environment, Fisheries and Oceans Canada, First Nations and public stakeholders. It delivers a wide range of conservation and enhancement projects for fish, wildlife and supporting habitats affected by BC Hydro's generation facilities.

TOTAL DISSOLVED GAS STRATEGY

When the gas concentration in water is at equilibrium with the air, it is "fully saturated". When the concentration is higher than that in the air, the water is "supersaturated". Studies have shown that fish and other aquatic organisms have limited ability to tolerate supersaturated waters. Some hydroelectric facilities can cause gas supersaturation while discharging large flows down spillways as the force of the water plunging into receiving waters below dams causes high concentrations of gas to be mixed in with the water.

We established the Total Dissolved Gas Strategy to address challenges associated with elevated total dissolved gas levels downstream of our generation facilities. The Strategy is being implemented at generation facilities, as needed, to minimize environmental and regulatory risk. The Strategy evaluates the total dissolved gas risk associated with facility operations to determine where:

- more monitoring is needed to develop the relationship between operations and total dissolved gas production;
- mitigation involving operational changes or cost-effective physical works can be undertaken.

Provincial and federal regulators review the Strategy's implementation on a regular basis to determine its overall success.

We applied the Strategy at Duncan Dam where monitoring revealed that spillway flows of more than 100 cubic meters per second can increase total dissolved gas concentrations above levels of concern. This finding is being used in operations and maintenance planning to ensure that the frequency of high spillway flows is reduced and that other discharge devices are fully utilized during high discharge periods.

FISH PASSAGE DECISION FRAMEWORK

The development of some of our dams in coastal rivers resulted in a blockage to migratory fish. Although the Fish & Wildlife Compensation Program (FWCP) funds many fisheries projects, funding fish passage programs was not originally considered as part of the FWCP. In 2008, we introduced the Fish Passage Decision Framework to support the FWCP in evaluating proposals for fish passage programs. We are currently applying the Framework at Coquitlam, Alouette and Wilsey (Shuswap) Dams.

SALMON RIVER DIVERSION PROJECT

Passage through the Salmon River Diversion Dam was difficult for steelhead, coho and chinook salmon, due to variable inflows, debris issues and poor passage design of the fishway originally constructed in 1992. In 2008, the Salmon River Diversion Dam Fish Passage Consultative Committee applied the Framework to improve salmon passage past the Salmon River diversion. After several feasibility studies and passage options analyses, it was agreed that the costs to improve the aging structure were too great to justify its continued operation. The diversion dam was decommissioned in 2016–2017, opening up 40 km of prime rearing and spawning habitat.

This was the first time we co-managed a major capital project with First Nations, in this case with We Wai Kai (Cape Mudge Band) and Wei Wai Kum (Campbell River Indian Band).



The Salmon River Diversion Dam prior to removal



Salmon River after removal of the diversion dam

For more information

To learn more about the Fish Impact Mitigation Program or the Water Licence Renewal Project, please contact us at wirenew@bchydro.com. We look forward to hearing from you.