

Williston Reservoir Entrainment Study

Monitoring movement of fish during spillway operation

The Peace Water Use Plan Committee recommended a study to monitor entrainment, the involuntary movement of fish from their natural course during spillway operation. The purpose of this study is to monitor Williston Reservoir fish diverted to the Dinosaur Reservoir during spillway operation.



Spillway operations in July 2012



Questions We Wanted to Answer

1. What number, size and species of fish are diverted through the dam spillway into Dinosaur Reservoir?
2. What is the relationship between spillway discharge rate and other variables (i.e. time of day) and entrainment?
3. What is the estimate of mortality in fish diverted through the spillway?

Study Update

- An estimated 12% of fish located near the forebay were entrained; the majority were 40-75 mm long and primarily Kokanee.
- Discharge rates of 700-1,300 m³/s had the highest number of fish entrained per hour.
- Entrainment of some sizes of fish was higher at night. Large fish were found closer to the surface at night.
- The study classified all diverted fish as dead, regardless of survival, as they would not return to the Williston Reservoir.

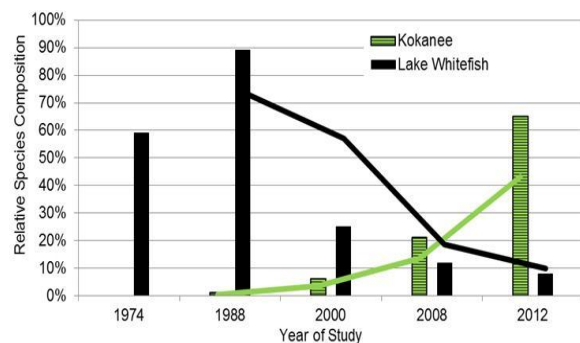
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Installation of hydro acoustic transducer at the dam.

Lessons Learned

- Tagged fish are not effective for spill-triggered studies given the uncertainty of spill event timing.
- Drawing relationships between certain variables (i.e., time of year) and entrainment in a single opportunistic study is not possible.
- Estimates the number of fish displaced by spillway operations should be based on relatively recent population estimates.



Relative abundance of Kokanee, Lake Whitefish captured within 15 km of W.A.C. Bennett Dam, 1974-2012. Source: Plate et al. 2012

Key Findings and Next Steps

- The number of fish displaced by spillway operations is substantially affected by time of day, size of fish, depth in water column, spillway gate and discharge level.
- Kokanee were the most common fish species found in the 2012 surveys, and likely the species most entrained during the 2012 spill.
- BC Hydro incorporates the study findings into its Entrainment Strategy.