Bridge River Project Water Use Plan

Monitoring Program Terms of Reference

- **BRGMON-14 Effectiveness of Cayoosh Flow Dilution, Dam Operation, and Fishway Passage on Delay and Survival of Upstream Migration of Salmon in the Seton-Anderson Watershed.**

Addendum 1

November 25, 2015

Addendum 1 to BRGMON 14 - Effectiveness of Cayoosh Flow Dilution, Dam Operation, and Fishway Passage on Delay and Survival of Upstream Migration of Salmon in the Seton-Anderson Watershed.

1.1 Addendum Rationale

The objectives of Bridge Monitor #14 (BRGMON-14) include: 1) evaluating the effectiveness of the Seton River dilution ratio targets, and 2) evaluating how flow releases from Seton dam affect upstream fishway passage successes at the Seton Dam.

Monitoring results from pre-WUP and post-WUP periods showed that there have been considerable fish passage delays occurring at the Seton dam tailrace under the normal routine flow release configuration. The delays have been partly attributed to highly turbulent flows provided by combined discharges from Siphon #1 (SSV1) and the Fish Water Release Gate (FWRG) located immediately at the mouth of the fishway entrance during the fish migration period. Migrant fish must overcome these turbulent flows in order to access the fishway and, therefore, the turbulent flows are considered as one possible factor contributing to fish delays. In 2014 an alternative flow release experiment involving transfer of flows from SSV1 to Siphon #4 (SSV4) and reducing discharges from the FWRG was implemented between August 8 and 9, 2014. Preliminary results from this experiment showed that fish passage success under the alternative flow scenario improved by about 9% for PIT tagged Gates Creek Sockeye. Cumulative post-dam passage survival to the spawning ground was improved by about 55% over the routine operation scenario for Gates Creek Sockeye. This preliminary result is based on the one-time experiment in 2014. Given the significance of these preliminary results we propose to extend the field study by one more year to re-run the alternative flow experiment in order to evaluate repeatability of these results. Repeatability of results will provide sound scientific basis for potentially using the study results to inform future operational changes to improve fish passage success and post-dam passage survival to spawning grounds.

The recommended changes are summarized in the following sections.

2.2 Approach

The overall approach to answering the management questions will remain the same. The program study period will be extended until May 30, 2018, from the original approach which envisioned completion of BRGMON-14 in 2017. This extension will provide for one more year of additional field data collection to repeat the alternative flow release experiment done in 2014.

2.3 Methods

An additional season of field data collection will be implemented, which involves: 1) a sockeye PIT tagging study designed to evaluate how an alternate flow scenario affects short-term (dam passage) and long-term (survival to spawning grounds) success of Gates Creek sockeye salmon, and 2) a radio telemetry program to support the PIT study and compliment the radio telemetry studies carried out in 2013, 2014 and 2015. Details on alternative flow release scenario settings, target species and tagging techniques will be kept consistent with the previous years' methods as described in the original Terms of Reference and/or as per the 2014 UBC proposal.

2.3.8 Reporting

An interim annual data report will be submitted in May 2017, and the final comprehensive synthesis BRGMON-14 program report will be submitted in May 2018.

2.5 Schedule

Field work will be extended by one year, through 2016, with data analysis implemented in 2017 and the final synthesis report submitted in 2018. The proposed schedule of implementation for the extended program is present in Table 1 below.

Table 1: Annual Schedule of Activities for BRGMON-14 Seton Tailrace Delay

	Task	**2016**	**2017**	**2018**
1	Project Coordination	x	x	x
2	Physical monitoring (temperature etc.)	x		
3	Adult Salmonid Telemetry	x		
4	Reporting			
	i. Annual Report		x	
	ii. Final Synthesis Report			x