Falls River Project Water Use Plan

Monitoring Programs Annual Report: 2017

Implementation Period: November 2016 to October 2017

- **FLSMON-1 Falls River Presence and Timing of Steelhead and Salmon Spawning Monitoring**
- **FLSMON-2 Falls River Fish Spawning Habitat Monitoring**
- **FLSMON-3 Big Falls Reservoir Tributary Access and Potential Stranding Monitoring**
- **FLSMON-4 Big Falls Reservoir Sedge Habitat Maintenance Monitoring**
- **FLSMON-5 Big Falls Reservoir Tributary Backwatering Monitoring**
- **FLSMON-6 Big Falls Reservoir Wildlife Shoreline Habitat Monitoring**

For Conditional Water Licences 120736 and 120739

November 29, 2017

BC Hydro Falls River Project Water Use Plan Monitoring Programs Annual Report: 2017

1 Introduction

This document represents a summary of the status and the results of the Falls River Water Use Plan (WUP) monitoring programs to October 31, 2017, as per the Falls River Order under the *Water Act,* dated April 4, 2006. There are six monitoring programs and no physical works.

2 Status

The following table outlines the dates that Terms of Reference (TOR) for the Falls River WUP monitoring programs and physical works were submitted to and approved by the Comptroller of Water Rights (CWR).

Table: 2-1: Dates of Falls River WUP TOR Submissions and Approvals by the CWR

Monitoring Program & Physical Works TOR	Order Clause	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
FLSMON-1 Falls River Presence and Timing of Steelhead and Salmon Spawning Monitoring	Clause 5.a	Oct 04, 2006	Nov 28, 2006		
FLSMON-2 Falls River Fish Spawning Habitat Monitoring	Clause 5.b	Oct 04, 2006	Nov 28, 2006		
FLSMON-3 Big Falls Reservoir Tributary Access and Potential Stranding Monitoring	Clause 5.c	Oct 04, 2006	Nov 28, 2006	Jun 22, 2009	Jul 13, 2009
FLSMON-4 Big Falls Reservoir Sedge Habitat Maintenance Monitoring	Clause 5.d	Oct 04, 2006	Nov 28, 2006	Jul 14, 2016	Oct 27, 2016
FLSMON-5 Big Falls Reservoir Tributary Backwatering Monitoring	Clause 5.e	Oct 04, 2006	Nov 28, 2006	Jun 22, 2009	Jul 13, 2009
FLSMON-6 Big Falls Reservoir Wildlife Shoreline Habitat Monitoring	Clause 5.g	Oct 04, 2006	Nov 28, 2006		

3 Schedule

The following table outlines the current schedule for the monitoring programs and physical works being delivered for the Falls River WUP.

Table 3-1: Monitoring Programs and Physical Works Schedule as of October 31, 2017

Monitoring Programs	2007 WLR YR1	2008 WLR YR2	2009 WLR YR3	2010 WLR YR4	2011 WLR YR5	2012 WLR YR6	2013 WLR YR7	2014 WLR YR8	2015 WLR YR9	2016 WLR YR10	2017 WLR YR11	2018 WLR YR12
FLSMON-1 Falls River Presence and Timing of Steelhead and Salmon Spawning Monitoring	✓	✓	✓	✓**F**								
FLSMON-2 Falls River Fish Spawning Habitat Monitoring		✓	✓	✓**F**								
FLSMON-3 Big Falls Reservoir Tributary Access and Potential Stranding Monitoring			✓	✓**F**								
FLSMON-4 Big Falls Reservoir Sedge Habitat Maintenance Monitoring	✓						■**?**				✓	
FLSMON-5 Big Falls Reservoir Tributary Backwatering Monitoring			✓	✓**F**								
FLSMON-6 Big Falls Reservoir Wildlife Shoreline Habitat Monitoring	✓	✓	✓	✓**F**								

Legend:
- ■ = Program to be undertaken/initiated in identified year
- **u/w** = Project is underway
- ✓ = Program completed for the year
- ■**?** = Program started, but encountered operational delays; Interim Review will determine if and when study is to be completed
- ✓**F** = All field work for this project is complete. No further field work is planned.

4 Monitoring Programs and Physical Works Terms of Reference

The monitoring programs being implemented under the Falls River WUP are described in Terms of Reference. These Terms of Reference and the reports for work completed to date can be found here:

https://www.bchydro.com/about/sustainability/conservation/water_use_planning/northern_interior/falls_river.html

5 Status of Monitoring Programs

This section outlines the status of the Falls River WUP monitoring programs as per the Order under the *Water Act,* dated April 4, 2006.

5.1 FLSMON-1 Falls River Presence and Timing of Steelhead and Salmon Spawning Monitoring

The objective of this three-year program was to determine the timing of adult salmon (Chinook, Chum and Pink) and steelhead spawning in the Falls River downstream of the dam (river and tailpond) and make adjustments to the estimated minimum flow (6.5 cms) timing (August 1 - October 15) using this data.

This program was initiated in April 2007, was carried out in 2008 and was completed in 2009/10 for a total of three years of monitoring. This program is complete. .

5.2 FLSMON-2 Falls River Fish Spawning Habitat Monitoring

The objective of this program was to determine the effects of operations on salmon egg-fry survival given the uncertainty in modelling the estimated influence of operations on spawning and egg incubation. Monitoring the salmon egg-to-fry survival at Falls River was intended to improve the model accuracy and better estimate salmon abundance at the population level.

This program was initiated in March 2008 and was carried out in 2009. The third and final year of this monitoring program took place in 2010.This program is complete.

5.3 FLSMON-3 Big Falls Reservoir Tributary Access and Potential Stranding Monitoring

The two objectives of this program were to:

1) survey the location of barriers within the drawdown zone at three tributaries.
2) identify the location and size of potential areas of stranding along the shoreline in the drawdown zone.

This program was scheduled to start in 2008; however, due to the spillway upgrade project required at Falls River Generating Station, the program did not commence that year. The program started in 2009 and the report for this one-year program was received in August 2010.

5.4 FLSMON-4 Big Falls Reservoir Sedge Habitat Maintenance Monitoring

The objective of this program was to document and map vegetation in the drawdown zone of the reservoir.

This program was initiated in August 2007 and is to be carried out over two years.

Year 1 was carried out in 2007 and Year 2 was scheduled to be carried out in 2011.

The Terms of Reference approved July 4, 2016 acknowledged that sampling was not conducted in 2011 but that sampling near the end of the WUP period was still valuable to assess the effect of reservoir operations on vegetation community change over time, specifically the high value sedge community.

Year 2 (the final year) of vegetation sampling was completed in September 2017 at transects established in September 2007. These transects were set up to quantify the potential effects the current operation of the Big Falls Reservoir on the sedge ecosystems at the upper end of the reservoir. The field vegetation observations and new aerial photography completed in September 2017 are being analysed together to help determine if the current operations are contributing to changes in these sedge ecosystems. The dam had flashboards in place that kept the reservoir level two metres higher up to the time of their removal in 2002.

The draft report is under preparation and is expected to be finalized by June 30, 2018.

5.5 FLSMON-5 Big Falls Reservoir Tributary Backwatering Monitoring

The objective of this program was to survey for cutthroat trout and Dolly Varden adults in spawning areas (redds) at locations where three tributaries join the reservoir and backwatering occurs during the spring spawning period.

This program was scheduled to start in 2008; however, due to the spillway upgrade project required at Falls River Generating Station, the program did not commence. As outlined in Section 2.0, the program started in 2009. Due to reservoir elevations in November 2009 not all the required data could be collected. Additional data collection was carried out in September 2010. The report for this one-year program was received in July 2011.

5.6 FLSMON-6 Big Falls Reservoir Wildlife Shoreline Habitat Monitoring

The objective of this program was to maximize the abundance and diversity of wildlife using the area around the Big Falls reservoir and to minimize stranding and flooding of bird nests or wildlife dens in the drawdown zone. To accomplish these objectives, mapping dens and nests established by birds and mammals in the drawdown zone of the reservoir was undertaken. This program was initiated in September 2007, was carried out in 2008 and was completed in 2009 for a total of three years of monitoring.

6 Monitoring Programs Costs

The following table summarizes the Falls River WUP monitoring programs costs approved by the Comptroller and the Actual Costs to October 31, 2017.

Table 6-1: Falls River WUP Monitoring Programs Costs

Monitoring Programs	Costs approved by CWR	Life to Date Actuals (LTD)	Estimated to Complete (Forecast)	Total Forecast (LTD and Forecast)	Variance Total to Approved	Explanation
Falls River WUP Annual Report	$5,680	$3,619	$1,750	$5,369	$311	2017 (F18 is final year to submit AP)
FLSM01A Timing Salmon & Steel	$144,552	$130,465	$9,712	$140,176	$4,376	Project Completed
FLSM01A Timing Salmon & Steel - OR DM	$32,020	$10,028	$9,712	$19,740	$12,280	
FLSM01A Timing Salmon & Steel - OR Imp	$112,532	$120,437	$0	$120,437	($7,905)	
FLSM02A Spawning Habitat	$222,881	$222,881	$0	$222,881	$0	Project Completed
FLSM02A Spawning Habitat - OR DM	$34,460	$34,728	$0	$34,728	($268)	
FLSM02A Spawning Habitat - OR Imp	$188,421	$188,153	$0	$188,153	$268	
FLSM03A Tributary Access	$34,216	$31,755	$2,009	$33,764	$452	Project Completed
FLSM03A Tributary Access - OR DM	$14,716	$14,251	$2,009	$16,260	($1,544)	
FLSM03A Tributary Access - OR Imp	$19,500	$17,504	$0	$17,504	$1,996	
FLSM04A Sedge Habitat	$126,968	$81,820	$32,373	$114,192	$12,776	Project to be completed in mid-2018.
FLSM04A Sedge Habitat - OR DM	$41,908	$37,712	$9,449	$47,161	($5,253)	
FLSM04A Sedge Habitat - OR Imp	$85,060	$44,108	$22,924	$67,032	$18,028	
FLSM05A Trib Backwater	$50,549	$50,549	$0	$50,549	$0	Project Completed
FLSM05A Trib Backwater - OR DM	$21,049	$21,049	$0	$21,049	$0	
FLSM05A Trib Backwater - OR Imp	$29,500	$29,500	$0	$29,500	($0)	
FLSM06A Wildlife Habitat	$63,180	$56,218	$6,949	$63,167	$13	Project Completed
FLSM06A Wildlife Habitat - OR DM	$22,477	$16,032	$6,949	$22,981	($504)	
FLSM06A Wildlife Habitat - OR Imp	$40,703	$40,186	$0	$40,186	$517	

OR - Ordered Remissible
ONR - Ordered Non-Remissible

* Red values in parentheses denote overage.