

# **Columbia River Project Water Use Plan Revelstoke Flow Management Plan**

## **Monitoring Program**

**Annual Report: 2013**

**Implementation Period: February 2012 to January 2013**

- **CLBMON-15a Middle Columbia River Physical Habitat Monitoring**
- **CLBMON-15b Middle Columbia River Ecological Productivity Monitoring**
- **CLBMON-16 Middle Columbia River Fish Population Indexing Surveys**
- **CLBMON-17 Middle Columbia River Juvenile Fish Habitat Use**
- **CLBMON-18 Middle Columbia River Adult Fish Habitat Use**
- **CLBMON-53 Middle Columbia Juvenile Fish Stranding**

**Conditional Water Licences for Kinbasket storage (27068 and 39432), Mica diversion (39431), Revelstoke diversion and storage (47215), and Arrow storage (27066)**

**February 28, 2013**

## **BC Hydro Columbia River Project Water Use Plan Revelstoke Flow Management Plan Monitoring Programs Annual Report: 2013**

### **1 Introduction**

This document represents a summary of the status and the results of the Columbia River Revelstoke Flow Management Plan Water Use Plan (WUP) monitoring programs and physical works to January 31, 2013, as per the Columbia River Order under the *Water Act*, dated January 26, 2007. There are six monitoring programs.

### **2 Status**

The following table outlines the dates that TOR for the Revelstoke Flow Management Plan WUP monitoring programs were submitted to and approved by the CWR.

**Table: 2-1: Dates of Revelstoke Flow Management Plan WUP TOR Submissions and Approvals by the Comptroller of Water Rights**

Monitoring Program & Physical Works TOR	Order Clause	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
CLBMON-15a Middle Columbia River Physical Habitat Monitoring	Schedule C, Clause 4 (a);	Mar 05, 2007	Mar 22, 2007	May 21, 2010	Jul 19, 2010
CLBMON-15b Middle Columbia River Ecological Productivity Monitoring	Schedule C, Clause 4 (a)	Mar 05, 2007	Mar 22, 2007	May 21, 2010	Jul 19, 2010
CLBMON-16 Middle Columbia River Fish Population Indexing Surveys	Schedule C, Clause 4 (b)	Mar 05, 2007	Mar 22, 2007	May 21, 2010	Jul 19, 2010
CLBMON-17 Middle Columbia River Juvenile Fish Habitat Use	Schedule C, Clause 4 (c)	Mar 05, 2007	Mar 22, 2007	May 21, 2010	Jul 19, 2010
CLBMON-18 Middle Columbia River Adult Fish Habitat Use	Schedule C, Clause 4 (d)	Mar 05, 2007	Mar 22, 2007	May 21, 2010	Jul 19, 2010
CLBMON-53 Middle Columbia River Juvenile Fish Stranding	Amended Order, Clause 2 (c)	Jul 31, 2008	Sep 11, 2008	Feb 02, 2009	Mar 26, 2009

### **3 Schedule**

The following table (Table 3-1) outlines the current schedule for the monitoring programs and physical works being delivered for the Revelstoke Flow Management Plan WUP.

**Table 3-1: Table of WUP Schedule**

Monitoring Programs	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6	WLR YR7	WLR YR8	WLR YR9	WLR YR10	WLR YR11	WLR YR12	WLR YR13
CLBMON-15a Middle Columbia River Physical Habitat Monitoring	✓	✓	✓	✓	✓	u/w	■	■	■	■	■	■	■
CLBMON-15b Middle Columbia River Ecological Productivity Monitoring	✓	✓	✓	✓	✓	u/w	■	■	■	■	■	■	■
CLBMON-16 Middle Columbia River Fish Population Indexing Surveys	✓	✓	✓	✓	✓	u/w	■	■	■	■	■	■	■
CLBMON-17 Middle Columbia River Juvenile Fish Habitat Use		✓	✓	✓	✓	u/w (yr5)	■						
CLBMON-18 Middle Columbia River Adult Fish Habitat Use		✓	✓	✓	x	x	x	■	■	■			
CLBMON-53 Middle Columbia River Juvenile Fish Stranding			✓	✓	✓	x	■						

Legend:

- = Program to be undertaken/initiated in identified year
- u/w = Project is underway
- ✓ = Program completed for the year
- x = Program started, but encountered operational or hydrological delays

#### 4 Monitoring Programs and Physical Works Terms of Reference

The Monitoring Programs and Physical Works being implemented under the Revelstoke Flow Management Plan WUP are described in Terms of Reference. These Terms of Reference and the reports for work completed to date can be found here:

[http://www.bchydro.com/about/sustainability/conservation/water\\_use\\_planning/southern\\_interior/columbia\\_river/revelstoke-flow.html](http://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior/columbia_river/revelstoke-flow.html)

#### 5 Summary of Monitoring Programs

##### 5.1 CLBMON-15a Middle Columbia River Physical Habitat Monitoring

###### 5.1.1 Status

This monitoring program was initiated in 2007 and will be carried out over 13 years. Attached is the report for Year 5 dated June 4, 2012. The Year 6 (2012) draft report is in preparation.

##### 5.2 CLBMON-15b Middle Columbia River Ecological Productivity Monitoring

###### 5.2.1 Status

This monitoring program was initiated in July 2007 and will be carried out over 13 years. Attached is the report for Year 5 dated May 2012. The Year 6 (2012 Data) draft report is in preparation.

### **5.3 CLBMON-16 Middle Columbia River Fish Population Indexing Surveys**

#### **5.3.1 Status**

This monitoring program was initiated in October 2007 and will be carried out over 13 years. Attached is the report for Year 5 dated June 29, 2012. The Year 6 (2012 Data) draft report is in preparation.

### **5.4 CLBMON-17 Middle Columbia River Juvenile Fish Habitat Use**

#### **5.4.1 Status**

This monitoring program was initiated in 2008 and will be carried out over 6 years. Attached is the report for Year 4 dated April 2012. The Year 5 (2012 data) draft report is in preparation.

### **5.5 CLBMON-18 Middle Columbia River Adult Fish Habitat Use**

#### **5.5.1 Status**

This monitoring program was initiated in 2008 and will be carried out over 6 years. The first three years have been completed for 2008-2010. The remainder of the program has been deferred to 2014 and will continue throughout 2016. There is no report for this reporting period.

### **5.6 CLBMON-53 Middle Columbia River Juvenile Fish Stranding**

#### **5.6.1 Status**

This monitoring program was initiated in 2009 and will be carried out over 4 years. Attached is the report for Year 3 dated March 2012. The first three years have been completed for 2009-2011. There was no work implemented in 2012. The fourth and final year will be implemented in 2013.

## **6 Monitoring Programs Costs**

The following table summarizes the Revelstoke Flow Management Plan WUP monitoring programs and physical works costs approved by the Comptroller and the Actual Costs to January 31, 2013.

**Table 6-1: Revelstoke Flow Management Plan WUP Monitoring Programs Costs**

Monitoring Programs	Activity	Costs approved by CWR	Life to Date Actuals (LTD)	Estimated to Complete (Forecast)	Total Forecast (LTD and Forecast)	Variance Total to Approved	Explanation	Corrective Action
Revelstoke Flow Management Plan Annual Report	OR	\$5,177	\$2,844	\$2,333	\$5,177	\$0		
<b>CLBMON#15 MID COL PHYSICAL HABITAT AND ECOLOGICAL PRODUCTIVITY</b>	OR	\$4,052,513	\$1,498,049	\$2,554,464	\$4,052,513	\$0		
CLBMON#15 Direct Management 001	OR	\$264,235	\$78,480	\$185,755	\$264,235	\$0		
CLBMON#15 Implementation 002	OR	\$3,788,278	\$1,419,569	\$2,368,709	\$3,788,278	\$0		
<b>CLBMON#16 MID COL FISH POPULATION INDEXING SURVEYS</b>	OR	\$2,880,201	\$950,174	\$1,930,027	\$2,880,201	\$0		
CLBMON#16 Direct Management 001	OR	\$105,704	\$43,399	\$62,305	\$105,704	\$0		
CLBMON#16 Implementation 002	OR	\$2,774,497	\$906,775	\$1,867,722	\$2,774,497	\$0		
<b>CLBMON#17 OR MID COL JUVENILE FISH HABITAT USE</b>	OR	\$495,994	\$452,410	\$43,584	\$495,994	\$0		
CLBMON#17 Direct Management OR 001	OR	\$39,494	\$30,156	\$9,338	\$39,494	\$0		
CLBMON#17 Implementation OR 002	OR	\$456,500	\$422,254	\$34,246	\$456,500	\$0		
<b>CLBMON#17 ONR MID COL JUVENILE FISH HABITAT USE</b>	ONR	\$103,056		\$103,056	\$103,056	\$0		
CLBMON#17 Direct Management ONR 001	ONR				\$0	\$0		
CLBMON#17 Implementation ONR 002 - REV 5	ONR	\$103,056		\$103,056	\$103,056	\$0		
<b>CLBMON#18 OR MID COL ADULT FISH HABITAT USE</b>	OR	\$862,641	\$539,637	\$323,004	\$862,641	\$0		
CLBMON#18 Direct Management OR 001	OR	\$42,322	\$27,088	\$15,234	\$42,322	\$0		
CLBMON#18 Implementation OR 002	OR	\$820,319	\$512,549	\$307,770	\$820,319	\$0		
<b>CLBMON#18 ONR MID COL ADULT FISH HABITAT USE</b>	ONR	\$178,104		\$178,104	\$178,104	\$0		
CLBMON#18 Direct Management ONR 001	ONR				\$0	\$0		
CLBMON#18 Implementation ONR 002 - REV 5	ONR	\$178,104		\$178,104	\$178,104	\$0		
<b>CLBMON#53 MIDDLE COLUMBIA: JUVENILE FISH STRANDING</b>	ONR	\$179,222	\$91,845	\$87,377	\$179,222	\$0		
CLBMON#53 Direct Management 001	ONR	\$58,310	\$22,385	\$35,925	\$58,310	\$0		
CLBMON#53 Implementation 002	ONR	\$120,912	\$69,460	\$51,452	\$120,912	\$0		
<b>OR - Ordered Remissible</b>								
<b>ONR - Ordered Non-Remissible</b>								