

Columbia River Water Use Plan

Lower Columbia River Fish Management Plan

Monitoring Programs

Annual Report: 2013

Implementation Period: August 2012 to July 2013

- **CLBMON-42 Lower Columbia River Fish Stranding Assessment and Ramping Protocol**
- **CLBMON-43 Lower Columbia River Sculpin and Dace Life History Assessment**
- **CLBMON-44 Lower Columbia River Physical Habitat and Ecological Productivity Monitoring**
- **CLBMON-45 Lower Columbia River Fish Population Indexing Surveys**
- **CLBMON-46 Lower Columbia River Rainbow Trout Spawning Habitat Assessment**
- **CLBMON-47 Lower Columbia River Whitefish Spawning Ground Topographic Survey**
- **CLBMON-48 Lower Columbia River Whitefish Egg Monitoring & Life History Study**
- **CLBMON-49 Lower Columbia River Effects of Whitefish Flows on Great Blue Heron & Winter Use of Waldie by Great Blue Heron**

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

August 31, 2013

BC Hydro Columbia River Project Water Use Plan Lower Columbia River Fish Management Plan Monitoring Programs Annual Report: 2013

1 Introduction

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

2 Status

The following table outlines the dates that TOR for the Lower Columbia River Fish Management Plan of the Columbia River WUP monitoring programs were submitted to and approved by the CWR.

Table: 2-1: Dates of Lower Columbia River Fish Management Plan of the Columbia River WUP TOR Submissions and Approvals by the Comptroller of Water Rights

Monitoring Program & Physical Works TOR	Order Clause (optional)	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
CLBMON-42 Lower Columbia River Fish Stranding Assessment and Protocol	Schedule E.2.a	Sep 10, 2007	Oct 29, 2007	Sep 26, 2012	Oct 09, 2012
CLBMON-43 Lower Columbia River Sculpin and Dace Life History Assessment	Schedule E.2.b	Oct 26, 2007	Dec 03, 2007		
CLBMON-44 Lower Columbia River Physical Habitat and Ecological Productivity Monitoring	Schedule E.2.c	Oct 26, 2007	Dec 03, 2007		
CLBMON-45 Lower Columbia River Fish Population Indexing Surveys	Schedule E.2.d	Sep 10, 2007	Oct 29, 2007		
CLBMON-46 Lower Columbia River Columbia Rainbow Trout Spawning Habitat Assessment	Schedule E.2.e	Oct 26, 2007	Dec 03, 2007	Jan 09, 2009	Mar 26, 2009
CLBMON-47 Lower Columbia River Whitefish Spawning Ground Topographic Survey	Schedule E.2.f	Oct 26, 2007	Dec 03, 2007		
CLBMON-48 Lower Columbia River Whitefish Egg Monitoring & Life History Study	Schedule E.2.g	Oct 26, 2007	Dec 03, 2007		
CLBMON-49 Lower Columbia River Effects of Whitefish Flows on Great Blue Heron and Winter Use of Waldie by Great Blue Heron	Schedule E.2.h	Oct 26, 2007	Dec 03, 2007	Jun 05, 2013	Jun 19, 2013

3 Schedule

The following table (Table 3-1) outlines the current schedule for the monitoring programs being delivered for the Lower Columbia River Fish Management Plan of the Columbia River WUP.

Table 3-1: Table of WUP Schedule

Monitoring Programs	2007 WLR YR1	2008 WLR YR2	2009 WLR YR3	2010 WLR YR4	2011 WLR YR5	2012 WLR YR6	2013 WLR YR7 Interim Review	2014 WLR YR8	2015 WLR YR9	2016 WLR YR10	2017 WLR YR11	2018 WLR YR12	2019 WLR YR13 Final Review
CLBMON-42 Lower Columbia River Fish Stranding Assessment and Protocol	✓	✓	✓	✓	✓	✓	■	■	■	■	■	■	■
CLBMON-43 Lower Columbia River Sculpin and Dace Life History Assessment			✓	✓	✓	✓	u/w						
CLBMON-44 Lower Columbia River Physical Habitat and Ecological Productivity Monitoring		✓	✓	✓	✓	✓	■	■	■	■	■	■	■
CLBMON-45 Lower Columbia River Fish Population Indexing Surveys	✓	✓	✓	✓	✓	✓	u/w	■	■	■	■	■	■
CLBMON-46 Lower Columbia River Columbia Rainbow Trout Spawning Habitat Assessment		✓	✓	✓	✓	✓	■	■	■	■	■		
CLBMON-47 Lower Columbia River Whitefish Spawning Ground Topographic Survey					✓	✓	u/w						
CLBMON-48 Lower Columbia River Whitefish Egg Monitoring & Life History Study		✓	✓	✓	✓	✓							
CLBMON-49 Lower Columbia River Effects of Whitefish Flows on Great Blue Heron and Winter Use of Waldie by Great Blue Heron							■	■	■				

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 Terms of Reference

The Monitoring Programs being implemented under the Lower Columbia River Fish Management Plan of the Columbia River WUP are described in Terms of Reference. These Terms of Reference can be found here:

http://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior/columbia_river/lower-columbia-fish.html

5 Summary of Monitoring Programs

5.1 CLBMON-42 Lower Columbia River Fish Stranding Assessment and Protocol

5.1.1 Status

This monitoring program was initiated in May 2007 and will be carried out over 13 years. The Year 6 report is currently being finalized and will be submitted in the 2014 Annual Report.

5.2 CLBMON-43 Lower Columbia River Sculpin and Dace Life History Assessment

5.2.1 Status

This monitoring program was initiated in 2009 and will be carried out over 5 years. Attached is the report for Year 4 dated 28 June 2013.

5.3 CLBMON-44 Lower Columbia River Physical Habitat and Ecological Productivity Monitoring

5.3.1 Status

This monitoring program was initiated in 2008 and will be carried out over 12 years. The Year 5 report is currently being finalized and will be submitted in the 2014 Annual Report.

5.4 CLBMON-45 Lower Columbia River Fish Population Indexing Surveys

5.4.1 Status

This monitoring program was initiated in September 2007 and will be carried out over 13 years. Attached is the report for Year 5 Study Period 2011 dated October 26, 2012.

5.5 CLBMON-46 Lower Columbia River Columbia Rainbow Trout Spawning Habitat Assessment

5.5.1 Status

This monitoring program was initiated in 2008 and will be carried out over 10 years. Attached is the report for Year 5 dated January 17, 2013.

5.6 CLBMON-47 Lower Columbia River Whitefish Spawning Ground Topographic Survey

5.6.1 Status

This monitoring program was initiated in 2011 and will be carried out over 3 years. Attached is the report for Year 2 dated July 26, 2013.

5.7 CLBMON-48 Lower Columbia River Whitefish Egg Monitoring & Life History Study

5.7.1 Status

This monitoring program was initiated in 2008 and will be carried out over 5 years. Attached is the report for Year 4 dated December 20, 2012.

5.8 CLBMON-49 Lower Columbia River Effects of Whitefish Flows on Great Blue Heron and Winter Use of Waldie by Great Blue Heron

5.8.1 Status

This monitoring program will be initiated in November 2013 and will be carried out over three years. No report is attached. Expected report due March 2014 to be submitted in next year's report.

6 Monitoring Programs Costs

The following table summarizes the Lower Columbia River Fish Management Plan of the Columbia River WUP monitoring programs costs approved by the Comptroller and the Actual Costs to July 31, 2013.

Table 6-1: Lower Columbia River Fish Management Plan of the Columbia 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	Corrective Action
Lower Columbia River Fish Annual Report	\$8,978	\$6,681	\$4,210	\$10,891	(\$1,913)	Annual report preparation has several projects that extend for the full duration of the WUP.	Resubmission of annual report costs will occur by March 2014.
CLBMON-42 LOW COL FISH STRANDING ASSESSMENT AND RAMPING PROTOCOL	\$1,565,971	\$483,752	\$970,718	\$1,454,471	\$111,500	Efficiencies found during project implementation.	No corrective action.
C08M42A LC: Fish Strand - OR DM	\$247,910	\$70,949	\$93,525	\$164,474	\$83,436		
C08M42A LC: Fish Strand - OR Imp	\$1,318,061	\$412,804	\$877,193	\$1,289,997	\$28,064		
CLBMON-43 LOW COL SCULPIN & DACE LIFE HISTORY ASSESSMENT	\$990,546	\$777,338	\$153,266	\$930,605	\$59,941	Efficiencies found during project implementation.	No corrective action.
C08M43A LC: Sculpin&Dace - OR DM	\$64,043	\$56,379	\$5,294	\$61,674	\$2,369		
C08M43A LC: Sculpin&Dace - OR Imp	\$926,503	\$720,959	\$147,972	\$868,931	\$57,572		
CLBMON-44 LOW COL PHYSICAL HABITAT & ECOLOGICAL PRODUCTIVITY	\$2,162,010	\$1,209,161	\$864,029	\$2,073,190	\$88,820	Efficiencies found during project implementation.	No corrective action.
C08M44A LC: Phys Hab&Eco - OR DM	\$171,319	\$137,408	\$50,558	\$187,966	(\$16,647)		
C08M44A LC: Phys Hab&Eco - OR Imp	\$1,990,691	\$1,071,753	\$813,471	\$1,885,224	\$105,467		
CLBMON-45 LOW COL FISH POPULATION INDEXING	\$2,744,109	\$1,006,062	\$1,505,006	\$2,511,068	\$233,041	Efficiencies found during project implementation.	Contingency. No corrective action required.
C08M45A LC: Fish Pop - OR DM	\$180,037	\$55,717	\$57,276	\$112,993	\$67,044		
C08M45A LC: Fish Pop - OR Imp	\$2,564,072	\$950,345	\$1,447,730	\$2,398,075	\$165,997		
CLBMON-46 LOW COL RAINBOW TROUT SPAWNING HABITAT ASSESSMENT	\$734,980	\$389,750	\$333,584	\$723,334	\$11,646	Efficiencies found during project implementation.	No corrective action.
C08M46A LC: Rainbow Tro - OR DM	\$115,994	\$65,843	\$50,775	\$116,618	(\$624)		
C08M46A LC: Rainbow Tro - OR Imp	\$618,986	\$323,907	\$282,809	\$606,716	\$12,270		
CLBMON-47 LOW COL WHITEFISH SPAWNING GROUND TOPOGRAPHIC SURVEY	\$292,267	\$240,666	\$21,724	\$262,390	\$29,877	Efficiencies found during project implementation.	No corrective action.
C08M47A LC: Whitefish Spwn - OR DM	\$38,246	\$15,999	\$3,018	\$19,017	\$19,229		
C08M47A LC: Whitefish Spwn - OR Imp	\$254,021	\$224,667	\$18,706	\$243,373	\$10,648		
CLBMON-48 LOW COL WHITEFISH EGG MONITORING & LIFE HISTORY STUDY	\$912,365	\$853,097	\$25,358	\$878,455	\$33,910	Efficiencies found during project implementation.	No corrective action.
C08M48A LC: Whitefish Egg - OR DM	\$62,520	\$46,033	\$4,358	\$50,391	\$12,129		
C08M48A LC: Whitefish Egg - OR Imp	\$849,845	\$807,064	\$21,000	\$828,064	\$21,781		
CLBMON-49 LOW COL EFFECTS ON GREAT BLUE HERON	\$299,359	\$30,486	\$268,873	\$299,359	\$0	Project commences in November 2013.	No corrective action.
C08M49A LC: EFF WFish GBH - OR DM	\$56,271	\$30,486	\$25,785	\$56,271	\$0		
C08M49A LC: EFF WFish GBH - OR Imp	\$243,088		\$243,088	\$243,088	\$0		
OR - Ordered Remissible							
ONR - Ordered Non-Remissible							

* Red values in parentheses denote overage.