

Clowhom Project Water Use Plan

Monitoring Programs

Annual Report: 2015

Implementation Period: May 2014 to April 2015

- **COMMON-1 Monitor of Aquatic Wildlife in Wetlands Affected by Dam Operations**
- **COMMON-2 Role of Littoral Zone in Governing Clowhom Reservoir Productivity Capacity**
- **COMMON-3 Validation of the Effective Littoral Zone Performance Measure**
- **COMMON-4 Archaeological Sites Monitoring**

For Water Licences 120562, 120565, and Conditional Water Licence 119822

May 31, 2015

BC Hydro Clowhom Project Water Use Plan Monitoring Programs Annual Report: 2015

1 Introduction

This document represents a summary of the status and the results of the Clowhom Project Water Use Plan (WUP) monitoring programs to April 20, 2015, as per the Clowhom Order under the *Water Act*, dated April 20, 2005. There are four monitoring programs.

2 Status

The following table outlines the dates that Terms of Reference (TOR) for the Clowhom Project WUP monitoring programs were submitted to and approved by the CWR.

Leave to commence was not received for the COMMON-4 Archaeological Sites Monitoring TOR. As per the October 28, 2005 letter, this work will proceed under the *Heritage Conservation Act*.

Table 2-1: Dates of Clowhom Project WUP TOR Submissions and Approvals by the Comptroller of Water Rights

Monitoring Program TORs	Order Clause (optional)	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
COMMON-1 Monitor of Aquatic Wildlife in Wetlands Affected by Dam Operations	Schedule A.1.a	Sep 23, 2005	Oct 28, 2005		
COMMON-2 Role of Littoral Zone in Governing Clowhom Reservoir Productivity Capacity	Schedule A.1.b	Sep 23, 2005	Oct 28, 2005	Apr 02, 2015	Apr 23, 2015
COMMON-3 Validation of the Effective Littoral Zone Performance Measure	Schedule A.1.c	Sep 23, 2005	Oct 28, 2005		
COMMON-4 Archaeological Sites Monitoring	Schedule A.2	Sep 23, 2005	Oct 28, 2005		

3 Schedule

The following table (Table 3-1) outlines the current schedule for the monitoring programs being delivered for the Clowhom Project WUP.

Table 3-1: Table of WUP Schedule

Monitoring Program	Study	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
		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	WLR YR14	WLR YR15	WLR YR16	WLR YR17	WLR YR18	WLR YR19	WLR YR20
COMMON-1 Monitor of Aquatic Wildlife in Wetlands Affected by Dam Operations	Wildlife Census	✓	✓	✓	✓	✓	✓	✓	✓	✓	■	■	■	■	■	■	■	■	■	■	■
	Air Photography	✓				✓	✓				■					■					■
COMMON-2 Role of Littoral Zone in Governing Clowhom Reservoir Productive Capacity	Fish Survey	✓		✓	✓	✓	✓				■					■					■
	Juvenile Habitat Use Survey		X	✓	X	✓	✓														
COMMON-3 Validation of the Effective Littoral Zone Performance Measure		✓	✓	✓	✓	✓	✓				■					■					■
COMMON-4 Archaeological Sites Monitoring			X	✓	✓																

Legend: □ = Project timing subject to change according to maintenance schedule
 ■ = Project to be undertaken/initiated in identified year
 ✓ = Project is completed for the year
 X = Encountered operational or hydrological delays

4 Monitoring Programs Terms of Reference

The monitoring programs being implemented under the Clowhom Project 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/toolbar/about/sustainability/conservation/water_use_planning/lower_mainland/clowhom.html

5 Summary of Monitoring Programs

5.1 COMMON-1 Monitor of Aquatic Wildlife in Wetlands Affected by Dam Operations

5.1.1 Status

This monitoring program was initiated in 2006 and will be carried out over 20 years. Attached is the report for Year 2012 dated August 2013 and Year 2013 dated September 2014. As indicated in our Clowhom Water Use Plan update letter dated April, 2, 2015 a re-evaluation of the monitoring programs will be undertaken and an update will be provided in the 2016 Clowhom Water Use Plan Annual Report.

Wildlife Census

The wildlife census was last completed in 2014.

Air Photography

Air photography was last completed in 2011.

5.2 COMMON-2 Role of Littoral Zone in Governing Clowhom Reservoir Productivity Capacity

5.2.1 Status

This monitoring program was initiated in 2006 and will be carried out over 20 years. As planned, no work was done in 2014. As indicated in our Clowhom Water Use Plan update letter dated April, 2, 2015 a re-evaluation of the monitoring programs will be undertaken and an update will be provided in the 2016 Clowhom Water Use Plan Annual Report.

Fish Survey

The fish survey was last completed in 2011.

Juvenile Habitat Use Survey

The survey portion of the monitor was completed in 2011.

5.3 COMMON-3 Validation of the Effective Littoral Zone Performance Measure

5.3.1 Status

This monitoring program was initiated in 2006 and data collection was completed in 2010. The juvenile Habitat use Survey was completed in 2011. As planned no work was done in 2014. As indicated in our Clowhom Water Use Plan update letter dated

April, 2, 2015 a re-evaluation of the monitoring programs will be undertaken and an update will be provided in the 2016 Clowhom Water Use Plan Annual Report.

5.4 COMMON-4 Archaeological Sites Monitoring

5.4.1 Status

This monitoring program was initiated in 2008 and was carried out over two years. This monitor is completed.

6 Monitoring Programs Costs

The following table summarizes the Clowhom Project WUP monitoring programs costs approved by the Comptroller and the Actual Costs to April 30, 2015.

Table 6-1: Clowhom Project WUP Monitoring Program 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
Clowhom WUP Annual Report	\$43,186	\$11,488	\$17,717	\$29,205	\$13,981		
COMM01A Mon Aquatic Wildlife	\$364,673	\$87,386	\$188,805	\$276,191	\$88,482	Efficiencies found during project implementation	Budget to be reassessed following monitor program re-evaluation
COMM01A Mon Aquatic Wildlife - ONR DM	\$174,773	\$17,278	\$75,505	\$92,783	\$81,990		
COMM01A Mon Aquatic Wildlife - ONR Imp	\$189,900	\$70,108	\$113,300	\$183,408	\$6,492		
COMM02A Role Littoral Zone	\$188,424	\$50,981	\$83,676	\$134,657	\$53,767	Efficiencies found during project implementation	Budget to be reassessed following monitor program re-evaluation
COMM02A Role Littoral Zone - ONR DM	\$85,324	\$18,991	\$33,647	\$52,638	\$32,686		
COMM02A Role Littoral Zone - ONR Imp	\$103,100	\$31,990	\$50,029	\$82,019	\$21,081		
COMM03A Valid Littoral Zone	\$155,909	\$102,187	\$9,619	\$111,806	\$44,103	Efficiencies found during project implementation	Budget to be reassessed following monitor program re-evaluation
COMM03A Valid Littoral Zone - ONR DM	\$57,909	\$15,443	\$7,619	\$23,062	\$34,847		
COMM03A Valid Littoral Zone - ONR Imp	\$98,000	\$86,744	\$2,000	\$88,744	\$9,256		
COMM04A Archaeological Sites	\$0	\$7,350	\$0	\$7,350	(\$7,350)	Project Completed	
COMM04A Archaeological Sites - ONR DM	\$0	\$6,681	\$0	\$6,681	(\$6,681)		
COMM04A Archaeological Sites - ONR Imp	\$0	\$669	\$0	\$669	(\$669)		

OR - Ordered Remissible
ONR - Ordered Non-Remissible

* Red values in parentheses denote overage.