

# **Puntledge River Water Use Plan**

## **Monitoring Program and Physical Works**

**Annual Report: 2016**

**Implementation Period: July 2013 to November 2016**

- **PUNMON-1 Assessment of Adult Fish Passage during Pulse Flow Releases**
- **PUNMON-2 Assessment of Egg Incubation Success in Reach C**
- **PUNMON-3 Steelhead Production**
- **PUNMON-4 Evaluating Effects of Ramping Rates on Fish Stranding in Puntledge River (Reach C)**
- **PUNMON-5 Puntledge River Kayak Pulse Flow Cost-Benefit Analysis**
- **PUNWORKS-1 Gravel Replacement in the Puntledge River**

**For Conditional Water Licences 120300, 120301, 120302**

**December 31, 2016**

## **BC Hydro Puntledge River Project Water Use Plan Monitoring Programs and Physical Works Annual Report: 2016**

### **1 Introduction**

This document represents a summary of the status and the results of the Puntledge River Water Use Plan (WUP) monitoring programs and physical works to November 30, 2016, as per the Puntledge River Order under the *Water Act*, dated January 19, 2005. There are five monitoring programs and one physical work.

On August 6, 2015, the Comptroller of Water Rights approved the delay of the 2016 Annual Report until December 30, 2016, anticipating an update on the completion of the last remaining project – Puntledge River Gravel Placement project (PUNWORKS-1).

### **2 Status**

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

**Table: 2-1: Dates of Puntledge 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
PUNMON-1 Assessment of Adult Fish Passage during Pulse Flow Releases	Schedule B.1.a	Aug 11, 2005	Sep 06, 2005	May 04, 2007	May 28, 2007
PUNMON-2 Assessment of Egg Incubation Success in Reach C	Schedule B.1.b	Aug 11, 2005	Sep 06, 2005		
PUNMON-3 Steelhead Production	Schedule B.1.c	Aug 11, 2005	Sep 06, 2005		
PUNMON-4 Evaluating Effects of Ramping Rates on Fish Stranding in Puntledge River (Reach C)	Schedule B.1.d	Aug 11, 2005	Sep 06, 2005	Oct 18, 2007	Jan 29, 2008
PUNMON-5 Puntledge River Kayak Pulse Flow Cost-Benefit Analysis	Schedule B.2	Aug 11, 2005	Sep 06, 2005	May 10, 2010	May 20, 2010
PUNWORKS-1 Gravel Replacement in the Puntledge River	Schedule C.1	Apr 26, 2016	Jul 14, 2016		

### **3 Schedule**

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

**Table 3-1: Monitoring Programs and Physical Works Schedule as of November 30, 2016**

Monitoring Programs	2006 WLR YR1	2007 WLR YR2	2008 WLR YR3	2009 WLR YR4	2010 WLR YR5	2011 WLR YR6	2012 WLR YR7	2013 WLR YR8	2014 WLR YR9	2015 WLR YR10	2016 WLR YR11	2017 WLR YR12
PUNMON-1: Assessment of Adult Fish Passage During Pulse Flow Releases		✓	✓	✓F								
PUNMON-2: Assessment of Egg Incubation Success in Puntledge River	✓	✓	✓F									
PUNMON-3: Steelhead Production	✓	✓	✓	✓	✓	✓F						
PUNMON-4: Evaluating Effects of Ramping Rates on Fish Stranding in Puntledge River	✓	✓	✓F									
PUNMON-5: Kayak Pulse Flow Cost - Benefit Assessment	✓	✓	✓	✓	✓	✓F						
<b>Physical Works</b>												
PUNWORKS-1: Gravel Placement in the Puntledge River					x		x	x	x	x	✓	■

Legend: ■ = Program to be undertaken/initiated in identified year  
 ✓ = Program completed for the year  
 x = Program start delayed  
 ✓F = All field work for this project is complete. No further field work is planned.  
 PCR = Project Completion Report submitted.

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

The monitoring programs and physical works being implemented under the Puntledge River 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/vancouver\\_island/puntledge\\_river.html](http://www.bchydro.com/about/sustainability/conservation/water_use_planning/vancouver_island/puntledge_river.html)

#### 5 Status of Monitoring Programs

##### 5.1 PUNMON-1 Assessment of Adult Fish Passage during Pulse Flow Releases

This monitoring program was initiated in June 2007 and completed September 2010.

##### 5.2 PUNMON-2 Assessment of Egg Incubation Success in Reach C

This monitoring program was initiated in August 2006 and completed September 2008.

##### 5.3 PUNMON-3 Steelhead Production

This monitoring program was initiated in January 2006 was completed November 2011.

##### 5.4 PUNMON-4 Evaluating Effects of Ramping Rates on Fish Stranding in Puntledge River (Reach C)

This monitoring program was initiated in July 2006 and was completed March 2008.

##### 5.5 PUNMON-5 Puntledge River Kayak Pulse Flow Cost-Benefit Analysis

This monitoring program was initiated in June 2006 and was completed April 2011.

## **6 Status of Physical Works**

### **6.1 PUNWORKS-1 Gravel Replacement in the Puntledge River**

This project is for the placement and periodic maintenance of approximately 2000 square metres of spawning gravel in the Puntledge River which is to be undertaken in consultation with agencies.

The project was deferred for several years pending assessments of an existing spawning habitat restoration project undertaken in Reach B of the Puntledge River in 2005. At the Puntledge WUP Interim Review (December 14, 2011), Fisheries and Oceans Canada (DFO) recommended the gravel placement project go ahead. However, the project was further delayed due to resource constraints at both BC Hydro and DFO in 2012 and 2013. Then in 2014, the project was deferred pending BC Hydro discussions with agencies as part of the Puntledge Fish Entrainment Action Plan. At that time BC Hydro, DFO and the Ministry of Forest, Lands and Natural Resources Office (FLNRO) were considering alternative suitable locations for gravel placement. In December 2014, a recommendation was made by agencies to proceed with the gravel placement as originally planned; however, in developing the Terms of Reference, BC Hydro encountered logistical challenges requiring further investigation.

On July 14, 2016, BC Hydro received approval of a Terms of Reference to determine feasibility and resolve issues associated with the preferred location for the gravel placement. This work is underway and is taking longer than originally anticipated. The Terms of Reference planned for submission in December 2016 will be delayed until next year.

## **7 Monitoring Programs and Physical Works Costs**

The following table summarizes the Puntledge River WUP monitoring programs and physical works costs approved by the Comptroller and the Actual Costs to November 30, 2016.

**Table 7-1: Puntledge River WUP Monitoring Programs and Physical Works 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
<b>Puntledge WUP Annual Report</b>	\$6,978	\$5,148	\$1,319	\$6,466	\$512		
<b>PUNM01A Adult Fish Passage Mo</b>	\$355,431	\$314,798	\$2,821	\$317,619	\$37,812	Project Completed. Final reporting outstanding.	
PUNM01A Adult Fish Passage Mo - OR DM	\$58,961	\$45,419	\$2,821	\$48,240	\$10,721		
PUNM01A Adult Fish Passage Mo - OR Imp	\$296,470	\$269,379	\$0	\$269,379	\$27,091		
<b>PUNM02A Egg Incubation Assess</b>	\$100,962	\$92,417	\$2,821	\$95,238	\$5,724	Project Completed. Final reporting outstanding.	
PUNM02A Egg Incubation Assess - OR DM	\$20,862	\$13,158	\$2,821	\$15,978	\$4,884		
PUNM02A Egg Incubation Assess - OR Imp	\$80,100	\$79,259	\$0	\$79,259	\$841		
<b>PUNM03A Steelhead Production</b>	\$346,928	\$329,858	\$2,821	\$332,679	\$14,249	Project Completed. Final reporting outstanding.	
PUNM03A Steelhead Production - OR DM	\$70,228	\$58,457	\$2,821	\$61,278	\$8,950		
PUNM03A Steelhead Production - OR Imp	\$276,700	\$271,401	\$0	\$271,401	\$5,299		
<b>PUNM04A Stranding Assessment</b>	\$15,841	\$15,017	\$2,821	\$17,838	(\$1,997)	Project Completed. Final reporting outstanding.	Request for re-allocation of funds prior to final reporting
PUNM04A Stranding Assessment - OR DM	\$7,472	\$6,813	\$2,821	\$9,634	(\$2,162)		
PUNM04A Stranding Assessment - OR Imp	\$8,369	\$8,204	\$0	\$8,204	\$165		
<b>PUNM05A Kayak Cost Benefit - OR</b>	\$64,094	\$64,094	\$2,821	\$66,915	(\$2,821)	Project Completed. Final reporting outstanding.	Request for re-allocation of funds prior to final reporting
PUNM05A Kayak Cost Benefit - OR DM	\$27,894	\$27,894	\$2,821	\$30,715	(\$2,821)		
PUNM05A Kayak Cost Benefit - OR Imp	\$36,200	\$36,200	\$0	\$36,200	(\$0)		
<b>PUNM05A Kayak Cost Benefit - ONR</b>		\$964		\$964	(\$964)	No TOR	
PUNM05A Kayak Cost Benefit - ONR DM		\$7		\$7	(\$7)		
PUNM05A Kayak Cost Benefit - ONR Imp		\$957		\$957	(\$957)		
<b>PUNW01A Gravel Replacement</b>	\$58,896	\$24,601	\$213,448	\$238,049	(\$179,153)	No TOR approved for future phases of work	TOR submission after the identification and feasibility phases are complete
PUNW01A Gravel Replacement - OR DM	\$58,896	\$24,601	\$13,448	\$38,049	\$20,847		
PUNW01A Gravel Replacement - OR Imp	\$0		\$200,000	\$200,000	(\$200,000)		

OR - Ordered Remissible  
ONR - Ordered Non-Remissible

\* Red values in parentheses denote overage.