Puntledge Hatchery Operations

A report on the Collaborative Agreement between Fisheries and Oceans Canada and B.C. Hydro, Fish and Wildlife Compensation Program, 2017-18

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Executive Summary

The Puntledge River supports one of only two summer runs of Chinook on Vancouver Island. This stock is distinct from the fall run of Chinook as the adults enter their home river from March to July and hold in the watershed until spawning in late September. The Puntledge stock is genetically unique and due to depressed escapement, it has been designated by Fisheries and Oceans Canada (DFO) as a stock of concern. Difficulties obtaining sufficient adult returns to supply an adequate number of eggs have resulted in juvenile release production targets not being realized to date. The overall goal of this program is to improve survival to achieve a self-sustaining run of approximately 2500 - 3500 adult spawners.

B.C. Hydro was responsible for providing water to the Upper Site enhancement facility since 1965. Recent studies regarding salmon migration have proven that the Upper facility was not the best environment for holding adult Chinook or for long term juvenile rearing. In 2011, DFO agreed to the decommissioning of the site, as requested by B.C. Hydro, with provisions that B.C. Hydro support operations at the Lower hatchery.

The collaborative agreement supports BC Hydro's commitment related to the decommissioning of the Upper Hatchery as well as activities outlined in the Puntledge River Watershed Salmonid Action Plan (October 2011). In 2016-17 the Puntledge River Hatchery (DFO) received financial support from B.C. Hydro through the Fish and Wildlife Conservation Program. Enhancement of the Summer Chinook stock will provide fish production off-setting fisheries impacts from B.C. Hydro's operational activities. This cooperative partnership realizes recognised benefits whereby both Parties gain through increased involvement and awareness with active community stakeholder interests within the Comox Valley. B.C. Hydro, DFO and the local community will benefit through efforts supporting salmon enhancement activities that will contribute to increased adult salmon returns in the Puntledge River watershed.

Introduction

There has been a dam at the outlet of Comox Lake on the Puntledge River since 1912, then operated by Canadian Collieries Dunsmuir Ltd. In 1953 the facility was purchased by the BC Power Commission and upgrades to the facilities ensued. During construction on the Impoundment Dam at Comox Lake, an earthen filled coffer dam failed with many tons of sediment covering existing salmon spawning beds downstream. In 1958, after construction of the facilities was completed, salmon and steelhead trout could no longer migrate to their natal spawning grounds. A formal commission (the Angus Commission), was called to review, address and make recommendation regarding impacts to Puntledge River salmon from the hydro facilities. The commission reviewed historical abundance of salmon and their spawning areas in the Puntledge River and reviewed scientific information addressing why the salmon and trout populations declined since the upgrades to the hydro-electric facilities. In summary, the report stated that the B.C. Power Commission Ltd. and Environment Canada (now Fisheries and Oceans Canada) would work cooperatively to restore the dwindling salmon stocks in the Puntledge River watershed. In 1965, a spawning channel and associated infrastructure was constructed as compensation at a location adjacent to the Diversion Dam, known as the "Upper Site". This channel was not successful so with additional effort and resources, artificial propagation was initiated in 1972. At the onset of DFO's Salmonid Enhancement Program in 1977, the program expanded to include a second hatchery (Lower Site) immediately below the existing generation station. This facility was primarily for egg incubation and rearing of Fall Chinook, Chum and Pink salmon while the original Upper Site continued to be utilized to rear and release juvenile Summer Chinook, Coho and steelhead trout. The Upper Site was also utilized to capture and hold migrating Summer Chinook adults over the summer months until they were artificially spawned in early fall. Poor water quality (high temperature, high total gas pressure and low oxygen) at the site resulted in high mortality of juvenile Coho as well as Chinook adults during the summer months. DFO Biologists believe that the early returning Summer Chinook migration was aided by spring freshets from snow melt and precipitation events. When the high river flows subsided in the summer, a natural migration obstacle resulted, ensuring delineation between the Summer and Fall runs of Chinook. Fishways built between the two hatchery sites in the 1960's and 1970's, to assist in salmon migration, may have created an overlap in the spawning areas to which the two runs can migrate, resulting in possible hybridization. DFO geneticists assure, through DNA analysis, the uniqueness of the Summer Chinook is still intact. Recent studies have revealed that during the months of July and August when water temperatures and recreational users of the river peak, adult migrant mortality could be as high as 50% in the river between the two hatchery facilities (Reach C). In 2010, BC Hydro and DFO initiated discussions regarding the decommissioning of the Upper facility. Information from studies, biological strategy changes in SEP's programs along with the desire by B.C. Hydro to reduce liability, led to a plan and agreement by the two parties to decommission the Upper facility. A formal arrangement between

the two agencies included funding by B.C. Hydro for added infrastructure at the Lower Site (chiller, tubs, storage, stand-by generator) as well as annual funding to support Summer Chinook enhancement. In 2012 the Upper facility was decommissioned by B.C. Hydro. The annual contribution from BC Hydro is presently administered through the Fish and Wildlife Conservation Program.

Results and Outcomes

Funds provided by the FWCP were utilized to offset some of the costs including:

- Fish feed ($5315.12)
- Parasite-S for adult holding fungus control ($367.24)
- The operation of chillers, water supply pumping and general fish culture including the transporting and holding of 427 Summer Chinook brood to the Rosewall Creek facility and the transporting of 150 Summer Chinook to Comox Lake ($00.00)
- Marking of 98,844 Summer Chinook ($11317.64)

In the Spring of 2018 264,330 Summer Chinook Smolts were released from the Lower Puntledge River Hatchery facility.

Puntledge River Summer Chinook Costs

OPERATIONS	DFO	BCH	
	35,000.00		Facility open. During the month of Jun. July, Aug, 100% of facility operation is for Summer Chinook
	0	5315.12	feed
	0	11317.64	tagging 98,844 @ $0.1145 each
	615.09	367.24	Parasite-S
	7000.00	00.00	hydro for pumping, chiller & otolith marking
	42,615.09	17,000.00	
LABOUR			
			Adult capture /transfer/support
	4,050.00		DFO (6 staff x 3 d x 30/h)
	900.00		DFO (1 staff x 3 d x 40/h)
			Adlt treatment
	3,600.00		12h /wk x 10 wks x 30/hr
			Eggtake
	7,200.00		5 stf x 8 hr/day x 6 days
			general care (inc, admin, etc)
	7,680.00		(8h /wk x 32 wks)
			Rearing
	20,250.00		(1 FT x 90 days)
	9,040.00		(1 cas x 33 days x 21.15/h)
	52,720.00		
TOTAL	95335.09	17,000.00	**$ 112,335.09**

Acknowledgements

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