

## **EXECUTIVE SUMMARY**

A Water Use Plan (WUP) is a technical document that, once reviewed by provincial and federal agencies and accepted by the provincial Comptroller of Water Rights, defines how water control facilities will be operated. The purpose of a water use planning process is to develop recommendations defining a preferred operating strategy using a multi-stakeholder consultative process.

The Falls River water use planning Consultative Committee process was initiated in May 2002 and completed in May 2003. The consultative process followed the steps outlined in the 1998 provincial government's *Water Use Plan Guidelines*.

This report summarizes the consultative process and records the areas of agreement and disagreement arrived at by the Falls River Water Use Plan Consultative Committee. It is the basis for the Falls River Draft Water Use Plan. Both the Falls River Consultative Committee Report and the Falls River Draft Water Use Plan will be submitted to the Comptroller of Water Rights.

### **Falls River Hydroelectric Project**

The Falls River hydroelectric project is located approximately 50 kilometres southeast of Prince Rupert on Falls River above its confluence with the Ecstall River. A short section of the Falls River is located below the spillway and flows into the Ecstall River, a tributary of the Skeena River.

The Falls River project has a single reservoir. Water flows from intakes from the Big Falls Reservoir through two penstocks to the two generating turbines in the powerhouse. Water from the turbines is discharged into the Falls River via a tailrace downstream of the facility.

### **Consultative Committee Process**

The Falls River Water Use Plan Consultative Committee consisted of seven representatives and their designated alternates (where applicable). Key interests included fish, wildlife, First Nations' traditional use and hydroelectric power. The representatives included BC Hydro, provincial and federal agencies, the Lax Kw'alaams Band, the Allied Tsimshian Tribes Association (ATTA), community fisheries organizations and industry.

The main Consultative Committee and its Fish and Wildlife Subcommittee held a total of seven meetings, ultimately reaching unanimous acceptance of a preferred operating alternative for the Falls River hydroelectric facility, and a specified monitoring program.

The Consultative Committee explored issues and interests affected by the operations of BC Hydro's Falls River hydroelectric facilities and agreed to the following objectives for the Falls River Water Use Plan:

- Cultural and Traditional Use: Minimize impacts on traditional use by maximizing the abundance and diversity of fish and wildlife around the Falls River facility.
- Fish in the Big Falls Reservoir: Maximize littoral productivity; maximize access (migration) to spawning and rearing habitats in tributaries; minimize back-watering of spawning and incubation habitats; minimize de-watering and stranding of fish; minimize sediment erosion and suspension (mobilization).
- Fish in the Falls River: Maximize available habitat (quality and quantity); minimize total gas pressure (TGP); minimize impacts of potentially acidic discharges on incubating eggs; minimize fine sediment releases into the river; minimize stranding of fish and de-watering of eggs; optimize flows for fish at all life stages.
- Greenhouse Gas (GHG) Emissions: Minimize the provincial greenhouse gas impacts associated with changes to generation at the Falls River facility.
- Power: Maximize the financial value of the power produced at the Falls River facility.
- Recreation: Maximize the recreational attraction of the river and reservoir by maximizing the abundance and diversity of fish and wildlife around the Falls River facility.
- Wildlife using the Reservoir: Maximize riparian habitat (sedge grass community); minimize stranding and/or inundation of nests and dens; maximize migratory access.

### **Agreement on a preferred operating alternative**

The Consultative Committee identified seven main water use objectives (see above) and 18 sub-objectives. Performance measures (indicators) were developed based on these objectives. In all cases, performance measures were modelled quantitatively. Operating alternatives were then developed to address the various objectives.

In total, 15 operating alternatives were run through BC Hydro's operations model and the consequences for each objective were discussed by the Consultative Committee based on the agreed-to performance measures.

Of those alternatives, two received acceptance from all members and one was chosen as the preferred alternative, on the condition that specified monitoring programs would also be implemented. The Committee reached this decision at their final meeting on 22–23 May 2003.

The Consultative Committee recommends the Falls River hydroelectric facility be operated as designed subject to a set of operating constraints (see Table 1).

**Table 1: Recommended Operating Constraints for the Falls River Hydroelectric Facility**

Area	Operating Variable	Constraint	When	Comment on Intent
River	Minimum discharge	2.6 m <sup>3</sup> /s when reservoir is at or above elevation of 88.4 metres. 1.3 m <sup>3</sup> /s when reservoir is at or below elevation of 88.4 metres.	Year round	Maximize habitat for fish in the river.
River	Minimum discharge	6.5 m <sup>3</sup> /s when reservoir is at or above elevation of 88.4 metres.	1 August-15 October	Maximize fall spawning habitat for fish in the river.
River	Generation curtailment	Curtail turbine discharge to 1.3 m <sup>3</sup> /s when reservoir is at or below elevation of 88.4 metres.	Year round	Increase reliability of minimum discharge.
River	Minimum discharge	Return to applicable minimum discharge as soon as possible.	Unplanned outages	Increase reliability of minimum discharge.
River	Minimum discharge	Ensure applicable minimum discharge is being provided through the sluice gates before shutting down turbines.	Planned outage of generation units (turbines).	Increase reliability of minimum discharge.
River	Ramping rate when ramping up (unit ramping)	Maximum rate of increase of 1.3 m <sup>3</sup> /s over 10 minutes for discharges between 1.3 and 6.5 m <sup>3</sup> /s.	15 February - 15 March	Minimize impacts on alevin below tailrace.
River	Ramping rate when ramping down (total discharge)	Maximum rate of decrease of 1.3 m <sup>3</sup> /s over 10 minutes for discharges between 1.3 and 6.5 m <sup>3</sup> /s.	1 November - 15 April	Minimize stranding of fish in the tailpond.
Reservoir	Flashboard Installation	Install annually.	Between 15 February and 15 March, the sooner the better.	Maximize sedge grass community maintenance.
Reservoir	Flashboard Removal	Remove annually.	Between 1 May and 15 May, the later the better.	Maximize sedge grass community maintenance.
Reservoir	Reservoir Elevation	Minimum elevation of 92.0 metres with potential incursions above 92.0 metres.	From 1 April to the removal of the flashboards.	Minimize backwatering of cutthroat tributary spawning habitat.
Other	Timing of Annual Maintenance	Preferably between March 1 and 28.	March	Maintain safety and reliability of facility.
Other	Operation of Undersluice	BC Hydro will consult with interested parties (provincial and federal agencies, First Nations and community fishery groups) before operating the undersluice.		Minimize impacts to fish related to fine sediment releases into the river.

## Consequences of the preferred alternative

The expected outcomes of the final recommended operating alternative are summarized in Table 2. The annual cost of implementing the operating alternative is expected to be \$50,000 in lost revenue.

The main benefits over the reference case<sup>1</sup> include: an increase (by a factor of three) in available spawning and incubation habitat for cutthroat trout in the Falls River Reservoir and an increase (by a factor of 10) in the area of sedge grass community maintained (valuable riparian wildlife habitat).

**Table 2: Expected Consequences of Recommended Alternative Compared to Reference Case**

Water Use Interest	Consequences
Fish in Falls River	<ul style="list-style-type: none"> <li>○ Neutral – No significant increase is expected in the area of fish habitat available for coho, chum and chinook spawning and rearing. However, the recommended operating constraints for minimum discharge and ramping are expected to minimize impacts on these fish during key life stages and in the event of planned and unplanned outages.</li> </ul>
Fish in Big Falls Reservoir	<ul style="list-style-type: none"> <li>○ Neutral – No significant change to tributary access for cutthroat trout or Dolly Varden.</li> <li>○ Neutral – No significant change is expected in the area of tributary spawning habitat in the drawdown zone for Dolly Varden.</li> <li>✚ Significant decrease (by a factor of 10) in the amount of tributary spawning habitat lost through back-watering in the drawdown zone.</li> <li>✚ Increase of 50% in expected area of effective littoral habitat.</li> </ul>
Wildlife in Big Falls Reservoir	<ul style="list-style-type: none"> <li>? Decrease of 25% in expected area of available shoreline habitat for nesting and denning wildlife.</li> <li>✚ Increase (by a factor of three) in the area of sedge community maintained.</li> </ul>
Power Generation	<ul style="list-style-type: none"> <li>? Decrease in power revenue of \$50,000 per year on average (approximately 2%) over reference case.</li> </ul>
Greenhouse Gas (GHG) Emissions	<ul style="list-style-type: none"> <li>? Increase in GHG emissions for BC Hydro’s integrated generation system.</li> </ul>

Due to the uncertainty surrounding the presence and use of Dolly Varden spawning habitat in the lower portion of Falls River Reservoir tributaries, the Consultative Committee chose an operating alternative option that maximized other ecological benefits and annual revenues from the Falls River hydroelectric project.

---

<sup>1</sup> Historic operations could not be used as the base case or reference case for the Falls River Water Use Plan because the outcome of a concurrent dam safety review process was a change in the allowable timing for a key operating variable (flashboard installation). Instead, a reference case was developed to reflect the operations BC Hydro would undertake moving forward in the absence of recommendations from the Falls River Water Use Plan Consultative Committee.

The Committee was willing to make this trade-off given: 1) the high degree of uncertainty regarding the presence and use of Dolly Varden fish habitat in the reservoir drawdown zone; and 2) the preferred operating alternative still provides a reduction in the impact on potential Dolly Varden habitat as compared to historic operations.

The results of the monitoring program designed to address the uncertainty about this issue and objective will allow future decision-makers to revisit this trade-off if necessary.

### Monitoring Program

The Consultative Committee discussed sources of uncertainty associated with implementing the preferred operating alternative. Through the water use planning process and trade-off discussions, the Committee reviewed a number of monitoring programs to address these uncertainties. Of these, six were thought to satisfy the eligibility criteria for monitoring studies under the Water Use Plan Program. The committee's recommended monitoring program is summarized in Table 3.

**Table 3: Summary of Recommended Falls River Monitoring Program Studies**

#	Monitoring Interest	Description	Cost	Schedule
<b>RIVER</b>				
1	Presence and Timing of Steelhead and Salmon Spawning	Monitor timing of adult presence in Falls River below the dam and in the tailpond for March, April, August, September & October.	\$12,000/year for up to 5 years (up to \$60,000 total)	5 years
2	Fish Spawning Habitat	Monitor egg-fry survival. Place egg boxes and measure habitat at site. Evaluate effect of operation on survival.	\$20,000/year for up to 5 years (up to \$100,000 total)	5 years
<b>RESERVOIR</b>				
3	Tributary Access and Potential Stranding	Survey location of barriers within drawdown zone in three tributaries and identify location and size of potential areas of stranding along the shore in the drawdown zone.	\$5,000 Potential to combine with Study #5 for cost savings	In 1 <sup>st</sup> year
4	Sedge Habitat Maintenance	Aerial overflight to identify extent of sedge habitat. Detailed assessment of species composition and density of vegetation in sedge habitat community.	\$15,000 in year one; \$15,000 in follow up year (\$30,000 total)	In 1 <sup>st</sup> year and in follow up year, 3-5 years later
5	Tributary Back-watering	Survey for redds in drawdown zone of three tributaries or, if necessary, sampling for adult spawners by netting, angling, or direct observation by snorkelling. Deploy temperature monitors and collect life history data.	\$6,000 to \$20,000 Potential to combine with Study #3 for cost savings	In 1 <sup>st</sup> year
6	Wildlife Shoreline Habitat	Survey drawdown zone for dens and nests established by birds and mammals. Map locations and measure elevation.	\$15,000/year (\$30,000 total)	In 1 <sup>st</sup> and 2 <sup>nd</sup> years
<b>Total</b>		<b>Implement all studies</b>	<b>\$245,000</b>	<b>Over 5 years</b>

Once the implementation of the operational changes approved under the final Falls River Water Use Plan has begun, then BC Hydro will: 1) develop detailed terms of reference for the monitoring program; and 2) start monitoring program study, data collection, analysis and reporting. The Consultative Committee recommended that the detailed terms of reference be developed in consultation with appropriate government agencies, First Nations, and interested parties.

The results of approved monitoring programs will be sent to all interested members of the Consultative Committee as they become available.

### **Review Period**

The Falls River Consultative Committee recommends that five years after the implementation of the Falls River Water Use Plan (or as soon as the results of all the approved monitoring program studies are available), a technical review of monitoring studies be undertaken by BC Hydro, appropriate government agencies, First Nations and interested parties. If scientific data and significant new risks are identified that could lead to a change in operations, a formal review of the Water Use Plan could be requested at that time.

If a review is not recommended during the five-year technical review of monitoring results, then the next review of the Falls River Water Use Plan will be conducted 10 years after the implementation of the Falls River Water Use Plan.