

## FISH AND AQUATICS

Stage 3 of the Site C Clean Energy Project (Site C) is the environmental and regulatory review phase. As part of an environmental assessment of Site C, BC Hydro will identify and assess potential project effects — environmental, economic, social, heritage and health — and opportunities to provide lasting benefits for the region and First Nations. Where effects cannot be avoided, BC Hydro will identify and evaluate options for mitigation.

This study update provides an overview of work completed to date and currently underway and is current as of fall 2011. Future studies may be changed or revised in scope or timing on the basis of input from regulators, government agencies, First Nations, stakeholders and the public as part of the pre-application stage of the environmental assessment process.

The Site C project requires environmental certification and other regulatory permits and approvals before it can proceed to construction. In addition, the Crown has a duty to consult and, where appropriate, accommodate Aboriginal groups.

### DEFINITION

In total 31 species of fish have been recorded in the Peace River in the vicinity of the proposed Site C. The most abundant species is mountain whitefish, followed by long nose sucker and the minnow group. None of the 31 fish species are listed under the federal *Species at Risk Act (SARA)*.

### STUDY PURPOSE

The purpose of the fish and aquatic study program is to collect data to further our knowledge and understanding of the Peace River ecosystem. This data will be used to assess potential environmental effects associated with the proposed project construction and operation activities. The potential changes to fish and aquatic habitat will be assessed using baseline data collected during Stage 1, 2 and 3, through modelling, and information from other reservoirs during the environmental assessment. The study information will also be used to explore mitigation options to avoid or minimize potential environmental effects, where possible.

### STATUS OF STUDIES

#### Consultation

The following feedback was received during Stage 2 consultation:

- First Nations and local, provincial and federal government agencies provided input into a review of the Stage 2 fish and aquatic program as part of the Fish and Aquatics Technical Advisory Committee (TAC). The Fish and Aquatics TAC emphasized the importance of management objectives as a means of assisting a future environmental assessment. The regional office of the BC Ministry of Environment committed to establishing regional management objectives for the project. The Peace River Management Objectives are currently being drafted by the Ministry.

- During Stage 2 Project Definition Consultation conducted in May/June and October/November 2008:
  - Issues about changes to aquatic ecosystems and fish populations were raised by participants. BC Hydro will continue to focus on understanding fisheries resources and productivity of aquatic ecosystems. Participants were concerned with changes on water quality, including mercury, and changes to fish and aquatic life. Partly in response to public concerns expressed about methyl mercury, BC Hydro added an additional component to existing Peace River fish studies to collect water, soil, vegetation and fish tissue samples to test for baseline mercury levels. A methyl mercury assessment to assess the potential levels of methyl mercury in the Peace River ecosystem is part of Stage 3 studies.
  - Participants commented that BC Hydro should build fish ladders to ensure fish can safely move past the dam. Fish ladders are just one technical option that could be considered to fulfill the objective of moving fish effectively past the proposed dam. During Stage 3, BC Hydro will conduct a feasibility assessment for potential fish passage.

During Stage 3, consultation results will be considered, along with financial and technical input, as the Site C project moves forward through the regulatory review stage and refines project plans.

### **Stage 3 Work**

During Stage 3, studies have been adjusted in response to input received during Stage 2 consultation to provide further information regarding fish community, aquatic productivity and the behaviour of methyl mercury.

The following is a summary of the field work underway as part of the 2010/2011 season. The location of aquatic study areas generally includes Dinosaur Reservoir and the Peace River from Hudson's Hope into Alberta, and local tributaries within the proposed reservoir area.

#### ***Peace, Moberly and Halfway Rivers Fish Inventories Study***

The 2010/2011 fish inventories build on data from previous years to expand knowledge of the Peace River, Halfway and Moberly River fish communities and contribute to existing baseline data and the current understanding of fish and fish habitat in the Site C study area. The studies describe the seasonal distribution and relative abundance of fish populations, biological characteristics and fish community assemblages.

The sampling sections have been selected because they represent fish habitats located in the major reaches of the rivers and they provide good spatial coverage of the study area.

The Peace River study period occurs during three seasons: spring (May); summer (August); and fall (October). The Moberly and Halfway inventory occurs in summer (August) during low flow conditions. A variety of sampling methods are employed, including boat electrofishing, backpack electrofishing, beach seining and gill nets. The spring and summer inventories are completed, and the fall inventory will be completed in October 2011.

### ***Peace, Moberly and Halfway Rivers Fish Rotary Screw Trap Study***

Building on the 2010 study, the 2011 study will build understanding of the movement of fish in the Peace River and its tributaries. The 2010 study evaluated the usefulness of the rotary screw trap to sample migrating fish in the Peace River and Moberly River. The study successfully documented the abundance and timing of fish movement downstream from the Moberly River into the Peace River, and in the Peace River past the proposed Site C dam site. In 2011, the program was expanded to include two rotary screw traps in the Halfway River. The study will further describe the biological characteristics and relative abundance of fish collected by the rotary screw traps.

There were five rotary screw traps placed in the lower sections of the Halfway River (two) and Moberly (one) River, and in the Peace River (two). The rotary screw traps are operational from May through October.

### ***Peace River Aquatic Productivity and Modelling Study***

Initiated in 2010, the study collected seasonal baseline data to gain an understanding of the current levels of invertebrate, primary production and nutrient dynamics in the Peace River system; and assess, determine and run the appropriate predictive modelling for assessing productivity in the current and post reservoir aquatic environment. In 2011, the study assessed current levels of aquatic productivity to assist in predicting productivity changes resulting from reservoir creation.

The 2011 field sampling plan included the same sampling sites used during the 2010 study: Williston and Dinosaur Reservoirs and the Peace, Halfway, Moberly, Pine and Beatton Rivers.

The summer sampling is completed, and fall sampling will be completed in October 2011.

### ***Peace River Mercury and Modelling Study***

In 2010, a mercury study approach was developed, and samples of water, sediment, aquatic invertebrates, fish, soil and vegetation were collected and analyzed for mercury content. Again in 2011, additional field data was collected to fill data gaps and provide additional baseline information. The baseline information, along with other physical environment data, will be used in a predictive mercury model. A complex mechanistic mercury model that has been used on other large hydroelectric development projects will be calibrated for Site C to predict the concentrations of mercury in fish and the aquatic environment over time. Mercury modelling work started in September 2011.

### **Stage 3: Consultation**

The Site C project requires environmental certification and other regulatory permits and approvals before it can proceed to construction.

The Stage 3 environmental and regulatory review process will include opportunities for consultation and input by the public, Aboriginal groups, communities, property owners and stakeholders.

In addition to the consultation opportunities led by the environmental regulatory agencies within the environmental assessment process, BC Hydro will lead several streams of public and stakeholder consultation during Stage 3:

- Regional and Local Government Liaison
- Property Owner Liaison
- Local Area Consultation
- Preliminary Design Consultation

BC Hydro and Aboriginal groups are also engaged in a thorough consultation process that will continue through all stages of the project.

### **How Input Will Be Used**

A Consultation Summary Report will be prepared and released on the project website following each consultation period and Consideration Memos will be prepared, indicating how input has been considered, along with technical and financial information, for project designs or plans, including engineering and environmental mitigation plans.

## **FURTHER INFORMATION**

The following information can be found at [www.bchydro.com/sitec](http://www.bchydro.com/sitec):

1. Field Studies Notices – Monthly updates on field studies.
2. Site C Clean Energy Project: Project Description Report. BC Hydro. 2011. (pages 70-75).
3. Stage 2: Consultation and Technical Review. 2009. (pages 81-84).
4. Peace River Fisheries Investigation Peace River and Pine River Radio Telemetry Study 2009. 2010.
5. Site C Fisheries Studies Halfway River and Moberly River Fall Mountain Whitefish Migration and Spawning Study 2009. 2010.
6. Site C Fisheries Studies Halfway River and Moberly River Summer Fish Survey (2009). 2010.
7. Site C Fisheries Studies Peace River Fish Inventory 2009. 2010.
8. Analysis and Assessment of the Ministry of Environment's Peace River Bull Trout and Arctic Grayling Radio Telemetry Database 1996 to 1999. 2010.
9. Peace River Site C Angling and Recreation-Use Creel Survey 2008-2009 Final Report. 2010.
10. Peace River Fisheries Investigation – Peace River and Pine River Radio Telemetry Study 2008. 2009.
11. Site C Fisheries Studies – Baseline Peace River Tributaries Fish Use Assessments in Spring and Fall 2008. 2009.
12. Site C Fisheries Studies – Juvenile Fish and Fish Habitat Inventory of Peace River Tributaries in Summer 2008. 2009.
13. Site C Fisheries Study – Upper Halfway River Watershed Bull Trout Spawning Survey 2008. 2009.
14. Site C Peace River – Mercury Levels in Peace River Fish Tissue – Data Report 2008. 2009.
15. Peace River Fisheries Investigation – Peace River and Pine River Radio Telemetry Study 2007. 2008.
16. Project Definition Consultation Discussion Guide and Feedback Form Round 2. October/November 2008. (pages 22-23).
17. Site C Feasibility Review: Stage 1 Completion Report. 2007. (pages 46 and 53-54).

### INQUIRIES

Updates on field studies are available at [www.bchydro.com/sitec](http://www.bchydro.com/sitec) and in the Community Consultation offices in Fort St. John and Hudson's Hope.

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