



International Kootenay Lake Board of Control

2010 Annual Report to the International Joint Commission

Juvenile Kootenai River Sturgeon



The Kootenai Tribal Sturgeon Hatchery near Bonners Ferry, Idaho, breeds numerous microcosms of white sturgeon from various family groups at different stages of life. These pictured young juveniles, a couple of centimetres long, will remain in the hatchery for about a year-and-a-half until they reach a length of between 15 and 30 centimetres, when they are most suited for a life in the river. In an effort to conserve the declining sturgeon population in the Kootenai River, the hatchery has reared and released over 170,000 fish since 1992. Unlike other sturgeon populations that can migrate to the ocean, the Kootenai white sturgeon have been isolated above Bonnington Falls at the outlet of Kootenay Lake since the last ice age 10,000 years ago.

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Board members along with Commissioner Brooks enjoyed the hospitality of the Kootenai Tribe of Idaho and the Kootenai Valley Reclamation Association with a visit to the hatchery on a crisp morning in late September. Sturgeon can impressively live to be up to 100 years old. When Tribal Chair Jennifer Porter was asked about the significance of the Kootenai River sturgeon, she described how tribal elders saw the ancient fish as their grandfathers, migrating up and down the river whispering to them the secrets of the river.

Kootenay Lake 2010 Summary

Throughout 2010, FortisBC (the Applicant) regulated the level of Kootenay Lake below the maximum limits prescribed by the 1938 Kootenay Lake Order. The maximum instantaneous water level for the lake at Queens Bay was observed at 14:55 PST on June 18th at elevation 532.980 metres¹ (1748.62 feet). The minimum instantaneous water level was observed at 04:55 PST on April 13th at elevation 529.919 metres (1738.58 feet). Kootenay Lake discharged 19.5 cubic kilometres (15.8 million acre-feet) of water in 2010, with an average flow of 617 cubic metres per second (21,800 cubic feet per second).

The Board and the Applicant jointly determined the date of the commencement of the spring rise as April 17th, 2010.

2010 Annual Report

This Annual Report covers the operations of the applicant, FortisBC, with respect to their management of the water level of Kootenay Lake. Fortis BC controls discharge through and around Corra Linn Dam in accordance with requirements of the Order of the International Joint Commission dated November 11, 1938. [FortisBC cooperates with BC Hydro, which also manages a lake level control structure—the Kootenay Canal Plant—at the lake’s outlet.]



In 2010, Larry Merkle retired from the role of the US section secretary after 22 years of service.

Board Membership

The Board members during 2010 were as follows:

for the United States,

Colonel Anthony Wright, District Engineer, Seattle District, United States Army, Corps of Engineers, Seattle, Washington;

Mr. Stephen Lipscomb, Director, Idaho Water Science Center, United States Geological Survey, Boise, Idaho;

and for Canada,

Mr. Kirk Johnstone, Chief, Pacific Storm Prediction Centre, Environment Canada, Vancouver, British Columbia;

Mr. Glen Davidson, Director, Water Management Branch, BC Ministry of Natural Resource Operations, Victoria, British Columbia.

Ms. Amy Reese and Mr. Daniel Millar provide secretariat support to the US and Canadian sections, respectively. Mr. Larry Merkle retired from the role of the US section secretary during the year after over two decades of service.

¹ All elevations are referred to G.S.C. 1928 datum.

1938 Kootenay Lake Order Sections 2(4) 2(5) and 2(6)

2(4) ...the Applicant shall be permitted to store water in the main body of Kootenay Lake to a maximum elevation of 1745.32, Geodetic Survey of Canada datum, 1928 adjustment (i.e. six feet above zero of the Nelson gauge), in accordance with the rule curve detailed in Sub-section (5).

(5) That after the high water of the spring and early summer flood and when the lake level at Nelson on its falling stage recedes to elevation 1743.32, Geodetic Survey of Canada datum, 1928 adjustment, the gates of the dam may be so operated as to retain it at said level until August 31st, and after said date, the level of the main body of the lake may be raised to elevation 1745.32, which shall be the maximum storage level until January 7, and thereafter it shall be lowered so that it shall not exceed elevation 1744 on February 1, elevation 1742.4 on March 1, and elevation 1739.32 (i.e. zero of the Nelson gauge) on or about April 1, except under extraordinary natural high inflow conditions, when sufficient gates shall be opened and remain open throughout such period of excess so as to lower the level of the main body of Kootenay Lake to the storage level at that time obtaining as above defined.

(6) ...throughout the period of flood flow in each and every year, (i.e. from the commencement of the spring rise in March or April until the level of the lake at Nelson returns to elevation 1743.32, Geodetic Survey of Canada, 1928 adjustment, on the falling stage), a sufficient number of gates and sluiceways of the dam shall be opened to provide, in conjunction with the flow through the turbines, for the lowering of the main body of Kootenay Lake ... by at least the amounts ... as follows:

Discharge from Kootenay Lake under original conditions (in second feet) [vs.] Amount of lowering to be affected on the main body of Kootenay Lake (in feet)

10,000	1.0
25,000	1.3
50,000	1.7
75,000	2.1
100,000.....	2.6
125,000.....	3.0
150,000.....	3.2
175,000.....	3.5
200,000.....	3.8
225,000.....	4.0



The Kootenai River, looking downstream from the Kootenai Tribal Sturgeon Hatchery dock near Bonners Ferry, is near the upstream limit of potential backwater caused by water storage in Kootenay Lake behind Corra Linn Dam.

Lake Regulation

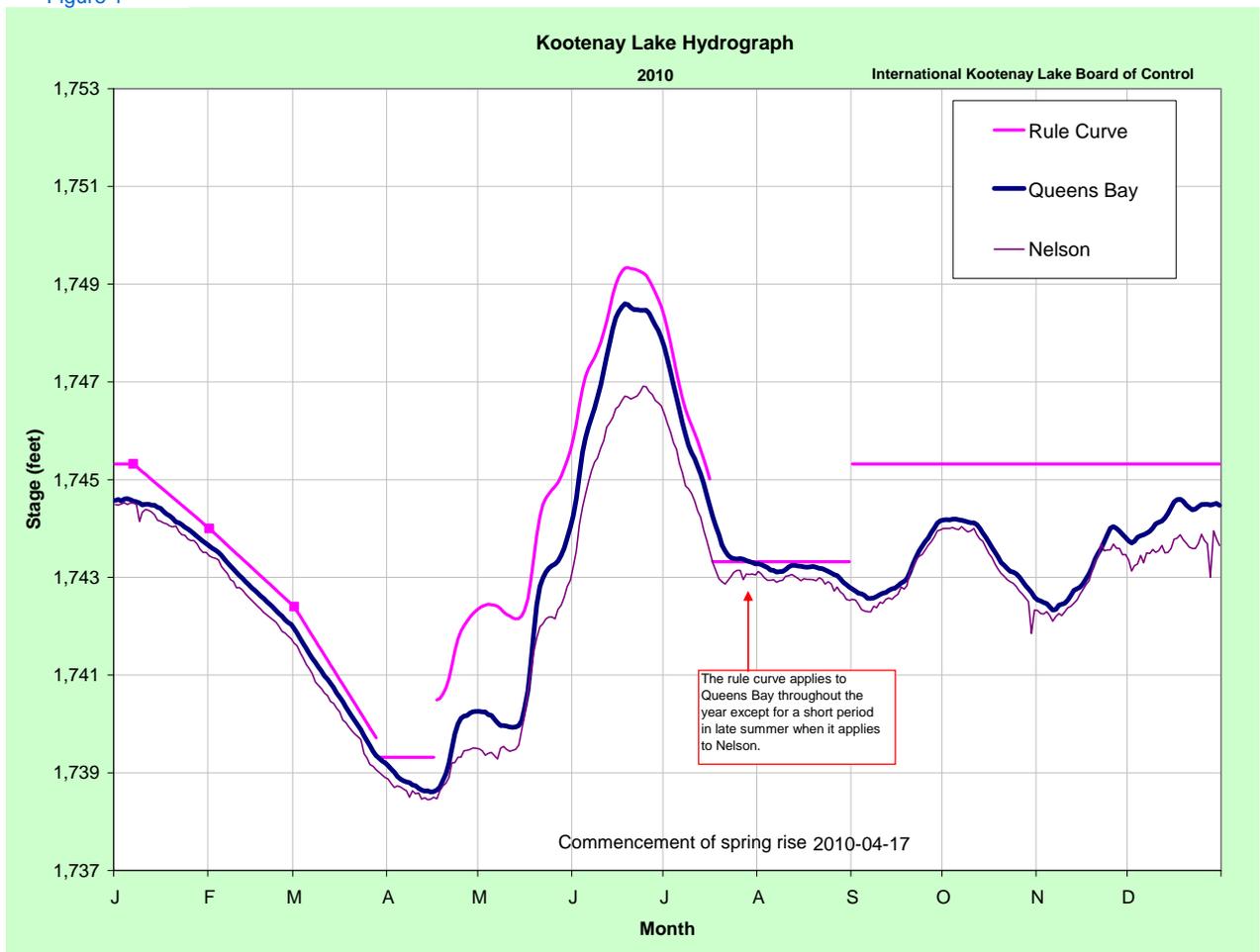
The level of Kootenay Lake was maintained in accordance with the 1938 Order throughout 2010.

Figure 1 presents observed water-year 2010 water levels on Kootenay Lake and allowable elevations specified in the November 11, 1938 Order. The maximum instantaneous water level of 532.980 metres (1748.62 feet) for the lake at Queens Bay was reached on June 18^h at 14:55 PST. The minimum instantaneous water level was observed on April 13th at 04:55 PST, elevation 529.919 metres (1738.58 feet). Relative to the 80-year period of record (1931 to 2010 with two years missing), this year's maximum water level ranked 55th highest, and the minimum was the 18th lowest annual minimum for the lake. Water levels in the lake have ranged from a high of 537.042 metres (1761.95 feet) in 1961 to a low of 529.563 metres (1737.41 feet) in 1944.

Kootenay Lake discharged 19.5 cubic kilometres (15.8 million acre-feet) of water this year through Corra Linn Dam and the Kootenay Canal Plant, with an average flow of 617 m³/s (21,800 cfs). Relative to the 73 years of available discharge data, the annual volume of flow out of the lake was 62nd highest. Total lake outflow has ranged from a high of 33.8 km³ (27.4 million acre-feet) in 1954 to a low of 13.8 km³ (11.2 million acre-feet) in 1944. The maximum daily mean outflow was 1,750 m³/s (61,800 cfs) on June 17th; the minimum was 292 m³/s (10,300 cfs) on April 18th.

The Board and the Applicant jointly determined the commencement of the spring rise to be 00:00 PST on April 17th, 2010.

Figure 1



FortisBC has continued to supply the Board with complete records of the regulation of Kootenay Lake as affected by the operations of Corra Linn Dam and the Kootenay Canal Plant.

FortisBC, the owner of Corra Linn Dam, reported to the Board the limits between which it considers the optimal range for lake levels. 1738.5 feet is the low extreme, below which there are negative effects on aquatic habitat and ferry operations. 1749.5 feet is the upper limit, above which one would anticipate flooding of lakeside structures. To the extent possible, Fortis attempts to operate the lake within this range, subject to the stipulations of the Order.



The Kootenay Lake water level recorder gauge house at Nelson, BC.

The company undertakes preventative maintenance of its water level recorders twice each year, most recently in October 2009 and June 2010. An additional diving inspection found equipment in good shape with only minor repairs needed for the Nelson stilling well intake pipes.

According to the 1938 Order, FortisBC must pay farmers on the Kootenai Flats in Idaho up to \$3000.00 for additional pumping costs related to dyke seepage from higher water levels during storage periods. A number of years ago, Fortis made a separate agreement with the State for an additional payment. However, the Kootenai Valley Reclamation Association (KVRA), the representative of the State, had not submitted invoices for the pumping costs to FortisBC for several years. A

negotiated settlement to cover the period from 2004 to 2008 was reached last year, culminating with a lump sum payment of \$42,000. The 2009 pumping costs were settled in April 2010 at \$19,978. KVRA has agreed to provide timely invoicing in the future.

Board Meetings

The Board held its annual and public meetings in Bonners Ferry, Idaho, on September 30th. The minutes have been delivered to the Commission. Guests raised a series of questions about lake levels, the water level monitoring gauges on the lake, and the capacity of the lake outlet, Grohman Narrows, to pass water.

During the Board's annual (business) meeting, guest Dwain Boyer of the BC Ministry of the Environment outlined two interesting programs related to the lake. The *Kootenay Lake Water Stewardship Partnership* is looking at the increasing development around the lake in an effort to maintain a productive and healthy lake ecosystem and to balance land and water uses. The *Creston Valley Floodplain Management Plan* is trying to balance flood risk management with consideration of economic, ecological, social and cultural values from Kootenay Lake to US Border where the lowland is protected by 80 – 90 km of dikes.

Prior to the meetings, Board members and attending IJC staff toured the Kootenai Tribal Sturgeon Hatchery near Bonners Ferry.