

Meeting Minutes

Annual Board Tour and Meeting, International Kootenay Lake Board of Control (IKLBC)

Thursday, September 22, 2016

Tour: 8:30AM to 12:30

Board Meeting: 1:00 – 4:30 PM

Best Western Kootenay River Inn, Bonners Ferry, Idaho

List of Acronyms

CBRAC	Columbia Basin Regional Advisory Committee
IJC	International Joint Commission
IKLBC	International Kootenay Lake Board of Control
PCIC	Pacific Climate Impacts Consortium
USGS	U.S. Geological Survey
RMJOC	River Management Joint Operating Committee

	Canada	United States
Chair	Bruno Tassone (Host)	Col. John Buck
Members	Glen Davidson	Kyle Blasch
Secretariat	Gwyn Graham	Sara Marxen
IJC Commissioners	Richard Morgan	Rich Moy
IJC Advisors	David Fay	Mark Colosimo
Guests	Jamie King (FortisBC), Chris Frans (USACE)	

IKLBC Board Tour Summary (8:30 AM to 12:30 PM)

Board members were received at the Kootenai Tribes recently opened sturgeon and burbot hatchery by Chairmen Gary Aiken and biologists Kevin James and Chris Miller who provided a guided tour of the facility.

The hatchery is the first facility, nationally or internationally, to be built to rear and release burbot to rehabilitate a native population. Burbot were once a primary winter food source for tribal members but the population has been nearly extirpated to an estimated 50 fish through many miles of the Kootenai River in Idaho. Additionally changes in river flow after the 1975 completion of Libby Dam in Montana altered river conditions drastically, reducing both burbot and sturgeon numbers. Sturgeon can live to be 100 years old and were even revered by the tribe as spiritual grandfathers able to lead tribal people safely up and down the river. The restoration of the two species has been a major goal of the Kootenai Tribe since its first sturgeon hatchery opened in 1991.

Tribal members described some of the limiting factors to natural recruitment of sturgeon populations they are: silt settling and suffocating eggs due to decreased fluctuations in river flows from the dams, lack of a pool-ladder structure in the river which helps sturgeon move to suitable spawning areas, ambient water temperatures that are too low, lack of nutrients due to

Koocanusa being a “sink” for nutrients, and lastly lack of food sources. It was clear that the sturgeon pulse from Libby Dam was one improvement that the tribe depended on for supporting sturgeon spawning.

From the hatchery, Board members drove to a Budweiser hops farm managed by Ed Atkins.

Ed described the operations of the hops farm and described that the farm employs over 200 people and is in the top five of employers in the County. He expressed that when the river elevation at the USGS Porthill gage exceeds 1750 feet he sees inundation in the fields at his farm. He also indicated that if inundation persists for 30 days it can kill whole plants. He indicated that the sturgeon pulse had exacerbated the frequency of inundation at the farm. He also indicated that while he was eligible for re-imbursement for pumping costs he did not apply for reimbursement simply because the cost of pumping was so low.

Draft minutes IKLBC 2016 annual Board meeting.

Introductions:

Col. Buck (US chair – IKLBC) welcomed and led roundtable introductions.

Guests: Chris Franz (USACE), Jamie King (Fortis BC), Darrel McElhinney (Fortis BC).

Regrets: Kyle Blasch (USGS)

Review of agenda:

Col. Buck led a review of the meeting agenda.

Board secretaries provided a review of minutes and actions from 2015 Board meetings.

Review of previous actions items:

1. Board secretaries to consider organizing a presentation on climate change impacts to Kootenay Lake; status: completed - Chris Frans presentation at 2016 Board meeting.
2. Board secretaries to provide climate change info on Board website; status: completed/ongoing.
3. Board to provide response to Queen’s Bay resident, Nancy Knight re. low water concerns during late summer period (2015); status: completed.
4. Board secretaries to post 2011 Board report on Grohman Narrows channel capacity evaluation on Board website – status: completed.

New Business:

The Board presented information on the following orders of new business:

- Overview of compliance with the IJC Order in 2016 (to date)
- Kootenay River Basin hydrology overview
- Brief description of the major dams regulating flow in the system

- Overview of key elements affecting Kootenay Lake levels – description of the Corra Linn Dam and Grohman Narrows effects on lake discharge and lake level.
- Explanation of the IJC Rule curve for Kootenay Lake; seasonal aspects of rule curve which limits maximum water levels on Kootenay Lake.

The Board discussed possible rationale for why the Nelson gage is applied to determine the timing of the end of freshet when the rest of the rule curve is with reference to the Queens Bay gauge. At time of initial project feasibility studies by the applicant (then West Kootenay Power and Light), Nelson was the period of record gage (there was no Queen's Bay gauge) and also the only gauge with both level and discharge. It is assumed that for these reasons, the Nelson gage data for flow and level were used to determine the statistical end of the freshet and remained as such after the establishment of the Queen's Bay gauge, since the flow readings are not available at the lake gauges (even though flow is not directly referenced by the Order in the criteria for end of freshet). The Board may seek further information on the relevance of the Nelson gauge since the issue of a possible transfer of the Nelson gauge criteria to Queen's Bay gauge remains an open issue for the Board.

The Board reviewed applicant compliance of the IJC Order for 2016. Kootenay lake exceeded the rule curve for approximately half of March, spring rise was declared on April 8th and Kootenay Lake water levels peaked at 1748.08 ft on May 27th. The Board reviewed upstream reservoir operations in order to understand potential effects on Kootenay Lake levels. Duncan Dam reservoir experienced minimum levels in the middle of April with overall normal patterns of water level change (reservoir operations). Libby Dam (Kooocanusa reservoir) experienced the minimum water level on April 20th. Operations were deviated from normal due to a request related to CRT system operations to support flow management through Grand Coulee during to drum gate maintenance at the dam. Therefore, the system-based operation resulted in higher discharge from Libby Dam in mid-late March. The Libby Dam refill started around April 20th, then VARQ discharge flows were followed with a sturgeon pulse on May 17th. August to September saw low discharge rates to assist with in-stream channel work (downstream) by Kootenai Tribes.

The Board discussed issues raised during the morning field trip, particularly the issues raised by the manager of a large Hops farm in the Kootenai River flood plain downstream of Bonners Ferry (Idaho). The farm manager expressed concern over ponding issues and risks to crops when river stage reaches 1750 ft (USGS Porthill gage). The Board expressed interested in knowing how the Porthill gage compares to Kootenay Lake hydrograph/levels and what the Lake level is at for times when the Porthill gauge reads at or above 1750 ft.

***Action item** – Secretaries to provide Porthill/Queen's Bay gauge comparison with superimposed hydrographs.

2016 Hydrological Conditions

The Board reviewed hydrological conditions on Kootenay Lake on April 1, the snowpack at the monitoring stations ranged from 75-125% average (essentially a normal snowpack year). The month of April saw record high temperatures (highest Bonners Ferry April air temp in 109 year

record) along with very low precipitation. The warming trend resulted in rapid and early snowpack melt. By May 1st, the snowpack in the Kootenay Basin was 25%-50% of normal, and with particularly poor snowpack at low elevations.

Jamie King (Fortis BC) provided a presentation by the Applicant, reviewing Corra Linn operations and planned upgrades at the dam.

The Applicant started with an overview of Kootenay Lake levels.

Fall 2015 was a kokanee shoal spawning year according to the COFAC (Columbia Operations Fisheries Advisory Committee). Jamie noted a need for a correction in the 2015 Board annual report to note that the peak spawning events occur every 3 years (applicant tries to keep lake level at around 1742 ft in the Fall to minimize stranding of redds – mid Sept-October). Researchers are investigating whether shoal spawning kokanee are genetically distinct from tributary spawners, which would provide added rationale for shoal spawning management activities.

In March, the Libby dam forecast was increased, as a result Corra Linn went into freefall on March 3 dropping the Queens Bay elevation to 1740.31 ft on March 7. From March 6 to March 8, Libby Dam increased the outflow from 4 kcfs to 13 kcfs. On March 16, IJC rule curve was exceeded; there were no recorded complaints/concerns from public. The Queen's Bay elevation peaked May 27 at 1748.08 ft; the second earliest peak since 1999. The ideal lake level from the perspective of local lakeshore residents is 1743-1743.5 ft. The end of freshet on July 1st (Nelson gauge) is one of the earliest freshet termination dates seen by the applicant.

Darren MacIlhane (Fortis BC) provided an update of dam improvement projects at Corra Linn.

Darren identified an error in 2015 Board report (for correction) that the spillway renewal project is not yet approved and that Fortis is seeking this approval in 2016.

Darren provided information on the Corra Linn spillway renewal project which resulted from a 2012 safety review of the dam. As a result of the review Corra Linn was upgraded to an "extreme consequence structure" status due to the downstream impact potential. The new rating requires improvements to withstand seismic activity. The applicant therefore is working to rehabilitate or replace flow control gates; the cost projections indicate that gate replacement may be more viable. If the plan is approved (hopeful by March 2017), the work will start in July/Aug 2018. A total of 14 gates require replacement. The proposed plan will have a completion date of 2021 at an estimated cost of \$63 million. During the construction, four gates will be isolated at a time. There are no implications for free-fall or the ability to pass the PMF since currently the dam does not open all gates to go into free-fall and only 11 gates are required to meet the probable maximum flood. It is expected that throughout the work, the forebay elevations and conditions will remain constant.

Darren reported that the Fortis BC Queen's Bay gauge platform walkway and handrail upgrades are in progress.

Payments issues to Idaho in 2016 (for pumping costs in 2015) amounted to approximately \$30,000 (USD).

Board Correspondence

Gwyn Graham provided an IKLBC overview presentation to CBRAC on Feb.1, 2016 as part of a session on Kootenay River system operations.

The Board discussed the BC Hydro Grohman Narrows decision (the Board previously received information from BCHydro on decision not to proceed). The Board suggested that this be mentioned during the public meeting to help with awareness and information exchange.

Spring Rise Determination

The Board declared Spring Rise on April 8, 2016 based largely on the related hydraulic response signal in stream gauges on unregulated streams in the Kootenay Basin. This was communicated by Board secretaries to stakeholders and other individuals/groups of relevance.

2016-17 Work Plan Discussion

Review of current priority items,

1. The Transboundary Watershed map (*note: secretaries to verify that map is on website*). Board discussed the potential to provide a smaller size than the current poster size.
2. Track Grohman Narrows project (BC Hydro) – *note: project is no longer being considered by BC Hydro.*
3. IWI projects for proposal? No proposals specified to date for the IKLBC. Every Spring/Fall there are IWI call for proposals. Proposals require US/Canadian Board section points of contacts, contract managers, etc. Proposals are usually \$75K or less. Consider phasing aspects where relevant. Proposals need to be submitted by October. Proposals typically require some back and forth with questions, revisions, etc so it is beneficial to submit them early.
4. IJC advisors provided the following ideas for proposals:
 - a. Provided short list of new strategic priorities: impacts (water quality and quantity) due to climate change, impacts due to excess nutrients; impacts due to heavy metals.
 - b. Within the Board mandates, consider how might climate change impacts affect the IJC Order. For IKLBC, this would relate to water levels, communications and implications relating to hydrology and flow regulation.
 - c. Rainy Lake Board created a video to explain hydrology/water management processes to help the public understand the system (i.e. room for creativity within Board mandates). Kootenay Lake can be difficult to describe, could something like this be useful.
 - d. Consider automating responsibilities of Board.

The Board discussed future priority study needs. The Board will deliberate on core/routine work and potential priorities or studies for the workplan update. The Secretaries will seek Board ideas within 90 days (by mid to late December).

***Action item** – Secretaries will seek Board ideas the work plan within 90 days (by mid to late December).

A question was raised whether there is any relation between Kootenay Lake levels and conditions of benefit/impact to White Sturgeon? Board members indicated that the IJC rule curve levels in the Fall provide sufficient flexibility.

The IJC advisors asked if there were any comments from the Board regarding the draft IJC Directive to the Board. The Board indicated that some minor editorial comments had been indicated.

Chris Frans (USACE): Climate Change presentation

The presentation began with an overview of the hydrologic assessment process for climate studies. Winter flows are expected to increase, spring peak flows (freshet) are predicted to be more variable and there will be greater uncertainty in prediction capability.

The presentation provided an overview of atmospheric CO₂, depicting a steady rise from 1980 to current levels of around 400 ppm. This was followed by a backtracking of historic CO₂ levels retrieved from ice core studies, over the last 800k years, levels have peaked at roughly 300 ppm. The important question is how much more CO₂ will be added to the atmosphere, this can be estimated based on a variety of plausible emission scenarios, the emission scenarios present a significant degree of uncertainty past the mid-century mark.

The presentation then gave a description and overview of Global Circulation Models (“GCMs”). There is a need to downscale the GCMs for better regional resolution (200 km res to 5 km res). From the GCMs, predicted temperature and precipitation data can be input to hydrological models for streamflow forecasting. At each stage of modeling a degree of uncertainty is compounded, resulting in considerable uncertainty estimates for each output parameter. The combined uncertainty feeds off output from all stages of analysis.

RMJOC-II (2015-18) study is ongoing and follows up on a previous study (in collaboration with WU and OSU). The University of Washington is providing the hydrologic models; USACE/BPA will apply operations models to the hydrology.

BCHydro/PCIC (Pacific Climate Impacts Consortium) utilize the VIC hydrologic model (similar to US studies) but incorporate a glacier loss model. The PCIC models are predicting 10-15% increases in precipitation (mostly during the winter) and 2-3 °C increase in summer temp. In this way, 2015 may be an analogue to the average future year (5 °F above mean temp, near norm

precipitation). Compared 2015 KL rule curve hydrograph; the rule curve exceedances are due to winter rain.

Regarding the IJC Order – the board posed the question, “in the climate change future, when does extraordinary high inflow become the norm?”. Chris looked at streamflow generation just based on temperature (increased warming). The models predict increases and exceedances during drawdown periods. Chris also plotted temperature change vs. precipitation change (%) and noted that increasing winter flow is a consistent outcome, modeled up to 200% above historic winter flows. Spring freshet will have a greater uncertainty in relative change from current.

The Board noted that the climate change models for Kootenay Lake (as presented) are suggesting lower peak levels but possibly greater rule curve exceedance events in the winter/spring period.

*Chris Frans’ presentation slides will be made available on the IKLBC Sharepoint site.

Col. Buck adjourned meeting at 4:25pm.