



Bow River Trout Foundation

A Need for Bow River Water Management Changes



Bow River Trout's second installment in a series of articles that offers an insight into the management of the Bow River water supply to meet water and electrical demands and the potential for this to have an impact on the sports fishery.

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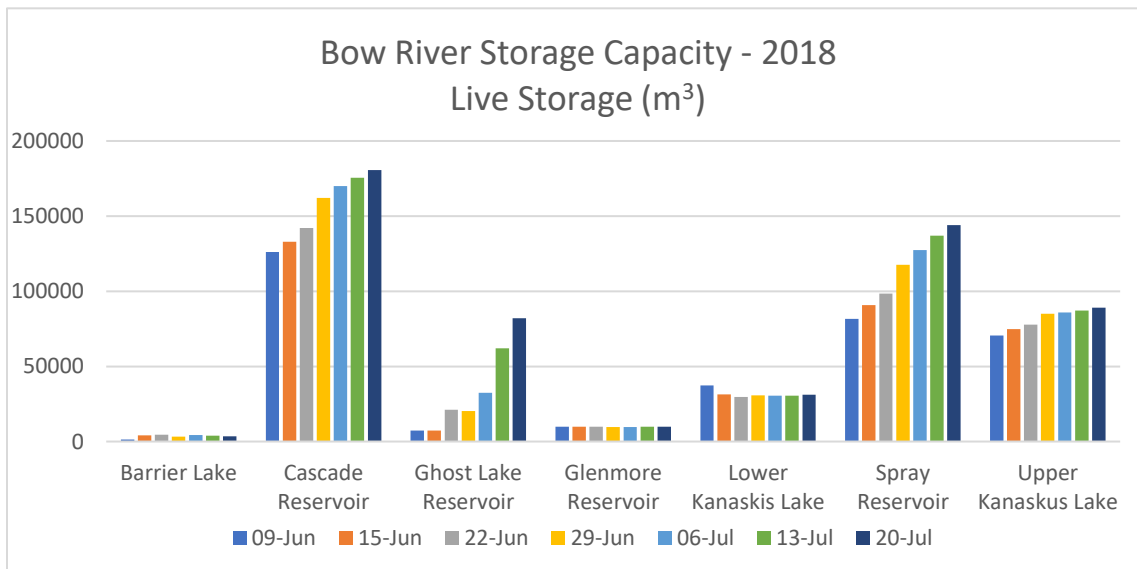
The Bow River fishery needs a constant supply of cold clean water to sustain its future as a world-recognized “Blue Ribbon” trout river.

The management of water flows is controlled by the Province of Alberta within long-standing agreements with TransAlta who control the hydro-electric dam infrastructure above Calgary, the City itself, and the irrigation districts downstream. Every week each of these stakeholders meets to establish the water release rates through the upstream storage capacity to meet demands for water and minimum flow legislation. Water will be released or held back within the Bow River Basin storage capacity to meet projected demand.

TransAlta Bow River Hydro-Electric System.

There are a total of 9 reservoirs within the Bow River Basin of which 7 have regulated capacity to store water for year-round operation of TransAlta’s power generation plants (Table 1). The largest storage capacity is maintained at Cascade and Spray Reservoirs which account for 60% of the total basin storage. Both Upper Kananaskis and Ghost Reservoirs each account for approximately 15% of the total. Storage levels in each of the reservoirs are at their lowest in the spring and reach their upper limits of capacity by the end of July.

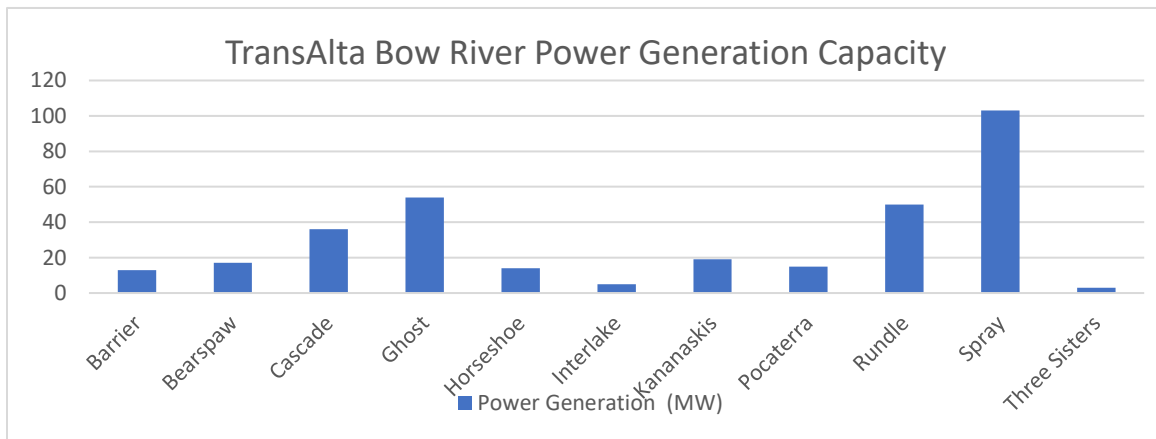
Table 1: Bow River Basin Storage Capacity Upstream of Calgary



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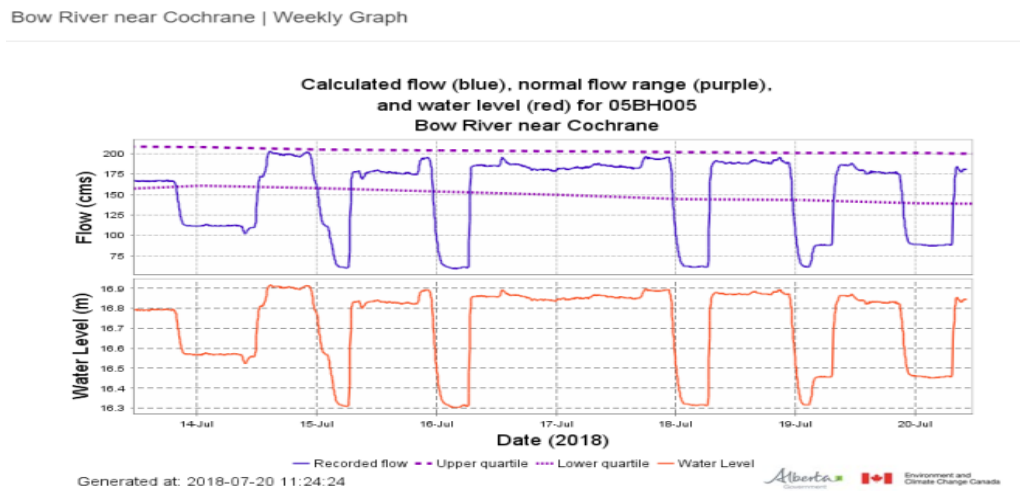
Water is subsequently released from each reservoir to meet hydroelectric demand throughout the year. Hydroelectric power generation (Table 2) is the highest at Spray (103 MW) followed by Ghost on the Bow River (54 MW) and Rundle on the Kananaskis River (50 MW). A total of 329 MW of electrical power capacity can be generated within the Bow River Basin, representing 5% of TransAlta’s total Alberta generating capacity.

Table 2: TransAlta Hydroelectric Power Generation Operations



Ghost hydroelectric plant is unique in so far as it is a “Peaking Facility” that allows TransAlta to turn the generators on when electrical power demand is high and turned off when not needed. This gives rise to extreme changes in flows below the dam (Figure 1).

Figure 1: Bow River Flows at Cochrane – Below Ghost Hydroelectric Plant

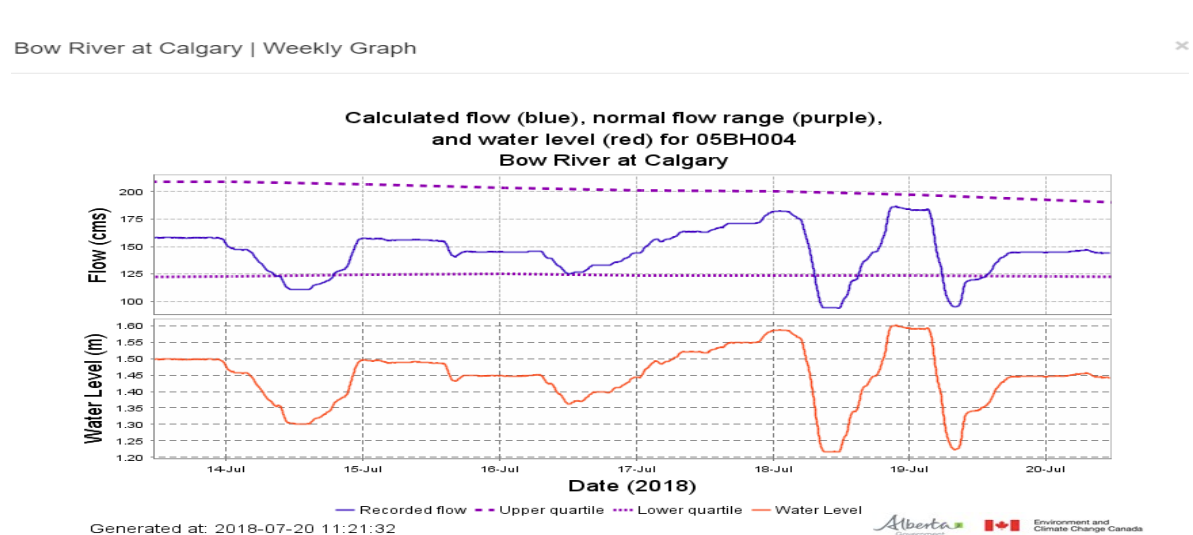


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The rapid changes in river flows below the Ghost hydroelectric power plant are contained by Bearspaw Reservoir that insulates the City of Calgary from the large water flow fluctuations experienced by the Bow River between Ghost and Bearspaw reservoirs.

Historically, consistent Bow River flows gave rise to a very productive trout fishery, but in recent years, floods, droughts, and modifications to the Bow River hydro operation protocol ⁽¹⁾ have given rise to extreme changes in flow rates. In recent years the Bow River downstream of Bearspaw has experienced as much as a 50% drop or increase in flows within a very short period (Figure 2). These dramatic fluctuations have a very detrimental effect on the Bow River fishery.

Figure 2: Bow River Flows at Calgary from July 14 to July 20, 2018



Why have we seen these dramatic changes in river flow in recent years?

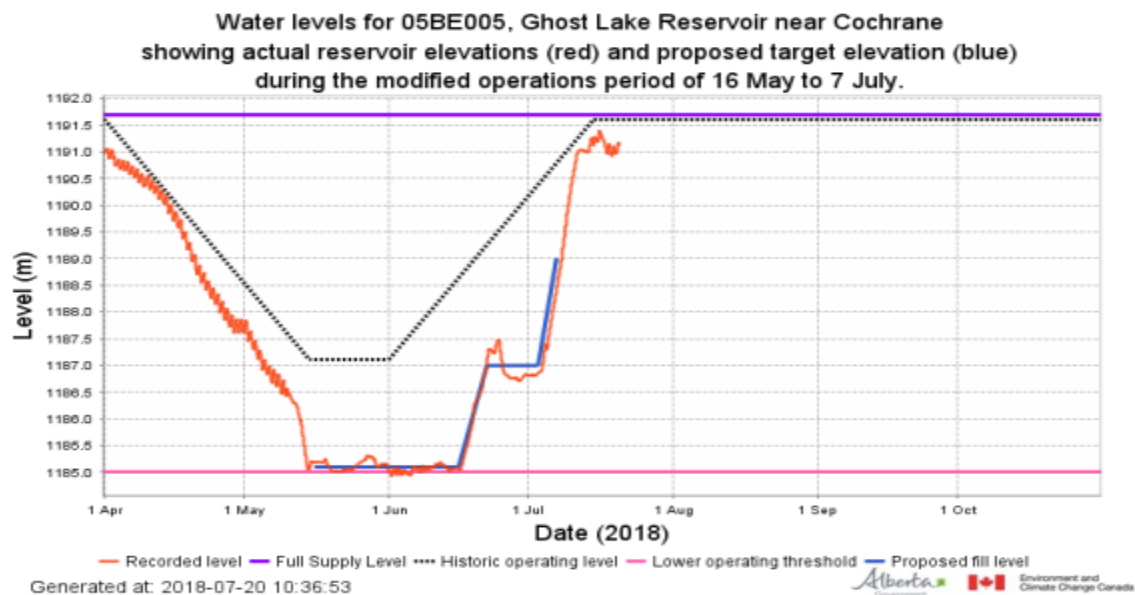
Due to a modified Bow River water management protocol that empties Ghost Reservoir in May to aid in potential flood relief for the City of Calgary in the event of high flow advisories (Figure 3). Once the city’s exposure to this threat is reduced, the reservoir will return to normal operation capacity by the middle of July. During this time, flood risk protocols are put in place across the upper Bow River watershed to contain water in the basins’ reservoirs during times of

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high rainfall and enhanced snowmelt. Once natural flows recede, the accumulated storage will be released to accommodate further containment of rainfall. Any excess water will flow through the upper Bow River and finally through Calgary. Although river flows will increase significantly after high rainfall in the mountains and foothills, the magnitude of the increase is reduced considerably through and downstream of Calgary.

Figure 3: Ghost Reservoir Water Levels for April – July 2018

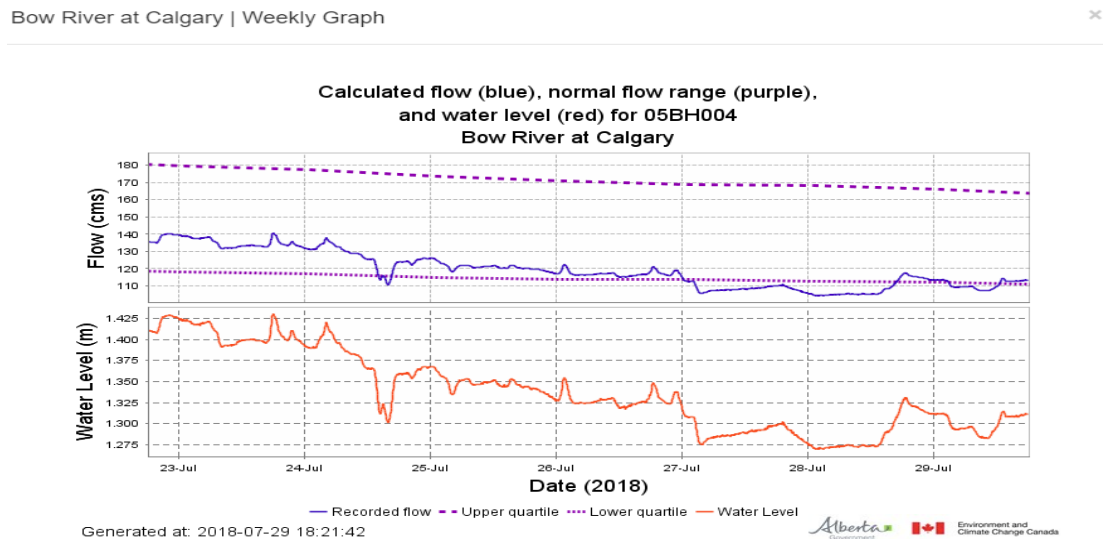
Ghost Lake Reservoir near Cochrane | Yearly Graph



Bow River Trout Foundation has documented the modified water management protocol for some time and has expressed our concerns to TransAlta and Alberta Environment & Parks regarding the sudden spikes and drops in water flow through the City of Calgary as illustrated in Figure 2. Unfortunately, there appeared to be a breakdown of the water management operations for the week of July 15, 2018, where the extreme changes in flow had a severe impact on the recreational fishing downstream of Calgary and may have long-term impacts on the survival of the fishery itself. An immediate correction in the water management protocol was put in place that hopefully will continue to stabilize flows through the summer months (Figure 4).

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Figure 4: Stabilized Bow River Flows at Calgary from July 23 to July 29, 2018



A Sustainable Water Supply for the Bow River Fishery

The 2013 flood had an enormous impact on the City of Calgary and other communities in the Bow River Basin. The hydrology of the Bow River in and downstream of Calgary was changed by the extremely high flows and the subsequent flood mitigation measures. The fishery was devastated but in recent years fish populations appear to have increased somewhat.

The Government of Alberta commissioned The Bow River Water Management Project to provide strategic advice on opportunities to reduce future flood damage, improve the reliability of water supply, and protect the long-term health of the Bow River Basin. A report, "Advice to Government on Water Management in the Bow River Basin"⁽²⁾, gave recommendations for short-term remediation and long-term solutions for flood control and water supply but with limited consideration of the impact on the ecosystem and fishery.

The short-term recommendations that were accepted by AEP Minister, Shannon Philips were put in place under the existing water license agreements within the Bow River Basin. The long-term solutions of new dams on the Bow River at either the Glenbow Ranch Provincial Park site between Calgary and Cochrane or on the Morley Indian Reservation will be debated for some time. Bow River Trout Foundation expressed our concerns to the Minister in August 2017 with a

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document, **“The Impact of Water Management Policy and Proposed Mitigation Initiatives on the Bow River Basin Fishery”** ⁽³⁾. The response directed us to various AEP departments for further discussion. Although in its infancy, the dialogue has been very constructive with the formation of a roundtable discussion group of AEP managers TransAlta and local stakeholder groups with the title of “Flows, Fishing and & Fish”. The focus of our discussions has been:

- Declines in Bow River trout populations with plans for further fish population surveys to establish a baseline for fishery management enhancement programs.
- A better understanding of the dynamics of a sustainable recreational sports fishery.
- An enhanced Bow River Water Management Protocol to protect fish habitat, invertebrate life, and the importance of the sports fishery to the local economy.

Bow River Trout Foundation Vision for the Future of the Fishery

- AEP has committed to conduct an enhanced Bow River fish population survey in September 2018 where sample sites will be expanded over the full stretch of the Bow River from within Calgary to the Carseland Weir. We are hopeful that this initiative will continue for several years.
- Bow River water licenses for TransAlta hydro operation expire in 2020. It is hoped that the stabilized river flows can be negotiated into new agreements to enhance the fishery and protect fish and the ecosystem for future generations.
- Bow River hydroelectric power generation represents only 5% of TransAlta’s total power generation capacity with Ghost Reservoir power plant representing only 16% of the Bow River power generation capacity. Is it time for a shift in the Ghost’s “Peaking Facility” protocol from its wide flow variants to a more stable power generation model with corresponding flow stability?
- The Kananaskis River cutthroat fishery has been destroyed by hydroelectric power generation operations. There is a need for advocacy to modify these operations or to decommission the plants in the interests of enhanced protection of the environment.

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- Future flood mitigation projects on the Bow River above Calgary need to be considered in a wider scope than flood protection of the City of Calgary and a sustainable water supply for commercial and agricultural use. The protection of the environment needs to be paramount in future discussions.

References:

1. Bow River Hydro Operations from a Water Management & Stakeholder Perspective, TransAlta, 2015
https://bowrivertrout.files.wordpress.com/2016/06/pres3_drury-transalta.pdf
2. Advise to the Government of Alberta on Water Management in the Bow River Basin presented to Alberta Environment & Parks Minister Sharon Philips. August 2017.
<https://bowrivertrout.files.wordpress.com/2017/04/advicewatermanagementbowriver-may17-2017.pdf>
3. The Impact of Water Management Policy and Proposed Mitigation Initiatives on the Bow River Basin Fishery.
<https://bowrivertrout.files.wordpress.com/2017/09/brt-aep-philips-01-sept-20171.pdf>