Calgary River Users Alliance

The Impact of Bow River Water Management Policy on Fish Populations – Update April 2021

Introduction:

In August 2020 Calgary River Users Alliance (CRUA) expressed our concern of the impact of Bow River water management policy on the fish populations to the Executive Director of the AEP Water Policy Branch. After extensive discussions, the Alberta Environment & Parks (AEP) Fish and Wildlife Policy Branch was brought into the conversation to form the current AEP-CRUA Joint Technical Liaison Group to define ways to cooperatively advance discussions to develop both water and fishery management policy to improve the Bow River sports fishery [(1)].

The economic importance of the Bow River recreation use exceeds $50 million per year with the sport fishery contributing more than $25 million to the local economy each year [(2)]. A more extensive assessment of the East Slopes Trout Fishery [(3)] documents the importance of the economic drivers and fishery management regulation change that is needed to support a sustainable sports fishery.

The scope of the AEP-CRUA Joint Technical Liaison Group:

1. **A Scientific Assessment of Fish Population Declines:**
   The recent Bow River Fish Population Survey from 2018-20 and the Angling Effort Survey from 2018 are important steps that have been taken to update the knowledge database of fish population dynamics. And when combined into a cumulative effect modeling framework will hopefully guide fishery management directives. Water quality and wastewater management policy may well need more scientific analysis. Specifically, the relationship between phosphorous, dissolved oxygen, sediment biomass content, and invertebrate populations. All of which have impacts on the fishery.

2. **Short-Term Water Flow Management Change:**
   The modified Bow River water management policy that had been in place since 2014 and renewed for a further five years in 2021 has created some degree of frustration within the fishing community. Certainly, flood protection for the City of Calgary is important, but rapid change in daily flows needs to be eliminated outside of emergency intervention to protect infrastructure. The daily flow discharge forecasts being made available to river user groups in recent years have been useful. But there is a need for more public consultation in advance of daily water operations directives being issued by the water regulators.

3. **Bow Basin Future Water Management Policy:**
   The Bow Basin Water Management Options to improve flood and drought protection will no doubt be controversial, especially any new dam additions in the future. Although there is a need for an environmental assessment, the scope of what has been completed to date has not taken into the impact on the wild-non-native trout population in the Bow River. The cumulative effect modeling of the lower Bow River, in and downstream of Calgary needs to be expanded to include the proposed new dam sites on the Bow River.

Should peak-hydro electrical power generation be phased out in the future? The Kananaskis River native cutthroat and bull trout fishery downstream of the Pocaterra Power Plant has been devastated by peak-hydro operations. The Bow River between Ghost and Bearspaw reservoirs is similar. Both these fisheries have the potential to absorb the ever-increasing angling pressure within the Bow Basin if water management and hydro operations were changed. There is a place to investigate the cost-benefit analysis of these possible changes.

Update of the AEP-CRUA Joint Technical Liaison Group:

4. **Outcome: A Scientific Assessment of Fish Population Declines:**

The Bow River Cumulative Effects Modelling – The AEP Science Team has established a baseline of 4 stressors that have been considered by the team to have a significant impact on the Bow River fish population. The Rainbow Trout has been defined as the sentinel species for the assessment due to the more readily available data sets for input into the Cumulative Effects Model (CEM). Consultation with stakeholders continues with an expansion to community focus groups later this year.

Flow Metrics – Both Peak Base Flow Ratio and Down Ramp Rates were included in the CEM. The data supports that Bow River hydro operations have a significant impact on the Bow Basin fish population. Hydro operations on the Kananaskis River have the greatest impact, and high levels of down ramping during the modified operations of the Ghost Reservoir on the Bow River in the spring and early summer of the year contribute to ecological damage downstream.

An Overview of Bow River flows; 1980-2014 vs 2015-2020, includes an analysis of short-term flow fluctuations during the summer of 2018 and 2020 (Appendix 1) that are a result of modified water management operation protocols. Flow variables of these magnitudes can have a severe impact on angling success and possibly fish population dynamics.

Angling Mortality - The recent fish population and creel surveys combined with historical data indicate that most of the angling mortality takes place by boat anglers on the lower Bow River between Calgary and Carseland. The highest mortality takes place in the summer months when water temperatures are at their highest. Further assessment of seasonal mortality is needed. Stressor curves were developed to address the principal outcome of fish population and creel surveys. Fishing regulation change is being considered for 2022 -23.

Road Salt – Sodium Chloride represents 95% of the salt used on Calgary streets and therefore was the focus of the CEM stressor input. The impact of road salt on Rainbow Trout, invertebrates, and algae formations was the focus of the investigation. Literature review and the City of Calgary database indicate little concern for the long-term chronic level of pollution that would impact the fishery.

Avian Predation – Pelicans and cormorants are generally opportunistic feeders, eating a variety of fish and invertebrate species. Further investigation is needed to ascertain the seasonal populations and food source. A pilot study is planned for 2021.

Draft Cumulative Effect Model Results – Using the 4 stressor groups identified in the preliminary analysis, a score of 44% average distribution for Rainbow Trout was predicted. A 100% score would only occur with no fishing, no hydro operations, and no human interference. Although other stressors will be evaluated in the future to expand the database, the focus for 2021 will be Flow Metrics and Angling Mortality.

5. **Outcome: Short-Term Water Flow Management Change:**
   The CEM -Flow Metrics Stressor and Overview of Bow River Flow 1980-2014 vs 2015-2020 indicate that the current modified water management policy for the Bow River that has seen severe upward and downwards flow changes in relatively short periods (Appendix 1) can have an impact on Rainbow Trout population dynamics during a time of year when they are most vulnerable due to spawning activity stress. The focus for the AEP-CRUA Joint Technical Liaison Group is to engage with TransAlta Corp. to develop a water management operational model to reduce flow variants during the time of modified operations. We are confident that improvements will be seen in 2021.

6. **Outcome: Bow Basin Future Water Management Policy:**
   The 2021 CRUA report, The Kananaskis Valley – It is time for Water Management Change [(4)] summarizes reports from 2001 and 2010 together with supplemental analysis that suggest the Kananaskis River could offer a viable high-quality trout fishery with modifications to the TransAlta hydropeaking electrical power protocol. The CEM -Flow Metrics Stressor Report further supports this belief. Further discussion is needed to define what action can be taken by AEP and stakeholders to advance this initiative.

CRUA Comments:

We are impressed with what has been achieved with the AEP-CRUA Joint Technical Liaison Group in less than 6 months. The Bow River Cumulative Effects Modelling – Science Team has developed the information that can guide both the Bow River water and fishery management policy for the future of a sustainable sports fishery. CRUA is more than an alliance of fishing interests, we like to believe we represent the stakeholder interests for all Bow River recreational use. For a successful outcome to the technical assessments that have taken place, there is a need for expanded engagement and communication to the river recreation community. This we encourage AEP to set as a priority with the delivery of a message of continued engagement on the AEP -CRUA Joint Technical Liaison Group activities documented in this report.

David Blair, Director of Bow River Trout Foundation, and the Angling Outfitters & Guide Association represent the fishing-related issues within CRUA. His summary of the discussion taking place within this forum [(5)] gives a more detailed review of the Cumulative Effect Modelling discussions. It is an important step to deliver important information to the fishing community. We do encourage AEP to take the next step and disseminate the currently available information as soon as possible.

Peter Crowe-Swords

CRUA – April 15, 2021.

References:

1. The Bow River Water Management Policy and the Impact on the Fishery. https://www.calgaryriverusers.org/the-bow-river-water-management-policy-and-the-impact-on-the-fishery/2/
2. The East Slopes Trout Fishery – A vision for the Future. https://www.calgaryriverusers.org/wp-content/uploads/2020/03/Alberta-East-Slopes-Trout-Fishery-03Mar2020.pdf
3. The Economic Impact of Bow River Recreational Use to the Local Economy – Update 2019. https://www.calgaryriverusers.org/wp-content/uploads/2019/08/The-Ecomomic-Importance-of-Bow-River-Recreational-se-to-the-Local-Economy-05August-2019.pdf
4. The Kananaskis Valley – It is time for Water Management Change. Peter Crowe-Swords CRUA. https://www.calgaryriverusers.org/wp-content/uploads/2021/04/CRUA-Kananaskis-River-Enhancement-Proposal-Final-25Jan2021-.pdf
5. Summary of Bow River Cumulative Effects Modelling and Scientific Team Discussions. David Blair, BRTF & AOGAA. https://www.calgaryriverusers.org/wp-content/uploads/2021/04/Government-Liason-Report-David-Blair-11Apr2021.pdf

Appendix 1:

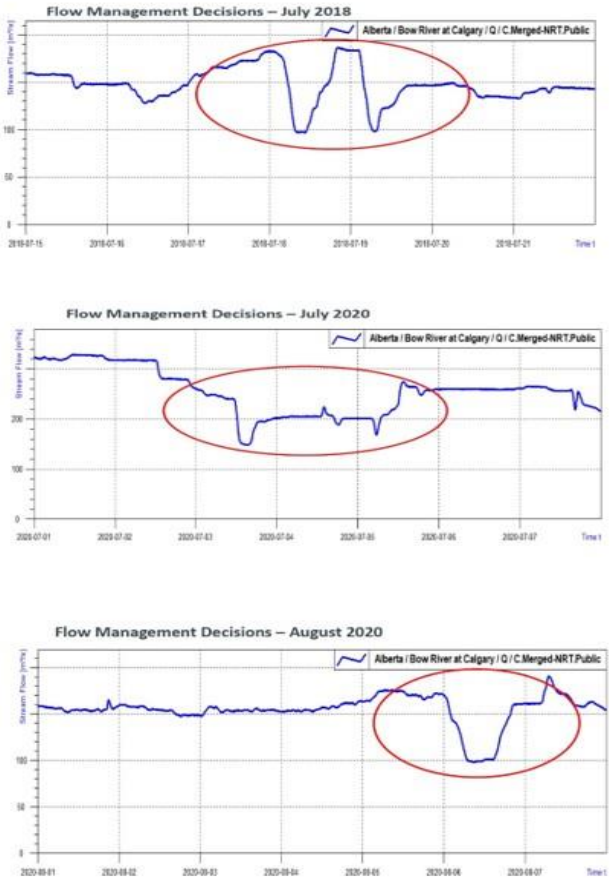

Figure 1: Short-term duration effect of the Bow River Water Management Operations. Alberta Environment & Parks Data. 2018-2020