



February 3, 2021

Laura Friend
Manager, Board Reviews
Natural Resources Conservation Board
250 – 5 Street SW
Calgary, AB T2P 0R4

Dear Ms. Friend:

**Re: Alberta Transportation Proposed Springbank Off-Stream Reservoir Project
NRCB Application No. 1701
Water Act No. 00387101**

In support of *Water Act* File No.00387101, NRCB Application No. 1701, Alberta Environment and Parks and associated government agencies have reviewed the Environmental Impact Assessment (EIA) report received on October 2017 and March 2018 , and Supplemental Information Request Response(s) received on June 14, 2019, April 2020, May 2020, June 2020 and December 2020 and have determined that the content of the report meets the Terms of Reference published on February 5, 2015.

Please be advised that I have deemed the EIA complete pursuant to Section 53 of the *Environmental Protection and Enhancement Act*.

Enclosed is a memo from the fisheries management section within Environment and Parks. They have requested I provide this memo to the NRCB regarding potential impacts to fish populations on the Elbow River

Please contact me if you have any questions or wish to discuss Alberta Environment and Parks' review of the EIA report.

Sincerely,

Corinne Kristensen
Director, Regulatory Assurance
Regulatory Programs Branch
(Designated Director, *Environmental Protection and Enhancement Act*)

Enclosure: Fisheries memo

cc: M. Hebert (AT) T. Holden (IR)
D. Bourget (AEP) K. Lund (AEP)
L. Cheperdak (Health) J. Howe (IAAC)
W. Unfreed (Alberta Culture M. Daneluk (AEP)
Multiculturalism and Status of Women)

Memorandum

January 29, 2021

Author

Paul Christensen
Senior Fisheries Biologist
Resource Stewardship Division, Fish and Wildlife

Subject: Risk to fish populations on the Elbow River- Springbank Off Stream Reservoir Project

Alberta Environment and Parks- Fisheries Management (AEP-FM) is writing this memo in regards to its review of the Springbank Off-Stream Reservoir Project environmental impact assessment report and subsequent Supplementary Information responses. AEP-FM has been involved with the review of the project, and has provided subject matter expertise to support assessment of this project; including drafting fisheries and fish habitat related questions in the Terms of Reference.

AEP-FM is of the opinion that certain aspects related to operation of the project pose significant risk to fish populations in the Elbow River system between Elbow Falls and Glenmore Reservoir, even after mitigation measures are applied. Bull Trout, a species listed as threatened under the provincial *Wildlife Act* and federal *Species at Risk Act*, uses this reach to complete all aspects of its life history. A summary of the concerns that remain is listed as follows:

Data Collection/Underlying Assumptions

- AEP-FM provided guidance on an appropriate study design and methods required to collect data and assess populations in this system. Specifically, assessing populations in medium sized rivers such as the Elbow River necessitates the use of float or raft electrofishers due to the types of deep and swift-water habitat present, river flows, variety of fish sizes and the amount of electrical current that needs to be applied to induce a sufficient response in fish to ensure they are adequately captured. Despite the advice provided with respect to technique and study design, backpack electrofishing was used to complete population studies in 2020. Given the size, depth, and swiftness of the river in these locations, the survey will be biased to fish that can be captured in the margins or shallower portions of the river that could be waded safely. In systems like the Elbow River at the project location, backpack electrofishing is a collection method that would be biased to small or juvenile fish found on the river margins and is expected to underestimate the abundance of adult fish present in the system. In order to fully understand and estimate the impacts of this project, an assessment of all life stages needs to occur.
- The primary reference (Post et al 2006) used to estimate fish losses into the offstream reservoir is not fully applicable for this project. While the primary literature for similar project types is lacking, it is not reasonable to estimate that entrainment losses and fish behavior in highly turbulent flood situations would be similar to entrainment rates and fish behavior experienced during normal flow conditions. Additionally, the referenced paper cited a high degree of

uncertainty with using these estimates, and stated that estimation of losses for smaller size classes is highly variable. This information, combined with AEP-FM's experience rescuing fish from stranded off-channel ponds on the Bow River in 2013, suggests that entrainment rates are likely to be significantly higher than estimated.

- The underestimate of fish population and extremely conservative estimates of fish entrainment rates is expected to produce low estimates of entrainment, which may lead to an underestimate of the significance of the project's impact on fish populations.

Mitigation for Entrained Fish

- AEP- FM maintains that the proposed means by which fish could be rescued will prove to be extremely challenging and ultimately, limited in effectiveness. High turbidity water combined with high air temperatures provides a very small window in which to attempt fish rescues, and creates challenging field conditions that could lead to high immediate mortality. Combined with the very large surface area of the offstream reservoir, it is unlikely that electrofishing will prove sufficient on a scale that would meaningfully rescue the majority of the entrained fish. This assertion is supported by AEP-FM's experience in 2013 whereby it attempted to rescue fish in ponds and isolated side channels that became stranded by the flood when water levels receded. Ultimately, large ponds proved to be very difficult to effectively rescue fish as warm water temperatures quickly rose and subsequently became an attractant for avian predators to consume dead and moribund fish. Given the lower lethal temperature tolerances for Bull Trout (compared to Rainbow Trout and Brown trout in the Bow River), it is anticipated this threshold may be crossed quickly and lead to a very limited window to rescue stranded fish.
- The interval for expected diversion operations occurs at a rate that is expected to be detrimental for Bull Trout, which can take up to 7 years to reach maturity. This may result in complete or multiple year class failures in recruitment, which further increases risk to Bull Trout populations.

Given the above noted items, AEP- FM is of the opinion that this project, as proposed, will present a high risk to fish populations in this reach of the Elbow River. Additionally, it is also of the opinion that Bull Trout may eventually become extirpated from this stream reach given the unique life history characteristics of Bull Trout in the Elbow River (i.e. documented use from Elbow Falls to Glenmore Reservoir and their late age to maturity) given the frequency of operation.

This project may put the local population of Bull Trout at high risk and may lead to extirpation in this reach of the Elbow River. If this population declines as a result of this project, this would represent a trade-off for fish populations in this reach. It should be further noted that fluvial life history strategies of large Bull Trout only reside in 2 reaches of the Elbow River; upstream of Elbow Falls, and downstream of Elbow Falls. Any plans to offset these losses should be carefully considered as it is unclear whether Bull Trout could persist sustainably in this reach of the Elbow River with the flood diversion operational over the long term. If deemed as an acceptable trade-off by regulatory agencies, alternative offsets should be pursued in consultation with Fisheries and Oceans Canada and other regulatory agencies in alignment with AEP-FM fisheries management objectives (FMOs).

References:

John R. Post, Brett T. van Poorten, Trevor Rhodes, Paul Askey & Andrew Paul (2006) Fish Entrainment into Irrigation Canals: An Analytical Approach and Application to the Bow River, Alberta, Canada, *North American Journal of Fisheries Management*, 26:4, 875-887, DOI: 10.1577/M05-047.1