

Alberta Conservation Association
2020/21 Project Summary Report

Project Name: North Raven River Beaver Management Project

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Partnerships

Alberta Environment and Parks

Key Findings

- Dissolved oxygen in the North Raven River throughout the summer and autumn of 2020 remained well above concentrations necessary for trout survival.
- We found no evidence that a beaver dam impounding the river had a negative impact on dissolved oxygen over the summer and autumn of 2020.

Abstract

The North Raven River (NRR) brown trout fishery is widely regarded one of Alberta's best. Management of beaver activity in the NRR began in 1973 and is considered necessary to maintain the trout fishery. It had been over two decades since the observations and assumptions underpinning beaver management along the NRR were critically assessed. We monitored dissolved oxygen (DO) in the river in 2020/21 to assess the potential for low DO to negatively impact the trout population. Our work was based on the findings of a review we completed in 2019 of the scientific literature concerning the potential impacts of beaver activity on stream ecosystems and trout we. We measured DO at five bridged crossings of the NRR and around a beaver impounded reach during the summer and autumn of 2020. Our spot measurements of DO

along the NRR were never below 7 mg/L, well above the 3 mg/L necessary for trout survival. Hourly monitoring of DO along the length of a beaver-impounded reach of river gave no indication that damming the river negatively impacted DO, which ranged between 5 and 10 mg/L. We continue to monitor DO in the river during the winter of 2021.

Introduction

The North Raven River (NRR) brown trout fishery is widely regarded as one of Alberta's best. Management of beaver activity in the NRR began in 1973 and was considered necessary to recover and maintain the trout fishery (DeRosa and Herman 1996). Management includes removal of beaver, beaver dams, and feed caches, and occurs from April to October. Beaver management focuses on the need to preserve trout migration corridors and minimize sedimentation of spawning areas along the river, but landowner and angler complaints also drive removal effort. Alberta Conservation Association (ACA) assumed full administration of the NRR beaver management in 2018. Based on a 2019 review of the scientific literature concerning the potential impacts of beaver activity on stream ecosystems and trout, we monitored dissolved oxygen (DO) in the river in 2020/21 to assess the potential for low DO to negatively impact the trout population. The goal of this project is to critically evaluate the current beaver management regimen for maintenance of the NRR trout fishery.

Methods

To assess DO concentrations throughout the river during the open-water season, we measured DO at five bridged crossings distributed along the length of the NRR. Measurements were taken weekly from July to September with a handheld meter in the early morning when daily oxygen levels are at their lowest. To assess the potential impact of beaver activity on stream DO, we monitored DO upstream, downstream, and within the pond of a beaver impounded reach of the NRR using data loggers. The beaver pond was located near the mouth of the river, data loggers were placed mid-water column and recorded temperature and DO hourly from June to October.

Results

Our weekly measurements of DO along the length of the NRR were never below 7 mg/L, well above the 3 mg/L necessary for trout survival. Hourly monitoring of DO along the length of a beaver-impounded reach of river gave no indication that damming the river negatively impacted DO, which ranged between 5 and 10 mg/L. Indeed, DO concentrations were slightly higher within the beaver pond later in the season (Figure 1).

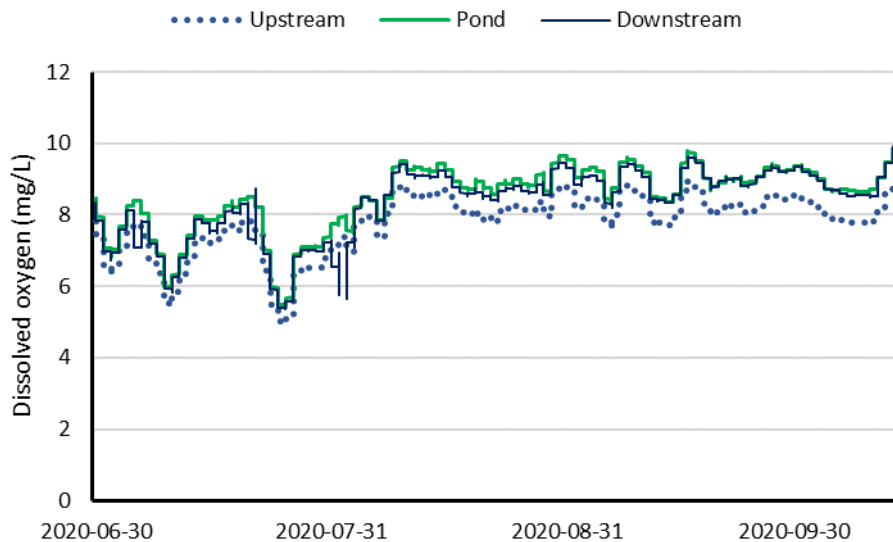


Figure 1. Dissolved oxygen concentrations immediately upstream, downstream, and within a beaver pond in the North Raven River. Dissolved oxygen concentrations above 3 mg/L are generally considered adequate for trout survival.

Conclusions

Based on a review of relevant scientific literature conducted in 2019, we concluded that increased impoundment of the NRR resulting from unmanaged beaver activity has the potential to negatively impact DO in the river. However, during the summer and autumn of 2020, spot measurements of DO taken throughout the river weekly, and hourly measurements taken at a beaver pond near the river mouth, were always well above levels required for trout survival. Our results indicate that DO concentrations throughout the NRR were adequate for trout during the open-water season of 2020 and we found no evidence that impoundment of the river by beaver negatively impacted DO. We continue to monitor dissolved oxygen to assess winter risk.

Communications

- Project results were shared with AEP area fisheries managers.

Literature Cited

DeRosa, D. and S. Herman. 1996. The 1995 progress report on redd counts and spawning observations of brown trout (*Salmo trutta*) and brook trout (*Salvelinus fontinalis*), in the North Raven River, Alberta. Alberta Environmental Protection Natural Resources Service. Rocky Mountain House, Alberta, Canada. 59 pp.

Photo



Aerial view of a beaver dam along the North Raven River. Photo: Erin Vandermarel.