

Alberta Conservation Association
2022/23 Project Summary Report

Project Name: Upper McLeod River Native Trout Inventory

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Partnerships

Alberta Native Trout Collaborative
Fisheries and Oceans Canada – Canada Nature Fund
Government of Alberta

Key Findings

- We sampled 53 sites distributed throughout the Upper McLeod River watershed, capturing 2,101 fish.
- Rainbow trout were the most widely distributed fish species across the four sub-watersheds we sampled.
- Bull trout were the most abundant fish species in the Upper McLeod above Beaverdam Creek sub-watershed.

Abstract

Athabasca rainbow trout and bull trout abundance and distribution has decreased from historical levels in Alberta. These species are listed under the *Species at Risk Act*, which identifies many anthropogenic threats to native trout in the province. Alberta's Native Trout Recovery Program is a collaboration of government and non-government organizations tasked with assessing native trout populations and, through remediation activities, recovering at-risk populations. The Upper McLeod River watershed is a priority for assessment. In the summer of 2022, we used backpack electrofishing gear to sample 38 sites randomly distributed throughout four sub-watersheds

within the Upper McLeod River watershed. We completed an additional 15 sites in the Upper McLeod above Beaverdam Creek sub-watershed initially sampled by the Government of Alberta (GoA) in 2017. We captured a total of 2,101 fish, with rainbow trout being the most widely distributed species across the four sub-watersheds. Bull trout were the most abundant fish species in the Upper McLeod above Beaverdam Creek sub-watershed. This is the second and final year of the project with four additional sub-watersheds completed in 2021. A final report summarizing our results will be complete by April 2023. Project results provide up-to-date information on the population status of native Athabasca rainbow trout and bull trout in the Upper McLeod River watershed.

Introduction

Native trout species along the Eastern Slopes of the Rocky Mountains have decreased in population size and distribution such that Athabasca River populations of rainbow trout (*Oncorhynchus mykiss*) are listed as *Endangered* under the *Species at Risk Act* while Western Arctic populations of bull trout (*Salvelinus confluentus*) are listed as a species of *Special Concern*. Anthropogenic threats including habitat alteration and fragmentation, sediment introductions, non-native fish stocking, hybridization, and angling mortality have led to the decline (COSEWIC 2012, DFO 2020).

Alberta's Native Trout Recovery Program, a collaboration of government and non-government organizations, has received funding through the Canada Nature Fund for Aquatic Species at Risk (CNFASR) to assess at-risk populations of native trout and, through remediation activities, aid in their recovery. Success of recovery actions is assessed using the Alberta Fish Sustainability Index (FSI), a standardized process of assessment that provides a landscape-level overview of fish sustainability within the province and enables broad-scale evaluation of management actions and land-use planning (MacPherson et al. 2014).

The Upper McLeod River watershed was identified as a priority for inventory work to provide current information on at-risk Athabasca rainbow trout and bull trout. While non-native rainbow trout stocking occurred in the watershed, genetic testing has shown that most rainbow trout populations are native (COSEWIC 2014). Angling restrictions have led to some protection;

however, habitat degradation, fragmentation, and poaching still contribute to the stresses on these populations.

Methods

To assess fish distribution and abundance, we selected sample sites from points placed along second- to fifth-order streams using a spatially balanced design. Within the Upper McLeod River watershed, we sampled the following sub-watersheds in 2022: Upper McLeod above Beaverdam Creek, Upper McLeod above Gregg River, Upper McLeod below Gregg River, and Sundance Creek (Figure 1). From July 12 to August 25, 2022, we used backpack electrofishing gear to sample 38 sites randomly distributed throughout the four sub-watersheds, including an additional 15 sites in the Upper McLeod above Beaverdam Creek sub-watershed. These additional sites were initially sampled by the Government of Alberta (GoA) in 2017 in the Mackenzie Creek drainage prior to initiating trail system restoration and upgrade work. Sites were 300 m in length, and we counted all captured fish by species and measured their fork length (FL; mm). Fish and habitat sampling followed Alberta Environment and Sustainable Resource Development's (ESRD 2013) *Standard for Sampling of Small Streams in Alberta*.

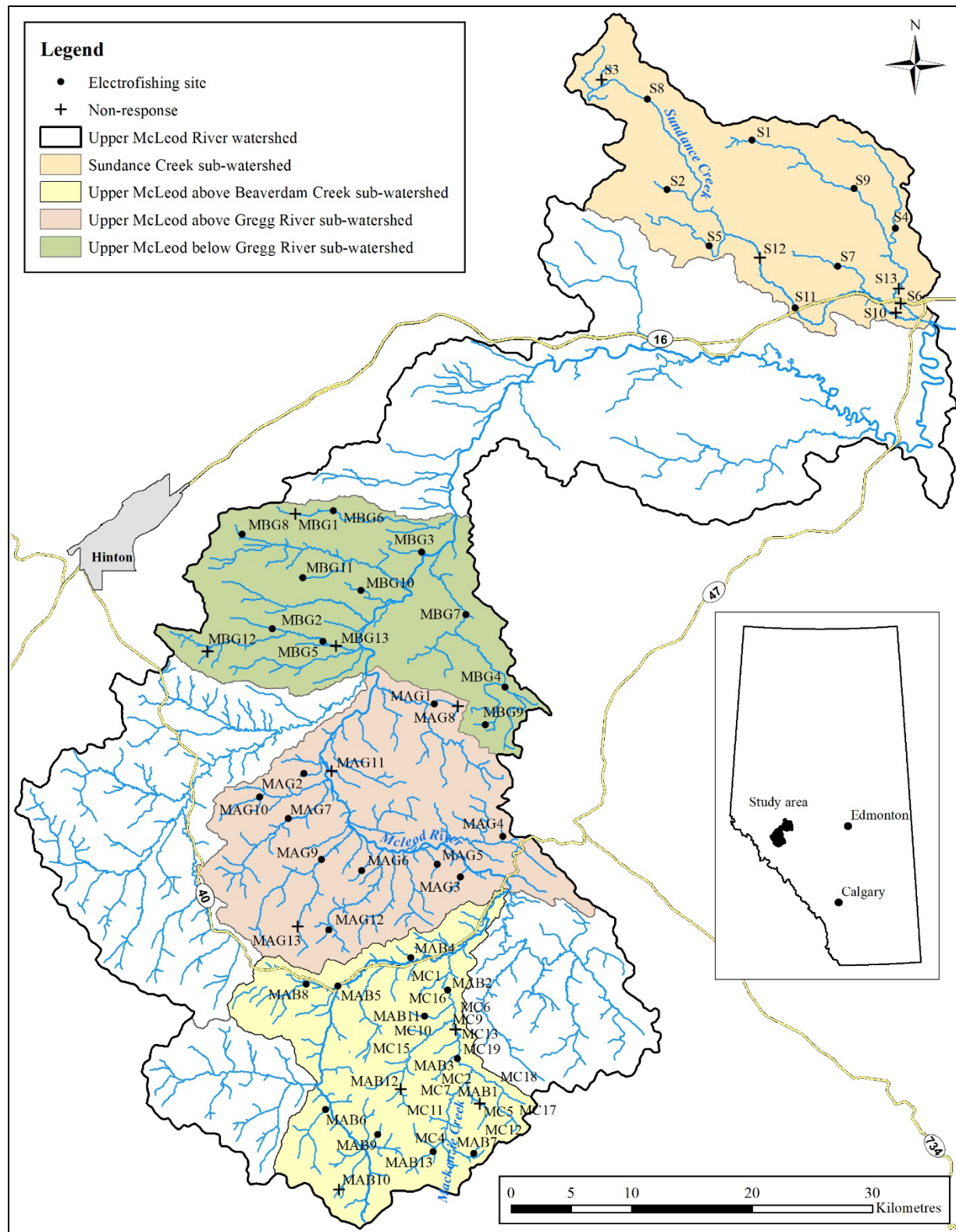


Figure 1. Backpack electrofishing fish inventory sites within the Upper McLeod River sub-watersheds, 2022.

Results

We sampled 53 sites resulting in over 50,500 seconds of effort over 15.7 km of stream. We captured 14 different fish species totalling 2,101 fish (Table 1). Rainbow trout were caught in each of the sub-watersheds and made up 5% of our total catch. We electrofished 25 sites in the Upper McLeod above Beaverdam Creek sub-watershed and captured 120 brook trout (*Salvelinus fontinalis*), 724 bull trout, one mountain whitefish (*Prosopium williamsoni*), and 50 rainbow trout. Bull trout were the most abundant fish species in the sub-watershed, comprising 81% of the total catch.

Table 1. Site detections and total catch of fish species in the Upper McLeod River by sub-watershed using backpack electrofishing gear, July 12 to August 25, 2022.

Species	Site Detections (n) per Sub-watershed				Total Catch (%)
	McLeod above Beaverdam	McLeod above Gregg	McLeod below Gregg	Sundance	
BKTR	2	2	1	4	177 (8)
BLTR	17	1	1	0	726 (35)
BRST	0	0	0	3	46 (2)
BURB	0	1	0	0	1 (<1)
FNDC	0	0	0	3	827 (39)
LKCH	0	0	0	2	13 (1)
LNDC	0	0	1	0	1 (<1)
LNSC	0	0	1	6	64 (3)
MNWH	1	1	0	0	2 (<1)
NRDC	0	0	0	2	17 (1)
NRPK	0	0	0	1	2 (<1)
PRDC	0	0	2	4	56 (3)
RNTR	7	5	2	4	107 (5)
WHSC	0	0	1	3	62 (3)

Species codes: BKTR = brook trout, BLTR = bull trout, BRST = brook stickleback, BURB = burbot, FNDC = finescale dace, LKCH = lake chub, LNDC = longnose dace, LNSC = longnose sucker, MNWH = mountain whitefish, NRDC = northern redbelly dace, NRPK = northern pike, PRDC = pearl dace, RNTR = rainbow trout, WHSC = white sucker.

Conclusions

Rainbow trout were the most widely distributed fish species captured in the Upper McLeod River watershed. Bull trout were the most abundant species in the Upper McLeod above Beaverdam Creek sub-watershed. This is the final year of a two-year project with four additional sub-watersheds completed in 2021. A final data report will be available in April 2023 at www.ab-conservation.com. Our project results provide up-to-date information on population abundance and distribution of Athabasca rainbow trout and bull trout in the Upper McLeod River watershed.

Communications

- Submitted data to GoA for inclusion in its Fisheries and Wildlife Management Information System database.
- Summary report completed and submitted to Fisheries and Oceans Canada (DFO).

Literature Cited

Alberta Environment and Sustainable Resource Development (ESRD). 2013. *Standard for Sampling of Small Streams in Alberta (Public Version)*. Alberta Fisheries Management Branch Standards Committee.

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Sinnatamby, N., A. Cantin, and J.R. Post. 2019. Threats to at-risk salmonids of the Canadian Rocky Mountain Region. *Ecology of Freshwater Fish* 29: 477–494.

Photos



Photo 1. ACA staff Chad Judd and Dakota Sullivan backpack electrofishing a stream in the Upper McLeod River watershed. Photo: Zachary Spence



Photo 2. A typical rainbow trout captured in the Upper McLeod River watershed. Photo: Zachary Spence