Alberta Conservation Association

2019/20 Project Summary Report

Project Name: East Slopes Fisheries Inventory

Fisheries Program Manager: Peter Aku

Project Leader: Chad Judd

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Partnerships

Alberta Environment and Parks
Sundre Forest Products – A Division of West Fraser Mills Ltd.

Key Findings

- We sampled 57 sites distributed throughout the James River watershed and tributaries in the upper Red Deer River drainage, capturing 15 fish species.
- The highest relative abundance of bull trout in the study area was in Wildhorse Creek.
- We detected brook trout in every watershed sampled.

Abstract

Alberta Environment and Park's Fish Sustainability Index is 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. Priority species for assessment in our sample area include bull trout and mountain whitefish. Bull trout is a native sport species classed as *Threatened* in Alberta and is particularly sensitive to habitat

change. In the summer of 2019, we used backpack and tote-barge electrofishing gear to sample 40 sites randomly distributed throughout the James River watershed, a tributary to the Red Deer River. In addition, we sampled 12 sites in the Yara Creek watershed and five sites in Wildhorse Creek. We captured a total of 996 fish in the study area, with brook trout being the most widely distributed and most abundant species captured. Bull trout were detected in Wildhorse Creek, the Yara Creek watershed, and the Upper James River watershed. Mountain whitefish were only captured in the Upper James River watershed. The highest catch rates of brook trout and bull trout occurred in Wildhorse Creek. Our study provides land-use managers with information on fish species distribution and abundance that is necessary to minimize land-use impacts to fish, evaluate bull trout status, and otherwise balance the diverse values of the Red Deer River drainages.

Introduction

Fishery inventories provide resource managers with information on fish abundance, species distribution, and fish habitat. This information is a key component of responsible land-use planning and management if threats to stream health are to be minimized. Alberta Environment and Park's (AEP's) Fish Sustainability Index (FSI) is 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). Priority species for FSI assessment known to occur in our study areas include bull trout (*Salvelinus confluentus*) and mountain whitefish (*Prosopium williamsoni*) (MacPherson et al. 2014). Collection of data to support FSI development for imperiled native sport species is a priority activity for Alberta Conservation Association (ACA).

Bull trout is classed as *Threatened* in Alberta (Saskatchewan – Nelson rivers populations) (COSEWIC 2012). Bull trout are particularly sensitive to habitat change and are thought to reflect general ecosystem health (COSEWIC 2012). This sensitivity, coupled with the species' relatively wide distribution, makes bull trout an attractive species for monitoring sustainability in headwater streams of the Red Deer River. In 2019, ACA assessed fish distribution and

abundance in the James River watershed and expanded our study area to include the Yara Creek watershed and Wildhorse Creek within the Upper Red Deer River drainage.

Methods

To assess fish distribution and abundance, we selected sample sites from points placed along third- to fifth-order streams using a spatially balanced design. Priority HUC 10 watersheds (hydrological unit code 10) for sampling were identified in consultation with project partners and included Lower James River, Middle James River, South James River, Upper James River, and Yara Creek (Figure 1). From June 24 to August 13, 2019, we used backpack and tote-barge electrofishing gear to sample 40 sites randomly distributed throughout the James River watershed, a tributary to the Red Deer River. In addition, we sampled 12 sites in the Yara Creek watershed and five sites in Wildhorse Creek. Sites were 300 m and 500 m in length for backpack and tote-barge sampling, respectively. We enumerated all captured fish by species and measured their fork length (FL; mm).

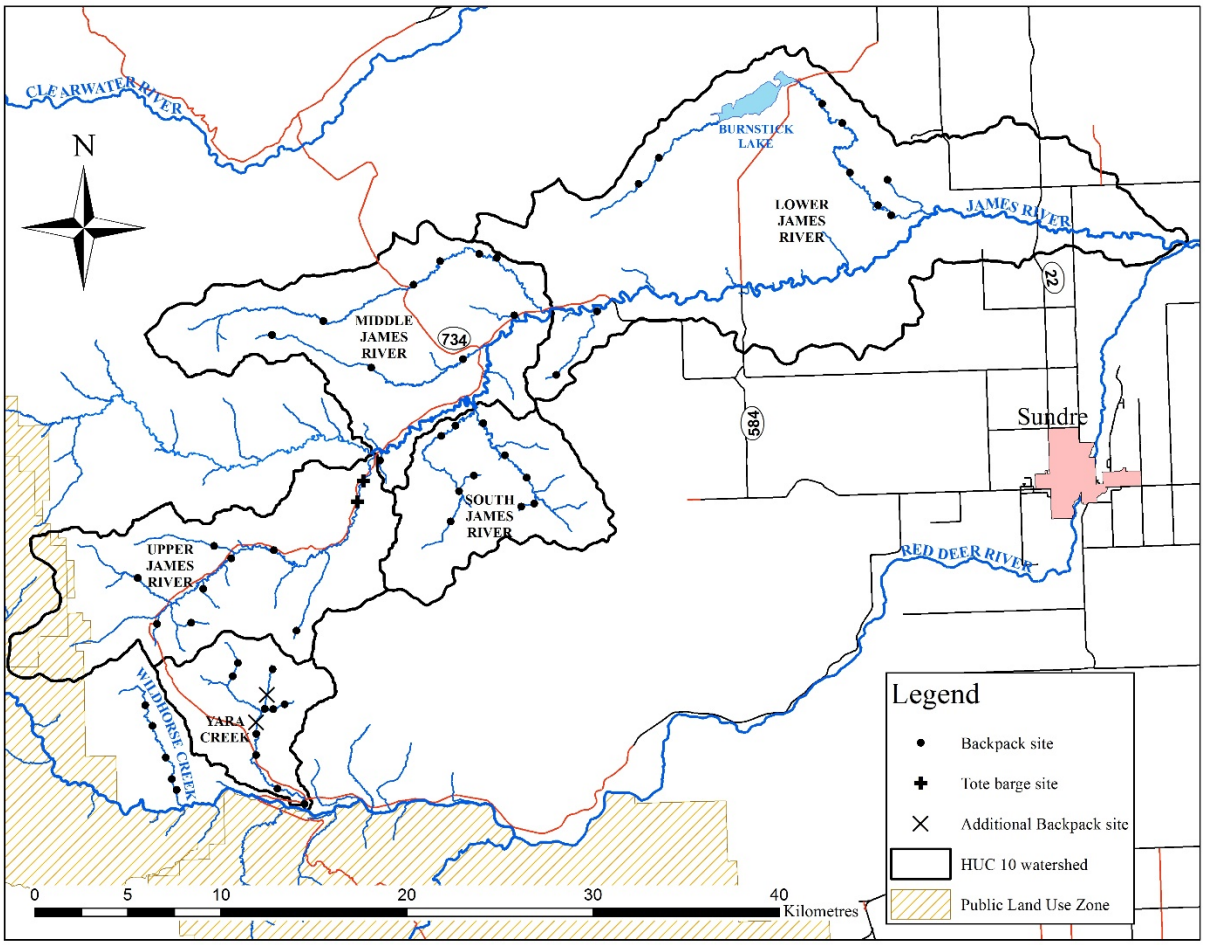

Figure 1. Fish inventory sites within the James River and Upper Red Deer River watersheds, 2019.

Results

We sampled 57 sites resulting in over 67,000 seconds of effort over 17.3 km of stream. We captured 15 different fish species totalling 996 fish (Table 1). Brook trout were caught in each of the HUC 10 watersheds and Wildhorse Creek, and made up over 70% of our total catch. Bull trout were detected at seven sites and were most abundant in Wildhorse Creek with a median catch rate of 0.33 fish/100 m. Mountain whitefish were only captured at our two tote-barge sites in the Upper James River HUC 10.

Table 1. Number of sites fish were detected per HUC 10 watershed and total catch of fish species during the East Slopes Fisheries Inventory project using backpack and tote-barge electrofishing gear, June 24 to August 13, 2019.

	Site detections (n) per HUC 10 watershed						
Species	Lower James	Middle James	South James	Upper James	Wildhorse	Yara	Total Catch (%)
BKTR	5	7	7	7	5	9	728 (73)
BLBK	0	0	0	0	1	1	2 (<1)
BLTR	0	0	0	2	3	2	21 (2)
BNTR	1	3	0	1	0	0	5 (1)
BRST	1	0	0	0	0	0	1 (<1)
FTMN	1	0	0	0	0	0	1 (<1)
LKCB	1	1	0	0	0	0	8 (1)
LNDC	5	1	3	2	0	0	192 (19)
LNSC	0	1	1	0	0	0	2 (<1)
MNSC	2	0	0	0	0	0	7 (1)
MNWH	0	0	0	2	0	0	9 (1)
PRDC	2	0	0	0	0	0	2 (<1)
SPSC	0	0	0	1	0	0	3 (<1)
WALL	1	0	0	0	0	0	1 (<1)
WHSC	3	0	0	0	0	0	14 (1)

Species codes: BKTR = brook trout, BLBK = bull trout brook trout hybrid, BLTR = bull trout, BNTR = brown trout, BRST = brook stickleback, FTMN = fathead minnow, LKCH = lake chub, LNDC = longnose dace, LNSC = longnose sucker, MNSC = mountain sucker, MNWH = mountain whitefish, PRDC = pearl dace, SPSC = spoonhead sculpin, WALL = walleye, WHSC = white sucker.

Conclusions

Brook trout was the most abundant and widely distributed species captured in the James River watershed and Upper Red Deer River drainage. Bull trout were captured in three of the six watersheds sampled and only at seven sites throughout the study area. The highest relative abundance of brook trout and bull trout occurred in Wildhorse Creek. Mountain whitefish were only captured at two sites in the Upper James River HUC 10. Our study provides land-use managers with information on fish species distribution and abundance that is necessary to minimize land-use impacts to fish, evaluate bull trout status, and otherwise balance the diverse values of the Red Deer River drainages.

Communications

- Submitted data to AEP for inclusion in its Fisheries and Wildlife Management Information System database.
- Data report completed and copies submitted to AEP and Sundre Forest Products.

Literature Cited

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2012. COSEWIC assessment and status report on the bull trout *Salvelinus confluentus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, Ontario, Canada. 103 pp.

MacPherson, L., M. Coombs, J. Reilly, M.G. Sullivan and D.J. Park. 2014. A generic rule set for applying the Alberta fish sustainability index, second edition. Environment and Sustainable Resource Development, Edmonton, Alberta, Canada. 51 pp.

Photos

ACA technician Andrew Clough and seasonal employee Dakota Sullivan backpack electrofishing in Wildhorse Creek. Photo: Zachary Spence

A juvenile bull trout poses after being captured in Wildhorse Creek. Photo: Andrew Clough