Alberta Conservation Association
2016/17 Project Summary Report

Project Name: North Saskatchewan River Fish Sustainability Index Data Gaps

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Partnerships

Alberta Environment and Parks
Hinton Wood Products – A Division of West Fraser Mills Ltd.

Key Findings

- We captured 12 fish species at 40 sites distributed throughout the Elk River, Rifle Creek and Crow Creek in the upper North Saskatchewan River watershed.
- Bull trout were detected at ten sites in the Upper and Middle Elk River indicating the existence of a remnant population.
- Immature bull trout were detected primarily at one location in a tributary to the Elk River.
- Burbot were detected in every sampling area, and mountain whitefish were detected in every area except Crow Creek.
- White sucker was the most abundant and widely distributed species.

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 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 area include bull trout (*Salvelinus confluentus*), burbot (*Lota lota*) 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 North Saskatchewan River watershed. In 2016, ACA assessed fish distribution and abundance in the Elk River and Brazeau watersheds.

Methods

To assess sport fish distribution within the upper North Saskatchewan River watershed, we selected sample sites from points placed along third- to fifth-order streams using a spatially balanced design. Priority areas for sampling were identified in consultation with project partners and included Upper Elk River, Middle Elk River, Lower Elk River, Rifle Creek and Crow Creek (Figure 1). We sampled the sites using backpack and tote-barge electrofishing gear. Sampling took place from June 15 to August 17, 2016. 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).

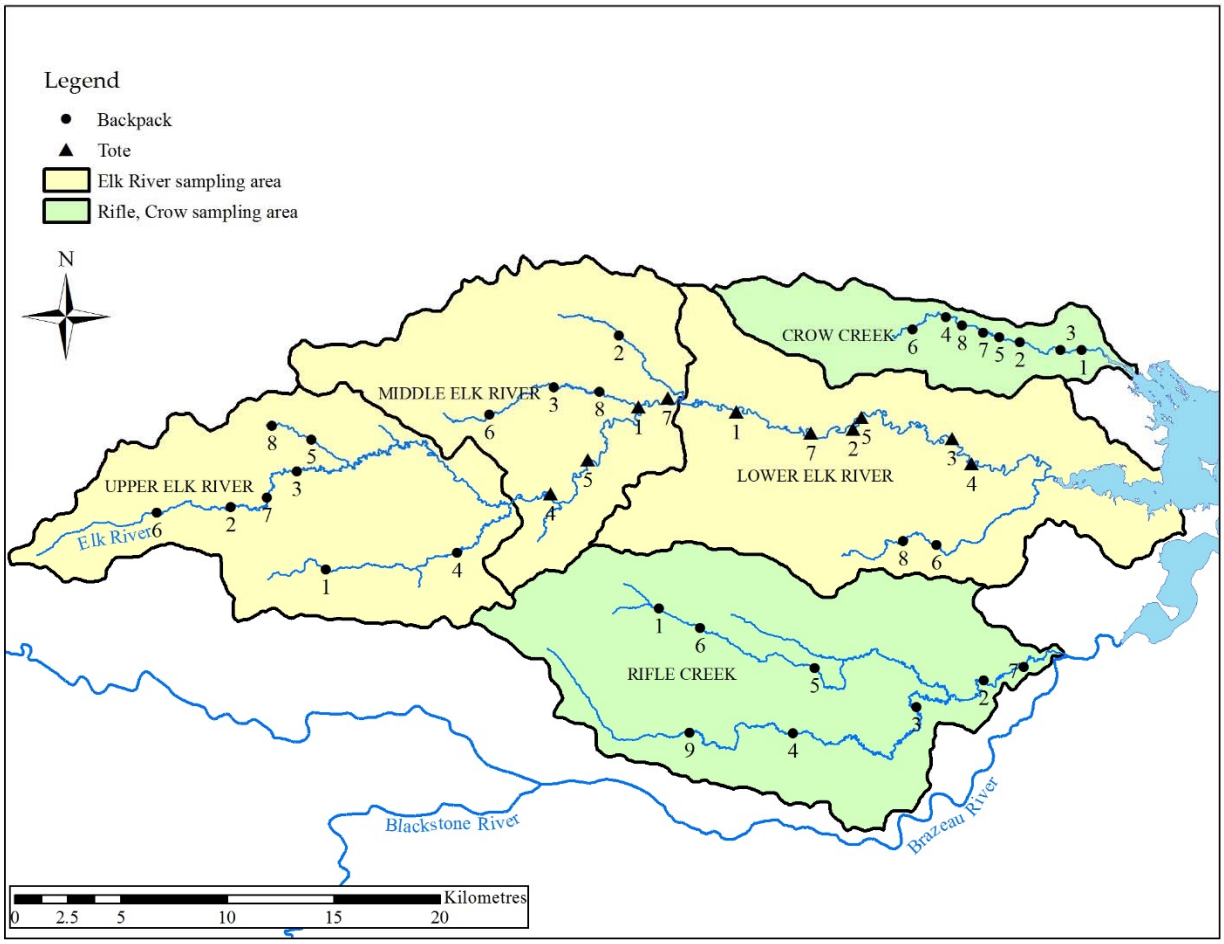

Figure 1. Fish inventory site locations within the Upper Elk River, Middle Elk River, Lower Elk River, Rifle Creek and Crow Creek.

Results

The 40 sites we sampled resulted in over 78,000 seconds of effort over 13 km of stream. We captured 3,793 fish, including 38 bull trout, 56 burbot and 27 mountain whitefish. Bull trout were detected at ten sites in the Upper Elk River and Middle Elk River. Immature bull trout (i.e., ≤150 mm FL) were detected at two sites in the Upper Elk River, with 19 of 20 immature bull trout captured at site Upper Elk River 1. Burbot were detected in every area, and mountain whitefish were detected in every area except Crow Creek. White sucker dominated our catch (n = 1,296) and was detected at 30 sites and in every area. Other species captured included (in decreasing order of abundance) longnose dace, pearl dace, trout perch, brook stickleback, longnose sucker, spoonhead sculpin, mountain sucker, and finescale dace (Table 1).

Table 1. Site detections and total catch of fish species using backpack and tote-barge electrofishing gear, June 15 to August 17, 2016. Species codes: BRST = brook stickleback, BLTR = bull trout, BURB = burbot, FNDC = finescale dace, LNDC = longnose dace, LNSC = longnose sucker, MNSC = mountain sucker, MNWH = mountain whitefish, PRDC = pearl dace, SPSC = spoonhead sculpin, TRPR = trout perch, WHSC = white sucker.

Species	Site detections (n)					Total catch (%)
	Crow	Rifle	Upper Elk	Middle Elk	Lower Elk	
BRST	2	4	0	0	3	343 (9)
BLTR	0	0	6	4	0	38 (1)
BURB	2	1	2	5	6	56 (1)
FNDC	0	0	0	0	1	3 (<1)
LNDC	3	2	1	6	7	961 (25)
LNSC	4	3	0	6	6	119 (3)
MNSC	1	0	0	2	5	100 (3)
MNWH	0	1	3	5	5	27 (1)
PRDC	6	7	0	6	7	381 (10)
SPSC	7	0	3	7	5	111 (3)
TRPR	0	2	0	4	3	358 (9)
WHSC	8	7	1	6	8	1,296 (34)

Conclusions

We captured 3,793 fish, including 38 bull trout, 27 mountain whitefish and 56 burbot at 40 sites in the upper North Saskatchewan River watershed. Our catch was dominated by white sucker, which was the most abundant and widely distributed species captured. Bull trout were detected in the Upper and Middle Elk River, with Upper Elk River Site 1 containing almost all the immature bull trout captured. This tributary to the Elk River could potentially be an important spawning stream for bull trout in the Elk River. Our study provides land-use managers with information on fish species distribution and abundance necessary to minimize land-use impacts on fish, evaluate bull trout status, and otherwise balance the diverse values of the the North Saskatchewan River watershed.

Communications

- Submitted data to Alberta Environment and Parks for inclusion in its Fisheries and Wildlife Management Information System database.
- Submitted progress report to Alberta Environment and Parks and Hinton Wood 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

Alberta Conservation Association staff Chad Judd and Zach Spence backpack electrofishing a small stream in Crow Creek. Photo: Andrew Clough

Alberta Conservation Association staff Andrew Clough, Mike Rodtka and Zach Spence measuring fish caught while tote-barge electrofishing. Photo: Chad Judd