Alberta Conservation Association

2020/21 Project Summary Report

Project Name: Ram River Bull Trout Assessment

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Partnerships

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

Key Findings

- We detected fish at six of the eight sites we sampled in the lower Ram River watershed, comprising seven different fish species.
- Bull trout were the most widely distributed species detected with at least one bull trout captured at every site where fish were caught.
- Fall Creek continues to be an important bull trout spawning stream with 66 bull trout redds counted during a survey of a 3.5 km reach of the creek.
- We designed and operated a solar-powered underwater video recording system for monitoring bull trout escapement in Fall Creek.
- We counted 76 bull trout migrating downstream past our camera system resulting in a spawner to redd ratio of 1.2.

Abstract

Bull trout is a native sport species classed as *Threatened* in Alberta and is particularly sensitive to habitat change. A government-led initiative, the North-Central Native Trout (NCNT) program was implemented in 2017 to recover native trout and whitefish in the central and northern east slopes of Alberta. The program involves implementation of recovery actions (e.g., trail remediation/closure, implementing industry best-management practices, suppression of non-native species) in an adaptive management framework. Success of this program will be measured using AEP's Fish Sustainability Index (FSI). The 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. In the summer and fall of 2020, we used a combination of backpack electrofishing and redd surveys to assess the bull trout population in the lower Ram River watershed. Our sample frame for backpack electrofishing included eight selected sites, where we detected fish at six of the eight sites, catching seven different species. Bull trout were the most widely distributed species captured. We captured 22 bull trout electrofishing, with six of the eight sites having at least one bull trout captured. Fall Creek remains an important spawning tributary in the Ram River watershed. We counted 66 bull trout redds on a survey of a 3.5 km reach of Fall Creek. In 2019, we designed and tested a solar-powered underwater video recording system to count adult bull trout exiting the Fall Creek spawning area. We obtained over 40 days of footage during the bull trout spawning migration and counted 76 bull trout migrating downstream past the camera; this equated to a spawner to redd ratio of 1.2, an index that can be used to estimate bull trout abundance in future redd surveys. Our study provides managers with information on fish species distribution and abundance that can be used to evaluate land-use impacts on fish and bull trout response to recovery actions.

Introduction

Bull trout, classified as *Threatened* (Saskatchewan – Nelson rivers populations), are particularly sensitive to habitat change and are thought to reflect general ecosystem health (COSEWIC 2012). This sensitivity, coupled with their relatively wide distribution, make bull trout an attractive species for monitoring sustainability in the North Saskatchewan River watershed. A government-led initiative, the North-Central Native Trout (NCNT) program was implemented in

2017 to recover native trout and whitefish in the central and northern east slopes of Alberta (Government of Alberta 2017). The program involves implementation of recovery actions (e.g., trail remediation/closure, implementing industry best-management practices, suppression of non-native species) in an adaptive management framework. These management actions will be evaluated using Alberta Environment and Park's (AEP) Fish Sustainability Index (FSI). The 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). We are monitoring native fish populations using a combination of FSI metrics, redd surveys, and habitat assessments.

Methods

From August 12 to August 19, 2020, we used backpack electrofishing gear to assess bull trout abundance and distribution in the lower Ram River watershed. Our sample frame for backpack electrofishing included all third- to fifth-order streams. Our eight selected sites were sampled following AEP's standard operating procedure for sampling small streams (Figure 1). On October 5, 2020, we surveyed a 3.5 km reach of Fall Creek, a known bull trout spawning tributary, for bull trout redds. In 2019, we designed and tested a solar-powered underwater video recording system to enumerate adult bull trout exiting Fall Creek for an estimate of spawner to redd ratio. Spawner to redd ratios can be used to estimate adult bull trout abundance in future redd surveys (Howell and Sankovich 2012). From August 26 to October 6, 2020, we operated this system in Fall Creek, using a fence to funnel fish past the underwater camera. We installed three temperature loggers throughout the study area to monitored summer water temperature (hourly) and assess thermal suitability of habitat for bull trout (Figure 1).

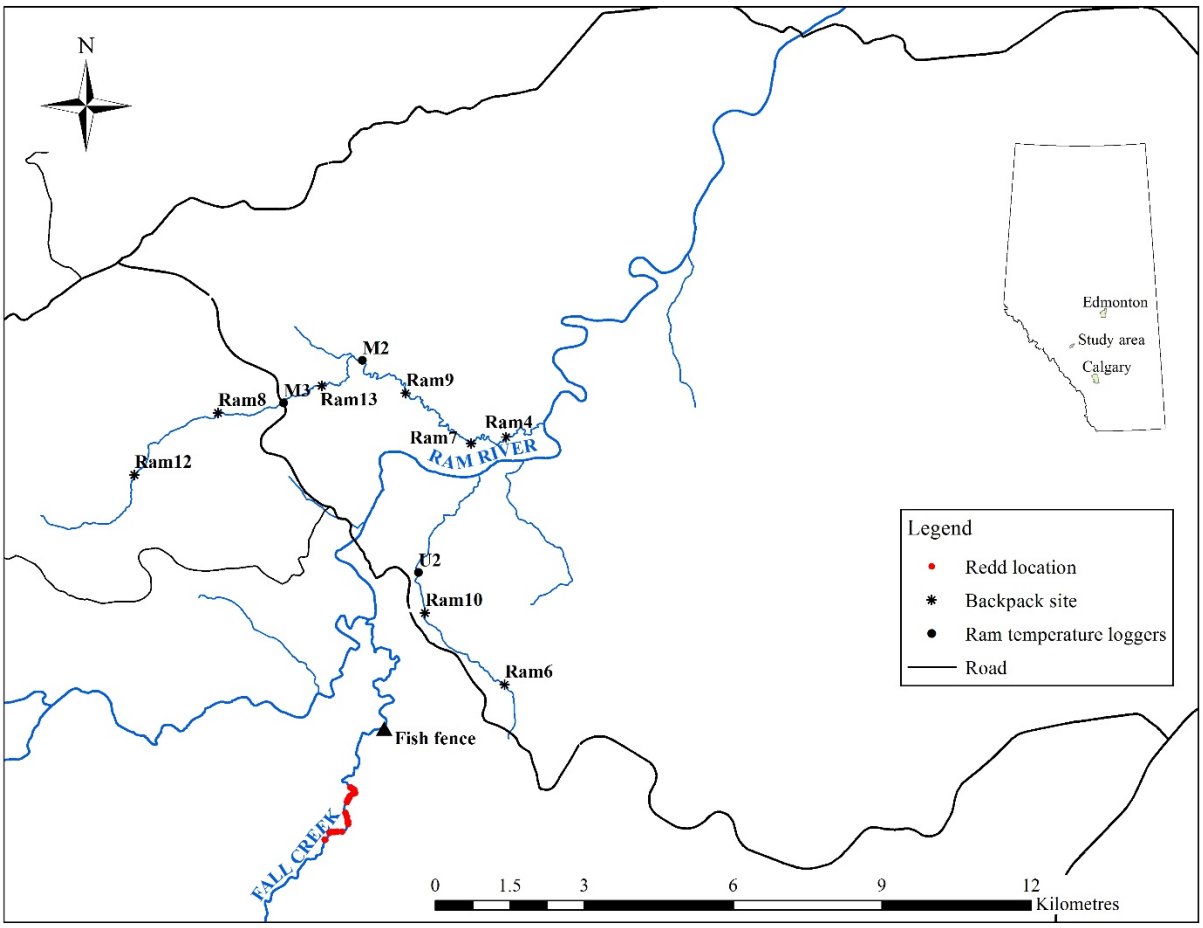

Figure 1. Ram River bull trout assessment project 2020 study area and sample sites.

Results

We backpack-electrofished eight sites resulting in over 10,000 s of electrofishing effort over 2,300 m of stream. Fish were captured at six of the eight sites and included 17 brook trout, 22 bull trout, nine cutthroat trout, 245 longnose dace, 11 longnose sucker, nine mountain sucker, and one mountain whitefish (Table 1). On October 5, we conducted a redd survey on 3.5 km of Fall Creek and counted 66 bull trout redds. This year's redd count is down slightly from the previous year (Figure 2). We obtained over 40 days of footage using an underwater video recording system. We counted 76 adult bull trout migrating downstream past the underwater camera (Figure 3) resulting in a spawner to redd ratio of 1.2. Thermally suitable habitat (i.e., water temperature at or below 15°C, Isaak et al. 2009) was found throughout the study area.

Average water temperature over the summer months is summarized for each logger location in Figure 4.

Table 1. Summary of backpack electrofishing sites (NAD 83, Zone 11) and fish capture by species in the Ram River watershed, August 12 to August 19, 2020. Species codes: BKTR = brook trout, BLTR = bull trout, CTTR = cutthroat trout, LNDC = longnose dace, LNSC = longnose sucker, MNSC = mountain sucker, MNWH = mountain whitefish.

Site ID	Distance (m)	Effort (s)	Species						
			BKTR	BLTR	CTTR	LNDC	LNSC	MNSC	MNWH
Ram 4	300	1881	0	1	3	42	2	0	0
Ram 6	300	1155	0	1	0	0	0	0	0
Ram 7	300	2191	1	1	1	85	4	1	0
Ram 8	200	375	0	0	0	0	0	0	0
Ram 9	300	1529	2	8	4	113	5	8	1
Ram 10	300	1468	0	8	1	0	0	0	0
Ram 12	300	999	0	0	0	0	0	0	0
Ram 13	300	1242	14	3	0	5	0	0	0

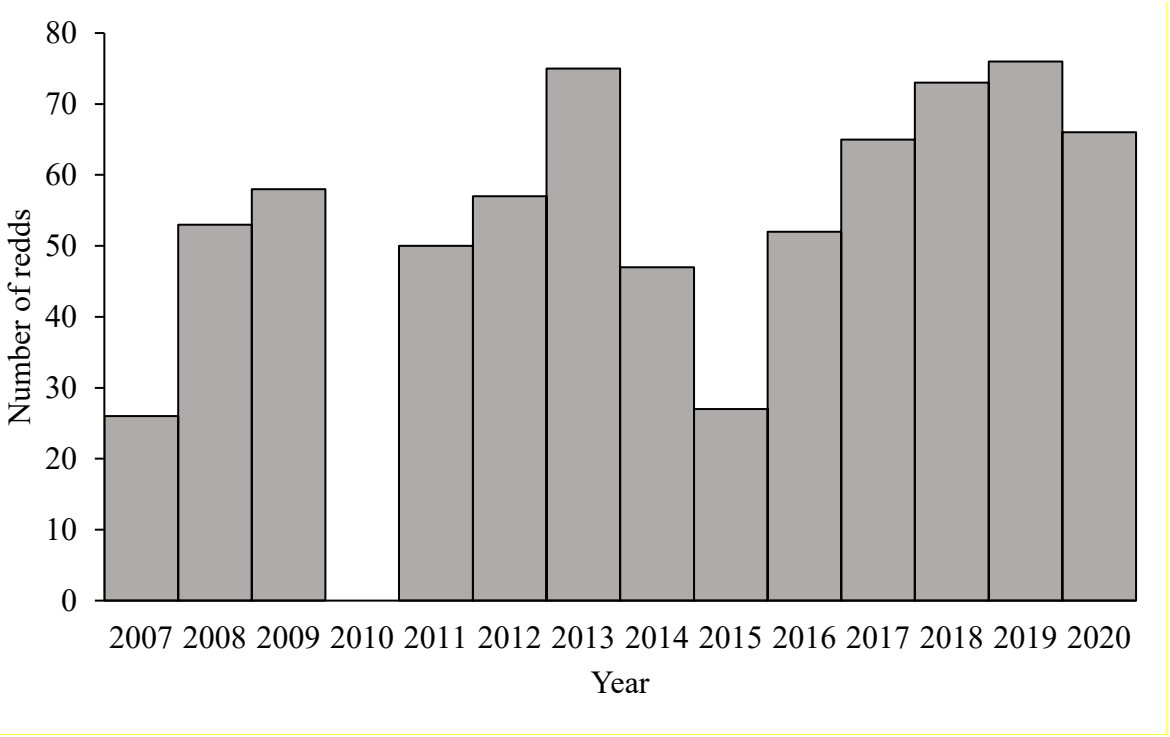

Figure 2. Survey counts by year of bull trout redds observed along Fall Creek in a 3.5 km reach below the falls, 2007 – 2020 (note: a redd survey was not conducted on Fall Creek in 2010).

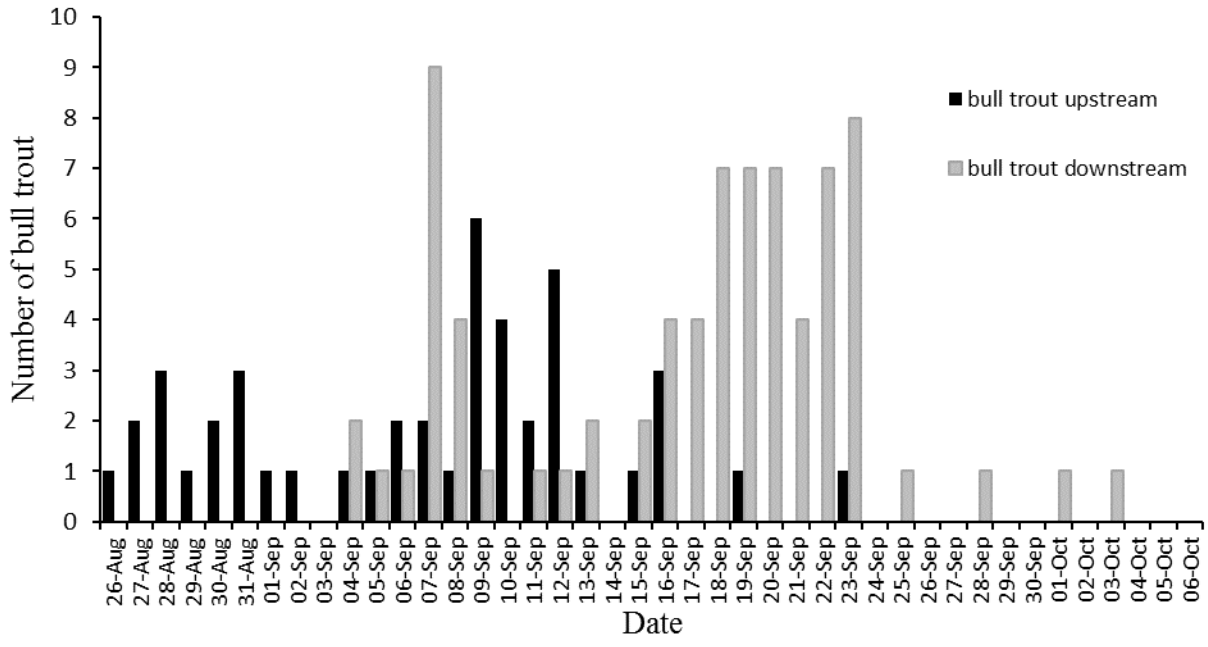

Figure 3. Daily count of bull trout migration past the underwater camera at the fish fence on Fall Creek, August 26 to October 6, 2020.

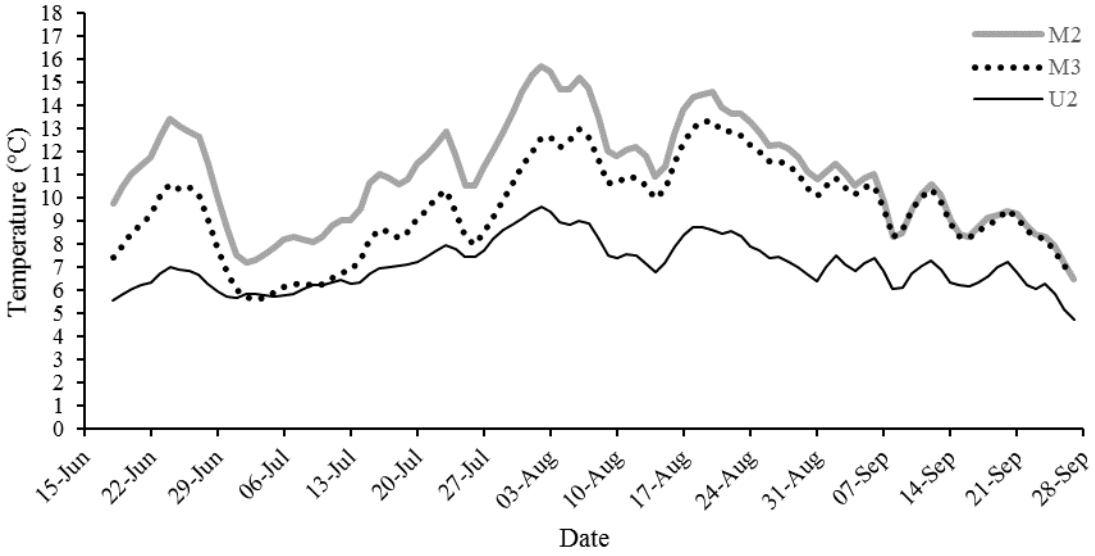

Figure 4. Two-day moving average water temperature at three locations in the Ram River watershed from June – September 2020.

Conclusions

Bull trout were the most widely distributed species detected while electrofishing in the Ram River watershed. Redd counts were down slightly from the previous year. We counted 76 bull trout migrating downstream past our underwater camera resulting in a spawner to redd ratio of 1.2. We will continue to monitor the bull trout population next year, repeating the same backpack sites, conducting redd surveys on Fall Creek, and recording underwater video of the spawning migration. Our study provides managers with information on fish species distribution and abundance that can be used to evaluate land-use impacts on fish in general, and bull trout response to recovery actions.

Communications

- Submitted data to AEP for inclusion in its Fisheries and Wildlife Management Information System database.

Literature Cited

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.

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Howell, P. J., & Sankovich, P. M. (2012). An evaluation of redd counts as a measure of bull trout population size and trend. *North American Journal of Fisheries Management*, 32(1), 1-13.

Isaak, D., B.E. Rieman, and D. Horan. 2009. A watershed-scale monitoring protocol for bull trout. General Technical Report RMRS-GTR-224, Fort Collins, Colorado, USA, Department of Agriculture, Forest Service, Rocky Mountain Research Station. 25 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 staff constructing the fish fence on Fall Creek.Photo: Chad Judd

Adult bull trout travelling upstream past the underwater camera in Fall Creek. Photo: Alberta Conservation Association