

Alberta Conservation Association
2021/22 Project Summary Report

Project Name: Ram River Bull Trout Assessment

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Project Leader: Chad Judd

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Partnerships

Alberta Environment and Parks

Fisheries and Oceans Canada (DFO) through the Canada Nature Fund

Sundre Forest Products – A Division of West Fraser Mills Ltd.

Key Findings

- We detected fish at five of the 12 sites we sampled in the lower Ram River watershed, comprising five different fish species. Bull trout were only captured at one site.
- The annual Fall Creek redd count was lower than previous years with 42 bull trout redds being counted in the 3.5 km section of creek.
- We counted 54 bull trout migrating downstream past our underwater camera system resulting in 1.3 spawners per redd.

Abstract

Bull trout is a native sport fish species classed as *Threatened* in Alberta and is particularly sensitive to habitat change. A government-led initiative, the Native Trout Recovery Program, was implemented in 2017 to recover native trout throughout the Eastern 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 2021, 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 12 selected sites, where we detected fish at five of the 12 sites, catching five different species. We captured 14 bull trout electrofishing, all at a single site. Fall Creek remains an important spawning tributary in the Ram River watershed. We counted 42 bull trout redds on a survey of a 3.5 km reach of Fall Creek. We continued to use our 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 54 bull trout moving downstream past the camera; this equated to 1.3 spawners per redd, 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 Native Trout Recovery Program (formerly the North-Central Native Trout Program) was implemented in 2017 to recover native trout throughout the Eastern Slopes of Alberta (GoA 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 July 5 to July 9, 2021, 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 12 selected sites were sampled following AEP's standard operating procedure for sampling small streams (Figure 1) (ASRD 2013). On October 4, 2021, 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, 2021, we operated this system in Fall Creek, using a fence to funnel fish past the underwater camera. We installed six temperature loggers throughout the study area to monitor summer water temperature (hourly) and assess thermal suitability of habitat for bull trout (Figure 1).

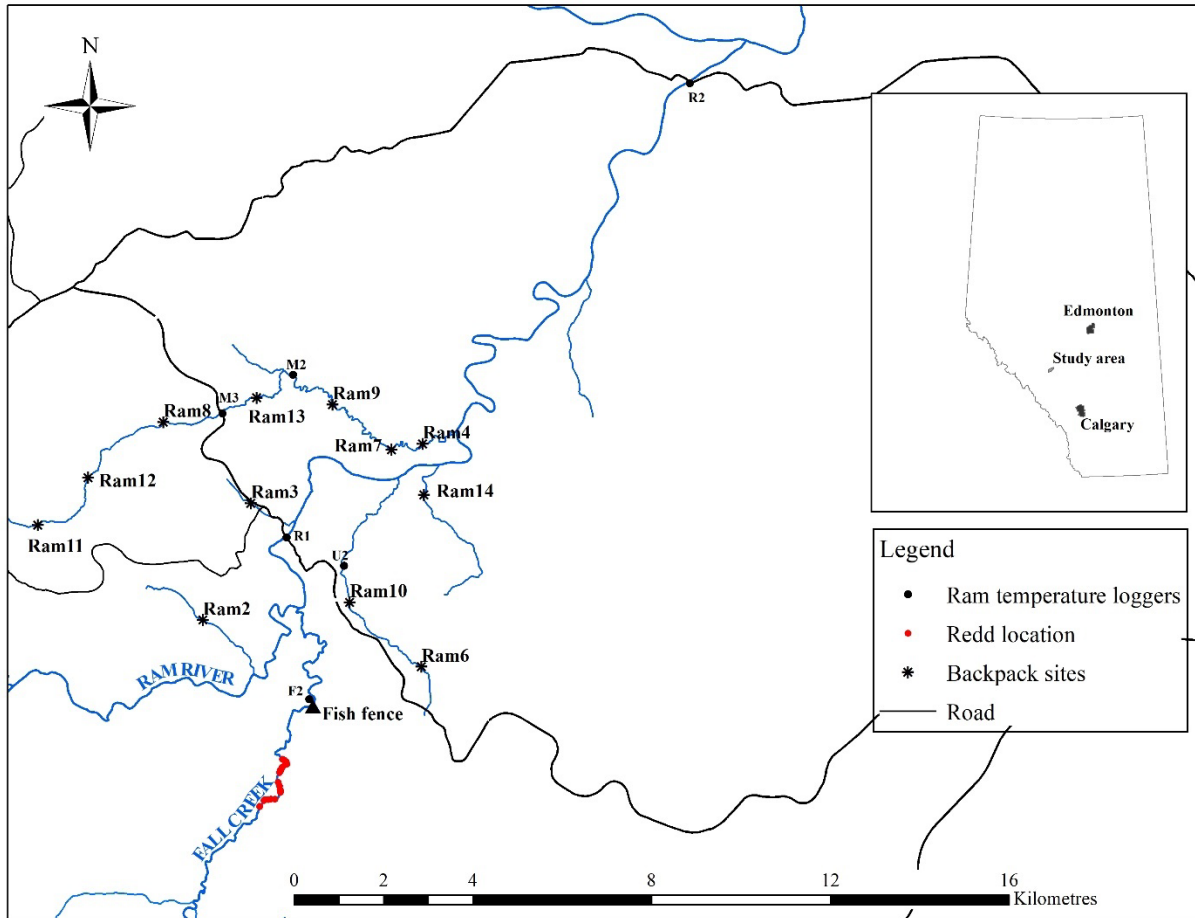


Figure 1. Ram River bull trout assessment project 2021 study area and sample sites.

Results

We backpack-electrofished 12 sites resulting in over 10,000 seconds of electrofishing effort over 3,600 m of stream. Fish were captured at five of the 12 sites and included 15 brook trout, 14 bull trout, 117 longnose dace, seven longnose sucker, and four mountain sucker (Table 1).

On October 4, we conducted a redd survey on 3.5 km of Fall Creek and counted 42 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 54 adult bull trout migrating downstream past the underwater camera (Figure 3) resulting in a spawner to redd ratio of 1:13. Thermally suitable habitat (i.e., water temperature at or below 15°C; Isaak et al. 2009) was found at three locations within the study area (Figure 4).

Table 1. Summary of backpack electrofishing sites (NAD 83, Zone 11) and fish capture by species in the Ram River watershed, July 5 to July 9, 2021.

Site	Distance (m)	Effort (s)	Species				
			BKTR	BLTR	LNDC	LNSC	MNSC
Ram2	300	474	0	0	0	0	0
Ram3	300	667	0	0	0	0	0
Ram4	300	720	0	0	20	2	0
Ram6	300	1,240	0	0	0	0	0
Ram7	300	1,150	1	0	47	1	0
Ram8	300	754	0	0	0	0	0
Ram9	300	857	2	0	43	4	4
Ram10	300	1,826	0	14	0	0	0
Ram11	300	680	0	0	0	0	0
Ram12	300	771	0	0	0	0	0
Ram13	300	929	12	0	7	0	0
Ram14	300	594	0	0	0	0	0

Species codes: BKTR = brook trout, BLTR = bull trout, LNDC = longnose dace, LNSC = longnose sucker, MNSC = mountain sucker.

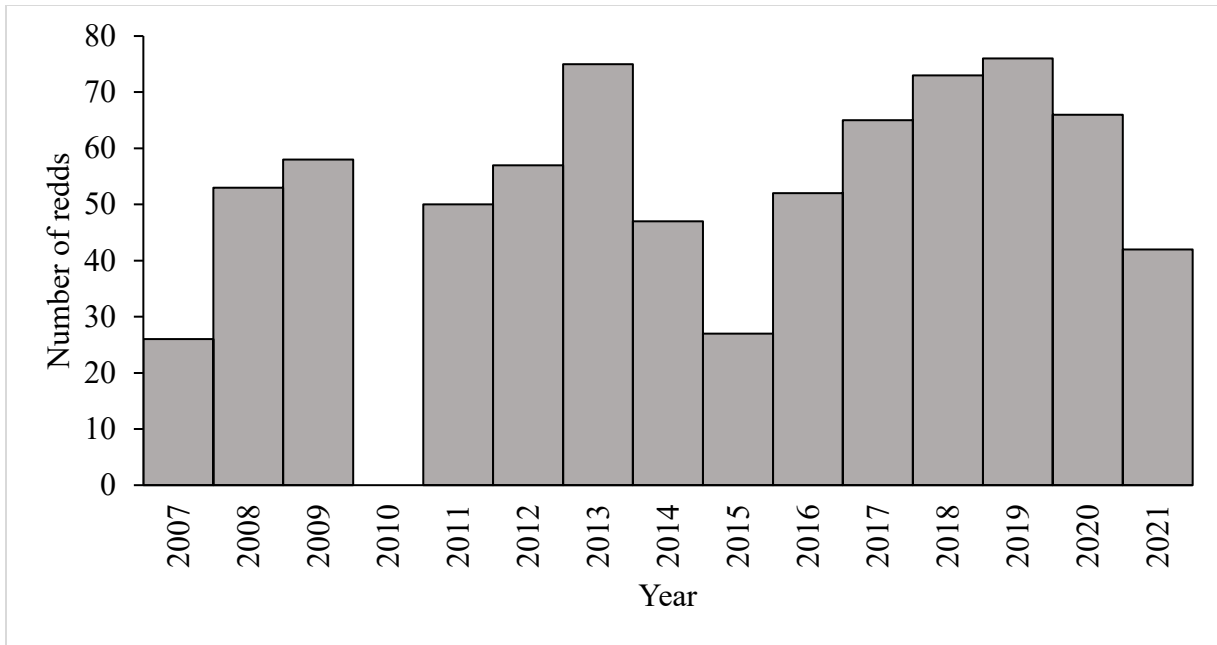


Figure 2. Survey counts by year of bull trout redds observed along Fall Creek in a 3.5 km reach below the falls, 2007 – 2021 (note: a redd survey was not conducted on Fall Creek in 2010).

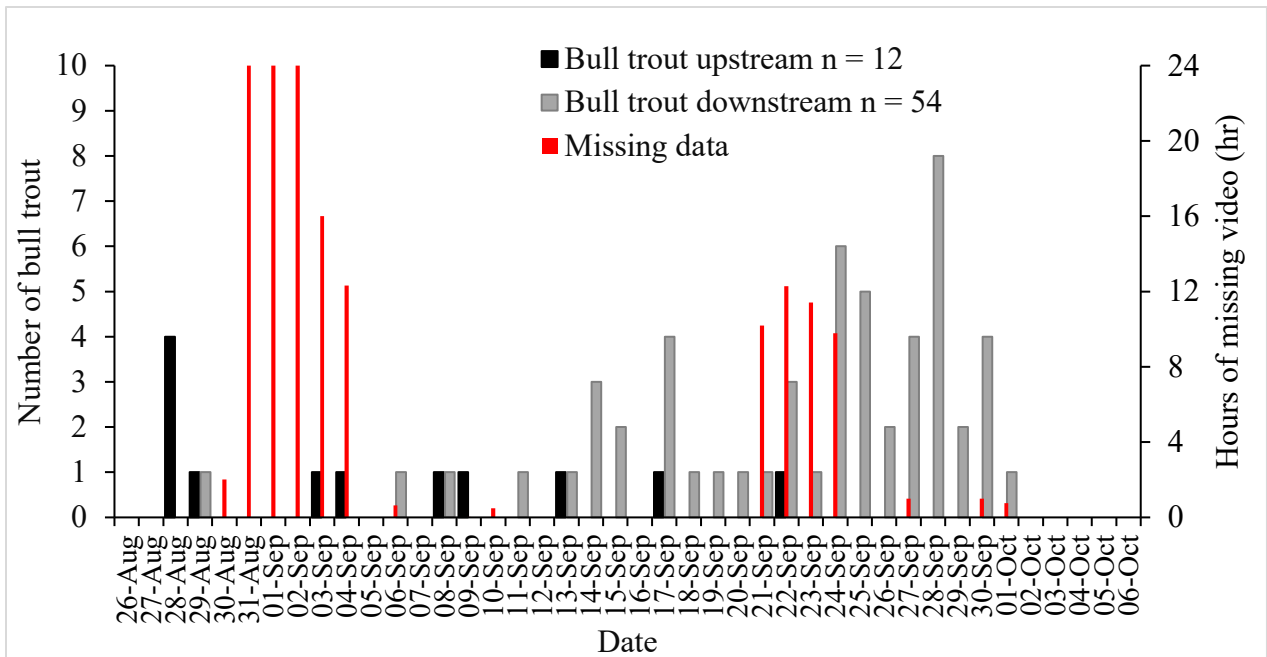


Figure 3. Daily count of bull trout migration past the underwater camera at the fish fence on Fall Creek, August 26 to October 6, 2021.

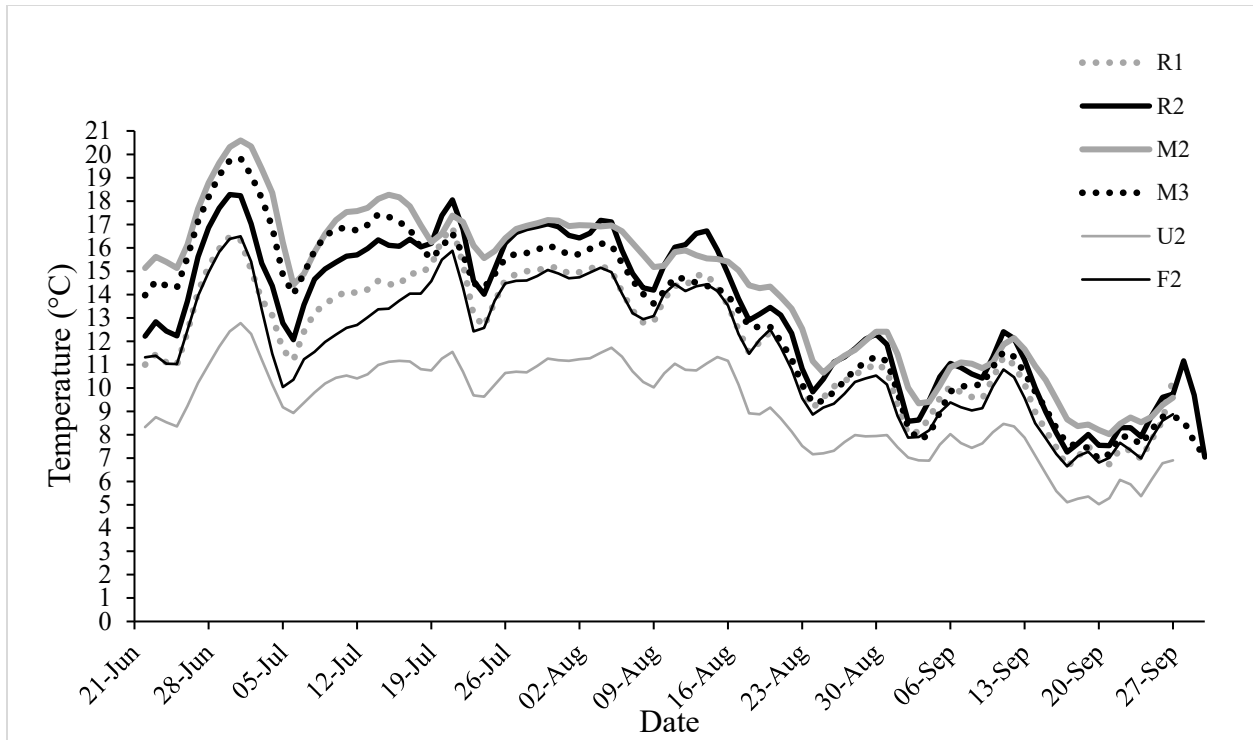


Figure 4. Two-day moving average water temperature at six locations in the Ram River watershed from June – September 2021.

Conclusions

Bull trout were only detected at one site while electrofishing in the Ram River watershed. Redd counts were down again from the previous year with a count of 42. We counted 54 bull trout migrating downstream past our underwater camera resulting in a spawner to redd ratio of 1:13. We will continue to monitor the bull trout population 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.
- Conducted an interview with Let's GO Outdoors
<https://www.youtube.com/watch?v=aUL7QrvQ0tM&t=1s>

Literature Cited

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Howell, P.J. and P.M. Sankovich. 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, CO: U.S. 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



Photo 1. ACA staff (Mike Rodtka and Dakota Sullivan) electrofishing a tributary in the Ram River watershed. Photo: Zachary Spence



Photo 2. Adult bull trout travelling downstream past the underwater camera in Fall Creek. Photo: ACA