

Alberta Conservation Association 2013/14 Project Summary Report

Project Name: Distribution and Abundance of the Migratory Bull Trout Population in the Castle River Drainage

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Partnerships

Alberta Environment and Sustainable Resource Development
Alberta Stream Watch Conservation Coalition
Devon Canada Corporation
Shell Canada Energy

Key Findings

- Reduced bull trout catch and redd counts resulted from unseasonable high flows, which caused trap failure and streambed scouring.
- Captured 81 adult migratory bull trout in fish traps in 2013: 21 in South Castle River, 39 in Carbondale River and 21 in Mill Creek.
- Recaptured 42 fish in 2013: 9 (43% recapture rate) in South Castle River, 24 (62% recapture rate) in Carbondale River and 9 (45% recapture rate) in Mill Creek.
- Surveyed a total of 60 stream kilometres in the Castle River drainage and observed 112 redds: 10 in South Castle River, 11 in West Castle River, 52 in Mill Creek and 39 in Carbondale River drainage.

Introduction

Alberta's bull trout (*Salvelinus confluentus*) population and distribution have been significantly reduced due to habitat fragmentation and degradation, migration barriers, introduction of non-native fish species and overharvest (Alberta Sustainable Resource Development and Alberta Conservation Association 2009). In southwestern Alberta, bull trout distribution has been reduced to approximately 31% of its historical range. Current populations, all of which are *At Risk* of extirpation, exist only in headwater streams. The abundance and distribution of these remnant populations is unclear. Current industrial, recreational and agricultural land-use activities in the Castle River drainage continue to impact bull trout streams and ultimately pose threats to their habitat and survival. Alberta Conservation Association is conducting a multi-year bull trout population and spawning habitat assessment in the Castle River drainage to update the status of these remnant populations. Specifically, we will determine abundance of the migratory

bull trout population and the distribution of spawning habitat throughout the Castle River drainage. This study will also provide baseline data to assess potential land-use impacts on the Castle River drainage. This report summarizes our results from year three of the study and compares these results with those from previous study years (2011 and 2012).

Methods

In the fall of 2013, we installed four directional conduit fish traps to capture post-spawn migratory bull trout. Traps were placed in three major bull trout spawning streams in the Castle River drainage: South Castle River, Carbondale River and Mill Creek (upper and lower reaches) (Figure 1). We did not survey the West Castle River in 2013 because our catch in previous years was low. We marked adult fish (≥ 300 mm fork length) with passive integrated transponder (PIT) tags to identify individuals during recapture events. We conducted redd counts in all bull trout spawning streams to determine the distribution of spawning habitat throughout the Castle River drainage. In conjunction with our redd count surveys, we sample angled to tag additional adult bull trout in each spawning stream. We also increased the number of marked fish during previous fisheries studies throughout the Castle, Crowsnest and Upper Oldman watersheds (Blackburn 2010, 2011; Hurkett et al. 2011).

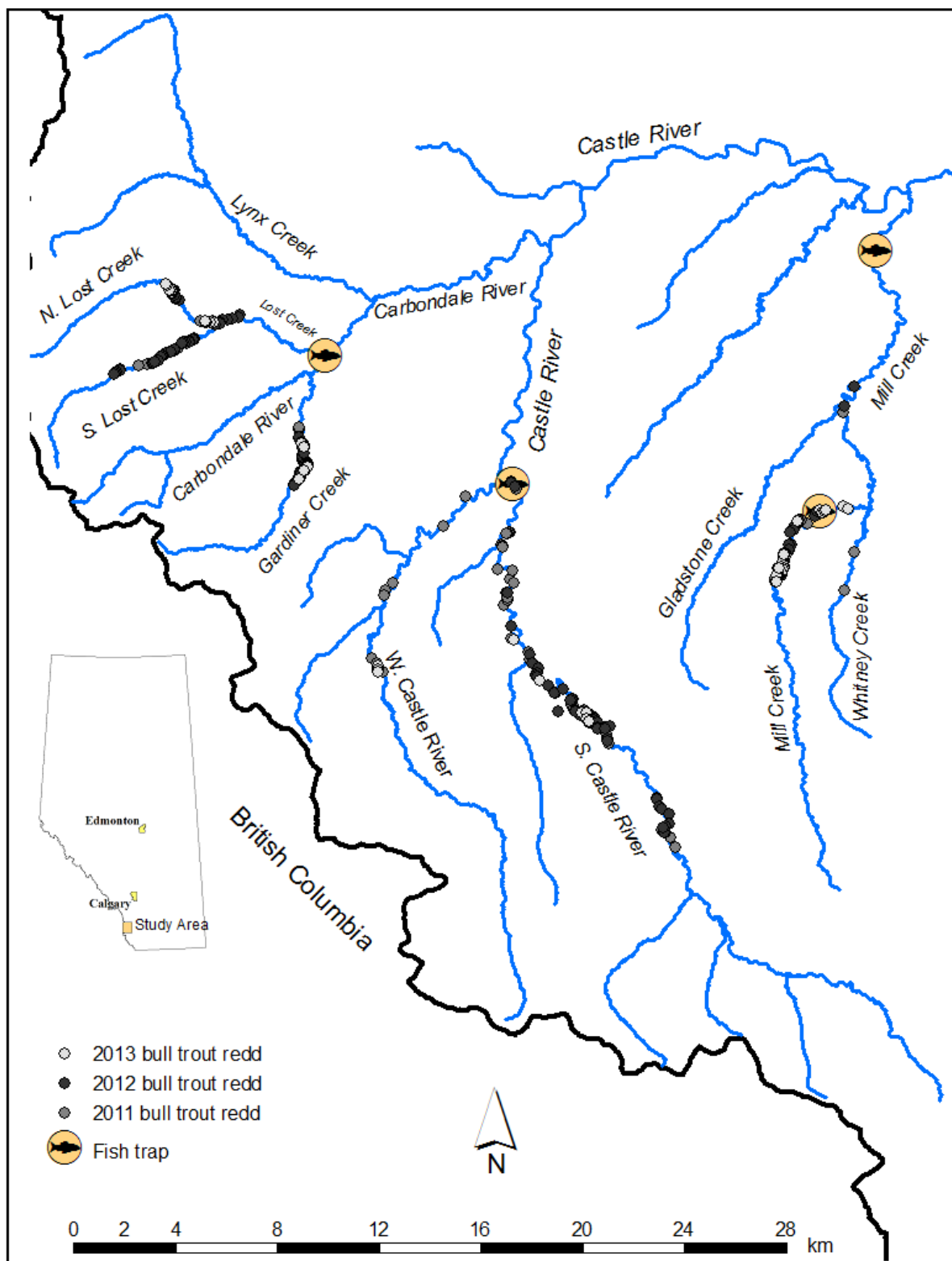


Figure 1. Bull trout redd and fish trap locations in the Castle River drainage, 2013.

Results

In 2013, unseasonably high stream flows resulted in trap failure at study sites during the peak bull trout migration period (September 29 to October 8). As a result, only 81 adult bull trout were intercepted by all traps: 39 from Carbondale River, 21 from South Castle River and 21 from the two traps in Mill Creek, all of which were significantly lower than previous study years.

We captured 17 bull trout by angling in several streams throughout the study area. Bull trout recapture rates were relatively high, ranging between 43% and 62%, because most recaptured fish were marked in the same stream; few recaptured individuals were marked in other streams (Table 1). We surveyed a total of 60 km of stream throughout the Castle River drainage and observed 112 redds in the same stream reaches surveyed in 2011 and 2012 (Figure 2). High stream flows and associated streambed scouring likely affected redd counts because we observed fewer redds in most streams than in previous years.

Table 1. Mark-recapture location for 42 bull trout in the Castle River drainage, 2013. Sample sizes indicated in parentheses denote the total number of tagged bull trout captured in each waterbody.

Marking location 2011 and 2012	Recapture location (2013)		
	Mill Creek (n = 21)	South Castle River (n = 21)	Carbondale River (n = 39)
Mill Creek	8	0	1
South Castle River	1	9	1
West Castle River	0	0	0
Carbondale River	0	0	21
Castle River (angling)	0	0	1
Recapture rate	42.9%	42.9%	61.5%

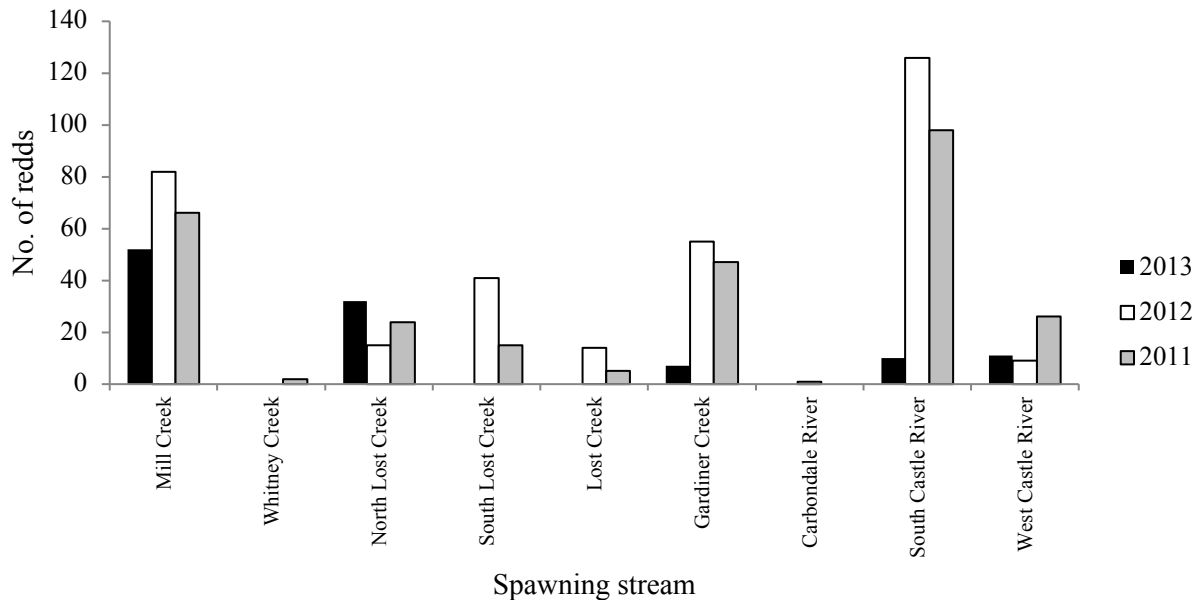


Figure 2. Bull trout redd counts in spawning streams surveyed in the Castle River drainage, 2011 to 2013.

Conclusions

Our study continues to provide a better understanding of the status of remnant bull trout populations in the Castle River drainage. Our mark-recapture data from 2013 have uncovered migratory trends and identified linkages between bull trout subpopulations within the Castle River drainage. Data on fish abundance and redd distribution have helped identify the relative importance of each bull trout spawning stream and its respective subpopulation. Our comprehensive redd surveys have allowed us to document most of the current spawning grounds in the drainage, which should aid management and conservation of the species.

Communications

- Interviewed by Michael Short for the television and radio program *Let's Go Outdoors*; this interview and associated video footage of our study and field activities will be broadcast in spring 2014.
- Demonstrated bull trout tagging and trapping procedures to the public.

Literature Cited

Alberta Sustainable Resource Development and Alberta Conservation Association. 2009. Status of the bull trout (*Salvelinus confluentus*) in Alberta, update 2009. Alberta Sustainable Resource Development, Wildlife Status Report No. 39 (Update 2009), Edmonton, Alberta, Canada. 48 pp.

Blackburn, J. 2010. Abundance and distribution of Westslope cutthroat trout in the Castle River drainage, Alberta, 2008 – 2009. Technical Report, T-2010-002, produced by Alberta Conservation Association, Lethbridge, Alberta, Canada. 39 pp + App.

Blackburn, J. 2011. Crowsnest River drainage sport fish population assessment, 2010. Technical Report, T-2011-001, produced by Alberta Conservation Association, Lethbridge, Alberta, Canada. 27 pp + App.

Hurkett, B., J. Blackburn, and T. Council. 2011. Abundance and distribution of migratory bull trout in the upper Oldman River drainage, 2007 – 2010. Technical Report, T-2011-002, produced by Alberta Conservation Association, Lethbridge, Alberta, Canada. 34 pp + App.

Photo Captions



Alberta Conservation Association staff member Andy Murphy holding an adult migratory bull trout captured in the lower Mill Creek fish trap in 2013. Photo: Brad Hurkett
[filename: Photo1_Castle BLTR_2013-14_Brad Hurkett.jpg]



Conduit fish trap in the Carbondale River failed because of high stream flows. Photo: Leah Neigum

[filename: Photo2_Castle BLTR_2013-14_Leah Neigum.jpg]



Large bull trout staging in spawning habitat. Photo: Brad Hurkett
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