

Alberta Conservation Association (ACA)

Date: 2014-2015

Project Name: Distribution and Abundance of the Migratory Bull Trout Population in the Castle River Drainage (Year 4 of 4)

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Partnerships

- Alberta Environment and Sustainable Resource Development
- Devon Canada Corporation
- Shell Canada Energy

Key Findings

- As of the final year of study, 493 bull trout captured and marked in the Castle River drainage between 2011 and 2014.
- Captured 191 adult migratory bull trout in fish traps in 2014: 73 in South Castle River, 89 in Carbondale River and 29 in Mill Creek.
- Recaptured 74 fish in 2014: 28 (38% recapture rate) in South Castle River, 35 (39% recapture rate) in Carbondale River and 11 (38% recapture rate) in Mill Creek.
- Surveyed 68 stream kilometres repeatedly in the Castle River drainage and observed 211 redds: 48 in South Castle River, 14 in West Castle River, 72 in Mill Creek and 77 in the Carbondale River drainage.

Introduction

The population and distribution of bull trout (*Salvelinus confluentus*) in Alberta 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 impact bull trout and ultimately threaten their habitats and survival. We have completed a multi-year bull trout population and spawning habitat assessment in the Castle River drainage to update the status of these remnant populations. Specifically, using mark-recapture and spawning survey data, we have estimated the

relative abundance of the migratory bull trout population and documented the distribution of spawning habitat throughout the Castle River drainage. Our study provides managers with baseline data to assess potential land-use impacts on the Castle River drainage's migratory bull trout. This report summarizes our results from 2014 and compares these results to previous study years (2011, 2012 and 2013).

Methods

In fall 2014, we installed four directional conduit fish traps to capture post-spawn migratory bull trout. Traps were set in three major 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 2014 because our catch in previous years was low. We marked adult fish (≥ 300 mm fork length; FL) with passive integrated transponder (PIT) tags to identify individuals during recapture events. We conducted redd counts in all bull trout spawning streams to document spawning habitat use 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. Our results include fish marked during previous studies throughout the Castle, Crowsnest and upper Oldman watersheds (Blackburn 2011; Hurkett et al. 2011; Blackburn 2010).

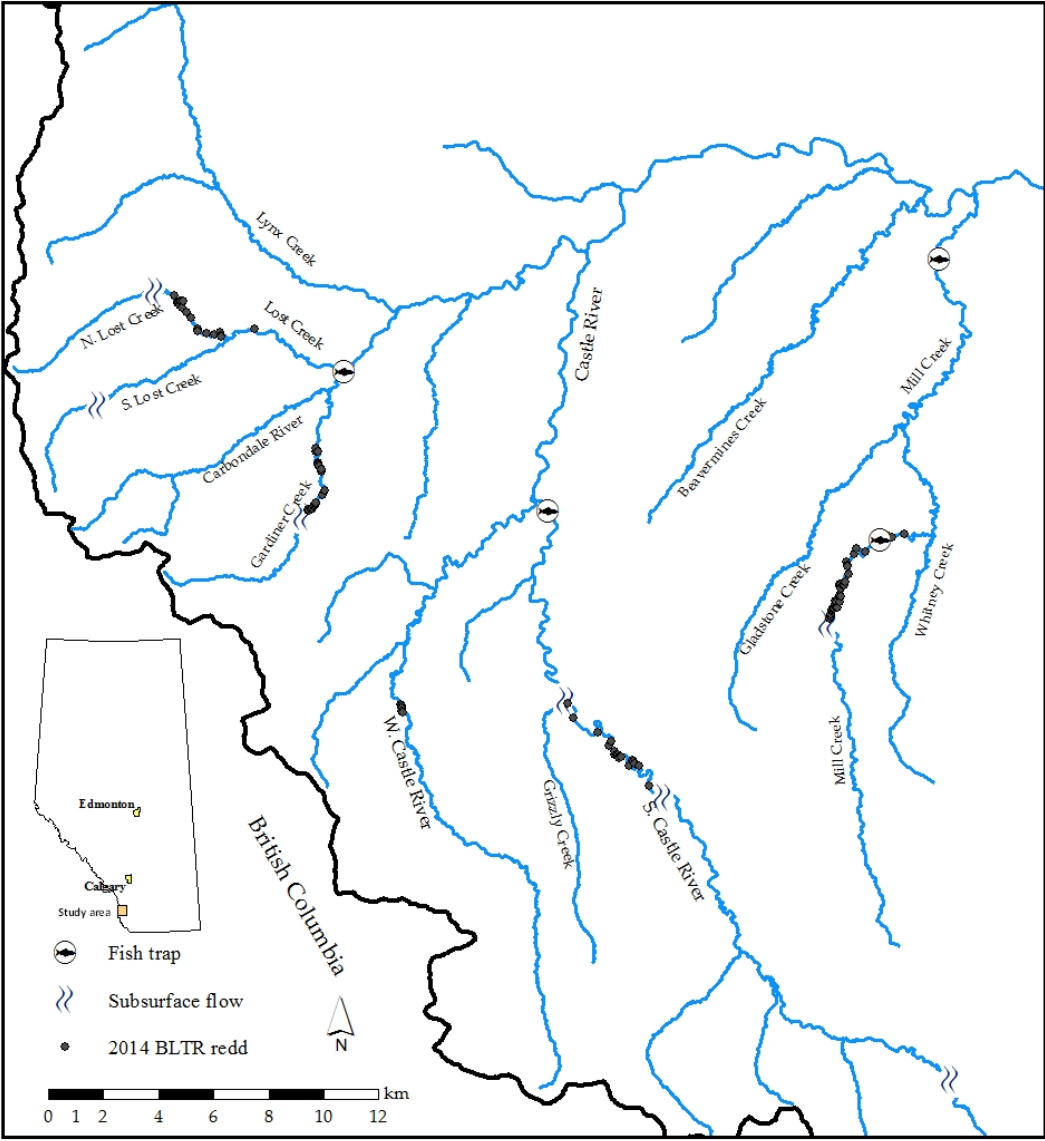


Figure 1. Bull trout redd and fish trap locations in the Castle River drainage, 2014.

Results

In total, we captured 191 adult bull trout in 2014: 73 from South Castle River, 29 from Mill Creek and 89 from Carbondale River. Recapture rates varied slightly between streams, ranging between 37.8% and 39.3% (Table 1). We caught four adult migratory bull trout during angling, one in South Castle River and three in Mill Creek. We surveyed 68 km in spawning reaches identified in previous years and detected 197 redds in major tributaries throughout the drainage (Figure 1). Our 2014 catch was remarkably higher than our 2013 catch at all locations; the Carbondale River trap had the highest catch during the study (Figure 2).

Table 1. Mark-recapture location of 74 bull trout in the Castle River drainage, 2014. Sample sizes indicated in parentheses denote the total number of tagged bull trout captured in each waterbody.

Marking location (2008 – 2013)	Recapture location (2014)		
	South Castle River (n = 73)	Mill Creek (n = 29)	Carbondale River (n = 89)
South Castle River	23	–	–
Mill Creek	1	9	1
Carbondale River	1	–	31
West Castle River	–	–	–
Oldman River	1	–	–
Crowsnest River	2	–	2
Castle River	–	2	–
Lost Creek	–	–	1
Recapture rate (%)	37.8%	37.9%	39.3%

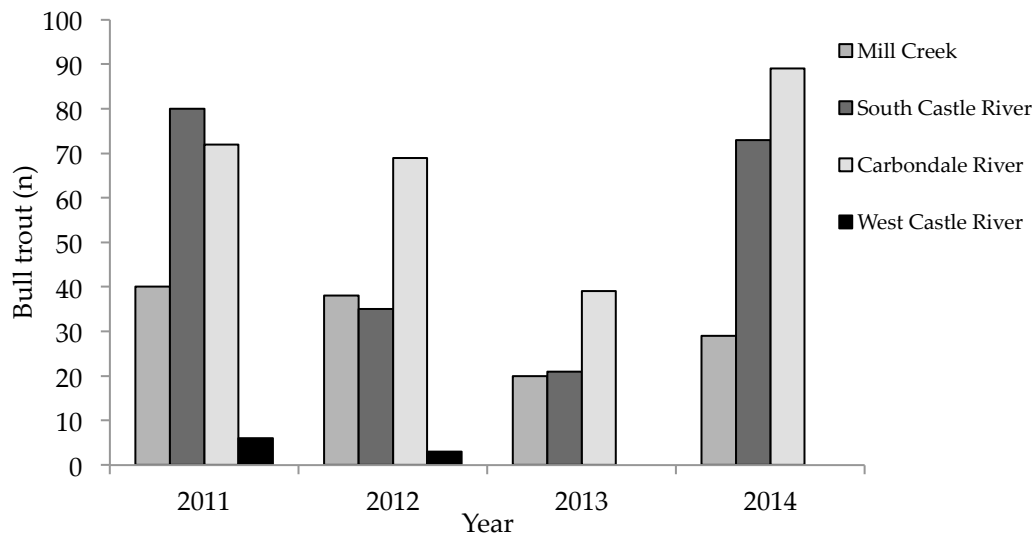


Figure 2. Bull trout catch at traps located in four major spawning streams in the Castle River drainage, 2011 to 2014. The West Castle trap was not installed in 2013 and 2014.

Conclusions

We concluded our final year of the bull trout population and spawning habitat assessment study. Data collected since 2011 has provided resource managers with valuable baseline information about the migratory bull trout population in the Castle River drainage. Fish mark-recapture data has enabled us to estimate the relative abundance and identify the migratory behaviour of subpopulations in the Castle River, Crowsnest River and upper Oldman River drainages. Our spawning surveys have identified most spawning reaches in major tributaries in the Castle River

drainage. Data collected from this study will be used to manage the Oldman watershed bull trout population.

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 were broadcast in spring 2014.
- Provided bull trout tagging and trapping demonstrations to 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. 2011. Crowsnest River drainage sport fish population assessment, 2010. Technical Report, T-2011-001, produced by the Alberta Conservation Association, Lethbridge, Alberta, Canada. 27 pp + App.

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 the Alberta Conservation Association, Lethbridge, Alberta, Canada. 39 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 the Alberta Conservation Association, Lethbridge, Alberta, Canada. 34 pp + App.

Photos



Looking downstream at the South Castle fish trap. Photo: Logan Redman



Driving vehicles in streams (clean parallel lines in stream gravel) causes serious harm to the aquatic environment, especially fish redds; this practice is illegal. Photo: Brad Hurkett



Bull trout pair actively spawning in Mill Creek. Photo: Brad Hurkett