

Alberta Conservation Association 2011/12 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 Sustainable Resource Development
Devon Energy Canada

Key Findings

- Captured a total of 197 adult migratory bull trout in our fish traps in 2011; 79 in the South Castle River, six in the West Castle River, 72 in the Carbondale River, and 40 in Mill Creek.
- Since 2008, tagged a total of 275 adult bull trout throughout the Castle River drainage using electrofishing, angling and trapping capture techniques.
- Recaptured two bull trout in the Carbondale River that we originally captured and tagged outside of the Castle River drainage; one fish was tagged in the lower Crowsnest River (2010) and the second fish was tagged in the Oldman River (2008).
- Surveyed a total of 110 stream kilometres in bull trout spawning streams throughout the Castle River drainage and observed a total of 283 redds; 98 redds in the South Castle River, 26 redds in the West Castle River, 68 redds in the Mill Creek drainage and 91 redds in the Carbondale River drainage.

Introduction

Bull trout (*Salvelinus confluentus*) abundance and distribution have been significantly reduced in Alberta due to habitat fragmentation and degradation, migration barriers, introduction of non-native fish species and overharvest (Alberta Sustainable Resource Development [ASRD] and Alberta Conservation Association [ACA] 2009). The distribution of bull trout in southwestern Alberta drainages, in particular, has declined to an estimated 31% of their natural range (Fitch 1997). Forestry, gas extraction, off-highway vehicle use, random-access camping and livestock grazing are all land-use activities in the Castle River drainage that continue to impact areas adjacent to bull trout streams, and ultimately pose threats to bull trout habitat and survival. ACA is conducting a multi-year bull trout population and spawning habitat assessment in the Castle River drainage to update the status of the species. 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 for assessing potential impacts of the proposed clear-cut timber harvesting in the Castle River drainage. This summary highlights results from the first year of the study.

Methods

In the fall of 2011, we installed directional conduit fish traps to capture post-spawn migratory bull trout in four major spawning streams in the Castle River drainage: South Castle River, West Castle River, Carbondale River and Mill Creek. We marked each adult fish (≥ 300 mm) with a passive internal transponder (PIT) tag for the purpose of identifying marked fish during recapture events. We began tagging efforts in the Castle River drainage at electrofishing sites included in Blackburn's (2010) Castle River cutthroat population stock assessment; tagging events also occurred at electrofishing sites along the lower Crowsnest River as part of the Crowsnest River drainage sport fish population assessment (Blackburn 2011). We conducted redd surveys in all bull trout spawning streams to determine the distribution of spawning habitat throughout the Castle River drainage. In conjunction with our redd surveys, we conducted sample angling to tag additional adult bull trout in each bull trout spawning stream. In previous studies, we conducted angling efforts to capture and tag adult bull trout in the Oldman River drainage (Hurkett et al. 2010).

Results

In 2011, we captured and tagged a total of 197 adult bull trout in our fish traps: 79 in South Castle River, six in West Castle River, 72 in Carbondale River and 40 in Mill Creek. Based on daily trap catches in all streams, we observed that the bull trout post-spawn run began during the first week of September and ended during the last week of October, with the peak number of fish entering our traps during the last week of September. According to our fish length data, all bull trout captured in our fish traps were of migratory size (≥ 300 mm; Figure 1). Fish lengths varied slightly among all four fish traps, but overall we captured higher numbers of larger fish in South Castle and Carbondale rivers (Table 1). In combination with fish marking during our electrofishing and angling efforts, we marked an additional 78 and 15 fish, respectively, in the Castle River drainage. Of these, we recaptured 15 fish in our traps in 2011. In addition, we recaptured two fish in the Carbondale River fish trap that we marked in previous studies; one from the Crowsnest drainage (2010) and one from the upper Oldman River drainage (2008). We conducted redd surveys on 110 stream kilometres in the Castle River drainage and observed a total of 283 redds in bull trout spawning streams; we observed most of these following the peak of the post-spawn run (Figure 2).

Figure 1. Length-frequency distribution of bull trout captured in the Castle River drainage, 2011. Results for West Castle River are not shown because of low catch rates.

Table 1. Size and number of bull trout captured in the Castle River drainage, 2011. Average size is shown \pm standard deviation.

Waterbody	Fork length range (mm)	Average fork length (mm)	n
South Castle River	444 – 808	570.3 \pm 82.6	79
West Castle River	489 – 518	584.7 \pm 65.5	6
Carbondale River	370 – 780	579.4 \pm 89.6	72
Mill Creek	365 – 698	539.7 \pm 83.9	40

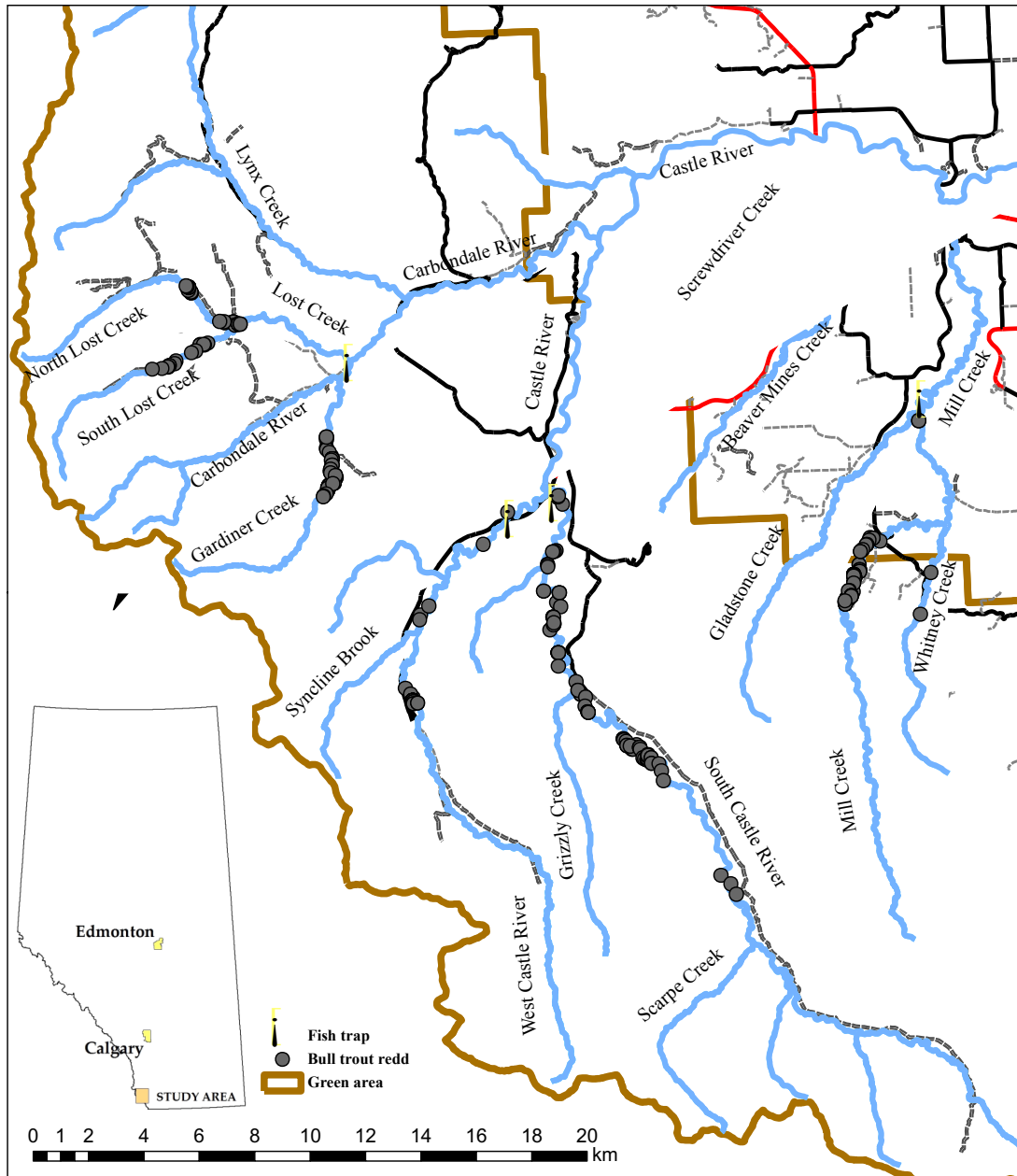


Figure 2. Bull trout redd and fish trap locations in the Castle River drainage, 2011.

Conclusions

Following the completion of year one of our study, we have a better understanding of the bull trout population and habitat in the Castle River drainage. Our mark-recapture data have not only defined the relative number of migratory bull trout annually spawning in each tributary, but have also allowed us to begin to understand bull trout movement patterns within and outside of the study area. Our fish abundance and spawning habitat data have permitted us to approximate the timing of spawning in each stream and have allowed us to define the distribution of bull trout spawning habitat in the Castle River drainage. Data collected in 2011 have demonstrated

interconnectedness between bull trout subpopulations in the Castle River drainage, which emphasizes the importance of each spawning stream to the Castle River bull trout population.

Communications

- Presented study objectives and results to stakeholders at the 2011 round table meeting hosted by Blairmore ASRD Fisheries managers.
- Provided Devon Energy Canada employees with a field tour of fish traps and redd surveys.
- Presented project results at the Alberta Chapter of the Wildlife Society meeting, Medicine Hat, Alberta, March 2012.

Literature Cited

- Alberta Sustainable Resource Development and Alberta Conservation Association. 2009. Status of the bull trout (*Salvelinus confluentus*) in Alberta, Update 2009. Wildlife Status Report No. 39 (Update 2009), produced by Alberta Sustainable Resource Development, 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 the Alberta Conservation Association, Lethbridge, Alberta, Canada. 39 pp + App.
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- Fitch, L.A. 1997. Bull trout in southwestern Alberta: notes on historical and current distribution. Pages 147–160. *In*: W.C. Mackay, M.K. Brewin, and M. Monita, editors. Friends of the bull trout conference proceedings. Trout Unlimited Canada, Calgary, Alberta, Canada.
- 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.



Adult migratory male bull trout captured in the South Castle River fish trap. (Photo: Andrew Clough)



Alberta Conservation Association seasonal staff member, Clint Goodman, holding a female bull trout captured in the South Castle River. (Photo: Andrew Clough)



All-terrain vehicle tracks observed in the stream channel that resulted in the destruction of two bull trout redds in the South Castle River. (Photo: Brad Hurkett)



Redd constructed by female bull trout in Mill Creek. (Photo: Andrew Clough)