

Alberta Conservation Association 2010/11 Project Summary Report

Project Name: *Clearwater Drainage Bull Trout Abundance Assessment*

Fisheries Program Manager: Peter Aku

Project Leader: Mike Rodtka

Primary ACA staff on project:

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Partnerships

Alberta Sustainable Resource Development

Key Findings

- Captured bull trout at 14 of 15 inventory sites that we electrofished in Elk Creek from April 14 – 28, 2010.
- Captured 135 bull trout ranging in size from 59 – 326 mm fork length at inventory sites.
- Estimated abundance of bull trout ≥ 70 mm fork length in Elk Creek to be 1,031 (95% CI = 827 – 1,327).
- Found bull trout density to be greatest 23 km upstream from the mouth of Elk Creek.

Introduction

Alberta Sustainable Resource Development (ASRD), in review of their bull trout (*Salvelinus confluentus*) management plan, has used a modification of the Natural Heritage Network ranking system to rank population trends in core areas. Core area status evaluations include the abundance of adult bull trout in identified subpopulations. The Clearwater core area is ranked as 'high risk' for extirpation with the bull trout population in decline, while the Elk Creek subpopulation (part of the Clearwater core area) has seen an increase at index sites (ASRD and Alberta Conservation Association (ACA) 2009). Threats to the bull trout population in Elk Creek include the introduction of brown trout (*Salmo trutta*) and brook trout (*Salvelinus fontinalis*), habitat degradation from livestock, and numerous road crossings increasing angler access. Our objectives for this study were to estimate the abundance of adult bull trout and describe the spatial distribution and size structure of bull trout in Elk Creek.

Methods

We used a handheld Global Positioning System (GPS) to locate 22 systematically-distributed inventory sites on Elk Creek. Of these, 15 were suitable to conduct backpack electrofishing surveys, while the remaining seven sites were either dry, iced in, or contained too little water (Figure 1). Sampling took place between April 14 – 28, 2010. We conducted capture-mark-

recapture (CMR) abundance estimates at two sites, E16 and E14. Single pass inventory sites were 250 m in length or 50 times the mean wetted-width, whichever was greater; for a total of 3.7 stream kilometres of sampling. We enumerated all captured fish by species, measured their fork length (FL, mm), and returned them to the creek. No data exists on size-at-maturity of bull trout in Elk Creek so we considered adult bull trout to be ≥ 250 mm FL (Rhude and Rhem 1995). We entered electrofishing capture efficiency data and inventory capture data into a spatial model to estimate the abundance of bull trout in Elk Creek following procedures in Fitzsimmons (2008).

Figure 1. Location of electrofishing inventory and mark-recapture sites in Elk Creek, April, 2010.

Results

We captured a total of 135 bull trout at inventory sites ranging in size from 59 – 326 mm (FL); only 4% ($n = 6$) of our bull trout catch was ≥ 250 mm (FL). In addition to bull trout, we captured brook trout, brown trout and mountain whitefish (*Prosopium williamsoni*), as well as bull trout x brook trout hybrids. We captured only one adult bull trout (≥ 250 mm FL) during CMR estimates which precluded calculation of adult abundance estimates or capture efficiencies. We estimated abundance of bull trout ≥ 70 mm (FL) to be 1,031 (95% CI = 827 – 1,327) (Figure 2). We found bull trout in 14 of 15 inventory sites with the greatest density occurring 23 km upstream from the mouth of Elk Creek.

Figure 2. Bull trout abundance estimates per 250 m in Elk Creek made using fish captures at inventory sites corrected with capture efficiencies from mark-recapture techniques. Mean abundance (10,000 model runs) and 95% confidence intervals (dotted lines) are shown.

Conclusions

Based on size-at-maturity data from the Clearwater River, we captured few adult bull trout in Elk Creek. Size-at-maturity data from Elk Creek would enable a better description of adult bull trout abundance in the stream. Bull trout (≥ 70 mm FL) density was greatest near the headwaters, approximately 23 km upstream from the mouth of Elk Creek. Our study provides resource managers with those data required to update the status of Elk Creek's bull trout population.

Communications

- Produced ACA report series data report: Abundance and Distribution of Bull Trout in Elk Creek, Alberta, 2010.
- An oral presentation made to ASRD on project delivery and results.

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. 48 pp.

Fitzsimmons, K. 2008. Assessment of trout abundance and distribution in the Waiparous Creek drainage, Alberta, 2006. Data report, D-2008-011, produced by Alberta Conservation Association, Cochrane Alberta, Canada. 39 pp + App.

Rhude, L.A., and P.J. Rhem. 1995. Bull trout population status, spawning and seasonal movement in the Upper Clearwater drainage, Alberta 1992 and 1993. Alberta Environmental Protection, Natural Resource Service, Fish and Wildlife, Rocky Mountain House, Alberta. 166 pp.

Photos



Alberta Conservation Association staff member, Chad Judd, holding a brown trout caught in Elk Creek. (Photo: Mike Rodtka)



Typical habitat in Elk Creek near inventory site E8. (Photo: Chad Judd)



Alberta Conservation Association electrofishing crew in Elk Creek. Left to right: Ariane Cantin, Chad Judd and Kevin Fitzsimmons. (Photo: Mike Rodtka)