

**Alberta Conservation Association
2008/09 Project Summary Report**

Project name: *North Saskatchewan and Ram Rivers Bull Trout Spawning Stock Assessment*

Fisheries and Aquatic Program Manager: Peter Aku

Project leader: Mike Rodtka

Primary ACA staff on this project:

Kevin Fitzsimmons, Paul Hvenegaard, Chad Judd, Mike Rodtka and Thomas Winter.

Partnerships:

Alberta Streamwatch Conservation Coalition
Alberta Sustainable Resource Development
Forest Resource Improvement Association of Alberta
Shell Canada Energy
Smoky Trout Farm

Key findings

- Fall Creek a key spawning stream for bull trout; it also provides rearing habitat for young-of-the-year and juvenile fish.
- Seventy-five bull trout were captured in the Fall Creek fish trap in 2008, 50 redds (the gravel nest of trout) were observed in the upper reaches of the stream below the falls.
- Approximately 10,000 juvenile bull trout were estimated to inhabit the 7.5 km of Fall Creek below the falls.
- Bull trout implanted with radio-transmitters in Fall Creek were tracked to overwintering locations in the Ram, North Saskatchewan and Clearwater rivers, travelling up to 71.8 stream kilometers.

Abstract

Anglers report catching large, presumably migratory, bull trout (*Salvelinus confluentus*) in Fall Creek, a tributary to the Ram River, but little else was known about the population. The Fall Creek drainage receives substantial recreational and industrial use; these activities have the potential to negatively impact bull trout populations; spawning areas are particularly susceptible. In 2007 we documented the use of Fall Creek by migratory bull trout for spawning; 2008 activities focused on identifying the stream of origin of these fish and the timing and magnitude

of the spawning run using a combination of genetic and telemetry techniques. Electrofishing, trapping and redd surveys allowed us to assess the stream's use by bull trout. Fifty-five and 299 bull trout were captured using angling and electrofishing gear, respectively in 2008. The size distribution of bull trout in the electrofishing catch (41–680 mm FL) suggests Fall Creek is an important stream for spawning and rearing bull trout. We estimated 9,744 juvenile fish (90% confidence limits 1494–23149) inhabited the 7.5 km of stream below the falls. We captured 75 fish trapping, 27 of which were implanted with radio-tags. Spawning activity in Fall Creek was concentrated in the upper reaches of the stream, peaked around the third week in September, and was complete by the first week in October. We identified 50 definite bull trout redds during the 2008 survey. Tagged fish migrated up to 71.8 km to overwintering locations in the Ram, North Saskatchewan and Clearwater rivers. The information we collect over the course of our study (which concludes in 2009) will be available to public and private sector land use planners, conservation groups and the general public, and is critical for the conservation and sound management of the species in the North Saskatchewan River watershed.

The size distribution of bull trout in the electrofishing catch ranged from 41–680 mm FL (Figure 1) indicating Fall Creek is an important stream for spawning and rearing bull trout

Introduction

Anglers report catching large, presumably migratory, bull trout (*Salvelinus confluentus*) in Fall Creek, a tributary to the Ram River, but little else was known about the population. Bull trout, Alberta's provincial fish and a native sport species, have declined significantly in abundance and distribution. The Fall Creek drainage receives substantial recreational and industrial use; these activities have the potential to negatively impact bull trout populations; spawning areas are particularly susceptible. In 2007 we documented the use of Fall Creek by migratory bull trout for spawning; 2008 activities focused on identifying the stream of origin of these fish and the timing and magnitude of the spawning run using a combination of telemetry and genetic techniques. By comparing the genetic profile of bull trout captured in Fall Creek to those captured elsewhere in the North Saskatchewan River watershed we can determine their relatedness.

Methods

We used angling gear to capture bull trout from the Ram, North Saskatchewan and Bighorn rivers, and Fall Creek from April to September 2008, for collection of tissue samples. An adipose fin clip was taken from all bull trout > 199 mm fork length (FL) and sent to the University of British Columbia for genetic analysis. Nine 250-m sites, systematically distributed throughout the lower reaches of Fall Creek, were electrofished in July to assess the distribution and abundance of bull trout in the stream. Electrofishing catch data were used to estimate abundance of juvenile bull trout (i.e. fish 70–300 mm FL) in the 7.5 km of stream below Fall Creek falls, a barrier to upstream fish passage. In addition we operated a conduit fish fence and

box trap near the mouth of Fall Creek (September–October 2008) to capture post-spawn bull trout as they left the stream. Twenty-seven of the 75 bull trout captured in the trap were implanted with coded radio-tags and tracked monthly, October 2008 –February 2009, to overwintering locations within the study area using a helicopter. We also surveyed Fall Creek for bull trout redds (the gravel nest of trout) during the autumn to assess the location and magnitude of spawning activity.

Results

We captured 55 bull trout in nearly 86 hours of angling and obtained tissue samples from the North Saskatchewan (n = 5), Big Horn (n = 2) and Ram (n = 25) rivers, and Fall Creek (n = 23). In addition we captured 299 bull trout in Fall Creek using electrofishing. Bull trout were distributed throughout Fall Creek below the falls but were most abundant in the upper reaches. The size distribution of bull trout in the electrofishing catch ranged from 41–680 mm FL (Figure 1) indicating Fall Creek is an important stream for spawning and rearing bull trout. We estimated 9,744 (90% confidence limits 1494–23149) juvenile bull trout in the stream below the falls. Bull trout spawning activity in Fall Creek was concentrated in the upper reaches of the stream below the falls, peaked around the third week in September, and was essentially complete by the first week in October. We identified 50 definite bull trout redds during the 2008 survey, up from the 40 observed in 2007. Implanted fish travelled up to 71.8 km, migrating rapidly to overwintering locations in the Ram, North Saskatchewan and Clearwater rivers (Figure 2). Fish movements during the winter months were minimal.

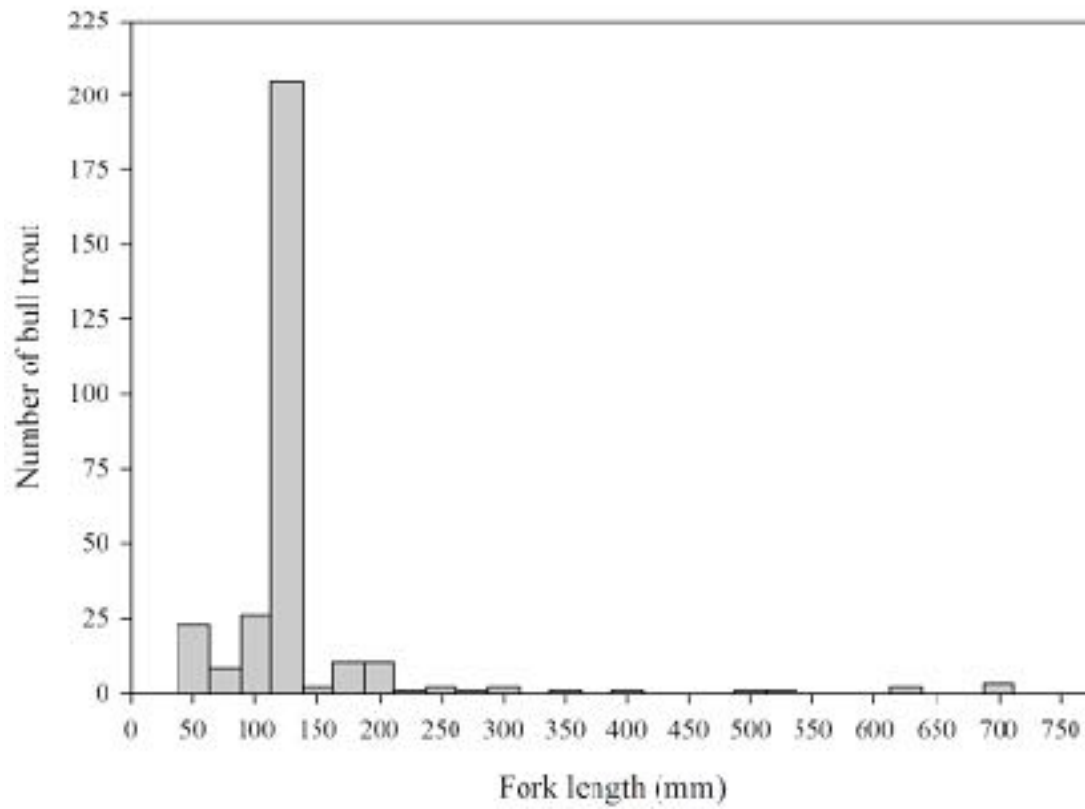


Figure 1. Length-frequency distribution of bull trout captured electrofishing Fall Creek, July 2008.

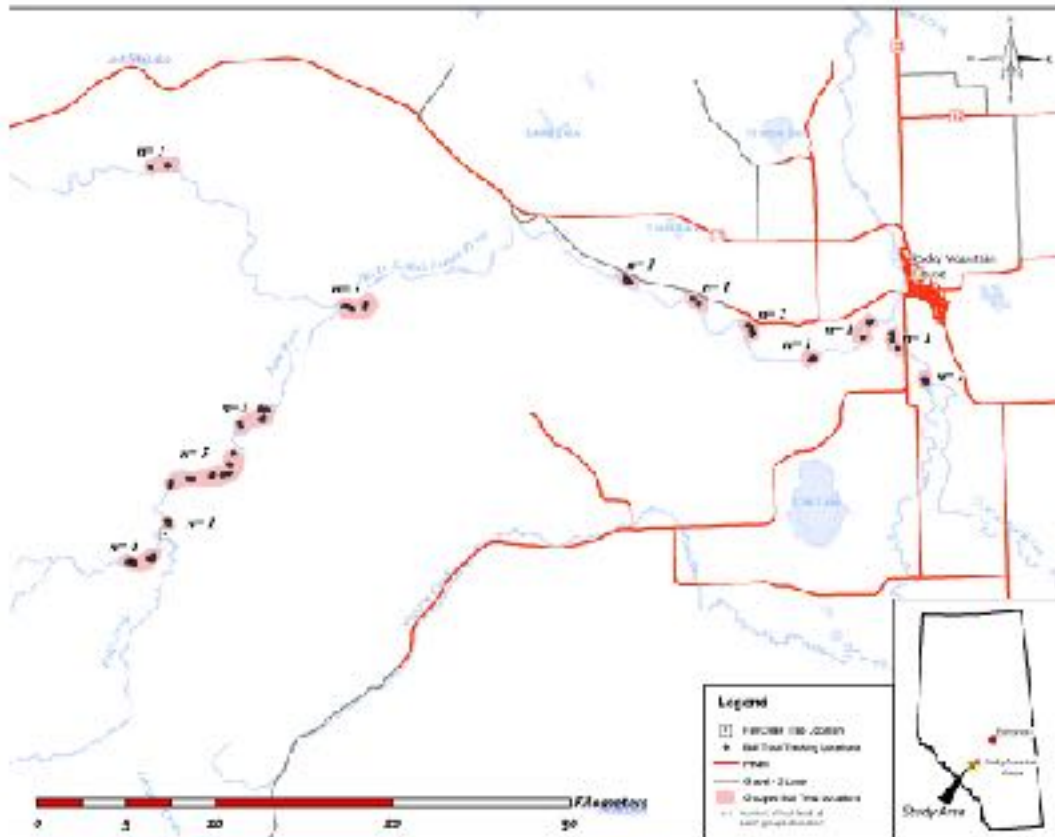


Figure 2. Locations in the Ram, North Saskatchewan and Clearwater rivers where bull trout tagged in Fall Creek have been located (October 2008-February 2009) using radio-telemetry.

Conclusion

Our results underscore the importance of Fall Creek to the maintenance and recovery of bull trout stocks in the Ram, North Saskatchewan and Clearwater rivers. Not only is Fall Creek a key stream for spawning bull trout, but it also provides rearing habitat for young-of-the-year and juvenile fish. None of this information was available prior to our study. The information we collect over the course of our study (which concludes in 2009) will be available to public and private sector land use planners, conservation groups and the general public, and is critical for the conservation and sound management of the species in the North Saskatchewan River watershed.

Communications

- Project summary information was distributed to project partners.
- Staff from Sundre Forest Products and Alberta Sustainable Resource Development were taken on field tours of the study area.

- Staff discussed the project with recreationists encountered in the field over the course of the study.



Alberta Conservation Association staff, Kevin Fitzsimmons and Chad Judd, preparing a bull trout for surgery. (Photo: Robin McDonald)



The conduit fish fence and box trap on Fall Creek. (Photo: Chad Judd)



Alberta Conservation Association staff, Chad Judd, holding a Ram River bull trout. (Photo: Kevin Fitzsimmons)