

**Alberta Conservation Association
2009/10 Project Summary Report**

Project Name: *Upper Oldman Drainage Adult Bull Trout Population Assessment*

Fisheries Program Manager: Peter Aku

Project Leader: Trevor Council

Primary ACA staff on project:

Jason Blackburn, Andrew Clough, Trevor Council, Brad Hurkett and Mike Marquardson

Partnerships

Alberta Sustainable Resource Development
Devon Canada Corporation

Key Findings

- Hidden Creek is an important fluvial Bull Trout spawning stream in the upper Oldman River drainage where at least 72% (200 of 279) tagged adult Bull Trout spawn.
- Hidden Creek is vital to the long-term persistence of Bull Trout in the upper Oldman drainage. Any negative impact to Bull Trout or their habitat in Hidden Creek could result in further decline of the species in the watershed.
- Newly discovered spawning locations in South Racehorse Creek, Dutch Creek and the upper Livingstone River suggest the presence of stream-resident Bull Trout.
- Adult Bull Trout that spawn in Hidden Creek are suspected to travel to the Livingstone River, Oldman River and Racehorse Creek to overwinter. Adult migratory Bull Trout captured at Racehorse Creek and Dutch Creek also are suspected to overwinter in the Livingstone River.

Introduction

Bull Trout (*Salvelinus confluentus*) distribution and abundance has declined throughout Alberta as a result of human activities, such as angling pressure, habitat degradation and fragmentation, migratory barriers, and the introduction of non-native fish species (Brewin and Brewin 1997). The decline is exacerbated by recreational and industrial activity that occurs within the watersheds along the Eastern Slopes of Alberta (Ripley et al. 2005), including the upper Oldman drainage. As a result, Bull Trout currently occupy only 33% of their historical distribution in the Oldman drainage (Fitch 1997). This report summarises three years of an ongoing, four-year Bull Trout population assessment within the upper

Oldman drainage. The primary objective of the study was to estimate the abundance of adult migratory Bull Trout and identify key spawning tributaries in the upper Oldman drainage.

Methods

We intercepted and tagged Bull Trout in key spawning streams within the upper Oldman drainage from August 24 to October 6, 2009. We installed aluminium conduit traps in Hidden Creek, the Livingstone River, Racehorse Creek and Dutch Creek to intercept post-spawn adult migratory Bull Trout (Figure 1). We weighed, measured and assessed the sex of all captured Bull Trout. We injected Bull Trout ≥ 300 mm (fork length, FL) with uniquely identifiable integrated transponder tags enabling us to track fish movements and determine spawning history of recaptured individuals. Supplementary to our fish trap efforts, we conducted redd surveys throughout the drainage to identify the number and location of Bull Trout redds and critical spawning habitats in key spawning tributaries.

Results

Our 2009 catch rates were substantially lower than in 2007 in all traps (Table 1). We intercepted a total of 59 adult Bull Trout in Hidden Creek in 2009, 34 of which (58%) were recaptures from Hidden Creek and/or other spawning streams in previous trapping years (Table 1). We intercepted a total of seven Bull Trout in the Livingstone River, four (57%) of which were recaptures from Hidden Creek and the Oldman River (electrofishing site from 2007). We intercepted a total of eight Bull Trout in the Racehorse Creek fish trap, three of which were recaptures from three different fish traps: Hidden Creek (2008), Racehorse Creek (2008) and the Livingstone River (2008). We captured four adult Bull Trout at Dutch Creek in 2009, two of which were recaptures from Dutch Creek (2008) and Hidden Creek (2007 and 2008).

Table 1. Summary of Bull Trout trapping and redd survey data in the upper Oldman drainage (2007 - 2009). Averages are shown with ± 1 SD.

	Total fish captured	Recaptured fish	Average Fork Length (mm)	Fork Length Range (mm)	Average Weight (g)	Weight Range (g)	Number of Redds
2007							
Hidden Creek	121	0	549 \pm 96.3	266 - 760	1738 \pm 864.2	125 – 4000	-
Electrofishing *	41	1	485 \pm 129.3	278 - 740	1403 \pm 104.7	218 - 4075	-
2008							
Hidden Creek	81	28	559 \pm 92.6	321 - 751	1830 \pm 859.1	328 - 3950	108

Livingstone River	19	12	551 ± 106.7	333 - 680	1657 ± 730.5	350 - 2800	26
Racehorse Creek	15	2	559 ± 82.7	434 - 693	1663 ± 597.5	700 - 2950	0
Dutch Creek	9	0	601 ± 43.4	518 - 670	1970 ± 537.6	1200 - 2750	25
2009							
Hidden Creek	59	33	547 ± 89.4	373 - 778	1653 ± 818.7	400 - 4300	77
Livingstone River	7	3	592 ± 50.5	525 - 671	2071 ± 482.1	1300 - 2600	41
Racehorse Creek	8	3	629 ± 80.6	490 - 758	2575 ± 1183.8	850 - 4900	21
Dutch Creek	4	2	623 ± 50.1	581 - 683	2250 ± 279.1	1600 - 2850	69
Combined	364	84					367

* Electrofishing from the upper Oldman drainage Cutthroat Trout population assessment (2007) was used to capture and tag Bull Trout throughout the upper Oldman drainage.

Since 2007, we have tagged 279 adult migratory Bull Trout in the upper Oldman River drainage. Our trapping results suggest that a total of 200 (72% of tagged fish) of these Bull Trout spawned in Hidden Creek, emphasizing the importance of Hidden Creek for fluvial Bull Trout spawning in the upper Oldman drainage. We observed spawning activity and redds at the same spawning locations in Hidden Creek and Dutch Creek as previously found in 2008. Our redd surveys conducted at previously unsurveyed locations resulted in 69 redds in Dutch Creek, 21 in South Racehorse Creek, one in Savanna Creek, 21 in the upper Oldman River and 41 in the upper Livingstone River.

Conclusions

Based on the greater proportions of tagged adult Bull Trout and redd densities, it is evident that Hidden Creek is a critical fluvial Bull Trout spawning tributary and vital to the long-term persistence of Bull Trout in the upper Oldman drainage. Our data indicates that adult migratory Bull Trout concentrate spawning efforts in Hidden Creek, and it is suspected that a considerable number overwinter in the Livingstone River and other major tributaries and main stem channels in the upper Oldman drainage. Our data also suggest that redds observed in the upper reaches of the Livingstone River, Racehorse Creek and Dutch Creek are likely from stream resident Bull Trout, as redds outnumbered fish captured in the traps. Monitoring Bull Trout in the upper Oldman drainage will continue in 2010, which will mark the final year of the study.

Communications

- Progress report submitted to Alberta Sustainable Resource Development.
- Presentation to the Oldman Chapter of Trout Unlimited Canada.
- Presentations and a guided tour to a Bull Trout organization (*Salvelinus confluentus* Curiosity Society).
- Guided tour of Hidden Creek to the Assistant Deputy Minister (ASRD Forestry Division) and other government officials within the ASRD Forestry and Fish and Wildlife divisions.

Literature Cited

- Brewin, P.A., and M.K. Brewin. 1997. Distribution maps for bull trout in Alberta. Pages 209 – 216. *In*: W.C. Mackay, M.K. Brewin, and M. Monita, editors. Friends of the bull trout conference proceedings. Bull Trout Task Force (Alberta), c/o Trout Unlimited Canada, Calgary, Alberta.
- 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. Bull Trout Task Force (Alberta), c/o Trout Unlimited Canada, Calgary, Alberta.
- Ripley, T., G. Scrimgeour, and M. Boyce. 2005. Bull trout (*Salvelinus confluentus*) occurrence and abundance influenced by cumulative industrial developments in a Canadian boreal forest watershed. *Canadian Journal of Fisheries and Aquatic Sciences* 62: 2431-2442.

Photo Captions - Upper Oldman River



Post-spawn Bull Trout recovering underwater. (Photo: Jason Blackburn)

No Image

Alberta Conservation Association employee, Mike Marquardson, holding large adult spawning Bull Trout intercepted at Hidden Creek. (Photo: Andrew Clough)



Oldman Bull Trout pair spawning in Hidden Creek. (Photo Brad Hurkett)



Bull Trout pair spawning in Hidden Creek. (Photo: Brad Hurkett)



Bull Trout actively spawning in Hidden Creek. (Photo: Brad Hurkett)