

**Alberta Conservation Association  
2007/08 Project Summary Report**

**Project name:** *Abundance and Distribution of Bull, Cutthroat and Brook Trout in the Waiparous Creek Drainage*

**Project leader:** Kevin Fitzsimmons

**Primary ACA staff on project:** Kevin Fitzsimmons and Chad Judd

**Partnerships:**

Alberta Sustainable Resource Development

**Key findings**

- Brook trout were the most abundant fish in the study area, followed by bull and cutthroat trout.
- The majority of marked fish were recaptured within 600 m of the location in which they were initially tagged.
- Distribution of trout between early and late sampling periods was relatively unchanged in all study streams.
- In all creeks, except Waiparous Creek, trout abundance was greater in the early sampling period (May to July) than in the late sampling period (September).
- Abundance and movement data suggest that the Waiparous Creek bull and cutthroat trout populations are primarily resident within the stream.

**Introduction**

Bull trout (*Salvelinus confluentus*) and westslope cutthroat trout (*Oncorhynchus clarkii lewisii*) are native to the Bow River drainage (Behnke 1992; Haas and McPhail 1991; Scott and Crossman 1973), and have experienced declines in distribution and abundance over the past century (Post and Johnston 2002; Behnke 1992) attributed to overexploitation, competition with introduced fish species and habitat alteration (Dunham and Rieman 1999; Rhude and Stelfox 1997). In Alberta, bull trout are listed as ‘*Sensitive*’ and cutthroat trout are listed as ‘*Threatened*’. In this project, we estimated the abundance and spatial distribution of bull, cutthroat, and brook trout (*Salvelinus fontinalis*) in Waiparous, Meadow, Johnson and Unnamed Creeks in early summer and fall. This information is necessary for effective management of these species.

**Methods**

We used backpack electrofishing to capture fish at 91 sites systematically distributed along the length of our study streams from 3 May to 7 July (59 sites) and 5 to 21 September (32 sites) in

2006. For all fish, we collected length and weight data. We conducted mark-recapture population estimates at one site on each study stream. To individually identify fish, we marked trout > 250 mm fork length (FL) using T-bar anchor tags. We estimated abundance and spatial distribution of each species using a general additive model first outlined by Paul and Dormer (2005).

## **Results**

We tagged 53 bull trout and 133 cutthroat trout during sampling. Of these, five bull and 17 cutthroat trout were recaptured at later dates. Four of the five bull trout were recaptured within 500 m of their initial capture and one moved 23.3 km between sampling periods. Fifteen of the recaptured cutthroat trout were found within 600 m of their initial capture, and two fish moved 4.94 km and 1.7 km, respectively.

In Waiparous Creek, trout abundance was greater in the late season (September) than in the early season (May to July), while the opposite pattern was observed in Meadow, Johnson, and Unnamed Creeks (Table 1). Spatial distributions followed roughly the same patterns between sampling periods. Overall, brook trout were the most abundant fish in the study area, followed by bull and cutthroat trout.

Table 1. Estimated abundance and 95% confidence limits for bull, cutthroat, and brook trout in early (May to July) and late (September) sampling periods in Waiparous Creek drainage.

Stream	Trout Species	Time period	Mean abundance	95% CL
Waiparous Creek	Bull	Early	1,035	347 - 3,450
		Late	2,122	574 - 7,806
	Cutthroat	Early	730	407 - 1,523
		Late	882	487 - 1,799
	Brook	Early	1,952	1,552 - 2,485
		Late	2,824	2,253 - 3,667
Meadow Creek	Bull	Early	197	94 - 466
	Cutthroat	Early	394	223 - 791
	Brook	Early	6,535	5,267 - 8,152
Johnson Creek	Bull	Early	99	46 - 240
		Late	89	40 - 222
	Cutthroat	Early	334	186 - 683
		Late	144	76 - 314
	Brook	Early	2,386	1,913 - 3,021
		Late	776	609 - 1,001
Unnamed Creek	Bull	Early	154	126 - 186
		Late	113	90 - 141

## Conclusion

Our data provide important abundance and spatial distribution information for trout in the Waiparous Creek drainage. In general, our tagged fish were recaptured close to their initial capture location suggesting that bull and cutthroat trout in the Waiparous Creek drainage are of the stream resident life history.

## Communications

- Alberta Conservation Association draft data report completed.
- Presentation made to an international meeting of bull trout biologists.

## Literature cited

- Behnke, R.J. 1992. Native trout of western North America. American Fisheries Society Monograph 6.
- Dunham, J.B., and B.E. Rieman. 1999. Metapopulation structure of bull trout: influences of physical, biotic, and geometrical landscape characteristics. *Ecological Applications* 9: 642-655.
- Haas, G.R., and J.D. McPhail. 1991. Systematics and distributions of dolly varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*) in North America. *Canadian Journal of Fisheries and Aquatic Sciences* 48: 2191-2211.
- Paul, A.J., and C.G. Dormer. 2005. Effect of a server flood on the cutthroat trout population of Silvester Creek, Alberta. G8 Legacy Chair in Wildlife Ecology Department of Biological Sciences. University of Calgary, Calgary, Alberta.
- Post, J. R., and F. D. Johnston. 2002. Status of the bull trout (*Salvelinus confluentus*) in Alberta. Wildlife Status Report No. 39, Alberta Sustainable Resource Development, Fish and Wildlife Division, and Alberta Conservation Association, Edmonton, AB. 40 pp.
- Rhude, L.A., and J.D. Stelfox. 1997. Status of bull trout in Alberta's fisheries management area three. Pages 161–169. *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.
- Scott, W.B., and E.J. Crossman. 1973. Freshwater fishes of Canada. Fisheries Research Board of Canada Bulletin 184.



Alberta Conservation Association employee Chad Judd holding a bull trout captured in Waiparous Creek. (Photo: Kevin Fitzsimmons)



Backpack electrofishing Johnson Creek. (Photo: Kevin Fitzsimmons)