

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

Project name: *Bow River Sport Fish Population Monitoring*

Project leader: Trevor Council

Primary ACA staff on this project: Jason Blackburn, Trevor Council, and Brad Hurkett.

Partnerships:

Alberta Sustainable Resource Development
Fisheries and Oceans Canada

Key findings

- Abundance of brown trout and rainbow trout remained well within the documented range of variability at the index site.
- A major flooding in June 2005 may have temporarily displaced fish from the index reach. Higher catch rates in 2007 compared to 2005 indicate that trout populations have re-established within the index reach.
- Rainbow trout have typically comprised approximately 40% of the electrofishing catch since 2003, whereas brown trout consistently comprised 20 - 30% of the catch.
- Mountain whitefish catches were more variable; the 2005 catch represented the lowest mountain whitefish catch rate, in nearly all size classes, documented thus far.

Introduction

The lower Bow River within and below the city of Calgary provides a quality sport fishery for rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*) and mountain whitefish (*Prosopium williamsoni*). Monitoring of the fishery is necessary to ensure its continuation as a popular fishery, described by many as being world class. Although sport fish abundance in the lower Bow River appears relatively stable, high estimates of annual mortality combined with threats from flow regulation, effluent input from the city and surrounding land uses have the potential to substantially impact the population. Monitoring the status and health of the fishery is important to detect any early indications of population deterioration to enable proactive management. The objective of this project was to estimate the abundance of brown trout, rainbow trout and mountain whitefish within an established index site in the Bow River, below Calgary, and compare the 2007 data to those from previous studies.

Methods

We estimated sport fish abundance at a 4-km long index section on the Bow River downstream of Calgary using multiple mark and recapture data. We sampled the section in 1-km intervals using two jet-driven electrofishing boats over a four-day period during late August 2007. For each sport fish, we measured, weighed, marked and returned it to the section in which it was captured. We collected scale samples to assess fish age. We derived abundance estimates using mark-recapture, length frequency distributions, relative abundance, and catch-per-unit-effort (CPUE) for all sport species. We compared the 2007 data with those from similar surveys conducted in 2000, 2003, and 2005.

Results

In general, abundance of brown trout and rainbow trout remained well within the documented range of variability at the index site (Table 1). Abundance of all three species was lower in 2005 than in any other survey year (Table 1) and may be attributed to a major flooding in June of that year that may have temporarily displaced fish from the index reach (Council and Ripley 2006). The higher abundance estimates (Table 1) and catch rates (Figure 1) in 2007 compared to 2005 indicate that trout populations have re-established within the index site.

With the exception of the 2000 survey, rainbow trout dominated the catch while brown trout made up approximately 20 - 30% of the catch in all years (Figure 1). Relative abundance (% composition) of mountain whitefish was down from a high of 48% in 2000 (R.L. & L. 2001) to 32% in our 2007 catch. The age range of fish in our catch remained unchanged and typically included fish age-1 to 7. We found little evidence for change in brown trout and rainbow trout growth rates since 2000, whereas growth rate of mountain whitefish peaked in 2005 (Council and Ripley 2006). Rainbow trout growth was high, exceeding that from similar populations in Alberta and the U.S.

Table 1. Estimated abundance (n) and associated 95% confidence intervals (95% CI) of brown trout, rainbow trout, and mountain whitefish derived by mark-recapture from the 4-km Bow River index site in 2000, 2003, 2005 and 2007.

Year	Brown trout		Rainbow trout		Mountain whitefish	
	n	95% CI	n	95% CI	n	95% CI
2000 ^a	2,696	1,615 - 4,646	2,735	1,972 - 3,872	4,617	3,436 - 6,293
2003	3,120	2,029 - 4,925	2,918	2,216 - 3,909	4,003	1,674 - 10,014
2005	1,346	995 - 1,958	1,807	1,466 - 2,268	930	651 - 1,386
2007	2,521	1,783 - 3,652	4,141	3,013 - 5,790	8,307	4,372 - 16,163

^aData obtained from R.L. & L. (2001).

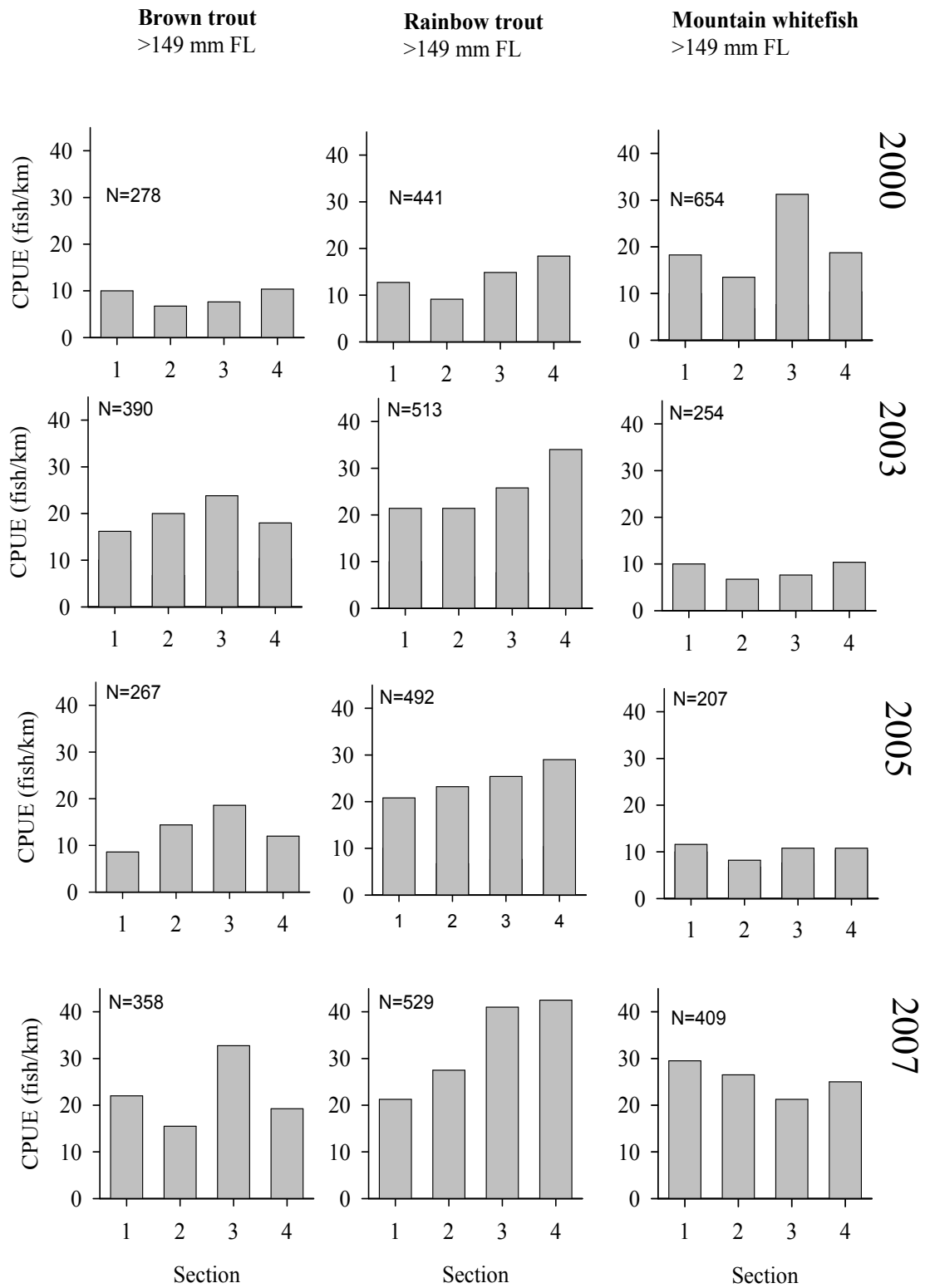


Figure 1. Relative abundance of brown trout, rainbow trout, and mountain whitefish captured in the Bow River in 2000, 2003, 2005 and 2007.

Conclusion

As part of a monitoring study, we electrofished a 4-km index section of the Bow River downstream of Calgary in 2003, 2005, and 2007. We used mark-recapture techniques to estimate fish abundance and assessed trends in brown trout, rainbow trout, and mountain whitefish abundance at the index site.

We found abundance of brown trout, rainbow trout, and mountain whitefish fluctuated but remained within the range of longer-term variability documented at the site. However, all species were less abundant in 2005 and we suspect flooding that summer temporarily displaced fish from the site. Our 2007 results indicate abundance of these species has returned to levels at or above those documented prior to the 2005 flood.

Communications

- Information presented at the 2008 Calgary Boat and Sportsman Show.
- Alberta Conservation Association data report prepared to summarize 2000, 2003, and 2005 data.

Literature cited

Council, T., and T.D. Ripley. 2006. Bow River sport fish population monitoring, 2003 and 2005. Data Report, D-2007-006, produced by the Alberta Conservation Association, Lethbridge, Alberta, Canada and Alberta Fish and Wildlife, Calgary, Alberta, Canada. 81 pp.

R.L. & L. Environmental Services Ltd. 2001. Lower Bow River fish population status assessment – August 2000. R.L. & L. Report No. 855F, prepared for Alberta Environment, Edmonton, Alberta. 30 pp. + App.



Electrofishing section on the Bow River below Calgary. (Photo: Jason Blackburn)



Electrofishing crew working on a section of the Bow River downstream of Calgary in late August 2005. Left to right: Vance Buchwald (Alberta Sustainable Resource Development), Trevor Council and Jason Blackburn (Alberta Conservation Association). (Photo: Jason Cooper)



Trevor Council holding a Bow River rainbow trout prior to sampling. (Photo: Jason Blackburn)