

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

**Project name:** *Little Smoky Arctic Grayling Assessment - Phase 2*

**Project leader:** Mike Blackburn

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**Partnerships:**

Alberta Sustainable Resource Development  
Forest Resource Improvement Association of Alberta

**Key findings**

- The distribution of Arctic grayling within the Little Smoky River has not changed appreciably since the 1990s.
- Estimated abundance of Arctic grayling ranged between 114 - 269 fish/km with a mean angling catch rate of 3.5 fish/h.
- Harvestable-sized Arctic grayling (> 323 mm fork length) accounted for only 4% (n = 78) of the catch.
- Angling was an effective method of obtaining mark-recapture abundance estimates for Arctic grayling.

**Introduction**

The Little Smoky River is considered to support one of the most productive Arctic grayling (ARGR, *Thymallus arcticus*) populations in Alberta and has provided extraordinary angling opportunities since the Amoco-Bigstone road opened public access to the upper reaches in 1976. However, no comprehensive assessment of the status of the ARGR population in the river has ever been conducted. The primary objective of the current study was to document the distribution, abundance and size structure of the ARGR population in the upper Little Smoky River. This information is important as the popularity of the fishery, coupled with increased industrial development within the watershed, is expected to result in increased fishing pressure on the river. Approximately half of Alberta's Arctic grayling sub-populations have declined by over 90% and the species is currently listed as 'Sensitive' in *The General Status of Alberta Wildspecies 2000* and 'Vulnerable' in *Alberta's Arctic Grayling Management and Recovery Plan* (Walker 2005). Data collected in the present study will aid in formulating management guidelines for the species.

## Methods

We used primarily angling, supplemented by electrofishing, to capture fish at 27, 1.0 - 2.5-km long reaches (sites) evenly distributed along a 235-km length of the Little Smoky River (i.e., river around and upstream of Fox Creek). Total fishing effort was 382 h of angling and 15 min of electrofishing. At each site we collected biological (i.e., size, sex, age) and abundance data on fish, as well as quantitative habitat data (stream width, water temperature). We used mark-recapture to estimate ARGR abundance at a subset of seven sites.

## Results

In total we captured 2,070 fish comprising eight species of which 1,891 were ARGR; ARGR were captured at all sites except at the last two downstream sites. There was a transition in catch from cold water species, such as ARGR, to cool water species, including walleye and northern pike, from upstream to downstream reaches. These results are consistent with those of an ARGR distribution documented in the study area in the 1990s (Stanislawski 1997). Mean ( $\pm$  SD) angling catch rate for ARGR was  $3.5 \pm 2.1$  fish/h and estimated abundance from the mark-recapture study ranged between 114 - 269 fish/km. Mean length of ARGR was 248 mm fork length (FL); legal-sized fish (i.e. > 350 mm total length, approximately 323 mm FL) only comprised 4% ( $n = 78$ ) of our catch (Figure 1).

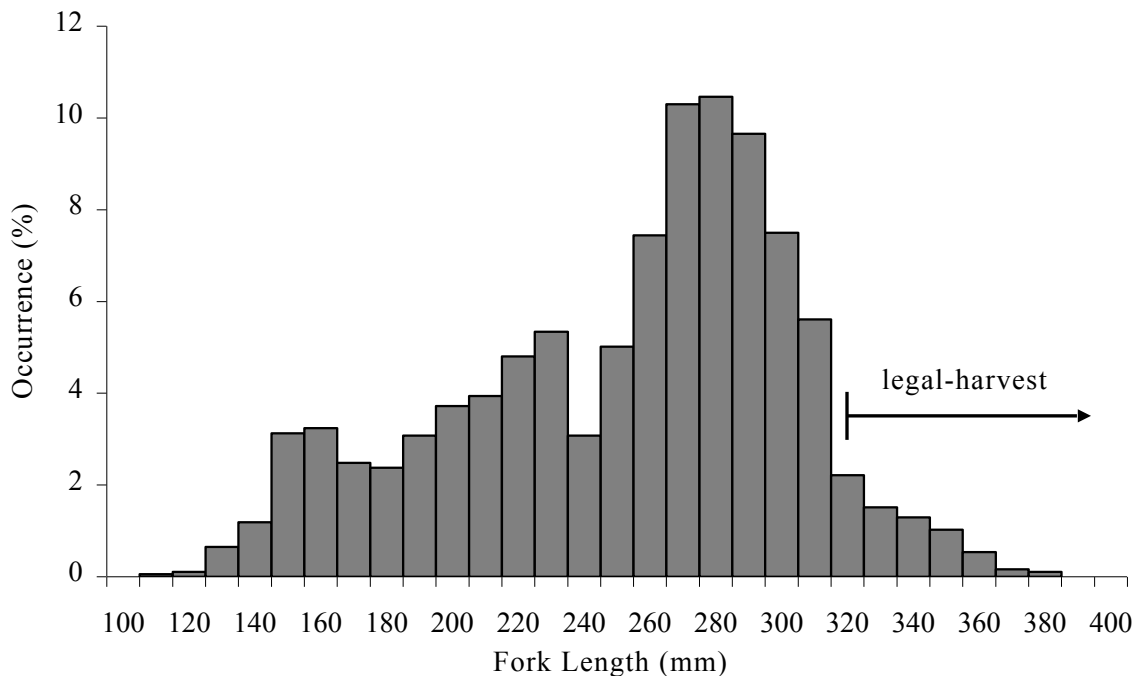


Figure 1. Fork length frequency distribution of Arctic grayling captured in the Little Smoky River during the summer of 2007 using angling (n = 1,854). Distribution of legal-sized fish (i.e.,  $\geq 323$  mm FL) is indicated.

### **Conclusion**

Distribution of ARGR in the Little Smokey River has not changed since the last comparable work was performed in the 1990s. Only 4% of our angling catch was legal-sized fish.

## **Communications**

- Quarterly progress reports were submitted to the Forest Resource Improvement Association of Alberta.
- Work was profiled in the March/April 2008 edition of the *Western Sportsman*.
- Results were presented to the Provincial Fisheries Standards Committee at a Lotic Monitoring Workshop.
- Proposals for funding were distributed to potential partners.

## **Literature cited**

Stanislawski, S.S. 1997. Fall and winter movements of Arctic grayling (*Thymallus arcticus*) in the Little Smoky River, Alberta. M.Sc. Thesis, Department of Biological Sciences, University of Alberta, Edmonton, Alberta. 91 pp.

Walker, J. 2005. Status of the Arctic grayling (*Thymallus arcticus*) in Alberta. Alberta Sustainable Resource Development, Fish and Wildlife Division, and Alberta Conservation Association, Wildlife Status Report No. 57, Edmonton, Alberta. 41 pp.



Little Smoky River within the study area. (Photo: Mike Blackburn)



Jay Wieliczko measuring an Arctic grayling. (Photo: Mike Blackburn)



Arctic grayling from the Little Smoky River. (Photo: Mike Blackburn)