

Alberta Conservation Association 2013/14 Project Summary Report

Project Name: Mikkwa River Arctic Grayling Population Assessment

Fisheries Program Manager: Peter Aku

Project Leader: Tyler Johns

Primary ACA staff on project:

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Partnerships

ConocoPhillips

Key Findings

- On Mikkwa River, we captured fish at three sites using backpack electrofishing and eight sites using test angling; on Burnt River, we captured fish at one site using test angling.
- We captured seven Arctic grayling: one by angling and six by electrofishing.
- Arctic grayling ranged in size from 55 to 273 mm fork length, with a mean size (\pm standard deviation) of 154 ± 85 mm ($n = 7$).
- We discontinued field surveys after two days because of low captures of grayling despite intensive effort.

Introduction

A key component to evaluate and manage human impacts on fish populations is the assessment of individual fish stocks. For results to be applicable across broad spatial and temporal scales, these assessments must be conducted in a consistent manner. To this end, Alberta Environment and Sustainable Resource Development is developing a new tool, the Alberta Fish Sustainability Index (FSI), to bring consistency to individual fish stock assessments across the province. The FSI requires basic demographic data from undisturbed or minimally disturbed “reference” populations, which will serve as benchmarks against which data from more disturbed populations can be measured. With its headwaters in the Birch Mountains Provincial Wildland Park and relative absence of any major industrial development in the watershed, the Mikkwa River is a candidate reference population for the Arctic grayling FSI. Although Arctic grayling are known to occur within the headwaters of the drainage, no formal fisheries assessments have occurred within the watershed. Our objective was to collect basic demographic data to assist in the development of an FSI for Arctic grayling.

Methods

We conducted surveys on July 23 and 24, 2013. We used a Generalized Random-Tessellation Stratified Survey Design (Stevens and Olsen 2004) to determine the location of survey sites. On Mikkwa River, we used backpack electrofishing at three sites (total 750 m) and test angling at eight sites. On Burnt River, we used test angling at one site. Four experienced anglers fished for a total of 17.7 h (over a two-day period) using fly fishing and spin fishing gear. Wetted widths ranged from 2.4 to 11.6 m and 6.0 to 54.0 m at electrofishing and angling sites, respectively. All Arctic grayling captured were measured for length (total and fork) and weight, and were sacrificed for age, gender and maturity determination.

Results

We captured a total of seven Arctic grayling, one by angling and six by electrofishing. Because of the low number of grayling captured in spite of the intensive effort, we discontinued field surveys after two days. The seven Arctic grayling ranged in size from 55 to 273 mm fork length, with a mean (\pm stand deviation) length of 154 ± 85 mm fork length. Associated weights ranged from 1 to 253 g, with a mean weight of 83 ± 102 g ($n = 7$). Age ranged from young-of-the-year to 3 y, with a mean age of 1.6 ± 0.9 y ($n = 5$). Of the Arctic grayling where sex could be determined, three were females and two were males. Other species caught included burbot, northern pike, white sucker, lake chub, yellow perch and pearl dace.

Conclusions

Limited Arctic grayling catch data precluded us from providing a detailed assessment and conclusions regarding the Arctic grayling population in the Mikkwa River.

Communications

N/A

Literature Cited

Stevens, D.L., Jr., and A.R. Olsen. 2004. Spatially-balanced sampling of natural resources. *Journal of the American Statistical Association* 99: 262–278.

Photo Captions



Alberta Conservation Association staff member Paul Hvenegaard fishing a pool along the Mikkwa River. Photo: Tyler Johns
[filename: Photo1_Mikkwa_2013-14_Tyler Johns.jpg]



An aerial view of a large pool along the lower section of the Mikkwa River. Photo: Tyler Johns
[filename: Photo2_Mikkwa_2013-14_Tyler Johns.jpg]



Alberta Conservation Association staff members Paul Hvenegaard and Dave Jackson electrofishing a section of the upper Mikkwa River. Photo: Troy Furukawa
[filename: Photo3_Mikkwa_2013-14_Troy Furukawa.jpg]