

Alberta Conservation Association 2011/12 Project Summary Report

Project Name: *Walleye Stock Assessment Program 2011/12 – Moose and Fawcett Lakes*

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Partnerships

Alberta Sustainable Resource Development

Key Findings

- Relative abundance of walleye was higher in Moose Lake (19.4 fish/100 m²/24 h) than in Fawcett Lake (15.3 fish/100 m²/24 h).
- Size of Fawcett Lake walleye ranged from 110 – 592 mm total length, with the majority of individuals 425 – 475 mm and in the 8 y age class.
- Size of Moose Lake walleye ranged from 118 – 650 mm total length, with the majority of walleye >450 mm and in the 4 y age class.
- Walleye populations in both lakes exhibited wide (>8 age classes) and stable age-class distributions.

Introduction

Walleye (*Sander vitreus*) populations throughout Alberta experience considerable fishing pressure due to an imbalance of high angler densities and limited fishing opportunities (Sullivan 2003). In 1995, Alberta Sustainable Resource Development (ASRD) implemented the Alberta Walleye Management and Recovery Plan (AWMRP) to facilitate the protection and recovery of exploited walleye fisheries (Berry 1995). The current sportfishing regulations for walleye at Moose and Fawcett lakes are a daily bag limit of three and one fish, respectively, over 500 mm total length. To examine population structure and growth of walleye, we conducted gill net surveys on these two lakes from September 16 – 29, 2011. The information collected will help ASRD determine the status of these walleye populations and will aid in future management decisions.

Methods

We captured walleye using gill nets following the Fall Walleye Index Netting (FWIN) protocol described by Morgan (2000). Each net consisted of eight 7.6 x 1.8 m panels of different mesh

sizes, ranging from 25 to 152 mm (stretched mesh), and was set for 22 to 25 h. We recorded species, fork length (FL, mm), total length (TL, mm), total weight (g), sex and state of maturity of each fish. We also collected otoliths for ageing of walleye. During the Moose Lake survey, two additional panels (12 and 19 mm) were attached to each gill net using a 15 m lead to assess the fish forage community in the lake. Fish caught in these panels were independent of the FWIN study and were not included in the analysis.

We measured relative abundance as catch-per-unit-effort (CPUE), expressed as the number of fish/100 m²/24 h, and used bootstrap techniques to estimate mean CPUE and associated 95% confidence intervals (95% CI) following Haddon (2001). We examined growth rate with the von Bertalanffy growth model (von Bertalanffy 1938) and interpreted population descriptors (age-class distribution, age-class stability, age-at-maturity and length-at-age) using the AWMRP criteria.

Results

We captured 180 walleye from Fawcett Lake and 283 from Moose Lake. Corresponding mean CPUE was 15.3 fish/100 m²/24 h (95% CI = 11.6 – 18.9, n = 11) for Fawcett Lake and 19.4 fish/100 m²/24 h (95% CI = 13.9 – 24.7, n = 14) for Moose Lake. Walleye ranged in size between 110 – 592 mm TL in Fawcett Lake and 118 – 650 mm TL in Moose Lake (Figure 1). The population in Fawcett Lake was predominantly fish between 425 – 475 mm TL; fish >525 mm TL and <275 mm TL were poorly represented. The population at Moose Lake was predominantly fish >450 mm TL, but fish 100 – 150 mm and 250 mm were also well represented. Age classes ranged from age 0 to 22 y (mean ± standard error [SE] = 9.1 ± 0.3 y, n = 180) for Fawcett Lake walleye and 0 to 21 y (mean ± SE = 6.8 ± 0.3 y, n = 274) for Moose Lake walleye. The dominant age class was 8 y (26% of total catch, n = 46) for Fawcett Lake walleye and 4 y (17% of total catch, n = 47) for Moose Lake walleye. Based on AWMRP criteria, the walleye population in Fawcett Lake is characterized as having a wide (>8 age classes) and very stable (mean age >9 y) age-class distribution, while the age-class distribution of Moose Lake walleye is wide and stable (mean age 6 – 9 y). Walleye in Fawcett Lake showed slow growth rates, with an estimated maximum size of 490 and 520 mm TL for males and females, respectively. Moose Lake walleye had moderate growth rates, with male walleye estimated to reach 500 mm TL by age 8 and females by age 7. The age-at-maturity (when 50% of the age class is sexually mature) of female walleye was age 6 in Fawcett Lake and age 5 in Moose Lake. Males matured at age 6 in Fawcett Lake and age 3 in Moose Lake.

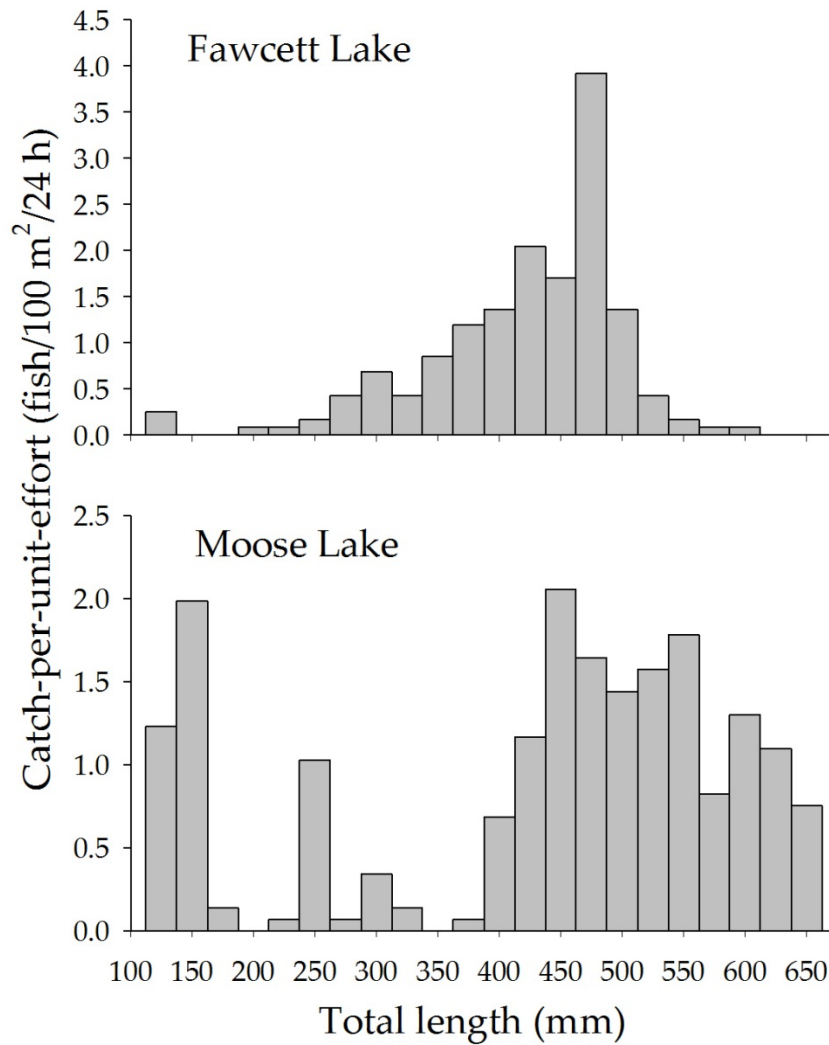


Figure 1. Length-frequency distributions of walleye from Fawcett and Moose lakes, Alberta, during the 2011 gill netting survey.

Conclusions

Walleye populations in both lakes exhibited wide age-class distributions and matured at an early age. The Fawcett Lake walleye population exhibited a very stable age-class distribution and slow growth rate, while the Moose Lake population exhibited a stable age-class distribution and moderate growth rate. This information will help provincial resource managers determine the current status of these walleye populations and will aid in future management decisions.

Communications

- Prepared ACA data report to summarize results: An Assessment of Walleye Populations in Fawcett and Moose Lakes, Alberta, 2011.

Literature Cited

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von Bertalanffy, L. 1938. A quantitative theory of organic growth. *Human Biology* 10: 181–213.



Alberta Conservation Association crew launching a boat on Fawcett Lake. Left to right: Jenny Straub and Troy Furukawa. (Photo: Melissa Buskas)



Alberta Conservation Association biologist, Bill Patterson, preparing to set a gill net on Fawcett Lake. (Photo: Melissa Buskas)



Alberta Conservation Association crew pulling and picking a gill net on Moose Lake. Left to right: Ariane Cantin, Clayton James and Troy Furukawa. (Photo: Melissa Buskas)



Alberta Conservation Association staff pulling a net on Moose Lake. Left to right: Clayton James and Brendan Ganton. (Photo: Melissa Buskas)