

## **Alberta Conservation Association 2013/14 Project Summary Report**

**Project Name:** Walleye Selective Harvest, 2013

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### **Partnerships**

Alberta Environment and Sustainable Resource Development  
Canada Summer Jobs  
Municipality of Fox Creek

### **Key Findings**

- Angling pressure at Iosegun and Smoke lakes was 2.4 h/ha and 3.8 h/ha, respectively.
- Harvest rate for walleye was 0.10 fish/h at both lakes; however, release rate was 1.5 fish/h at Iosegun Lake and 2.3 fish/h at Smoke Lake.
- Walleye yield at Iosegun Lake was 0.3 kg/ha and at Smoke Lake was 0.18 kg/ha.
- 18% and 21% of anglers at Iosegun and Smoke lakes possessed a Special Walleye Licence.
- No walleye at Iosegun Lake and very few walleye at Smoke Lake were growing larger than 50 cm total length.

### **Introduction**

A restrictive management strategy due to the overharvest of walleye in Alberta has resulted in increases in walleye numbers but few large fish. Recently, research concluded that restrictive minimum-size regulations at lakes with both high angling effort and high catches of walleye selected against larger walleye (Spencer 2010). The result was populations that were not growing large regardless of age. Plausible explanations for the large number of small, yet old walleye include density compensation resulting in stunted growth, size-selective mortality of larger fish, or selective harvest-induced genetic changes in growth rate. Paradoxically, management solutions for density compensation and size-selective mortality are in opposition: either harvest more or harvest less, respectively. Consequently, a Special Walleye Licence (SWL; i.e., a draw and tag system) was implemented at Iosegun, Smoke and Spencer lakes to attempt to increase the number of medium- to large-sized walleye by limiting the harvest of fish <50 cm (total length). The goal of this project is to evaluate the effectiveness of this regulation to reverse size-selective harvest using surveys at Iosegun Lake and Smoke Lake. Spencer Lake is being surveyed by Alberta Environment and Sustainable Resource Development.

## Methods

We conducted creel surveys (Pollock et al. 1994; Rasmussen et al. 1998) at Iosegun and Smoke lakes between May 18 and August 25, 2013. Seasonal staff interviewed anglers at the end of their fishing trips, recording date, SWL information, hours spent fishing, and number of fish species harvested and released. We test-angled to collect additional length and age data on walleye that were not vulnerable to the sport fishery. Biological data were also collected from fish that were harvested and test-angled. Test-angled fish were immediately released after being measured for length and sampled for age determination. Since the SWL restricted harvest to specific size ranges, we used test-angled fish to determine population structure.

For each lake, we calculated estimates and associated 95% confidence intervals (CI) for the number of angler trips, hours fished, angling pressure (h/ha), number of fish harvested and released, and yield (kg/ha). We calculated angler catch rates as total ratio estimators (Malvestuto 1983).

## Results

We interviewed 215 and 246 anglers from Iosegun and Smoke lakes, respectively. Angling pressure at Iosegun Lake was 2.4 h/ha (95% CI = 1.5 – 3.5), with anglers making 1,480 trips (95% CI = 994 – 2,024) and fishing for 3,203 h (95% CI = 1,965 – 4,672). Corresponding values at Smoke Lake were 3.8 h/ha (95% CI = 2.8 – 4.8), 1,545 angler-trips (95% CI = 1,195 – 1,937) and 3,623 angling-h (95% CI = 2,716 – 4,633).

We observed 41 harvested walleye from Iosegun Lake and 44 from Smoke Lake. Of the harvested fish at Iosegun Lake, 32% were in the <43 cm class and 68% were in the 43 – 50 cm class. At Smoke Lake, 41% were in the <43 cm class and 59% were in the 43 – 50 cm class. The harvest and release catch rates for walleye at Iosegun Lake were 0.1 fish/h and 1.5 fish/h, respectively. At Smoke Lake, harvest and release catch rates were 0.1 fish/h and 2.3 fish/h, respectively. No illegal harvest (i.e., wrong size or harvest without a SWL) was observed at Iosegun Lake. However, at Smoke Lake, six walleye were observed harvested illegally; four were the wrong size for the SWL, and two were harvested without an SWL.

The estimated total harvest (95% CI) of walleye from Iosegun and Smoke lakes was 309 fish (76 – 626) and 241 fish (113 – 397), respectively. The total yield of walleye from Iosegun and Smoke lakes was 0.30 kg/ha (0.14 – 0.49) and 0.18 kg/ha (0.13 – 0.39), respectively. The fish released by anglers and estimated to have died at a later time at Iosegun and Smoke lakes contributed 42% and 66% to the total yield, respectively.

Of the 215 and 246 anglers surveyed at Iosegun and Smoke lakes, 18% and 21%, respectively, had an SWL. The percentages of anglers with an SWL at Iosegun Lake in the <43 cm and 43 – 50 cm size classes were 10% and 8%, respectively. At Smoke Lake, 13% of anglers had an SWL for the <43 cm size class and 8% had an SWL for the 43 – 50 cm size class. The SWLs for the <43 cm size class at Iosegun and Smoke lakes were undersubscribed (i.e., 29/1,016 and 11/919,

respectively). The SWLs for the 43 – 50 cm size class were fully subscribed at both lakes (i.e., 57 and 139 SWLs, respectively).

We test-angled 374 and 377 walleye from Iosegun and Smoke lakes in 143 h and 220 h, respectively. No walleye larger than 500 mm total length were observed at Iosegun Lake. At Smoke Lake, the walleye population showed strong evidence of recruitment, with very few fish growing larger than 500 mm (Figure 1).

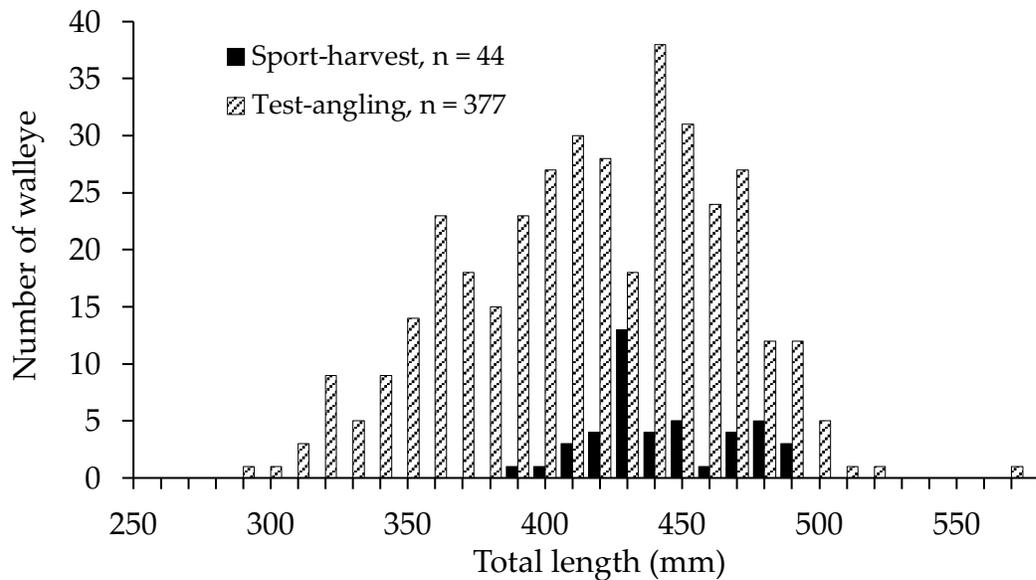


Figure 1. Length distribution of walleye from Smoke Lake, 2013.

## Conclusions

We collected information on the sport fisheries at Iosegun and Smoke lakes necessary to help evaluate the effectiveness of the regulation designed to reverse size-selective harvest. Eighteen percent and 21% of the anglers at Iosegun and Smoke lakes possessed an SWL. No walleye larger than 50 cm total length were observed at Iosegun Lake, and very few walleye larger than 50 cm were observed at Smoke Lake.

## Communications

N/A

## Literature Cited

- Malvestuto, S.P. 1983. Sampling the recreational fishery. Pages 397 – 419. *In*: L.A. Nielsen and D.L. Johnson, editors. Fisheries techniques. American Fisheries Society, Bethesda, Maryland, USA. 468 pp.
- Pollock, K.H., C.M. Jones, and T.L. Brown. 1994. Angler survey methods and their applications in fisheries management. American Fisheries Society Special Publication 25. 371 pp.

Rasmussen, P.W., M.D. Staggs, T. D. Beard Jr., and S.P. Newman. 1998. Bias and confidence interval coverage of creel survey estimators evaluated by simulation. *Transactions of the American Fisheries Society* 127: 469–480.

Spencer, S.C. 2010. The increasing prevalence of smaller fish in highly exploited fisheries: concerns, diagnosis and management solutions. Ph.D. Thesis. University of Alberta, Edmonton, Alberta.

### Photo Captions



Field crew collecting biological data from northern pike during test angling, 2013. Photo: Bill Patterson

[filename: Photo1\_Walleye SH\_2013-14\_Bill Patterson.jpg]



Cleaning table and sign notifying anglers of the regulation change at Smoke Lake, 2013. Photo: Bill Patterson  
[filename: Photo2\_Walleye SH\_2013-14\_Bill Patterson.jpg]



The shoreline near the campsite at Smoke Lake, 2013. Photo: Caitlin January  
[filename: Photo3\_Walleye SH\_2013-14\_Caitlin January.jpg]