

**Alberta Conservation Association
2008/09 Project Summary Report**

Project Name: *Lentic: Summer Sport Fishery Assessment: Buck, Moose, Pine, and Pinehurst lakes, Alberta, 2008*

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Partnerships:

Alberta Tourism Parks and Recreation
Alberta Sustainable Resources Development
Toronto Dominion Bank – Friends of the Environment Foundation

Key Findings:

- Angler effort was highest at Pine Lake and lowest at Moose Lake with intermediate values at Pinehurst and Buck lakes
- Catch rate of walleye was similar and higher at Buck, Pine, and Pinehurst lakes and lower at Moose Lake. In contrast, catch rate of northern pike was highest at Moose Lake and lower at Buck, Pine, and Pinehurst lakes
- Total yield of walleye was highest at Pinehurst Lake, intermediate at Buck and Pine lakes and lowest at Moose Lake. While total yield of northern pike was similar across all four lakes.

Abstract:

High fishing pressure, coupled with slow-growing and late-maturing populations have resulted in the over-harvest of many of Alberta's fish populations including walleye and northern pike. To aid in the recovery of these two species the Alberta Sustainable Resource Development developed management strategies in 1995 and 1999 for walleye and northern pike, respectively. This report summarizes results of creel surveys conducted on four lakes (Buck, Moose, Pine, and Pinehurst) during the summer of 2008 to evaluate the efficacy of these management plans. Estimated total angling hours were 17,276 for Pine, 33,558 for Moose, 49,997 for Pinehurst, and 53,781 for Buck lakes. Fishing pressure was highest at Pine Lake (42.7 h/ha) and lowest at

Moose Lake (7.4 h/ha) with intermediate values at Buck (21.3 h/ha) and Pinehurst (12.6 h/ha) lakes. Catch rate for walleye was 0.2 fish/ha for Moose Lake, 0.7 fish/ha for Buck Lake and 0.8 fish/ha for both Pine and Pinehurst lakes. For northern pike, catch rate was 0.2 fish/h at both Buck and Pine lakes, 0.3 fish/h at Pinehurst Lake, and 0.5 fish/h at Moose Lake. Estimated harvest of walleye was 700 fish at Moose Lake, 4,200 at Buck Lake, and 5,466 at Pinehurst Lake; no estimates are provided for Pine Lake, as it is managed with a zero-harvest regulation. Northern pike harvests were 1,070, 1,318, and 1,758 fish, for Buck, Pinehurst, and Moose lakes, respectively; there was no harvest at Pine Lake. Total yield of walleye was variable among lakes ranging from a low of 0.31 (kg/ha in Moose Lake to a high of 2.52kg/ha in Pinehurst Lake. In contrast to walleye, total yield of northern pike was similar among all the study lakes with values ranging from a low of 0.82) kg/ha in Pine Lake to a high of 1.13 kg/ha in Pinehurst Lake.

Introduction:

High fishing pressure, coupled with slow-growing and late-maturing populations have resulted in the over-harvest of many of Alberta's fish populations including walleye (*Sander vitreus*) and northern pike (*Esox lucius*) (Sullivan 2003). Consequently, the Alberta Sustainable Resource Development (ASRD) developed management strategies in 1995 and 1999 for walleye (Alberta's Walleye Management Recovery Plan (AWMRP), Berry 1995) and northern pike (Alberta's Northern Pike Management and Recovery Plan (ANPMRP), Berry 1999), respectively to aid in the recovery of these species. This report summarizes the results of creel surveys conducted on four lakes (Buck, Moose, Pine, and Pinehurst) during the summer of 2008. Our objective was to collect the information required by the management plans: angler effort, catch rate, and sport fish yield, facilitating future management decisions by allowing managers to monitor the effect of current angling pressure, and harvest regulations

Methods:

Following methods described in Pollock *et al.* (1994), we conducted multiple access angler surveys at Buck and Moose lakes, a single access angler survey at Pinehurst Lake, and a roving angler survey at Pine Lake between 16 May and 30 August. During each survey we asked anglers a series of questions including: hours spent fishing, number of each fish species harvested and released, and residency. We recorded species and number, fork and total length, and weight as well as collected aging structures from their catch.

We used a bootstrap technique (Haddon 2001) to estimate the total number of angler trips, hours fished, angling pressure (h/ha), sport fish harvest and total yield and associated 95% confidence intervals (95% CI). We then extrapolated from these estimates to account for time periods (e.g., days of rest) and spatial areas we did not sample. We calculated angler catch rate as a total ratio estimator following Malvestuto (1993).

Results:

During the survey period the most visited lake was Buck Lake, where anglers made an estimated 21,763 trips and the least visited was Pine Lake with 5,501 trips; visits to Pinehurst and Moose lakes were intermediate (Table 1). Similarly, estimated total angling hours was highest and lowest at Moose (53,781 h) and Pine lakes (17,276 h), respectively with intermediate values at Pinehurst and Moose lakes (Table 1). In contrast, when standardized to lake area, fishing pressure was highest at Pine Lake, with an effort of 42.7 h/ha, and lowest at Moose lake with an effort of 7.4 h/ha; fishing pressure at Buck and Pinehurst lakes were 21.3 and 12.6 h/ha respectively (Table 1).

Table 1. Summary of 2008 creel survey data from Buck, Pinehurst, Moose, and Pine Lakes, Alberta. Means and associated 95% confidence intervals (95% CI) were estimated using bootstrap techniques.

Lake	Number of Trips		Total Number of Hours		Fishing Pressure (h/ha)	
	Mean	95% CI	Mean	95% CI	Mean	95% CI
Buck	21,763	17,935 – 26,080	53,781	42,926 – 64,747	21.3	17.4 – 25.6
Pinehurst	15,942	13,977 – 17,911	49,997	44,024– 56,272	12.6	11.1 – 14.2
Moose	12,198	9,417 – 15,703	33,558	27,259 – 41,314	7.4	6.0 – 9.1
Pine	5,501	4,403 – 6,786	17,276	14,668 – 19,964	42.7	36.2 – 49.3

The angler-reported average catch rate for walleye was highest at Pine and Pinehurst lakes, both with a value of 0.8 fish/h and lowest at Moose Lake with a value of only 0.2 fish/h; the catch rate at Buck Lake was 0.7 fish/h. For northern pike, the highest catch rate was at Moose Lake with a value of 0.5 fish/h. The catch rate was slightly lower at the other lakes, with values of 0.3 fish/h at Pinehurst Lake, and 0.2 fish/h at both Buck and Pine lakes.

Harvest and Yield:

Estimated harvest (fish kept by anglers) of walleye ranged from a low of 700 (95% CI = 468 -1002) fish at Moose Lake to a high of 5,466 (95% CI = 4,564 – 6,464) at Pinehurst Lake; estimated harvest at Buck Lake was 4,200 (95% CI = 3,063 - 5,454). In contrast to walleye, estimated harvest of northern pike was highest at Moose Lake with a value of 1,758 (95% CI = 1,273 – 2,355) fish. Northern pike harvest was slightly lower at Pinehurst and Buck lakes with values of 1,318 (95 CI = 1,120 – 1,552) and 1,070 (95% CI = 775 – 1,417) fish, respectively.

No estimates are provided for Pine Lake, as it is managed with a zero-harvest regulation.

Estimated number of walleye released by anglers was highest at Pinehurst Lake with a value of 42,891 (95% CI = 35,901 – 48,717) and lowest at Pine Lake with 11,871 (4,559 – 21,643); number of walleye released at Buck Lake was intermediate with a value of 21,538 (16,106 - 27,928). For northern pike, estimated number released was high and similar for Pinehurst (n = 12,647; 95% CI = 10,755 – 14,695) and Moose (n = 12,941; 95% CI = 9,809 – 16,969) lakes, respectively; lower values were observed at Buck (n = 6,854; 95% CI 5,376 – 8,618) and Pine (n = 4,134; 2,301 – 6,683) lakes.

Estimated total yield (based on number harvested and released) of walleye was variable among lakes ranging from a low of 0.31 (95% CI = 0.21 – 0.43) kg/ha in Moose Lake to a high of 2.52 (95% CI = 2.05 – 3.03) kg/ha in Pinehurst Lake (Figure 1). In contrast to walleye, total yield of northern pike was similar among all the study lakes with values ranging from a low of 0.82 (95% CI = 0.45 – 1.33) kg/ha in Pine Lake to a high of 1.13 (0.89 – 1.44) kg/ha in Pinehurst Lake (Figure 1).

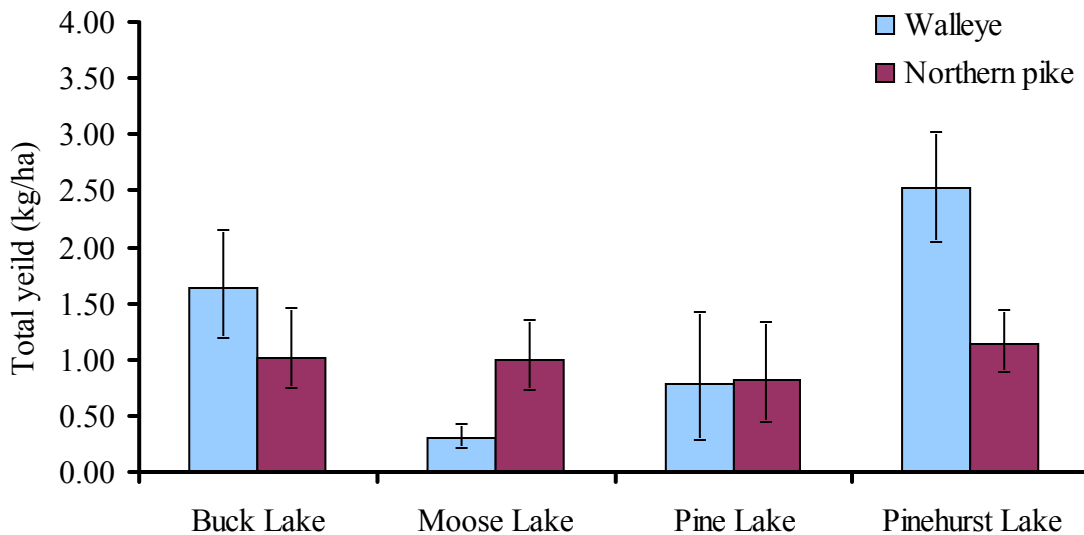


Figure 1. Total yield of walleye and northern pike from Elinor, Ironwood, Haig, and Wadlin lakes, Alberta during the 2008 survey.

Conclusions:

In general, angler effort at the study lakes varied, it was highest at Pine Lake and lowest at Moose Lake. Catch rate of walleye was similar and higher at Buck, Pine, and Pinehurst lakes than at Moose Lake. In contrast, catch rate of northern pike was highest at Moose Lake and

lower at Buck, Pine, and Pinehurst lakes. Total yield of walleye was highest at Pinehurst Lake, intermediate at Buck and Pine lakes and lowest at Moose Lake. Total yield of northern pike was similar across all lakes. This information will be available to managers assisting in the monitoring of these sport fisheries.

Communications:

ACA data report prepared for the Conservation Report Series.

Literature cited:

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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.

Sullivan, M.G. 2003. Active management of walleye fisheries in Alberta: dilemmas of managing recovering fisheries. North America Journal of Fisheries Management 23: 1343-1358.

Pictures:



Photo 1: Creel attendant learning to collect biological data from fish. Left: Matt Voramwald (ACA) Right: Michael Sullivan (ASRD). (Photo: Shane Wood)



Photo 2: Boat traffic and dock at Moose Lake during the 2008 creel survey. (Photo: Shane Wood).



Photo 3: ACA staff with sample angled fish at Moose Lake. Left: Shane Wood (ACA) Right: Roy Schmelzeisen (ACA). (Photo: Matt Voramwald)