

**Alberta Conservation Association  
2009/10 Project Summary Report**

**Project Name:** *Sport Fishery Surveys: Christina, Ethel, Fickle, Grist, Hilda and Shiningbank Lakes, Alberta, 2009*

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**Partnerships**

Alberta Sustainable Resources Development  
Christina Lake Lodge  
Grist Lake Lodge

**Key Findings**

- Angler effort was high at Fickle Lake, intermediate at Ethel, Hilda and Shiningbank lakes, and low at Grist and Christina lakes.
- Catch rate of Walleye was highest at Fickle and Hilda lakes and lowest at Shiningbank Lake. In contrast, catch rate of Northern Pike was highest at Shiningbank Lake and lowest at Grist Lake.
- Total yield of Walleye was highest at Fickle Lake, intermediate at Christina, Ethel, and Hilda lakes, and lowest at Shiningbank Lake. Total yield of Northern Pike was highest at Shiningbank Lake and lowest at Grist Lake.
- Catch rate and yield of Lake Trout at Grist Lake were low.

**Introduction**

High fishing pressure, coupled with slow-growing and late-maturing populations have resulted in the over-harvest of many of Alberta's sport fish populations (Sullivan 2003), including Walleye (*Sander vitreus*), Northern Pike (*Esox lucius*), and Lake Trout (*Salvelinus namaycush*). To aid the management of these species, we conducted creel surveys on six priority lakes (Christina, Ethel, Fickle, Grist, Hilda and Shiningbank) during the summer of 2009. Our objective was to generate the information required for effective management: angler effort, catch rate and sport fish yield, facilitating future decisions regarding harvest regulations and angling pressure.

## **Methods**

Following methods described in Pollock et al. (1994), we conducted single access angler surveys at Christina, Grist and Fickle lakes and a multiple access angler survey at Shiningbank Lake from May 16 to August 30, 2009. We also conducted low effort, roving angler surveys at Ethel and Hilda lakes utilizing programmable trail cameras to help capture angler effort following procedures in van Poorten et al. (Unpublished). During each survey, we interviewed anglers recording hours spent fishing, number of each fish species harvested and released, and collected biological data from their catch.

For each lake, we calculated estimates and associated 95% confidence intervals (95% CI) for the total number of angler trips, hours fished, angling pressure (h/ha), number of fish harvested, number of fish released, and total yield. We calculated angler catch rates as total ratio estimators following Malvestuto (1993).

## **Results**

Estimated angler visits varied from a high of 3,407 trips at Fickle Lake to a low of 1,081 trips at Grist Lake (Table 1). Similarly, estimated total angling hours ranged from a high of 7,546 h at Fickle Lake to a low of 3,013 h at Grist Lake. Fishing pressure remained highest at Fickle Lake (19.8 h/ha), while both Cristina and Grist lakes shared the lowest effort at 2.7 h/ha (Table 1).

Table 1. Summary of 2009 creel survey data from Christina, Ethel, Fickle, Grist, Hilda and Shiningbank lakes, Alberta. We estimated means and associated 95% confidence intervals (95% CI) using bootstrap techniques.

Lake	Number of Trips		Total Number of Hours		Fishing Pressure (h/ha)	
	Mean	95% CI	Mean	95% CI	Mean	95% CI
Christina	2,214	1,946 – 2,474	5,921	5,213 – 6,664	2.7	2.4 – 3.1
Ethel	2,112	1,178 – 3,412	6,243	3,550 – 9,780	12.7	7.2 – 20.0
Fickle	3,407	3,012 – 3,815	7,546	6,629 – 8,529	19.8	17.4 – 22.3
Grist	1,081	952 – 1,209	3,013	2,270 – 3,863	2.7	2.0 – 3.5
Hilda	2,004	1,042 – 3,295	4,122	2,200 – 6,499	11.6	6.2 – 18.3
Shiningbank	1,600	1,283 – 1,932	4,821	3,472 – 6,508	10.6	7.6 – 14.3

Average catch rate (harvest + release) for Walleye was relatively higher at Hilda (0.99 fish/h) and Fickle (0.90 fish/h) lakes, lowest at Shiningbank Lake (0.04 fish/h), and intermediate at Christina (0.43 fish/h) and Ethel lakes (0.37 fish/h). No Walleye are present in Grist Lake. For Northern Pike, catch rate was highest at Shiningbank Lake (2.0 fish/h), lowest at Grist Lake (0.11 fish/h), and intermediate at Hilda (1.25 fish/h), Ethel (1.20 fish/h), Christina (0.75 fish/h) and Fickle (0.32 fish/h) lakes. Anglers at Grist Lake also reported a Lake Trout catch rate of 0.13 fish/h.

Harvest of Walleye was only permitted at Hilda Lake, where an estimated 83 Walleye were kept by anglers (Table 2). Estimated harvest of Northern Pike varied, ranging from a high of 175 fish at Hilda Lake to no harvest at Fickle Lake (Table 2). Lake Trout were only present in Grist Lake where anglers harvested an estimated 92 (95% CI = 69 – 117) fish.

The number of Walleye released by anglers was variable; highest at Fickle Lake with 6,827 fish and lowest at Shiningbank Lake with 168 fish (Table 2). The estimated number of Northern Pike released varied, it was relatively higher at Shiningbank and Ethel lakes with 9,604 and 7,407 fish, while it was lowest at Grist Lake with only 296 fish (Table 2). Additionally, anglers released an estimated 296 (95% CI = 223 – 379) Lake Trout at Grist Lake.

Estimated total yield (number harvested + release mortalities) of Walleye was variable among lakes ranging from a high of 341 fish at Fickle Lake to a low of 8 fish at Shiningbank Lake (Table 2). Total yield of Northern Pike ranged from a high of 500 fish at Shiningbank Lake to a low of 36 fish at Grist Lake (Table 2). Additionally, there was a total yield of 106 (95% CI = 80 – 136) Lake Trout at Grist Lake.

Table 2. Summary of 2009 harvest, release, and yield data from Christina, Ethel, Fickle, Grist, Hilda, and Shiningbank lakes, Alberta. Means and associated 95% confidence intervals (95% CI) were estimated using bootstrap techniques.

Species	Lake	Fish Harvested		Fish Released		Total Yield	
		Mean	95% CI	Mean	95% CI	Mean	95% CI
Walleye	Christina	n/a	-	2,533	2,406 – 2,646	127	112 – 143
	Ethel	n/a	-	2,292	1,303 – 3,591	115	65 – 180
	Fickle	n/a	-	6,827	5,997 – 7,717	341	300 – 386
	Hilda	83	47 – 138	3,998	2,134 – 6,303	287	153 – 453
	Shiningbank	n/a	-	168	121 – 226	8	6 – 11
Northern Pike	Christina	124	118 – 129	4,306	4,094 – 4,498	339	307 – 372
	Ethel	100	57 – 157	7,407	4,211 – 11,603	471	268 – 737
	Fickle	0	-	2,434	2,138 – 2,752	122	107 – 138
	Grist	21	16 – 27	296	223 – 379	36	27 – 46
	Hilda	175	93 – 276	4,961	2,648 – 7,822	423	226 – 667
	Shiningbank	20	14 – 27	9,604	6,918 – 12,966	500	360 – 675

## Conclusions

In general, angler effort varied among the study lakes, being highest at Fickle Lake and lowest at Christina and Grist lakes; Ethel, Hilda and Shiningbank lakes were intermediate. Catch rate of Walleye was higher at Fickle and Hilda lakes and lowest at Shiningbank Lake. In contrast, catch rate of Northern Pike was highest at Shiningbank Lake and lowest at Fickle and Grist lakes. Total yield of Walleye was highest at Fickle Lake, intermediate at Christina, Ethel and Hilda, and lowest at Shiningbank Lake. No Walleye were captured in Grist Lake; however, total yield of Lake Trout was 106 fish. Total yield of Northern Pike was higher at Christina, Ethel, Hilda and Shiningbank lakes than at Fickle and Grist lakes. This information will facilitate future decisions regarding harvest regulations and angling pressure.

## Communications

- Report prepared for ACA’s Conservation Report Series: Sport Fishery Surveys: Christina, Ethel, Fickle, Grist, Hilda and Shiningbank lakes, Alberta, 2009 (in preparation).

## 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.

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

van Poorten, B.T., M.A. Hawkshaw, E.A. Parkinson, and C.J. Walters. Unpublished. Evaluation of commercially available cameras for use in monitoring recreational angling effort. Fisheries Centre, University of British Columbia, 2202 Main Hall, Vancouver, British Columbia, Canada, V6T 1Z4.



Creel attendant and Alberta Conservation Association employee, Jessica Parker, with test-angled Lake Trout at Grist Lake. (Photo: Shane Wood)



Alberta Conservation Association employee, Shane Wood, collecting biological data from a large Northern Pike. (Photo: Bill Patterson)



Alberta Conservation Association employees, Jessica Parker and Shane Wood, loading boat, and a view from the launch at Christina Lake. (Photo: Bill Patterson)