UNNAMED LAKE (KEITH LAKE - Richardson Backcountry) FALL WALLEYE INDEX NETTING SURVEY, 2010

Fisheries Management
Waterways-Lac La Biche Area

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Abstract

No walleye were caught during the survey and only 32 fish from two species were caught. The catch was evenly split between northern pike (n=16) and lake whitefish (n=16).

The catch rate for northern pike was 3.4 fish/100 m^2/24 hr (95% C.I. 2.1-4.7). Northern pike total lengths (n=16) ranged from 520 to 970 mm with fish over 630 mm representing 75% of the catch..

The catch rate for lake whitefish was 3.4 fish/100 m^2/24 hr (95% C.I. 2.1-4.7). Lake whitefish total lengths ranged from 240 to 460 mm.

Introduction

Alberta Environment and Sustainable Resource Development develops and implements strategies to sustainably manage fish populations and provide opportunities for harvest when suitable. Monitoring is required to evaluate the effectiveness of these strategies and to develop alternate strategies where evidence supports change. During Fall Walleye Index Netting (FWIN) our objective is to estimate relative abundance, population structure and growth of walleye, and also collect data on other species. These data are essential to provide sustainable harvest allocations for sport fish. This FWIN survey was conducted in September 2010 to determine abundance, structure, and reproduction (recruitment) of the walleye (*Sander vitreus*) population in an Unnamed Lake (UTM 493544E 6419575N Zone 12) in the Richardson Backcountry known locally as Keith Lake.

Methods

This FWIN survey was conducted from September 17-18, 2010. A comprehensive description of equipment and methodology can be found in the Manual of Instructions Fall Walleye Index Netting (FWIN) (Morgan 2002). The FWIN nets consisted of eight panels, 7.62 m in length and 1.83 m in height with stretched mesh sizes of 25, 38, 51, 64, 76, 102, 127, and 152 mm. Nets were set at four sites randomly selected and weighted by depth stratum. Nets were set for 24 hrs (± 3 hours) before being cleared of fish and reset at new locations. Surface water temperatures ranged from 9 to 9.6^{o}C when nets were set. Set and pull times were recorded. Nets were set perpendicular to depth contours, and minimum and maximum depths were recorded. Net locations were recorded in Universal Transverse Mercator (UTM) projection coordinates using the North American Datum 1983 (NAD 83) on handheld GPS units.

All fish species were kept for biological sampling. Catches were recorded by net location and mesh size. A net ID, date, mesh size, and count of each species of fish caught were recorded for each panel for catch-per-unit-effort (CPUE) calculations. All fish were measured for fork length (FL), and total length (TL) to the nearest millimetre, and weighed in grams, with individual data recorded on a sample envelope for each fish. Walleye, northern pike (*Esox lucius*),and lake whitefish (*Coregonus clupeaformis*) were examined for gender and maturity, and a bony structure was removed for ageing. Cleithrum were collected from northern pike and scales from the lake whitefish and aged following the criteria in Mackay et al. (1990). Growth was described using the von Bertalanffy growth model in FAMS 1.0 (Slipke 2010).

Relative abundance expressed as CPUE was calculated as number of fish caught/100 m^2/ 24 hours with 95% confidence intervals empirically determined by bootstrapping catches to 10,000 replications (Haddon 2001).

Interpretations of the walleye population status are based on criteria contained in the *Alberta's Walleye Management Recovery Plan* (Berry 1996, Sullivan 2003) modified for FWIN (Watters and Davis 2004).

The raw data is stored digitally in the Fish and Wildlife Management Information System (FWMIS), project # 14753.

Results

No walleye were caught during the survey and only 32 fish from two species were caught (Table 1). The catch was evenly split between northern pike (n=16) and lake whitefish (n=16) (Table 1).

The catch rate for northern pike was 3.4 fish/100 m^2/24 hr (95% C.I. 2.1-4.7) (Table 2). Northern pike total lengths (n=16) ranged from 520 to 970 mm with fish over 630 mm representing 75% of the catch (Figure 1). The northern pike were spread out over the size range and were not concentrated in any size category. There were seven age-classes present (ages 3-4, 6 & 9-12) (Figure 2). The abundance of all year classes was low and less than one fish/100 m^2/24 hr (Figure 2).

The catch rate for lake whitefish was 3.4 fish/100 m^2/24 hr (95% C.I. 2.1-4.7) (Table 2). Lake whitefish total lengths ranged from 240 to 460 mm (Figure 3). The lake whitefish were spread out over the size range and were not concentrated in any size category. There were ten age-classes present (ages 0, 2-8, 10 & 11), with age-class five being the most abundant (Figure 4). The abundance of all year classes was low and less than one fish/100 m^2/24 hr (Figure 4).

Interpretation

There appears to be no walleye in Keith Lake and low to moderate populations of northern pike and lake whitefish. These very small lakes lakes in this area are generally oligitrophic (have very low nutrients) and have naturally low productivities. These populations are on the northern edge of the walleye's natural distribution.

Table 1. Species catch summary by site, Keith Lake, September 2010.

Site	Lift Date (2010)	Stratum	UTM Easting[a]	UTM Northing[a]	Set Duration (hours)	Number of fish caught		
						LKWH	NRPK	Total
KL13	Sept 18	shallow	493544	6419575	24.88	4	5	9
KL14	Sept 18	shallow	494088	6420152	25.02	6	3	9
KL16	Sept 18	shallow	494778	6419023	25.42	2	5	7
KL23	Sept 18	shallow	494408	6419494	25.17	4	3	7
				Grand Total		16	16	32

[a] UTM 12U, NAD 83 map datum

Table 2. Species catch rates from the 2010 Keith Lake FWIN survey.

Species	CPUE	95% CI
Lake whitefish	3.4	(2.1-4.7)
Northern pike	3.4	(2.6-4.3)

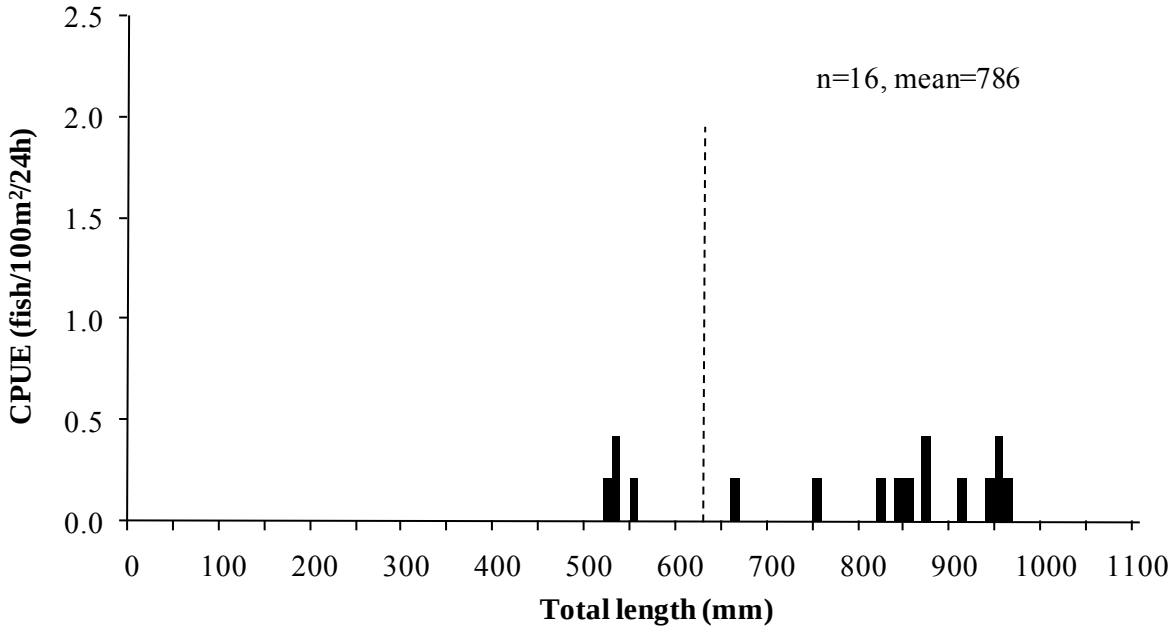

Figure 1. Northern pike total length frequency distributions from the 2010 FWIN survey on Keith Lake. Dashed line denotes the 63 cm TL minimum size limit

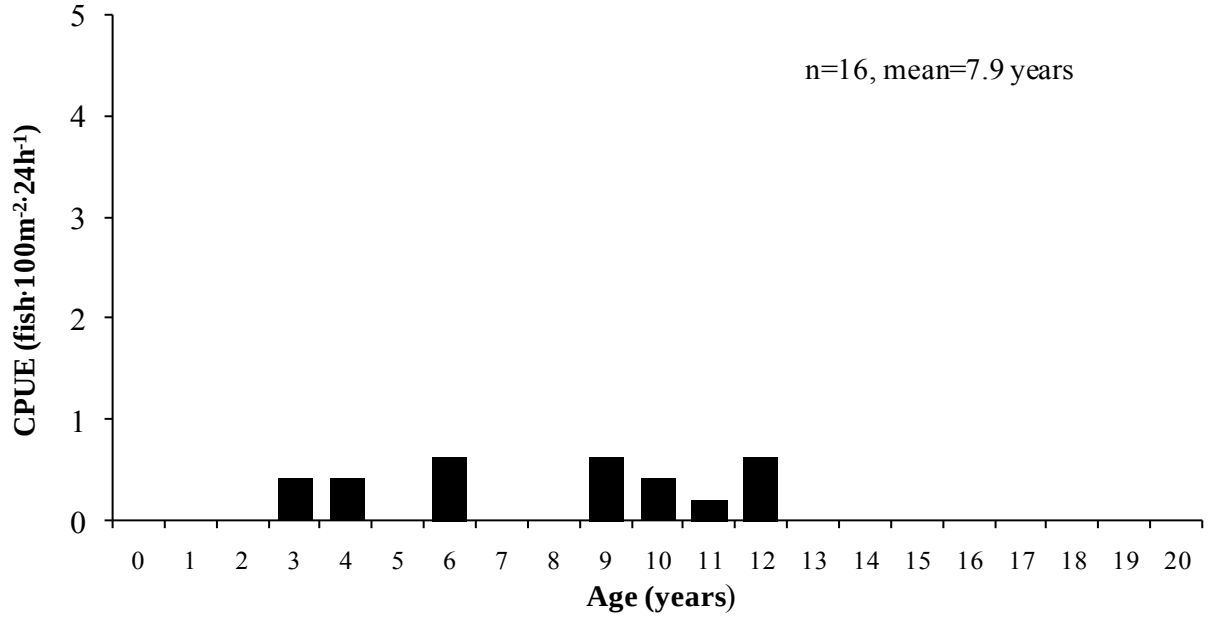

Figure 2. Northern pike age frequency distributions from the 2003 and 2010 FWIN surveys on Keith Lake.

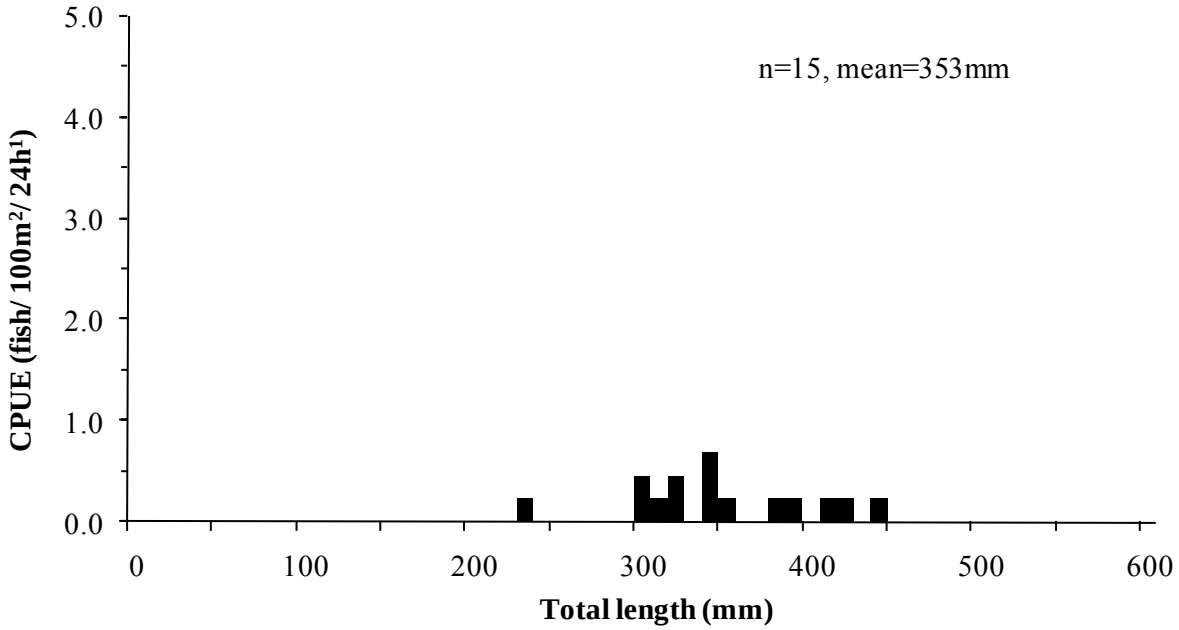

Figure 3. Lake whitefish total length frequency distribution from the 2010 FWIN surveys on Keith Lake.

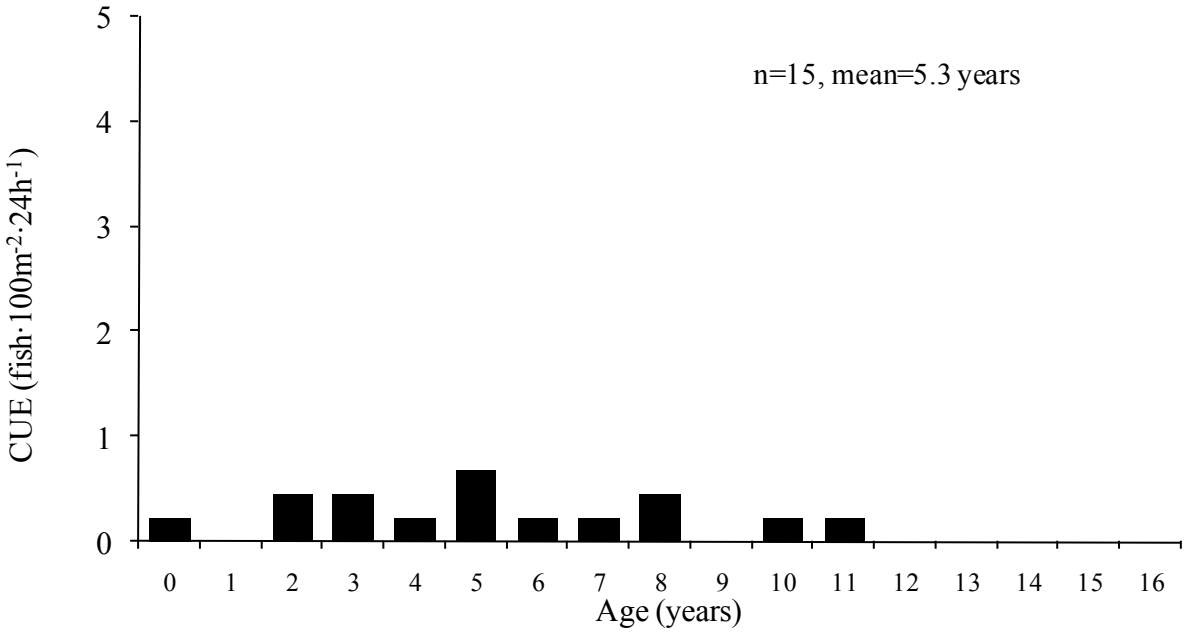

Figure 4. Lake whitefish age frequency distributions from the 2010 FWIN survey on Keith Lake.

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Literature Cited

Berry, D.K. 1996. Alberta's walleye management and recovery plan. Alberta Environmental Protection, Natural Resources Service. Number T/310. 32 pp.

Mackay, W.C., G.R. Ash, and H.J. Norris (eds.). 1990. Fish ageing methods for Alberta. R.L.& L. Environmental Services Ltd. in assoc. with Alberta Fish and Wildl. Div. and Univ. of Alberta, Edmonton. 113 p.

Morgan, G.E. 2002. Manual of instructions – fall walleye index netting (FWIN). Percid Community Synthesis, Diagnostics and Sampling Standards Working Group. Ontario Ministry of Natural Resources. 34 p.

Slipke, J. W. 2010. Fishery Analyses and Modeling Simulator (FAMS 1.0).

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, 2003.

Watkins, Owen B. and Stephen C. Spencer 2010. Collection, preparation and ageing of walleye otoliths. Fish and Wildlife Division, Alberta Sustainable Resource Development. 14pp.

Watters, D. and C. Davis. 2004. Calling Lake Walleye Status Assessment and Comparison of Fall Walleye Index Netting Surveys in 2001 and 2002. Fisheries Management Division Technical Report. Alberta Sustainable Resource Development. 36 pp.