Kirby Lake Fall Walleye Index Netting, 2011

Fisheries Management
Waterways/Lac La Biche

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Abstract

A Fall Walleye Index Netting (FWIN) survey was conducted on Kirby Lake from September 21 to 23, 2011. A total of 756 fish of 5 species were caught, including 73 northern pike, 211 yellow perch, 368 lake whitefish, and 76 cisco. The catch rate for northern pike was 6.8 fish/100m^2/24 hours (95% confidence interval 4.0 –10.0). Pike total lengths ranged from 223 to 940 mm (n = 73), and pike over 630 mm made up 70% of the sample. Eighty-six percent of captured northern pike were mature; both males and females began maturing at age 2. Male pike reached a mean total length of 630 mm by age four and females by age three.

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Introduction

Alberta Environment and Sustainable Resource Development implements strategies to sustainably manage fish populations and provide sustainable harvest allocations for sport fish. Monitoring is required to evaluate the effectiveness of these strategies. The Lac La Biche area Fisheries Management team conducted a Fall Walleye Index Netting (FWIN) survey on Kirby Lake during the third week of September 2011. The purpose of this survey was to assess the presence and relative abundance and population structure of sport fish species. Species known to inhabit Kirby Lake include northern pike (*Esox lucius*) yellow perch (*Perca flavescens*), lake whitefish *(Coregonus clupeaformis*), white sucker *(Catostomus commersoni),* and burbot (*Lota lota*).
The current sportfishing regulation on Kirby Lake allows an angler to retain 3 northern pike over 630 mm total length.

Methods

This FWIN survey was conducted from September 21 to 23, 2011. A comprehensive description of equipment and methodology can be found in the Manual of Instructions Fall Walleye Index Netting (FWIN) (Morgan 2002). Twelve sampling locations were used for this survey (Table 1). These sites were selected randomly and were weighted by depth stratum. The FWIN nets consisted of eight panels, were the standard length of 7.62 m, and 1.83 m in height with stretched mesh sizes of 25, 38, 51, 64, 76, 102, 127, and 152 mm. Two additional panels of 12 and 19 mm stretched mesh were attached but separated from the standard gang by ten meter leads to collect data for an ongoing regional forage study. Nets were set for approximately 24 hours before being cleared of fish and reset at a new location. Nets were set perpendicular to depth contours, and minimum and maximum depths were recorded. Net location were recorded in Universal Transverse Mercator (UTM) projection coordinates using the North American Datum 1983 (NAD 83) on handheld GPS units. Surface water temperature was also recorded for most net locations, and ranged between 12.0-14.0 °C.

All fish species were kept for data collection. 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 (CUE) calculations. Data was collected, including fork and total length (to the nearest millimetre) and weight (in grams) for all species, as well as sex and maturity from all sportfish. Bony aging structures were also collected from sport fish for age determination. Otoliths were collected from perch and lake whitefish. Cleithra were collected from northern pike and were aged following the criteria in Mackay et al. (1990).

For the analysis, only data from fish caught in the standard eight panel FWIN nets is presented in this report. The supplemental 12 and 19 mm mesh panels are not relevant to this FWIN survey. Relative abundance expressed as CUE was calculated as number of fish caught/100 m^2/net/24 hours with 95% confidence intervals empirically determined by bootstrapping catches to 50,000 replications. Growth was described using the von Bertalanffy growth model in FAMS 1.0 (Slipke 2010).

All statistics are reported to the standard fish/100m^2/24hrs. The raw data from this FWIN survey, including the supplemental 12 and 19 mm panels, is stored digitally in the Fish and Wildlife Management Information System (FWMIS) under Project ID # 15858.

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Results

A total of 756 fish of five species were caught during this FWIN (Appendix 1). The catch rate for northern pike was 6.8 fish/100m^2/24 hours (95% confidence interval 4.0 – 10.0) and the catch rate for yellow perch was 19.2 fish/100m^2/24 hours (95% CI. 14.6 – 24.1) (Table 1).

Northern pike total lengths ranged from 223 mm to 940 mm (n = 73, Figure 1) and 70% of sampled pike were over 630 mm total length, which is the minimum harvestable size limit for Kirby Lake.

Northern pike ages ranged from one to twelve years old. The largest age classes were the two- and four-year classes with catch rates of at 1.3 and 1.2 fish/100m^2/24 hours, respectively (Figure 3).These two classes represent 37% of the sample. The average age of sampled pike was 5.2 years. Eighty-six percent of captured northern pike were mature (63 of 73). Based on the minimum ages-at-maturity present in the sample, both female and male northern pike started maturing at 2 (Figures 3 and 4). All pike aged four years or older were mature. Female northern pike reached 630 mm total length at approximately age 3 and males shortly after at age 4 (Figure 5).

Other species caught included 211 yellow perch (*Perca flavescens*), 368 lake whitefish (*Coregonus clupeaformis*), 76 cisco (*Coregonus artedi*), and 28 white suckers (*Catostomus commersoni*) (Appendix1). Yellow perch samples were not aged, but total lengths ranged from 100 mm to 205 mm and averaged 139 mm.

Table 1. Species catch rates from the 2011 Kirby Lake FWIN survey.

Species	CUE (fish/100m^2/24 hours)	95% C.I.
NRPK	6.8	4.0 – 10.0
YLPR	19.2	14.6 – 24.1
LKWH	33.2	22.8 – 43.7
CISC	6.8	1.2 – 12.9

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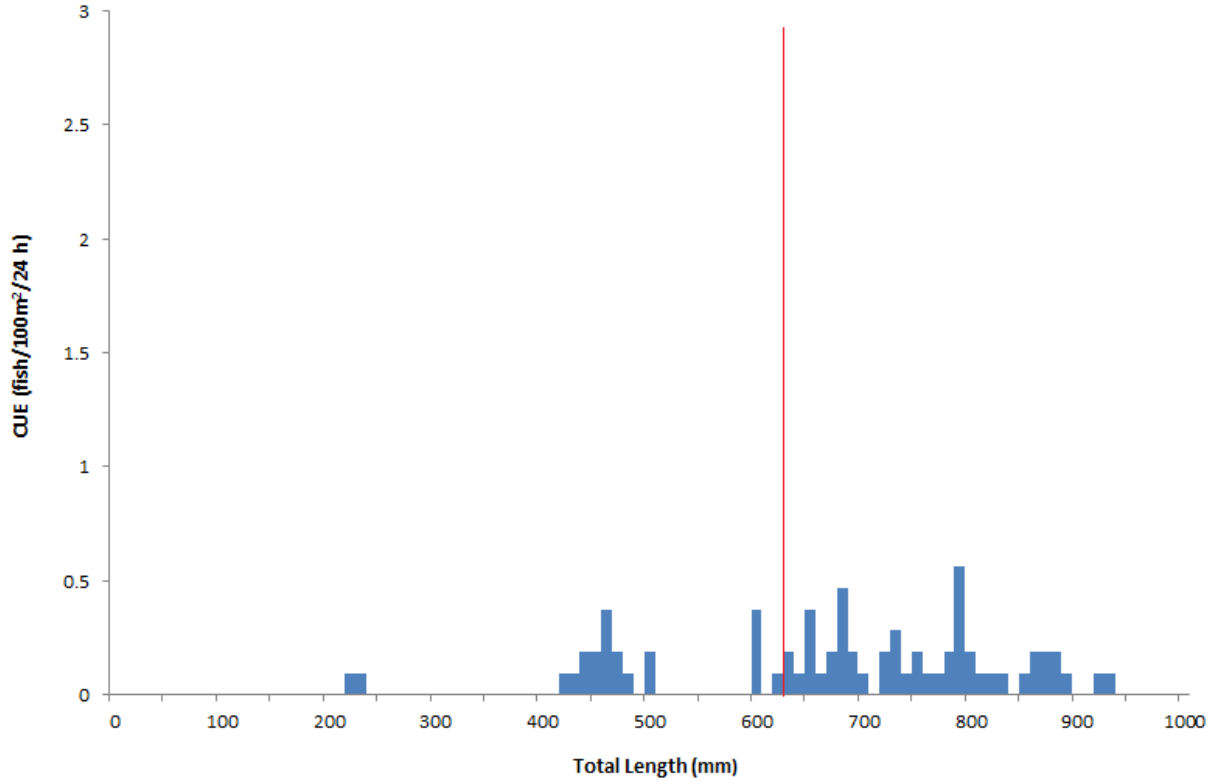

Figure 1. Total length distribution of northern pike sampled during the 2011 Kirby Lake FWIN survey (n=73).

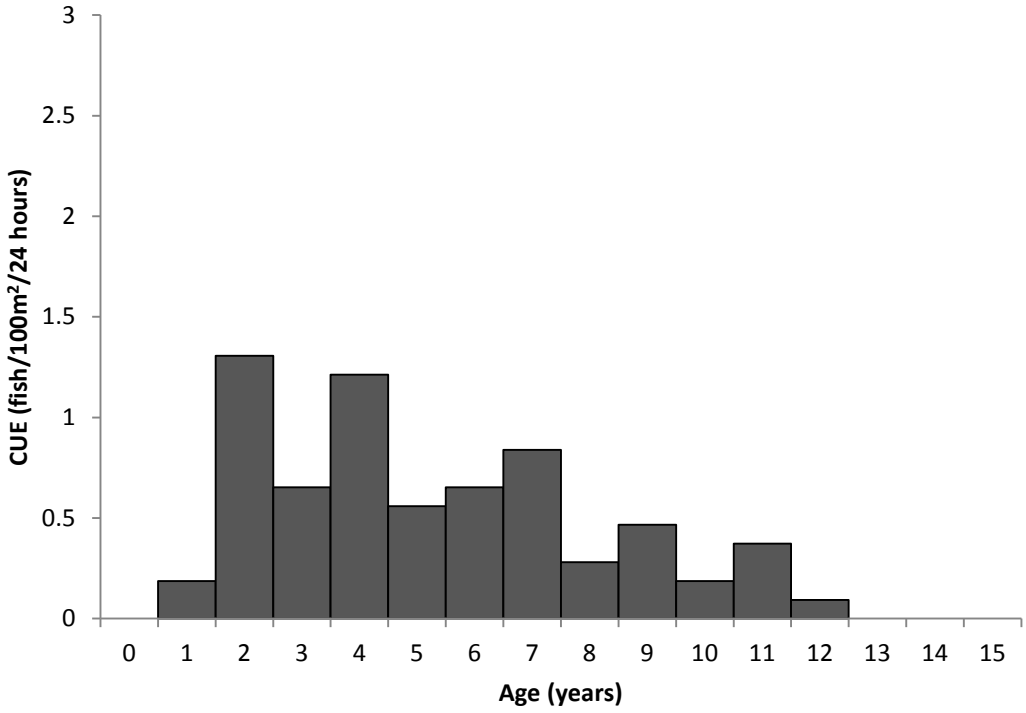

Figure 2. Age distribution of northern pike sampled during the 2011 Kirby Lake FWIN survey (n=73).

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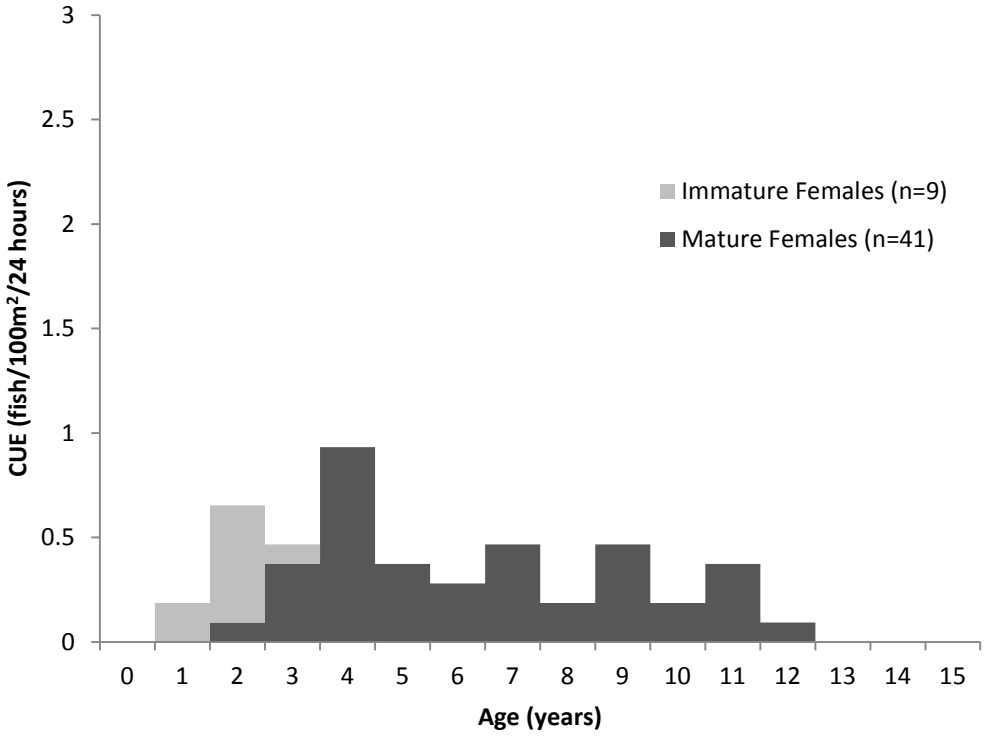

Figure 3. Age-at-maturity distributions for female northern pike caught during the 2011 Kirby Lake FWIN survey.

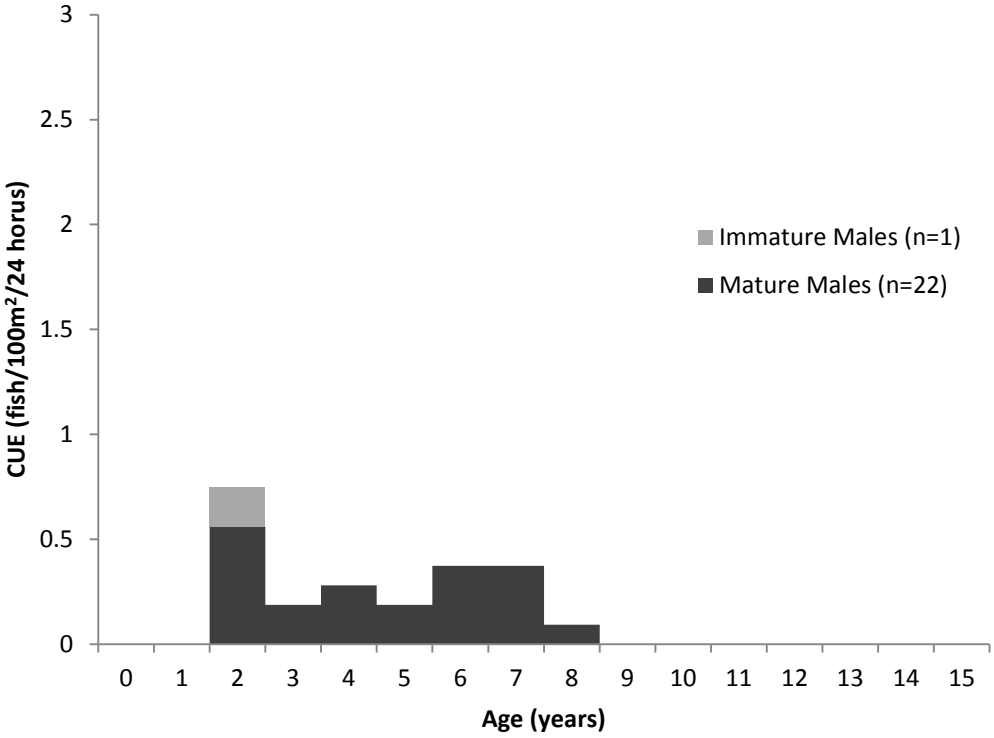

Figure 4. Age-at-maturity distributions for male northern pike caught during the 2011 Kirby Lake FWIN survey.

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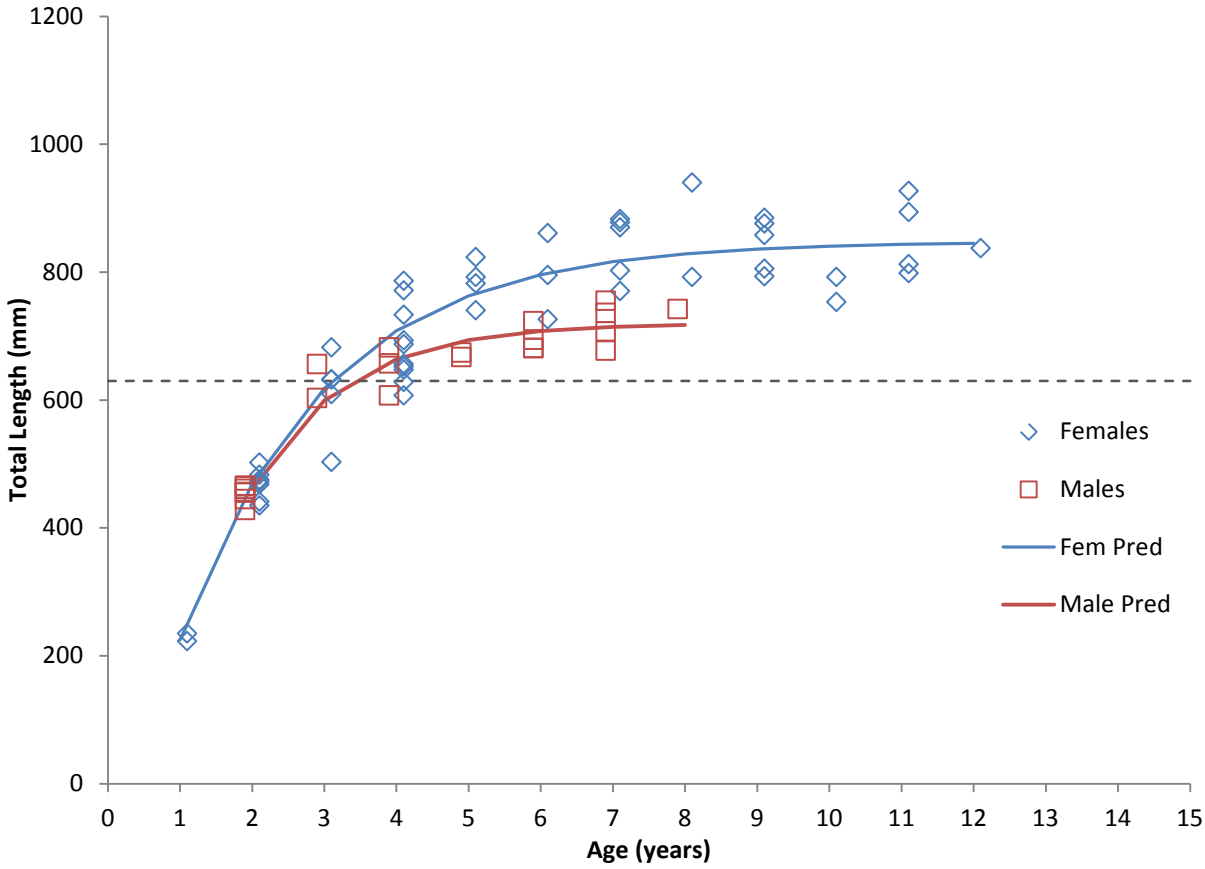

Figure 5. Total length-at-age for Kirby Lake northern pike from the 2011 Kirby Lake FWIN survey (Females: L_{inf} = 847.525, K = 0.499, t_o = 0.381, R^2 = 0.98, Prob > F= 0.0001; Males: L_{inf} = 720.00, K = 0.761, t_o = 0.652, R^2 = 0.95, Prob > F= 0.0002).

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Appendix 1. 8 panel catch summary from the Kirby Lake FWIN survey September 21 to 23, 2011. Set coordinates are Universal Transverse Mercator Zone 12, North American Datum 83.

Set Number	UTM E	UTM N	Lift Date/Time	Soak Time (h)	Max Depth (m)	Min Depth (m)	Number of Fish Caught					
							CISC	LKWH	NRPK	WHSC	YLPR	Set Total
KL 01	515366	6147322	22-Sep-11	24.90	4.2	2.0	22	19	10	6	17	74
KL 02	514048	6146732	22-Sep-11	23.10	9.5	9.2	0	57	5	0	33	95
KL 03	515016	6148347	22-Sep-11	26.23	9.8	8.9	0	46	2	2	14	64
KL 04	513441	6146565	22-Sep-11	22.42	5.0	2.5	1	12	2	2	14	31
KL 05	514755	6146448	22-Sep-11	24.03	5.0	2.8	1	13	11	4	21	50
KL 06	514516	6148511	22-Sep-11	26.82	3.8	2.0	0	15	16	0	14	45
KL 07	516114	6147351	23-Sep-11	22.08	2.5	2.5	2	4	7	1	11	25
KL 08	515773	6148257	23-Sep-11	21.32	10.0	9.4	1	48	1	0	9	59
KL 09	515513	6147728	23-Sep-11	22.18	10.8	9.9	0	48	1	0	17	66
KL 10	514224	6148116	23-Sep-11	21.62	7.4	5.5	24	22	8	2	7	63
KL 11	513232	6145947	23-Sep-11	23.37	3.7	2.9	22	43	6	0	29	100
KL 12	513975	6147493	23-Sep-11	22.95	5.0	2.0	3	41	4	11	25	84
						Total	76	368	73	28	211	756

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