Alberta Government

Fall Walleye Index Netting at Wizard Lake, Alberta, 2010

Fisheries Biologist(s): Jason Cooper, Kelly Dick – Fisheries Management, Red Deer

Disclaimer
This is a summary report prepared for public distribution by Alberta Environment and Sustainable Resource Development, Fisheries Management Branch. This report has been peer reviewed, but may be subject to revision pending further data analysis.

Abstract

No Walleye were caught during the Fall Walleye Index Netting (FWIN) survey at Wizard Lake, but a total of 174 fish representing four other species were captured. Northern Pike were the most abundant species in the FWIN nets accounting for 57% of the catch. Individual net catches were variable ranging from 13 to 22 Northern Pike. The catch-per-unit effort (CPUE) for Northern Pike was 14.9 fish·100m^{-2}·24hrs^{-1} (95% C.I. 12.9–17.0). Northern Pike total lengths (TL) (n=100) ranged from 339 to 599 mm and there were 8 age-classes present (ages 3 to 10).

The CPUE for Yellow Perch was 1.0 fish·100m^{-2}·24hrs^{-1} (95% C.I. 0.4–1.6). Yellow Perch TLs (n=7) ranged from 92 to 154 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 (*Sander vitreus*), and in addition collect data on other species. Although FWIN is not designed specifically for managing and estimating abundance of other sport fish species, FWIN surveys have been useful as a tool in assessing and monitoring those populations as well. These data are essential to provide sustainable harvest allocations for sport fish, and provides insight into the current management strategies by comparing the results from previous FWIN surveys. This FWIN survey was conducted in September 2010 to determine if a Walleye population was still present in Wizard Lake following historical stockings of nearly 1.1 million fry over four years (1949, 50, 51, 53) to establish a self sustaining population. In addition, this survey provided updated data for future assessments of the status of Northern Pike (*Esox lucius*). The FWIN survey is still being developed as an assessment tool for Northern Pike, as such the information summarized and presented are therefore preliminary and form a benchmark to assess future trends and changes to this population.

Methods

This FWIN survey was conducted on September 26 and 27, 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 6 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. Set and pull times were recorded. 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 at all net locations, and ranged between 11.6 and 11.9°C.

All fish species were kept for biological sampling. Catches were recorded by net location and mesh size. Net identification, 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. Northern Pike and Yellow Perch (*Perca flavescens*) were examined for gender and maturity, and a bony structure was removed for ageing. Otoliths were collected from Yellow Perch and aged following criteria in Watkins and Spencer (2009). Cleithra were collected from Northern Pike and aged following the criteria in Mackay et al. (1990).

Relative abundance expressed as CPUE was calculated as number of fish caught$\cdot100m^{-2}\cdot24hrs^{-1}$ with 95% confidence intervals empirically determined by bootstrapping catches to 50,000 replications (Haddon 2001).

The raw data is stored digitally in the Fish and Wildlife Management Information System (FWMIS), project # 14714.

Results

No Walleye were caught during the 2010 Fall Walleye Index Netting (FWIN) survey at Wizard Lake, but a total of 174 fish representing four other species were captured (Table 1). Northern Pike were the most abundant species in the FWIN nets accounting for 57% of the catch. Individual net catches were variable ranging from 13 to 22 Northern Pike. The catch-per-unit effort (CPUE) for Northern Pike was 14.9 fish$\cdot100m^{-2}\cdot24hrs^{-1}$ (95% C.I. 12.9–17.0) (Table 2). Northern Pike total lengths (TL) (n=100) ranged from 339 to 599 mm and the majority of fish captured were in the 470 to 580 mm TL size category (Figure 1). There were 8 age-classes present (ages 3 to 10), with 3 stable age-classes (> 3 fish$\cdot100m^{-2}\cdot24hrs^{-1}$) of 5, 6 and 7-year-olds (Figure 2). The most abundant age-classes were the 6-year-olds, which represented 35% of the catch and the mean Northern Pike age was 6.0 years.

The CPUE for Yellow Perch was 1.0 fish$\cdot100m^{-2}\cdot24hrs^{-1}$ (95% C.I. 0.4–1.6). Yellow Perch TLs (n=7) ranged from 92 to 154 mm (Figure 3).

Interpretation

The Northern Pike population was composed entirely of small individuals, with no fish exceeding the minimum size limit of 63 cm TL. Recruitment appears consistent with a wide age-class distribution and three stable age-classes of reproductively mature individuals. The catch rate of Northern Pike was relatively high in comparison to other Alberta lakes. Growth rates appear to be slow and maximum size is quite low when compared to with other lakes in the region. The data suggests that the Northern Pike population at Wizard Lake is in a stable condition and the data collected provides a baseline in which to assess future trends for this population.

The catch rate of Yellow Perch was low and size class distribution was generally small and narrow suggesting that this population could be in a collapsed state.

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

Set Number	Lift Date (2010)	Stratum	UTM Easting	UTM Northing	Meridian	Soak Time (h)	BURB	NRPK	WHSC	YLPR	Set Total
4C	27-Sep	Shallow	304384	5888881	-117 (Zone 12)	24.25	1	14	21	2	38
5B	27-Sep	Shallow	305508	5888677	-117 (Zone 12)	24.25		17	15	2	34
6C	27-Sep	Deep	306261	5888349	-117 (Zone 12)	24.25		22	7		29
7C	27-Sep	Deep	307250	5888424	-117 (Zone 12)	24.00		18	10	1	29
8A	27-Sep	Deep	308250	5888732	-117 (Zone 12)	24.00		16	6		22
9D	27-Sep	Deep	309799	5888259	-117 (Zone 12)	24.00		13	7	2	22
Species Total							1	100	66	7	174

Table 2. Species catch rates from the 2010 Wizard Lake FWIN surveys.

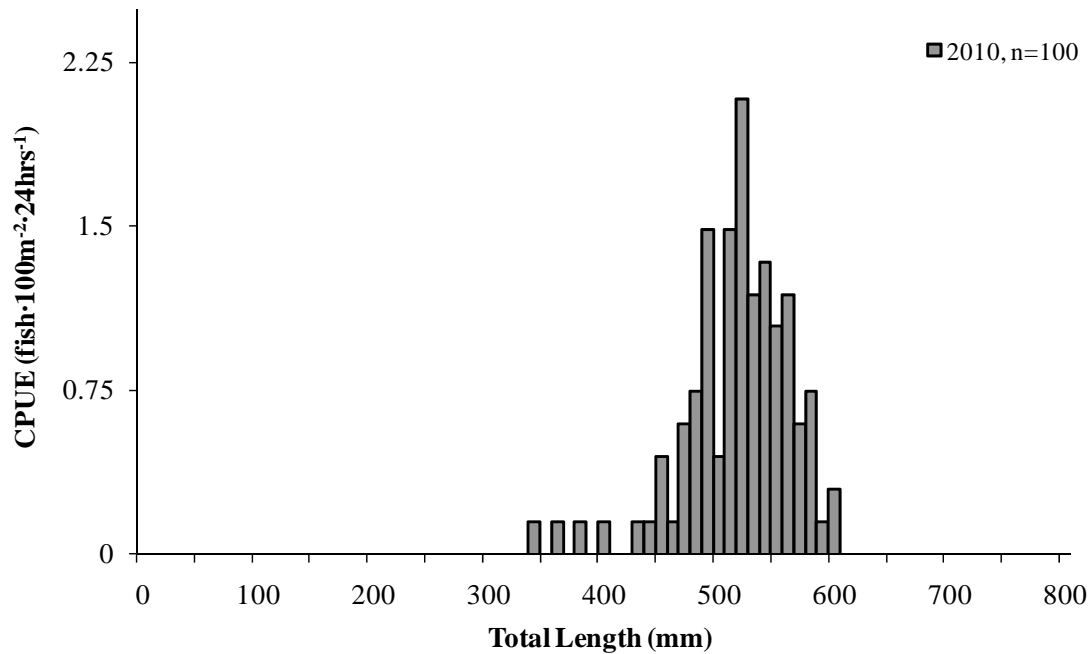| Species	Year	CPUE	95% CI
BURB	2010	0.1	(0.0 - 0.4)
NRPK	2010	14.9	(12.9 - 17.0)
WHSC	2010	9.8	(6.4 - 13.9)
YLPR	2010	1.0	(0.4 - 1.6)

Figure 1.   Northern Pike total length frequency distribution from the 2010 FWIN survey on Wizard Lake.
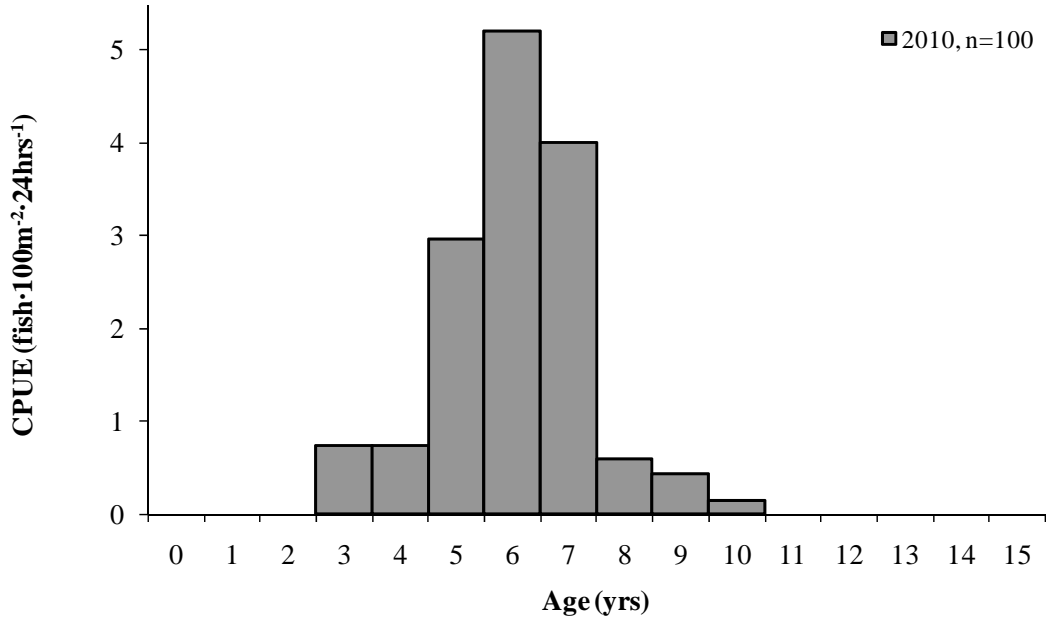
Figure 2.   Northern Pike age frequency distributions from the 2010 FWIN survey on Wizard Lake. Mean age was 6.0 years.
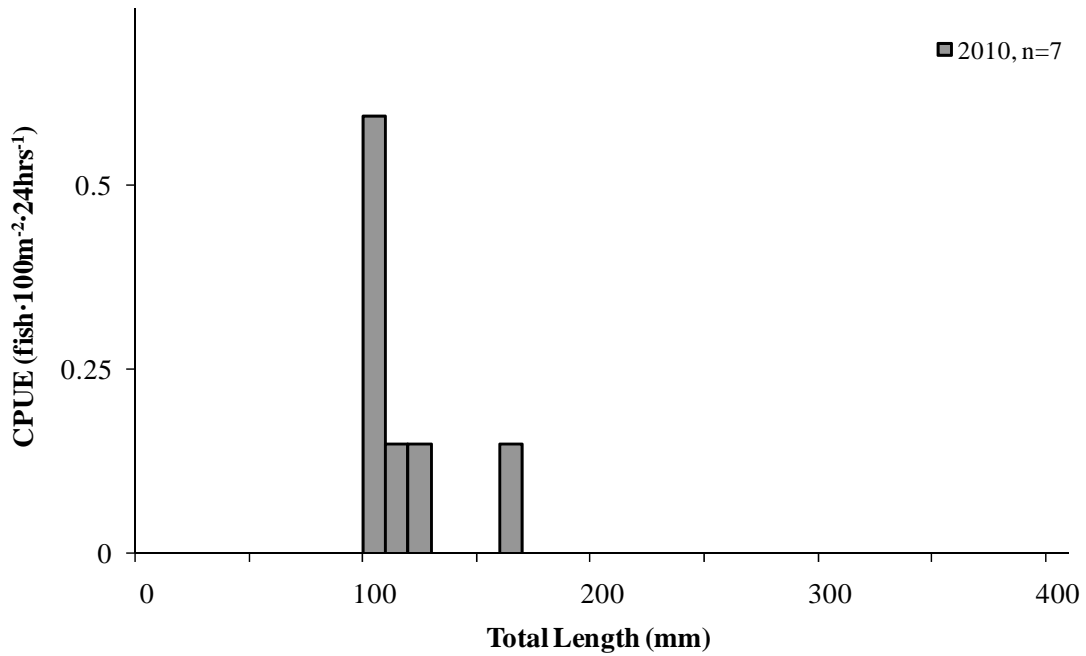

Figure 3.   Yellow Perch total length-frequency distribution from the 2010 FWIN survey on Wizard Lake.

Literature Cited

Haddon, M. 2001. Modeling and quantitative methods in fisheries. Chapman & Hall/CRC, Boca Raton, London, New York, Washington D.C., 406 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.

Watkins, O.B. and S.C. Spencer. 2009. Collection, preparation and ageing of walleye otoliths. Fish and Wildlife Division Technical Report. Alberta Sustainable Resource Development. 40 pp.