

Buck Lake Fall Walleye (*Sander vitreus*) Index Netting Survey, 2008

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ABSTRACT

The 2008 Fall Walleye Index Netting Survey (FWIN) of Buck Lake was conducted from September 18, 2008 to September 19, 2008. The objectives of the survey included estimating catch per unit effort and assessing various population dynamics (such as age, growth rate, and reproductive status) to monitor the effects of management and maintain or improve the status of the Walleye population at this location. In total 261 Walleye were caught at Buck Lake in 2008, with a mean catch per unit effort of 35.4 Walleye/100m²/24h. The mean fork length for this species was 368 mm, and Walleye were caught ranging from 165 mm to 487 mm. Walleye had attained 500 mm in total length by ten years of age. A wide range of ages were represented in the sample (from 1 to 19 years), and the mean age was 6.8 years. Female Walleye were entirely mature by nine years of age, while males matured earlier, by the age of four years. A gonadosomatic index of 1.0% separated mature spawning females from immature fish. The growth rate for Walleye sampled at Buck Lake in 2008 resembled previous years in this location. Based on the population parameters outlined in *Alberta's Walleye Management and Recovery Plan (Berry,2005)*, the Walleye population in Buck Lake would be classified as vulnerable in 2008; which represents a decline from the stable status of previous years.

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1.0 INTRODUCTION

Walleye (*Sander vitreus*) are a popular sport fish in Alberta, and have consequently been subjected to high levels of angling pressure. Historically this species was managed on a province-wide basis, which proved ineffective in preventing the decline or collapse of Walleye populations at locations with high levels of angling pressure. Alberta Sustainable Resource Development established *Alberta's Walleye Management and Recovery Plan* (WMRP) (Berry, 1995) in response, with the goals of restoring collapsed and vulnerable populations, and preventing other declines. Under this plan individual populations are classified as stable, vulnerable, or collapsed, and are managed according to their status and exploitation level.

Buck Lake is situated in close proximity to two major population centers (exceeding one million people each) and receives high levels of angling pressure. Harvest levels for sport species must therefore be carefully managed to prevent overharvest and subsequent population decline. As a result sport angling for Walleye has been limited to the possession of 1 Walleye over 43 cm TL.

The 2008 Fall Walleye Index Netting (FWIN) study at Buck Lake was conducted to monitor the overall population status and determine natural recruitment levels, following up on similar assessments conducted from 2005 to 2007. The management status of Buck Lake was classified as stable during these previous studies based on the five biological characteristics of a Walleye population outlined in *Alberta's Walleye Management and Recovery Plan* (WMRP) (Winkel, 2011; Watkins, 2007).

2.0 METHODS

2.1 STUDY AREA

Buck Lake (Township 46, Range 6, West of the 5th Meridian) is located approximately 309 km northwest of Calgary, and 105 km southwest of Edmonton in Alberta (Figure 1). Public access via vehicle is possible from a variety of secondary roads branching from Highway 12 and Highway 22. Buck Lake is eutrophic, with a surface area of 2,540 ha (Mitchell and Prepas 1990). While the primary inlet (Buck Creek) flows into the lake from the southeast, drainage is located at the north end, where Buck Creek eventually merges with the North Saskatchewan River. There is extensive development around the lake, including several cottage developments, camp grounds, and the town of Buck Lake.

Ten fish species occur in Buck Lake. These include: Walleye (*Sander vitreus*), Northern Pike (*Esox Lucius*), Yellow Perch (*Perca Flavescens*), Burbot (*Lota Lota*), Lake Whitefish (*Coregonus Clupeaformis*), White Sucker (*Catostomus Commersoni*), Spottail Shiner (*Notropis Hudsonius*), Brook Stickleback (*Culaea Inconstans*), Trout-Perch (*Percopsis Omiscomaycus*) And Iowa Darter (*Etheostoma exile*) (Mitchell and Prepas 1990).

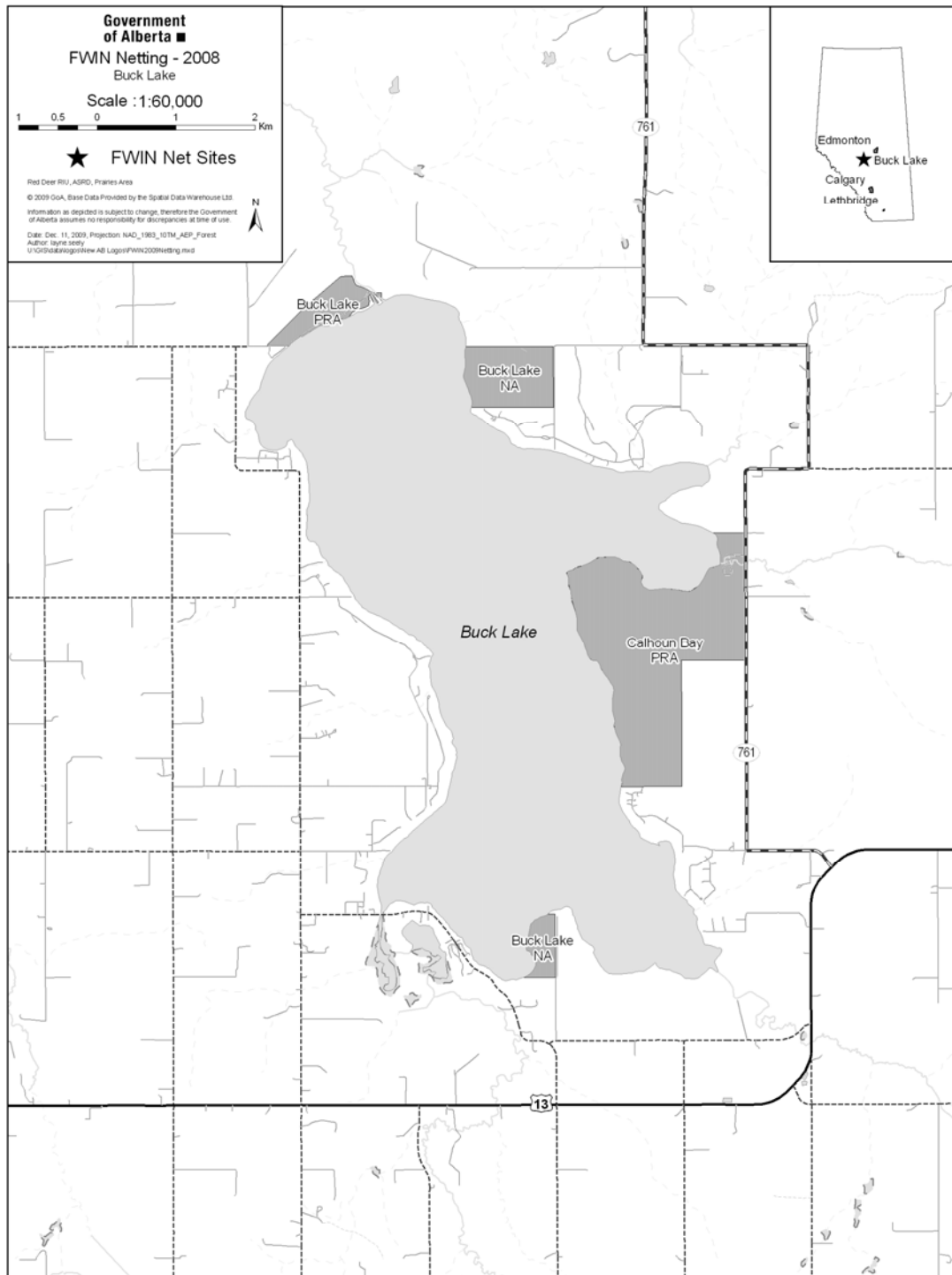


Figure 1. Map of Buck Lake, including 2008 netting locations and location in southern Alberta

2.2 SURVEY METHODS

The Fall Walleye Index Netting (FWIN) protocol developed by the Ontario Ministry of Natural Resources in 2000 was employed to survey Buck Lake in 2007 (Morgan 2000). According to this method, nets are composed of eight ascending panels of different mesh sizes (25 mm, 38 mm, 51mm, 64mm, 76mm, 102mm, 127mm, and 152mm, respectively) without spacers. As a result, the standard FWIN net measures 61.0m long by 1.8 m deep, spanning an area of 109.8m².

Nets were placed in a spatial distribution determined by assigning random locations within depth and distance strata according to the methodology described in Morgan (2000). While this methodology allows for the selection of an alternate location if an inappropriate spot is initially chosen (too shallow, heavily vegetated, or a very steep bottom gradient), all of the randomly generated locations were used in 2007. Three nets were set in the shallow stratum, and five in the deep stratum, for a total of eight nets set for 2007 (Figure 1). In accordance with protocol, nets were set perpendicular to shore for approximately 24 hours.

The catches for individual panels were bagged separately and identified with grid location numbers and mesh sizes. Six species were caught in 2007, including Walleye, Northern Pike, Lake Whitefish, Yellow Perch, White Sucker, and Spottail Shiner. Sport species were visually examined to catalogue hooking injuries and illnesses and subjectively assess their general physical condition (normal weight versus exceptionally fat or thin individuals). Fork length (mm), total length (mm), and weight (mm) were measured, and species specific aging structures were collected (otoliths for Walleye, Lake Whitefish and Yellow Perch, and cleithra for Northern Pike). Gender and sexual maturity for were determined by examination of the gonads, (which for Walleye included weighing the female gonads to the nearest grams). If the gonads were considered to be sufficiently developed for spawning during the following spring fish were classified as mature. Non spawning females were identified by the absence of developing eggs despite the presence of mature gonadal development.

For some of the analysis and comparisons in this report a weighted CUE (catch per unit effort) was used. The weighted CUE is the number of fish caught per net per twenty-four hours. The weighted CUE is calculated using the formula:

$$\text{Weighted_CUE} = \left(\frac{\left(\frac{\text{Number_of_fish} \times 24\text{h}}{\text{Number_of_hours_net_was_set}} \right) \times 100\text{m}^2}{109.8\text{m}^2} \right)$$

Walleye ages were assigned by a modified methodology from that described in MacKay et al. (1990). The first annulus tightly surrounding the focus (indicating one year of age) was identified using the following formula:

$$1^{\text{st}} \text{ annulus} = \frac{rL (\text{age-0 } L)}{L}$$

where:

rL = radius length (distance from the center of the focus to the furthest edge)

Age-0 L = hypothesized length of age-0 Walleye at time sampled

L = length of the sampled Walleye

The von Bertalanffy growth equation was used to calculate growth parameters. The following equation was used:

$$L_t = L_{\infty}(1 - e^{-k(t-t_0)})$$

where:

L_{∞} = maximum theoretical length (fork length infinity) that can be obtained;

k = growth coefficient;

t = time of age in years;

t_0 = is the time in years when length would theoretically be equal to zero and;

e = exponent for natural logarithms.

L_{∞} , t_0 , and k were calculated using the Fishery Analysis and Simulation Tools ver. 2.1 (Slipke and Maceina 2001). The length-at-age data were fitted to the growth model by applying the equation independently to each sample.

All data were analysed and reported on using Microsoft Office 2000 Professional (9.0.7616 SP-3) (MSAccess, MSExcel, MSWord). The data set for this study is stored in the Alberta Sustainable Resource Development *Fisheries and Wildlife Management Information System* database (FWMIS) under project number 13196.

3.0 RESULTS AND DISCUSSION

3.1 Water temperatures and Netting Effort

The (FWIN) at Buck Lake was conducted on September 18 and 19, 2008. Water temperatures varied from 14.3°C to 14.8°C. Eight nets were set for a mean soak time of 23.6 hours (95% CI: 23.1 – 24.0 hours, n=8) (Appendix 1).

3.2 Catch Results

The FWIN catch for 2008 totalled 404 fish, and consisted of six species (Appendix 1). The mean catch was 54.7 fish/100m²/24h (95% CI: 40.0 – 70.8 fish/100m²/24h). Deep sets caught 41.9 fish/100m²/24h (95% CI: 31.2 – 54.4 fish/100m²/24h, n=197), while the shallow sets caught 75.9 fish/100m²/24h (95%CI: 52.8 – 95.9 fish/100m²/24h, n=207). Walleye were the most commonly caught species (n=261, 64.6%), followed by Northern Pike (n=68, 16.8%), Yellow Perch (n=48, 11.9%), and Lake Whitefish (n=20, 4.9%). White sucker (n=4, 1.0%) and Spottail Shiner (n=3, 0.7%) were also caught.

3.3 Walleye Catch Per Unit Effort

During the 2008 FWIN Walleye were caught in all mesh sizes at Buck Lake (Appendix 1). The 51 mm panel had the highest catch (9.4 Walleye/100m²/24h (95% CI: 5.8 – 13.1 Walleye/100m²/24h, n=70). While shallow sets caught a mean of 51.8 Walleye/100m²/24h (95%CI: 32.7 – 63.2 Walleye/100m²/24h) in 2008, deep sets caught a mean of 25.5 Walleye/100m²/24h (95%CI: 14.5 – 36.5 Walleye/100m²/24h). The weighted catch per unit effort for Buck Lake in 2008 was 35.4 Walleye/100m²/24h (95% CI: 22.9 – 48.2 Walleye/100m²/24h), and the catch was normally distributed (Figure 2).

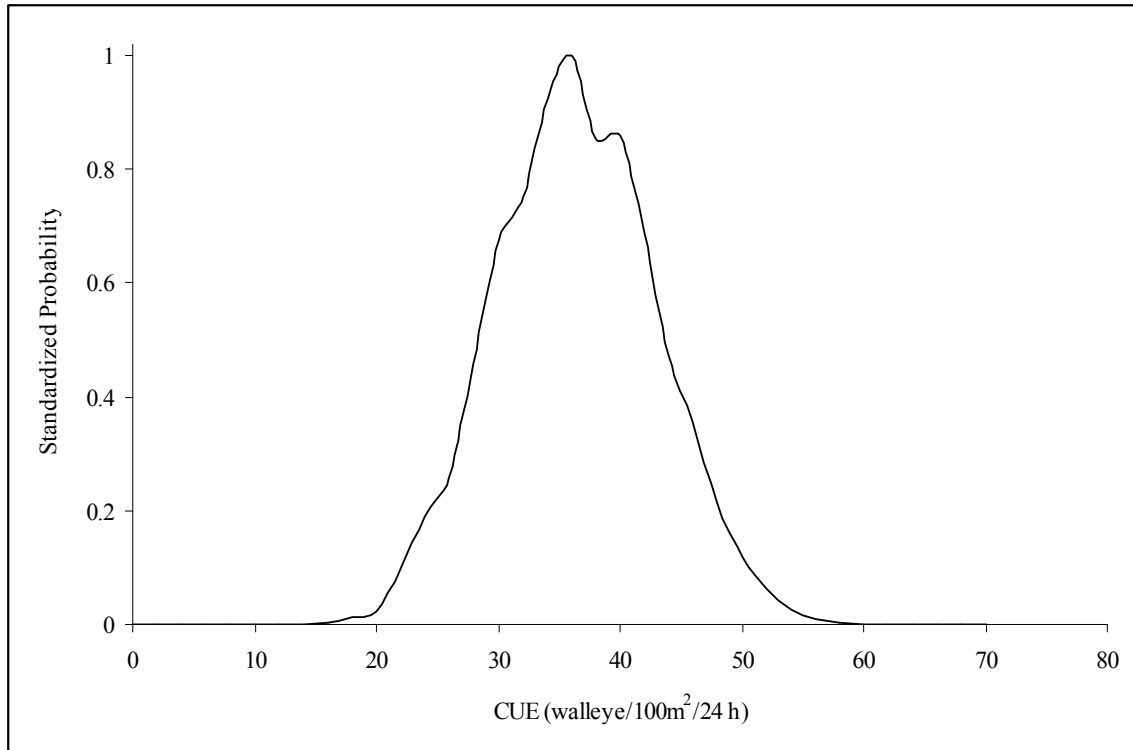


Figure 2. Walleye FWIN catch frequency distribution, Buck Lake 2008.

The catch rate for Walleye at Buck Lake is high in comparison to catch rates elsewhere in Alberta (Figure 3). The 2008 catch rate from Buck Lake was higher than for Pigeon Lake and Pine Lake, but lower than for Battle Lake. The catch for this location was lower than it was in 2004 and 2007, but similar to the catches in 2005 and 2006 Figure 3.

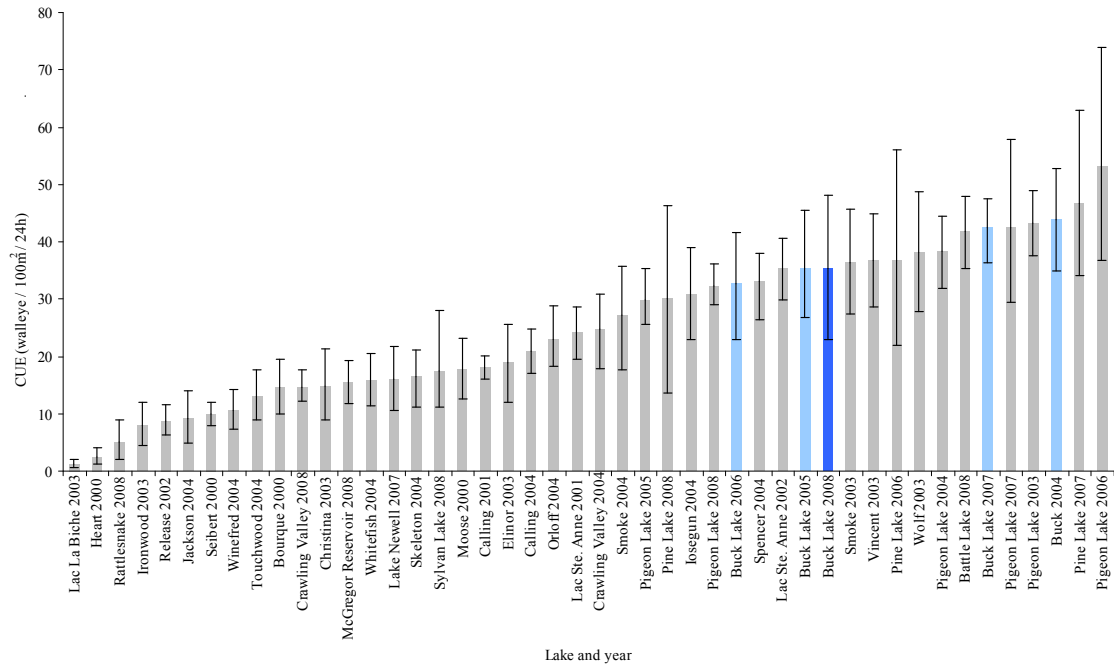


Figure 3. FWIN catches of Walleye from 46 Alberta lakes from 2000-2008. Error bars depict 95% confidence intervals.

3.4 Walleye Fork Length Frequency Distribution

In 2008 the Walleye fork length distribution ranged from 165 mm to 487 mm (n=261, mean = 368mm). Fish between 370 mm and 450 mm in length predominated in the sample, with a cumulative CUE of 21.5 Walleye/100m²/24h (Figure 4). Collectively fish in this range represented 60.6% of the total sample.

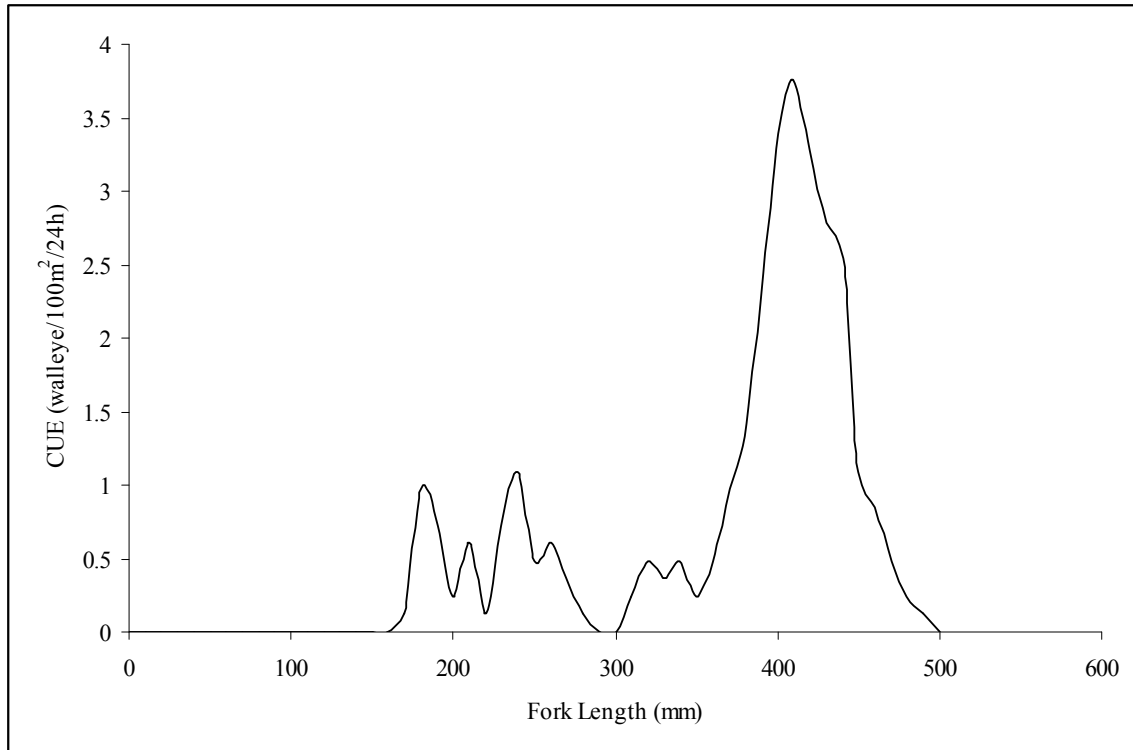


Figure 4. Walleye fork length frequency distribution, Buck Lake 2008.

3.5 Walleye Age Class Frequency Distribution

Walleye ranged from 1 to 19 years of age in 2008 (Figure 5). Fish aged 5 and 11 years dominated the sample, with CUEs of 9.7 Walleye/100m²/24h (27.4%) and 7.6 Walleye/100m²/24h (21.5%), respectively.

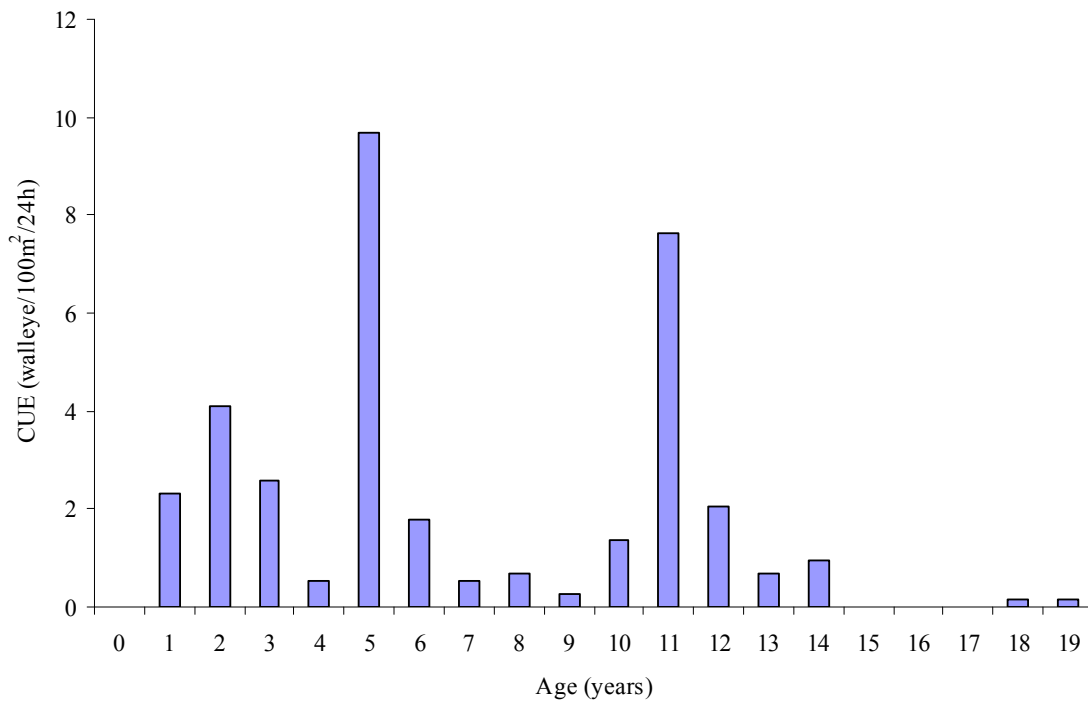


Figure 5. Walleye age-class frequency distribution, Buck Lake 2008.

The population is primarily supported by two age classes, and has a mean age of 6.8 years. These characteristics are indicators of a stable and vulnerable population, respectively (Table 1). In previous years both the age class distribution and age class stability of Walleye from Buck Lake had been classified as stable, so this change indicates that both the mean age and general age distribution in the population have decreased for this location (Winkel, 2011; Watkins, 2007).

Table 1. Criteria for classifying status of Walleye fisheries, modified for FWIN analysis (from Sullivan, 2003).

STATUS OF STOCK	TROPHY	STABLE	VULNERABLE	COLLAPSED
Age-class Distribution	Wide 8 or more age classes mean age >9	Wide 8 or more age classes mean age = 6-9	Narrow 1-3 age classes mean age = 4 - 6 few old (>10 years) fish	Wide or Narrow Mean age = 6 - 10
Buck Lake 2008		16 age-classes mean age 6.8		
Age-class Stability	Very Stable 1 - 2 age classes out of smooth catch curve	Relatively Stable 2 - 3 age classes out of smooth catch curve	Unstable 1 - 3 age classes support fishery	Stable or Unstable Recruitment failures
Buck Lake 2008			2 age classes	
Age-At-Maturity	Females 10 - 20 Males 10 - 16	Females 8 - 10 Males 7 - 9	Females 7 - 8 Males 5 - 7	Females 4 - 7 Males 3 - 6 Ages will vary with age class distribution
Buck Lake 2008				Females at 5 Males at 3
Length-at-age	Very slow 50 cm (FL) in 12 - 15 years	Slow 50 cm (FL) in 9 - 12 years	Moderate 50 cm (FL) in 7 - 9 years	Fast 50 cm (FL) in 4 - 7 years
Buck Lake 2008		50 cm FL in 10 years		
Catch Rate FWIN		High >30 Walleye / net	Moderate 5 - 25 Walleye / net	Low <5 Walleye / net
Buck Lake 2008		35.4 Walleye/net		

3.6 Walleye Age Class Stability

There was a broad range of ages classes observed for Walleye from Buck Lake in 2008 (age 1 to 19 years old), with a mean age of 6.8 years. No fish aged 15 to 17 years were captured during the FWIN, which accords with the absence of 14 and 15 year old fish from the previous year's sample (Figure 5). Recruitment is also high at this location, with over a quarter (26.9%) of the fish captured less than five years of age. The absence of young of the year from the FWIN sample in 2008 may represent a year class failure, which would have to be assessed in future surveys. In general the limited number of age classes supporting the population coupled with the absence of a smooth catch curve places the Buck Lake Walleye population status in the vulnerable category in 2008 according to *Alberta's Walleye Management and Recovery Plan* (Berry 1995) (Table 1).

3.7 Walleye Age at Maturity

The gender ratio observed for Walleye in 2008 was 1 female: 1.31 males. The earliest recorded maturation for female Walleye occurred at five years of age, with the population maturing completely by age nine (Figure 6). As was the case in previous years, male Walleye in Buck Lake matured earlier than females, starting as young as three years, and attaining complete maturity by age four (Figure 7). The timing of maturation in 2008 was characteristic of a collapsed population (Table 1).

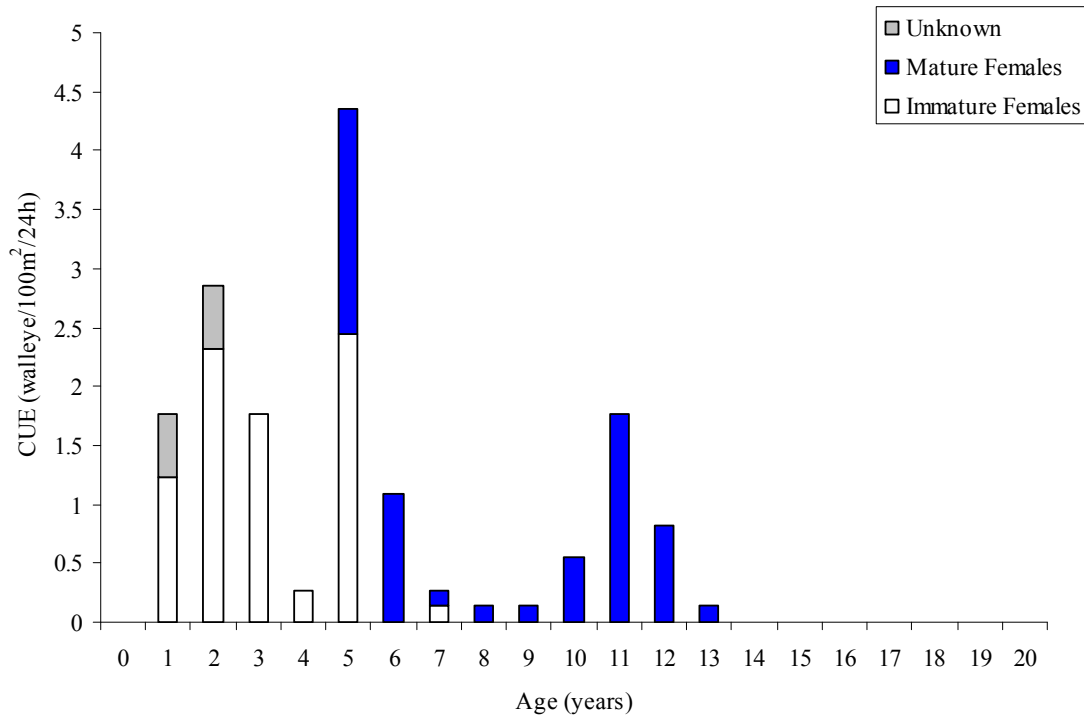


Figure 6. Age-at-maturity of female Walleye, Buck Lake 2008.

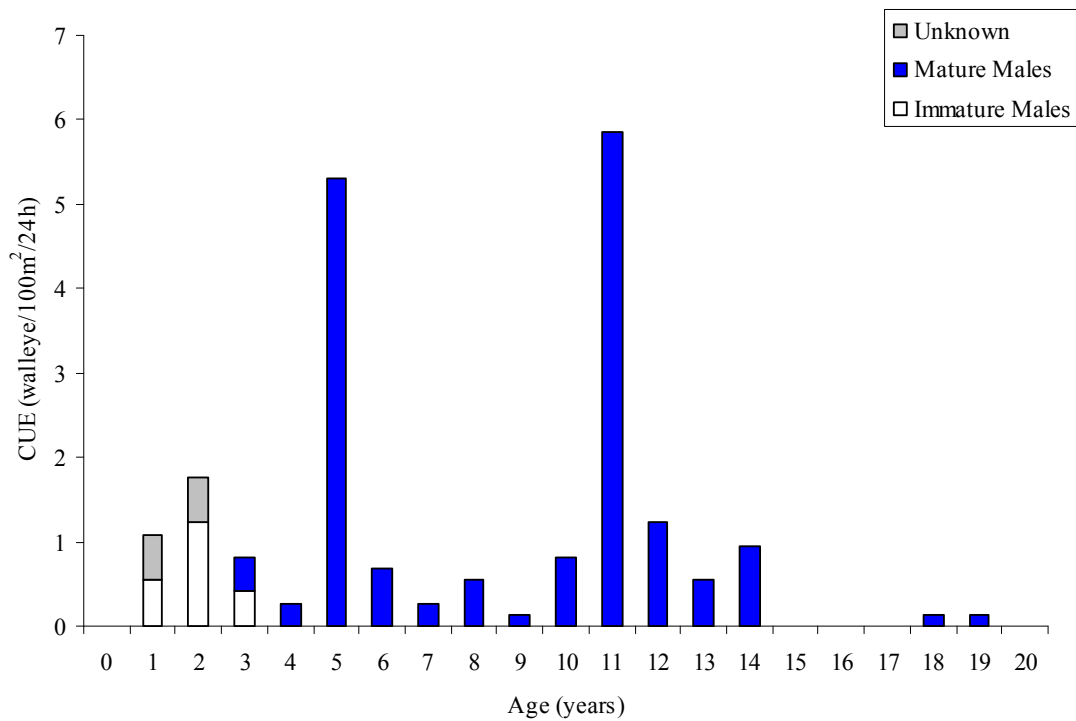


Figure 7. Age-at-maturity of male Walleye, Buck Lake 2008.

3.8 Walleye Length at Age

Male and female Walleye grew at similar rates in Buck Lake in 2008 (Figure 8). Female growth outpaced male growth progressively after the age of five.

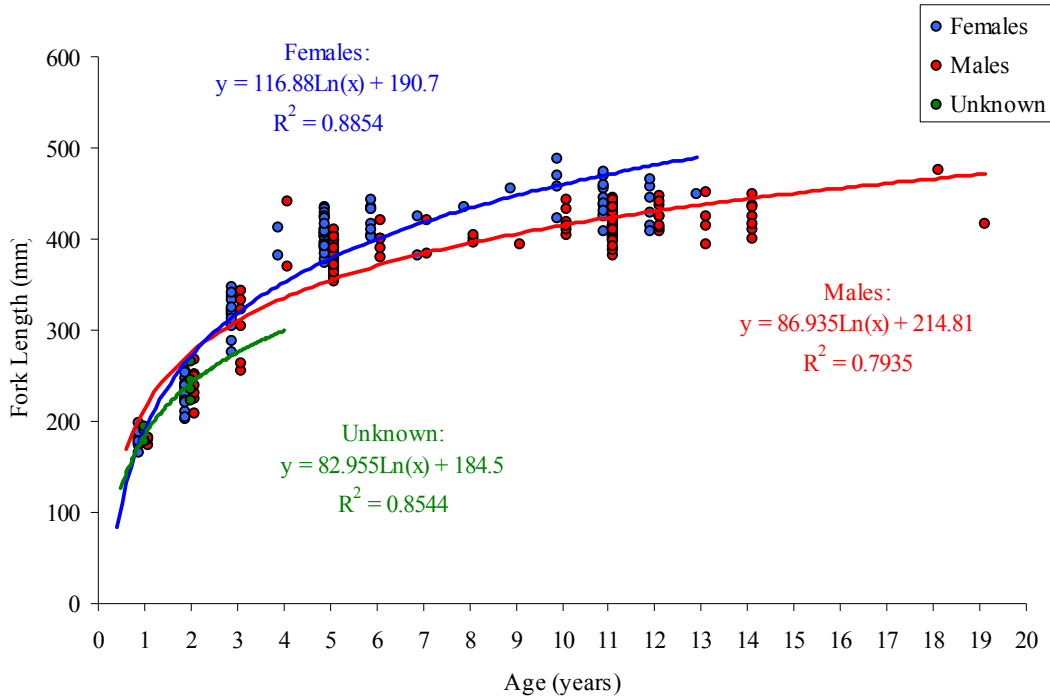


Figure 8. Relative growth of female, male, and unknown Walleye from Buck Lake, 2008.

There were two Walleye caught in 2008 which were equal to or greater than 500 mm in total length (Figure 9). The population attained this size at approximately the age of ten, which is characteristic of slow growth and therefore a stable population according to the parameters established in *Alberta's Walleye Management and Recovery Plan* (Berry 1995) (Table 1).

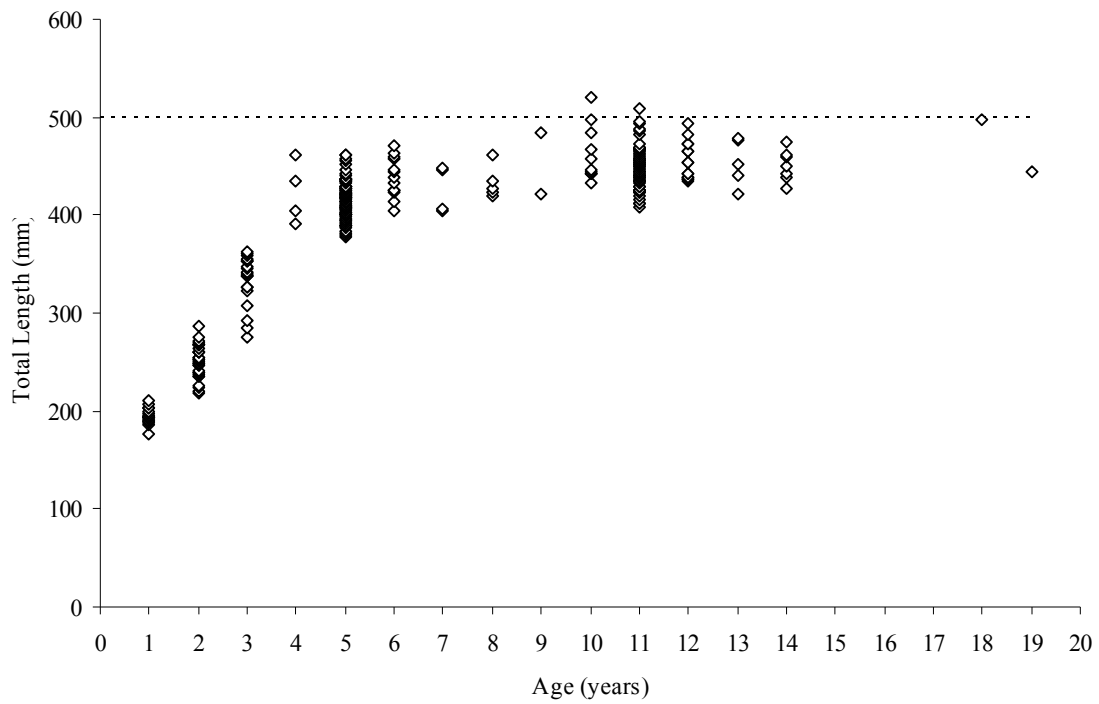


Figure 9. Total length-at-age for Buck Lake, 2008.

3.9 Walleye Length at Weight

The growth observed for Walleye at Buck Lake in 2008 was characteristic of a healthy population. Weight increased in proportion to length in a normal ratio for the species (Figure 10). The mean weight was 608 g, and ranged from 46 g to 1298g.

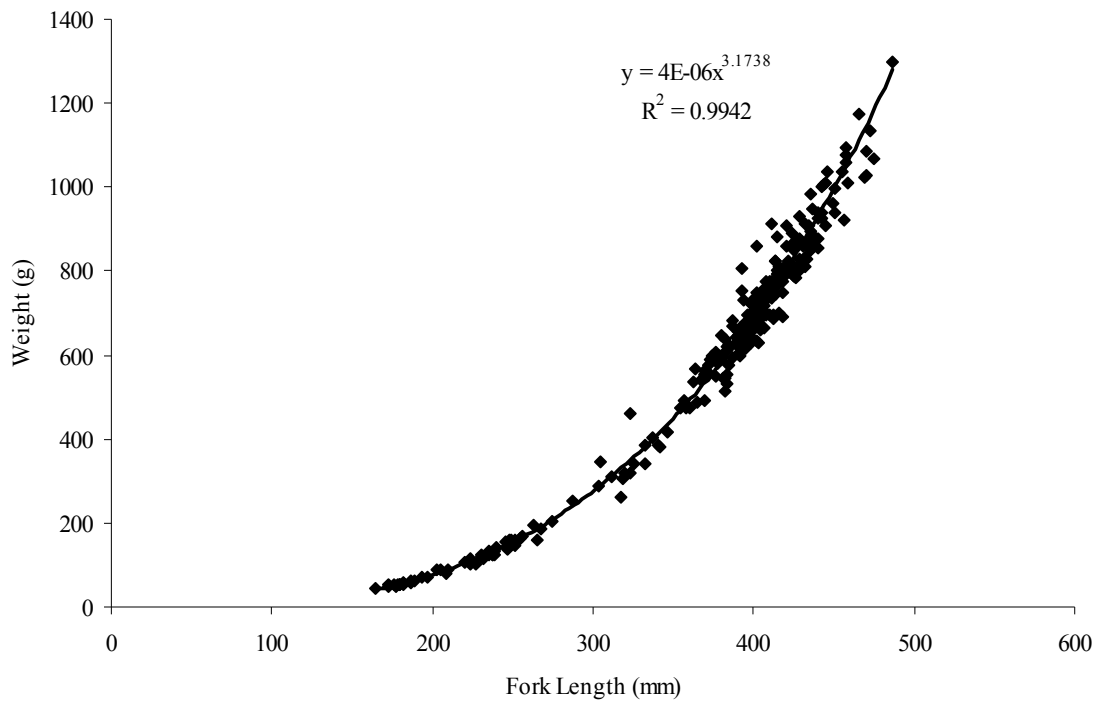


Figure 10. Growth as weight (g) in proportion to fork length (mm) for Walleye from Buck Lake, 2008.

3.10 Von Bertalanffy Growth Equation

Growth parameters for Walleye in 2008 resembled those from previous years for Buck Lake (Figure 11). The growth rate (k) was 0.402, (2007: 0.316; 2006: 0.443) while the asymptotic fork length (L_∞) was 441 mm (2007: 449 mm; 2006: 440 mm) (Winkel, 2011; Watkins, 2007). Consequently the Walleye population in Buck Lake can be concluded to be growing at a rate similar to that observed in previous years.

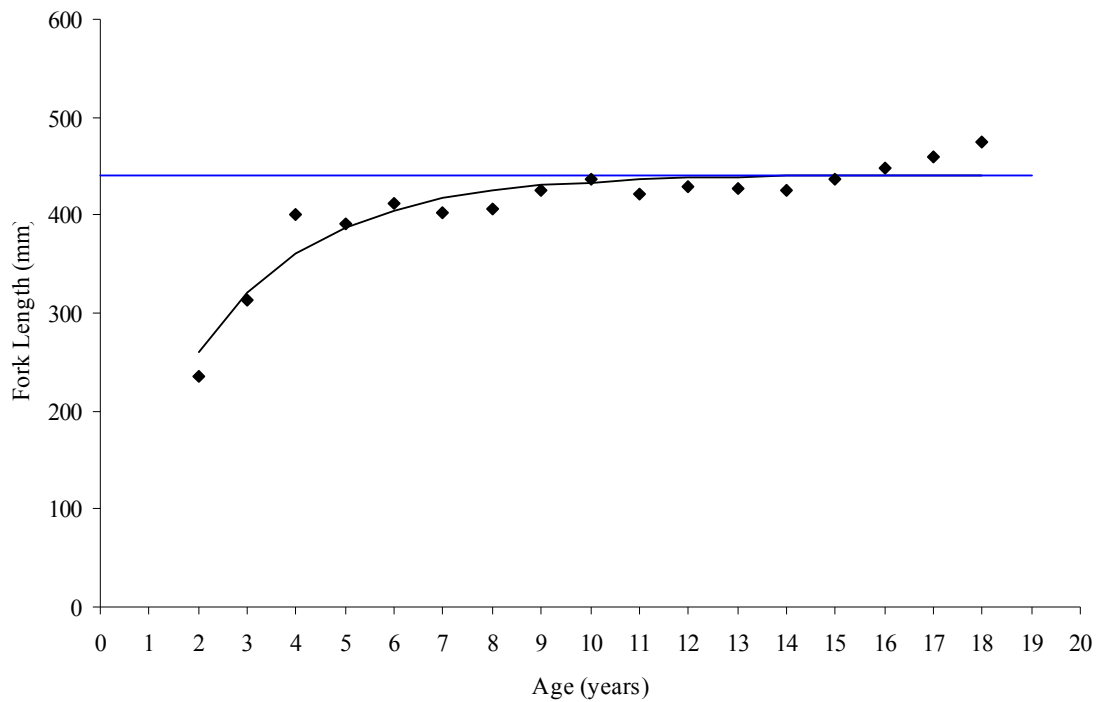


Figure 11. Von Bertalanffy growth curve for 2008 ($L_{\infty} = 441$ mm FL, $k = 0.402$, $t_0 = -0.224$).

3.11 Gonadosomatic Index

The Gonadosomatic Index is the ratio of the weight of the gonads relative to the weight of the whole body of a female fish. This metric is used to distinguish between immature and mature Walleye, and will also identify adult individuals in a non-spawning condition. No mature non-spawning female Walleye were captured during the 2008 FWIN at Buck Lake (Figure 12). All females with a GSI of greater than 1.2% were mature and in spawning condition.

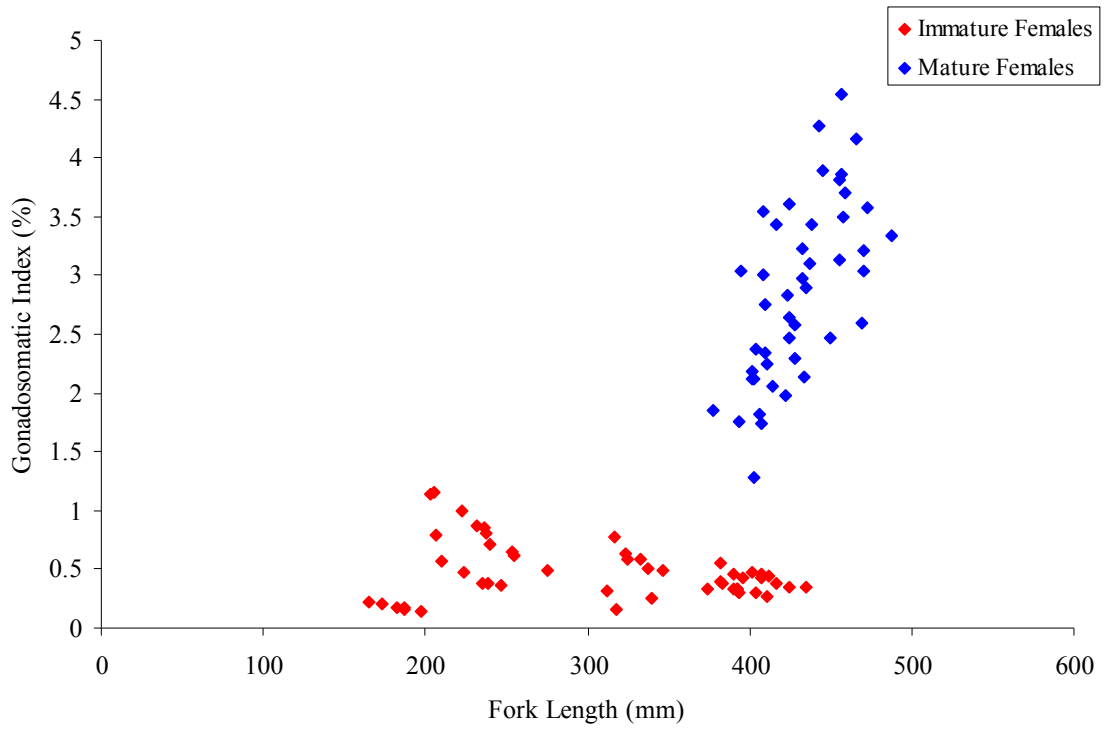


Figure 12. Walleye Gonadosomatic Index, Buck Lake, 2008.

4.0 SUMMARY

The biological characteristics measured for Buck Lake in 2008 indicate that this location supports a vulnerable Walleye population according to the criteria established in the *Alberta's Walleye Management and Recovery Plan* (Berry 1995).

Recruitment is strong at this location, indicated by the relatively high proportion of young fish in the population. While older fish are present in relatively lower numbers, no year class failures (for fish older than one year) have been observed for this population as a result reproduction can be concluded to be stable. The population is supported by only two year classes, with the 5 and 11 year old fish representing 48.9% of the fish sampled. The shift to a population dominated by two year-classes, however, categorizes the Buck Lake Walleye population as vulnerable. The low age of sexual maturity for males and females suggest that the population may be reacting to exploitation pressures.

A wide variety of ages are represented among Walleye sampled from Buck Lake in 2008. While the oldest fish are present in relatively low numbers, persistence of older fish in the population is an indicator of relative stability.

The growth rate for Walleye at Buck Lake is proportionately slower than that for many other locations in southern Alberta, since Walleye do not reach 500 mm in total length until the age of ten. This relatively slow growth is also an indicator of a stable Walleye population.

In general the Walleye catch rate for Buck Lake is high relative to other locations in southern Alberta, and is also characteristic for a stable population. Continued monitoring of the population status is required since there are some indications that the status of the population has changed from stable to vulnerable.

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6.0 APPENDICES

6.1 Catch Composition from FWIN Nets, Buck Lake 2008

Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Species						Total
				WALL	LKWH	NRPK	YLPR	SPSH	WHSC	
10D	(37.4 - 37.8)	14.5	24.25	13	0	9	3	0	0	25
12A	(7.9 - 14.3)	14.3	24.00	54	2	8	7	0	1	72
15B	(37.6 - 39.0)	14.4	23.42	13	0	13	2	1	0	29
18A	(15.4 - 15.4)	14.5	23.08	31	5	6	8	0	0	50
34A	(17.3 - 18.0)	14.8	22.50	41	1	4	1	0	0	47
3C	(6.4 - 11.3)	14.4	24.67	56	10	10	9	0	0	85
3D	(23.6 - 25.8)	14.3	22.83	15	0	13	9	0	0	37
8B	(18.1 - 23.2)	14.5	23.75	38	2	5	9	2	3	59
Total				261	20	68	48	3	4	404
Mean				32.6						50.5

6.2 Catch composition from deep sets, Buck Lake FWIN 2008.

Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Species						Total
				WALL	LKWH	NRPK	YLPR	SPSH	WHSC	
10D	(37.4 - 37.8)	14.5	24.25	13	0	9	3	0	0	25
15B	(37.6 - 39.0)	14.4	23.42	13	0	13	2	1	0	29
34A	(17.3 - 18.0)	14.8	22.50	41	1	4	1	0	0	47
3D	(23.6 - 25.8)	14.3	22.83	15	0	13	9	0	0	37
8B	(18.1 - 23.2)	14.5	23.75	38	2	5	9	2	3	59
Total				120	3	44	24	3	3	197
Mean				24.0						39.4

6.3 Catch composition from shallow sets, Buck Lake FWIN 2008.

Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Species						Total
				WALL	LKWH	NRPK	YLPR	SPSH	WHSC	
12A	(7.9 - 14.3)	14.3	24.00	54	2	8	7	0	1	72
18A	(15.4 - 15.4)	14.5	23.08	31	5	6	8	0	0	50
3C	(6.4 - 11.3)	14.4	24.67	56	10	10	9	0	0	85
Total				141	17	24	24	0	1	207
Mean				47						69

6.4 Walleye, Northern Pike, and Lake Whitefish catches by mesh size, Buck Lake
2008

WALL

Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Mesh Size								Total
				25	38	51	63	76	102	127	152	
10D	(37.4 - 37.8)	14.5	24.25	0	1	4	4	2	2	0	0	13
12A	(7.9 - 14.3)	14.3	24.00	4	13	13	9	6	7	0	2	54
15B	(37.6 - 39.0)	14.4	23.42	0	4	3	2	3	1	0	0	13
18A	(15.4 - 15.4)	14.5	23.08	0	0	17	6	4	4	0	0	31
34A	(17.3 - 18.0)	14.8	22.50	2	8	11	7	9	4	0	0	41
3C	(6.4 - 11.3)	14.4	24.67	0	10	12	16	12	5	1	0	56
3D	(23.6 - 25.8)	14.3	22.83	0	5	3	2	3	2	0	0	15
8B	(18.1 - 23.2)	14.5	23.75	4	12	7	8	6	1	0	0	38
Total				10	53	70	54	45	26	1	2	261

LKWH

Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Mesh Size								Total
				25	38	51	63	76	102	127	152	
10D	(37.4 - 37.8)	14.5	24.25	0	0	0	0	0	0	0	0	0
12A	(7.9 - 14.3)	14.3	24.00	0	0	0	0	0	0	0	2	2
15B	(37.6 - 39.0)	14.4	23.42	0	0	0	0	0	0	0	0	0
18A	(15.4 - 15.4)	14.5	23.08	0	0	4	0	1	0	0	0	5
34A	(17.3 - 18.0)	14.8	22.50	0	0	0	0	0	0	1	0	1
3C	(6.4 - 11.3)	14.4	24.67	0	0	0	0	0	2	3	5	10
3D	(23.6 - 25.8)	14.3	22.83	0	0	0	0	0	0	0	0	0
8B	(18.1 - 23.2)	14.5	23.75	0	0	0	0	0	0	1	1	2
Total				0	0	4	0	1	3	5	6	20

NRPK

Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Mesh Size								Total
				25	38	51	63	76	102	127	152	
10D	(37.4 - 37.8)	14.5	24.25	0	1	3	2	3	0	0	0	9
12A	(7.9 - 14.3)	14.3	24.00	1	0	2	1	4	0	0	0	8
15B	(37.6 - 39.0)	14.4	23.42	0	1	4	4	3	1	0	0	13
18A	(15.4 - 15.4)	14.5	23.08	0	0	1	3	2	0	0	0	6
34A	(17.3 - 18.0)	14.8	22.50	0	0	1	0	3	0	0	0	4
3C	(6.4 - 11.3)	14.4	24.67	0	0	3	2	5	0	0	0	10
3D	(23.6 - 25.8)	14.3	22.83	0	1	2	8	1	1	0	0	13
8B	(18.1 - 23.2)	14.5	23.75	0	1	1	1	2	0	0	0	5
Total				1	4	17	21	23	2	0	0	68

6.5 Yellow Perch, Spottail Shiner, and White Sucker catches by mesh size, Buck Lake 2008.

YLPR												
Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Mesh Size								Total
				25	38	51	63	76	102	127	152	
10D	(37.4 - 37.8)	14.5	24.25	1	0	2	0	0	0	0	0	3
12A	(7.9 - 14.3)	14.3	24.00	0	2	3	2	0	0	0	0	7
15B	(37.6 - 39.0)	14.4	23.42	0	0	2	0	0	0	0	0	2
18A	(15.4 - 15.4)	14.5	23.08	0	0	6	2	0	0	0	0	8
34A	(17.3 - 18.0)	14.8	22.50	0	0	1	0	0	0	0	0	1
3C	(6.4 - 11.3)	14.4	24.67	0	0	2	7	0	0	0	0	9
3D	(23.6 - 25.8)	14.3	22.83	0	2	7	0	0	0	0	0	9
8B	(18.1 - 23.2)	14.5	23.75	1	4	1	3	0	0	0	0	9
Total				2	8	24	14	0	0	0	0	48

SPSH												
Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Mesh Size								Total
				25	38	51	63	76	102	127	152	
10D	(37.4 - 37.8)	14.5	24.25	0	0	0	0	0	0	0	0	0
12A	(7.9 - 14.3)	14.3	24.00	0	0	0	0	0	0	0	0	0
15B	(37.6 - 39.0)	14.4	23.42	1	0	0	0	0	0	0	0	1
18A	(15.4 - 15.4)	14.5	23.08	0	0	0	0	0	0	0	0	0
34A	(17.3 - 18.0)	14.8	22.50	0	0	0	0	0	0	0	0	0
3C	(6.4 - 11.3)	14.4	24.67	0	0	0	0	0	0	0	0	0
3D	(23.6 - 25.8)	14.3	22.83	0	0	0	0	0	0	0	0	0
8B	(18.1 - 23.2)	14.5	23.75	2	0	0	0	0	0	0	0	2
Total				3	0	0	0	0	0	0	0	3

WHSC												
Set	Depth (m) (min - max)	Temp (°C)	Soak Time (h)	Mesh Size								Total
				25	38	51	63	76	102	127	152	
10D	(37.4 - 37.8)	14.5	24.25	0	0	0	0	0	0	0	0	0
12A	(7.9 - 14.3)	14.3	24.00	0	0	0	0	0	0	1	0	1
15B	(37.6 - 39.0)	14.4	23.42	0	0	0	0	0	0	0	0	0
18A	(15.4 - 15.4)	14.5	23.08	0	0	0	0	0	0	0	0	0
34A	(17.3 - 18.0)	14.8	22.50	0	0	0	0	0	0	0	0	0
3C	(6.4 - 11.3)	14.4	24.67	0	0	0	0	0	0	0	0	0
3D	(23.6 - 25.8)	14.3	22.83	0	0	0	0	0	0	0	0	0
8B	(18.1 - 23.2)	14.5	23.75	0	0	0	0	0	3	0	0	3
Total				0	0	0	0	0	3	1	0	4

6.6 Statistics of the catch distribution for game fish catches, Buck Lake, 2008.

This data is for presentation of the statistical nature of the catch distribution and are based on the geometric mean values (unweighted)

	Walleye	Lake Whitefish	Northern Pike	Yellow Perch	Spottail Shiner	White Sucker
Mean	32.6	2.5	8.5	6.0	0.4	0.5
Standard Error	6.2	1.2	1.2	1.2	0.3	0.4
Median	34.5	1.5	8.5	7.5	0	0
Mode	13	0	13	9	0	0
Standard Deviation	17.7	3.5	3.4	3.4	0.7	1.1
Sample Variance	312.3	12.0	11.7	11.7	0.6	1.1
Kurtosis	-1.7	3.0	-1.3	-1.8	3.2	5.5
Skewness	0.1	1.8	0.2	-0.6	2.0	2.3
Range	44	11	10	9	3	4
Minimum	13	0	4	1	0	0
Maximum	56	10	13	9	2	3
Sum	261	20	68	48	3	4
Count	8	8	8	8	8	8
Confidence Interval (95%)	12.2	2.4	2.4	2.4	0.5	0.7