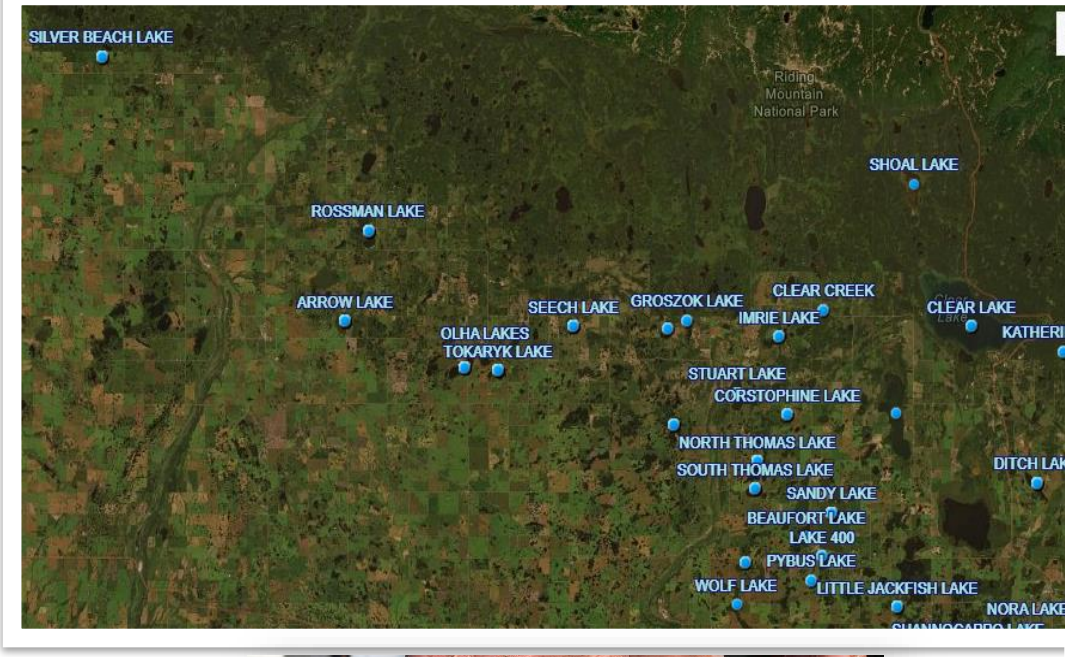
Wildlife, Fisheries and Resource Enforcement Branch Report

2021

Southwest Stocked Walleye Lake Investigations



Agriculture and Resource Development
2021

Manitoba

Introduction

Walleye fry stocking is a common practice in southwestern Manitoba lakes that historically had no walleye present, limited natural recruitment, or high levels of angling pressure and require supplemental stocking to provide good quality angling. In an effort to gauge the success of recent walleye fry stocking in several of the lakes in the prairie pothole area south of Riding Mountain National Park, an investigation project was carried out on in the spring and summer of 2021. The lake investigations aimed to evaluate the success of walleye stocking using North American Standard (NAS) gillnets, Ontario Small Mesh (OSM) gillnets, occasionally trapnets, while also while also updating existing species composition information and relative measure of abundance.

The previous stock assessment on some of the lakes was last done in the early 1980's and mid-1990's, which showed limited and varying success of the walleye fry stocking at the time.

Overview

The prairie pothole region south of Riding Mountain National Park is covered with hundreds of small waterbodies, some of which are utilized as recreationally fisheries and are stocked with walleye fry. Lakes assessed during this project included: Arrow, Crawford (Dalamas), Ditch, Imrie, Little Jackfish, North Thomas, South Thomas, Rossman, Sandy, Seech, Silver Beach, Stuart and Wargatie (Dummy) (see *Figure 1a&b*).

Figure 1a: Map of project area (east).

Figure 1b: Map of project area (west).

Methods

North American Standard (NAS) Gillnets and an Ontario Small Mesh (OSM) Gillnet were used to assess the fish population on most lakes and 4 foot rectangular trapnets were used on North Thomas Lake. NAS gill nets were 24.8 m long, consisting of eight 3.1 m long by 1.8 m deep panels ordered 76, 114, 51, 89, 38, 127, 64, and 102 mm (3, 4.5, 2, 3.5, 1.5, 5, 2.5, and 4 inch) clear mono-filament nylon mesh. The OSM gill net was 12.5 m long, consisting of five 2.5 m long by 1.8 m deep panels with 32, 19, 38, 13, and 25 mm (1.25, 0.75, 1.5, 0.5, and 1.0 inch) clear mono-filament nylon mesh.). NAS gillnets were set overnight in June at random locations and one OSM gillnet set to capture small-bodied fish.

All large-bodied fish were sampled for fork length and round weight. Additional information with sex, maturity and aging structures were collected from walleye, northern pike, and white sucker. Yellow perch were from the small mesh net were subsampled for length and the rest counted and bulk weighed. Data analysis conducted includes relative abundance, length and age frequencies, and species biomass.

Stocking

The stocking regime at each of the lakes investigated for the past 10-years is as follows:

Arrow Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	200,000	Fry	1,667
2020	WALLEYE	200,000	Fry	1,667
2019	WALLEYE	200,000	Fry	1,667
2018	WALLEYE	50,000	Fry	417
2017	WALLEYE	200,000	Fry	1,667
2016	WALLEYE	200,000	Fry	1,667
2015	WALLEYE	400,000	Fry	3,333
2015	YELLOW PERCH	6,758	Adult (>30 cm)	
2014	WALLEYE	400,000	Fry	3,333
2013	WALLEYE	100,000	Fry	833
2012	WALLEYE	300,000	Fry	2,500
2012	YELLOW PERCH	2,500	Adult (>30 cm)	
2011	WALLEYE	200,000	Fry	1,667

Crawford (Dalamas) Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	100,000	Fry	1,563
2019	WALLEYE	200,000		3,125
2016	WALLEYE	200,000	Fry	3,125
2015	WALLEYE	300,000	Fry	4,688
2014	WALLEYE	300,000	Fry	2,500

Ditch Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	100,000	Fry	1,064
2020	WALLEYE	200,000	Fry	2,128
2019	WALLEYE	100,000	Fry	1,064
2018	WALLEYE	300,000	Fry	3,191
2017	WALLEYE	400,000	Fry	4,255
2016	WALLEYE	200,000	Fry	2,128
2015	WALLEYE	400,000	Fry	4,255
2014	WALLEYE	400,000	Fry	3,333
2011	WALLEYE	100,000	Fry	1,064

Imrie Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	100,000	Fry	926
2020	WALLEYE	100,000	Fry	926
2019	WALLEYE	100,000	Fry	926
2017	WALLEYE	300,000	Fry	2,778
2016	WALLEYE	200,000	Fry	1,852
2015	WALLEYE	300,000	Fry	2,778
2014	WALLEYE	300,000	Fry	2,500
2011	WALLEYE	100,000	Fry	926

Little Jackfish Lake

Year	Species	Number	Size	Fry/hectare
2020	WALLEYE	200,000	Fry	1,266
2019	WALLEYE	100,000	Fry	633
2018	WALLEYE	100,000	Fry	633
2017	WALLEYE	300,000	Fry	1,899
2016	WALLEYE	200,000	Fry	1,266
2015	WALLEYE	400,000	Fry	2,532
2014	WALLEYE	400,000	Fry	3,333

North Thomas Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	100,000	Fry	356
2018	WALLEYE	100,000	Fry	356
2017	WALLEYE	700,000	Fry	2,491
2016	WALLEYE		Fry	
2015	WALLEYE	300,000	Fry	1,068
2014	WALLEYE	300,000	Fry	2,500
2013	WALLEYE	100,000	Fry	356
2012	WALLEYE	400,000	Fry	1,423
2011	WALLEYE	100,000	Fry	356

South Thomas Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	100,000	Fry	1,136
2019	WALLEYE	100,000	Fry	1,136
2016	WALLEYE	400,000	Fry	4,545
2015	WALLEYE	300,000	Fry	3,409
2014	WALLEYE	300,000	Fry	2,500

Rossman Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	400,000	Fry	1,786
2020	WALLEYE	500,000	Fry	2,232
2019	WALLEYE	500,000	Fry	2,232
2018	WALLEYE	200,000	Fry	893
2017	WALLEYE	500,000	Fry	2,232
2016	WALLEYE	500,000	Fry	2,232
2015	WALLEYE	600,000	Fry	2,679
2014	WALLEYE	600,000	Fry	5,000
2013	WALLEYE	100,000	Fry	446
2012	WALLEYE	400,000	Fry	1,786
2011	WALLEYE	300,000	Fry	1,339

Sandy Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	800,000	Fry	1,426
2020	WALLEYE	600,000	Fry	1,070
2019	WALLEYE	500,000	Fry	891
2018	WALLEYE	300,000	Fry	535
2017	WALLEYE	1,000,000	Fry	1,783
2016	WALLEYE	800,000	Fry	1,426
2015	WALLEYE	800,000	Fry	1,426
2014	WALLEYE	800,000	Fry	1,667
2013	WALLEYE	200,000	Fry	891
2012	WALLEYE	500,000	Fry	535
2011	WALLEYE	300,000	Fry	357
2010	WALLEYE	200,000	Fry	357

Seech Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	100,000	Fry	1,613
2020	WALLEYE	200,000	Fry	3,226
2018	WALLEYE	100,000	Fry	1,613
2017	WALLEYE	300,000	Fry	4,839
2016	WALLEYE	300,000	Fry	4,839
2015	WALLEYE	300,000	Fry	4,839
2014	WALLEYE	300,000	Fry	2,500
2013	WALLEYE	100,000	Fry	1,613
2013	LAKE TROUT	25,000	12-15 CM	
2011	WALLEYE	100,000	Fry	1,613

Silver Beach Lake

Year	Species	Number	Size	Fry/hectare
2020	WALLEYE	200,000	Fry	2,469
2018	WALLEYE	50,000	Fry	617
2017	WALLEYE	300,000	Fry	3,704
2016	WALLEYE	200,000	Fry	2,469
2015	WALLEYE	400,000	Fry	4,938
2014	WALLEYE	400,000	Fry	3,333
2012	WALLEYE	200,000	Fry	2,469
2011	WALLEYE	200,000	Fry	2,469

Stuart Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	400,000	Fry	1,600
2020	WALLEYE	300,000	Fry	1,200
2019	WALLEYE	200,000	Fry	800
2018	WALLEYE	100,000	Fry	400
2017	WALLEYE	500,000	Fry	2,000
2016	WALLEYE	300,000	Fry	1,200
2015	WALLEYE	400,000	Fry	1,600
2014	WALLEYE	500,000	Fry	4,167
2013	WALLEYE	100,000	Fry	400
2012	WALLEYE	300,000	Fry	1,200
2011	WALLEYE	100,000	Fry	400

Wargatie (Dummy) Lake

Year	Species	Number	Size	Fry/hectare
2021	WALLEYE	200,000	Fry	1,198
2019	WALLEYE	200,000	Fry	1,198
2017	WALLEYE	300,000	Fry	1,796
2016	WALLEYE	300,000	Fry	1,796
2015	WALLEYE	500,000	Fry	2,994
2014	WALLEYE	500,000	Fry	4,167
2012	WALLEYE	400,000	Fry	2,395
2011	WALLEYE	200,000	Fry	1,198
2010	WALLEYE	200,000	Fry	1,198

Results

A total of 269 walleye were captured at the 13 lakes investigated with ages ranging from 0 to 25. The most commonly captured species were yellow perch (290), walleye (269), white sucker (129), and northern pike (105). Small bodied fish were also captured to a lesser degree (See appendix).

Walleye size classes were quite variable between the years and lakes, as seen in Figures 2, possibly due to the nature of the lakes being supplemented by stocking of fry and natural recruitment in some of the lakes and ability for some lakes to grow larger/older fish.

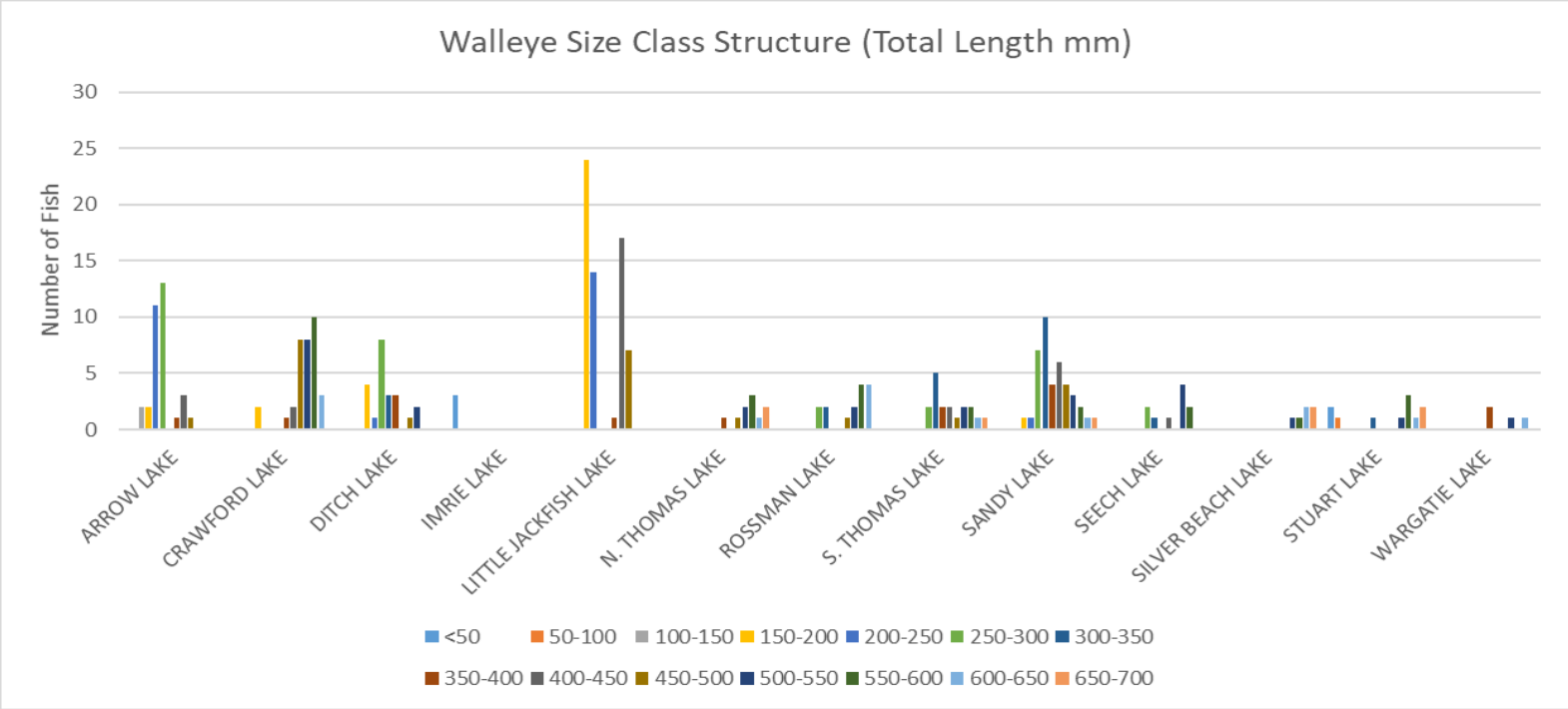


Figure 2. Summary of walleye catch by lake by length size bins.

Northern pike were more abundant in most lakes with consistent age and size classes, as seen in Figures 3a and 3b. Little Jackfish, Rossman, and Stuart Lakes were the few waterbodies assessed with sporadic pike recruitment or at least less presence in the index nets. Angling pressure and/or limited suitable habitat could be the cause for fewer pike compared to walleye in these lakes.

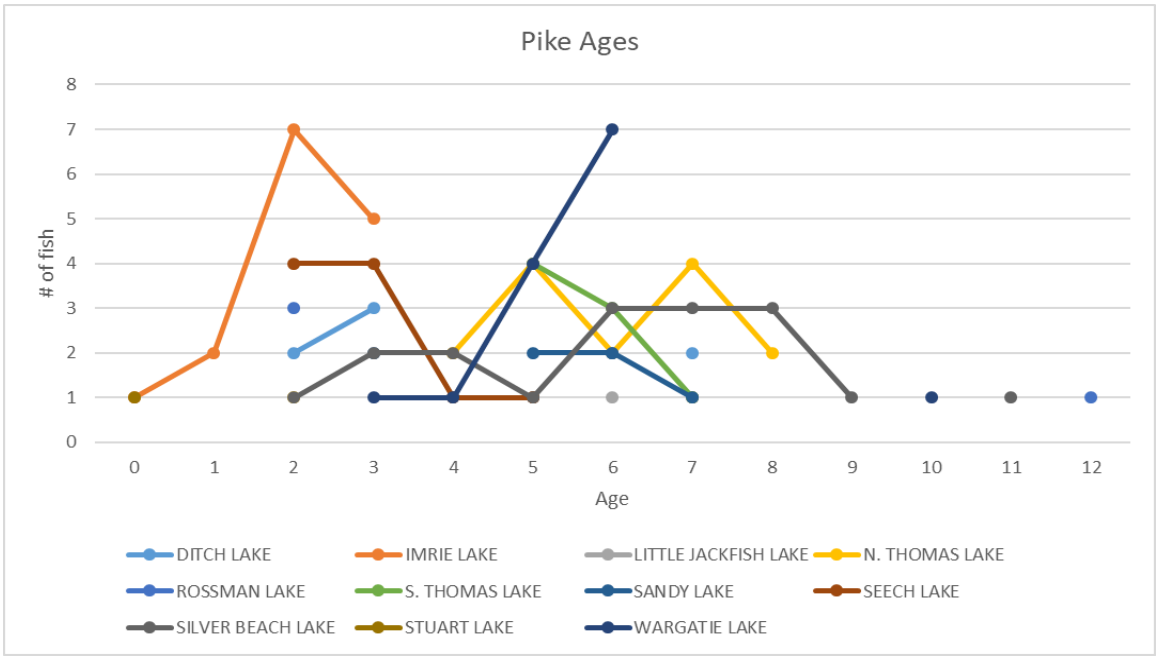


Figure 3a. Summary of northern pike catch and age classes by lake (see appendix for table).

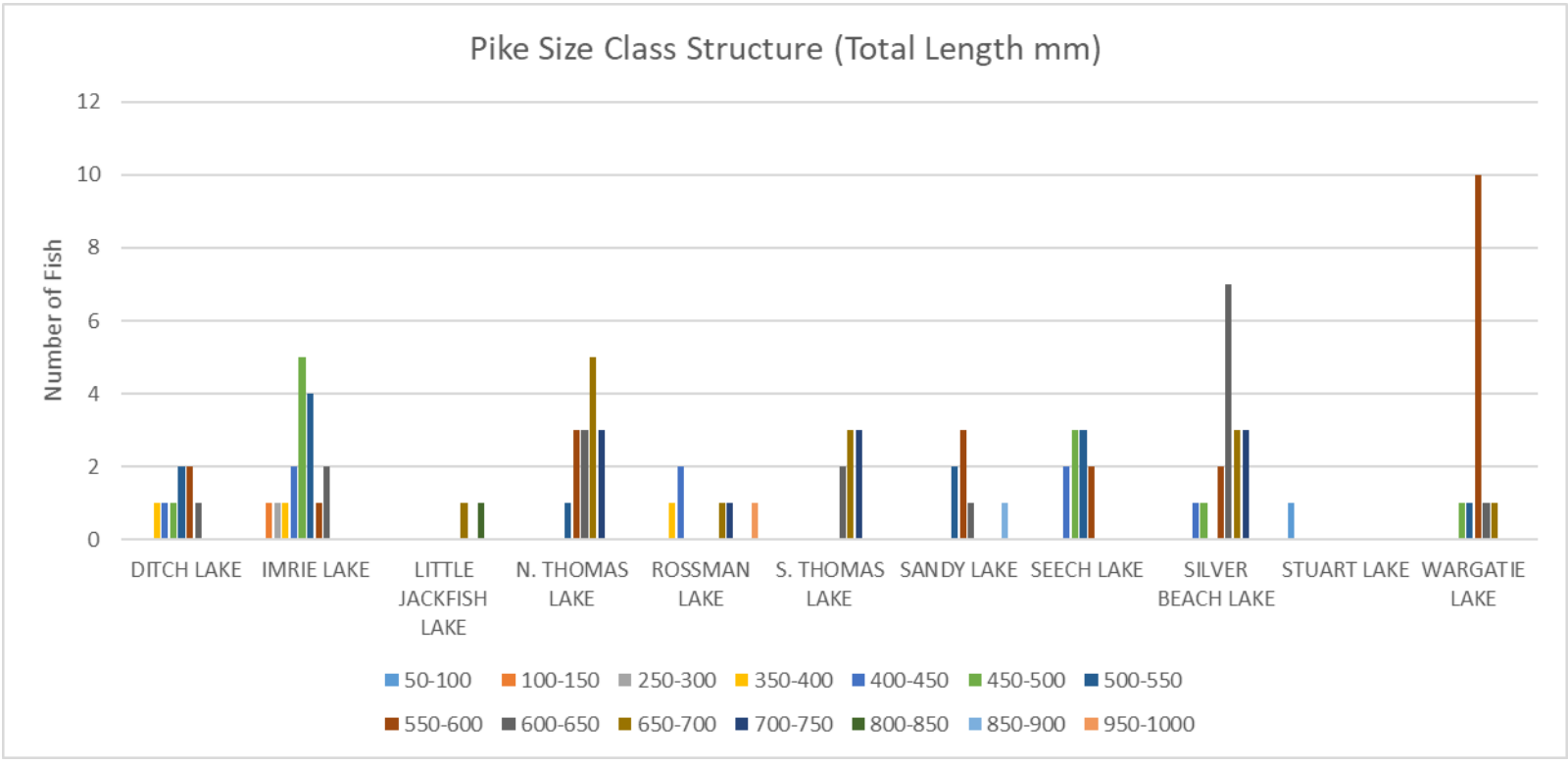


Figure 3b. Summary of northern pike catch by lake by length size bins.

Figure 4a, shows the age composition of walleye caught per 100,000 fry stocked from all lakes, which could be used as a measure of walleye fry quality and/or suitable environmental conditions on the days and weeks following stocking (survival success) for the past 10 years. The strong 2018 year class (age 3 (2018)) was the most abundant year class, primarily from Little Jackfish Lake and Sandy Lake. The abundance of year 3 fish is

partly due to this year-class being fully recruited to the gear, but also could be from low stocking densities and climatic conditions in 2018. Fish aged 3+ are likely starting to experience fishing mortality and the start of natural mortality, which contribute to the decline in abundance of older fish.

Figure 4a. Relative success of fry stocking in project lakes as determined by presence in index nets.

Relative abundance of all pike, walleye, and yellow perch from index netting was good in most lakes, but has shown the odd poor condition (<10), which could be based on variable recruitment/survival of fry, competition, and harvest rates over the years (Figure 4b).

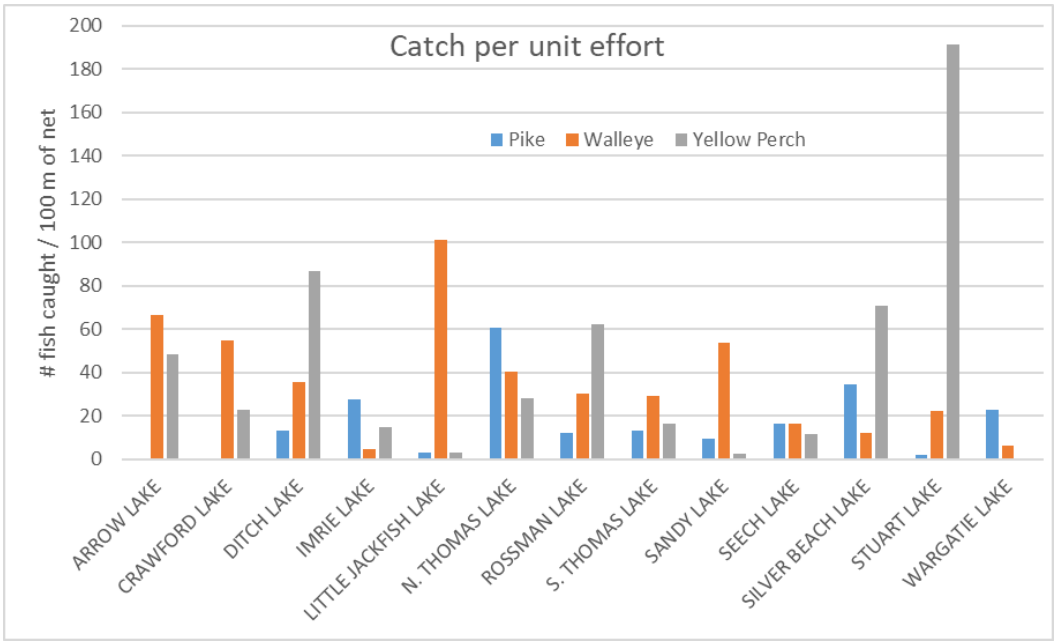


Figure 4b. Relative abundance of pike, walleye and yellow perch caught per 100 meters of gillnet.

Manitoba's Master Angler (MA) Program offers valuable information to help assess fisheries performance and a lakes ability to produce large fish. Many factors affect the number of fish reported in the program: increased knowledge of the program, ease of reporting, the minimum size standard; and the number of trophy fish in a population, their catchability, and the amount of effort direct at those fish. Since 2005, the size standard for

Walleye in the MA Program has been 71 cm. Overall, Rossman Lake has produced the most MA walleye from the lakes assessed for the past 15 years, with the most being caught in 2013 (Figure 5). Stuart Lake used to have a few MA size walleye caught a year, but in the past 6 years has not produced any.

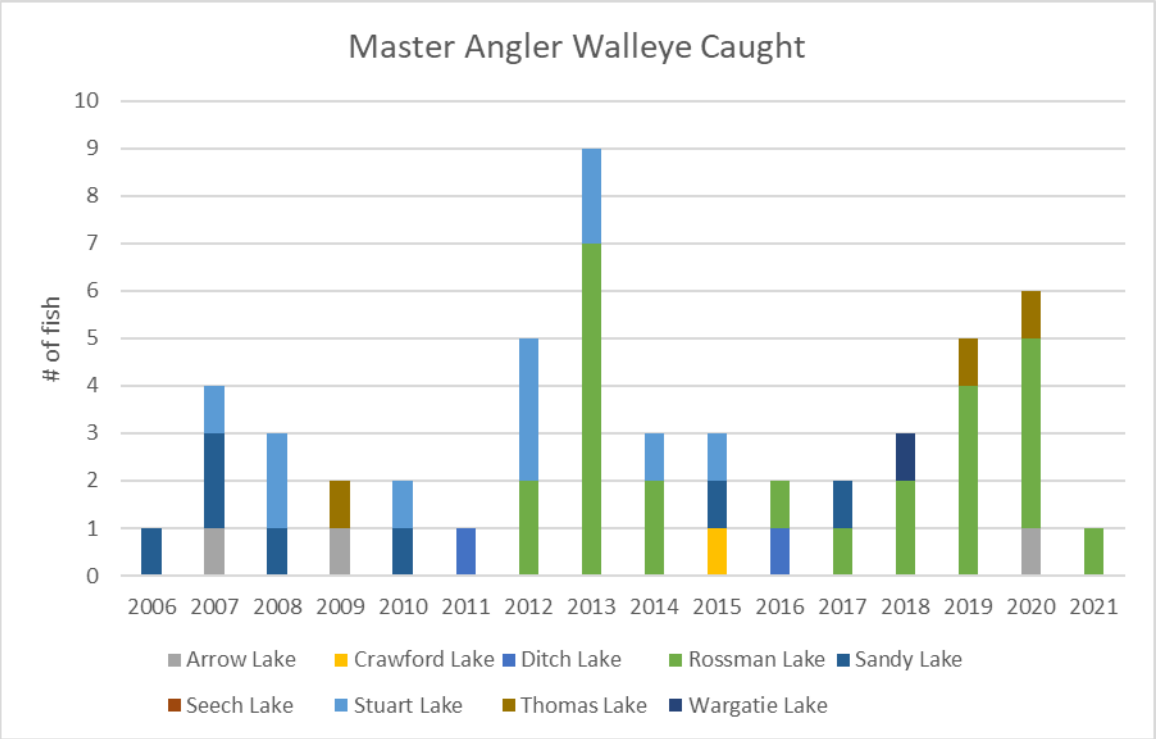
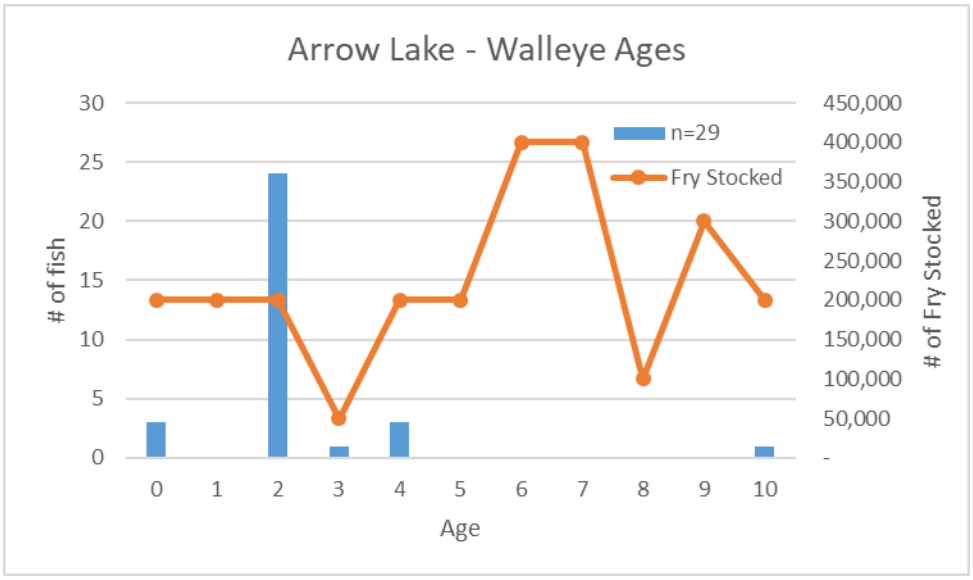
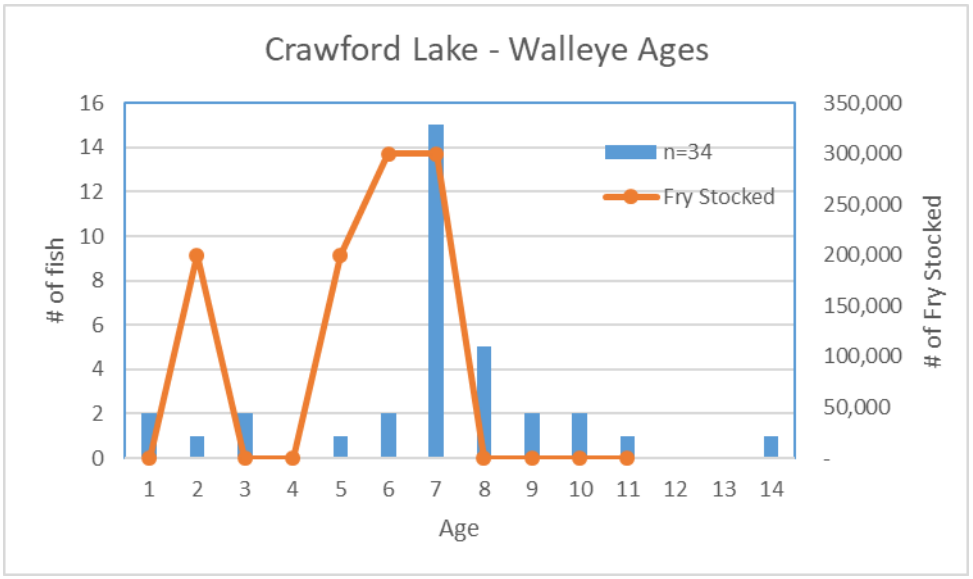


Figure 5. Master angler records by lake for past 15 years.

In comparison of the stocking data with aging results, there are a few years in some lakes (i.e. North Thomas Lake) where no fish were stocked, but there are some fish aged to be born in those years. This points to the likelihood of natural recruitment in those lakes, which may be able to be self sustaining at a marginal/low level. Aging results of walleye from all lakes are shown in Figure 6.





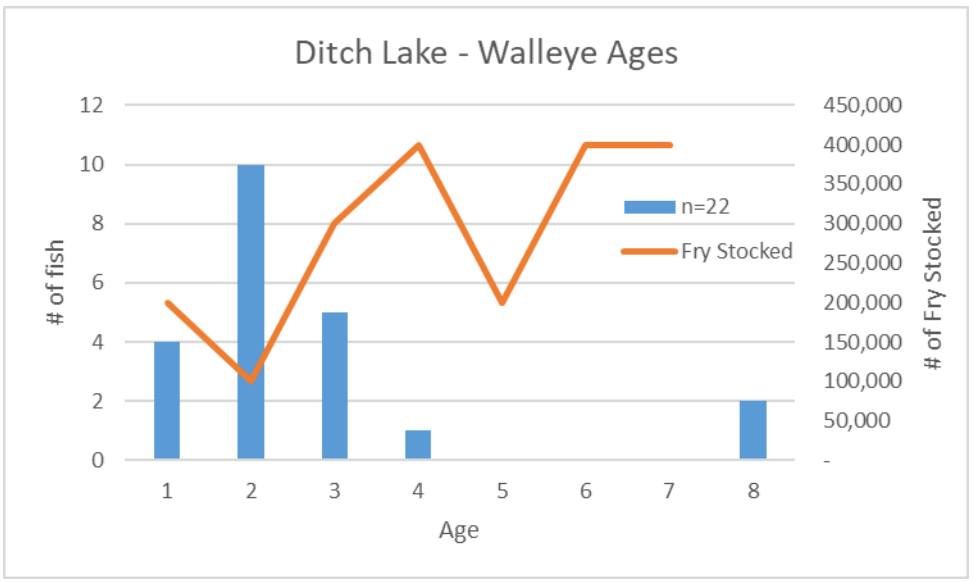
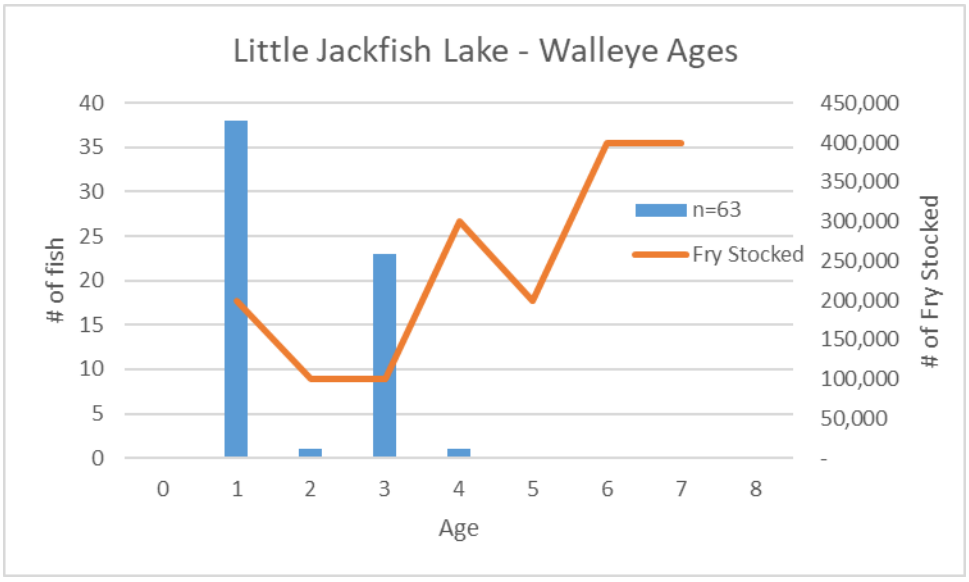
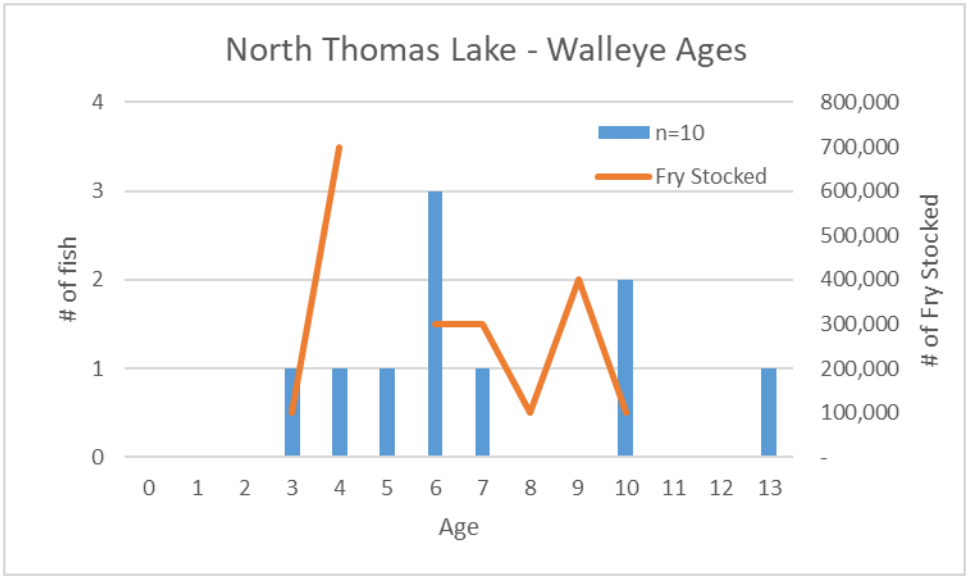


Figure 6: Walleye age class abundance from gill netting in comparison to stocking levels.





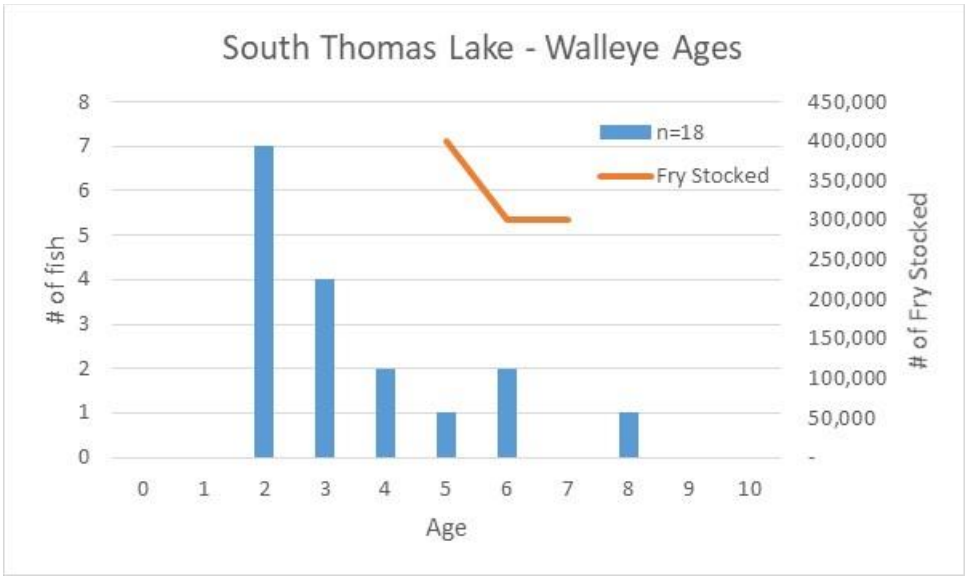
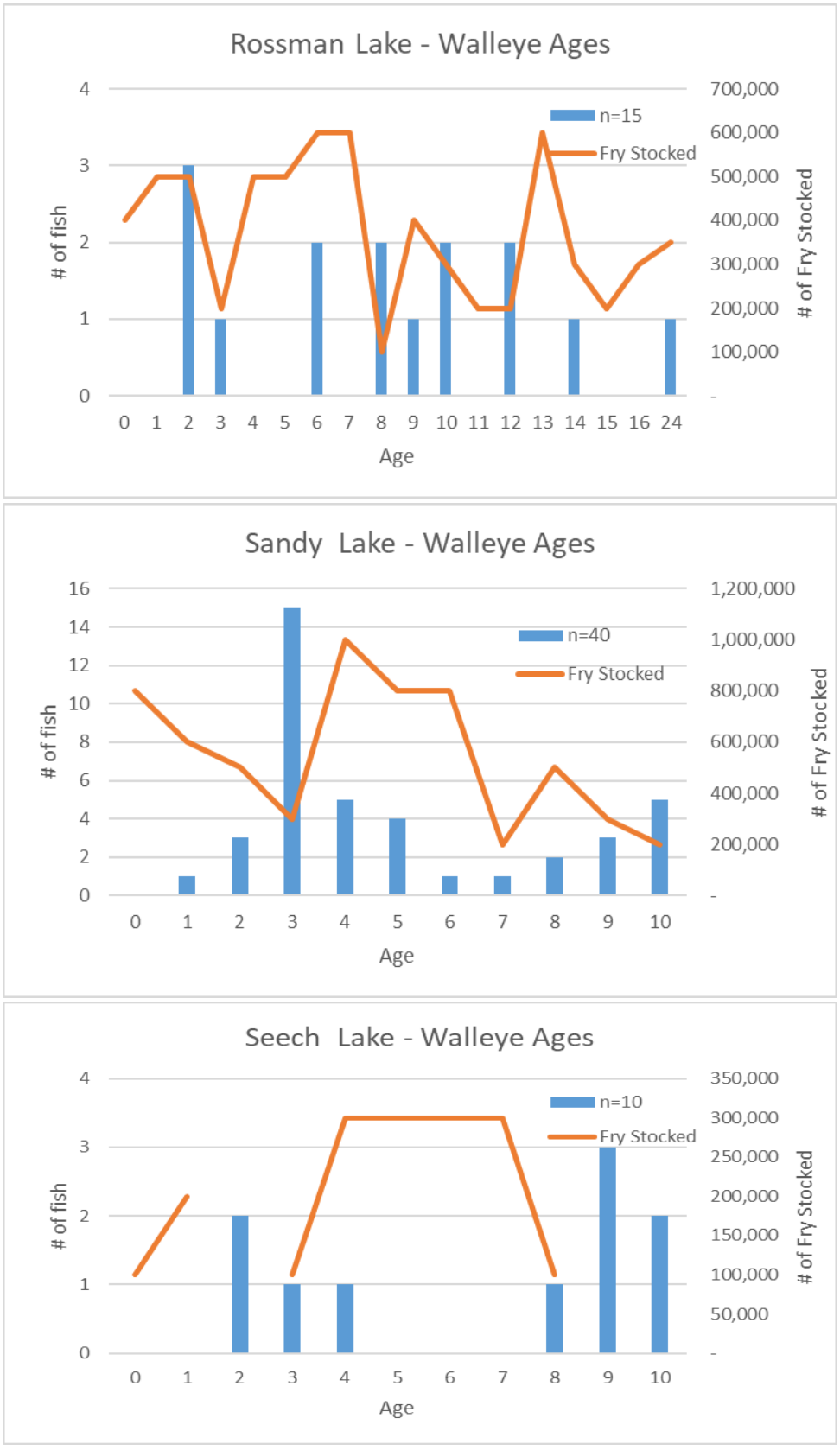


Figure 6: Walleye age class abundance from gill netting in comparison to stocking levels.



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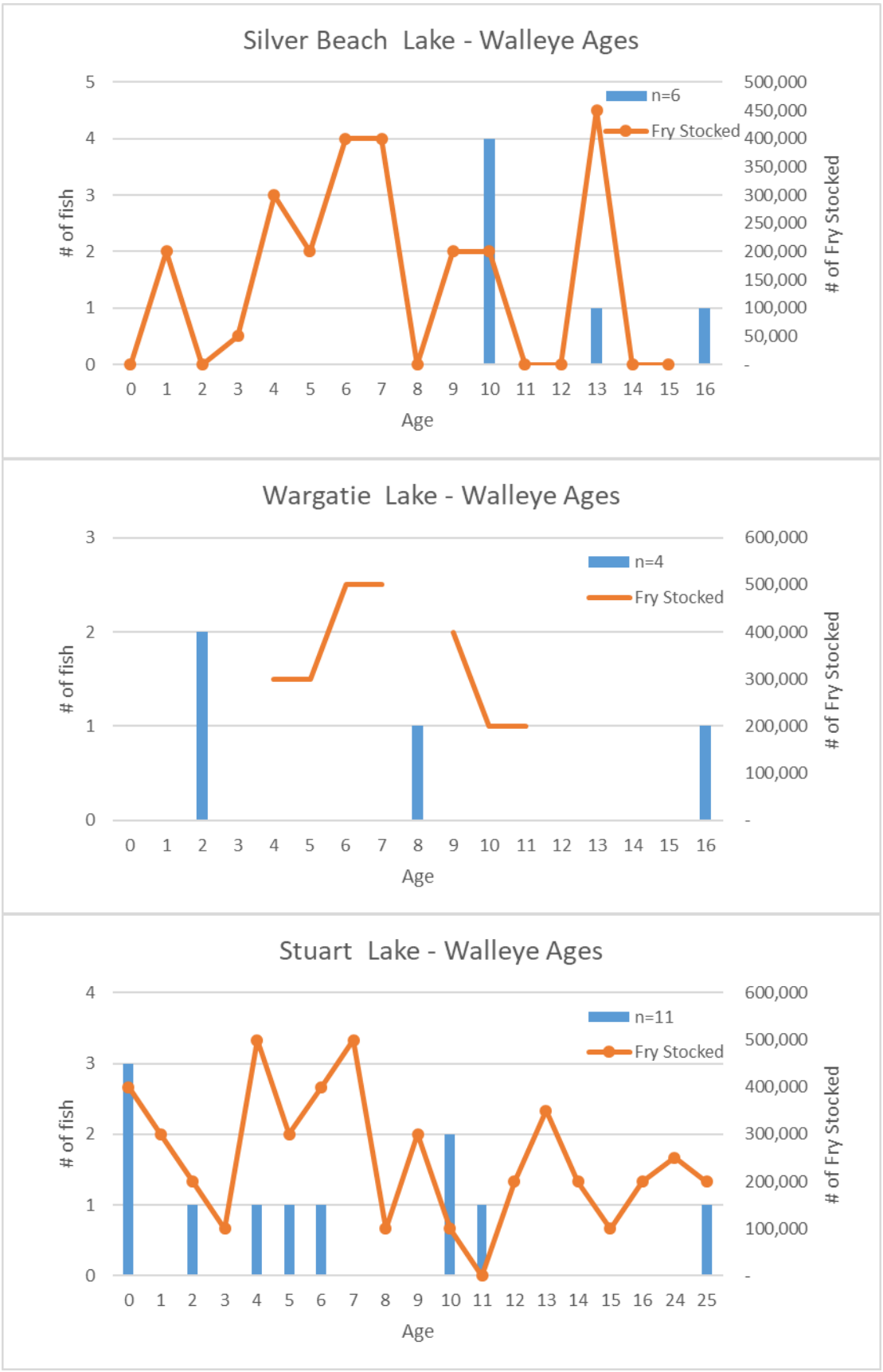

Figure 6: Walleye age class abundance from gill netting in comparison to stocking levels.

The overall health from walleye in all lakes investigated was good with most fish above 0.8 (Figure 7). Sandy Lake relative weights were higher in early lift stages and declined as walleye aged, which could be due to prey availability or competition. Other lakes walleye relative weights were quite consistent and generally declined as the fish got to older ages (>15).

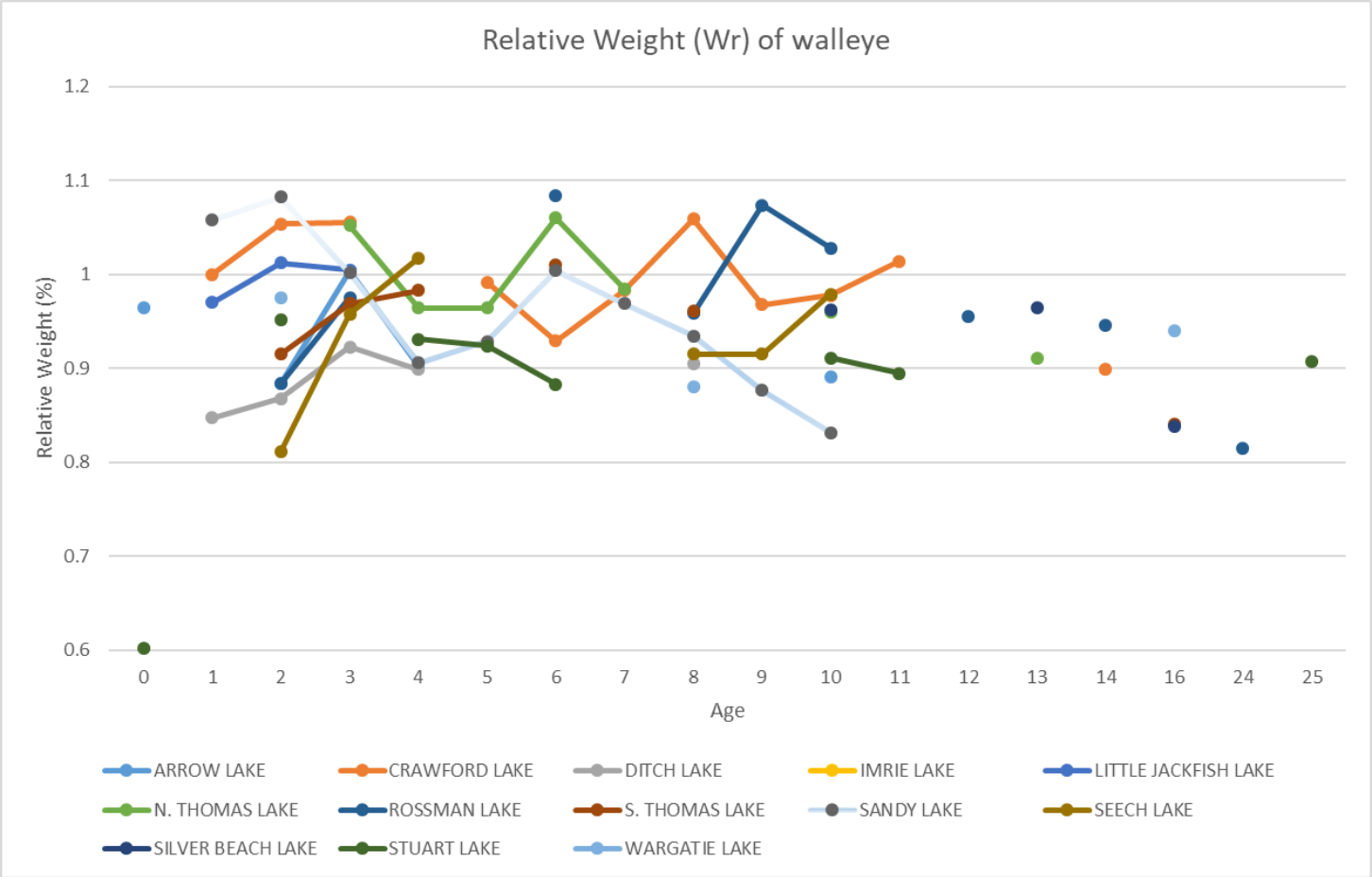

Figure 7. Relative weight of walleye from all lakes.

APPENDIX

Table A.1. Species catch, weight, yardage and CPUE from individual lakes.

	# Fish	Weight (g)	Yardage	CPUE/100m
ARROW LAKE	**145**	**15100**	49.6	292.3
WALL	33	7352	49.6	66.5
YLPR	24	2158	49.6	48.4
WHSC	88	5590	49.6	177.4
CRAWFORD LAKE	**121**	**51549**	49.6	244.0
WALL	34	50935	49.6	68.5
YLPR	14	517	49.6	28.2
STBK	55	71.2	49.6	110.9
FTMN	17	24.4	49.6	34.3
LGPR	1	1	49.6	2.0
DITCH LAKE	**106**	**24585**	49.6	213.7
NRPK	8	6705	49.6	16.1
WALL	22	8396	49.6	44.4
YLPR	54	148.4	49.6	108.9
SPSH	15	50.4	49.6	30.2
WHSC	7	9285	49.6	14.1
IMRIE LAKE	**30**	**12310**	49.6	60.5
NRPK	17	11965	49.6	34.3
WALL	3		49.6	6.0
YLPR	9	343.5	49.6	18.1
BNSH	1	2	49.6	2.0
LITTLE JACKFISH LAKE	**68**	**25641**	49.6	137.1
NRPK	2	5030	49.6	4.0
WALL	63	20526	49.6	127.0
YLPR	2	75.5	49.6	4.0
FTMN	1	9	49.6	2.0
N. THOMAS LAKE	**43**	**45515**	24.8	173.4
NRPK	15	25540	24.8	60.5
WALL	10	19975	24.8	40.3
YLPR	7		24.8	28.2
STBK	1		24.8	4.0
FTMN	5		24.8	20.2
DACE	5		24.8	20.2

ROSSMAN LAKE	**53**	**35679**	49.6	106.9
NRPK	6	10250	49.6	12.1
WALL	15	23512	49.6	30.2
YLPR	31	456.7	49.6	62.5
WHSC	1	1460	49.6	2.0
S. THOMAS LAKE	**36**	**29470**	49.6	72.6
NRPK	8	16240	49.6	16.1
WALL	18	13125	49.6	36.3
YLPR	10	105	49.6	20.2
SANDY LAKE	**49**	**38790**	74.4	65.9
NRPK	7	11300	74.4	9.4
WALL	40	27350	74.4	53.8
YLPR	2	140	74.4	2.7
SEECH LAKE	**41**	**41191**	49.6	82.7
NRPK	10	8230	49.6	20.2
WALL	10	10714	49.6	20.2
YLPR	7	307	49.6	14.1
WHSC	13	21940	49.6	26.2
CRAYFISH	1		49.6	2.0
SILVER BEACH LAKE	**70**	**44160**	49.6	141.1
NRPK	17	26430	49.6	34.3
WALL	6	14345	49.6	12.1
YLPR	35	1165	49.6	70.6
WHSC	12	2220	49.6	24.2
STUART LAKE	**115**	**31444**	49.6	231.9
NRPK	1	2.3	49.6	2.0
WALL	11	15251	49.6	22.2
YLPR	95	1981	49.6	191.5
WHSC	8	14210	49.6	16.1
WARGATIE LAKE	**18**	**20560**	49.6	36.3
NRPK	14	15680	49.6	28.2
WALL	4	4880	49.6	8.1
Grand Total	**895**			

Sum of Count	Column Labels					
Lakes	**1**	**2**	**3**	**SAUGNET1**	**SM1**	**Grand Total**
ARROW LAKE	6	18			9	33
CRAWFORD LAKE	15	19				34
DITCH LAKE	6	9			7	22
IMRIE LAKE	3					3
LITTLE JACKFISH LAKE	50	7			6	63
N. THOMAS LAKE	10					10
ROSSMAN LAKE	3	11			1	15
S. THOMAS LAKE	8	10				18
SANDY LAKE	23	13	4			40
SEECH LAKE	2	8				10
SILVER BEACH LAKE	4	2				6
STUART LAKE	4	4			3	11
WARGATIE LAKE	1	1		2		4
Grand Total	**135**	**102**	**4**	**2**	**26**	**269**

Species	**NRPK**											
Age Classes												
	DITCH	IMRIE	LITTLE JACKFISH	N. THOMAS	ROSSMAN	S. THOMAS	SANDY	SEECH	SILVER BEACH	STUART	WARGATIE	Grand Total
0		1								1		2
1		2										2
2	2	7		1	3			4	1			18
3	3	5					2	4	2		1	17
4			1	2				1	2		1	7
5	1	1		4		4	2	1	1		4	18
6			1	2	2	3	2		3		7	20
7	2	1		4		1	1		3			12
8				2					3			5
9									1			1
10											1	1
11									1			1
12					1							1
Grand Total	8	17	2	15	6	8	7	10	17	1	14	105