Spray Lake Stock Assessment 2021

In part of reporting for FES Project 20-040
SVSFE Recreational Angling Initiatives 2021

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Executive Summary

SVSFE applied to the Fish and Wildlife Enhancement Fund to investigate walleye stock on two recipient lakes of the Beautiful Lake Walleye Transfer. Featured in this report is the data from Spray Lake.

Results found a healthy walleye population with multiple age classes. A total of 52 walleye were sampled during the assessment and fish were in excellent condition. Growth rates were on par with other walleye lakes in the Duck Mountains. In addition, schools of 30-50 walleye were observed in shallows areas of high cover during the assessments. When correlating age class strength to stocking records, no conclusions could be drawn. There appears to be potential evidence of successful natural recruitment. If the availability of walleye stock ever becomes a concern, natural recruitment could be studied as a potential lake to be taken off the stocking list. However, at this time, there is not enough evidence to make any considerable changes to the stocking regime.

As a fishery, angler reports are few and far between. The fact that the lake supports small watercraft only and has no proper boat launch most definitely limits angling pressure. The results of the survey in addition to the on-water observations were surprising to say the least. The clear waters provide anglers with the unique opportunity to sight fish pike and walleye in shallow water. Walleye stocking appears to be successful, and therefore no changes should be made to the current stocking strategy.

Spray Lake has an area with 50.2 hectares with 33.1 being littoral (<3m). Recommendation is to continue walleye stocking at the current stocking rate of 12.5 fish/hectare on alternate years (n=628) from the Beautiful Lake Walleye Transfer. If this program ever becomes disrupted, a bag of 100,000 on alternate years will be more than sufficient for this particular waterbody.

One can anticipate winterkill to become more frequent in future if annual snow accumulation increases. Also, as anglers talk, one can also assume the lake will increase in popularity as a put-n-take walleye fishery in the Duck Mountains. These trends should be monitored to determine if changes to the stocking regime become necessary or not.

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Background Information

Stocking History

Spray Lake was historically a characteristic Duck Mountain pike fishery. Initial walleye introductions occurred in 1983, and the lake had been stocked with walleye fry intermittently from this point until 2017. Since 2017, walleye stock came exclusively from the Beautiful Lake Walleye Transfer Program (Table 1).

Table 1: Stocking Records

Year	Species	Amount	Life Stage	Comments
1983	Walleye	600,000	Fry	Initial Stocking
1991	Northern Pike	1,602	Adult	Wellman Lake
1994	Walleye	200,000	Fry	
1995	Walleye	150,000	Fry	
1996	Walleye	200,000	Fry	
1999	Walleye	150,000	Fry	
2001	Walleye	150,000	Fry	Grand Rapids
2002	Walleye	150,000	Fry	Swan Creek Hatchery
2003	Walleye	200,000	Fry	Swan Creek Hatchery
2004	Walleye	200,000	Fry	Swan Creek Hatchery
2005	Walleye	200,000	Fry	
2006	Walleye	150,000	Fry	
2007	Walleye	150,000	Fry	
2008	Walleye	250,000	Fry	
2009	Walleye	100,000	Fry	
2010	Walleye	200,000	Fry	
2010	Walleye	50	Adult	Beautiful Lake
2011	Walleye	200,000	Fry	
2011	Walleye	41	Adult	Beautiful Lake
2012	Walleye	400,000	Fry	
2012	Walleye	75	Adult	Beautiful Lake
2014	Walleye	100,000	Fry	
2014	Walleye	285	Adult	Beautiful Lake
2015	Walleye	200,000	Fry	
2016	Walleye	300,000	Fry	
2016	Walleye	868	Adult	Beautiful Lake
2017	Walleye	100,000	Fry	
2017	Walleye	312	Adult	Beautiful Lake
2021	Walleye	261	Adult	Beautiful Lake

Research History

Table 2: Research History

Year	Researcher	Program	Results
1993	Unknown	NRO Creel Check	July 20, 1993 - 1 angler 3.5 hours. 2 walleye (0.57 fish/hour, 3 pike (0.86 fish/hour)
1995	Brian Yake	Winterkill Investigation	A winterkill of undetermined severity has occurred. Observed 25 walleye (2-3lbs), ~35 perch, and 4 pike. 85% of fish noted in north side of lake. Loons present on lake.
1995	Brian Yake	Test Netting	Overnight index netting. 20 pike (range: 8oz - 5lb 4oz), 1 perch (11 oz). Sex and stomach contents in file. Secchi reading 9ft. Temp 51°F top and bottom. Dissolved Oxygen 14ppm throughout water column.
1996	Unknown	Winter DO Testing	February 20th. Station 1 (Top 4.3ppm, bottom 0.2ppm), Station 2 (Top 3.0ppm, bottom 0.0ppm)
1997	Unknown	Winter DO Testing	March 6th. Station 1 (top 0.5ppm)
1999	Unknown	Winter DO Testing	February 26th. Station 1 (Top 5.5ppm, Bottom 2.0ppm), Station 2 (Top 5.0ppm, Bottom 2.3ppm)
2001	Unknown	Winter DO Testing	February 28th. Station 1 (Top 4.0ppm, Bottom 1.4ppm)
2004	Unknown	Winter DO Testing	March 2nd. Station 1 (Top 2.16, Bottom 0.9ppm)
2004	Unknown	Test Netting	1 standard gang set overnight. 1 NRPK caught in 3" mesh. No indication of winterkill (fish dead on shore)
2014/ 2015	J. Stevens, L. Rowe	Test Netting	Missing field book. Only pike caught in ~4hrs netting in both 2014 and 2015. Notes indicate: Winterkill occasionally a factor to affect walleye sustainability more than pike.

Study Area

Spray Lake is located 68km south-east of Swan River, MB off of PR366 in the Duck Mountain Provincial Park. The lake is 50.2 hectares with a maximum depth of 11.4 meters (Figure 1). Targetable fish species present are walleye, northern pike, and yellow perch.

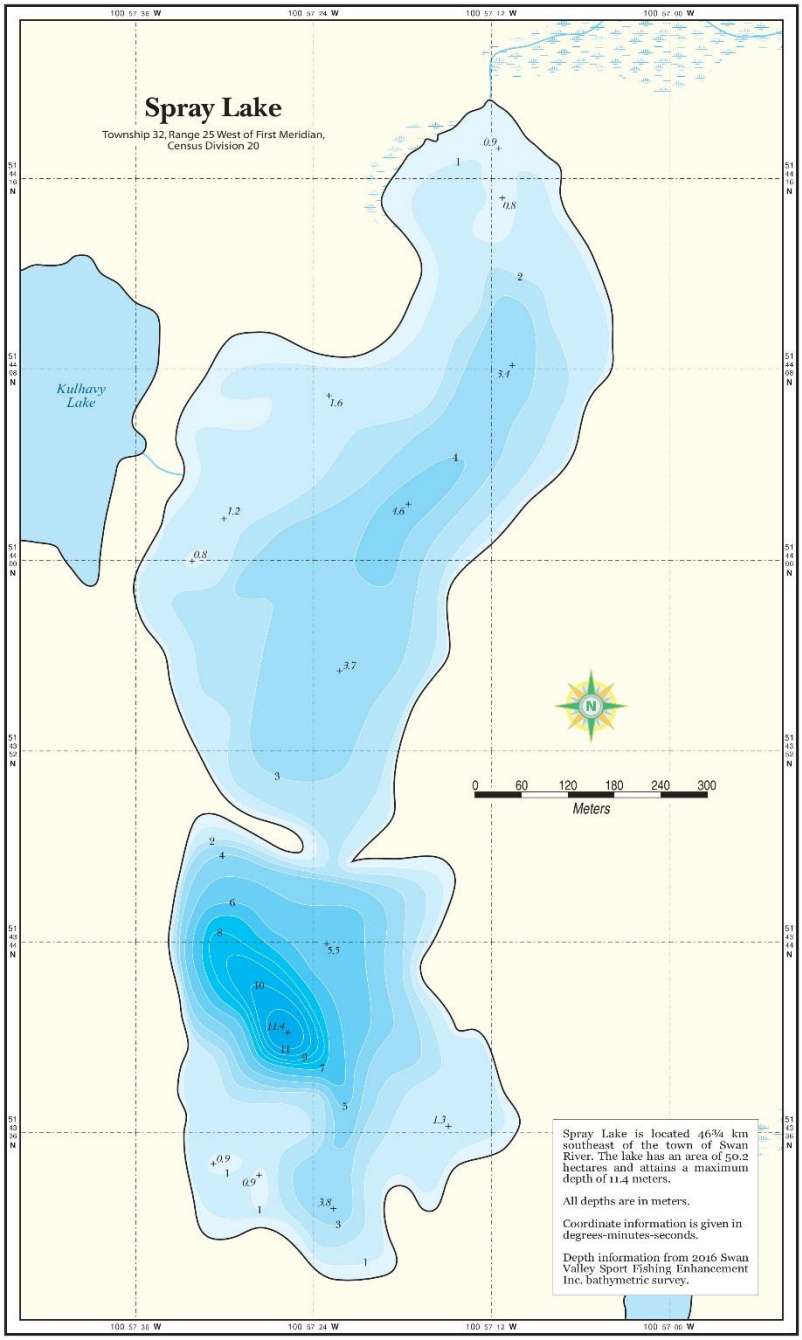

Figure 1: Spray Lake Bathymetry

Methods

The methodology used to assess the Spray Lake fishery was a variation of Ontario's End of Spring Trap Netting (ESTN). Trap nets were the sole method of capture and sites were chosen according to depth suitability. The assessment was designed to be achievable within a work week which consisted of 6 overnight sets fishing for a minimum of 21 hours. The netting schedule was created based ESTN's netting requirements. The nets used were standard Lake Superior Trap Nets which consisted of a 6'x 6' x 11'4" crib and 150' lead. All nets were marked with several buoys and identification flags. Information recorded at set time included: project code, UTM coordinates of set location, project site code, site type (general substrate, fish cover) bottom type (substrate, fish cover), net set crew, set date, set time, lead length, distance offshore, angle to shore, start depth, mid depth, gap depth, and any comments. Information recorded at net pull consisted of; net lift crew, lift date, lift time, effort status, duration of set, water temperature, cloud cover, precipitation type, wind direction & speed, general weather for set duration and surface conditions through set. As the trap was pulled, fish were placed in an onboard live-well. All game fish caught were identified by species, and sampled for fork/total length, weight, age and left pectoral fin clipped to identify recaptured fish. Age structures taken included scales from walleye and northern pike. Once all fish were sampled and released, traps were relocated and reset at the next assigned fishing location.

Figure 2: Net Locations

Results

Netting occurred between June 14th-17th, 2021. Effort equated to 135.3 fishing hours which yielded a total catch of 155 fish (Table 3). Six trap net locations were selected with 2 trap nets fishing at a time. Surface temperatures were between 19.9°C - 20.9°C throughout the assessment. Catch results are summarized as follows:

Table 3: Catch Summary

Sample	Hours Fished	Total Fish Caught	Total CPUE	Walleye		Northern Pike	
				Total	CPUE	Total	CPUE
1	**23.4**	32	1.37	17	0.73	12	0.51
2	**24**	41	1.71	3	0.13	38	1.58
3	**21.7**	24	1.11	15	0.69	9	0.41
4	**21.7**	14	0.65	4	0.18	8	0.37
5	**22.2**	25	1.13	5	0.23	20	0.90
6	**22.2**	19	0.86	8	0.36	11	0.50

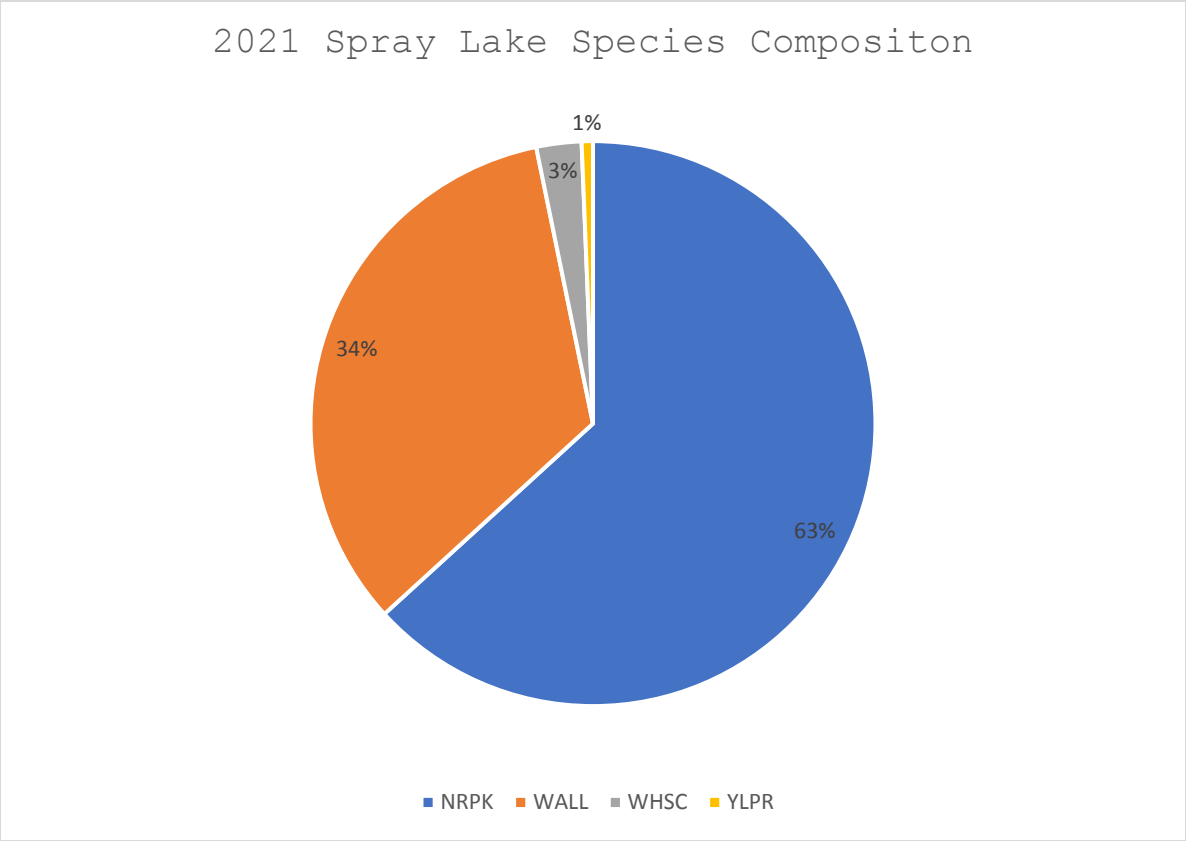

Figure 3: Catch Composition

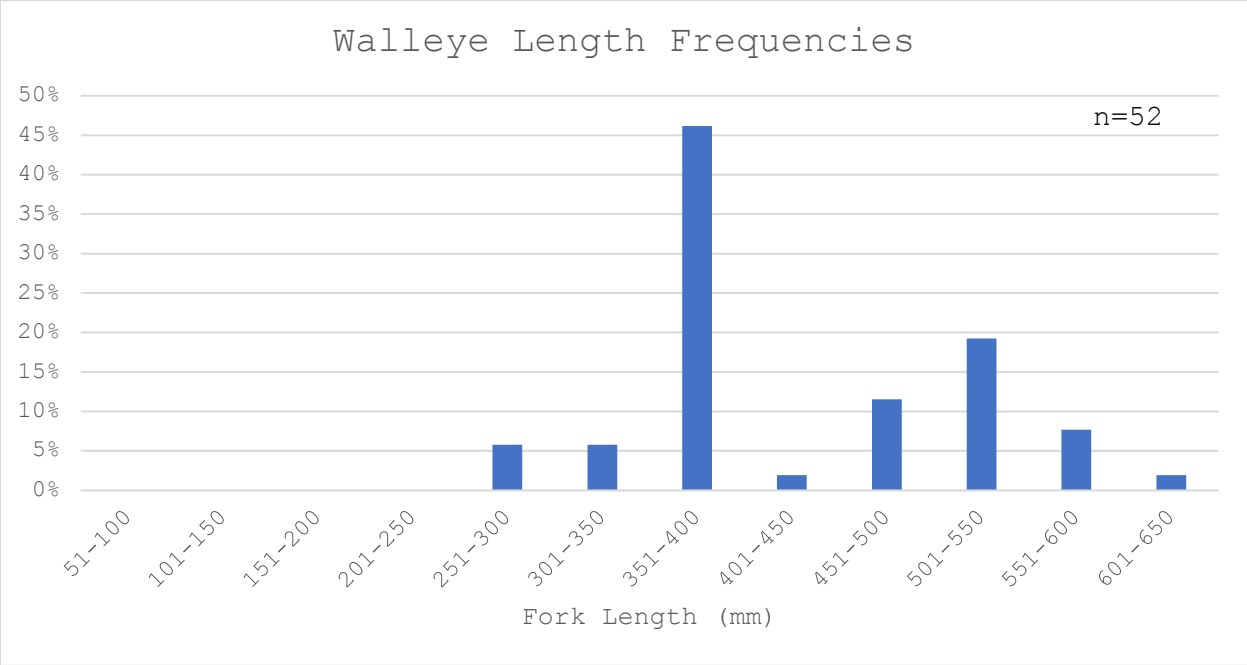

Figure 4: Walleye Length Frequencies

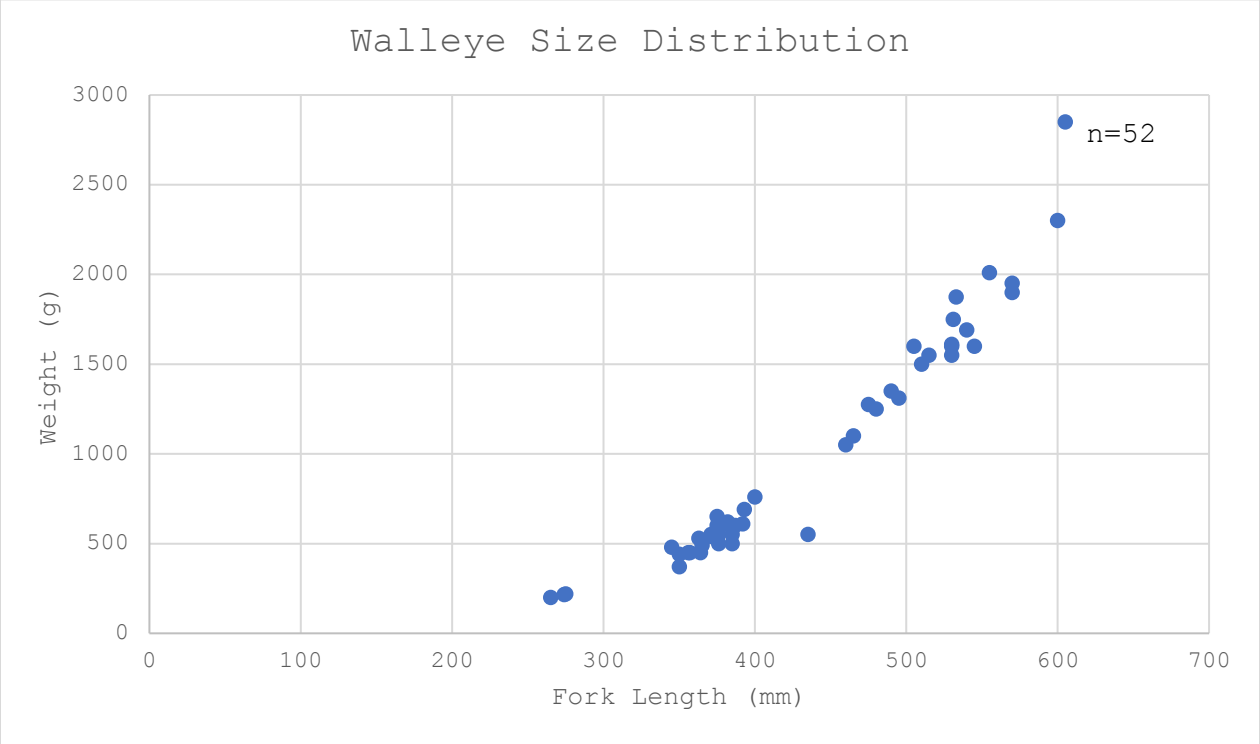

Figure 5: Walleye Size Distribution

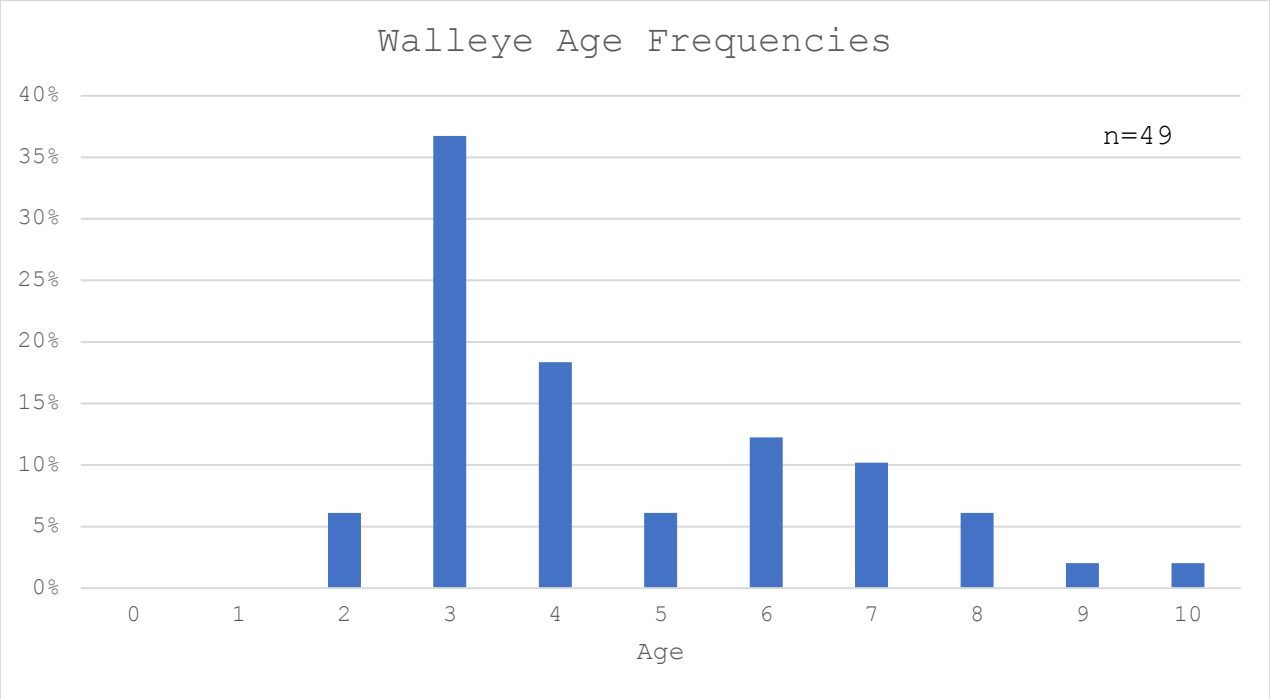

Figure 6: Walleye Age Frequencies

Figure 7: Spray Lake Walleye

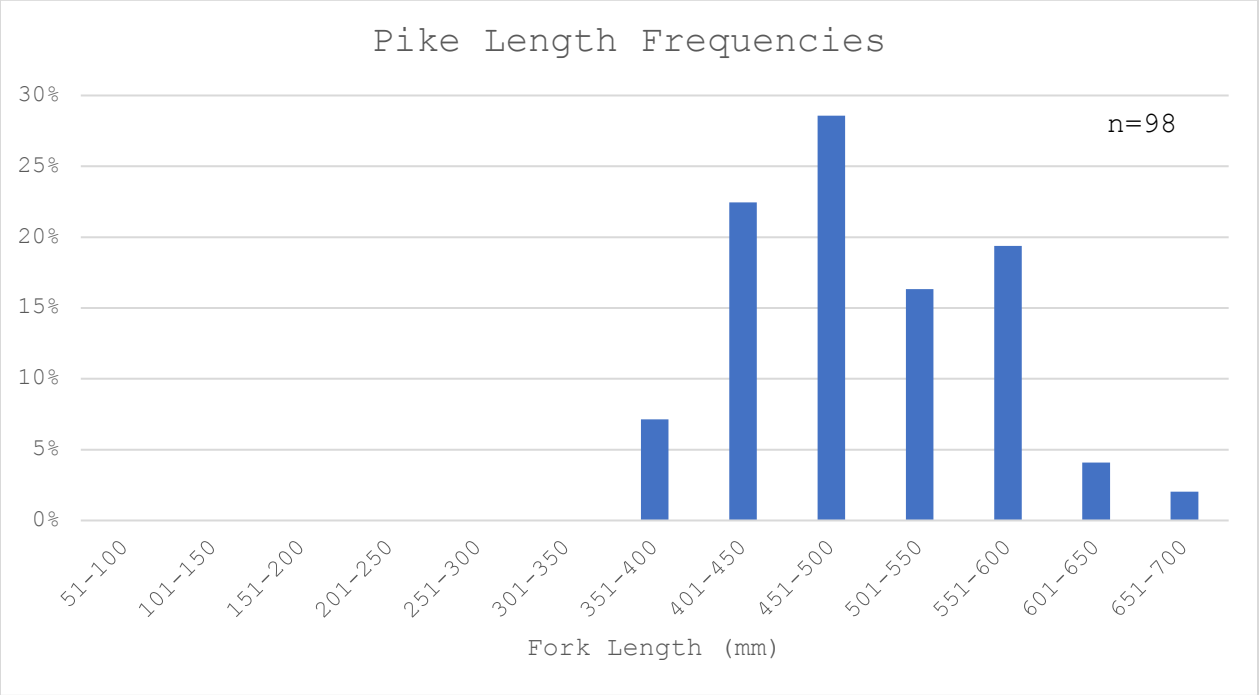

Figure 8: Pike Length Frequencies

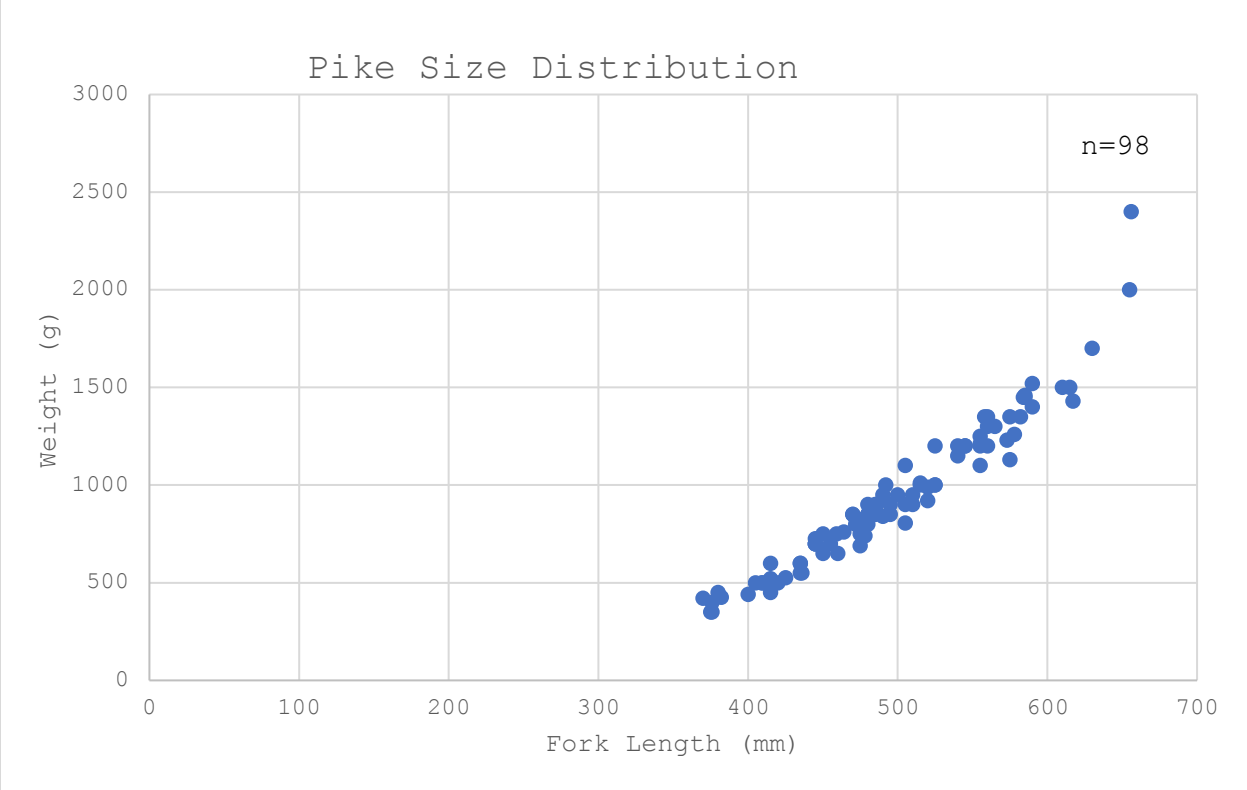

Figure 9: Pike Size Distribution

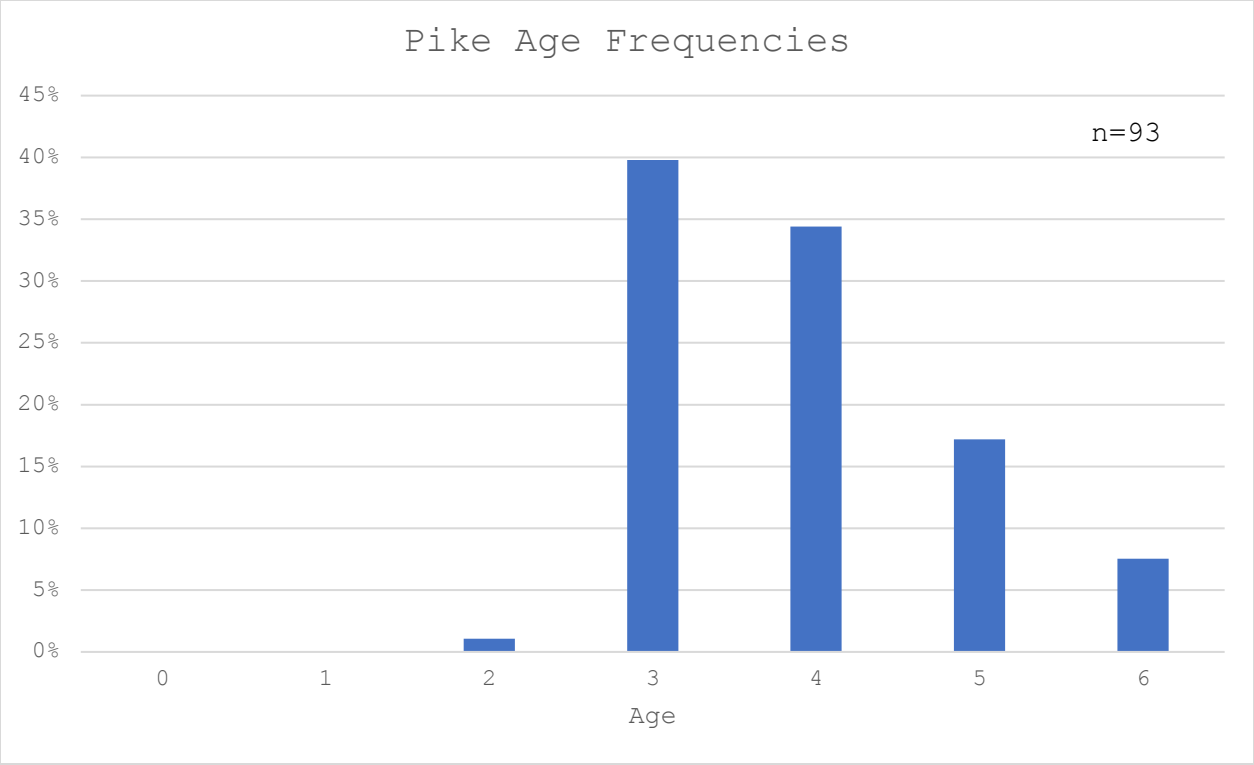

Figure 10: Pike Age Frequencies

Figure 11: Spray Lake Pike

Table 4: Other species

Project Site Code	Fish #	Species	Fork Length (mm)	Total Length (mm)	Weight (g)
SP-TR-21-001	SP-21-0005	WHSC	535		
SP-TR-21-001	SP-21-0012	WHSC	510		
SP-TR-21-001	SP-21-0022	WHSC	350		
SP-TR-21-004	SP-21-0102	YLPR	166	175	50
SP-TR-21-004	SP-21-0104	WHSC	545		

Figure 12: Spray Lake Sucker

Discussion

Historically, Spray Lake has concerned managers as it experiences low winter dissolved oxygen on select years. Today, late winter DO's are still a concern and it can be anticipated we will experience winterkills at different severities in future years. Snow accumulation over the past decade has been below average and is likely part of the reason there have been no reports of winterkill recently. In addition, multiple different age classes of walleye were sampled in 2021 (up to 10+ years). Recent conversations with local trapper and retired Conservation Officer, Brian Hunter, have revealed the lake has between 2 and 3 known spring upwellings. Brian has noticed these along the east shore of the north bay while travelling the shorelines on snowmobile. These upwellings likely benefit fish populations in years/periods of low dissolved oxygen.

Trap netting results found a surprising number of walleye in multiple different age/size classes. In addition to trap netting data, walleye were observed in large schools on multiple occasions during the assessment. These schools had between 30-50 walleye hunting in shallow waters in thick cover. Angling reports from Spray Lake are uncommon. Terry Kulhavy, a retired Fire Ranger, often fishes Spray Lake and has expressed he generally gets a few walleye at each outing. Walleye caught during the survey were in excellent condition, and when correlating size at age data, Spray Lake walleye growth are on par with other Duck Mountain walleye fisheries. When correlating age classes to stocking data it appears not too many conclusions can be drawn. The highest age frequency (3+) correlates to no documented walleye stocking. As we know, fish ages are simply estimates. Although there appears to be potential evidence of significant natural recruitment, there is not enough evidence to make any significant changes to the stocking strategy.

Spray lake has a very strong pike population and the clear waters provide excellent sight fishing opportunities. Interestingly, in 2015 while conducting angler interviews in the Duck Mountains, SVSFE's Megan Paterson ran into a group of six from Casper, Wyoming. These folks were fly fishing and expressed that they primarily visit the Duck Mountains to sight fish pike at Spray Lake. Pike caught in 2021 were in excellent condition and found in multiple age/size classes.

Since the new SVSFE dock was installed in 2017, reports of families shore fishing for perch has increased. It is important to point out the importance of the perch fishery to locals and young children. Only one perch was caught during 2021 assessments, however they were observed in large schools in the shallows over the course of the survey.

Recommendations for future management and development are outlined in the executive summary of this report. At this time, there is no reason to make any significant alterations to the current management strategy.