Summary of Activities

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To: Ian Kitch
Manitoba Sustainable Development

From: Holly Urban, Brock Koutecky, Megan Paterson - Swan Valley Sport Fishing Technical Staff
Contact:
swanvalleysportfish@gmail.com

Subject: Deep and Virgin Lake - Recruitment Surveys 2017

Location: Deep Lake, Porcupine Provincial Forest, 14 U 336346 5833473
Virgin Lake, Porcupine Provincial Forest, 14 U 334787 5834186

SVSFE is known for their interest in walleye recruitment success to facilitate proper walleye stocking rates and stocking densities. Both Deep and Virgin lake are well known walleye/pike fisheries to the local fisherman who visit the Porcupine Mountains. Although they are well known, recently in terms of fisheries research, little work has been completed on either fishery. These fisheries are located adjacent to each other northwest of North Steeprock Lake (Figure 1).

Figure 1: Study Area

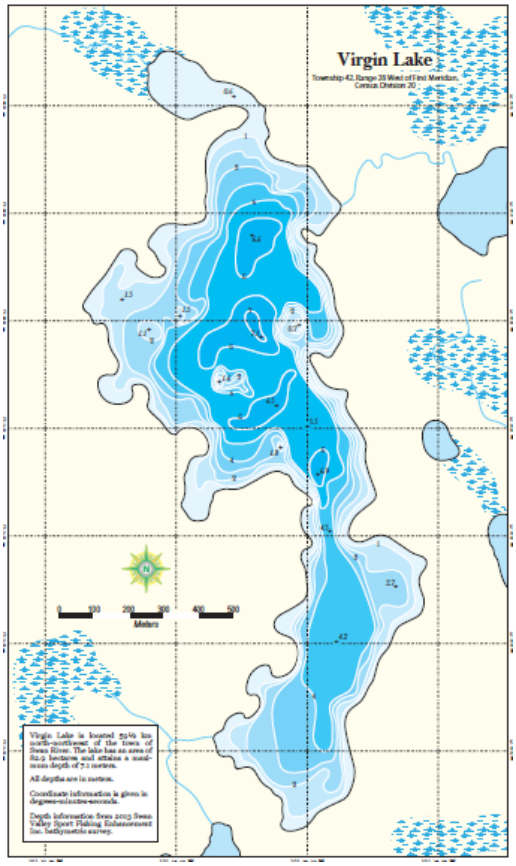

Figure 2: Virgin Lake

Virgin Lake is a 82.9 hectare lake with depths up to 7.1 meters (Figure 2). This lake contains various reefs or underwater structure along with shallow weedy bays and rocky shorelines. Deep Lake is similar in nature at 94.5 hectares with maximum depths of 12.8 meters (Figure 3). Unlike Virgin, Deep Lake does possess a few sandy beaches.

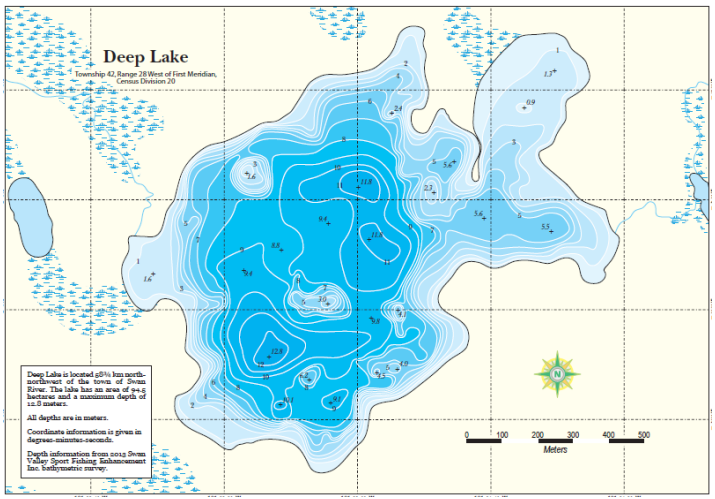

Figure 3: Deep Lake

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History:

Records indicate Deep Lake was initially stocked with walleye in 1993 (Table 1). Interestingly, a memorandum (T. Smith) from 1988 stated an overnight test netting on June 23rd caught walleye. This report stated the lake possessed and high population of whitefish, pike and white suckers. It also mentioned the walleye population was rather small due to competition, the splake were non-existent and that some "serious" netting would have to be completed before the lake would be "a productive walleye or trout lake". Through conversations with hatchery staff, it was discovered the federal government conducted stocking in the 80s on various waterbodies in the Porcs, explaining the presence of walleye prior to the "initial" stocking.

Following the 1993 fry stocking, test netting was completed in 1997 with an overnight set of 200 yards of gill net. The results found a healthy handful of walleye (18), 22 whitefish and five white suckers. At this time it is assumed pike were present in the population but just not contribute to the catch. The 18 walleye were found to be between the age of 8 and 14, with the most frequent ages between 11 -14 years old. It is hypothesized walleye were first introduced in 1983, the same year Virgin Lake was first stocked.

In 97' the lake received 6,745 fingerlings from the North Lake transfer project. From then it was intermittently stocked with walleye fry when available or with fingerlings when North Lake transfer occurred. Today, anglers know the lake as a good pike fishery which produces the a few nice walleye (reported 27" in 2017). Whitefish are still present, but unfortunately are hosts to the Cestode, triaenophorus crassus.

Table 1: Stocking history of Deep Lake from 1993 - 2017

Deep Lake Stocking History		
Year	**Stock**	**# of Fish**
1993	fry	100,000
1994-1996	-	-
1997	fingerling	6,745
1998 - 2006	-	-
2007	fry	100,000
2008	fry	100,000
2008	fingerling	100
2009 - 2013	-	-
2014	fingerling	5,286
2015	fry	200,000
2016 - 2017	-	-
Total	**Fry**	**500,000**
	fingerling	**12,131**

As stated previously, walleye were first introduced to Virgin Lake in 1983 (Table 2). As an experiment, in 1986 Virgin Lake was part of total fish removal to (1) prepare the lake for introduction of walleye fry by removing a significant number of predators (mainly northern pike) and (2) to evaluate the standing crop of fish and species composition (Edwards, 1994). The removal was carried out in the summer (July) and fall (Oct) of 1986 and the summer (June/July) of 1987. A total of 9,654 fish or 5,281 kg of fish were removed including white suckers, northern pike, yellow perch, walleye and burbot (Table 3). Of the <2% of walleye caught, they appeared to correlate with the 1983 stocking as the average sized walleye measured 371mm and 560g. This would be a typical three year old walleye.

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Virgin Lake was further test netted in 1988, 1996 and 2000 to assess the of stocking (Table 4). Size of mesh and amount of nets varied between the test netting assessments, so not too many conclusions can be made. Throughout the late 80s and 90s, Virgin Lake was stocked on four occasions amounting to 450,000 fry and 10,549 fingerlings in part of the North Lake transfer. Following the 2000 test netting, managers decided to no longer stock walleye in Virgin Lake due to the poor results of both fry and fingerling stocking. Interestingly, fry were stocked in 2002 and intermittently years after.

Table 2: Stocking history of Virgin Lake from 1983 - 2017

Virgin Lake Stocking History		
Year	Stock	# of Fish
1983	fry	1,050,000
1984 - 1986	-	-
1987	fry	150,000
1988	fry	100,000
1989 - 1993	-	-
1994	fry	200,000
1995 - 1996	-	-
1997	fingerling	10,549
1998 - 1999	-	-
2000	fry	300,000
2001	-	-
2002	fry	200,000
2003 - 2006	-	-
2007	fry	200,000
2008	fry	100,000
2008	fingerling	200
2009	fry	100,000
2009 - 2013	-	-
2014	fingerling	5,490
2015	fry	200,000
2016 - 2017	-	-
Total	Fry	2,600,000
	fingerling	16,239

Table 3: Fish removal project catch summary

Virgin Fish Removal - # of fish removed by year			
	1986	**1987**	**Total**
NRPK	1160	1506	2666
WHSC	2171	3632	5803
WALL	76	77	153
BURB	15	21	36
YLPR	12	984	996
Total	**3434**	**6220**	**9654**

Table 4: Virgin Lake test netting results from 1988,1996 & 2000

Virgin Lake Test Netting Catches			
	1988	**1996**	**2000**
NRPK	34	6	13
WHSC	24	8	87
WALL	0	1	1
BURB	0	0	0
YLPR	12	0	0

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Results: In 2017, SVSFE decided to add both Virgin and Deep Lake to the walleye recruitment assessment regime. Both lakes are frequented by anglers and understanding the success of natural recruitment will aid in the long term management of the lakes. On the evening of August 30th, 2017, SVSFE technicians set out to seine five locations at Deep Lake (Figure 4) and three locations at Virgin Lake (Figure 5). Virgin lake was not very suitable for seining. A good portion of the lake was highly vegetated, therefore only the three sites. Areas with little vegetation were targeted for seining, though two of the three sites contained large cobble, steep drop offs and slippery conditions, making it difficult to efficiency seine. Deep Lake possessed more preferable seining sites distributed along the shoreline.

Figure 4: Seining locations at Deep Lake

To compare seining results, catches are review in CPUE or total # fish caught per meter seined.

Deep Lake - Catches included 260 yellow perch (CPUE 1.220), 1 northern pike (CPUE 0.004), and 98 white suckers (CPUE 0.460). The pike at 117 mm, would be considered a young of the year (Figure 6). This fish was infested with blackspot (*Neascus*), a common parasite. Forage species noted during assessments, starting with the most frequent of occurrences were spottail shiners, snails, blacksided darter, caddisflies, crayfish and backswimmers. The higher concentrations on snails correlate with the presence of blackspot as snails are a intermediate host for this particular parasite.

Figure 5: Seining locations at Virgin Lake

Figure 6: Young of the year pike

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Virgin Lake - Catches included 83 yellow perch (CPUE 0.838), 4 northern pike (CPUE 0.040), and 13 white suckers (CPUE 0.131). Pike ranged from 165 – 298 mm, would be 1 -2+ aged fish (Figure 7). Forage species noted during assessments, starting with the most frequent of occurrences were spottail shiners, crayfish, blacksided darter, dragonflies and caddisflies, respectively. No young of the year walleye were found at either lake.

Figure 7: 1+ old northern pike

Discussion:

The 2017 recruitment results indicate recruitment in both lakes are minimal to non-existent for the 2017 season. Unfortunately, seining isn't always the best method to target smaller walleye, particularly when shoreline habitat is unsuitable. SVSFE believes it would be beneficial to introduce electrofishing as a method to assess both fish community and recruitment at both; Virgin and Deep Lake(s). Both lakes can be accessed easily as long as road conditions are dry. This method would provide a two-fold objective; 1) evaluate cwalleye recruitment 2) assess the current status of each fishery to correlate walleye ages to stocking efforts.

Management regulations on Deep and Virgin Lake differ from other walleye lakes in the Porcupine Mtn. They are also significantly smaller waterbodies with less fishing pressure. Possess limits include four walleye, opposed to the regular two limit and anglers are allowed one walleye over 55cm. This is not suggesting a regulation change would improve walleye angling in either fishery but just a note for future findings.

SVSFE has tentatively scheduled an electrofishing survey into the 2018 field activities (pending funding). This efficient and effective method will hopefully shed some more light on both of these fisheries.

Literature Cited

Edwards, G. (1994) Virgin Lake Fish Removal Project 1986-1987 – Summary

Manitoba Natural Resources, Fisheries Branch, Test Netting Results, Deep Lake (1988, 1997), Virgin Lake (1988, 1996, 2000)

Manitoba Sustainable Development, Fisheries Branch, Western Region Stocking Database file