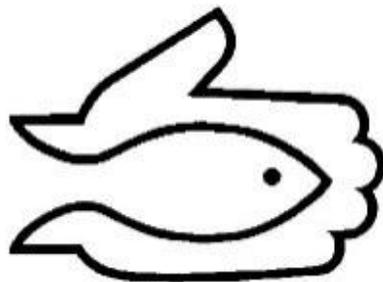
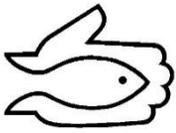


2017 Glad Lake Pike Transfer *Summary of Activities*



Submitted by: Holly Urban, Brock Koutecky & Megan Paterson
on behalf of Swan Valley Sport Fishing Enhancement





Summary of Activities

Date: November, 2017

To: Ian Kitch -

Manitoba Sustainable Development

cc. Lloyd Rowe, Jonathan Stephens

Manitoba Lodges & Outfitters Association

Glad/Wellman Campers & Cottage Owners Assoc.

Wellman Lake Lodge

From: Holly Urban, Brock Koutecky &

Megan Paterson

Swan Valley Sport Fishing Enhancement

Technical Staff

Subject: 2017 Glad Lake Pike Transfer

Contact: swanvalleysportfish@gmail.com

Location: Glad Lake, Duck Mountain Provincial Park, MB 14U 369326 5741636

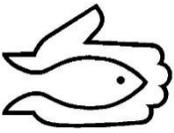
History: In March of 2015, SVSFE received \$4,800 through the Hunter & Angler Preservation Fund (HAPF) to purchase 22,500 arctic char eggs destined for Glad Lake. Arctic char have not been stocked since the 1990s and SVSFE's objectives are to provide a unique angling opportunity for resident and non-resident anglers in the Parkland Region, which in turn will benefit the local economy and attraction to the area. Glad Lake once produced master angler arctic char and SVSFE strives to meet this goal by working cooperatively with Provincial Fisheries Staff in creating and managing Glad Lake as an arctic char and lake trout fishery.

As part of this management plan, SVSFE and fisheries staff proposed a pike removal program in 2015 to increase the success of char stocking, as Glad Lake is known to house a few very large pike. Northern pike are primarily piscivorous and tend to be more opportunistic than selective. Most research has shown that esocids will tend to utilize the most abundant prey species present in a body of water (Smith 2008). In this case, it was the annually stocked hatchery trout. The pike populations had degraded what was once a valued trout destination due to the lack of maintenance of the species (removal programs and angler harvests). The 2015 - 2017 efforts are the beginning to a long term maintenance plan for Glad Lake. Please refer to the 2015 & 2016 for a comprehensive analysis on past efforts/removals, including literature review regarding previous non-salmonid removal programs in Glad Lake.

Highlights of the 2016 recommendations:

- 1) Develop and maintain a committed long term yet cost-effective maintenance program to remove target species
- 2) Designate an alternative stocking objective for Glad Lake if char stocking is unsuccessful
- 3) Evaluate all levels of available forage
- 4) Implement stocking plan - time of year/species/frequency
- 5) Impose new regulations. - suggest catch and release for char and allow one pike over 75cm
- 6) Investigate the status and condition of both outflow structures

This report will summarize efforts in 2017, along with total efforts since the program was initiated in May of 2015 and future considerations.



Summary of Activities

Subject: 2017 Glad Lake Pike Transfer

Results:

SVSFE initiated the "Glad Lake Pike Transfer" on April 27th, 2017 by setting one trap net in the north bay of the lake prior to ice out. The key to catching pike is to be fishing spawning areas as early as possible, as pike commonly spawn when the lake is still ice covered. Catch methods were exclusive to trap netting. Trap netting has proven to be the most effective method over the transfer years. The remaining three traps were set on May 4th, with nets checked every 3 - 5 days. On May 18th effort was decreased from four trap nets to two as catches dramatically decreased and the nets were required for other projects (Figure 1). The project concluded June 5th

2017 Glad Lake catch per unit effort
of northern pike by trap net through transfer

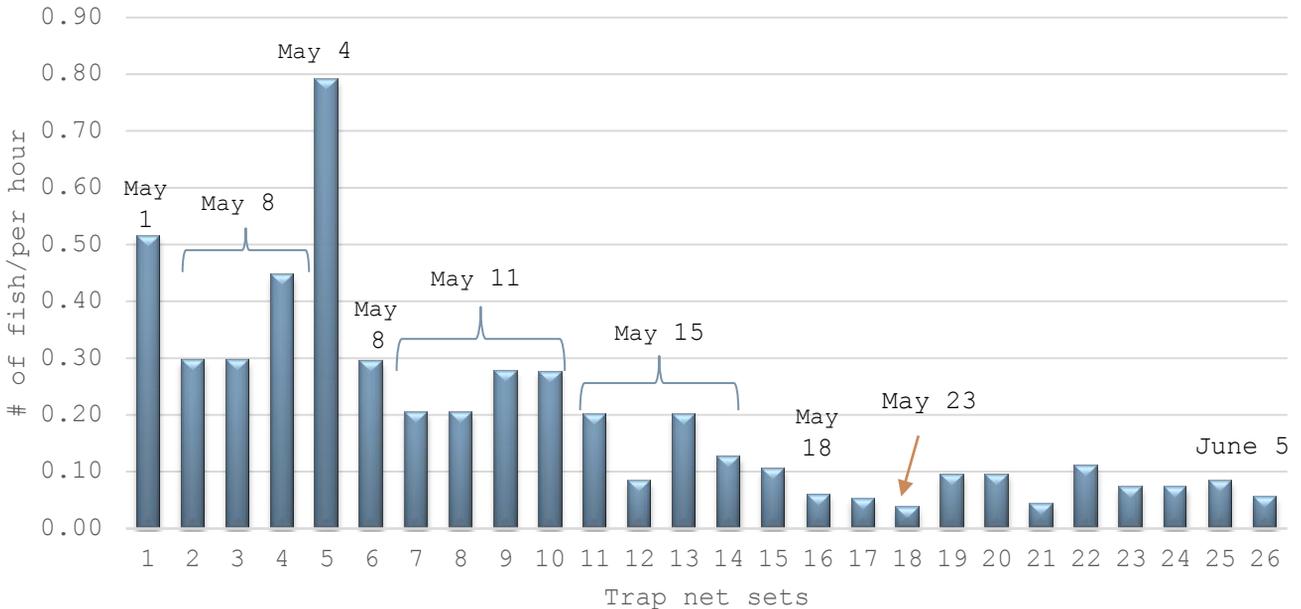
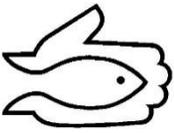


Figure 1: CPUE by net

In the sample period a total of 26 nets were set in the most productive locations equating to a total effort of 2,466 fishing hours. Nets were moved once catchment became minimal in a particular location and continued until catches were essentially insignificant. In total, 450 pike were captured and removed (CPUE 0.182 fish/hour) in 2017. Recipient lakes for the pike in 2017 included Wellman Lake and Chain Lakes. The larger pike (>750mm), walleye and smallmouth bass were destined for Wellman Lake. Chain Lakes was assigned for the smaller pike (<750mm). Wellman Lake received four pike, two walleye and one smallmouth bass. Chain Lakes was the recipient of 314 pike (110 to the north basin & 204 to the south basin). A total of 132 pike were repurposed due to either net mortality or infestations of blackspot (*Neascus spp*).



Summary of Activities

Subject: 2017 Glad Lake Pike Transfer

In 2015 & 2016 efforts removed 112 pike (CPUE 0.155 fish/hour) and 398 pike (CPUE .119 fish/hour), respectively (Figure 2). In summary, since May 2015, SVSFE has successfully removed a total of 960 northern pike, 11 walleye, 134 white suckers, 42 yellow perch and 1 smallmouth bass.

Glad Lake Pike Transfer CPUE by Species



Figure 2: CPUE by species

In terms of walleye, the two fish caught in 2017 were found at what we call "Storozuk's Bay" located on the west shoreline south of the southern cottage development. The walleye were similar in size at 480mm and 485mm and aged at six and five years old, respectively (Figure 3).



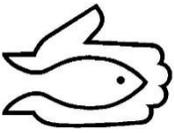
Figure 3: walleye

The one smallmouth bass was caught on the last day of the transfer (Jun 5) in "Scale's Bay" south of the northern cottage development and measured 290mm with results indicating the bass was age two (Figure 4).



Figure 4: smallmouth bass

Little data was collected on the yellow perch and white suckers but it was noted through observations that there is an increase in larger yellow perch >100mm. All suckers and yellow perch were released back into Glad Lake.

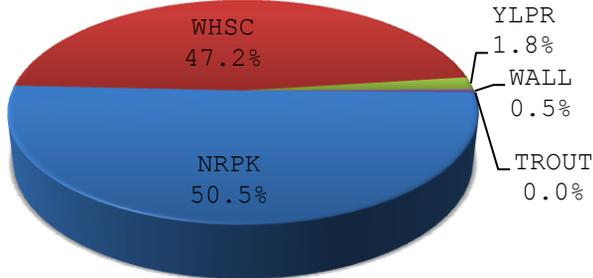


Summary of Activities

Subject: 2017 Glad Lake Pike Transfer

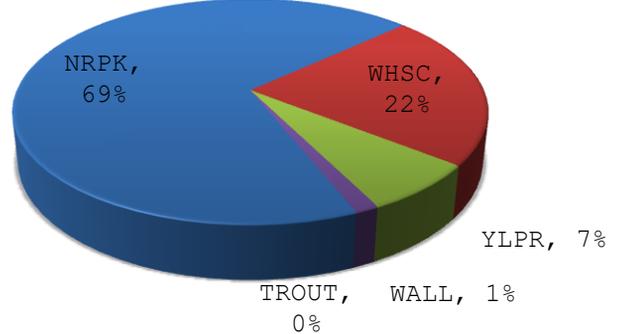
2015 Species Composition

n = 218



2016 Species Composition

n = 574



2017 Glad Lake Pike Transfer Species Composition of Total Catch

n=738

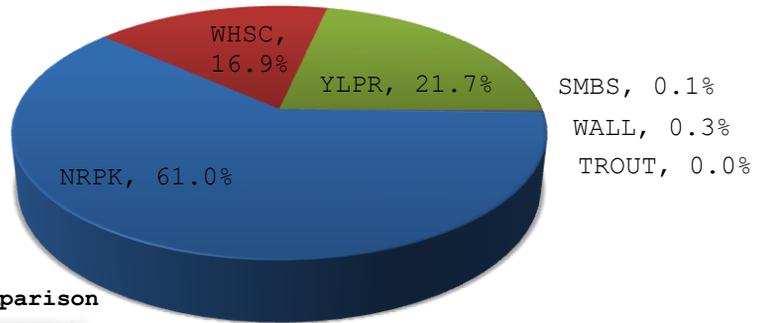
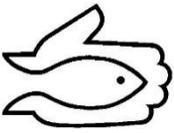


Figure 5: Species composition comparison



Observing the species composition over the past three years depicts some significant shifts (Figure 5). It is important to note, catchment methods have improved over time, therefore causing an increase in number of fish caught. Northern pike made up 61% of the species composition for 2017, slightly down from the 69% in 2016. Both walleye and white suckers' composition to the catch are lower than 2016 while yellow perch occurrences have increased as expected with removing top predators from a system. 2017 marked the first occurrence for smallmouth bass during the pike transfer.

Figure 6: pike being transfer from nets to transfer tank



Summary of Activities

Subject: 2017 Glad Lake Pike Transfer

The size of northern pike caught has significantly changed over the years (Figure 7). During the first year, SVSFE removed several large pike from the population. As a direct response to removing the "police", numbers of smaller pike increased. In 2017, the large pike are almost none existent.

A few pike were aged and one of the largest pike (850mm) was nine years old while the small pike at ~250mm and ~300mm were found to be two and three years of age, respectively. These smaller pike contributed to 35% of the catch.

Glad Lake Northern Pike Length Frequencies Comparison of 2015 - 2017 Catches

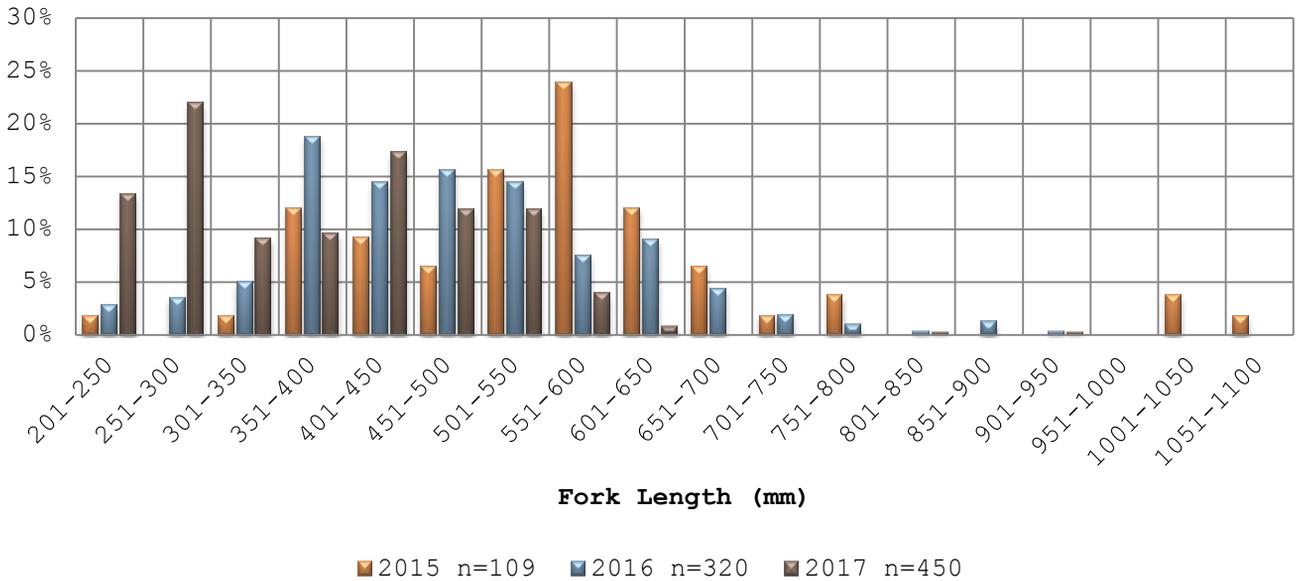


Figure 7: northern pike length frequencies

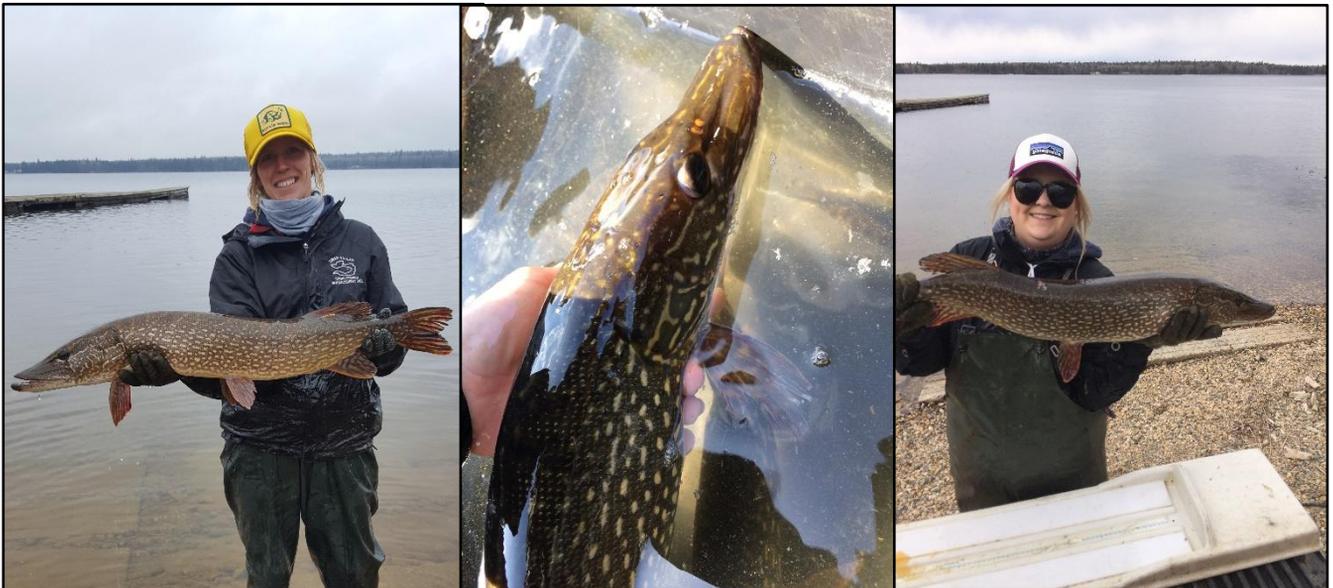
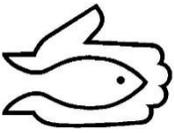


Figure 8: northern pike caught during the 2017 transfer



Summary of Activities

Subject: 2017 Glad Lake Pike Transfer

Discussion: As mentioned previously, the 2016 transfer had recommendations to complete or initiate prior to arctic char stocking and in part of creating fisheries management objectives for Glad Lake. The following is a review of actions taken to date.

Investigate Outflow - One objective was to investigate the connection between Glad and Wellman lake to prevent any future encroachment of undesired species. There are several natural barriers (beaver dams) between to two lakes but in high water/spring runoff, the possibility of fish movement is undeniable (Figure 9). On May 17th, SVSFE staff, upon approval from Parks Branch, installed an aluminum grate under the Glad Lake hiking trail boardwalk which crosses the outflow from Glad to Wellman Lake (Figure 11). There was no barrier installed at the secondary structure on the outlet of the waterbody east of Glad, as Parks has experienced beaver activity at this location and felt a barrier would allow the beavers to become problematic once again (Figure 10).



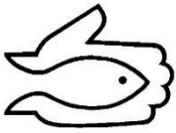
Figure 9: Boardwalk at outlet in 2011



Figure 10: Secondary structure



Figure 11: Aluminum grate install on outlet boardwalk in 2017



Summary of Activities

Subject: 2017 Glad Lake Pike Transfer

Regulation Changes - The second recommendation was to impose a catch and release regulation for arctic char and allow anglers to retain one pike over 750mm. In May of 2017, Fisheries Branch approved the catch and release regulation for arctic char and for signage to be installed. This fall government approved the pike regulation be changed to a standard provincial general limit for Glad Lake. This allows anglers six northern pike with regular licence and four with a conservation licence with only one exceeding 75cm.

Char Stocking - Thanks to the partnership and funding support from the Whiteshell Fish Hatchery and the Hunter & Angler Preservation Fund, SVSFE was able to initiate the arctic char stocking. Back in November of 2015, a total of 30,000 char eggs were originally purchased from the Icy Waters Hatchery in Whitehorse, YT and transported to the Whiteshell hatchery to be hatch and raised. To increase char angling opportunities, it was agreed to stock 5,000 of these fish in Snail Lake in April of 2016, Fisheries Branch and SVSFE staff did just that. The char were transported via snowmobile and stocked through the ice as this lake is winter access only (Figure 12).



Figure 12: Snail lake char stocking

On June 7th, 2017 the day had finally arrived! A final total of 22,250 arctic char were scatter stocked in Glad Lake (Figure 13). The char ranged from as small as ~3" up to ~10" (Figure 14). Thankfully the hatchery was able to keep the char for the 2016/17 winter as this gave SVSFE the opportunity to complete three full pike transfers prior to stocking and gives the char the opportunity to escape to the preferred cooler waters for the summer months, decreasing levels of predation on newly stocked fish.

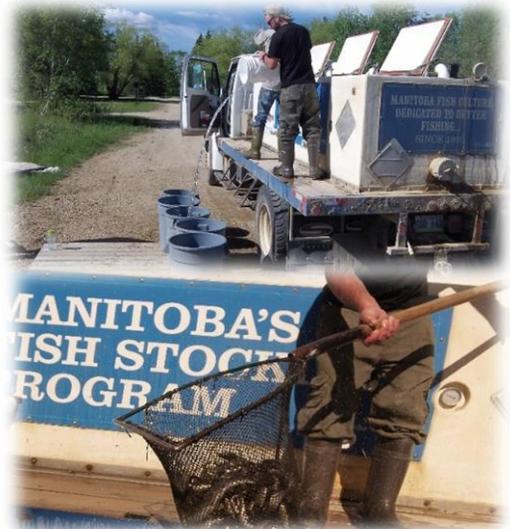


Figure 13: Glad lake char stocking

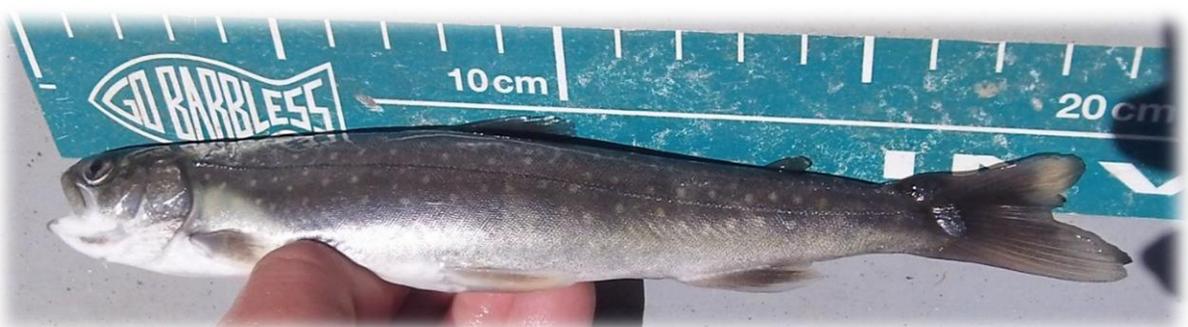
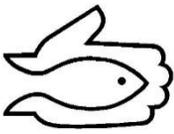


Figure 14: Average size of char stocked on June 7, 2017



Summary of Activities

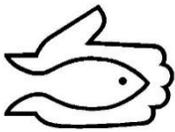
Subject: 2017 Glad Lake Pike Transfer

In regards to other recommendations from 2016, these include; developing the long term maintenance plan and future stocking strategies.

Maintenance Plan - The longevity & frequency of the transfer has always been of interest. At this time, we need to understand this is an annual commitment until the CPUE reaches a maintainable level and we are seeing evidence of trout survival. Research states pike "maturity often occurs at age three to four for males, and ages four to five for females, depending on local conditions" (Diana 1983). This study also states "in situations with high exploitation rates and high natural mortality rates, males mature at age two, and females at age three. This change in maturation is believed to be due to selective pressure by angling and removal of large northern pike, resulting in the change in the reproductive life history of the fish. In this situation, fast growing and early maturing pike are more common in the population" (Diana 1995). In fact, this is an occurrence taking place in pike found in Glad Lake. Pike are maturing at age two at sizes of 230 - 300mm. Understanding this effect on the population dynamics, displays the importance of maintaining strategies to target pike of all sizes.

In regards to methods, SVSFE has found spring trap netting prior to full ice out is most effective. Very little fish were caught past mid May and the highest catches were during the ice covered period or shortly after ice out. The electrofishing boat was scheduled for use in the spring of 2017 but unfortunately due to mechanical issues, SVSFE was unable to test the boat's effectiveness. For 2018, an adjustment in methodology will be required in order to avoid char mortality from larger mesh trap nets and predation. Nets will require daily monitoring and SVSFE may be limited to traps with specific mesh sizes. Utilizing the electrofishing boat will also provide a non-lethal method if proven successful, but depends on availability.

Stocking Strategies - When considering future plantings of arctic char, both the success of the current stock and the availability of future stock must be considered. Monitoring growth and number of fish returns (creel) will aid in future stocking strategies. Further investigations are required to source char if future stocking becomes a demand. SVSFE is now familiar with the process and understands it requires several years of planning to undertake the initiative of sourcing char. There were discussions of an opportunity in the spring of 2017 to purchase larger char (6-12") from a large-scale algal and fisheries cultivation company located in Southern MB, but due to the price tag, hoops to jump and testing required it is unsure if this source is viable. SVSFE may have to consider raising or sourcing funds for future char eggs/fish. Regardless, communication with Fisheries Branch and the hatchery will be imperative. Future stocking practices should continue with spring scatter plantings.



Summary of Activities

Subject: 2016 Glad Lake Pike Transfer

Another topic within the stocking strategy includes introducing an alternative trout species. Char are slow growing species and may not provide sufficient angling opportunities for anglers year to year. In addition, the availability of char stock may not always exist. This species is only stocked in two lakes in MB (Snail and Glad lake), both located in the Swan Valley Area. Both lakes possess the potential to offer exceptional char fishing, which could potentially sustain a char stocking program. Considering this, SVSFE has recommended the introduction of a faster growing trout species, specifically rainbow trout, to offer additional angling opportunities. It is suggested to hold off on stocking rainbows until char reach a size >250mm (10"). At this size, char switch to a piscivorous diet and this strategy will lower any interspecific competition between the species.

By following the set out maintenance plan and strategies, SVSFE remains optimistic that Glad Lake can once again be a destined trout fishery in the Ducks.

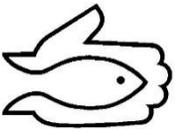
Acknowledgements: Big thank you to Alvin & Linda Wiebe and Terry & Lorrel Scales for keeping tabs on the ice conditions for us this past spring. Thanks to you, we were able to get out on the water prior to the entire lake opening up and this increased our catches significantly! Also thank you to all the volunteers and cabin owners who have helped us over the years in either; the pike transfer, stocking and with our occasional mechanical issues. Your dedication to many of our projects within the Ducks is appreciated. Additionally, projects like this could not be completed without continued partnerships, financial support and assistance from the various organizations/individuals who continually back up SVSFE; in this project - Hunter & Angler Preservation Fund, Intermountain Sport Fishing Enhancement Inc, Fisheries & Wildlife Enhancement Fund, Manitoba Sustainable Development staff and friends, the Whiteshell Fish Hatchery and the anglers. We thank you.



Figure 15: North bay ice free



Figure 16: SVSFE technicians pulling in trap net



Summary of Activities

Subject: 2016 Glad Lake Pike Transfer

Literature Cited:

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