



# Wellman Lake Walleye Recruitment Surveys 2020

In part of reporting for FES Project 19-035  
Recreational Fisheries Enhancement and Youth  
Angling Opportunities in the North Parkland

Author: Brock  
Koutecky

December 2020

Swan Valley Sport  
Fishing Enhancement  
Inc.

## Contents

List of Figures .....	1
Executive Summary .....	2
History .....	2
Study Rationale .....	3
Study Area .....	4
Methods .....	5
Reef Guzzling .....	5
Oxytetracycline (OTC) Detection on Age 0+ walleye .....	5
Results .....	6
Reef Guzzling .....	6
Oxytetracycline (OTC) Detection on Age 0+ walleye .....	7
Discussion .....	9
References .....	9

## List of Figures

Figure 1: Study Area.....	4
Figure 2: Guzzling Results 1992-2020.....	6
Figure 3: 2020 OTC Effort Map.....	7
Figure 4: 2020 Wellman Lake Walleye.....	8
Figure 5: 2020 North Lake Walleye.....	8

## Executive Summary

In 2020, reef guzzling results were very encouraging. Eyed egg CPUE of 18.2 live-eggs/minutes was the highest recorded since 1995 (17.9 live eggs/minute). As for OTC analysis, the 2019 results found 87/100 (87%) of the sample size had no mark and could be considered a cohort of the natural population. Unfortunately, efficacy trials were not completed in 2019, suggesting one should not draw too many conclusions from the 2019 results until additional years are completed. At the time of writing this intermediate report for the Fish and Wildlife Enhancement Fund (January 25<sup>th</sup>, 2021), the Wellman Lake OTC and North Lake Efficacy trials lab analysis and has not yet been completed by AAE Tech Services. AAE anticipates the lab work to be completed in early February 2021. SVSFE is eager to analyze the results next month and to continue with year-three of the survey in fall of 2021. Results from this multi-year survey will assist Fisheries Branch in developing a long-term walleye stocking and monitoring strategy for Wellman Lake.

## History

Historically, Wellman Lake was a high-quality walleye fishery that did not require artificial propagation. As access improved in the 1950's so did angling pressure. Angling pressure ultimately increased until the 1980's where the walleye fishery collapsed. The common understanding of what happened from the 1950's-1980's can be summarized by the angling culture that existed during that time. Generally, walleye were kept (8 fish limit), and pike were released (unless it was a large pike). Supplemental stocking of walleye did not occur on a regular basis in those days. Four decades of this led to a composition shift, which ultimately resulted in the establishment of a "hammer-handle" fishery.

By the late 1980's, SVSFE and Fisheries Branch began working deliberately to shift the species composition back to "historical" levels. Efforts throughout 1990s included: increased walleye stocking (fry, and rearing programs), limno-corral walleye rearing program, Loat Lake rearing program, spawning reef enhancement (1993), pike removals through various netting efforts and fishing derbies, and walleye regulation changes from an 8 fish limit to a zero fish limit (1989), and then to a 2 fish limit with a protected slot (1993). The pike removal programs were discontinued in 1993 and walleye stocking (fry and sub-adult) has occurred regularly since.

In recent years, (2010-present) SVSFE in partnership with Fisheries Branch have begun assessing the walleye population and recruitment success under the new management regime. The objective has been to understand the population dynamics and recruitment under current levels

of angling pressure. Efforts since 2010 have included annual reef guzzling (2010-present), annual barrel counts (2011-2019), near-shore community index netting (2010, 2011 and 2019) and a multi-year oxytetracycline (OTC) survey (2019-2021/22). Reef guzzling resulted in the re-enhancement of the spawning reef in the winter of 2017. Population assessments found that under current management, the walleye fishery had rebounded from the collapse in the early 1990's. 2019 netting data had shown a walleye composition of (45%); the highest it has been since 1967 (58%) alongside healthy population dynamics with a wide range of age classes. Inconsistent stocking and a lack of information on natural recruitment success made it difficult to propose a future stocking strategy based on available information. A full research history and data summary for NSCIN can be viewed at: 2019 Wellman Lake Nearshore Community Index Netting & Walley Recruitment Surveys.

In late 2019, it was recommended to continue with the OTC study until at least three years of data is acquired. At this point, a stocking strategy could be proposed based on results. It was also recommended annual guzzling occur on the reef and it is suggested that notes on sedimentation are observed and recorded to determine if cleaning becomes necessary. Barrel counts should continue annually, and replication of the near-shore community index netting program should occur every six-eight years from 2019 forward. If recruitment to younger cohorts becomes low following the natural recruitment/fry management strategy outlined through OTC results - fingerling stocking can be considered again; as there appears to be notable age class success resulting from plantings via the Beautiful Lake Walleye Transfer (2009-2017).

## Study Rationale

The objectives of research conducted on Wellman Lake in 2020 are as follows:

- 1) As a method to quantify reef usage by walleye, replicate guzzling protocol for monitoring purposes.
- 2) As an effort to determine natural recruitment success, conduct year two of a three-year OTC study. This data will provide valuable information on natural recruitment success which will ultimately contribute to the development of a long-term stocking strategy.
- 3) Using the data collected in 2020 - complete an intermediate report for Fisheries Branch, The Fish and Wildlife Enhancement Fund (FWEF), the SVSFE board of directors, and the Wellman Lake cottage owners/lake users.

## Study Area

Wellman Lake is one of the largest waterbodies in the Duck Mountain Provincial Park. Located in the north-central portion of the park, Wellman Lake lies approximately 54km southeast of Swan River, Manitoba. The lake is 429.5 hectares and has a maximum depth of 18.7 meters. Wellman is one of the most developed lakes in the Duck Mountains with 127 cottages, 105 campsites (seasonal & transient), and an additional 13 cottages at the nearby - Glad Lake. The destination has many public and private services. Wellman lake Lodge has 7 available cabins for rent, a private campground, boat rentals, a restaurant, and a convenience/grocery store amongst other services.

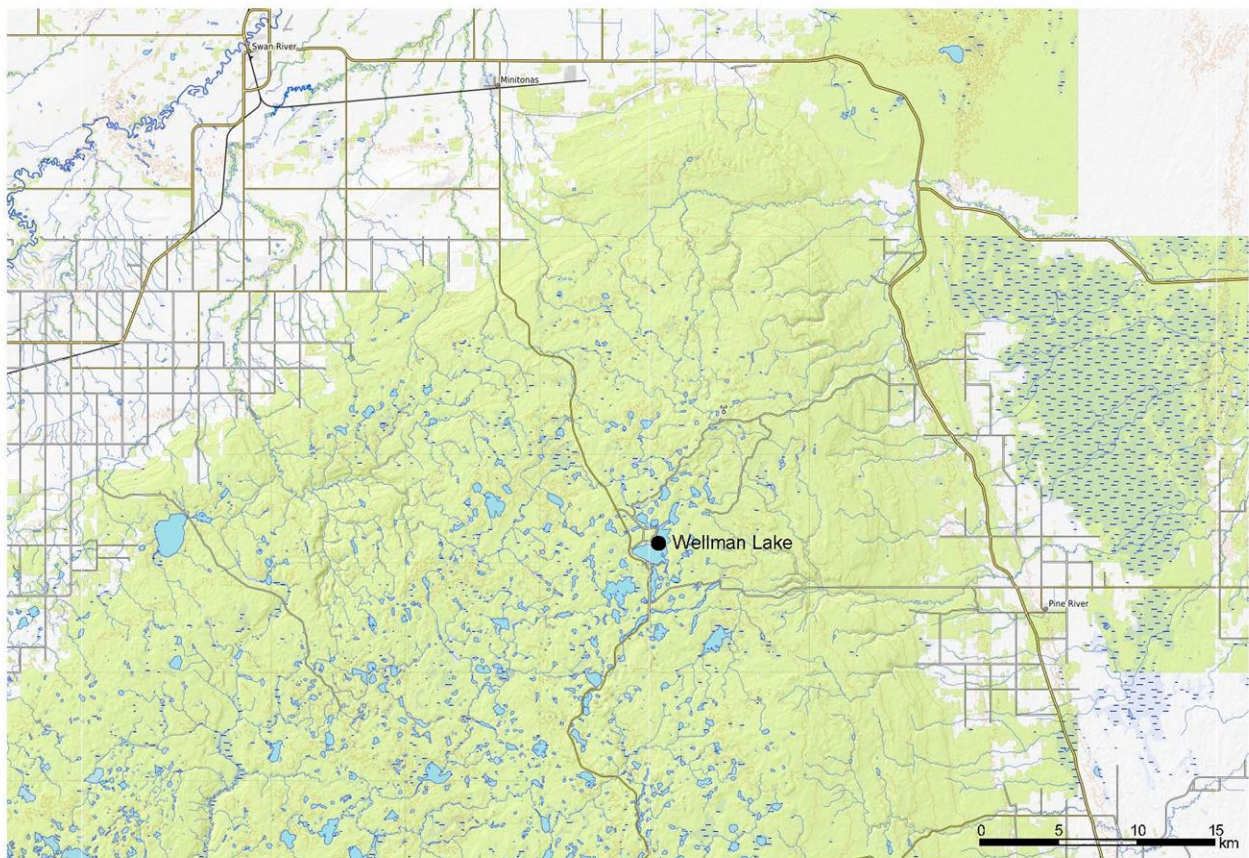


Figure 1: Study Area

## Methods

### Reef Guzzling

Guzzling the reef to determine walleye utilization has been the selected method since 1992. The guzzling equipment used from 1992-1995 was an electric pump, while eggs collected from 2011 to 2019 used a manual hand pump. The number of sites varied over the years with a minimum being 6, and a maximum being 10. Sites were randomly chosen each year and 1 square meter plots were guzzled for durations of 1 minute to 5 minutes. Since 2016, 10 random sites were guzzled for 60 seconds with a 30 second flush. Live egg CPUEs are counted and released back onto the reef following sampling. In 2020, reef guzzling occurred on May 26<sup>th</sup> and surface temperatures averaged 14.2°C.

### Oxytetracycline (OTC) Detection on Age 0+ walleye

Since 2003, the Whiteshell Fish Hatchery has been marking walleye fry using Oxytetracycline (OTC). OTC is a non-lethal, non-toxic internal dyeing agent that imprints a mark on bony structures of fish (i.e. otoliths). Prior to stocking, recently hatched walleye fry are immersed in an OTC solution for 6-7 hours; thus dyeing their bony structures. Efficacy trials for the Whiteshell Hatchery have reached the 95+% mark (Kansas, 2013).

On May 25<sup>th</sup>, 2020 200,000 fry supplied by the Whiteshell Fish Hatchery were stocked on the west shore of Wellman Lake. The surface water temperature was 19.1° C and fish were stocked on the windward shore to maximize the potential for the fry stocking location to overlap with the location of zooplankton.

Collection surveys were completed on the evening/early morning of Monday, September 8<sup>th</sup> - Tuesday September 9<sup>th</sup>. Electrofishing used DFO's Smith-Root SR20 electrofishing boat, which was the chosen method to target young-of-year (YOY) walleye. Surveys did not begin until after sundown, and areas targeted were those that were pre-determined based on YOY surveys conducted in previous years. At each transect, information collected included; the date, the crew, wind speed/direction, cloud cover, water temperature, conductivity, electrofishing settings, site name, site UTMs, time of start, effort (in seconds), boat speed, average depth, and the catch. The survey continued until the minimum sample size was met; (n=100) YOY walleyes.

North Lake was the chosen waterbody for efficacy trials in 2020. On May 25<sup>th</sup>, 25,000 OTC fry were stocked in North Lake. On September 8<sup>th</sup>, 2020 two trap nets were set in North Lake which were pulled the next day on September 9<sup>th</sup>. Between both nets one YOY walleye was captured and therefore nets were reset. The following week, on September 15<sup>th</sup>, the nets were pulled once again. The objective was to capture ~30 YOY for efficacy trials. Each net yielded 5 YOY walleye and which equated to a total of 11 YOY walleye for efficacy trails in 2020.

All walleye were sampled for fork length(mm), total length(mm) and weight (to a tenth of a gram). Otoliths were placed in micro-tubes to protect from damage during shipping. When present, stomach contents were recorded.

Otolith samples were sent to AAE Tech Services out of Winnipeg, Manitoba on September 21<sup>st</sup>, 2020. AAE Tech Services, is known for their quality of work in all aspects of fisheries research and meet the aging standard and OTC detection standards set out by the Department of Fisheries and Oceans. For year 2 and 3 of the OTC study fry will be supplied by the Whiteshell Fish Hatchery, collection will be done by SVSFE staff, and OTC detection by AAE Tech Services.

## Results

### Reef Guzzling

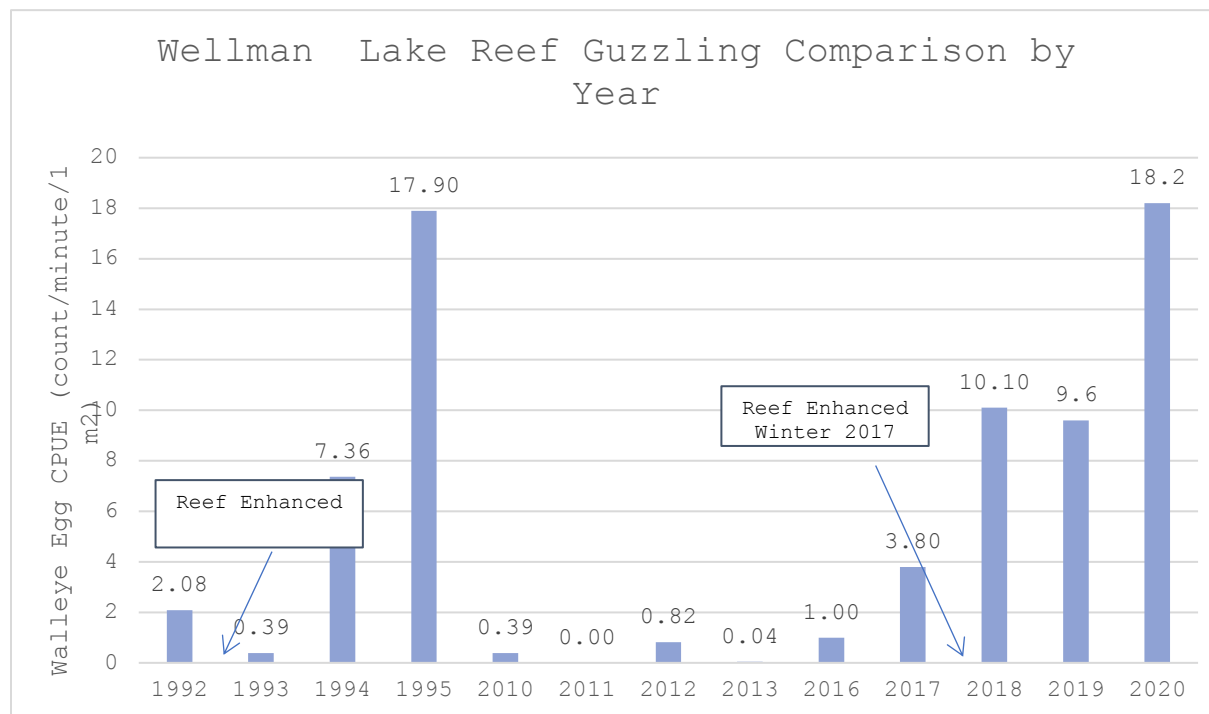


Figure 2: Guzzling Results 1992-2020

## Oxytetracycline (OTC) Detection on Age 0+ walleye

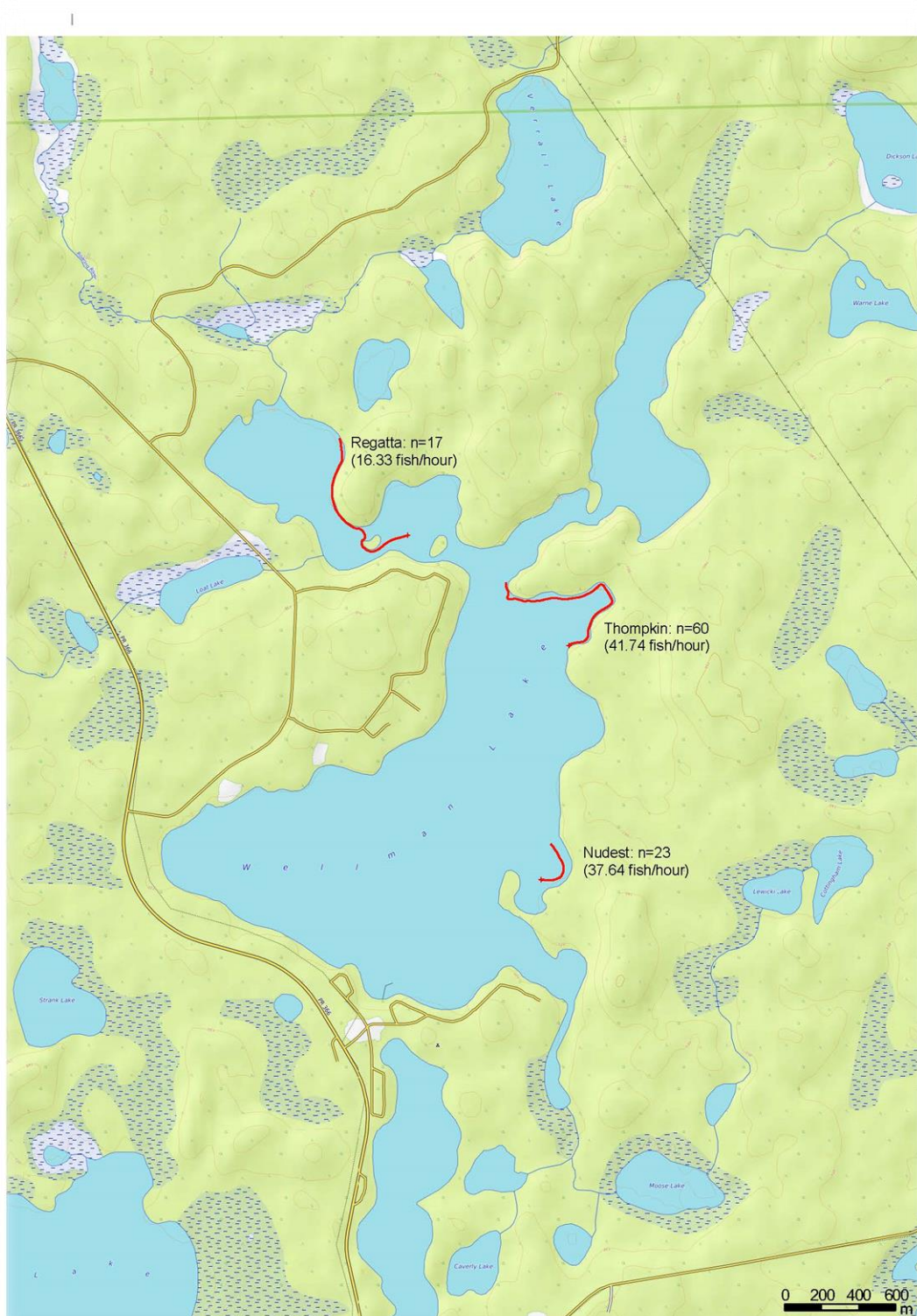


Figure 3: 2020 OTC Effort Map

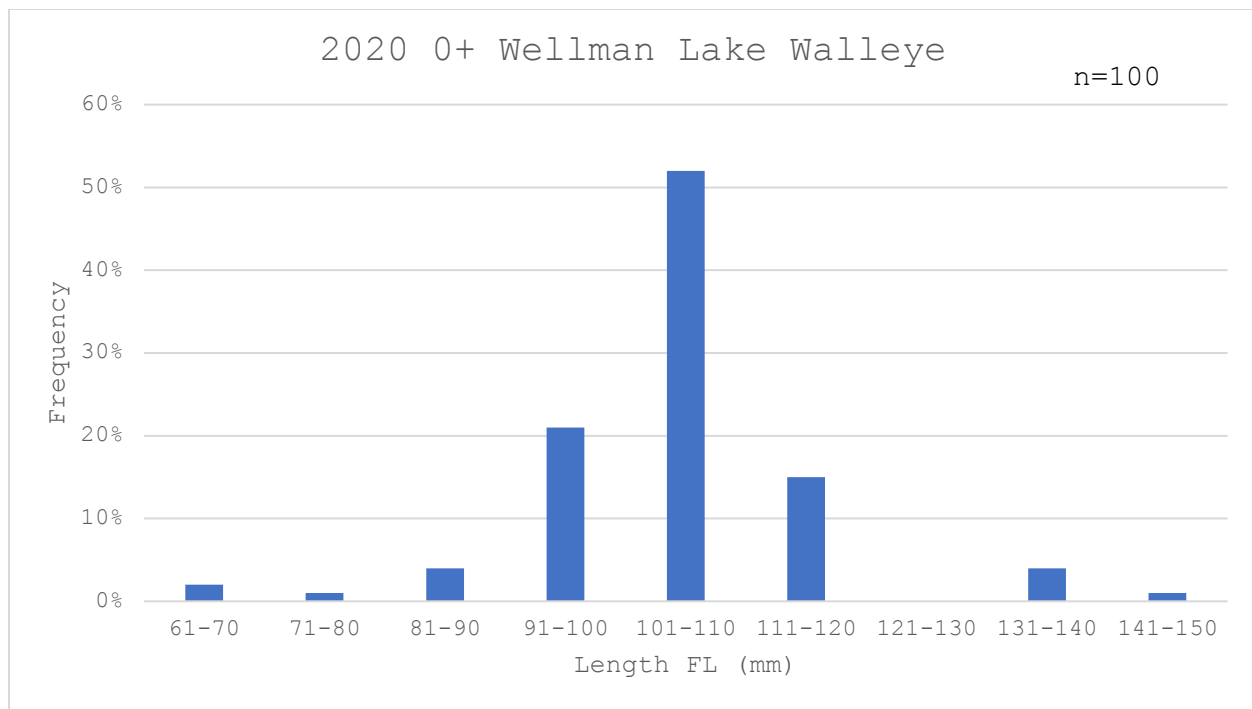


Figure 4: 2020 Wellman Lake Walleye

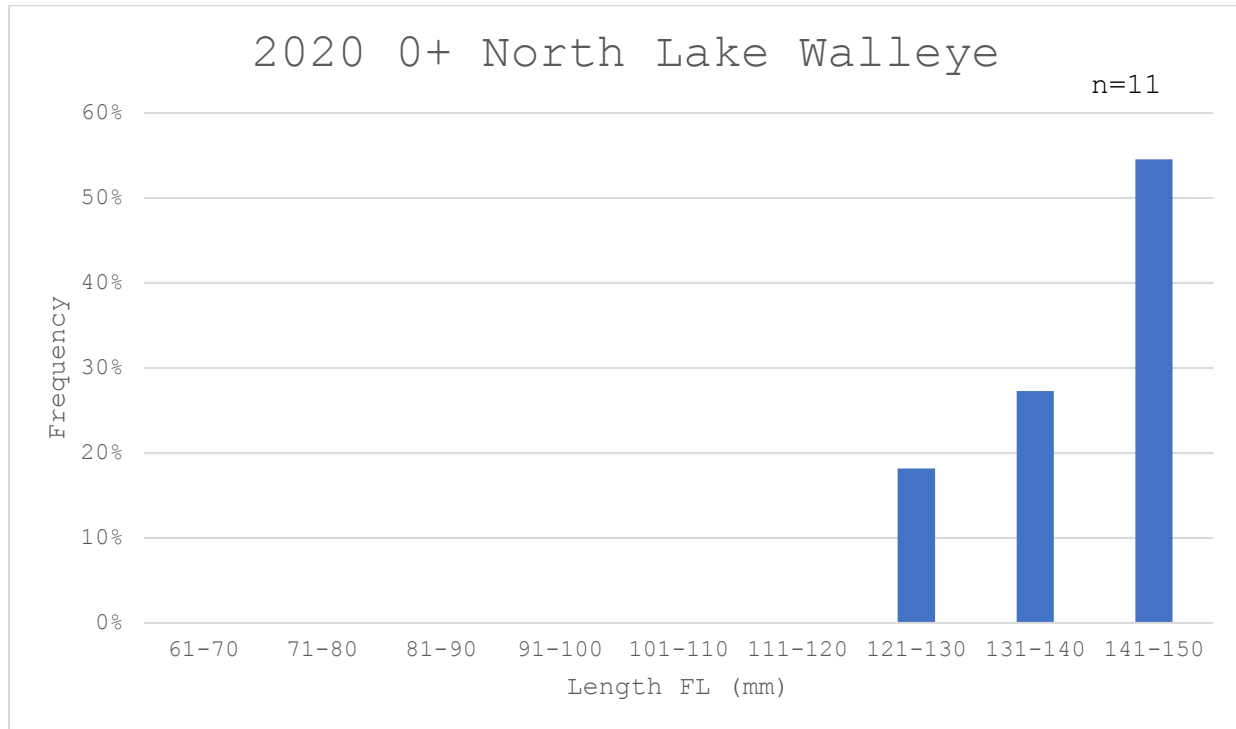


Figure 5: 2020 North Lake Walleye

## Discussion

In 2020, reef guzzling results were encouraging. The eyed egg CPUE of 18.2 live-eggs/minutes was the highest recorded since 1995 at 17.9 live eggs/minute. As for OTC analysis, at the time of writing this intermediate report for the Fish and Wildlife Enhancement Fund (January 25<sup>th</sup>, 2021), the Wellman Lake OTC and North Lake Efficacy trials lab analysis and has not yet been completed by AAE Tech Services. AAE anticipates the lab work to be completed in early February 2021. Interpretation of the data is not possible until this lab work is received. SVSFE is eager to analyze the results next month and, also to continue with year-three of the survey in fall of 2021. Results from this multi-year survey will assist Fisheries Branch in developing a long-term walleye stocking and monitoring strategy for Wellman Lake.

## References

Fisheries Branch, and SVSFE. 1992-2019. Wellman Lake reef guzzling. Data summary from reef guzzling 1992-2019. Acquired from Sustainable Development District Fish Shop, SVSFE Electronic Copy, Swan River, Manitoba, Canada

Groening, L.D. 2015. The use of oxytetracycline marking to monitor stocking success of walleye fry in eastern Manitoba, a thesis to the Faculty of Graduate Studies of the University of Manitoba

Kansas, K. 2014 Multi-year OTC study (FEF Project 10-004) Internal Report. Unpublished project summary

Koutecky, B. Urban, H., 2013. Walleye telemetry Wellman Lake & Swan River FEF Project 12-025. Acquired from Sustainable Development Fish Shop, SVSFE Electronic Copy. Swan River, Manitoba, Canada

Koutecky, B. 2019. Wellman Lake Nearshore Community Index Netting & Walleye Recruitment Surveys. Acquired from Sustainable Development Fish Shop, SVSFE Electronic Copy. Swan River, Manitoba, Canada

McLeod, J.A., and Moir, D.R., .1942. An investigation of certain waters in Duck Mountains. File Report. Acquired from Sustainable Development District Office, Swan River, Manitoba, Canada.

McLeod, J.A., and Moir, D.R., .1944. An investigation of certain waters in Duck Mountains. File Report. Acquired from Sustainable Development District Office, Swan River, Manitoba, Canada

Stewart-Haye, R.K., 1951. A biological survey of Wellman Lake. Department of Mines and Natural Resources. Game and Fisheries Branch.

SVSFE, 2010. Wellman Lake near shore community index netting. File Report. Acquired from Sustainable Development Fish Shop, SVSFE Electronic Copy. Swan River, Manitoba, Canada

SVSFE, 2011. Wellman Lake near shore community index netting. File Report. Acquired from Sustainable Development Fish Shop, SVSFE Electronic Copy. Swan River, Manitoba, Canada

Swan Valley Sport Fishing Enhancement. 2017. Project HCAA 16-00408 Wellman Lake spawning reef project summary. File Report. Submitted to Recreational Fisheries Partnership Conservation Program, and Department of Fisheries and Oceans Canada.

Western Region Stocking Database. 2019. Manitoba Sustainable Development. Acquired from:  
<https://swanvalleysportfishing.com/stocking-reports/>

Yake, B., 1998. Wellman Lake walleye telemetry project. File Report. Acquired from Sustainable Development District Office, Swan River, Manitoba, Canada