



September 12, 2022

Higgins Lake Water Exposure Study: a quantified measure of swimmer's itch

2022 Final Report

Background

Higgins Lake has conducted a program of trap and relocation of common merganser broods since the summer of 2015. The primary assessment of the program has used snail infection data, which documents a dramatic decline in the percent of snails infected (from ~3% in 2015 to ~0.05% or less in 2019, 2020, and 2022). This means the population of the swimmer's itch parasite has drastically declined, but an important question is how much has swimmer's itch declined as a result?

During the 8-year period of the relocation program, our company website has also been open to receive reports of swimmer's itch (SI). The overall trend of this data is also a dramatic decrease (>150 reports in 2015 to only 9 in 2022), but the decrease was not as swift as the snail infection data and even went up slightly some years when snail infection rates were falling or very low. The data arising from a system of self-reporting of SI cases can be difficult to interpret because there is: 1) variability in people's knowledge of the importance of reporting and where to report it; 2) changing motivation for reporting, for example, there may have been more motivation when the problem was more severe (frustration, hope that something could be done) than when the problem had gotten better (cases less severe, fatigue from reporting); and 3) no motivation or mechanism to report when people entered the water and did NOT get swimmer's itch.

With the trap and relocation program suspended in 2022 by the DNR due to avian bird flu, it was recognized that another method to document SI cases was needed that would be less affected by the issues above. The purposes of gathering such data were to A) provide further documentation for the success of the relocation program, and B) have strong data to compare to future years if common merganser broods appeared and remained on the lake for the summer of 2022.

Study outcomes

Recruitment and training

Participants were recruited through HLSIO communications and 9 people signed up for the study. These individuals completed a Google form that asked for basic information like address and contact info (with ability to indicate preference for email or text) as well as choose a 4-digit PIN that would allow them to file reports without having to enter their name and address for each report. An online

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orientation zoom session was held to give instructions on reporting and to answer any questions. The 20-minute session was recorded so that it could be viewed later by those who could not attend.

Reporting forms

The form for reporting was constructed so that it only took 1-2 minutes to complete. Each report consisted of a few questions, most of which just required selecting one of a few choices:

1. PIN
2. Date of water use
3. Location (Default was home address which could be obtained from the PIN; other choices were common places like the state parks, or the sunken island).
4. How many people were in the water
5. How long people were in the water
6. What time of day people were in the water
7. Whether wind was onshore/offshore (onshore winds can increase likelihood of SI)
8. Whether any precautions against SI were taken (e.g. wore Swimmer’s Itch Guard)
9. How many people got SI
10. Severity of the SI cases
11. Any other details they wished to provide (optional)

Participants also were also able to easily ‘correct’ any reports if SI appeared later.

Results

A total of 182 reports were submitted as of 9/9/22 by 6 of the study enrollees. Together, these reports represent 440 people in the water at 18 different locations on the lake from July 1 to September 9. Most (400 of 440 (90.9%)) did not wear a wet suit and the average time spent in the water was 35 minutes. Of those 440 exposures to water, **only 4 SI cases were reported for a case rate of 0.9%. Moreover, all 4 cases were relatively mild, as reported in Table 1 below.**

Table 1. Swimmer’s itch cases at Higgins Lake in 2022 reported in the water exposure study.

Date	Location	No. people in water	Time in water	No. of SI cases	Case severity	Wind	Precautions
7/9/22	South side of island	6	31-60 min	2	11-30 papules	Calm	None
7/31/22	N shore, east of B&B marina	1	31-60 min	1	2 papules	Calm	Short wet suit
8/21/22	N shore, east of B&B marina	1	1-2 hr	1	1 papule	Calm	Short wet suit

Discussion

The data from this study represent the first time that SI cases have been recorded on a lake-wide basis as a rate per water exposure, providing a better measure of the current SI situation. Moreover, the low SI case rate determined from the data is good news for Higgins Lake. It affirms the value of the trap and relocation program and suggests that the low number of SI cases reported on our website in recent years is reflective of a much reduced SI issue, and not due to reporting fatigue or lack of knowledge about where to report. The only other study we know like this one has been

conducted by the Congregational Summer Assembly (CSA) at Crystal Lake, which is specific to their beach at the southwest end of the lake where many swimmers participate in lessons. The results are comparable: the CSA has seen case rates of 3-6% before common merganser relocation be reduced to less than 0.5% in 2019 and 2022.

This data also provides excellent evidence that can be provided to the Michigan DNR to substantiate the effectiveness of the trap and relocation program and to show that HLSIO continues to be motivated to scientifically assess the program in the best ways possible. It also provides excellent baseline data should merganser broods return to the lake.

Although we would have liked to have had higher participation in the study, faithful and persistent reporting by participants for all members of their family/party resulted in a data set that was significant in the number of water exposures (440) and the number of locations on the lake (18). We sincerely thank the participants in the study! We also thank the HLSIO board, especially Duncan Lawrence, for recruiting the participants.

One may note that all 4 SI cases occurred in calm conditions, which at face value seems to contradict other findings that moderate onshore winds increase SI cases. With onshore winds, the parasites can be brought in from a vast offshore area, increasing the SI risk for people wading or swimming near the shore. In calm conditions, the parasites tend to disperse slowly away from the snail that they came from, so people who do not happen to swim or wade through the immediate area near an infected snail will not get SI. However, many of the participants were actively swimming/playing all through the area they visited, and thus were more likely to encounter an area near an infected snail during their time in the water.

Recommendations

Based on the success of this study and the value of the data generated, **we recommend extending this study into next summer and to include Crystal Lake as a comparison.** Crystal Lake has a successful trap and relocation program but had to leave the common merganser broods on the lake in 2022 (at least 9 broods, totaling 91 birds). We expect that Crystal Lake will see an uptick in SI cases in 2023 as a result, while we do not expect an increase at Higgins Lake. It would be great to document this with the same methodology described in this report and be able to compare the two lakes in 2023 using a proven whole-lake methodology (the annual study conducted by the CSA only focuses on one beach). **Such a comparison would be powerful evidence to show the DNR and anyone else that the link between common merganser broods and SI cases is real and that the impact of the relocation program's suspension is immediately felt in the following year.**