# Swimmer's Itch in Lake Leelanau – Charting a Course for the Future

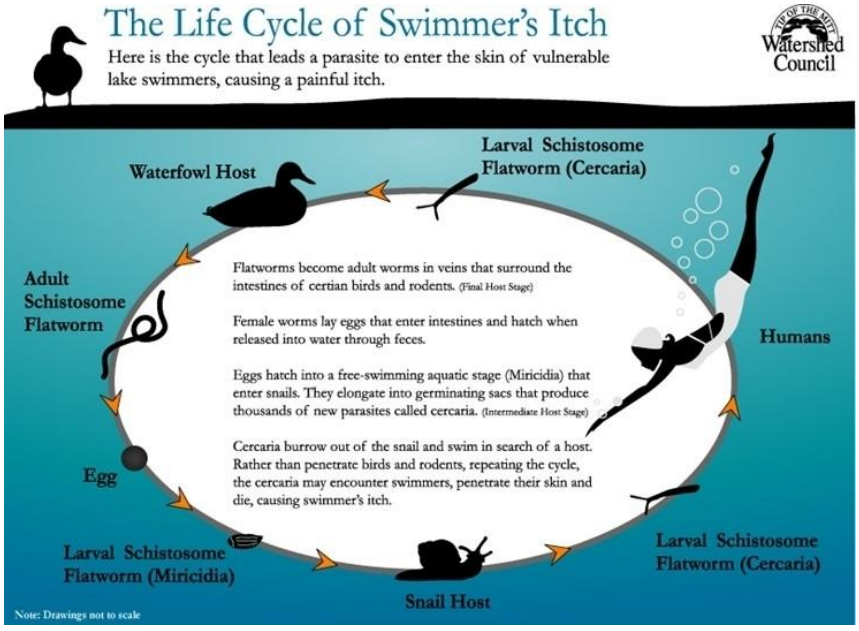
Swimmer's Itch is caused by several different species of native parasites. The type of parasite, and its life cycle in Northern Michigan lakes was first described in the 1930's, so it is a as a naturally occurring component of the life of our lake. But to us, much like black flies or mosquitoes, Swimmer's Itch is a major annoyance.

For years, lake associations in Leelanau County have pioneered new methods of controlling the parasites that cause Swimmer's Itch, and new technologies have allowed us to more fully understand the environmental factors that put swimmer's in harms way, and most importantly, how all of us can learn to avoid getting a severe case of "the itch."

Some Historical Perspective

Swimmer's Itch is caused by a family of Schistosome parasites with a complex life cycle that has two host stages: an intermediate host snail and a final host bird. Each species of parasite capable of causing swimmers itch has its own characteristic hosts. Swimmer's Itch occurs when the free-swimming "cercarial" stage of the parasite penetrates a human body rather than a duck and causes the nasty set of itchy bumps that can ruin a vacation.

Research conducted in the 1980's and 1990's on Glen Lake and Lake Leelanau determined that the majority of Swimmer's Itch cases at that time were caused by a parasite that cycled between two hosts: the common merganser duck and a species of snail (Stagnicola emarginata) common to sandy-bottomed lakes in northern Michigan. If both hosts were present on a given lake it was virtually certain that Swimmer's Itch would be a problem (see life cycle diagram below).




The discovery of the host species of the itch-causing parasites offered the possibility of intervening in the life cycle by eliminating from the lake one or the other of the hosts - either the snail or the duck. For years, snails had been poisoned by use of copper sulfate, a process that released large amounts of toxins into the lake, often with limited and fleeting success at reducing rates of Swimmer's Itch. Researchers reasoned that removing the common merganser from lakes could offer a far more effective and less ecologically disruptive way of breaking the parasite's life cycle.

Once researchers learned to live-trap common mergansers and remove the host birds from lakes, Swimmer's Itch cases plummeted within three years. This was the experience on Lake Leelanau in the period 1999-2002. When reported cases again ramped up ten years later, the same method of removing the common mergansers was employed on North Lake Leelanau beginning in 2017. But this time, results were not conclusive. After removing all common mergansers for two years in a row, reported cases of Swimmer's Itch did not drop significantly.

Fortunately new technologies have become available that could directly measure the amount of DNA in the water from the actual cercaria that cause Swimmer's Itch. This qPCR (quantitative polymerase chain reaction) method allowed researchers to directly study exactly what species of parasites were present in the water, and their concentration under different environmental conditions (time of day, wind, water depth etc.).

Over a 20 week period in 2019 Lake Leelanau, Glen Lake, and Walloon Lake participated in a landmark study that involved weekly water sample collections at ten locations on each of the three lakes in the study, followed by qPCR analysis of each sample. This study made two major findings: 1) Common mergansers migrating in the Spring and Fall (rather than Summer residents) were a very significant source of parasite transmission; and 2) a new species of Swimmer's Itch causing parasite is responsible for a significant portion of Swimmer's Itch cases on North Lake Leelanau, and it is the dominant player on South Lake Leelanau.

A Change in Course

What does this all mean? First, we need to recognize that our efforts to institute "lake-wide" Swimmer's Itch control, which largely worked in several decades ago, are no longer getting the same results. We can't keep doing the same thing if the data shows that it's not working.

Again, we need to do more research to confirm results and to see if the newly-discovered parasite, which cycles through Canada geese and a tiny snail never thought to host such parasites, can be effectively controlled. The good news is that our ability to directly measure the concentration of itch-causing parasites in the water offers an opportunity for swimmers to learn to avoid coming in contact with the itch. As researcher Ron Reimink has pointed out: we don't try to kill all the mosquitoes as we did in the 1960's, now we find effective ways to protect ourselves individually by avoiding mosquitoes when we can, and by using protective gear to greatly reduce our exposure when we can't.

We could call this avoidance "smart swimming" techniques. We already know enough to offer the following firm suggestions:

1. **Avoid swimming when the wind is blowing on-shore. The cercaria ("worms") drift with wind and currents, and are concentrated in shallow waters when the wind blows in. When it is blowing away from the land, worms are blown out to deeper water and dispersed.**
2. **Swim later in the day. The cercaria are released early in the morning by snails, but they live less than a day. If you swim in the afternoon, the concentration of cercaria is almost always much lower than early in the morning.**
3. **If you must swim and suspect that conditions are not perfect, or if you are exceptionally susceptible to Swimmer's Itch, consider wearing a "rash guard." These are commercially available suits that prevent direct water/skin contact, making it nearly impossible for the cercaria to penetrate your skin.**

**A Final Word:** Lake Leelanau Lake Association has been one of the leaders in Michigan in understanding this complex problem. As research points us in new directions, we are shifting focus to dealing with the problem by spearheading new studies and by working to educate swimmers**. Please report all cases of Swimmer's Itch to the hotline at lakeleelanau.org.** By visiting the website you will be able to see where current "hot-spots" for the Itch may be, and find the latest advice on prevention strategies