Michigan Swimmer’s Itch Partnership

Caroline Keson
Our Mission

The Tip of the Mitt Watershed Council speaks for Northern Michigan's waters. We are dedicated to protecting our lakes, streams, wetlands, and groundwater through respected advocacy, innovative education, technically sound water quality monitoring, thorough research, and restoration actions. We achieve our mission by empowering others and we believe in the capacity to make a positive difference. We work locally, regionally, and throughout the Great Lakes Basin to achieve our goals.
Tip of the Mitt Watershed Council's service area includes the water resources in Antrim, Charlevoix, Cheboygan, and Emmet Counties.

Water resources in our service area include:

- More than 2,500 miles of rivers and streams
- Multiple blue-ribbon trout streams
- 14 lakes larger than 1,000 acres (among the largest in the State)
- 38 lakes between 100 - 1,000 acres
- 184 lakes between 10 - 100 acres
- 1,600 lakes that are less than 10 acres
- 363,998 acres of wetlands
The Life Cycle of Swimmer’s Itch

Here is the cycle that leads a parasite to enter the skin of vulnerable lake swimmers, causing a painful itch.

Flatworms become adult worms in veins that surround the intestines of certain birds and rodents. (Final Host Stage)

Female worms lay eggs that enter intestines and hatch when released into water through feces.

Eggs hatch into a free-swimming aquatic stage (Miricidia) that enter snails. They elongate into germinating sacs that produce thousands of new parasites called cercaria. (Intermediate Host Stage)

Cercaria burrow out of the snail and swim in search of a host. Rather than penetrate birds and rodents, repeating the cycle, the cercaria may encounter swimmers, penetrate their skin and die, causing swimmer’s itch.

[Diagram of the life cycle with labels for Waterfowl Host, Larval Schistosome Flatworm (Cercaria), Adult Schistosome Flatworm, Egg, Larval Schistosome Flatworm (Miricidia), Snail Host, and Humans]
History of Swimmer’s Itch

- 1928: Swimmer’s itch discovered on Douglas Lake in Cheboygan County
- Early 1980s: Common Merganser is discovered to be the main culprit. Merganser removal work begins.
What is Common Merganser removal?

- Birds are trapped before ducklings can imprint on a lake
- Birds are moved to relocation sites
Informal grouping of lakes (Higgins, Glen, Crystal, Leelanau, Lime)
Oakland University Study of 16 lakes
qPCR research
Year 2 of Partnership

- Merganser Control Permit Program
- 5 lakes removed 35 broods
- 7 lakes conducted assessments
- 10 release sites analyzed
- Equipment and training
Year 2 of Partnership

- Cercariae concentrate at the top of the water column in downwind areas (Rudko, et al. 2018)
- Using qPCR to assess specific swimmer’s itch cercariae (Rudko, et al. 2019)
- Snail infection level vs. qPCR (Blankespoor & De Jong, 2018)

<table>
<thead>
<tr>
<th>Snail Infection Level</th>
<th>Category</th>
<th>qPCR (cercariae/25 L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.24%</td>
<td>Ideal</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>0.25-0.49%</td>
<td>Tolerable</td>
<td>5.0-9.9</td>
</tr>
<tr>
<td>0.50-0.99%</td>
<td>Moderate</td>
<td>10.0-29.9</td>
</tr>
<tr>
<td>1.00-1.99%</td>
<td>Severe</td>
<td>30.0-99.9</td>
</tr>
<tr>
<td>&gt; 2.00%</td>
<td>Epidemic</td>
<td>&gt; 100</td>
</tr>
</tbody>
</table>

Life cycle summary of the avian schistosome species targeted for species-specific qPCR tests designed in this study.
Year 3 of Partnership

- 6 lakes removed 32 broods
- 6 lake assessments
- Equipment and training
- State-wide snail survey
- Merganser relocation effectiveness
- Common merganser behavior
Annual Conference

• November 10, 2019
• Kirtland Community College in Grayling
• 9am-3pm
• Register at www.watershedcouncil.org

“Attend an Event”
“Register Online”

Credit: Curt Blankespoor
Thank You

• Caroline Keson

Phone: (231) 347-1181
• caroline@watershedcouncil.org

Tip of the Mitt Watershed Council
426 Bay Street
Petoskey, MI 49770

www.watershedcouncil.org
www.facebook.com/watershedcouncil
www.Instagram.com/tipofthemittwatershed
www.watershedcouncil.org/videos