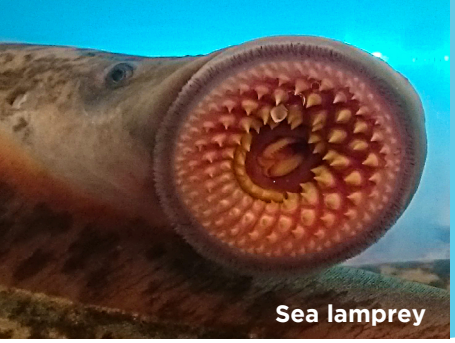
Sea lamprey

What You Need to Know About Niclosamide (Bayluscide)

What are sea lampreys?

Sea lampreys (shown in the photo above) are parasitic fish that are native to the Atlantic Ocean. They kill fish by attaching to them and feeding on their blood and other bodily fluids.

Over time, sea lampreys have moved from the Atlantic Ocean into the Great Lakes. Every year, they kill more than 100 million pounds of Great Lakes fish, which is roughly the same weight as the Titanic.[1] This has led to efforts to control the sea lamprey population and keep them from entering streams that feed the Great Lakes. These efforts aim to keep balance in the aquatic ecosystem (or among the wildlife that live in a body of water).[2]

What are lampricides and niclosamide?

Lampricides are chemical treatments (pesticides) that are used to control sea lamprey populations. One common lampricide is called niclosamide. Niclosamide is a toxic (poisonous) chemical. Niclosamide is used to kill the young, developing sea lamprey larvae before they reach the adult stage. It has been used around the Great Lakes since the 1960s to kill sea lampreys.[3]

There are both liquid and pellet (granular) forms of niclosamide. Granular Bayluscide comes as pellets and includes niclosamide as its active ingredient. This pesticide is spread on the surface of the water and then slowly releases niclosamide as it sinks to the bottom.[4] Niclosamide is also a prescription medicine for patients who have tapeworm infections.[5]

How does it affect the environment?

Niclosamide breaks down naturally over time and does not build up in the environment. However, niclosamide can have negative effects on the environment. For example, niclosamide harms small water animals like insects, snails, and tiny crustaceans that are important for a healthy ecosystem. These animals often breathe through their skin or gills. Niclosamide can make breathing more difficult for them, leading to stress or death. Some of these animals are also very sensitive to changes in water chemistry, even from low levels of niclosamide.[6] The death of these small animals can have a negative effect on the entire food chain, including the fish and birds that rely on them for food.

Niclosamide often sticks to mud and sand at the bottom of rivers and lakes and can stay there longer. This may negatively affect animals that live at the bottom, like crayfish, mussels, or burrowing insects. Granular Bayluscide has a higher chance of harming these animals because it is made to sink and slowly release the chemical.[4]

Although the risk is low, niclosamide could move through soil and reach groundwater in certain situations. This is called environmental leaching. The likelihood of this depends on how much chemical is used, the type of soil, and other environmental factors.[4]

Because of the negative effects that niclosamide can have on the environment, scientists carefully monitor how it is used.

How can niclosamide affect your health?

Professionals should use niclosamide as directed. After a niclosamide treatment, community members should follow any safety recommendations. This includes staying out of the treatment area and not using the water, wildlife, or soil in it for a period of time (usually up to 72 hours). These steps help lower the risk of niclosamide. According to the United States Environmental Protection Agency, niclosamide poses little to no health risk to people when these steps take place.[5] If someone is exposed to lampricide treatments, symptoms may include skin irritation, eye irritation, or a headache.[7]

Who is most likely to come in contact with niclosamide?

Community members should not enter the treatment areas during or shortly after the treatment. As a result, the general public is less likely to be exposed to niclosamide. However, some groups are at higher risk:

- Residents living near the treated areas
- Recreational users (like boaters, swimmers, and fishermen) who visit the treated areas during or shortly after the treatment
- Fisheries and wildlife workers
- Environmental scientists and technicians

What should you do if you come in contact with niclosamide?

Follow the steps below[8]:

- If on Your Skin: Remove any contaminated clothing. Wash the area with soap and clean water. Have clean clothing handy.
- If in Your Eye: Rinse your eyes gently with clean water for at least 15 minutes. Reach out to a health care professional if you have eye irritation.
- If Swallowed: Rinse your mouth with clean water. Contact Poison Control at 800-222-1222 or a health clinic immediately.
- If Breathed in: Move to an area with fresh air. Contact a health care professional if you feel nauseous, dizzy, or have trouble breathing.

How can it affect cultural practices?

For many Tribes, water is sacred and plays an important role in ceremonies and daily cultural practices. Activities like fishing, gathering wild rice (manoomin), and holding spiritual ceremonies depend on clean, healthy water. Also, in many Tribal cultures, women are seen as the protectors of water, showing how water is tied to identity and tradition.[9]

Some Tribal communities worry about how niclosamide may affect their cultural traditions and connection to water. During and shortly after niclosamide treatments, Tribal members should not use the water in the treatment area. This can disrupt cultural practices.[10] Some examples are listed below:

- Wild rice is important to many Tribal Nations. Chemical treatments could affect the timing or safety of harvesting it.[10]
- Some native fish and other wildlife that are sensitive to chemicals may be harmed. This can affect the ecosystem and the cultural practices linked to this wildlife.[10]
- Tribes worry that chemical treatments could impact their treaty rights to fish and manage natural resources, which are key parts of their sovereignty.[11]

How can Tribes help protect their cultural practices against niclosamide?

Tribal communities can partner with the agencies that use niclosamide:

- Tribes can require informed Tribal consent before treatments take place.
- Tribes and these agencies can work together to create treatment schedules and tell Tribal members about them.

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Sources: 1) Sea lamprey: what is at risk? Great Lakes Fishery Commission. Accessed May 2025. https://www.glfc.org/what-is-at-risk.php 2) What is a sea lamprey? National Ocean Service. Updated June 16, 2024. Accessed August 1, 2025. https://oceanservice.noaa.gov/facts/sea-lamprey.html 3) Boogaard, MA. Acute toxicity of the lampricides TFM and niclosamide to three species of unionid mussels. US Geological Survey. Published 2006. Accessed August 2025. https://pubs.usgs.gov/of/2006/1106/ 4) Dawson VK. Environmental fate and effects of the lampricide Bayluscide: a review. Journal of Great Lakes Research. 2003;29(Supplement 1):475-492. doi:10.1016/S0380-1330(03)70509-7 5) Niclosamide. US Environmental Protection Agency. November 1999. Accessed May 2025. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-077401_1-Nov-99.pdf 6) Boogaard MA, Bills TD, Johnson DA. Acute toxicity of TFM and a TFM/niclosamide mixture to selected species of fish, including lake sturgeon (Acipenser fulvescens) and mudpuppies (Necturus masculosus), in laboratory and field exposures. J Great Lakes Res. 2003;29(Supplement 1):529-541. doi:10.1016/S0380-1330(03)70514-0 7) Ceballos DM, Beaucham CC, Kurtz K, Musolin K. Assessing occupational exposure to sea lamprey pesticides. Int J Occup Environ Health. 2015;21(2):151-160. doi:10.1179/2049396715Y.0000000002 8) First aid in case of pesticide exposure. United States Environmental Protection Agency. Updated December 31, 2024. Accessed June 2025. https://www.epa.gov/pesticide-incidents/first-aid-case-pesticide-exposure 9) Anderson K. Aboriginal women, water and health: reflections from eleven First Nations, Inuit, and Métis grandmothers. October 2010. Accessed August 8, 2025. http://www.pwhce.ca/pdf/womenAndWater.pdf 10) Climate Change Program. Great Lakes Indian Fish & Wildlife Commission (GLIFWC). Accessed August 8, 2025. http://glifwc.org/stewardship/climate-change-program#tribal-adaption-menu 11) Whyte KP. On the role of traditional ecological knowledge as a collaborative concept: a philosophical study. Ecological Process. 2013. https://doi.org/10.1186/2192-1709-2-7