
Sea lamprey

What You Need to Know About TFM (3-Trifluoromethyl-4-Nitrophenol)

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 TFM?

Lampricides are chemical treatments (pesticides) that are used to control sea lamprey populations. One common lampricide is called TFM (3-trifluoromethyl-4-nitrophenol).

TFM is a toxic (poisonous) chemical. It is used to kill the young, developing sea lamprey larvae before they reach the adult stage. TFM has been used in the U.S. since the 1960s. It has been widely used in the Great Lakes region by the U.S. Fish and Wildlife Service.[3]

How does TFM affect the environment?

There are limited studies on TFM in the environment. This means we are still learning TFM's positive and negative impacts. All TFM treatments are closely monitored to protect both environmental health and human health.

TFM is a chemical used in rivers and streams. According to the U.S. Environmental Protection Agency (EPA), TFM breaks down naturally over time and does not build up in the environment. TFM breaks down quicker in warmer, oxygen-rich water. However, TFM can remain toxic for longer (sometimes up to 80 days) in certain conditions such as in cold, slow-moving water.[3]

TFM treatments are carefully planned to kill sea lamprey larvae and limit exposure to other wildlife. When used as directed, TFM is not expected to have long-term environmental harm. TFM also does not build up in fish or animals. This means it is unlikely to move up the food chain. In other words, wildlife that are exposed to TFM and those that eat the wildlife should not have high levels of TFM. Most aquatic ecosystems will return to how they were before the TFM treatment within weeks or months. Treated areas usually do not need another application for three to five years.[3]

Although the risk is low, TFM could move through soil and reach groundwater. This is called environmental leaching. The likelihood that this will take place depends on the type of soil, water movement, and other environmental factors.[4] If TFM moves through soil, it does not easily bind to soil particles. This reduces the chance (or likelihood) that the soil will stay contaminated for a long time.

How can TFM affect your health?

Professionals should use TFM as directed. After TFM 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 TFM. According to the EPA, TFM poses little to no health risk to people when these steps take place.[3] If someone is exposed to lampricide treatments, symptoms may include skin irritation, eye irritation, or a headache.[5]

Who is most likely to come in contact with TFM?

Community members should not enter the treatment areas during or shortly after the

TFM treatment. As a result, the general public is less likely to come in contact with TFM. 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 TFM treatment
- Fisheries and wildlife workers
- Environmental scientists and technicians

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

Follow the steps below if you come in contact with TFM[6]:

- 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 TFM 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, which shows how deeply water is tied to identity and tradition.[7]

Some Tribal communities worry about how TFM may affect their cultural traditions and connection to water. During and shortly after TFM treatments, the treatment area should not be used. This can disrupt cultural practices.[8] Some examples are listed below:

- Wild rice is important to many Tribal Nations. Chemical treatments could affect the timing or safety of harvesting it.[8]
- 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.[8]
- Tribes worry that chemical treatments could impact their treaty rights to fish and manage natural resources, which are key parts of their sovereignty.[9]

How can Tribes help protect their cultural practices against TFM?

Tribal communities can partner with the agencies that use TFM:

- 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) TFM. US Environmental Protection Agency. November 1999. Accessed May 2025. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-036201_1-Nov-99.pdf 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) 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 6) First aid in case of pesticide exposure. U.S. Environmental Protection Agency. Updated December 31, 2024. Accessed June 2025. https://www.epa.gov/pesticide-incidents/first-aid-case-pesticide-exposure 7) 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 8) Climate Change Program. Great Lakes Indian Fish & Wildlife Commission (GLIFWC). Accessed August 8, 2025. http://glifwc.org/stewardship/climate-change-program#tribal-adaption-menu 9) 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