FACT SHEET

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TFM and SEA LAMPREY CONTROL
A Success Story

Sea lampreys are native to the Atlantic Ocean, not the Great Lakes. They entered the upper Great Lakes in the early 1900s through shipping canals. Sea lampreys were a major cause of the collapse of lake trout, whitefish, and chub populations in the Great Lakes during the 1940s and 1950s. These fish were the mainstay of a vibrant and productive fishery, and by the 1950s, the very existence of a Great Lakes fishery was at stake. The governments of the United States and Canada recognized that unless something was done to control sea lampreys, the fishery would collapse.

What is TFM?

During the 1950s, under the direction of the U.S. Fish and Wildlife Service, scientists tested almost 6,000 compounds to identify one to which sea lampreys were especially sensitive. Through this research, scientists, in 1958, discovered that TFM (3-trifluoromethyl-4-nitrophenol) was remarkably effective in controlling sea lampreys without significantly impacting other species. Since its discovery as an effective sea lamprey control tool, the Great Lakes Fishery Commission and its agents have used the selective lampricide TFM to suppress sea lamprey populations in the Great Lakes; it is the primary means by which sea lampreys are controlled. About 250 Great Lakes tributaries are treated at regular intervals with the lampricide.

PHOTO: MIKE MILLAR

Lampricide treatments remove larval sea lampreys from Great Lakes tributaries.

Why Use TFM?

TFM has a 40-year track record of success. The lampricide is effective and selective; at treatment levels, it is non-toxic to fishes other than lampreys. Because treatments are caried out on an average 4-year rotation, populations of shorter-lived invertebrates, which may be affected, can recover between treatments. Through biological assessments and careful TFM use, the Great Lakes Fishery Commission and its agents have successfully reduced sea lamprey populations in the Great Lakes by 90%. A remarkable success! Sea lamprey suppression allows fish a chance to survive in the lakes long enough to reproduce or to be harvested.

Sea lampreys are most vulnerable during their larval stage. Because TFM is effective when it is used to target larval sea lampreys in streams, TFM is applied to streams, not to the open waters of the Great Lakes. Tributary streams to the Great Lakes where larval sea lampreys are found are treated at three to ten year intervals, depending on the abundance, rate of growth, and age of the populations.

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Department of Fisheries & Oceans Canada
U.S. Geological Survey, Biological Resources Division

Larval assessment surveys are done to determine what streams need to be treated, when they need to be treated, and the actual location and abundance of larvae so no more TFM than is necessary is used in treatment. Larval sea lampreys are usually not found throughout an entire stream, so lampricide treatments target only infested areas within a stream.

Prior to a lampricide treatment, extensive research is done to understand the chemical and physical conditions of the stream. The stream's rate of flow, temperature, pH, and alkalinity, for instance, all influence the effectiveness of TFM. During the lampricide treatment, the stream's physical and chemical conditions are monitored and adjustments are made continually to the amount of TFM applied to maintain very low concentrations in the stream water and to ensure maximum effectiveness, efficiency, and environmental safety. A typical treatment takes between 48 and 72 hours to complete, but could take as long as a week, depending on the size of the river.

Is TFM Safe to Organisms Other than Sea Lampreys?

Exhaustive laboratory tests—more than 40 years' worth—show that at the dose needed to eliminate sea lampreys, TFM is nontoxic or has minimal effects on aquatic plants, other fish, and wildlife. The impact on non-target species can be reduced by closely controlling the concentration of TFM applied and by applying TFM during the right season (after the spawning run, for instance). Studies have also shown TFM to be nontoxic to humans and other mammals. This compound is registered as a lampricide by the U.S. Environmental Protection Agency and Agriculture Canada and has met or surpassed all criteria for application in Great Lakes streams.

TFM does not bioaccumulate in the aquatic environment and it breaks down in a matter of days. In the Great Lakes, long term studies have shown no traces of TFM in fish even in cases where several treatments had been made in streams tributary to the lakes in which the fish were caught. The commission and its agents continue to carefully monitor fish and other animals during treatments. Continuous quality control of the TFM production and on-going laboratory studies ensure that this exceptional record of environmental safety is maintained.

PHOTO: DEPARTMENT OF FISHERIES AND OCEANS CANADA

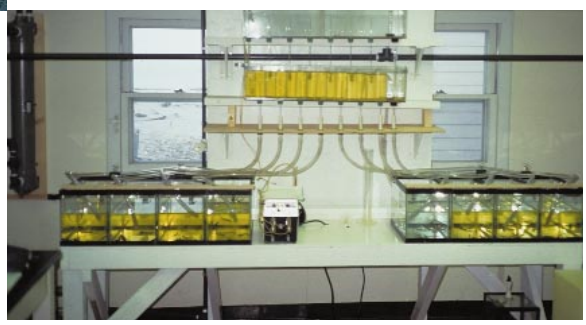

PHOTO: U.S. FISH AND WILDLIFE SERVICE

Flow-through bioassay equipment in the lab (right) confirms the proper lampricide concentrations to use during stream treatments. A mobile lab (above) is used at the site of a stream treatment to ensure the most effective and safe use of lampricides. The amount of lampricide used during a treatment depends on specific physical and chemical characteristics of the stream at the time of treatment.

The Great Lakes Fishery Commission was established by Convention between Canada and the United States in 1955 to improve and perpetuate fishery resources.

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