FACT SHEET

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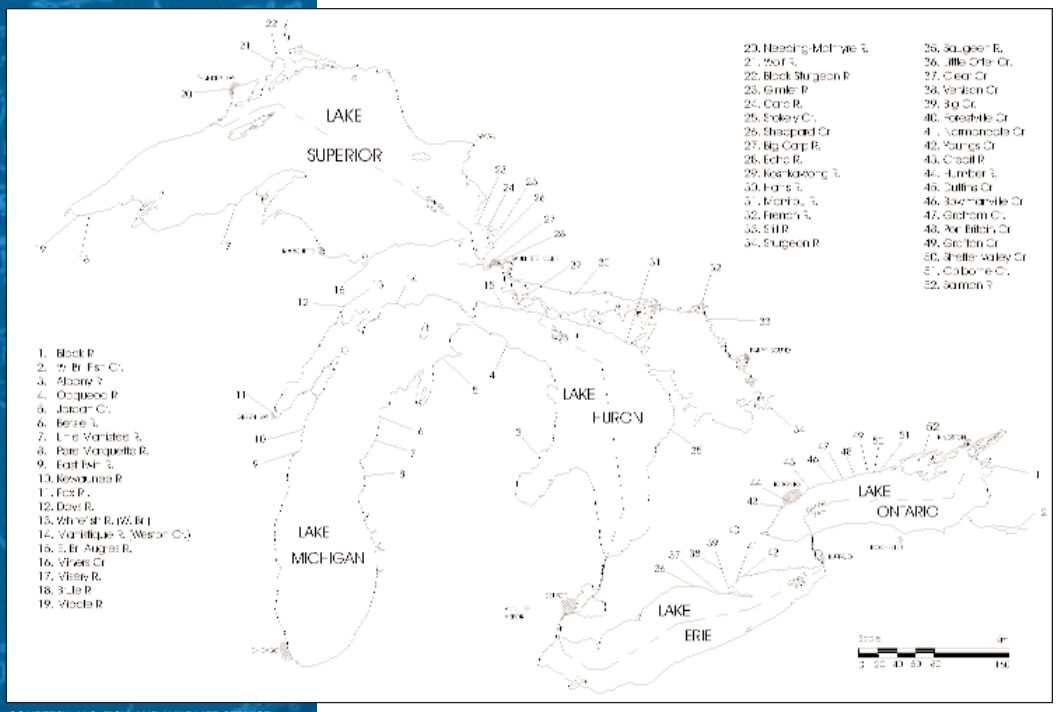
SEA LAMPREY BARRIERS
New Technologies Help Solve an Old Problem



COURTESY: U.S. FISH AND WILDLIFE SERVICE AND DEPARTMENT OF FISHERIES AND OCEANS

Locations of barriers constructed or modified to stop spawning sea lamprey migrations.

SEA LAMPREY BARRIERS are proven non-chemical weapons to help control sea lampreys in the Great Lakes.

Barriers are constructed on streams in strategic locations throughout the Great Lakes basin to prevent sea lampreys from spawning, and thus, to effectively reduce the number of streams that produce sea lampreys. When constructed with sea lampreys in mind, barriers prevent their passage, while still allowing the passage of most other fish species.

Prior to the discovery of TFM as an effective lampricide in the late 1950s, sea lamprey control agents relied exclusively on electrical and mechanical barriers to prevent sea lampreys from spawning. These barriers were not entirely effective in stopping sea lampreys and even killed some fish that ventured near them. Because the lampricide TFM proved to be such an effective control tool, the program relied almost exclusively on TFM until the 1980s. In the 1980s, consistent with a desire to reduce the use of costly lampricides, the commission decided to take another look at what barriers had to offer. In 1988, a binational task-force concluded that properly constructed barriers could block spawning runs of sea lampreys, while still allowing desirable fish to pass and reach their spawning grounds.

How Do Barriers Complement the Sea Lamprey Control Program?

Barriers block sea lampreys, yet allow desirable fish to pass. Located downstream from spawning grounds, barriers block sea lampreys from access to suitable spawning habitat, thus eliminating larval lamprey production and the need for lampricide treatment. In some cases, sea lampreys may spawn below the barriers, but the remaining shorter stretches of streams are usually much easier and less expensive to treat than the entire river system.

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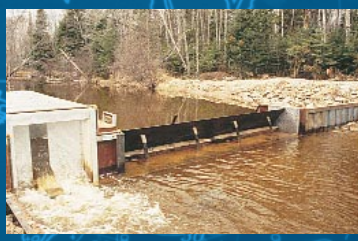
Low-Head Barrier



New adjustable-crest barriers (shown in raised position) will help improve fish passage and block sea lamprey migrations.

Velocity barriers exploit lampreys' poor swimming ability.

Old electrical barriers (above, no longer in use) were ineffective and unsightly. New electrical barriers (below) do not block the flow of the stream and could be effective in stopping sea lamprey migrations.

PHOTOS: GREAT LAKES FISHERY COMMISSION, DEPARTMENT OF FISHERIES AND OCEANS CANADA, U.S. FISH AND WILDLIFE SERVE

The benefits of barriers include savings in lampricide costs, decreased application costs, and more efficient sea lamprey control. Trapping facilities associated with barriers allow removal of sea lampreys from the spawning population, provide assessment information, and provide male sea lampreys for the sterile-male-release-technique.

What Types of Barriers Are Used on the Great Lakes?

Although most of the existing sea lamprey barriers on the Great Lakes are low-head dams, the commission has made it a priority to improve the design of barriers to enhance fish passage while still blocking sea lampreys. The commission currently uses four main types of barriers:

LOW-HEAD BARRIERS

The low-head barrier is the most common type of barrier used on the Great Lakes to prevent sea lamprey spawning. This relatively simple barrier creates a two to four foot drop that stops sea lampreys from proceeding further upstream. A lip is often used to keep sea lampreys from using their suction-cup mouth to climb over the barrier. Inclusion of a jumping pool below the structure allows most migratory salmonids to pass easily. Passage for non-jumping fish is made possible at low-head barriers with the addition of vertical slot or denil fish passes.

ADJUSTABLE-CREST BARRIERS

Adjustable-crest barriers draw upon the best aspects of the low-head barrier design and add improvements that make the barrier less intrusive, enhance passage of fish, and still prevent sea lamprey passage. These barriers have air bladders that inflate an adjustable barrier crest. This crest is raised only during the sea lamprey spawning runs; it remains lowered on the river bottom during all other times of the year, permitting free passage of all species of fish. The air bladder is controlled by a computer which automatically adjusts the barrier height based on specific water levels, thus minimizing the alteration of the river's natural flow. Adjustable crest barriers operate with pools to pass jumping salmonids or with fish passage devices.

VELOCITY BARRIERS

Sea lampreys are poorer swimmers than most fish. They tire easily and need to attach to solid surfaces in order to rest. Velocity barriers exploit this poor swimming ability by creating areas of very fast moving water with surfaces to which sea lampreys cannot attach. The result is a fish pass through which fish can swim, but through which sea lampreys cannot. These experimental structures have been effective in passing a variety of jumping and non-jumping fish species.

ELECTRICAL BARRIERS

Some of the first barriers used to control sea lampreys used alternating current (AC) electric power, but the barriers at the time were ineffective because they were often flooded and were plagued by power outages. Today, sea lamprey control agents are experimenting with entirely new electrical barrier designs that use direct current (DC) electric power to deter sea lampreys without risk to other fish or animals. These barriers are built into the stream bed and, in contrast to the low-head dams, do not block the flow of a stream at all. Electrical barriers are used only during the sea lamprey spawning runs and, where required, can utilize improved fishways to enhance passage of fish.

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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