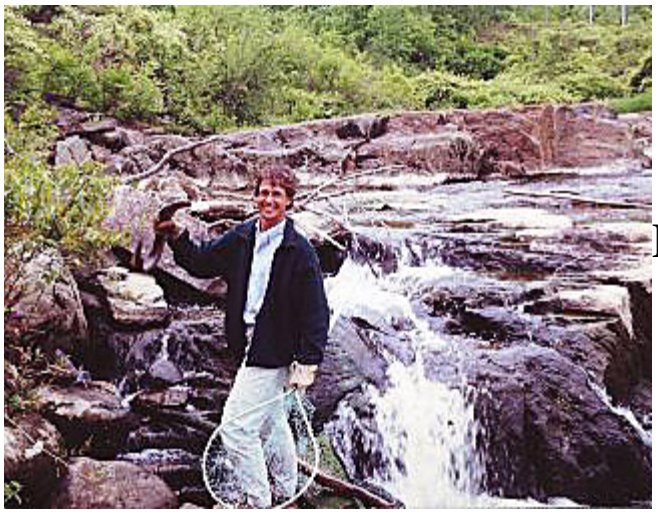

**Helping sea lamprey**

**Friends of the Kennebec Salmon volunteer Douglas Watts helps a spawning sea lamprey ascend the ledges at the head of tide of Bond Brook in Augusta, Maine this June. FKS has found that many sea lampreys get stuck and die in the crevices of these ledges at Bond Brook while trying to ascend them.**

**This year, FKS volunteers have helped dozens of sea lamprey safely reach their native spawning habitat in Bond Brook by creating a natural boulder fishway at the ledges and by carrying them over by hand. These actions will help ensure a healthy population of native sea lamprey in Bond Brook in the future. (Photo by Bill Norbert.)**

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# Sea Lampreys -- a miracle of nature.

The sea lamprey (Petromyzon marinus) is the Kennebec River's most misunderstood and unfairly maligned native fish species.

Late May and June marks the return of adult sea lamprey to their birthplace in the Kennebec River and its tributaries. This spring -- the year 2000 -- river watchers have seen the largest run of spawning sea lamprey to the Kennebec in recent memory.

Sea lampreys are members of a very old family of fishes. Their family contains many different species with many different habitats and life histories. Unlike "bony" fishes such as trout, bass or minnows, lampreys lack scales and gill covers. Instead, they breathe through a distinctive row of "pencil hole" like openings behind their mouths and eyes.

The sea lamprey is the only member of the lamprey family native to Maine. It lives a long, complex and mysterious life that encompasses our freshwater streams and brooks, our rivers' broad main-stem and brackish estuaries as well as the open Atlantic ocean.

The sea lamprey spends its first years of life (8 years or longer) as a small, tan to gray eel-like fish called an ammocete in freshwater rivers and streams. At this stage, the lamprey has yet to develop eyes and

stays buried a few inches below the streambed in fine sand and silt, where it feeds by filtering very small bits of organic material from the stream bed.

After a number of years of growth, the ammocete stage of the lamprey (now about 6-7 inches long) emerges from its home in the streambed during the late fall and early spring and begins swimming downstream to the ocean. At this stage, the lampreys turn a dusky silver color, are called "smolts" (like salmon), and like Atlantic salmon, undergo a complex physiological transformation which allows them to survive in saltwater.

As the move toward saltwater, the eyes of the sea lamprey emerge (which were not needed during their time in the streambed) and they begin to seek nourishment by attaching themselves to other fish with a set of rasp-like teeth in a round, sucker-like mouth. Lamprey smolts born in streams far from the sea will sometimes begin to feed on other fish as they travel downstream in freshwater. For example, bright Atlantic salmon returning to the Penobscot River are sometimes observed at the river's head of tide with small lampreys attached to them. However, sightings of this type are uncommon and the young lampreys are usually too small and remain attached for too short a period to harm the salmon.

After two or three years in the open ocean, sea lampreys reach lengths of 1.5 to 3 feet long and resemble American eels in shape, although their color is a mottled tan and brown instead of the solid dark greenish-brown common to adult eels. In the spring of their second or third year at sea, lamprey undergo another complex physiological transformation. First, their sex organs begin to grow substantially and their entire bodies become geared to reproducing. Second, they begin the complex internal transformation necessary to move from saltwater to freshwater and begin migrating upstream to their freshwater birthplaces. Lastly, the lampreys completely stop feeding as they enter freshwater and rely on their accumulated stores of energy until they spawn. Like Pacific salmon, all adult sea lampreys die soon after giving birth. They have only one chance in their lives to reproduce and try very hard to make this once chance count.

Sea lamprey seek very similar spawning sites in the Kennebec River as Atlantic salmon and trout -- the shallow, gravelly riffles and pool tails of the main river and its tributaries. Quite often, the spawning "redds" dug by sea lamprey in early June are exactly the same sites that Atlantic salmon will use to dig their own spawning redds in late October. To reach these spawning sites, lamprey tenaciously swim many miles upriver, through rapids and over ledges, using their sucker-like mouths as "hold fasts" to climb over steep vertical drops and amazingly, 20-30 foot high dams.

Upon selecting a suitable spawning site, the lamprey dig a depression in the stream bed by picking up baseball and softball-sized stones with their mouths and carrying them to the downstream side of the hole. Over many days in early June, the lamprey will move hundreds of stones and dig a depression in the streambed as large as a truck tire. In streams with healthy lamprey populations, shallow riffles in early June are completely pock-marked with these nests that are often noted by curious anglers and streamgoers. After the nest has reached a suitable size and depth, the male and female lamprey swim closely together in the nest and begin to mate. The female releases her tiny eggs in the depression and the male fertilizes them with his milt. The river's current then pushes the eggs into the crevices of the loose stones of the nest where they rest for a number of days before hatching.

After spawning, the exhausted parent lamprey quickly lose their vigor and die close to their nest, where their spent bodies decay and are consumed by many creatures and micro-organisms. Within a number of days, the eggs hatch from the nests and the newborn lamprey drift downstream to eddies and backwaters with fine sediments where they burrow into the streambed to begin the cycle again.

# Why sea lampreys are misunderstood.

In Maine's coastal river systems, sea lamprey have lived peacefully beside other native fish and wildlife since the last Ice Age. The species' undeserved notoriety in Maine rests upon an unfortunate and poorly-thought action by people in the Great Lakes Region of the United States.

In the mid-20th century, a large shipping canal was built between Lake Ontario and Lake Erie to bypass the impassable navigation barrier at Niagara Falls. This canal, the Welland Canal, allowed barges and freight ships -- and sea lamprey -- to easily travel into the Great Lakes by avoiding the precipice of Niagara Falls. Sea lamprey were never found in the Great Lakes above Lake Ontario prior to the construction of the Welland Canal nor had the native fish of the Great Lakes, primarily lake trout, ever seen a sea lamprey before.

Once they reached the Great Lakes through the locks of the Welland Canal, sea lamprey began spawning in tributary streams and lived their adult life stage in the lakes themselves instead of travelling back down the St. Lawrence River to the Atlantic Ocean. As a result, the adult lampreys began feeding on the lake's native lake trout and caused severe damage to these trout.

While many have interpreted this situation as "proof" that sea lampreys are inherently bad wherever they live, more thoughtful observers have noted that the real "cause" of the sea lamprey problem in the Great Lakes was our decision to build the Welland Canal while ignoring the risk of allowing access by fish species to the Great Lakes that had never existed there before.

# As a result ...

For the reasons outlined above, it is inappropriate to compare the negative experience of sea lampreys in the Great Lakes (where they are an EXOTIC species) to their presence in Maine's coastal rivers (where they are a NATIVE species).

Unfortunately, some people persist in saying that because sea lampreys are bad for the Great Lakes (which they are), they are also bad for Maine rivers, where they have lived for thousands of years.

Simply put, such assertions have no scientific or evidentiary support. They are superstitions. There is no evidence that sea lamprey in harm Maine's river ecosystems or their native fish and wildlife. While some young lamprey heading to sea may attach themselves to other freshwater fish, such predation is no different or damaging than the predation which occurs from loons, osprey, great blue heron, bald eagles, kingfishers, otter, mink and other fish. Evidence shows that freshwater fish in Maine often survive an encounter with a young sea lamprey. In contrast, very few survive an "encounter" with an osprey or great blue heron, since the lamprey only wants a "meal" from the fish while the osprey or great blue heron eats it whole.

In fact, there is a growing body of evidence which suggests that sea lamprey may be one of the most important and beneficial native residents of Maine's coastal river systems. In particular, these animals appear to be very beneficial to the wild Atlantic salmon adults and juveniles that share our Kennebec River with them.

Stay tuned for more details.

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