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Overview of the River Herring Resources of the Kennebec River

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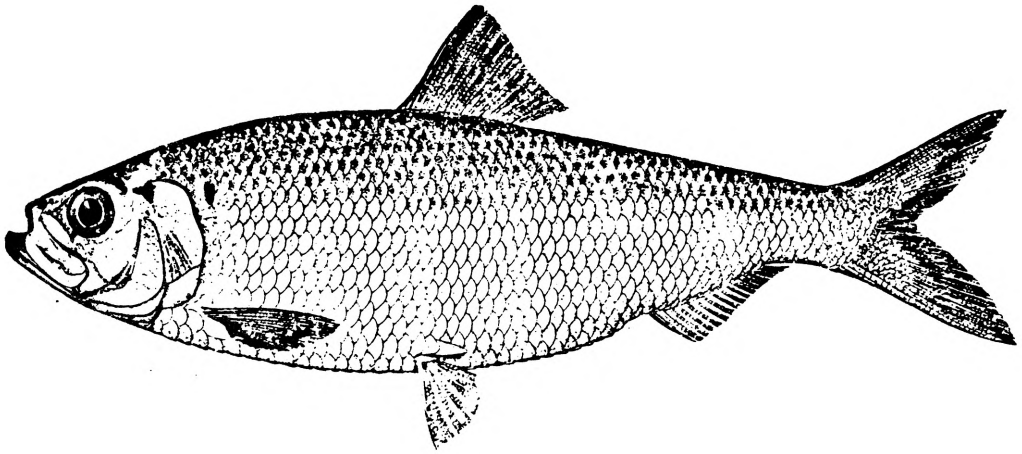

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River Herring

There are two (2) species of river herring found in the Kennebec River: the alewife (Alosa pseudoharengus) and the blueback herring (Alosa aestivalis). Alewives and blueback herring are usually referred to collectively as "river herring" because no distinction is made between the two species in the commercial catch. The alewife is the predominant species found in the State of Maine and the Kennebec River. Recent DMR surveys in the Kennebec River system have shown that blueback herring have only been found in small numbers in Merrymeeting Bay.

The alewife can be distinguished from the blueback herring by the following features: 1) the alewife has a larger eye in relation to head size than the blueback herring; and 2) the alewife has a pink body cavity lining as opposed to blackish in the blueback herring. The alewife spawns in lakes, ponds, and deadwater areas, whereas the blueback herring usually spawns in the moving currents of rivers and streams. Alewives usually enter Maine rivers from early May to early June and run upstream into lakes and ponds to spawn. Blueback herring usually spawn later than alewives, with runs extending from mid May to late June. Each female alewife produces 100,000-300,000 eggs, depending on the size of the individual fish. The majority of the surviving adults then migrate back downstream shortly after spawning, although sometimes the adults become trapped in the lake until fall rains provide sufficient outflow. The juvenile fish migrate downstream from the lakes to the ocean from mid July through early December, with the majority leaving the lakes by October. Seaward migrating juvenile alewives range in length from 1.25 to 6 inches long. After spending 4-5 years at sea and reaching 12 inches in length, they return to their natal lakes to spawn and complete the life cycle. The blueback herring's life cycle is similar with the exception that it spawns in rivers and is slightly smaller when it returns to spawn.

History

Historically, alewives ascended in immense numbers as far as Norridgewock Falls, 89 miles from the sea, on the main stem of the Kennebec River. They ascended the Sandy River as far as Farmington and on the Sebasticook River they had access to nearly every square mile of lake surface area. The Sebasticook River was the principle spawning and nursery area for alewives above Augusta. The ponds draining into Sevenmile Stream also supported a significant alewife run. Alewives were prevented from ascending the Sandy River as early as 1804 when a dam was built at New Sharon. The Sandy River was never a major alewife producer because of the limited lake surface area available. Although many dams were built on the Sebasticook River prior to 1800, passage was provided at these dams so that a major run continued to exist until the dam built at Augusta completely cut them off. Both the Towns of Newport and Clinton had exclusive fishing rights to the taking of alewives within their town

boundaries. The annual catch in the Town of Clinton alone is estimated to have been 3,000 bushels, which is equivalent to approximately 1.2 million alewives. The Town of Clinton auctioned the run off to the highest bidder and received $500 to $1,200 yearly, quite a sum of money in the early 1800's. The Town of Vassalboro had the fishing rights to the run of alewives on Sevenmile Stream and there is mention in the town reports of the fishery existing as early as 1777. The alewife fishery was an important asset to the community up until 1837, when the Augusta dam prevented them from reaching Sevenmile Stream.

The Cobbosseeconte Stream drainage was also a major spawning and nursery area for alewives, but this run was extinguished even before the alewife runs above the Augusta dam. The Town of Wales (then including Monmouth) had a fish committee appointed in 1787 whose duty it was to see that the fishways were kept open according to law, but the dams built in Gardiner in the late 1700's were impassable and the alewife run was destroyed. The Town of Winthrop also had a fish committee which unsuccessfully tried to obtain fish passage at Gardiner.

Togus Stream and Nehumkeag Pond, which enter the Kennebec River below Augusta in Pittston, had significant alewife runs which were also blocked by dams at an early date.

A population of alewives continued to sustain itself below Augusta from 1837 to the 1930's. This population was only a fraction of its previous size. In the mid to late 1800's, landings of alewives in the tidal waters of the Kennebec River exceeded 600,000 pounds. The severe water pollution from the 1930's to the early 1970's reduced the alewife population to remnant levels.

Present

Since the early 1970's, water quality has improved dramatically and the tidal waters of the Kennebec River should support an alewife population similar to that found in the system after 1837. The tidal section of the Kennebec River is freshwater from the outlet of Merrymeeting Bay to Augusta, a distance of 20 miles, making it the only Maine river which will support significant shad and river herring runs below head-of-tide. This section of the river is excellent shad spawning and nursery habitat. It is marginal alewife habitat, but because of the large amount of easily accessible riverine area, the total production of alewives would easily exceed one million pounds, making it one of the largest runs in the state. While it is difficult to estimate the current population size, recent juvenile seine surveys show that the alewife is currently the most abundant of the three alosids (shad, alewife, and blueback herring).

Management

Current management efforts are directed at restoration of alewives to their historical habitat. A plan entitled, "Strategic Plan and Operational Plan for the Restoration of Shad and Alewives To The Kennebec River Above Augusta," has recently been prepared by the Department of Marine Resources. This plan outlines the restoration goals and the time schedule and means for achieving those goals. The long range goal is to restore a run of six million alewives to the Kennebec River above Augusta.

The interim goal for the first ten years is to initiate restoration to eleven of the twenty-one lakes which historically produced anadromous alewives. This is to be accomplished by trapping ripe adult alewives at the proposed fish passage, trapping, and sorting facility at the Augusta dam. A fish passage facility was requested at the Augusta dam by a petition sent to the Federal Energy Regulatory Commission by the Commissioners of Marine Resources, Inland Fisheries and Wildlife, and the Atlantic Salmon Commission through the Attorney General's Office. This action was the result of a Legislative Resolve (H.P. 1267-L.D. 1494) passed in 1977 and amended in 1979 (H.P. 559-L.D. 706). Once the alewives are trapped at Augusta, they will be transported by tank trucks and released into the lakes.

The Department of Inland Fisheries and Wildlife has expressed several concerns regarding the alewife restoration program on the Kennebec River. One concern is the spread of species such as carp and lamprey eels, which might have adverse impacts on the current management programs in inland waters. The Department of Marine Resources plans to trap and sort fish at fish passage facilities at those dams which have been identified by the Department of Inland Fisheries and Wildlife as being strategic barriers. The fish passage/trapping/sorting facility at Augusta will be manned by state fishery personnel and only selected species, such as alewives, shad, and Atlantic salmon, will be stocked or allowed to pass upriver. During the last three years, a fish passage/trapping/sorting facility has been operated successfully at the head-of-tide dam on the Androscoggin River at Brunswick. An additional safeguard is that alewives will be transported to the lake systems by tank trucks and fish will not be allowed free passage into the lakes by means of fishways on the lake outlet dams during the interim period.

Another concern of the Department of Inland Fisheries and Wildlife is the possibility that alewives might compete with landlocked smelt. While there is some data to suggest that landlocked alewives, which are not native to the State of Maine, might compete with landlocked smelt, the data is lacking to make the same inference about anadromous alewives. The major difference between landlocked alewives and anadromous alewives is that only the juvenile stage (age 0+) of the anadromous alewife, and occasionally postspawner adults, are found in the lakes and then only from June through October. At this time of year in most lake systems, the landlocked smelt is usually found in the colder waters in or below the thermocline, whereas the juvenile alewives are usually found in the warmer surface waters. The study

by Gately (1978), done on the interactions of landlocked alewives and landlocked smelt in Echo Lake, Mt. Desert Island, Maine, is the study most referenced as showing that "alewives" compete with smelt. This study found that there was overlap in the diets of landlocked smelt and landlocked alewives and that the growth rate of the older age classes of landlocked smelt was less than found in other lakes not containing landlocked alewives. Because there was no data to show that the food source was a limiting factor or that there had been a change in the population size of landlocked smelt, it was improper for this study to conclude that there was competition. Gately did find that the overlap in diet between juvenile landlocked smelt and juvenile landlocked alewives was only moderate and that the growth of juvenile smelt in Echo Lake was equal to or greater than that found in other Maine lakes. Thus, because only the juvenile stage of the anadromous alewife is found in the freshwater lakes, it is much less likely to compete with landlocked smelt than landlocked alewives. It should be noted that the fishery manager has more control over managing anadromous alewives because the number of spawning adults gaining access to the lake can be controlled in a fish passage facility or by truck stocking.

The Department of Marine Resources is not planning to stock anadromous alewives for a ten-year period in any lake in the Kennebec drainage that the Department of Inland Fisheries and Wildlife has listed as having landlocked smelt and significant coldwater fisheries. The interaction of anadromous alewives with salmonids, smelts, and other inland fish will be assessed through a cooperative research project sponsored by the Maine Departments of Marine Resources and Inland Fisheries and Wildlife. Based on the results of these studies, a cooperative decision will be made regarding future alewife introductions into the listed waters.

A fully restored alewife run to the Kennebec River above Augusta would be capable of supporting a commercial fishery of 1.2 to 1.8 million pounds, which at current landed value would be worth $100,000 to $144,000 annually. The major demand for alewives is for lobster bait. The alewife is very valuable as a bait source as it is available at a time of year when other bait sources are scarce.

The indirect benefits provided by alewife restoration may be the most valuable. Alewives are a valuable forage fish for important inland, riverine, estuarine, and marine finfish. Presently the alewife is the dominant forage species for the spectacular salmonid fisheries in the Great Lakes. Adult alewives are important in attracting valuable gamefish to our estuaries, such as the striped bass. In addition, alewives may be an important buffer against the predation of salmon smolts by avian predators when they migrate downstream to the ocean in the spring. The alewife should also provide for an increased food base for the loon, osprey, American eagle, and other avian piscovores. Hydroelectric dams, if not provided with effective downstream passage facilities, may become the new focal point for our large gull population, which has been displaced due to the phaseout of open dumps. Although it is very difficult to assign a value to the indirect benefits of alewife restoration, it is hoped that they are not overlooked by the regulatory bodies responsible for managing the divergent and often conflicting uses of our rivers.