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## DAMARISCOTTA (MAINE) ALEWIFE FISHERY

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Migrations of alewives (*Pomolobus pseudoharengus*) from the sea to spawning grounds in fresh water occur each spring along the Atlantic coast of North America from the Carolinas to Nova Scotia. In colonial times the sluggish rivers or streams, draining lake or pond systems, supported large alewife runs. In recent years

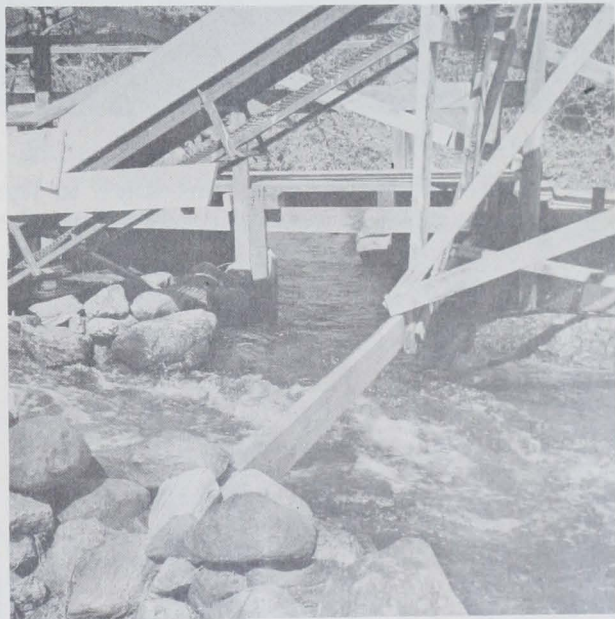
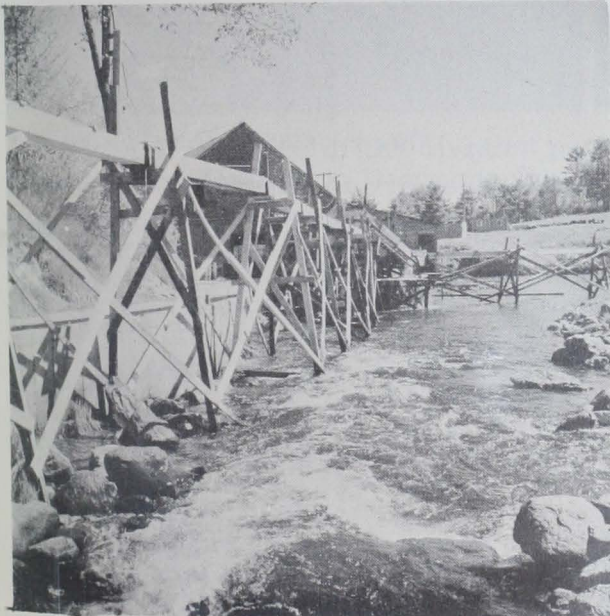


FIG. 1 - STREAM APPROACH TO TRAP, SLUICEWAY, AND PROCESSING PLANT.

FIG. 2 - DIVISION POINT, RIGHT TO LAKE, LEFT TO TRAP.

the construction of tidewater dams preventing upstream movement of alewives, pollution and exploitation have greatly reduced and in instances eliminated alewife runs.

The alewife spends most of its life in the ocean where it may reach a foot in length and attain a weight of one-half pound. In the spring mature fish enter the streams and move up into the ponds and lakes where they spawn. Most adult alewives do not die after spawning, as do the Pacific salmon, but survive to return to the sea. The young of the year begin their seaward migration and downstream movement during summer and fall months. The alewives remain in the ocean until they mature at an age of 3 or 4 years.

The sight of these hordes of fish, working their way up small streams to the lake, is one that never fails to fascinate. The instinct to propagate the race is so

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strong in these fish that they never cease trying to get upstream no matter what obstruction is placed in their path. At the entrance to West Harbor pond at Boothbay Harbor, Maine, they can be observed at times trying to penetrate a net that some-



FIG. 3 - LOWER SECTION OF FISHWAY.



FIG. 4 - FISHWAY POOL

times cuts off the fishway entrance to the pond. They are so oblivious to everything but reaching the spawning ground that they can be easily caught by hand.

Alewives are important to man in several ways: (1) as a source of food and (2) as a fine supply of forage fish for the game fish in the waters where they are spawned and spend most of the summer. Sometimes new runs are started in suitable lakes with outlets to the sea just to provide an adequate summer supply of food for the trout, salmon, or bass residing there.

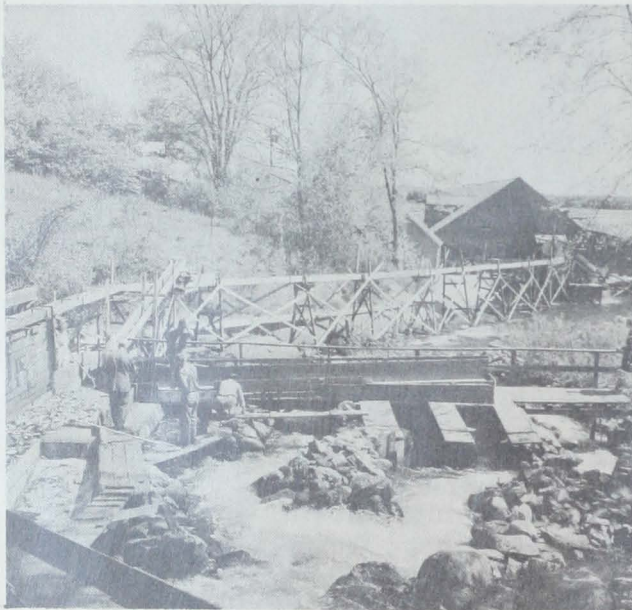


FIG. 5 - TRAP, SLUICeway, AND PLANT.

Alewives are good food fish either fresh or processed. Most of them, commercially processed for food, are either cold-smoked or pickled. Many people prefer them to sea herring processed in the same manner. Many of the alewives caught in Maine go into cat food and more and more are being processed for meal and oil. Some are utilized for lobster bait.

One of the larger runs of these fish occurs in the Damariscotta River and lake system near Damariscotta, Maine. The location of the fishing operation is handy to U. S. Route 1. Each

spring the migrating alewives are an attraction to many local and out-of-state people. The fishery is owned by the Town of Damariscotta, but the production is leased each year to a private party. The town is paid a percentage for the fish utilized. Visitors are definitely welcome.



The methods by which these fish are taken and handled at Damariscotta are depicted in Figures 1 to 10. It is probably one of the simplest and easiest methods of catching fish that has ever been developed, and it is possible only because of the single-minded purpose of the alewife to go upstream to the lake. Figure 1 is a downstream view from the fishway and fish trap, showing the stream approach up which the fish come. The wooden structure at the left of the picture is the sluiceway down which the captured fish are washed to the scaling machine and processing plant shown in the background. In the plant the fish are mechanically headed, gutted, and filleted. Then they pass through a series of salt brines until properly preserved. Finally they are packed in barrels in a mild vinegar pickle for shipment to other locations for final processing into a retail pack of pickled herring. A few of the fish are smoked whole in a small smokehouse nearby and some are sold as lobster bait.



FIG. 6 - TAKING BLOOD SAMPLES.

Figure 2 is a view of the division point where the fish can, by choice, turn right and ascend the fishway to Damariscotta Lake or turn left and be caught. The rate of



FIG. 7 - DIPPING ALEWIVES FROM TRAP.

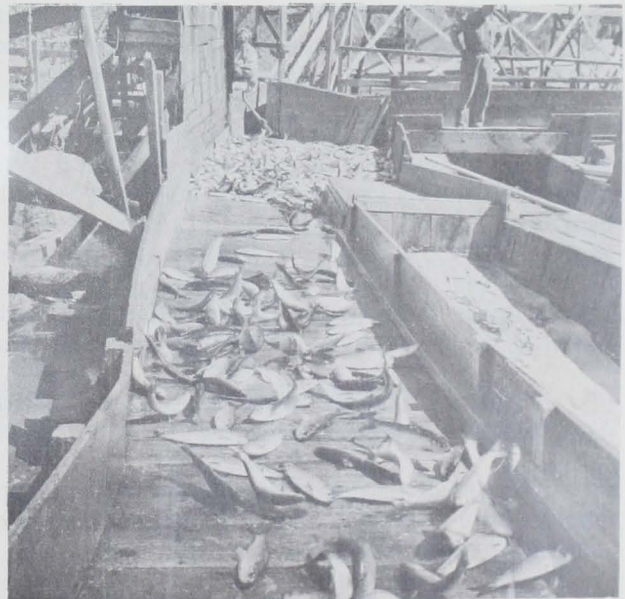


FIG. 8 - ALEWIVES ON RAMP.

flow from the trap is greater than that from the fishway which no doubt attracts a higher percentage of fish to the trap than to the fishway.

Figure 3 is a view looking upstream in the fishway from the division point.

Figure 4 depicts a resting pool in the fishway part way to the lake. There are a number of these pools above and below this one through which the fish must pass.



Figure 5 shows the fishing area from which the alewives are carried via an elevated wooden chute or sluice to the processing plant.

At the lower left fish netted with dip nets can be seen lying on the wooden ramp beyond the wooden trap chamber where the fish congregate. More of these wood trap



FIG. 9 - IMPASSABLE FALLS ABOVE TRAP.

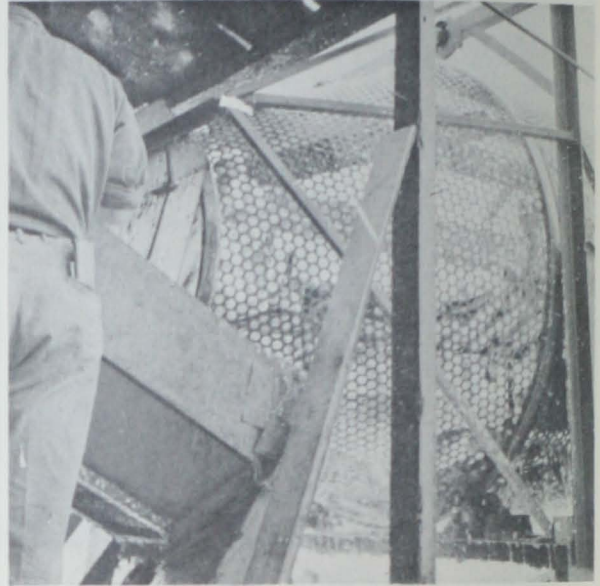


FIG. 10 - SCALING MACHINE.

chambers can be seen on the right. The fish come up the stream beside the man farthest right and when they are turned back by the falls they concentrate in the chambers where they are easily caught.

Figure 6 - A blood sample is being collected from an alewife for later analysis. Through classification based on blood types and other characteristics scientists may be able to separate the alewife population into different racial groups. These biological studies being conducted by the Division of Biological Research of the Bureau of Commercial Fisheries are aimed at improving the alewife fishery.

Figure 7 shows workman dipping fish from the channel on the left onto the ramp leading to the conveyor which carries the fish into the sluiceway.

Figure 8 shows alewives, just dipped, flopping on the ramp. A pile of alewives can be seen in the background ready to be shoveled onto the conveyor.

Figure 9 - In the background the impassable falls above the trap area can be seen. The water operating the sluiceway is taken from the falls. A wooden trapping chamber is in the foreground.

Figure 10 - This is a cylindrical perforated mechanical scaler at the end of the sluiceway. From here the fish are taken into the plant for processing.

The alewife is a very hardy fish and stands handling and transporting alive from one area to another well. It is estimated that only 5 percent are allowed to escape to spawn in some of the more heavily-fished streams along the coast of Maine, and these runs have not diminished significantly. Rounsefell & Stringer (1943) point out . . . "artificial maintenance, for more than a century, of a commercial run in Jones Stream (West Goldsboro) by planting about ten percent of each year's run in Jones Pond for spawning." There are many streams along the coast in the range of this fish in which runs could be established again providing pollution were abated



and fishways over impassable dams and falls were built. The alewife unlike the shad, can pass quite steep fishways. Establishment of new runs and better management of already established runs could increase the production tremendously. Rounsefell & Stringer (1943) state "Production from alewife runs in Maine can be easily doubled by carrying out the suggestions embodied in this report in regard to fishways, natural obstructions, management methods to guarantee an adequate annual spawning stock, and by continuation of the stocking program."

Increased interest by Maine towns, stimulated by the reports of Rounsefell & Stringer (1943) and Baird (1953-1956) in increasing the production of alewives by better management of present runs and the establishment of new ones by stream improvement and stocking gives promise of steady progress towards a practical maximum yield from waters suitable for Maine alewife production in the future. The biologists of the State of Maine Sea and Shore Fisheries and Inland Fish and Game Departments are encouraging this progress and assisting the towns by doing the needed research for establishing suitable management plans.

It might be said that there is no market for alewives at this time and, therefore, it is not desirable to increase the catch. This would be partly true if they are considered for human consumption only. Baird (1956) interviewed present alewife producers and was told that they could handle any steady increase in production with ease. He states . . . "our problem is not one of markets, but one of sufficient production to satisfy these markets." At the present rate of population increases in this country and most other countries any direct source of protein will by all present indications be of maximum importance in 10 to 15 years if not sooner. In the meantime the surpluses can be utilized by the producers of fish meal and oil and cat food who are definitely interested in any source of fish at competitive prices.

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#### EUROPE SHIPS FRESH SALMON BY AIR FREIGHT

Fresh salmon packed in polyethylene bags with crushed ice are being transported by air freight from Ireland to British and European Markets. The packaging costs are said to be less than those normally encountered. (Der Fischwirt, February 1957.)