HADDOCK ...TRADITIONAL NEW ENGLAND FOODFISH

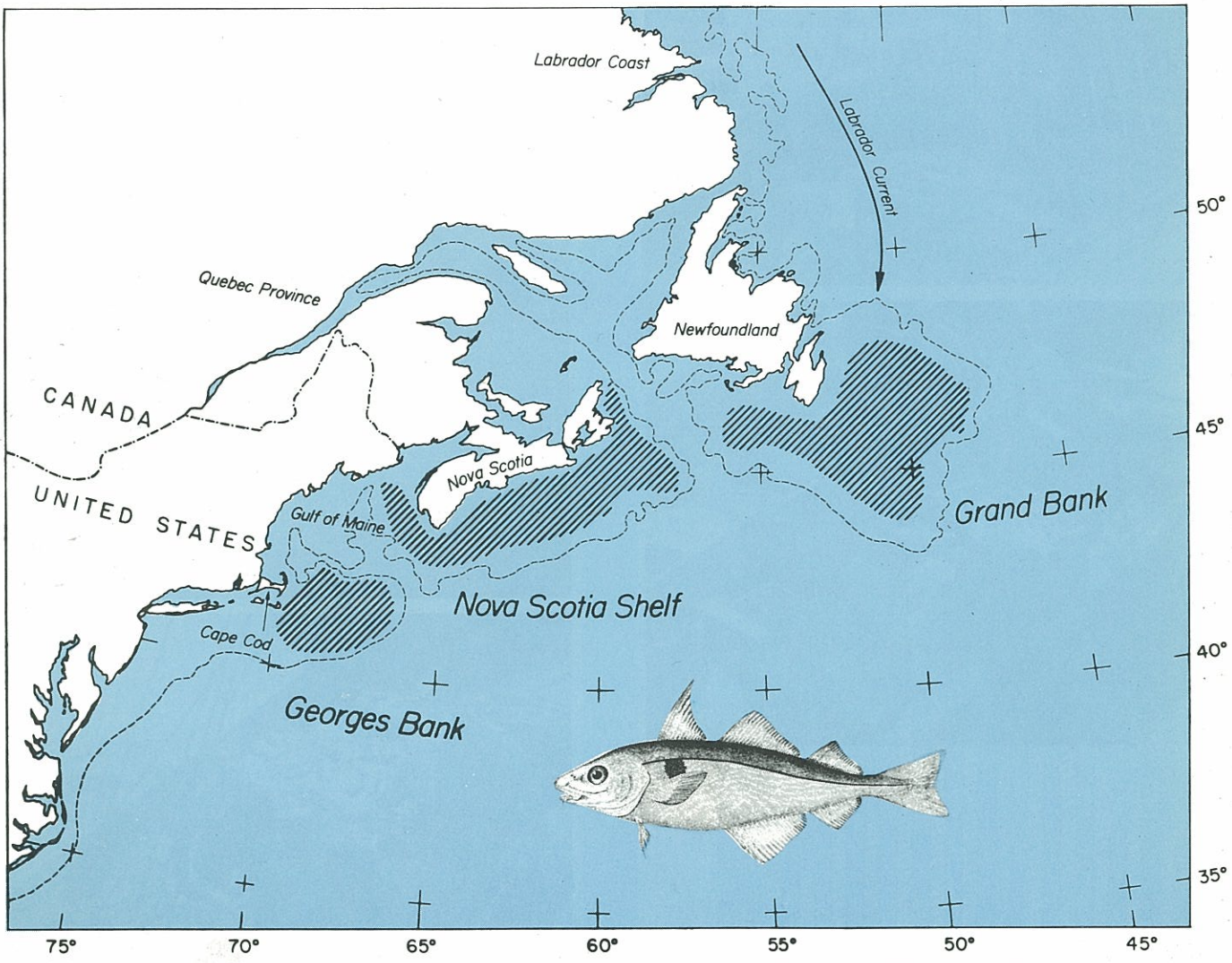
The haddock (*Melanogrammus aeglefinus* L.) is in the same family of fishes (Gadidae) as the cod, pollock, and hakes. It is a soft-rayed fish with three large dorsal fins, a prominent dark lateral line, and a black patch on the shoulder which legend calls the "Devil's thumbprint." The term "scrod" is commonly used to describe the smaller market-sized fish 13 to 22 inches (33 to 55 cm) in length and 1.0 to 3.8 pounds (0.5 to 1.7 kg) in weight.

A North Atlantic Resident

Haddock are found only in the North Atlantic Ocean. In the Northeast Atlantic they range from Iceland through the North Sea to the Barents Sea. In the Northwest Atlantic they range principally from the waters off Cape Cod to the Grand Banks of Newfoundland. Important concentrations of the species occur on Georges and Browns banks, while small groups may be found inshore along both sides of the Gulf of Maine.

Adult haddock are found primarily at depths of less

In the Northwest Atlantic haddock range from Georges Bank to the Grand Banks off Newfoundland. Adult haddock are restricted in their distribution by the temperature and depth of the water. The dashed line shows the 600-foot (183 meter) depth contour.



INSET: **This picture of an adult haddock was photographed directly from *Fishes of the Gulf of Maine* (by H.B. Bigelow and W.C. Schroeder, 1953).**

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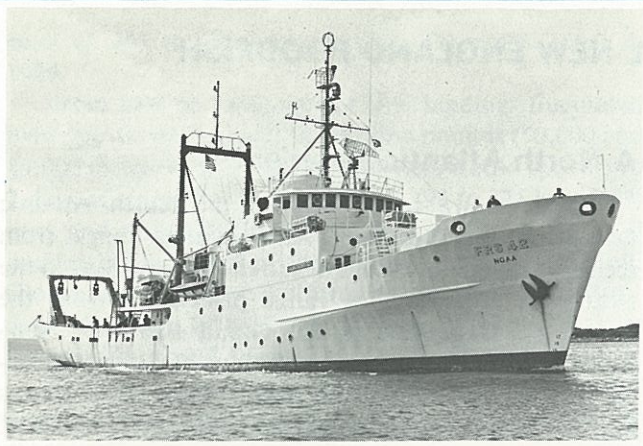


The **Albatross IV** (top left), a research vessel for the National Marine Fisheries Service, is based at the Woods Hole (Massachusetts) Laboratory of the Northeast Fisheries Center. She is used regularly to make surveys to determine the abundance and distribution of young and adult haddock as well as of haddock eggs and larvae. In the next picture (second left) biologists measure a variety of fishes collected during a survey cruise. The samples collected provide vital information for the management of haddock and other important species. A pair of ''bongo'' plankton nets (top right) are being hoisted over the side of the research vessel. Towed through the water, the nets will collect haddock eggs and larvae. The samples taken will enable biologists to determine the success or failure of the species' spawning.

Landing the catch at the Boston Fish Pier (third left) shows commercial ''lumpers'' unloading a vessel. Commercial side trawlers like the vessel pictured at bottom left are widely used in groundfishing operations for cod, yellowtail, flounder and other species. U.S.A. fishermen are allowed to take limited amounts of haddock as ''by-catch'' in the course of such operations.

Processing the catch at sea (bottom right). During warmer months (April to November) haddock must be gutted and gills removed prior to landing, and they are frequently processed in this manner during winter also.

than 600 feet (183 m) and temperatures between 34° and 50° F (1° and 10° C). As bottom dwellers they prefer grounds where sand and gravel are common. Their food includes a wide variety of invertebrates including crustaceans, worms, mollusks, brittle stars and sea cucumbers. Larger haddock may capture more agile animals such as small fishes and squids, but these are not major food items.

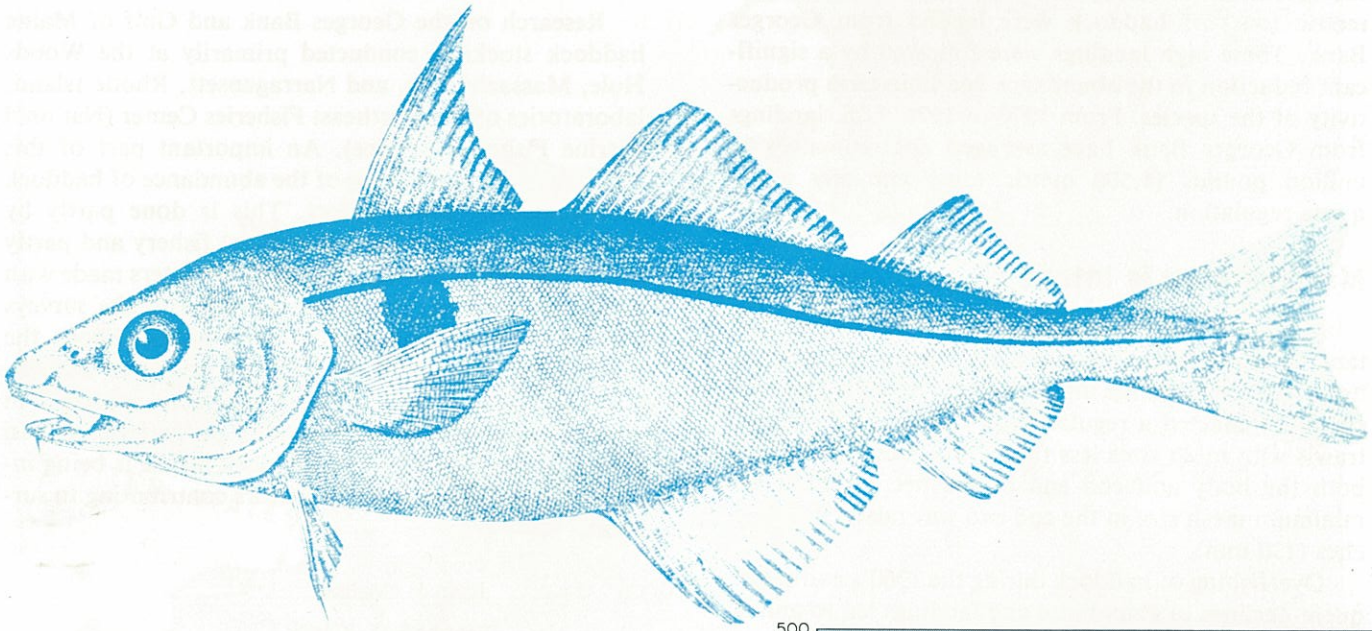
A Spring Spawner

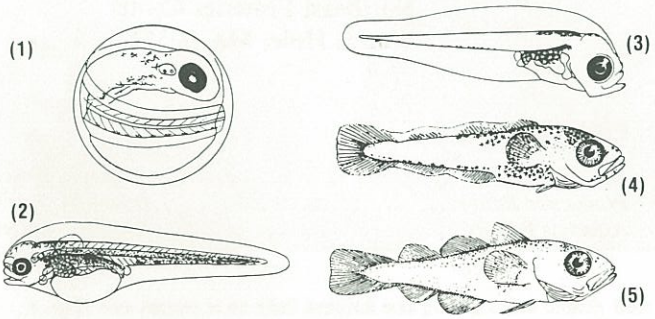
Haddock spawn between January and June off New England, with peak spawning during March and April. A single female, depending upon her size, may produce from 100,000 to 3 million eggs. Spawning occurs near the seabed; fertilized eggs rise nearly to the surface and hatch in about 2 weeks. Newly hatched larvae are about 0.2 inches (4 mm) long. After 4 to 6 months, the juvenile haddock—now averaging about 6 inches (15 cm) in length—settle to the bottom for the remainder of their lives. On Georges Bank, haddock reach sexual maturity in 2 to 3 years and may live as long as 18 years. Maximum sizes are about 30 inches (76 cm) in length and 25 pounds (11 kg) in weight.

From 1956 to 1967, 3-year-old Georges Bank haddock caught by commercial fishermen averaged 18 to 19 inches (45 to 49 cm) in length and 2.3 to 2.8 pounds (1.0 to 1.3 kg) in weight. Since 1968, these size ranges have increased to 20 to 22 inches (50 to 55 cm) and 3.0 to 3.8 pounds (1.3 to 1.7 kg), respectively. This increase in growth has coincided with declines in abundance in recent years. (With fewer fish in the population, possibly more food has become available for individual fish.)

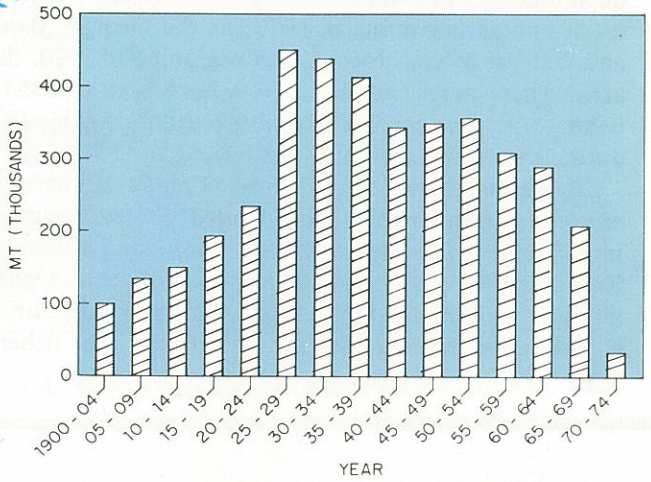
Commercial Fishery

The decline of the market for salted fish (chiefly cod) early in this century, the increased demand for fresh and frozen fillets, and the expansion of otter trawling, all contributed to the growth of the United States haddock fishery. By the late 1920's, total U.S. haddock landings had increased sharply and reached a





Pictured above is the egg and several larval stages of haddock. From top to bottom and left to right they are as follows: (1) egg, (2) larva just hatched, (3) larva 4.2 mm, (4) larva 15 mm, (5) young fry 25 mm.



This graph shows the total United States haddock landings (in metric tons) from all fishing grounds during 5-year periods, 1900-1974.

peak of 291 million pounds (132,000 metric tons) in 1929.

From 1931 to 1966, annual U.S. landings fluctuated between 100 million and 187 million pounds (50,000 and 85,000 metric tons). The U.S. trawlers would spend 5 to 7 days at sea, going 50 to 200 miles (93 to 371 km) from port and returning with their fish gutted, gilled, and packed in ice. Most of the trawlers landed at Boston, Gloucester, and New Bedford, Massachusetts. Historically, the bulk of the U.S. landings have come from Georges Bank and from areas on the Scotian Shelf.

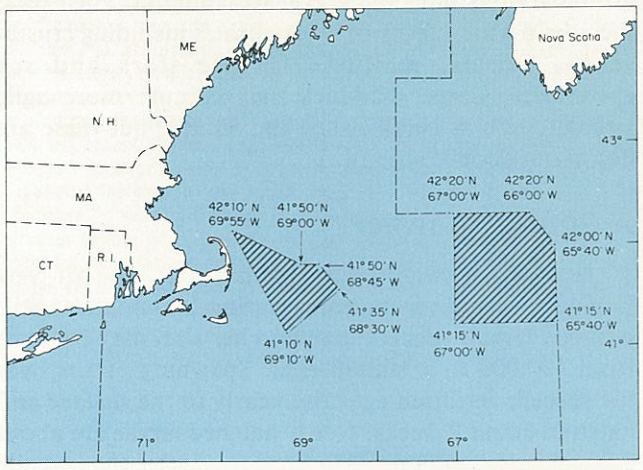
In 1962, Canada and the Soviet Union (U.S.S.R.) began to take appreciable quantities of haddock on Georges Bank. In 1964, these two nations accounted for one-fourth of the 141 million pounds (64,000 metric tons) of haddock landed from the bank in that year. The following year, landings from Georges Bank increased dramatically to over 331 million pounds (150,000 metric tons). The U.S. share, however was less than half the total; the remainder was taken primarily by Canada and the U.S.S.R. In 1966, 267 million pounds (121,000 metric tons) of haddock were landed from Georges Bank. These high landings were followed by a significant reduction in the abundance and long-term productivity of the species. From 1970 to 1976, U.S. landings from Georges Bank have averaged approximately 10 million pounds (4,500 metric tons) annually under quota regulation.

Management is Intensive

Management of the Georges Bank and other important haddock stocks began in 1953 when the International Commission for the Northwest Atlantic Fisheries (ICNAF) enacted a regulation prohibiting use of otter trawls with mesh sizes less than 4.5 inches (114 mm) in both the body and cod end of the net. In 1974, the minimum mesh size in the cod end was raised to 5.1 inches (130 mm).

Overfishing of haddock during the 1960's and subsequent declines in abundance and landings led to annual catch quotas beginning in 1970 for the Georges Bank and Gulf of Maine stocks. Also beginning in 1970, the areas where most haddock spawn have been closed to fishing with gear capable of taking bottom-dwelling fish during the spring spawning season.

Beginning March 1, 1977 Public Law 94-265 became effective, under which the United States assumed jurisdiction over a fishery conservation zone extending 200 miles (371 km) seaward from the coastline. Under this law, the New England Fishery Management Council is primarily responsible for managing the fishery resources, including haddock, on Georges Bank and in the western Gulf of Maine.



Areas indicated here were closed to gear capable of taking bottom-dwelling fish during March, April and May of 1977. The boundaries of these areas may vary from year to year.

Research is Vital

Research on the Georges Bank and Gulf of Maine haddock stocks is conducted primarily at the Woods Hole, Massachusetts, and Narragansett, Rhode Island, laboratories of the Northeast Fisheries Center (National Marine Fisheries Service). An important part of this research is the monitoring of the abundance of haddock in relation to fishing effort. This is done partly by analyzing data from the commercial fishery and partly by surveys of the coastal and offshore waters made with research vessels such as the *Albatross IV*. The surveys also provide a great deal of information about the biology and ecology of the haddock and other species. Current research also includes studies of changes in growth, maturation, and fecundity of the haddock. In addition, the physiology of haddock larvae is being intensively studied to evaluate factors contributing to survival.

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