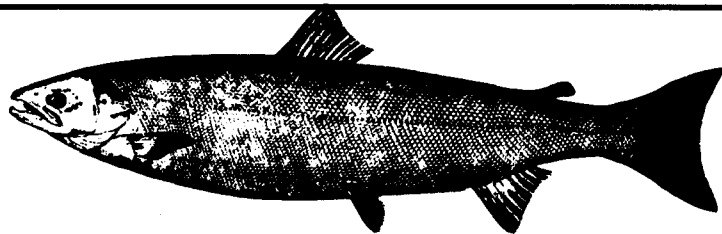


Atlantic Salmon

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The Atlantic salmon, *Salmo salar*, is a highly prized food and game fish native to New England rivers. The historic North American range of Atlantic salmon extended from the rivers of Ungava Bay, Canada, to Long Island Sound. As a consequence of industrial and agricultural development, most of the runs native to New England have been extirpated. Self-supporting runs of Atlantic salmon in the United States now persist only in eastern Maine. Restoration and rehabilitation efforts, in the form of stocking and fish passage construction, are underway in the Connecticut, Pawcatuck, Merrimack, Penobscot, and eastern Maine rivers of New England.

Atlantic salmon life history is extremely complex owing to its use of both freshwater and marine habitats and long ocean migrations. Atlantic salmon spawn in freshwater during fall. Eggs remain in gravel substrates and hatch during winter, and fry emerge in spring. Juvenile salmon, commonly called parr, remain in freshwater two to three years in New England rivers depending on growth. When parr grow to sufficient size (>16 cm or 6.4 in.) they develop into smolts and migrate to the ocean. Tagging data for New England stocks indicate that young salmon migrate as far north as the Labrador Sea during their first summer in the ocean.

After their first winter at sea (the fish are now referred to as 1 sea-winter salmon), a small portion of the cohort becomes sexually mature and returns to their natal rivers to spawn. Those remaining at sea feed in the coastal waters of Canada, mostly Newfoundland and Labrador, and West Greenland. Historically, it has been in these

foraging areas that commercial gillnet fisheries for salmon occurred. After their second winter at sea, most U.S. salmon return home to spawn. Three sea-winter and repeat-spawning salmon life history patterns also occur in New England populations.

The last two decades mark a period of decline in stock status for all Atlantic salmon populations of the North Atlantic. Both indices and complete measures of population abundance indicate that marine survival plummeted as much as fivefold for some stocks during these years. This has intensified concern over the additive effects of overfishing in both home-water and mixed stock fisheries on the high seas and habitat issues that persist in U.S. rivers.

Homewater fisheries are limited to an angling fishery in Maine on sea-run fish and a fishery on surplus broodstock in the upper Merrimack River. Angler catches in Maine have averaged approximately 486 salmon in recent years. Declines in runs has led to a no retention policy statewide, thus landings have been zero. The Merrimack River broodstock fishery began in 1993 and has resulted in an annual catch of approximately 1,000 salmon. The popularity of the fishery is reflected in increased license sales each successive year of the fishery. Management authority for Atlantic salmon in U.S. waters resides with the states and the New England Fishery Management Council.

The commercial fisheries in Canada and Greenland are managed under the auspices of the North Atlantic Salmon Conservation Organization (NASCO), of which the United States is a member. These fisheries have been evaluated by extensive tagging experiments with U.S. stocks. Harvest estimates based on Carlin tag returns have indicated exploitation rates of approximately 60% and 80%, for the U.S. 1-seawinter and 2-seawinter stock components, respectively. These results indicated that the stocks were overexploited.

The Greenland fishery is managed by a quota system that has been in place since 1976. Responding to concerns over stock status, a multi-year quota system was agreed to during 1993 negotiations within NASCO that provided a framework for quota setting based on a forecast model of salmon abundance. Subsequent to the NASCO quota agreement, a private initiative was successful in purchasing the 1993 and 1994 quotas with the exception of a small fishery for local use. In 1997, the agreement was modified to allow for a local use fishery and to provide for data collection even when stock abundance is below recommended conservation levels. Concerns persist that local harvests may take a significant fraction of the stock when at low abundance.

The Canadian fishery has been managed by time-area closures and quotas. Responding to concerns over

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the status of salmon stocks in North America, the fishery around Newfoundland, which was the largest component of the commercial fishery, was closed under moratorium by the Canadian government in 1992. Along with the moratorium, a fishing license buy-back program was also initiated. The remaining commercial fishery in Labrador has been reduced by an amount consistent with the reduction in licensed effort in that part of the province.

Responding to a petition request to list Atlantic salmon as endangered under the Endangered Species Act, the National Marine Fisheries Service and U.S. Fish and Wildlife Service conducted a status review of salmon populations in New England and developed a proposed rule to list several stocks in eastern Maine as threatened under the Act. Subsequently, the State of Maine developed a conservation plan to meet the goals of the proposed rule. The services have withdrawn the proposed rule and are working with the state to implement the conservation plan in lieu of a listing action.

For further information

Mills, D. 1989. Ecology and Management of Atlantic Salmon. New York: Chapman and Hall.
 ICES NASWG. 1997. Report of the ICES North Atlantic Salmon Working Group. *ICES C.M.* 1996/Assess:10.

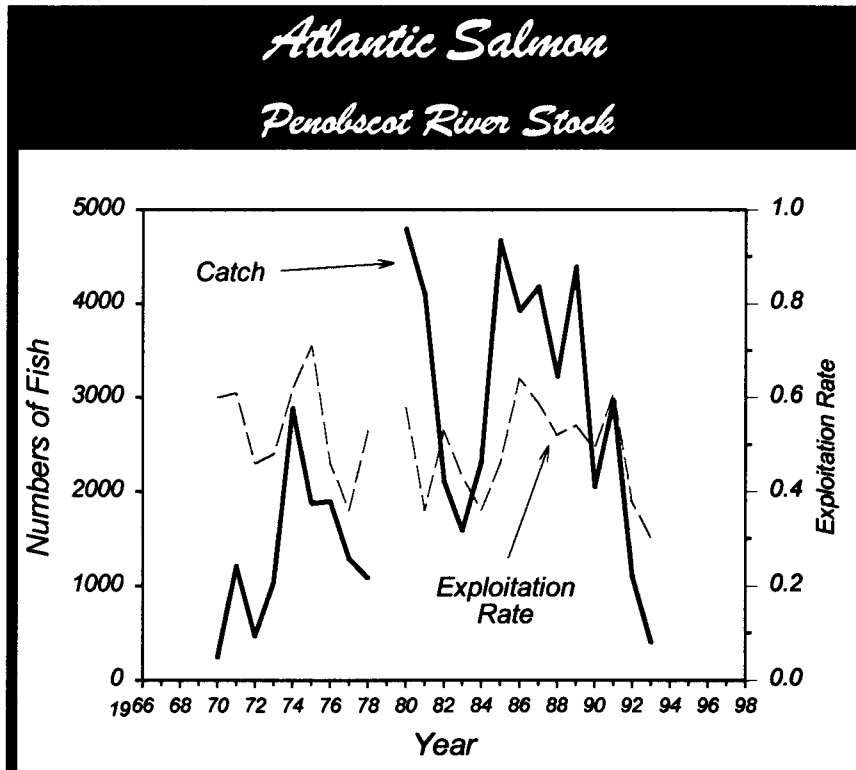


Table 37.1 Recreational catches and commercial landings (numbers, sea-run populations only)

Category	Year										
	1977-86 Average	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
U.S. recreational	845	424	400	1007	1414	477	600	659	262	370	542
Commercial ¹											
United States	0	0	0	0	0	0	0	0	0	0	0
Canada	3339	1212	590	1722	780	1425	275	129	-	-	-
Greenland	2755	4175	3757	3797	1525	1871	1067	327	-	-	-
Total nominal catch	4184	4391	5165	6486	5991	3427	2746	1855	589	370	542

¹Carlin tag harvest estimates for Maine stocks

Summary Status

Long-term potential catch	=	Unknown
SSB for long-term potential catch	=	Unknown
Importance of recreational fishery	=	Major
Management	=	Atlantic Salmon FMP NASCO Treaty
Status of exploitation	=	Protected
Age at 50% maturity	=	2 sea years
Size at 50% maturity	=	71.0 cm (28.0 in.)
Assessment level	=	Age structured
Overfishing definition	=	None defined, optimum yield is set at zero under FMP
Fishing mortality rate corresponding to overfishing definition	=	N/A
M = 0.12 F_{0.1} = Unknown F_{max} = Unknown F₁₉₉₆ = 0.3		