
Atlantic Anadromous Fisheries

INTRODUCTION

The anadromous fishes of the Atlantic seaboard are a diverse group, including river herrings (alewife and blueback herring), American shad, hickory shad, striped bass, Atlantic salmon, sturgeons (Atlantic and shortnose), and rainbow smelt. Regulation of these stocks is likewise diverse: the Atlantic States Marine Fisheries Commission (ASMFC) has implemented fishery management plans for shad, river herring, and Atlantic sturgeon, while shortnose sturgeon are managed under a recovery plan prepared under the Endangered Species Act. Atlantic salmon are regulated by a New England Fishery Management Council fishery management plan and by the North Atlantic Salmon Conservation Organization (NASCO). Striped bass are regulated under an ASMFC fishery management plan and by special Congressional authority under the Striped Bass Conservation Act (implemented by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service).

Recent average landings of Atlantic anadromous species (Table 3-1; Figures 3-1 and 3-2) are about 9,400 metric tons (t), far below historic levels. Several species have recreational importance to the region (including American shad, striped bass, and Atlantic salmon). The recreational portion of the recent average landings is dominated by striped bass which averaged 6,300 t annually during 1995–97.

Landings of most Atlantic anadromous species have declined greatly in recent years. River herring catches peaked in 1965 at about 28,000 t coast-wide, but have since declined to less than 500 t annually. Likewise, commercial landings of American shad had a peak of over 2,500 t in 1970, but are now only averaging 600 t. Striped bass

commercial landings were over 6,000 t in 1973, but decreased to less than 1,000 t by 1985. Following several years of sharply reduced landings of about 400 t due to severe management restrictions, commercial landings of striped bass increased to 2,200 t in 1997. Catches of U.S.-origin Atlantic salmon, taken primarily in foreign commercial fisheries, were in excess of 10,000 fish annually during the 1980's. Currently, domestic and foreign fisheries for U.S.-origin Atlantic salmon are closed by regulation or private quota purchase agreement.

SPECIES AND STATUS

Unlike most of the offshore resources in the Northeast region, Atlantic anadromous stocks have been greatly influenced by nonfishing human activities in the coastal zone. Damming of rivers preventing access to former spawning grounds was a major factor in the decline of Atlantic salmon, sturgeons, river herrings, and shad. Environmental contamination is implicated in the decline of several species. Today, these species are threatened by coastal pollution and development as well as reduced population sizes from which recovery is uncertain.

Atlantic Salmon

In the United States, Atlantic salmon were indigenous from the Housatonic River in Connecticut to tributaries of the St. John River in northern Maine. As a consequence of industrial and agricultural development, all native runs south of the Kennebec River in Maine were extirpated. The only primarily self-sustaining U.S. runs now occur in several small (<100 km) rivers in eastern Maine, and these populations are perilously small

Unit 3

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Table 3-1
Productivity in metric tons and status of Atlantic anadromous fisheries resources.

Species	Recent average yield (RAY) ¹	Current potential yield (CPY)	Long-term potential yield (LTPY)	Fishery utilization level	Stock level relative to LTPY
Striped bass ²	8,300	8,100	Unknown	Full	Above
American shad	600	Unknown	Unknown	Over	Below
Alewife/blueback	500	Unknown	Unknown	Over	Below
Sturgeons	7	Unknown	Unknown	Over	Below
Atlantic salmon	1	Unknown	Unknown	Over	Below
Total	9,408	9,208	9,208		

¹1995–97 average (including recreational landings).

²Includes significant recreational landings.

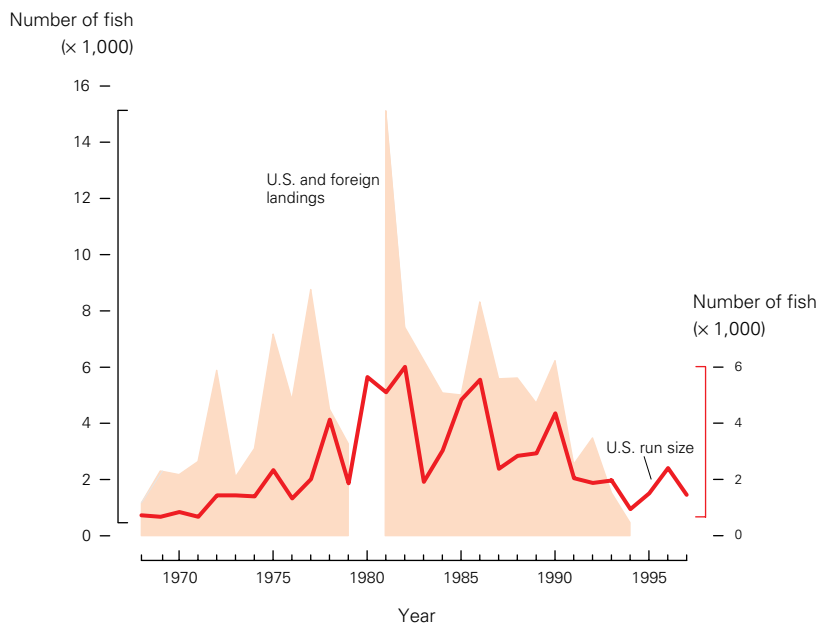


Figure 3-1
Size of spawning run of Atlantic salmon returning to Maine rivers, and total catch by U.S. anglers from Maine rivers and by at-sea foreign fisheries, 1968–97. The catch for 1980 was not reported. Catches since 1994 are not estimated because of fishery closures.

with total run sizes of less than 300 spawners annually. In addition, the Penobscot River in Maine has remained the largest U.S. population, but it is heavily supplemented by hatchery production from returning adults. Current rehabilitation of these stocks in Maine is being undertaken with an innovative river-specific fry stocking program. Wild parr or returning adults are collected and held until spawning time, and their progeny are scatter-stocked as fry in their natal rivers. In addition, restoration efforts, in the form of stocking and fish passage construction, are underway in the Connecticut, Pawcatuck, Merrimack, and Saco rivers. In these rivers, as well as in the Penobscot River, some Atlantic salmon are also stocked as

smolts. The donor stocks for these programs are largely from the Penobscot River. NMFS is involved in assessing the viability of these populations, the success of supplementation, and the conservation of these unique genetic resources.

In U.S. rivers, juvenile salmon are resident in freshwater streams for 2 or 3 years before migrating to the sea where they typically remain for two winters. While at sea, they generally undergo extensive migrations to waters off Canada and Greenland before returning to their natal rivers in June and spawning in November.

The abundance of Atlantic salmon stocks in Maine rivers is represented by estimates of catch and run size (Figure 3-1). The abundance of extant U.S. stocks, like most stocks in North America, has declined during the past decade. Home-water fisheries (those in U.S. waters) are limited to catch and release angling in Maine. Tagging experiments conducted by the NMFS have demonstrated that distant-water commercial gillnet fisheries off Canada and Greenland had previously exploited U.S. stocks at approximately 50%. Those commercial oceanic fisheries are now regulated more stringently under the auspices of NASCO. Canadian interception fisheries have been greatly curtailed, and the Greenland fishery is quota controlled to allow for adequate spawning escapement. Despite these conservation measures, the overall abundance of Atlantic salmon throughout North America continues to decline, and several populations would be extirpated if supplementation of them did not continue.

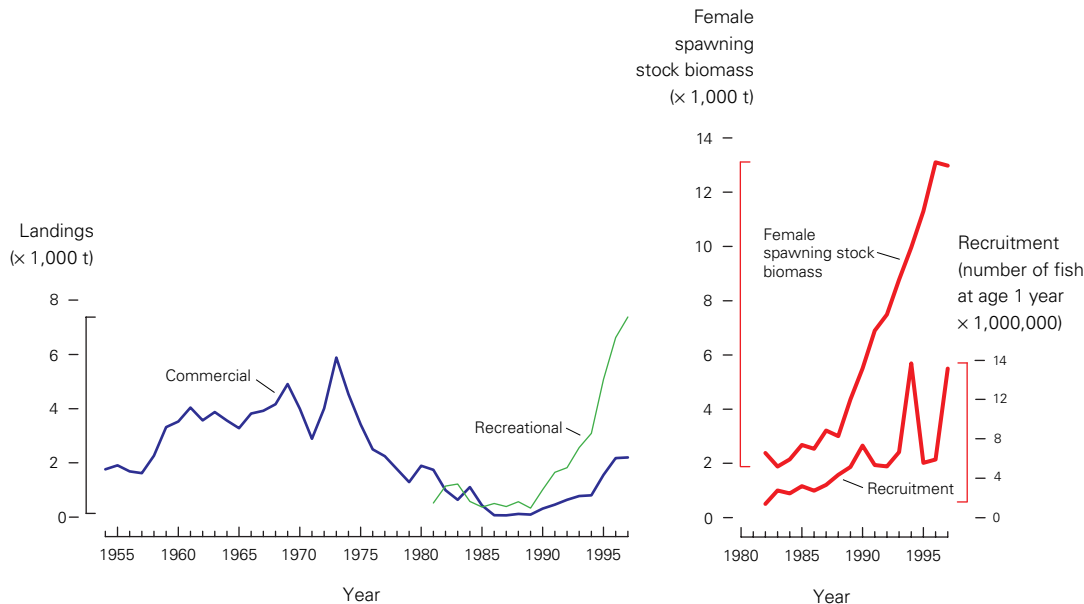


Figure 3-2
Commercial and recreational landings and female spawning stock biomass in metric tons (t), and recruitment of striped bass, 1954–97.

Striped Bass

Four primary stocks of striped bass occur along the Atlantic coast: Hudson River, Delaware Bay, Chesapeake Bay, and Roanoke River (North Carolina). Striped bass stocks historically have supported important commercial and recreational fisheries, with recreational harvests often equaling or exceeding commercial landings (Figure 3-2). Commercial fisheries use a variety of gears including haul seines, trawls, pound nets, gillnets, and hook-and-line.

Commercial landings peaked in 1973 and then began a precipitous decline. The declining landings coupled with consistently poor recruitment indices in the Chesapeake Bay provided the impetus for highly restrictive management actions taken by ASMFC in the mid-1980s. Additionally, Congress passed the Striped Bass Conservation Act which empowered the Departments of Commerce and Interior to impose a moratorium on striped bass fishing in any state which ASMFC found not in compliance with its fishery management plan.

The fisheries were monitored closely and under severe management restrictions. However, a high recruitment index in 1989 in the Chesapeake Bay triggered a slight relaxation of management restrictions and allowed increased fishing on migratory Atlantic striped bass stocks the following year. Recruitment has continued to improve, and

the growth of the population has reached a level of abundance equivalent to the mid-1970s (prior to the decline). Owing to the improved conditions, ASMFC has declared Atlantic striped bass fully restored, allowing a further relaxation of management restrictions in the commercial and recreational fisheries.

A recent assessment of the striped bass coastal complex (Northeast Fisheries Science Center, 1998a,b) indicates that the current level of fishing mortality is at the target level established in the fishery management plan. The large recreational fishery, which includes both landings and discard losses, accounted for the majority of the fishing mortality. The recent average yield is about 8,300 t (Table 3-1), 74% of which is attributed to recreational landings. The spawning stock biomass has continually increased since the reopening of the fishery in 1990 (Figure 3-2). Recruitment of historically large year classes in 1993 and 1996 (Figure 3-2) should result in a continued population increase under the current levels of fishing mortality.

ISSUES

Transboundary Stocks and Jurisdiction

The interception of U.S.-origin Atlantic salmon in commercial fisheries off Canada and

West Greenland is an impediment to the restoration of runs and U.S. fisheries. However, beginning in 1992, the largest portion of the Canadian fishery, that around Newfoundland, was closed and remains severely restricted. Likewise, the Greenland fishery quota, set to meet spawning escapements to North American rivers, should provide adequate protection. If these conservation tools remain in place, the threat of those intercept fisheries to U.S. salmon is greatly reduced.

Endangered Species Concerns

Anadromous Atlantic salmon populations throughout their U.S. range were petitioned for listing under the Endangered Species Act. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service, working in partnership, formed a biological review team to evaluate the status of these populations. This team determined that available biological evidence indicated that the population structure described in the petition did not meet the definition of species under the Endangered Species Act. The team also concluded that native population segments south of the Kennebec River were extirpated. However, the two Federal agencies proposed a rule to list a population complex in several Maine rivers containing remnant native populations as threatened. The proposed rule has been withdrawn in lieu of a conservation plan put forward by the State of Maine. The National Marine Fisheries Service now lists this population segment as a "species of concern" and is committed to improving the health of these stocks to make them viable populations with sustainable fisheries through its partnership in sup-

port of the Maine conservation plan. Shortnose sturgeons are listed as endangered, and a status review of Atlantic sturgeon is currently underway.

Management Controls

An issue of particular concern for striped bass is the potential impact of discard mortality. Recreational fishing effort for striped bass currently far exceeds commercial effort, and over 90% of the recreational catch was released alive during the 1990's. Even with high survival rates of hooked and released striped bass, the large number of fish subjected to hooking mortality may compromise the conservation benefit from high minimum-size regulations. Another concern as the striped bass population increases is the greater likelihood of striped bass bycatch in nondirected commercial fisheries. There is a desire by all interests not to negate the progress made in rebuilding the severely depleted spawning stocks in Chesapeake Bay.

LITERATURE CITED

- Northeast Fisheries Science Center. 1998a. Report of the 26th Northeast Regional Stock Assessment Workshop (26th SAW) Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. Northeast Fisheries Science Center Reference Document 98-03, Woods Hole, Massachusetts, 283 p.
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