Northeast Pelagic Fisheries

Unit 2

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INTRODUCTION

Northeast pelagic fisheries target small schooling species in the U.S. Exclusive Economic Zone, particularly Atlantic mackerel, Atlantic herring, bluefish, and butterfish.[1] The fisheries on these stocks are seasonal and reflect the migratory patterns and availability of these species. Generally, these species overwinter in relatively warm offshore waters of the Mid-Atlantic continental shelf and southward to avoid seasonal cooling of nearshore northern waters. This is followed by a northward and inshore migration during the spring and summer to feed and reproduce.

Various fishing gears including bottom trawls, midwater trawls, gillnets, and seines are employed to harvest pelagics in the Northeast Region. During 1995–97, total landings averaged 158,500 metric tons (t) (Table 2-1), 77% by the United States and 23% by Canada, including recreational landings (primarily bluefish and mackerel) of about 9,000 t. The ex-vessel value of the 1997 U.S. commercial landings was about $28 million. Recreational landings of bluefish and mackerel are also important in the Northeast Region. For example, over $300 million is spent annually by recreational anglers fishing for bluefish.

The two principal Northeast pelagics, Atlantic mackerel and Atlantic herring, were exploited heavily by distant-water fleets during the early 1970's. As a result, stock sizes and yields declined to very low levels by the late 1970's. Abundance has since increased due to low harvest rates and improved recruitment. Current stock sizes for these species are at historically high levels.

Northeast pelagic fisheries are managed under three fishery management plans, the first developed by the Mid-Atlantic Fishery Management Council, the second jointly by the Mid-Atlantic Council and the Atlantic States Marine Fisheries Commission, and the third by the New England Fishery Management Council in coordination with the Atlantic States Marine Fisheries Commission—the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan, the Atlantic Bluefish Fishery Management Plan, and the Atlantic Sea Herring Fishery Management Plan.

SPECIES AND STATUS

The Northeast pelagic fisheries are dominated by four species: Atlantic mackerel, Atlantic herring, bluefish, and butterfish. Three of these are considered to be underutilized (mackerel, herring, and butterfish), while bluefish is considered to be overutilized. The abundance of mackerel, herring, and butterfish is presently above average, while that of bluefish is below average.

The long-term population trends for mackerel and herring, as measured by research vessel survey data, have fluctuated considerably during the last 25 years (Figure 2-1). The combined abundance index for these two species reached minimal levels in the mid-to-late 1970's, reflecting pronounced declines for both and a collapse of the Georges Bank herring stock, but it climbed steadily because of the rebuilding of both species and reached a peak in 1994. The abundance of both species has remained at a high level in recent years and will be reassessed in 1999.

[1]Long- and short-finned squid are described in Unit 4 for taxonomic consistency.

Table 2-1
Productivity in metric tons and status of Northeast pelagic 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
Atlantic herring[2,4]	111,000	317,000	317,000	Under	Above
Atlantic mackerel[2,3,5]	33,500	383,000	326,000	Under	Above
Bluefish[3]	11,200	4,350	42,700	Over	Below
Butterfish	2,800	7,200	16,000	Under	Above
Total	158,500	711,550	701,700		
U.S. Subtotal	121,300	439,350	462,000		

[1]1995–97 average (including foreign and recreational landings).
[2]Includes significant foreign (Canadian) landings.
[3]Includes significant recreational landings.
[4]For herring, U.S. portion of RAY is 92,700 t (84% of total).
[5]For mackerel, U.S. portion of RAY is 14,600 t (44% of total).

Atlantic Mackerel

The Atlantic mackerel stock recovered during the 1980's, and the most recent stock assessment (Northeast Fisheries Science Center, 1996a,b) indicated that the spawning stock biomass was around 2 million t in 1994. Abundance indices from research vessel surveys have remained fairly stable in subsequent years suggesting that stock biomass has remained approximately at that level. In comparison, recent annual landings were about 33,500 t (Table 2-1), of which 57% was taken by Canada. Although the size of the mackerel stock is imprecisely known (because of low harvest rates, and abundance indices from bottom trawl surveys are not the most efficient method to index schooling species), mackerel landings could be increased severalfold without jeopardizing stock productivity. U.S. commercial landings of mackerel nearly doubled from 1995 (8,500 t) to 1996 (15,800 t) due to increased effort on mackerel because of improved world markets for mackerel and continued low abundance of traditional groundfish stocks. There are indications that growth and maturity rates of mackerel declined as stock size increased during the 1980's.

Atlantic Herring

The Atlantic herring stock complex in the Northeast Region is considered to be underutilized (Northeast Fisheries Science Center, 1996c,d). Total landings of herring were 118,900 t in 1997 (U.S. landings were 98,200 t), down slightly from 1996 and about 29% higher than in 1995. Recent average landings totaled 110,500 t (Table 2-1). The coastal stock complex consists of three major stock groups in U.S. waters: Gulf of Maine, Georges Bank, and Nantucket Shoals. Canadian catches off New Brunswick have also been included in the combined stock analysis since these fish mix with those from the other stocks during portions of the year. The Georges Bank herring stock had collapsed by 1976 after intensive exploitation by distant-water fleets during the 1960's and early 1970's. Although the stock complex is capable of supporting much higher levels of landings than presently taken, there is concern that the Gulf of Maine stock, from which the majority of the landings have recently been taken, may be fully exploited.

Bluefish

Bluefish landings peaked in 1981 at 51,400 t, but have declined to a recent annual average of only 11,200 t (Table 2-1). About two-thirds of the recent bluefish landings have been taken by recreational fishermen. The recent downward trend in recreational and commercial landings corresponds to a decline in stock biomass. Currently, the bluefish stock is overutilized and at a low level of abundance (Northeast Fisheries Science Center, 1997a,b).

Butterfish

The butterfish stock is considered to be underutilized based on current research survey results and historic landing patterns. Butterfish landings have declined significantly in recent years to less than 3,000 t/year, primarily due to reduced export demand. The stock is currently being fished well below its long-term potential yield (Table 2-1) and is considered to be above average in abundance based on research survey indices.

ISSUES

Scientific Advice and Adequacy of Stock Assessments

Although historical catch data (except perhaps for bluefish) are generally adequate for assessment purposes, stock assessments for the Northeast pelagic resources are relatively imprecise, owing to the highly variable trawl survey indices of abundance used for calibrating cohort analysis models, the short life-span of some stocks (butterfish), and current low exploitation rates of some species (mackerel and herring). The development of more precise assessments will require the use of hydroacoustic and midwater trawl surveys to estimate herring and mackerel abundance, and alternative types of sampling surveys to estimate bluefish abundance. A modest effort to improve stock assessments using these methods has begun.

Underutilized Species

All of the pelagic species, except bluefish, are considered to be underutilized. Total recent average yields (158,500 t) could be quadrupled and still not reach the aggregate long-term potential yield for the Northeast pelagics (477,700 t, Table 2-1). The aggregate current potential yield (477,550 t) is nearly five times the total recent average yields. Although current estimates of stock sizes for the principal pelagic stocks are relatively imprecise (see above), the foregone yields for mackerel and herring are substantial, and domestic harvests could be increased without jeopardizing the productivity of these stocks.

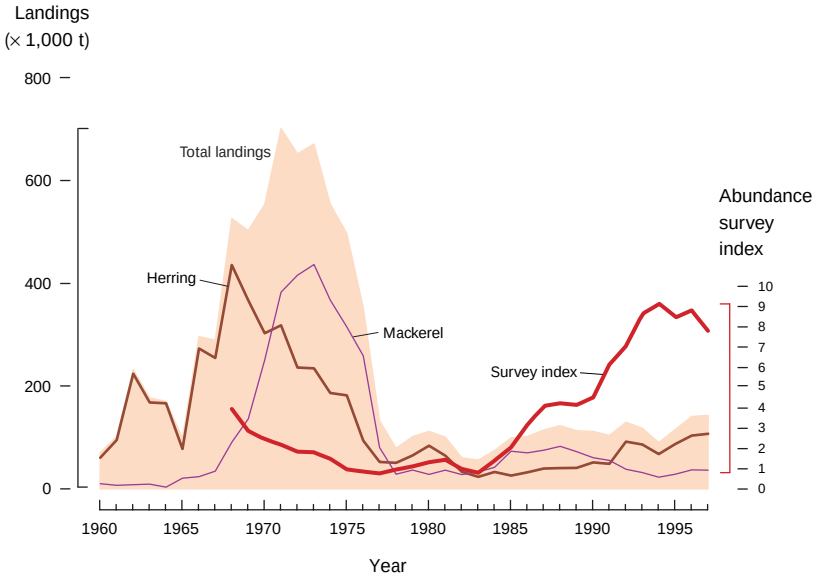

Figure 2-1
Landings in metric tons (t) and abundance index of principal pelagic stocks, 1960–97.

Bycatch and Multispecies Interactions

Concentrations of schooling fish such as the Northeast pelagics are utilized by a wide variety of predatory fish, marine mammals, and birds. In winter months, the fisheries directed for Atlantic mackerel and herring historically have taken some marine mammals, including pilot whales and common dolphins, as bycatch. An intensification of these fisheries to take advantage of these underutilized resources might result in greater marine mammal takes. Choosing the correct time and place for fisheries could keep these takes at minimal levels.

LITERATURE CITED

Northeast Fisheries Science Center. 1996a. Report of the 20th Northeast Regional Stock Assessment Workshop (20th SAW) Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. Northeast Fisheries Science Center Reference Document 95-18, Woods Hole, Massachusetts, 211 p.

Northeast Fisheries Science Center. 1996b. Report of the 20th Northeast Regional Stock Assessment Workshop (20th SAW) SAW Public Review Workshop. Northeast Fisheries Science Center Reference Document 95-19, Woods Hole, Massachusetts, 52 p.

Northeast Fisheries Science Center. 1996c. Report of the 21st Northeast Regional Stock Assessment Workshop (21st SAW) Stock Assessment Review Commit-

tee (SARC) Consensus Summary of Assessments. Northeast Fisheries Science Center Reference Document 96-05d, Woods Hole, Massachusetts, 200 p.

Northeast Fisheries Science Center. 1996d. Report of the 21st Northeast Regional Stock Assessment Workshop (21st SAW) Public Review Workshop. Northeast Fisheries Science Center Reference Document 96-05h, Woods Hole, Massachusetts, 50 p.

Northeast Fisheries Science Center. 1997a. Report of the 23rd Northeast Regional Stock Assessment Workshop (23rd SAW) Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. Northeast Fisheries Science Center Reference Document 97-05, Woods Hole, Massachusetts, 191 p.

Northeast Fisheries Science Center. 1997b. Report of the 23rd Northeast Regional Stock Assessment Workshop (23rd SAW) Public Review Workshop. Northeast Fisheries Science Center Reference Document 97-06, Woods Hole, Massachusetts, 40 p.