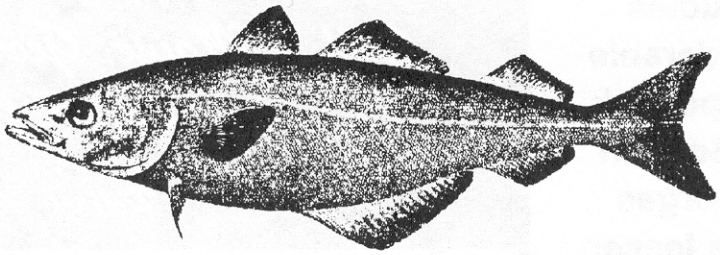
Pollock



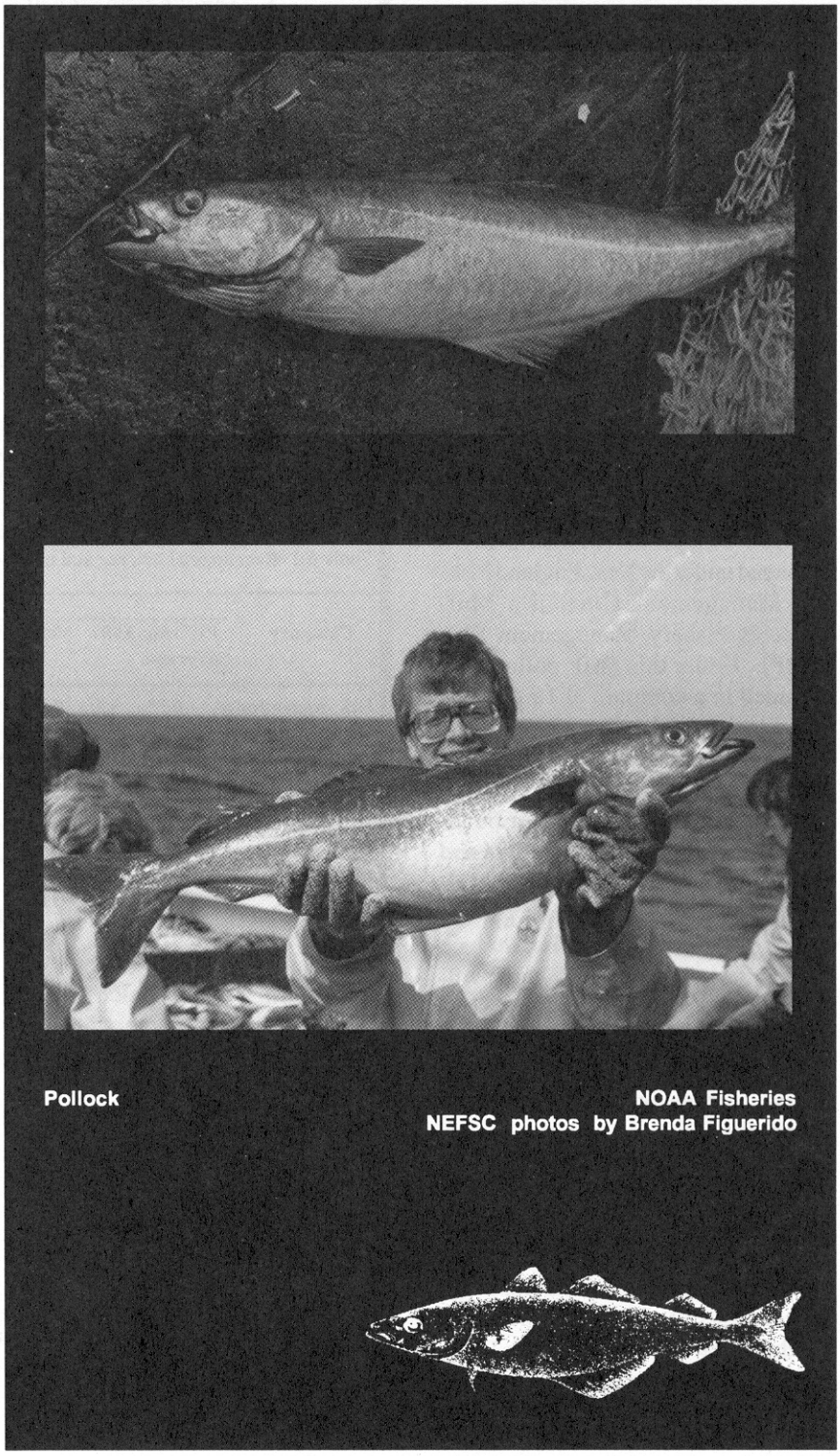
by R.K. Mayo

Pollock, *Pollachius virens*, occur on both sides of the North Atlantic; in the Northwest Atlantic, they are most abundant on the western Scotian Shelf and in the Gulf of Maine. One major spawning area exists in the western Gulf of Maine, and several areas have been identified on the Scotian Shelf. Tagging studies suggest considerable movement of pollock between the Scotian Shelf and Georges Bank and, to a lesser extent, between the Scotian Shelf and the Gulf of Maine. Electrophoretic analyses of pollock tissue samples from the Scotian shelf and western Gulf of Maine showed no significant differences between areas, although differences in some morphometric and meristic characteristics were significant. Accordingly, pollock from Cape Breton and south (Northwest Atlantic Fisheries Organization or NAFO Divs. 4VWX and Subarea 5) continue to be assessed as a unit stock by U.S. scientists.

Spawning occurs in winter. Sexual maturation is essentially complete by age 6, although more than 50% of fish are mature by age 3. Juvenile harbor pollock are common in inshore areas, but move offshore as they grow older. Pollock attain lengths up to 110 cm (43 in.) and weights of 16 kg (35 lb).

Traditionally, pollock were taken as bycatch in the demersal otter trawl fishery, but directed otter trawl effort increased steadily during the 1980s, peaking in 1986 and 1987. Directed effort by Canadian and U.S. trawlers has since declined substantially. Similar trends have also occurred in the U.S. winter gill net fishery.

Since 1984, the U.S. fishery has been restricted to areas of the Gulf of Maine and Georges Bank west of the



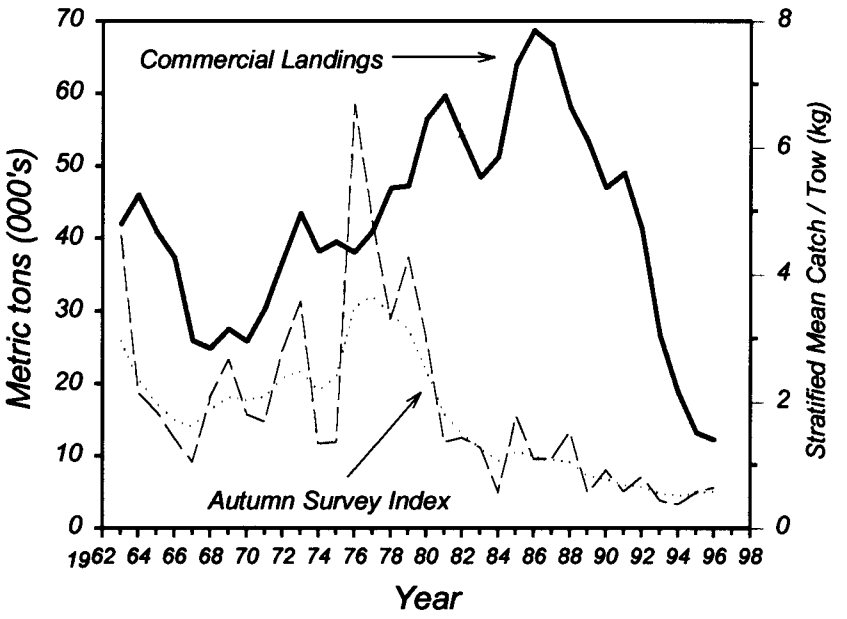
Pollock

NOAA Fisheries
NEFSC photos by Brenda Figuerido

"Tagging studies suggest considerable movement of pollock between the Scotian Shelf and Georges Bank, and, to a lesser extent, between the Scotian Shelf and the Gulf of Maine."

Gulf of Maine, Georges Bank, Scotian Shelf

Pollock



line delimiting the U.S. and Canadian fishery zones (NAFO Divs. 5Y and 5Z). The Canadian fishery occurs primarily on the Scotian Shelf (NAFO Divs. 4VWX) with some additional landings from Georges Bank east of the line delimiting the U.S. and Canadian fishery zones (NAFO Subdiv. 5Zc). This fishery has shifted westward over time, and the contribution to the total catch from larger, mobile gear vessels has steadily diminished since 1981.

The U.S. portion of the fishery is managed under the New England Fishery Management Council's Multispecies Fishery Management Plan (FMP). Under this FMP pollock are included in a complex of 10 groundfish species which have been managed by time/area closures, gear restrictions, minimum size limits, and, since 1994, direct effort controls including a moratorium on permits and days-at-sea restrictions under Amendments 5 and 7. The ultimate goal of the management program is to reduce fishing mortality to levels which will allow stocks within the complex to rebuild to above minimum spawning biomass thresholds. The Canadian fishery is managed under fleet-specific quotas.

The total nominal catch of pollock in 1996 was 12,300 mt, 54% less than in 1993 (26,800 mt). Most of the recent decrease has been due to sharp reductions in Canadian landings reflecting significantly reduced TACs for the Canadian fishery since 1993. United States commercial landings declined by 47% between 1993 and 1996 (from 5,700 mt to 3,000 mt).

Table 6.1 Recreational catches and commercial landings (thousand metric tons)

Category	Year										
	1977-86 Average	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
U.S. recreational	0.8[1]	0.1	0.2	0.4	0.1	0.1	<0.1	<0.1	0.2	0.3	0.0
Commercial											
United States	17.3	20.4	15.0	10.6	9.6	7.9	7.2	5.7	3.8	3.4	3.0
Canada	34.8	45.3	41.8	41.0	36.2	37.8	32.1	20.3	15.2	9.8	9.2
Other	0.7	0.8	1.3	1.8	1.3	3.3	2.1	0.8	0.0	0.1	0.1
Total nominal catch	53.6	66.6	58.3	53.8	47.2	49.1	41.4	26.8	19.2	13.6	12.3

[1] 1979-1986

Summary Status

Long-term potential catch	=	37,000 mt
SSB for long-term potential catch	=	122,000 mt
Importance of recreational fishery	=	Minor
Management	=	Multispecies FMP
Status of exploitation	=	Fully exploited
Age at 50% maturity	=	2.3 years, males 2.0 years, females
Size at 50% maturity	=	41.8 cm (16.5 in.), males 39.1 cm (15.4 in.), females
Assessment level	=	Age structured
Overfishing definition	=	20% MSP
Fishing mortality rate corresponding to overfishing definition	=	$F_{20\%} = 0.65$

M = 0.20 $F_{0.1}$ = 0.20 F_{med} = 0.47 F_{1996} = unknown

Estimated U.S. annual recreational catches have fluctuated between negligable levels and 1,300 mt since 1979. No information is available for the Canadian recreational harvest, although it appears to be of minor importance. The total nominal catch from the stock, including recreational, has been steadily declining since 1986; the 1996 total represents an 82% reduction from 1986.

Nominal commercial catches from the Scotian Shelf, Gulf of Maine, and Georges Bank region increased from an annual average of 38,200 mt during 1972-76 to 68,800 mt in 1986. Canadian landings increased steadily from 24,700 mt in 1977 to an annual average of 43,900 mt during 1985-87, while U.S. landings increased from an average of 9,700 mt during 1973-77 to more than 19,000 mt annually from 1985-1987, peaking at 24,500 mt in 1986. Landings by distant-water fleets declined from an annual average of 9,800 mt during 1970-73 to less than 1,100 mt per year during 1981-88. Distant-water fleet landings increased to 3,300 mt in 1991, but have since declined to negligible levels. Over time, most of the distant water fleet catch has been taken by the USSR/ Russian fleet on the Scotian Shelf.

Total stock size estimated from virtual population analysis (VPA) increased continuously throughout the 1970s and early 1980s, declined through the late 1980s, and has since increased slightly. Biomass indices for the Gulf of Maine-Georges Bank portion of the stock, derived from NEFSC autumn bottom trawl surveys, increased during the mid-1970s, declined sharply during the 1980s, and have remained relatively low since 1989. Indices derived from Canadian bottom trawl surveys conducted on the Scotian Shelf increased during the 1980s but declined sharply during the early 1990s. Commercial catch per unit effort (CPUE) indices for U.S. trawlers fishing predominantly in the Gulf of Maine increased during the late 1970s, but declined after 1983 and have remained consistently low since 1987 at less than one-half the 1977-1983 average. Canadian commercial catch per unit effort (CPUE) indices from the Scotian Shelf also increased during the late 1970s to mid-1980s, declined steadily between 1986 and 1994, and increased slightly in 1995 and 1996.

Spawning stock biomass increased from 90,000 mt in 1974 to more than 200,000 mt in 1985. After 1985, however, SSB declined by 39 percent, reaching a low of 122,000 mt in 1991. The increases in stock biomass during the 1970s and early 1980s resulted from recruitment and growth of several relatively strong year classes, notably those of 1971, 1975, and 1979. Recruitment conditions were favorable during this period, with moderate to strong year classes appearing every 3 to 4 years. Year classes produced between 1983 and 1986 were all average or below average, but the 1987 and 1988 year classes were well above the long-term mean. The most recent strong year class was produced in 1988 in the Gulf of Maine and in 1989 on the Scotian Shelf. These year classes were expected to recruit fully to the fishery in 1995 and 1996. The 1990 through 1992 year classes, however, appear to be well below average in size.

High landings during the mid-1980s and later years (in excess of 63,000 mt per year between 1985 and 1987) resulted in relatively high fishing mortality rates ranging from 0.62 (42% exploitation rate) to 0.85 (53% exploitation rate) during the late 1980s and early 1990s. Subsequent projections indicate a substantial reduction in fishing mortality in 1993 to about 0.3-0.4 due to the combined effect of reduced catch and effort in the Canadian sector, and continued recruitment of the 1988 and 1989 year classes. Further reductions in F occurred in 1995 and 1996. The 1991 and 1992 levels of F were well above $F_{0.1}$ (0.20, 17% exploitation rate), substantially greater than F_{med} (0.47, 34% exploitation rate) and slightly above $F_{20\%}$ (0.65, 44% exploitation rate) the level corresponding to the overfishing definition of 20% maximum spawning potential. On the Scotian shelf, F was reduced dramatically in 1995 and 1996 to well below $F_{0.1}$ due to sharp reductions in the Canadian TAC, and adult biomass has increased by about 50% since the early 1990s.

Over the full range of the stock, current fishing mortality appears to be in the range of $F_{0.1}$, and spawning biomass is increasing. Within the Gulf of Maine, however, stock abundance and biomass remain low. Overall the stock is considered fully exploited.

For further information

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