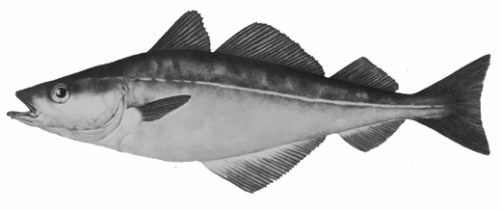

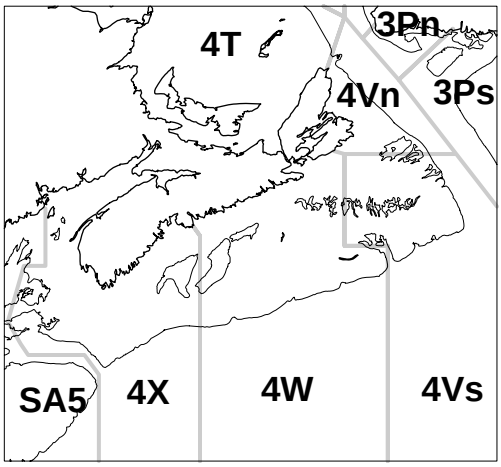

POLLOCK IN 4VWX5Zc

Background

Pollock in the western Atlantic range from southern Labrador south to about Cape Hatteras. The main fishable concentrations, however, occur in the Georges Bank, Gulf of Maine, and Scotian Shelf areas.

Young pollock are closely associated with nearshore habitats, recruiting to the offshore populations at around age 2. Based on observations by fishermen and acoustic studies, pollock spend the least time on the bottom of all the cod-like fish. Pollock show strong schooling behaviour. Food of adult pollock include euphausiids and fish such as herring, sand lance and silver hake.

Pollock are mature at ages 3 to 5 (corresponding lengths range from 46 to 57 cm), depending on the area. Pollock also show marked differences in growth rate by area, with fish in the Bay of Fundy area growing faster than those on the Eastern Scotian Shelf.

The management unit includes the Canadian portion of Georges Bank and the Gulf of Maine, and the Scotian Shelf. A variety of fishing gear are used to fish pollock, including primarily otter trawls, gillnets, handlines and longlines. Pollock are also landed as by-catch in the small-mesh silver hake fishery. The Canadian fishery is managed on the basis of a target exploitation rate of about 25% of the population.

The Fishery

Landings (thousand metric tons)

Year	70-79 Avg.	80-89 Avg.	1991	1992	1993	1994	1995	1996
TAC	-	-	43.0	43.0	21.0	24.0	14.5	10.0
Canada[1]	23.3	39.5	37.9	32.0	20.3	15.2	9.7	
TOTAL[1]	37.2	40.9	39.6	34.1	21.1	15.2	9.8	

[1] The management unit included NAFO Subarea 6 and divisions 5Y and 5Z prior to 1988. Starting with 1988, only the Canadian portions of divisions 5Y and 5Z were included in the landings.

The recent pollock fishery can be described as dynamic, with significant changes in area fished within the management unit and dominant gear type. During the 1980s, **landings** from Divs. 4VW accounted for about 30% of landings from the management unit. From 1993 to 1995, Div. 4VW landings have accounted for about 20% of total landings. The contribution of larger trawlers to total landings (TC 4+) has been steadily declining since 1981. In contrast, the contributions of TC 1-3 trawlers and fixed gear vessels (gillnet, longline) have been increasing over the same period.

Available from: Maritimes Regional Advisory Process, Department of Fisheries and Oceans, Box 1006, Stn B105, Dartmouth, Nova Scotia, Canada B2Y 4A2 Telephone: 902-426-8487. E-Mail: d_geddes@bionet.bio.dfo.ca

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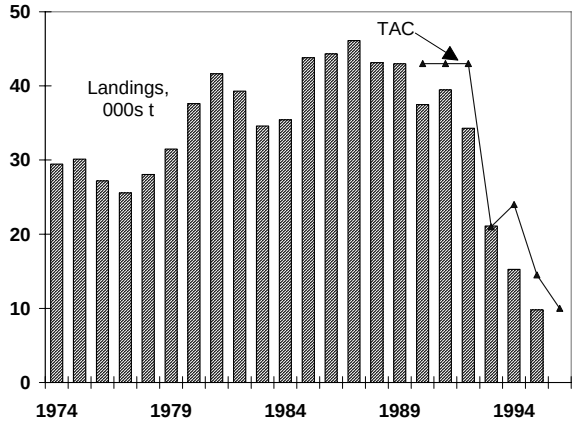
In 1995, landings declined to 9795 t, the lowest observed during the period 1960 to 1995. Most gear sectors (with the exception <45' gillnetters) did not land their quotas. In particular, vessels >100' caught only 37% of their quota. Fishermen note that shortfalls against quota reflect market and fishing strategies (such as "banking" pollock to allow continued fishing on cod and haddock), not a lack of abundance.



Landings in the small mesh silver hake fishery increased slightly to 58 t from 10 t in 1994.

The size composition of landings in 1995 included a more narrow range than 1994 for all gear sectors, with fewer larger fish in the catch. The catch at age reflected this, with ages 5 and 6 dominating, and few fish of ages 7,8 and 9 compared with 1994. Age 6 fish (the 1989 year-class) was considerably more abundant than in the average catch at age composition over the past ten years. Average weights at age from the fishery have been stable since 1987, although prior to that there were considerable declines for certain ages.

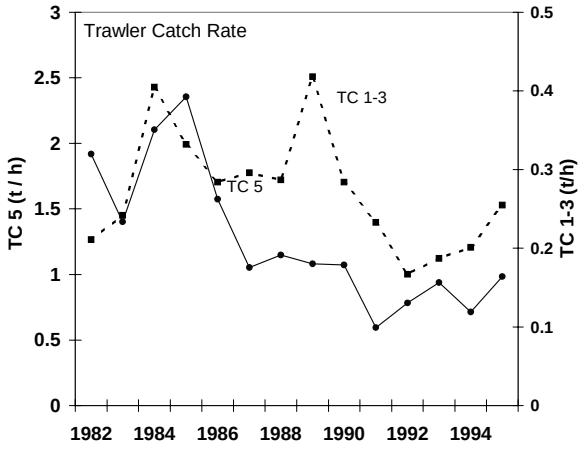
Reports from the fishery almost unanimously indicate that pollock have increased in abundance in the western half of the management unit over the past several years. However, reports from the eastern half of the management unit have not yet indicated any recovery of the resource.

Resource Status

The stock status evaluation was based on an analysis employing landings statistics, sampling for size and age composition of the commercial catch and trends in commercial fishery catch rate. Changes in the 1995 assessment included a revision of the 1989 and 1990 catch at age using an approach which better reflected differences in growth rate by season and area within the management unit, and further development of the commercial catch rate information.

The **stern trawler TC5 catch rates** from the Observer Program play an important part in this assessment. However, given the trend of diminishing contribution to total landings for this gear sector, development of an alternative index of abundance seemed advisable.

A standardized catch rate series was constructed using catch rate information from OTB TC 1-3 vessels in NAFO Div. 4X and Subarea 5. Vessels used in the series were those which had a history of involvement in the pollock fishery, and were selected in consultation with industry. The development of the catch rate series accounted for differences in catch rate by vessel tonnage class, mesh type, area, month and year.

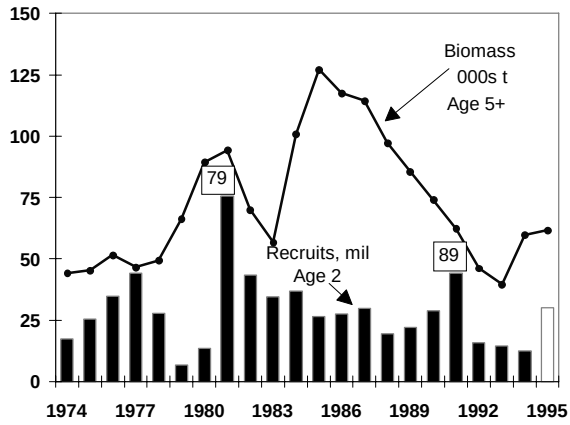


The two catch rate series show some concurrence, although the TC1-3 series shows

a greater increase in the 1992 to 1995 period. An obvious exception occurs in 1989, when TC 1-3 catch rates may have been influenced by unusual fishery practices that year, including an early fishery closure and the implementation of a combined quota for cod, haddock and pollock in Div. 4X. The catch rate series declined from 1985 to 1991, and have now started to recover. While the new catch rate series seemed to have promise, further work is required before it is included as an additional index of abundance.

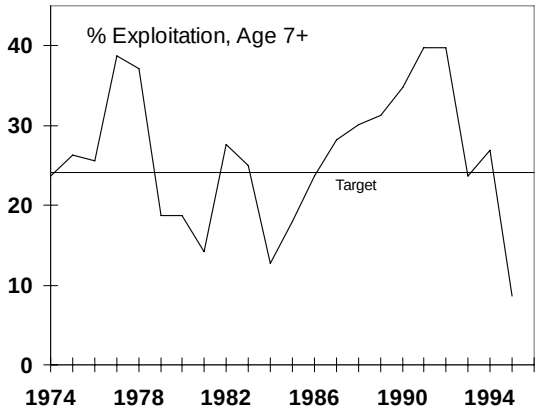
Research vessel survey data are not currently employed as an index of abundance in this assessment, as there is considerable unexplained interannual variation of many year-classes concurrently, which is inconsistent with our knowledge of fisheries dynamics. The distribution of sets which caught pollock during the 1995 research surveys was comparable to that seen over the past three surveys. However, in 1996, there were relatively few sets made on the eastern half of the Scotian Shelf that caught pollock. The length composition of the catch in 1995 had fewer fish larger than 55 cm compared with the average length composition from the surveys over the period 1985 to 1994.

Population abundance (age 5+) estimates indicate that biomass declined from 1985 to the lowest level in the series in 1993. 0Since then, total biomass has been increasing, due to the strong 1989 year-class recruiting to the fishery.



Recruitment after the strong 1979 year-class remained close to the long-term average of 28 million fish for nine years. The 1989 year-class is the second-largest year-class in the series. Subsequent year-classes appear to be lower than the long term average (shown as an open bar in the figure above).

The **exploitation rate** has been increasing since 1984 and reached a peak in 1992. The most recent value has declined to about 10%, due in large part to the low level of removals by the fishery in recent years.



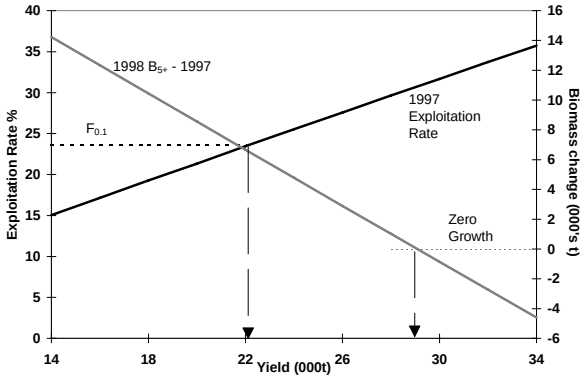
The current assessment presents a more positive interpretation of stock status than provided last year. The change can be attributed to the revisions in the catch at age, and a different approach to the population model which improved the estimates at younger ages and considered younger ages more fully recruited to the fishery. If the newly-developed TC 1-3 catch rate series was included in the model, an even more optimistic view of the resource would be obtained.

A retrospective analysis was completed for the new population model, to determine if addition of new data each year results in a change in estimates of year-class abundance. For pollock, there was general consistency of estimates of year-class abundance as additional data were added. For the most abundant year-class (1989) in the analysis, however, there was a tendency for more recent estimates to provide

a more conservative interpretation of year-class abundance.

Outlook

If the TAC of 10,000 t is taken in 1996, the resulting fully recruited fishing mortality will be about 0.14. The beginning of year age 5+ biomass will increase from 70,582 t in 1996 to 73,601 t in 1997. The $F_{0.1}$ catch in 1997 is 22,159 t, with about 33% contributed by the 1989 year-class. The implications of various rates of exploitation on biomass change and yield is shown below.



While the assessment reports a positive outlook, it should be noted that the assessment results appear unusually sensitive to changes in input data and how they are used to determine population size. Some of the more important potential sources of the uncertainty include the large management unit, the small catch weight accounted for by the TC5 catch rate index in recent years, and the schooling semi-pelagic nature of the resource which makes traditional approaches to groundfish stock assessment difficult.

For More Information

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References

Neilson, J., and P. Perley. 1996. The 1996 assessment of pollock (*Pollachius virens*) in NAFO Divisions 4VWX and Subdivision 5Zc. DFO Atl. Fish. Res. Doc. 96/100.