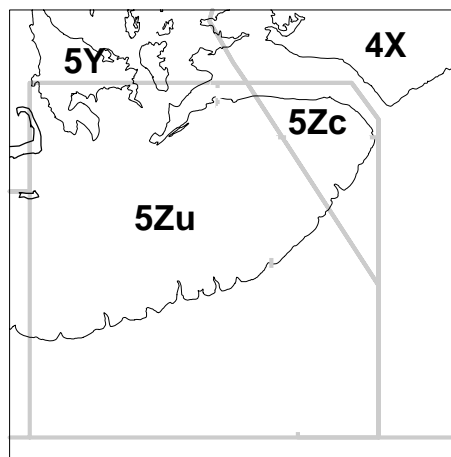


YELLOWTAIL FLOUNDER ON GEORGES BANK



Background

Yellowtail flounder (*Limanda ferruginea*) range from Labrador to Chesapeake Bay and are considered relatively sedentary. A major concentration of yellowtail occurs on Georges Bank to the east of the Great South Channel. While tagging work indicates limited movement from Georges Bank to adjacent areas, knowledge of seasonal movement of yellowtail flounder on Georges Bank is poor. Yellowtail are most commonly caught at depths between 37 and 73 meters (20 and 40 fathoms).

On Georges Bank, spawning occurs during the late spring period peaking in May. From the distribution of both ichthyoplankton and mature adults, it appears that spawning occurs on both sides of the international boundary. Yellowtail flounder are considered about 80% mature at age 2 and 100% mature at age 3.

The Canadian fishery is mainly pursued using otter trawl gear from vessels less than 65'. The trawls are specially equipped with small rollers and employ less headline flotation, giving a smaller vertical opening. The fishery occurs in a relatively limited portion of Georges Bank known as the Yellowtail Hole, and with current management restrictions, operates in the latter half of the year only.

The Fishery

Landings (thousand metric tons)

| Year | 70-79 Avg. | 80-89 Avg. | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---------------------|---------------|---------------|------|------|------|------|------------------|------------------|
| TAC | - | - | - | - | - | - | - | 0.4 |
| Canada ¹ | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 0.2 | 1.3 | 0.4 |
| Canada ² | - | - | - | - | - | 0.7 | 2.1 | 0.5 |
| USA | 12.0 | 5.2 | 2.7 | 1.8 | 2.8 | 2.1 | 1.5 ³ | 1.0 ³ |

¹ Canadian landings specified as yellowtail.

² Canadian yellowtail landings, plus prorated unspecified flounder (see text below)

³ Estimated values, provided by US NMFS

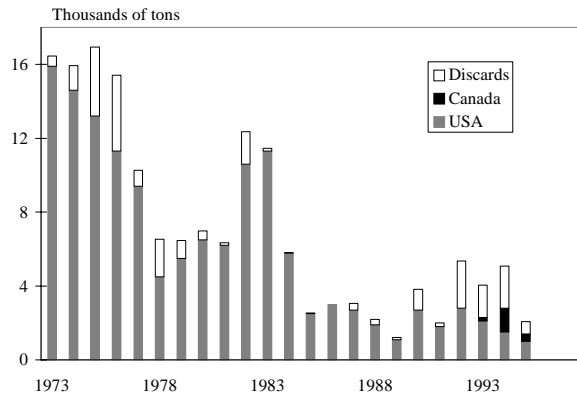
The directed Canadian fishery for yellowtail flounder is a relatively recent development, with significant landings first occurring after the introduction of specialized gear in 1993. Landings of unspecified flounder on Georges Bank can be substantial, and industry sources have indicated that most landings of unspecified flounders are yellowtail flounder. In consultation with industry, it was determined that the best indication of total landings of yellowtail flounder would be obtained by adding landings of known yellowtail plus a prorated amount of unspecified flounder (in proportion to the ratio of known yellowtail flounder:American plaice:winter flounder). Canadian landings peaked in 1994, with landings of 2,142 t. Under quota control for the first time in 1995, landings were 495 t against a quota of 400 t. There have also been reports of discarding in this fishery, but the extent is unknown.

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

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April 1996

US landings for 1994 and 1995 are estimates due to incomplete information regarding area of capture. Estimates are available for the amount of small yellowtail discarded in the USA fishery.



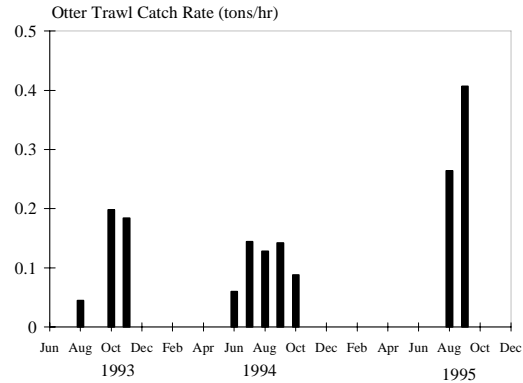
Few ages contribute to the Canadian landings, with ages 3 and 4 accounting for about 85-90% (by numbers) of the 1993-1995 landings.

Fishermen indicated that catch rates improved considerably in 1995 compared with 1994, increasing from 500-1000 lb/h to as much as 1500-2500 lb/h in some instances. They consider that this resource could sustain higher exploitation than was exerted in 1995.

Resource Status

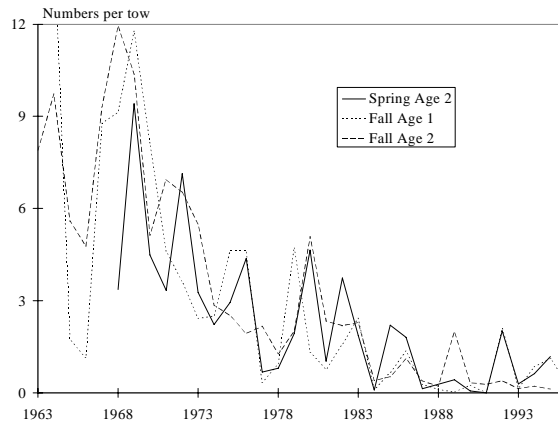
The stock status evaluation was based on an assessment using catch statistics from Canada and the USA, sampling for age and length composition of the USA fishery, sampling for length composition of the Canadian fishery (augmented by the age sampling from the USA fall survey) and trends in abundance from three bottom trawl surveys (USA spring and fall and Canadian spring). The USA catch statistics and sampling information for 1994 and 1995 were not available. The USA catch at age for these years was based on a projection using an approximate estimate of landings which was provided.

Canadian mobile gear **catch rates** were also examined for this resource. Consistent with reports from industry, the catch rates have increased significantly between 1994 and 1995. Factors other than abundance which may have caused such an increase were reviewed with industry. While catch rates may prove to be useful as an index of abundance, the time series is too short to be included directly in the assessment at present.

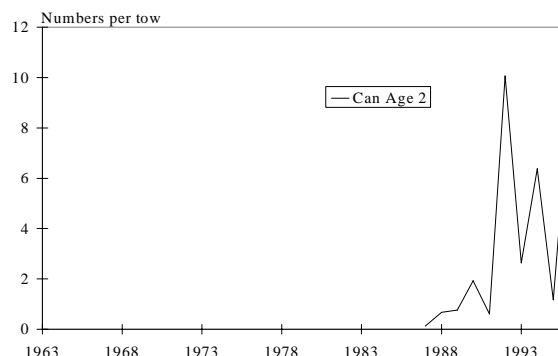


There are three **research surveys** conducted annually on Georges Bank. The age sampling from the USA spring survey was used to obtain abundance indices by age from the Canadian survey.

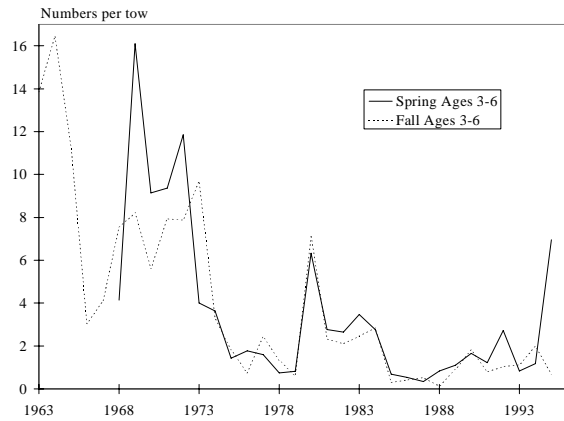
The mean number per tow at age 2 from the USA spring and fall surveys and at age 1 from the USA fall survey (lagged ahead 1 year) show a generally declining trend since 1963. There is some moderate increase in recent years but it is almost imperceptible compared to historical levels.



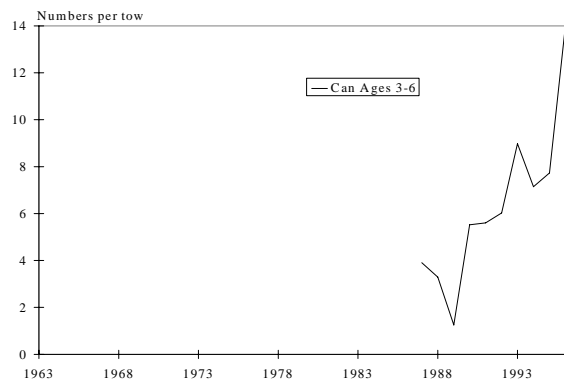
The trend for age 2 abundance from the Canadian survey also indicates some improved recruitment in recent years, but it lacks a historical perspective.



The mean number per tow at ages 3-6 declined to a low in the mid 1980s and has since tended to increase somewhat. The 1995 USA spring index shows a substantial increase over the previous year.

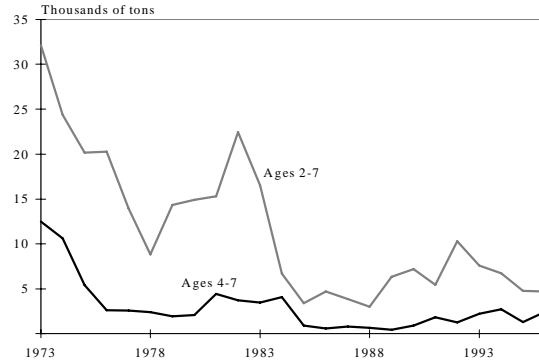


The Canadian survey results for ages 3-6 support the apparent increasing trend since the mid 1980s.

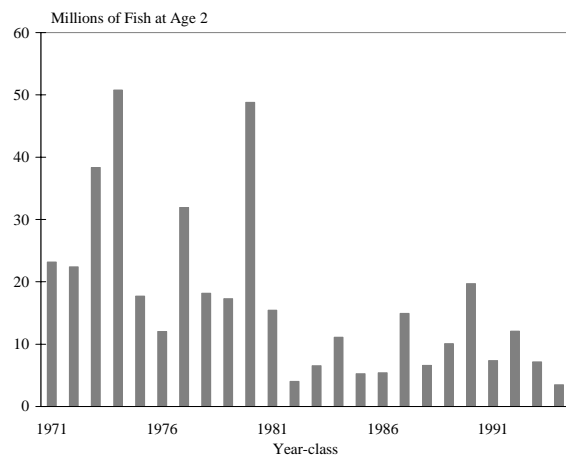


Due to lack of age information, the 1996 Canadian survey observations were not used formally in the analyses.

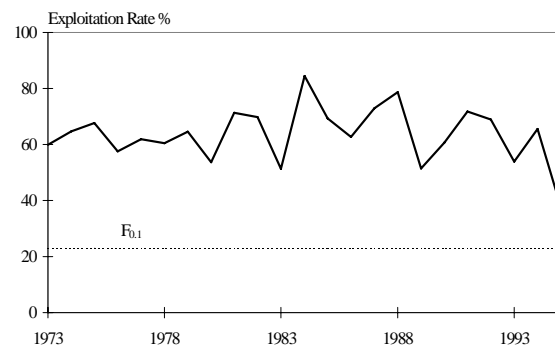
Population abundance estimates indicate that population biomass declined rapidly from 1973 to 1985 reaching the lowest observed level and has since only increased moderately.



Recruitment during the 1980s has been considerably poorer than that experienced during the 1970s. Only the 1987, 1990 and 1992 year-classes have been near average in the past decade.



The **exploitation rate** on ages 4 and older has been very high, often exceeding 60% since 1973. Since the mid 1980s, the exploitation rate shows a modest declining trend, reaching the lowest observed level of about 40% in 1995. The exploitation rate on age 3 is often as high and sometimes higher than that observed on ages 4 and older.



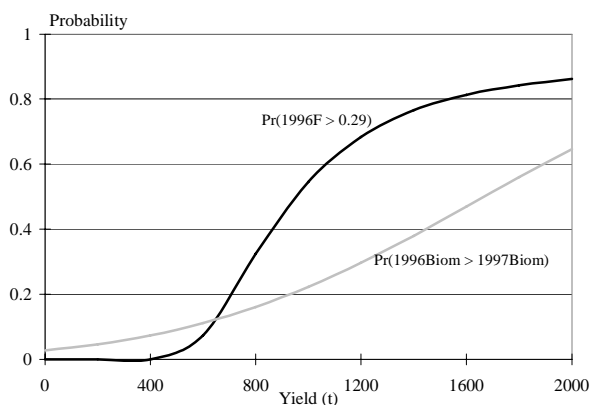
The assumptions regarding 1994 and 1995 USA catches, the low level of sampling for ages,

uncertainties about discarding by USA and species mis-reporting by Canada, potential for unaccounted differences in growth between males and females and poor fit of the data in relationships between indices and population abundance, suggest that these assessment results should only be considered as rough indicators.

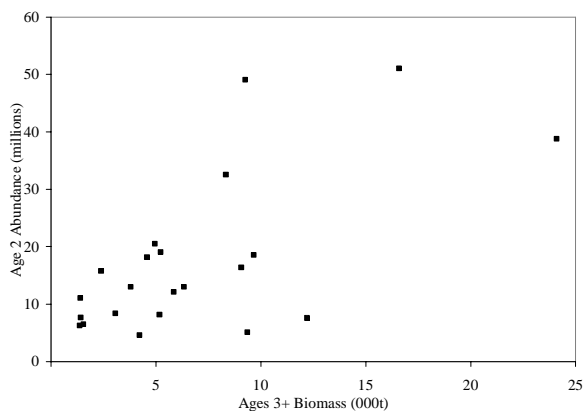
Outlook

Commercial catch rates and the most recent survey observations suggest that abundance increased between 1995 and 1996. The assessment results also reflect this trend but indicate that biomass is very low compared to historic levels. Recent recruitment has generally been poor and exploitation rates have greatly exceeded common reference levels. The truncated age structure suggests that a rebuilding strategy should be followed. Maintaining the 1996 Canadian catch at about the 1995 Canadian allocation of 400 t should, if the USA target TAC of 385 t is not exceeded, result in a fishing mortality rate in 1996 approximating the $F_{0.1} = 0.29$.

The uncertainty associated with model assumptions has been noted but the uncertainty arising from imprecision of the observed data is also considerable for this resource. To reduce the chances to less than 20% that the $F_{0.1}$ reference is not exceeded, the combined Canada and USA yield would have to be reduced to less than 700t. On the other hand, the chances are better than 50% that the biomass will increase in 1997 for yields up to about 1600t. For yields greater than 1600t, the 1997 biomass is more likely to decrease.



The apparent relationship between abundance at age 2 and beginning of year biomass for ages 3 and older suggests that recruitment could be improved by rebuilding the spawning biomass. High levels of recruits were only observed when the biomass exceeded about 8,000 tons.



Discarding of small yellowtail results in lost potential yield and contributes to the reduction of spawning biomass. Measures to avoid the capture of small yellowtail could considerably enhance the benefits from this fishery.

The reported quantity of unspecified flounder landings decreased in 1995, improving the quality of data. Further progress in this regard is strongly encouraged.

For More Information

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References

Gavaris, S., J.J. Hunt, J.D. Neilson, and F. Page. 1996. Assessment of Georges Bank yellowtail flounder. DFO Atl. Fish. Res. Doc. 96/22 .