

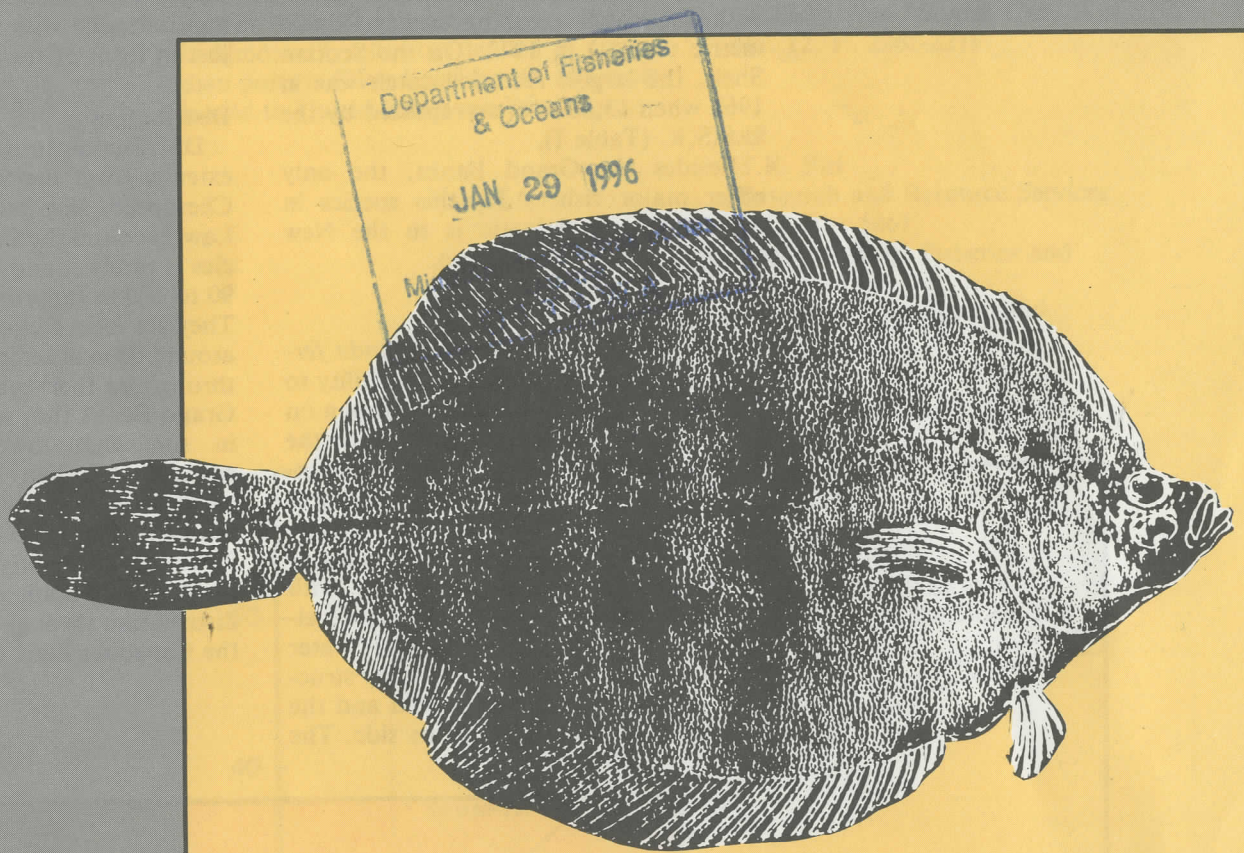
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UNDERWATER WORLD



Yellowtail Flounder



Fisheries
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Canada

Yellowtail Flounder

For eastern Canadian fishermen, yellowtail flounder became of significant importance in the late 1960s and early 1970s when a notable fishery developed on the Grand Banks. Since then, yellowtail flounder have become a substantial addition to the commercial fishery there.

Prior to 1966, landings of yellowtail by Canadian trawlers were minimal. However, in the mid 1960s, possibly because of the drastic reduction in the haddock stock, yellowtail increased in abundance, with the catch reaching nearly 40,000 metric tons (t) in 1972. On the Scotian Shelf, the largest recorded catch was in 1968 when 13,000 t were reported by the U.S.S.R. (Table 1).

Besides the Grand Banks, the only other major fishery for this species in the Northwest Atlantic is in the New England-Georges Bank area.

Description

The yellowtail flounder (*Limanda ferruginea*) has a remarkable adaptability to the colour of the bottom of the ocean on which it lies, and easily blends into the environment to become practically invisible. This is a trait shared with some other members of the flatfish family.

In the early larval form, it is indistinguishable from other bony fish with respect to its body shape, but as development proceeds in the upper water layers, a change occurs in the body structure. The head becomes twisted and the fish now lies and swims on its side. The

upper side, which now has both eyes, is pigmented, while the lower side lacks pigmentation. Adult yellowtail almost always have eyes on the right side of their bodies. Yellowtail have small mouths, and the mouth region is turned up to give the appearance of a "snout". The line running along the sides of the body (the lateral line) is distinctly arched just behind the gill openings (Fig. 1), and the tail is rounded. The upper side is usually brownish green, with many irregularly shaped rusty reddish spots, and white on the underside with yellowish colouration just in front of the tail fin.

Distribution

Distribution in the Northwest Atlantic extends from the Strait of Belle Isle to Chesapeake Bay including the Gulf of St. Lawrence and the Grand Banks. This species is rarely found in waters deeper than 90 to 100 m (approximately 50 fathoms). They are most frequently found at depths around 60 m at temperatures of 3° to 5°C throughout their range. However, on the Grand Banks they are frequently located in somewhat lower temperatures. In eastern Canadian waters, by far the largest abundance is on the Grand Banks, especially in NAFO Divs. 3N and 30 (Fig. 2). Except for relatively small populations on St. Pierre Bank and the Scotian Shelf, distribution throughout the remainder of the Canadian Zone is rather sparse.



Fig. 1
Yellowtail flounder (*Limanda ferruginea*).

Spawning

In the area of heaviest exploitation in Canadian waters on the Grand Banks, male yellowtail begin to mature around four years of age and females at about five. At this age, the fish are from 25 to 30 cm in length. In the New England area, yellowtail mature at a younger age. While no distinctive spawning localities have been documented in eastern Canadian waters, it appears that most spawning occurs on the southern half of the Grand Banks (Fig. 2).

Yellowtail produce large numbers of very small eggs. Thus, a 30- to 35-cm fish produces between 350,000 and 500,000 eggs and a 50- to 55-cm fish up to 4 million eggs. Although a very large number of eggs are released by the mature female fish, only a small percentage of these are fertilized and develop into larval fish. From those that are fertilized, only a relatively small percentage survive to become adult fish, since large numbers are destroyed by adverse environmental conditions and predation by other fish.

As with most marine groundfish (demersal), yellowtail spawn at or near the bottom and the fertilized eggs float to the surface layer where early embryonic development occurs. During this phase the larvae probably drift away from the spawning site, this movement resulting in larval loss when the developing fish try to settle beyond the continental shelf and cannot find a habitat in a suitable depth of water.

Age and Growth

The size that a yellowtail attains at any particular age probably depends on the environmental conditions, such as water temperatures during the early years. Food supply is the basic element, but the rate at which it is utilized depends on environmental factors. Differences in the size (length) at a particular age for Grand Banks and Scotian Shelf yellowtail are compared with those from New England-Georges Bank (NAFO Subarea 5) (Fig. 3). Thus, on the Grand Banks a four-year-old yellowtail is between 25 and 30 cm. This is the size at which they are taken by the commercial fishery.

In Canadian waters, yellowtail up to 12 years of age have been recorded, but on the Grand Banks, at least in recent years, yellowtail over the age of 10 years are rarely seen.

Food and Feeding

Because yellowtail have relatively small mouths, they are somewhat restricted in their choice of prey species; hence, their diet consists, to a large extent, of small crustaceans and marine worms that live at or in the ocean floor.

Year	Divisions 3LNO Catch	Divisions 4WVX Catch	Subareas 5&6 Catch
1965	3	6	41
1966	7	5	34
1967	9	5	33
1968	13	13	39
1969	16	4	58
1970	26	4	39
1971	37	2	31
1972	39	2	39
1973	33	2	31
1974	24	1	25
1975	23	2	20
1976	8	1	17
1977	12	1	17
1978	15	3	11
1979	19	2	16
1980	12	3	19

Table 1.
Catches of yellowtail in the Northwest Atlantic from 1965 to 1980 in thousands of metric tons.

Fisheries Management

There are two stocks recognized in Canadian waters for management purposes; the Grand Banks stock (NAFO Divs. 3LNO) and the Scotian Shelf stock (NAFO Divs. 4VWX). However, the latter stock is managed in combination with the other flatfish species in this area, such as American plaice and witch flounder. There is, of course, an important stock in the United States zone (NAFO Subareas 5 and 6).

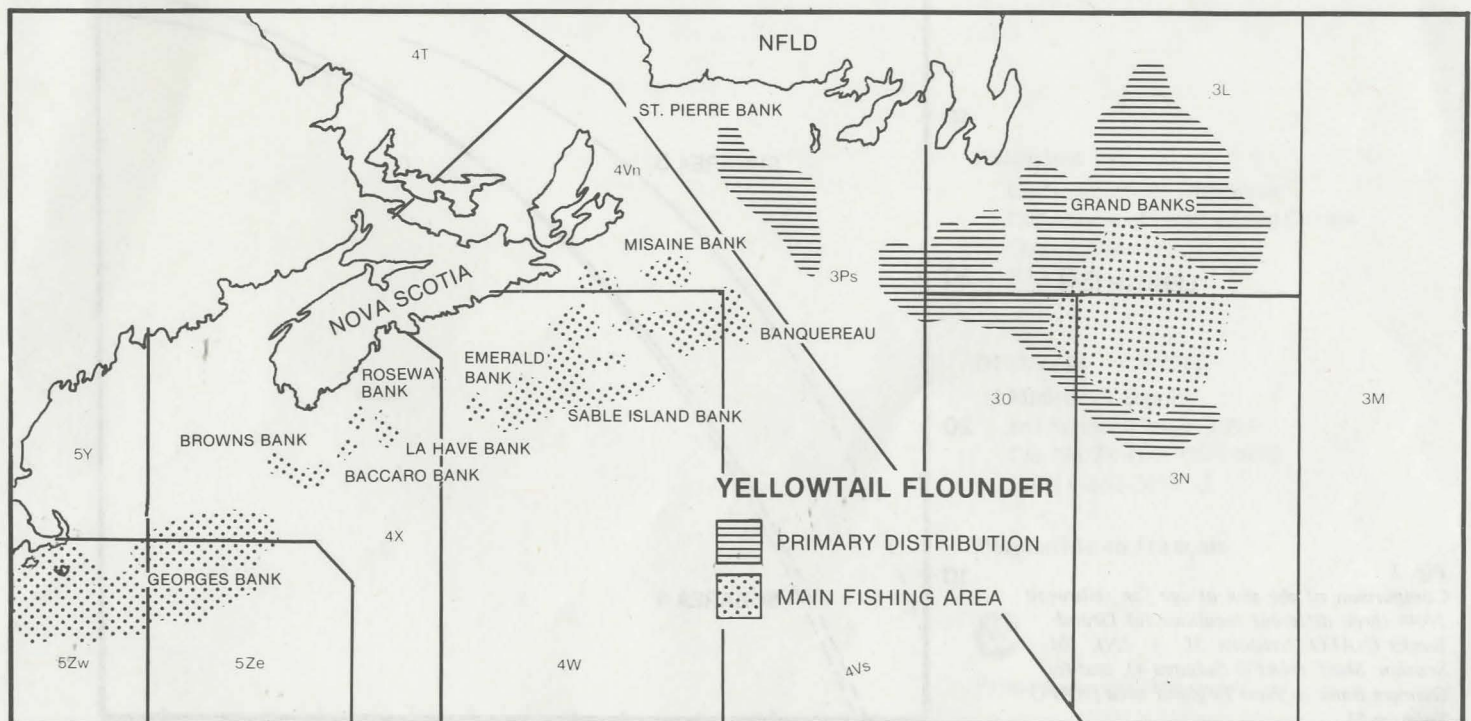
As with most fish stocks, an assessment is carried out annually to determine the amount of fish that can be caught each year by the commercial fishery — the total allowable catch (TAC). In recommending this level biologists determine, as far as possible, the level of fishing that will allow the stock to remain at a size that will sustain itself on a continuing basis. Consideration is also given to maintaining the stock at a size that will produce an economically viable catch for each unit of fishing effort.

The fishery for yellowtail on the Grand Banks came under quota management in 1973 with a TAC of 50,000 t. This was not based on a proper stock assessment and was subsequently lowered to 40,000 t in 1974 and 35,000 t in 1975. In 1976, because of apparently poor recruitment,

the TAC was drastically reduced to 9,000 t. Since then the TAC has gradually increased and was 18,000 t in 1980. On the Scotian Shelf (Divs. 4V, W and X), yellowtail are managed in combination with plaice and witch. In Subareas 5 and 6 in the American economic fishing zone, yellowtail has been a relatively important fishery and dates back to at least the early 1940s. This fishery has been under catch quota limitation since the early 1970s.

The difficulty in predicting the appropriate removal level for yellowtail on the Grand Banks and Scotian Shelf is the fact that only a few age groups — ages five to eight — make up the bulk of the catch. Yellowtail are first caught at four years of age. Unfortunately, up to now, there has been great difficulty in determining the relative abundance of the young fish entering the fishery. Stock assessments are done a full year in advance. For example, the amount of fish that can be caught in 1980 is calculated in the spring of 1979. If there are no good estimates available of the number of four-year-olds in 1979, only an estimate can be made of the stock size of these fish in 1980. Hence, the predicted value could contain errors from this source alone.

Fig. 2
Locations of primary distribution and main fishing localities



The Fishery

The fishery for yellowtail in the Canadian economic zone is almost entirely by the Canadian otter trawler fleet, with relatively small quantities being taken by St. Pierre and Miquelon trawlers.

While landings of this species are not especially high, they are important to the Newfoundland-based trawler fleet. Yellowtail are fished in conjunction with American plaice and a proportion of the yellowtail catch is taken by trawlers fishing for American plaice.

Almost all yellowtail landed in Canadian ports is filleted and frozen and most is sold to United States markets.

Further Reading:

- Leim, A.H., and W.B. Scott. 1966. *Fishes of the Atlantic coast of Canada*. Fisheries Research Board of Canada Bulletin No. 155.
- Pinhorn, A.T. 1976. (ed.) *Living marine resources of Newfoundland-Labrador, status and potential*. Fish. Res. Board Can. Bulletin No. 194.
- Pitt, T.K. 1970. "Distribution, abundance, and spawning of yellowtail flounder, *Limanda ferruginea*, in the Newfoundland area of the Northwest Atlantic." *J. Fish. Res. Board Can.* Vol. 27, No. 12, P. 2261-2271.

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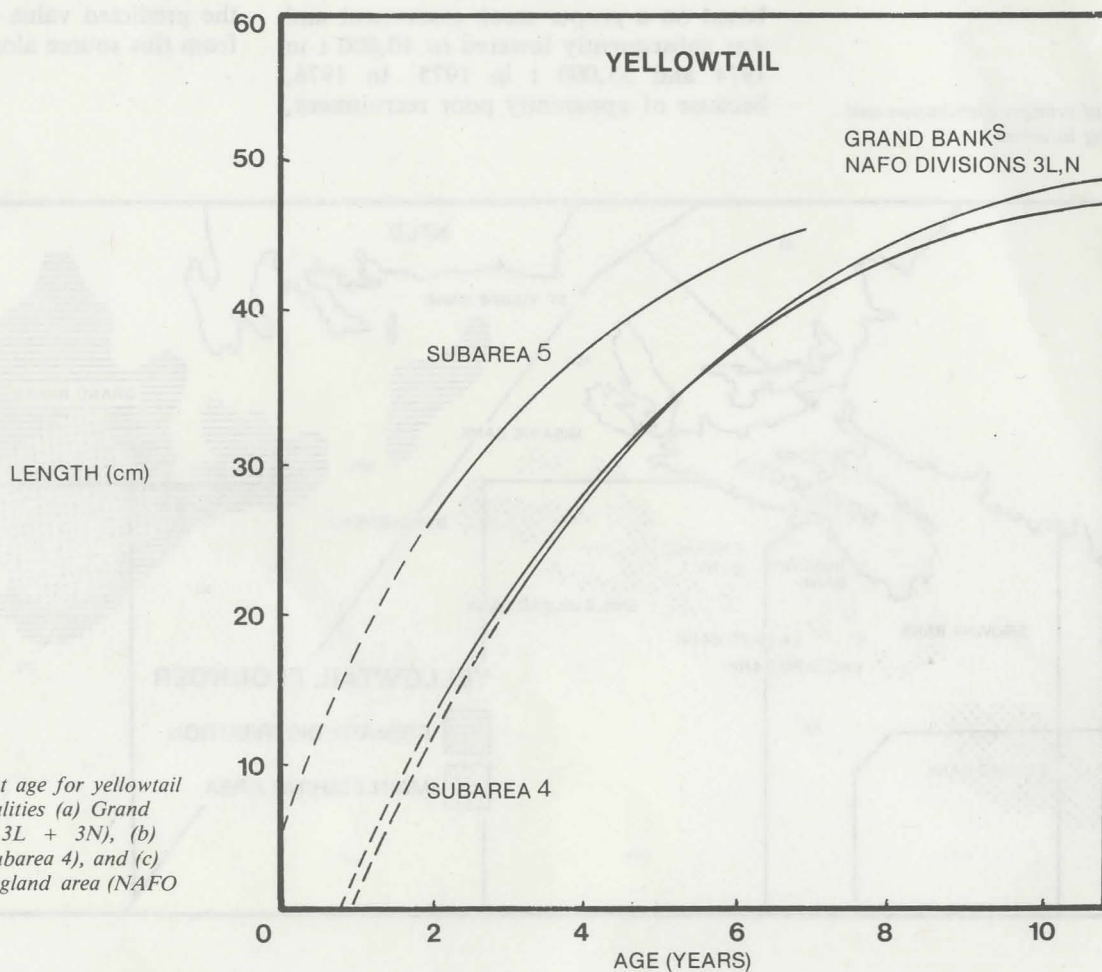


Fig. 3
Comparison of the size at age for yellowtail from three different localities (a) Grand Banks (NAFO Divisions 3L + 3N), (b) Scotian Shelf (NAFO Subarea 4), and (c) Georges Bank — New England area (NAFO Subarea 5).

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