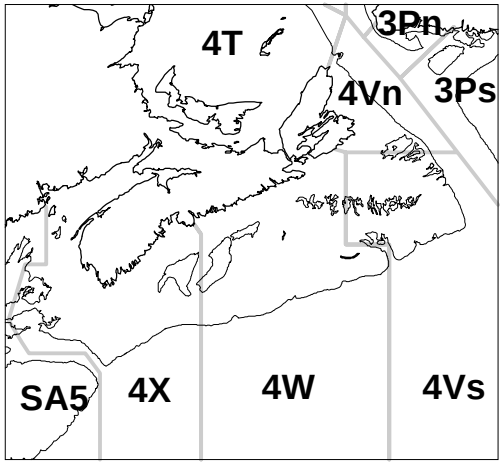
Witch Flounder In Div. 4VWX



Background

Witch flounder occur in the Northwest Atlantic from off southern Labrador to Cape Hatteras, usually at 50 - 300 m in water of 2 to 6^0 C but they have been recorded between 18 and 1570 m and at -1 to 11^0 C. They occur most commonly in deep holes and channels and along the shelf slope on muddy bottom. There is no evidence that witch undertake extensive migrations but there are seasonal changes in concentration associated with spawning. The spawning period is protracted, and on the Scotian Shelf is thought to occur from May to October with a peak in July-August. The post-larval, pelagic phase is unusually long, lasting up to one year, and it is thought that the first few years of demersal life are spent in much deeper water than the adults. Food consists primarily of worms supplemented by other benthic invertebrates such as small crustaceans and bivalve molluscs. Witch is a long-lived, slow-growing species; a maximum age of about 30 yr. and a maximum size of 78 cm (weight of about 5 kg) have been recorded.

Stock structure of witch flounder is not known and Div. 4VWX is a management unit based on administrative, rather than biological considerations. There is a continuity in distribution of witch between Div. 4V and Div. 4RST and Div. 3P that suggests some affinities between these populations. Similarly, concentrations of witch in western Div. 4X are continuous with those in the rest of the Gulf of Maine.

The Fishery

(Landings in thousands of tonnes)

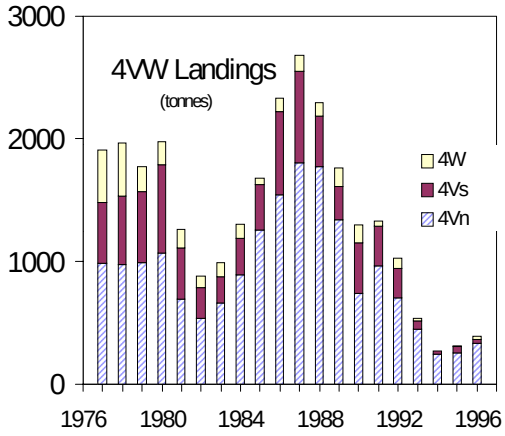
Year	77-81 Avg.	82-91 Avg.	1992	1993	1994	1995	1996
Canada	2.1	1.8	1.9	0.9	0.7	0.6	0.8
Foreign		+**	0.1	+	+	+	+
Total	2.0	1.9	1.9	0.9	0.7	0.6	0.8

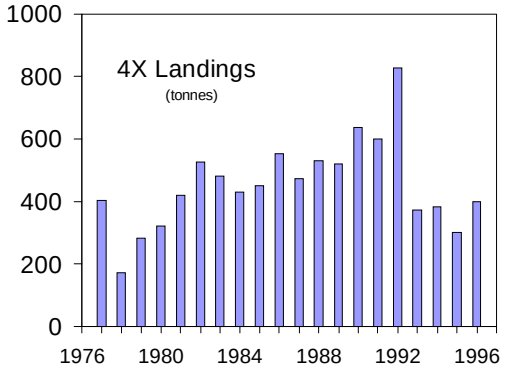
\+ values less than 50 tonnes
** 1987 to 1991

Witch flounder on the Scotian Shelf came under catch quota as one of three species regulated under a general flatfish Total Allowable Catch (TAC) established by ICNAF. This multi-species TAC (for witch flounder, American plaice and yellowtail flounder) was necessitated by the failure of the various national statistical agencies to report catch statistics separately for these species, much of the catch being recorded as unspecified flounder. Catches of Scotian Shelf flatfish continue to be regulated under a multi-species TAC but, from 1994, this TAC has been partitioned between Div. 4VW and Div. 4X and winter flounder has

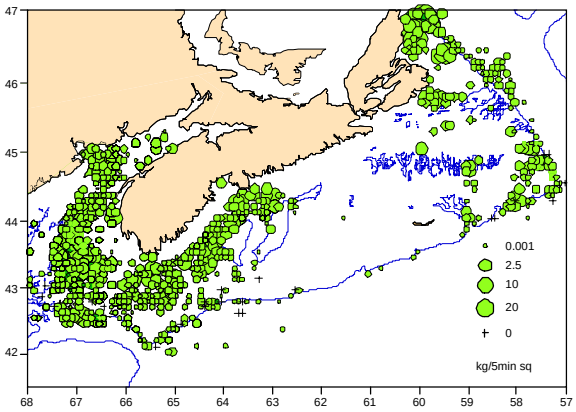
been added to the species covered under the Div. 4X portion.

Canadian fishery statistics continue to show a substantial portion of flatfish **landings** from Div. 4VWX as unspecified flounders. Much of this problem stems from the fact that there is no difference in price paid for plaice, yellowtail and winter flounder. However, there has historically been a higher price paid for witch flounder, and this practice continues today, providing an incentive for witch landings to be separated out by fishermen and recorded separately in the statistical system. Consultations with fishermen and within DFO confirm that, as a result of this price differential, recorded witch landings do not share the reporting problems that prevail for other flounder species.





Canadian landings of witch flounder from Div. 4VWX varied between 1400 and 2300 t in 1977-85 but increased to about 3000 t in 1986-88 before dropping to 600-800 t in 1994-96. Prior to 1994, the majority of the catch came from Div. 4VW, and most of that came from Subdiv. 4Vn and were contiguous with those in the Laurentian Channel. Div. 4X catches were mainly in the range of 400-500 t until 1990-92 when they rose to 600-800 t, falling subsequently to 300-400 t. Small boats less than 150 grt (tonnage classes 1-3) accounted for almost all of the landings of witch after 1992, otter trawlers being the predominant gear type in Div. 4X and Scottish and Danish seiners predominating in Subdiv. 4Vn. In Div. 4X, catches came mainly from two locations: north and west of LaHave Basin and in the Gulf of Maine. There was not a complete separation of these fishing locations as there were also some catches in the deep water north of Browns Bank.



4VWX Witch Flounder Catch for 1996

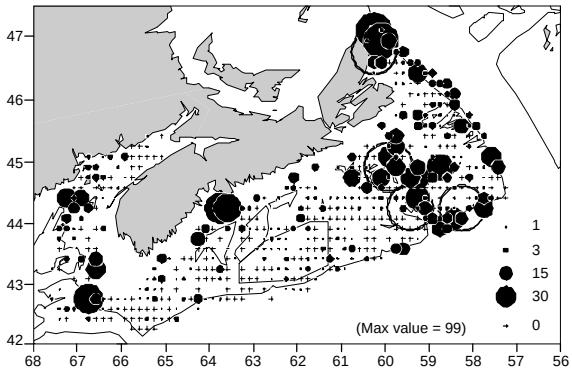
Catch rates (from logbooks) in the Subdiv. 4Vn seine fishery for witch declined from the early 1990s to 1993-94 but showed an increase subsequently to early 1990s levels. Catch rates of trawlers in eastern and western Div. 4X decreased from 1991-92 to 1995-96. Note: a number of factors affect commercial fishing success and thus changes in catch rates cannot necessarily be interpreted as reflecting changes

in resource abundance.

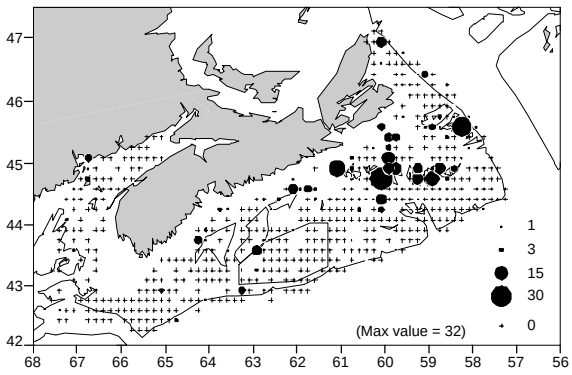
Foreign witch flounder catches in Div. 4VWX in 1987-97 were minor (3-64 t) and were taken almost exclusively as bycatch in the small mesh silver hake fishery, primarily in Div. 4W.

Resource Status

Research vessel surveys in Div. 4VWX show witch distributed throughout the area, mainly in water deeper than 50 fm. The primary concentration occurred in Sydney Bight (Subdiv. 4Vn) extending south (into Subdiv. 4Vs) along the slope of the Laurentian Channel. There were concentrations also in the holes north of Banquereau Bank, in the Gully, north of Emerald and LaHave basins, and in the approaches to the Bay of Fundy. There was a notable scarcity of records from the Emerald and LaHave basins themselves and from the outer slopes of the banks from Sable to Browns, which is the area of warmest bottom temperatures on the Scotian Shelf.

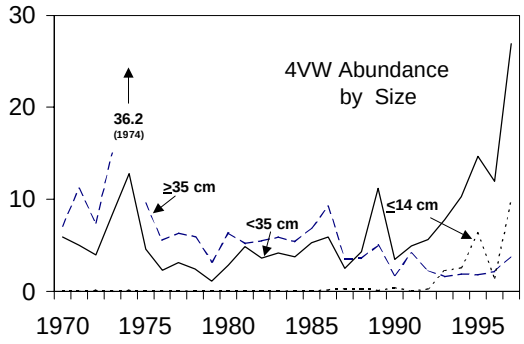


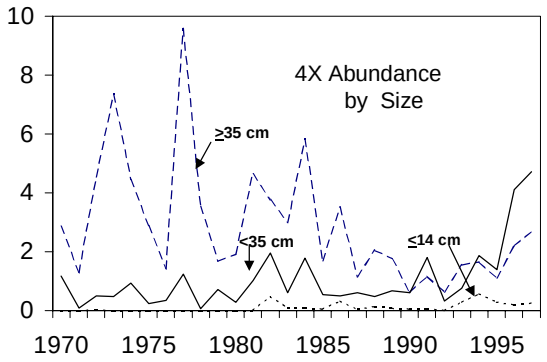
Numbers per std tow of Witch Flounder greater than 14 cm for 1993–1997



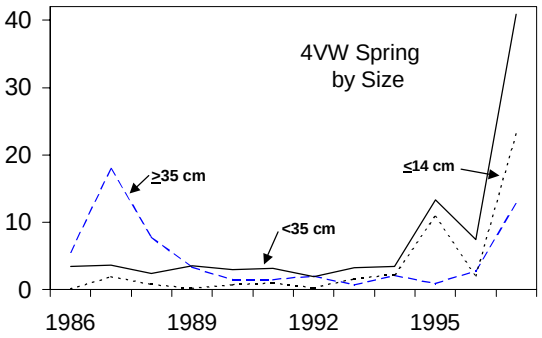
Numbers per std tow of Witch Flounder 14 cm and under for 1993–1997

Abundance estimates from research vessel surveys, when separated into fish greater than and less than 35 cm, provide estimates of trends in the fished portion of the population and of recruitment, respectively. In summer surveys, the fished part of the population was fairly stable in abundance in the mid-1980s but declined in the late 1980s and early 1990s to lows in 1992-93 in both Div. 4VW and Div. 4X. There was an increase in pre-recruit abundance in both areas after 1992 and, in both cases, pre-recruit abundance is presently the highest in the 28-year time series.





The index of small witch less than or equal to 14 cm, which are probably 2 year olds, form a substantial part of the pre-recruit index. Spring surveys show essentially the same trends.



Outlook

Witch flounder populations in both Div. 4VW and Div. 4X declined substantially in abundance between the mid-1980s and the mid-1990s and the fished part of the population is at about the lowest level observed. There are, however, a number of strong year-classes in the population, spawned in the early 1990s, that have not yet reached fishable sizes. The distribution of these pre-recruits is strongly localized, occurring predominantly in the Gully and in the deep holes to the north of Banquereau in Div. 4VsW. It is not known to what extent this recruitment will contribute to the populations presently being fished in Subdiv. 4Vn and in Div. 4X. In any case, witch year-classes can be expected to progressively contribute to the fishery over a substantial number of years beginning at about age 6. Any concentration of fishing on recruiting age groups at this time would be detrimental to potential future yields, as well as result in the opportunity being missed to rebuild the population of commercial-sized fish.

Given the multi-species character of the flatfish TAC, there is substantial opportunity to direct increased effort towards witch flounder which would be undesirable under present circumstances. Furthermore, the present flatfish TAC has not been limiting on catches from the species complex as a whole. Thus, the proportion of flatfish landings attributable to witch flounder should be maintained close to the status quo. The statistical problems created by the assignment of flatfish landings to the unspecified category do not apply to witch flounder, therefore the opportunity exists to monitor and control the level of witch landings separately.

There is an area of relatively low abundance of witch in the central Scotian Shelf which separates areas of higher witch abundance in Div. 4VW and Div. 4X. Thus the subdivision of the management unit Div. 4VWX into Div. 4VW and Div. 4X is an appropriate one, allowing exploitation to be controlled for each area of higher population abundance separately. However, it seems unlikely that either of these management units encompasses a self-propagating stock; there are likely important links to witch populations to the north and east in the case of Div. 4VW and to the west and south in the case of Div. 4X. Stock structure, and its relationship to present management units, requires investigation.

For More Information

Contact:

Jeff McRuer
Marine Fish Division
Bedford Institute of Oceanography
P.O. Box 1006, Dartmouth
Nova Scotia, B2Y 4A2

TEL: (902) 426-3585
FAX: (902) 426-1506
E-Mail: McRuerJ@mar.dfo-mpo.gc.ca

Reference

McRuer, J., R.G. Halliday, R.M. Branton, M.A. Showell, and R. Mohn. 1997. Status of witch flounder in Div 4VWX in 1997. DFO Canadian Stock Assessment Secretariat Res. Doc. 97/106.

This report is available from the:

Maritimes Regional Advisory Process
Department of Fisheries and Oceans
P.O. Box 1006, Stn. B105
Dartmouth, Nova Scotia
Canada B2Y 4A2
Phone number: 902-426-7070
e-mail address: MyraV@mar.dfo-mpo.gc.ca

Internet address: http://csas.meds.dfo.ca

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