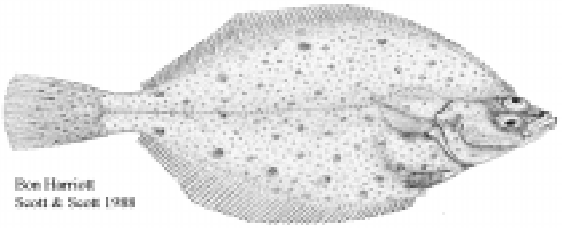


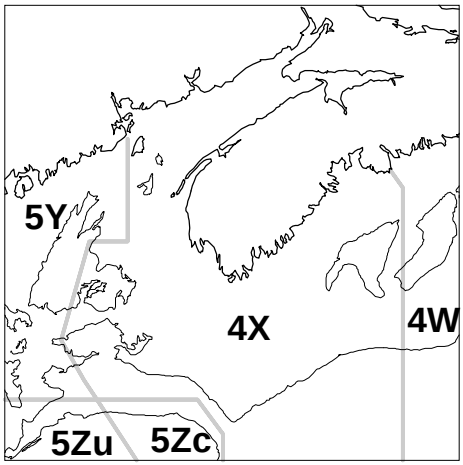
Southwest Nova Winter Flounder, American Plaice And Yellowtail Flounder

Background

Flatfish are bottom dwelling fishes primarily associated with soft substrate (mud and sand bottom). They are unique among other fish in being asymmetrical, both eyes lying on one side of the highly flattened body. Early in life they start swimming on one side, and the eye on the underside migrates to the upper side. Flatfishes lie on the bottom on the blind side. Principal food items include crustaceans, molluscs, polychaete worms and small fishes.

Prior to 1994, yellowtail flounder, witch flounder and American plaice were managed as one stock complex (4VWX); winter flounder was excluded from management considerations. In 1994, the management area was divided into an eastern (4VW) and western (4X) component, winter flounder was included, and the overall Total Allowable Catch (TAC) partitioned between the two areas based on catch history. The flounder fishery in 4X was placed under the Individual Transferable Quotas (ITQ) program in August 1994. The 1996 and 1997 management plans set the 4VWX flatfish TACs at 6,875t and 6,000t respectively, with 3,375t and 3,000t being allocated to the 4X fishery.

Management of the four species together under one TAC reflected the fact that it has been impossible to obtain reliable statistics on landings separated by species. The reported witch flounder landings are generally considered to be reliable, due to the higher price paid for this species. But the unreliability of the catch data for the other three species, coupled with the reports from the fishing industry of serious mis-reporting of other species as flatfish prior to 1991 eliminates the value of that information in determining resource exploitation. Initiation of ITQ logs and dockside monitoring of landings has had limited success in separating catch to individual species because landings were not separated at weighout or were misidentified by the weighmaster. It was decided to consider witch flounder separately from the other three species in 1997. The bulk of landings in 4X of these three species is made up of winter flounder; plaice and yellowtail make a relatively small contribution to the fishery.

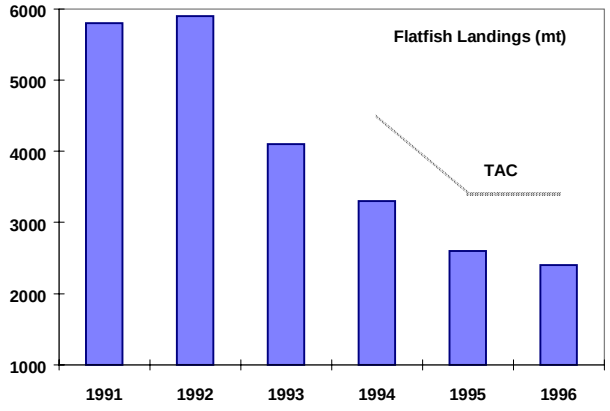


The Fishery

Canadian landings (thousands of tonnes)

Year	80-89 Avg.	1990-1991	1992	1993	1994	1995	1996	1997
TAC*					4.5	3.4	3.4	3.0
Flatfish**	3.7	5.2	5.1	3.7	2.9	2.3	2.0	
Witch	.5	.6	.8	.4	.4	.3	.4	
TOTAL	4.2	5.8	5.9	4.1	3.3	2.6	2.4	

* - 4X flatfish TAC includes witch flounder.
** - Winter flounder, yellowtail flounder, American plaice and unidentified flatfish



Total landings for flatfish in 4X in 1996 was 2,453t, a slight decrease from the 2,563t reported for the 1994 fishery. Over 95% of the catch was taken by tonnage class 1-3 otter trawlers; tonnage class 2 trawlers were the

Canada

dominant component of the fishery, taking over 50% of the catch. Excluding witch flounder, and assuming all 'unspecified flounder' landings were either winter flounder, yellowtail flounder or American plaice, the landings for that complex of species was 2,049t. Given the higher price paid for witch flounder, this is not an unreasonable assumption. 'Unspecified flounder' made up 44% of the reported landings, a slight decrease from that reported for the 1995 fishery. In 1996, the commercial fishery took winter flounder in a broad band from Browns Bank to the head of the Bay of Fundy, but little to the east of Browns, similar to that observed in 1994 and 1995. Catches to mid-summer, 1997, appeared to cover a similar geographic range. Reported landings specified as American plaice and yellowtail catches were low in 1996 and 1997 as in the past several years. They were concentrated off south-western Nova Scotia with limited catches in the Bay of Fundy or in the eastern part of 4X.

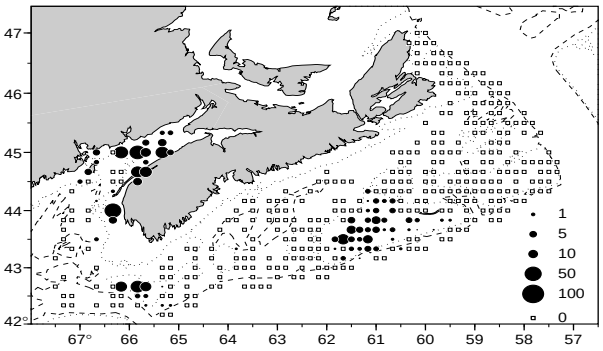
Industry representatives have expressed greater concern for the depleted state of these resources than the survey data would suggest. They expressed the opinion that abundance of all 4X flatfish resources are depleted with catch rates in some traditional fishing areas being insufficient to warrant fishing there. They suggested that a reduction in catch levels of at least 25% should be considered. Some industry representatives expressed concern about particular localised aggregations of winter flounder, because they are considered to consist of numerous, fairly discrete sub-groups.

Resource Status

Stock status evaluations were based on the commercial catch rates, and survey abundance indices and size composition by species. Due to the unresolved problems with the large component of 'unspecified flounder' in the catch, commercial landings are of limited use in the stock status evaluations. There are few length frequency samples available for 4X American plaice or yellowtail flounder and no recent age-length keys for any of the three species.

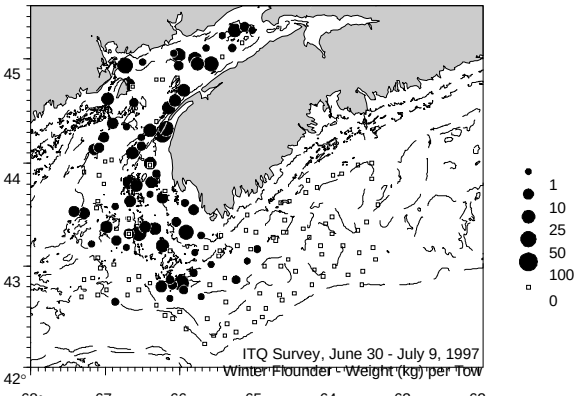
Winter Flounder

The recent **geographic distribution** of winter flounder on the Scotian Shelf indicates the relative discreteness of the 4X stock(s) from that in 4VW. In 4X, this species is primarily located in the Bay of Fundy and on Browns Bank.



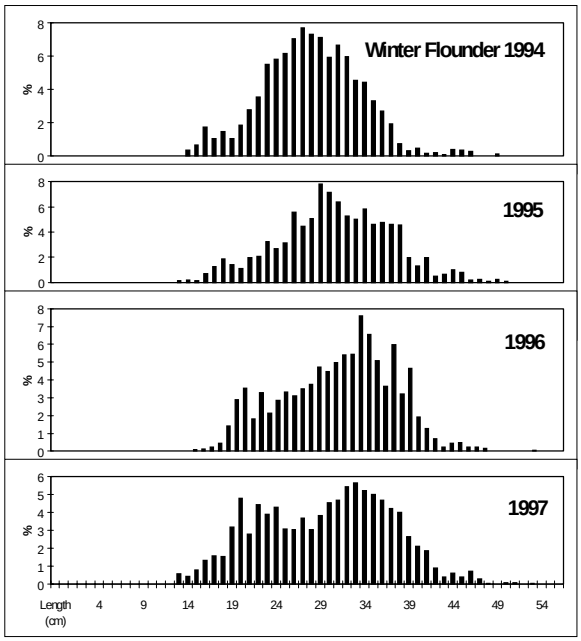
Winter Flounder Biomass (kg/tow) from the 1994-1997 Summer Groundfish Surveys.

A joint **industry/DFO science survey** has been conducted in 4X in 1995, 1996 and 1997. The survey provides more intensive coverage of all flounder species within the RV survey strata and in the inshore area which is unsurveyed by the RV. The ITQ surveys provide distributional, abundance and length frequency information. As the time series increases, they should greatly enhance the ability to monitor the population status of these species. Winter flounder catches were common in offshore and nearshore areas of the Bay of Fundy, and to the south and west of Nova Scotia, but rare to the east of Browns Bank.

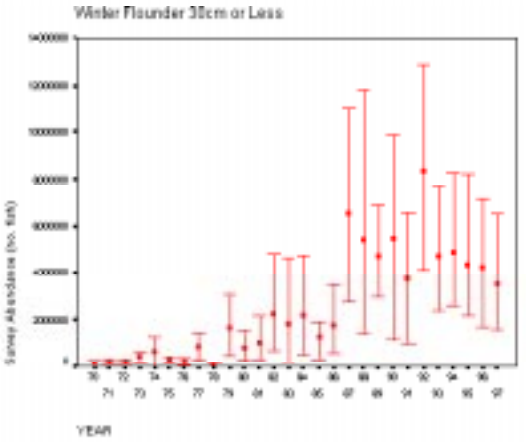


The distribution of commercial catch and effort during the last 3 years corresponded well with the RV and ITQ surveys in terms of species distribution and concentration.

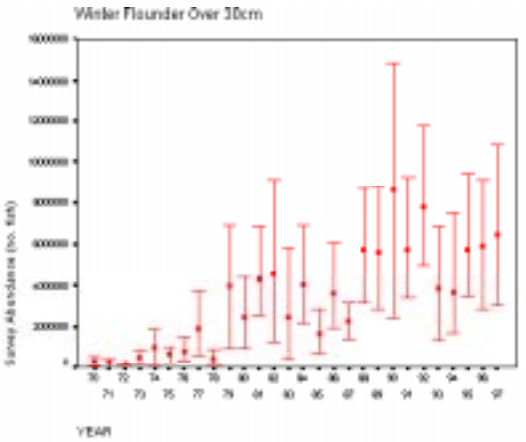
Research vessel **survey length frequency distributions** indicate there are fewer fish greater than 40cm in length than in the 1980s, but a maintenance in the overall abundance of fish greater than 30cm.



Research vessel **survey abundance estimates** (minimum trawlable abundance) of winter flounder indicate a slight, but continuing decline, in the number of small fish (30cm and under) since 1987. Although the abundance estimates of small fish for the period pre-1987 are much lower, the degree to which the increase in 1987 reflects real change in abundance is under investigation. The 95% confidence intervals are provided on the graphs as a measure of uncertainty in the estimates.

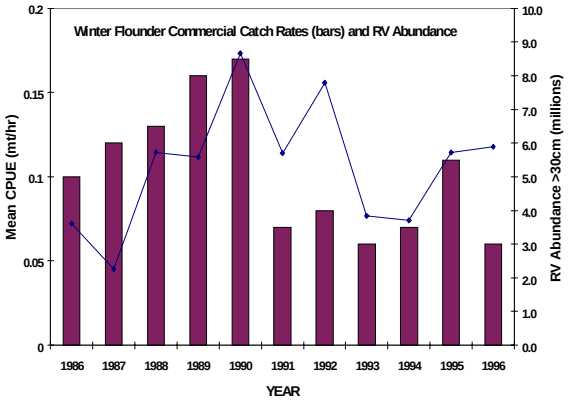


The abundance estimates for winter flounder greater than 30cm in length indicate little change over the last decade. Again, any comparison with abundance estimates before 1987 may be spurious.



The **commercial catch rate** information was evaluated for main species caught by all vessels and by a subset of 22 vessels that have had a sustained history in the flounder fishery in 4X. The catch rate series for the 22 vessels was more consistent, though not significantly different than that of the total fleet, and this subset was considered in the evaluation of stock status. The catch rate has declined slightly since 1991. Commercial catch rates are often not considered reliable indicators of abundance since they often do not track changes in stock abundance, or the severity of those changes, very well. However, the observed decline is in accord with observations made by industry of declining stock abundance for all 4X flounder resources in recent

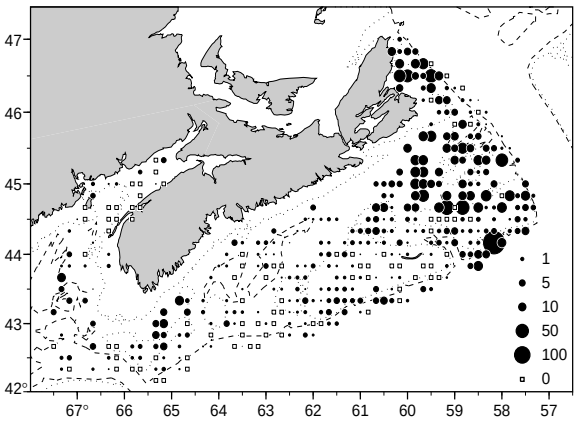
years. Comparison of catch rates to RV abundance estimates of winter flounder greater than 30cm suggest only a slight decline in abundance during the last few years.



In **summary**, the RV survey suggests a reduction in the numbers of large fish and no signs of significant new recruitment, but little change in the overall abundance of winter flounder greater than 30cm in length. The fishing industry catch rates also show only a slight decline.

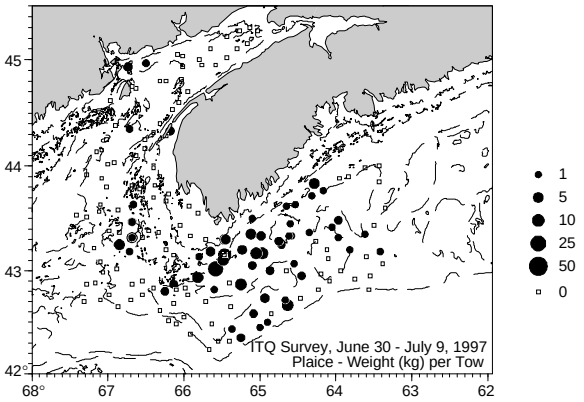
American Plaice

The recent **geographic distribution** of American plaice on the Scotian Shelf indicates that the major concentrations reside in the 4VW area, with relatively low abundances in 4X. In 4X, this species is primarily located in unit area 4Xo with some evidence of association with the western portion of 4W.

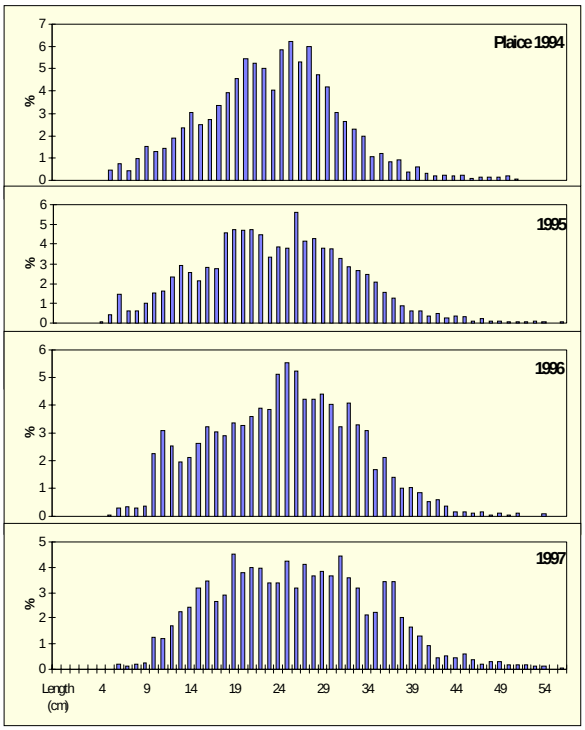


Plaice Biomass (kg/tow) from the 1994-1997 Summer Groundfish Surveys.

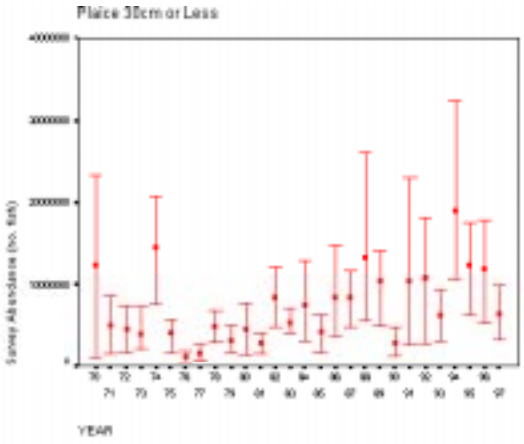
The **ITQ surveys** indicate that the distribution of catches of plaice were almost opposite to those of winter flounder, being concentrated in eastern 4X and virtually absent from the Bay of Fundy.



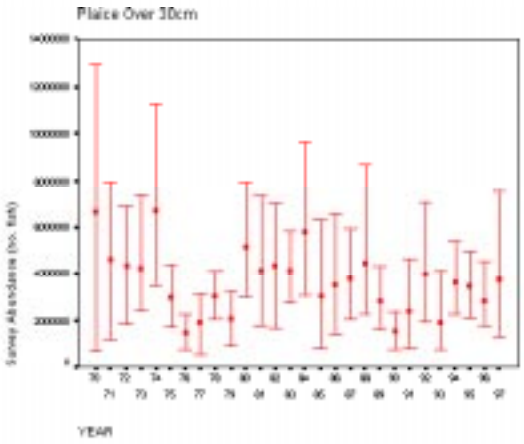
Research vessel **survey length frequency distributions** indicate a substantial reduction in the abundance of plaice larger than 40cm since the 1970s and 1980s, and no significant signs of new recruitment. The situation has been relatively stable during the 1990s. The modes in the length frequencies do not track well over the time series. Thus, the survey provides poor estimates of plaice abundance.



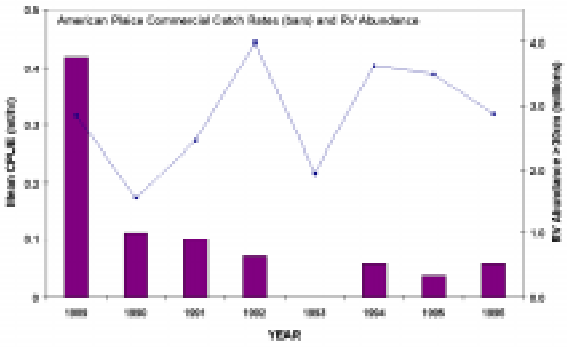
Research vessel **survey abundance estimates** indicate no overall trend in the abundance of plaice 30cm and under since 1987. The initial signs of new recruitment in 1993-1996 in the length frequency plots of average number per standard tow have not resulted in significant increases in the larger length groups. In fact, the abundance estimates suggest a decline has occurred since 1994.



The abundance estimates for plaice greater than 30cm in length indicate little change over the last decade.



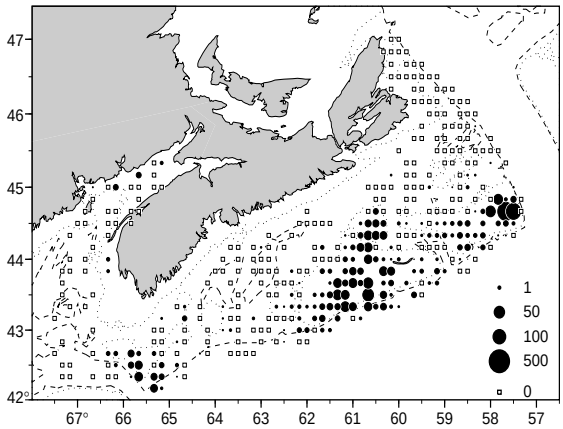
The **commercial catch rates** have been consistently low, indicating an overall low abundance level for this species in 4X. Further, the rate has been declining every year since 1989. Commercial catch rates are often not considered reliable indicators of abundance since they often do not track changes in stock abundance, or the severity of those changes very well. However the observed decline is in accord with observations made by industry of declining stock abundance.



In **summary**, the research survey indicates little overall change in abundance of fish greater than 30cm. However a reduction in larger plaice has occurred, with further indications of a decrease in abundance of plaice less than 30cm, and a decrease in commercial catch rate is evident.

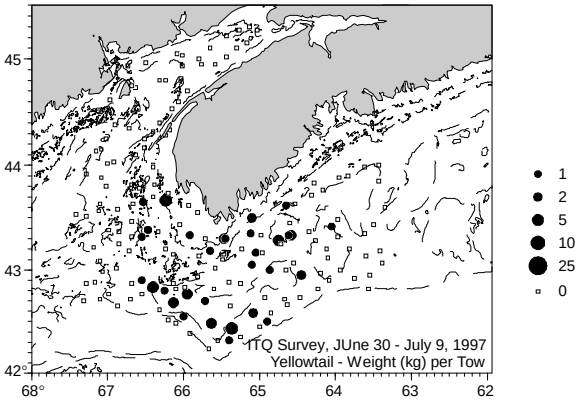
Yellowtail Flounder

The recent **geographic distribution** of yellowtail flounder on the Scotian Shelf indicates that the major concentrations reside in the 4VsW area, with relatively low abundances in 4X. In 4X, this species is primarily located in unit areas 4Xo,p and the western part of 4Xn. There is little evidence of occurrence in the Bay of Fundy or the eastern portion of 4X.

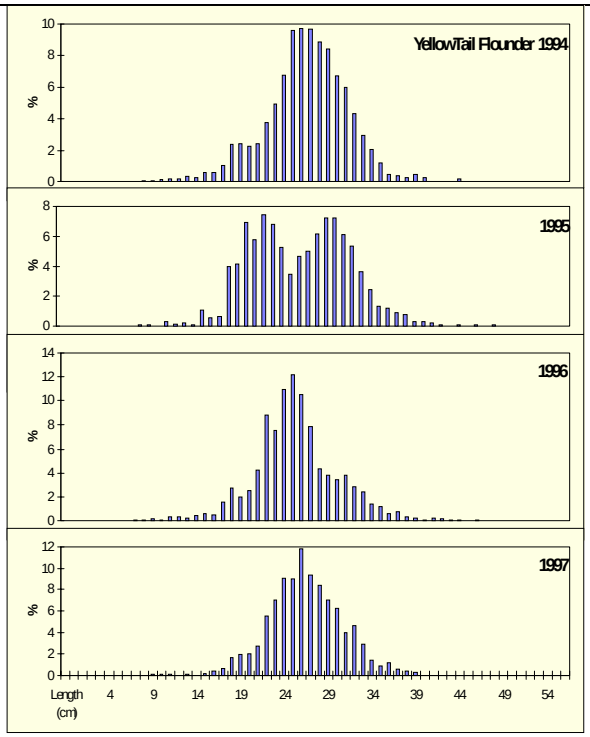


Yellowtail Flounder Biomass (kg/tow) from the 1994-1997 Summer Groundfish Surveys.

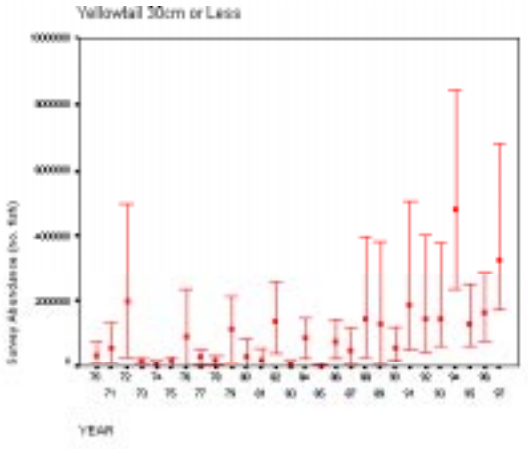
The **ITQ surveys** indicate occurrence of yellowtail in 4Xq as well as in 4Xo,p as shown in the RV survey. Yellowtail distributions generally overlap with those of plaice, but were less easterly and more inshore. Distribution plots of commercial catches agree with the ITQ distributions for this species in 4X.



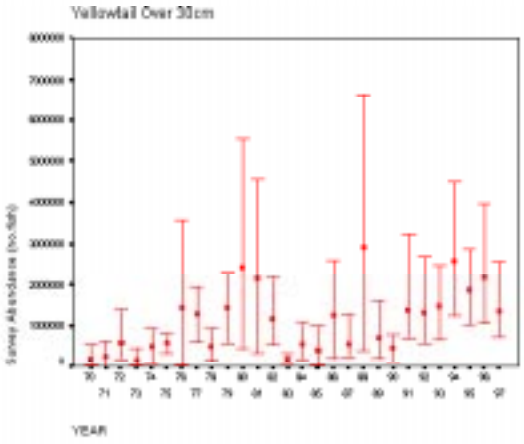
Research vessel **survey length frequency distributions** indicate a reduction in the abundance of yellowtail greater than 40cm in length since the 1970s and 1980s, and no signs of significant new recruitment. However, the modes in the length frequencies do not track well over the time series, suggesting that the survey provides poor estimates of yellowtail status.



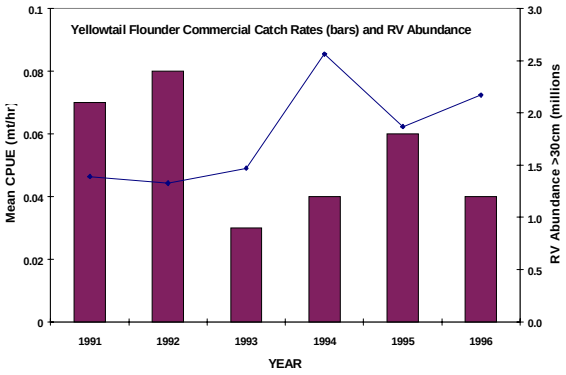
Research vessel **survey abundance estimates** indicate abundance of yellowtail 30cm and under shows no decline since 1987. In fact some modest increase may be occurring.



The abundance estimates for yellowtail greater than 30cm in length indicate a modest increase during the last decade. Although there has been a decline during the past 4 years, the average abundance is greater than that observed in the late 1980s.



The **commercial catch rates** are very low for this species. The rate has declined since 1991, although it has been rather stable since 1993. Commercial catch rates are often not considered reliable indicators of abundance since they often do not track changes in stock abundance, or the severity of those changes very well. The apparent increase in catch rate for 1995 is entirely due to a single observation of 1.7 tons/hr. In the absence of this observation, the 1995 catch rate roughly parallels that of 1993. This would portray a decline in accord with observations made by industry of declining stock abundance.



In summary, the research survey indicates a modest increase in abundance of fish less than 30cm and over 30cm in length. This is in contrast to the trend in CPUE.

Outlook

The 4X flatfish TAC has been both unrestrictive to, and unattainable by, industry throughout its existence. Since the downturns in recent years of major fisheries for cod, haddock and pollock, effort has been redirected to the flatfish. In 4X, this is of particular concern for winter flounder. Fishing efficiency has also continued to improve, such that any decline in catch rates may under-emphasize the magnitude of declines in availability of the fish. Finally, the RV survey shows a general reduction in the age range of all three species, and poor signs of incoming recruitment.

The assessment does not provide a quantitative evaluation of the exploitation rate. Thus we cannot provide a quantitative estimate of the reduction in effort necessary to redress the situation. However, considering the negative signals deriving from this assessment, and in keeping with the precautionary approach, immediate action should be taken to reduce fishing effort on 4X flatfish. This might be achievable by lowering the TAC such that landings in 1998 will be lower than landings in 1996.

Management Considerations

Given the multi-species character of the flatfish TAC, there is substantial opportunity to direct increased effort towards vulnerable species within the group. This flatfish TAC has not been limiting on catches from the species complex as a whole, and thus has not been limiting on catches of any particular species of flatfish. Management plans should attempt to spread the effort proportionally among the four species.

Landings have not been considered in the current evaluation of the status of these species individually because a large component of the landings are recorded as unidentified flounders. Effort should be made to ensure that landings for each species are recorded separately in future. These efforts should include the incorporation of the plant weighouts, by

species, into the log/purchase slip documents through the dockside monitoring program (DMP).

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References

Stobo, W.T., G.M. Fowler, and S.J. Smith. 1997. Status of 4X winter flounder, yellowtail flounder, and American plaice. DFO Canadian Stock Assessment Secretariat Res. Doc. 97/105.

This report is available from the:

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