Fisheries and Oceans Pêches et Océans

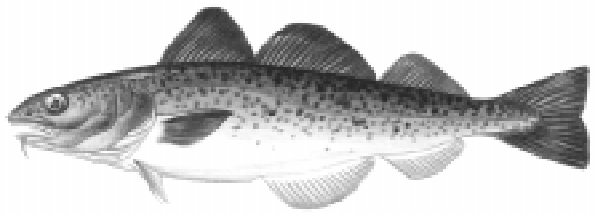
Maritimes Region

DFO Science
Stock Status Report A3-35(1998)

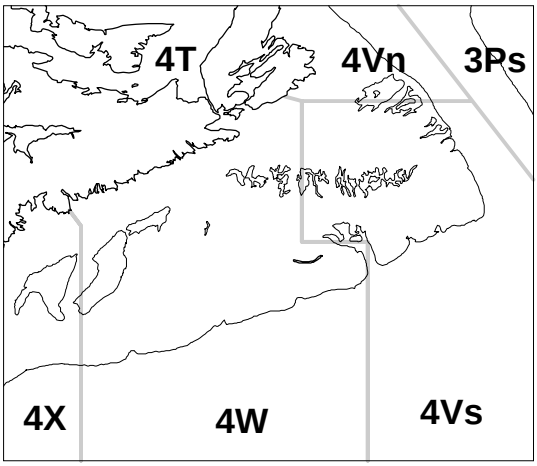
Updates on Selected Scotian Shelf Groundfish Stocks in 1998

December 1998

Canada



Eastern Scotian Shelf Cod



Background

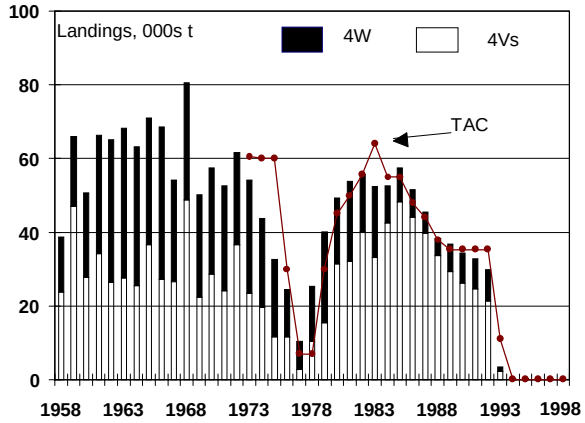
This document repeats the outlook for this stock based on a previous assessment contained in SSR A3-03 (1998). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

The Fishery

Landings (tonnes)

Year	92	93	94	95	96	97	98
TAC	35200	11000	0*	0*	0*	0*	0*
4Vs	21320	2320	180	180	160	100	
4W	8490	1160	190	90	150	130	
TOTAL	29810	3470	370	270	310	230	

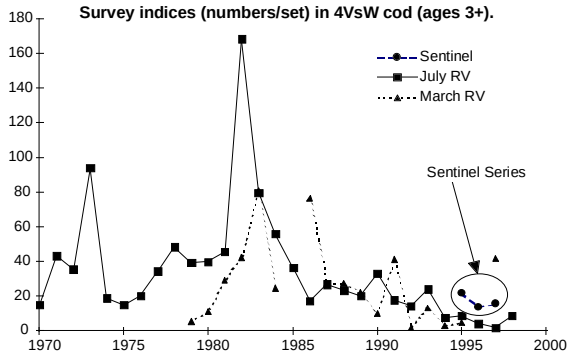
* by-catch only



Landings from 1998 represent additional data since the last SSR (DFO, 1998). The 1998 landings, to October 14, are 218t. Detailed historical information on the cod fishery is available in Mohn et al. (1998).

Resource Status

Survey data from July 1998 represent new information available since the last SSR. Information on the annual spatial distribution and length frequency from 1995 to 1998 is contained in Branton and Black (1998).



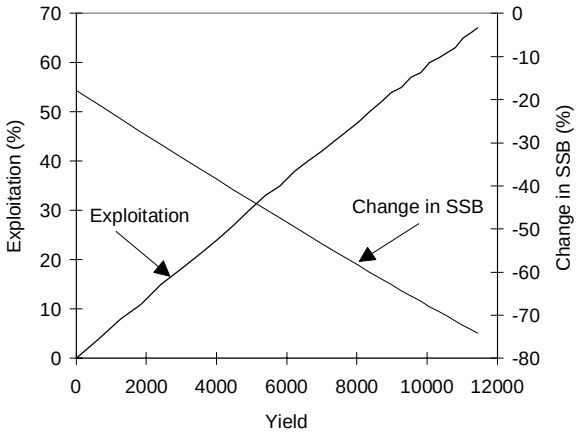
Outlook

The outlook from the last Stock Status Report (DFO, 1998) for this stock, based on assessment of the stock (Mohn et al., 1998) was as follows:

"The short-term prospects for this fishery remain dismal. The productivity of the stock is very low, there are several factors causing increased mortality overall as well as seal predation on the younger age groups. The spawning stock biomass, while not declining, has not rebuilt since the closure of the fishery.

The most optimistic prognosis for this stock is based on including the March 1997 survey data. Although considered unreliable, the March 1997 survey suggests that there are more cod in the stock area than detected by the July survey. If the March 1997 survey were included in the population analysis, then the prospects for improvements in the spawning stock biomass would be much better. The spawning stock biomass could increase by 15% in the absence of any fishery and catches up to 4,000 t would not cause any decline in biomass.

The most likely population analysis, presented in the preceding sections, is much less optimistic. Based on one year **projections,** the exploitation rate and change in biomass associated with a range of yields indicate that, even with no fishery, the spawning stock biomass is projected to decline by about 18%. Although this can be cast in terms of risk, there is little point as there is a very high probability that the biomass will decline in 1999 without any fishing. Thus even by-catch in other fisheries may pose a serious threat to the recovery of this stock.



It is not possible to distinguish between the two models given the existing data, however the two different models of seal consumption of cod lead to different conclusions about the impact of seal predation on the rebuilding of the cod stock. If cod is a constant proportion of the seal diet it suggests that cod recruitment at age 1 has been good in recent years but that survival of those recruits to age 3 or 4 has been very poor. This leads to the conclusion that cod stock rebuilding will not likely occur while this degree of predation continues. The variable proportion model of cod in the seal diet suggests that recruitment, even at age 1, has been poor and that subsequent survivorship to age 3 or 4 has been much less of a factor in the failure to rebuild than it is in the constant proportion model. Thus, in the variable proportion model the recruitment to the fishery will be less affected by seal predation than in the constant proportion model. Regardless of which model of seal consumption of cod is closer to reality, the recruitment and subsequent survivorship must both improve before it is likely that the stock will rebuild strongly."

The above outlook from the previous SSR has not been revised.

For More Information

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References

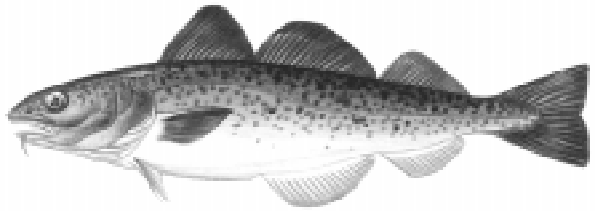
Branton, R., and G. Black. 1998. 1998 summer groundfish survey updaye for selected Scotia-Fundy groundfish stocks. DFO Canadian Stock Assessment Secretariat Res. Doc. 98/133.

DFO, 1998. Eastern Scotian Shelf Cod. DFO Sci. Stock Status Report. A3-03 (1998).

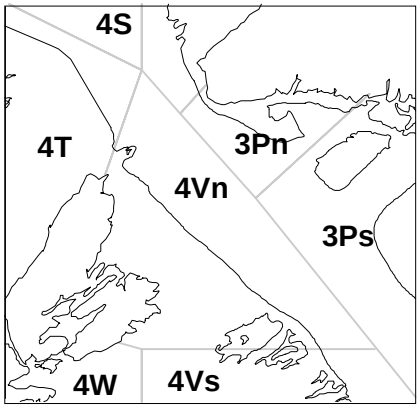
Fanning, L.P., R.K. Mohn, and W.A. MacEachern. 1996. Assessment of 4VsW Cod in 1995 with consideration of ecological indicators of stock status. DFO. Atl. Fish. Res. Doc. 96/27.

Mohn, R.K., and W.D. Bowen. 1993. A model of grey seal predation on 4VsW cod and its effects on the dynamics and potential yield of cod. DFO Atl. Fish. Res. Doc. 93/22.

Mohn, R.K., and W.D. Bowen. 1996. Grey seal predation on the Eastern Scotian Shelf: modeling the impact on Atlantic cod. Can. J. Fish. Aquat. Sci. 53:2722-2738.



Cod in Sydney Bight



Background

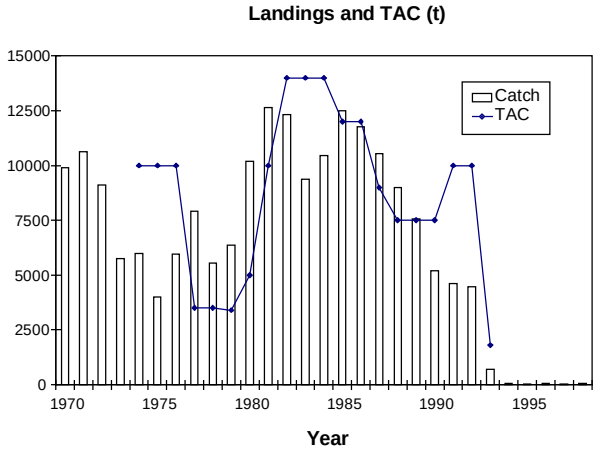
This document repeats the outlook for this stock based on a previous assessment contained in SSR A3-02 (1998). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

The Fishery

Landings ('000t)

	1992	1993	1994	1995	1996	1997	1998
TAC	10.0	1.8	-[2]	-[2]	-[2]	-[2]	-[2]
Landings	5.1[1]	8.6	<0.1	<0.1	<0.1	<0.1	

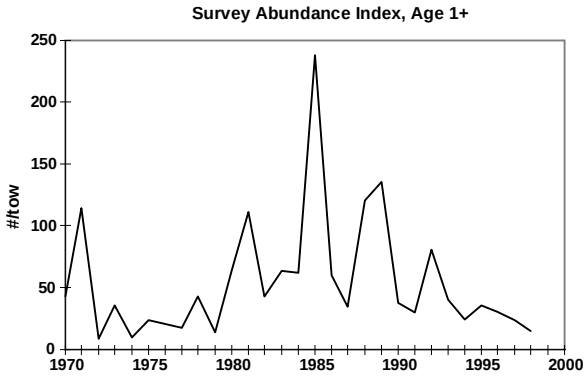
[1] May - December only
[2] By-catch only



Landings data from 1997 represents additional information since the last SSR (DFO, 1998). Less than 50 tonnes of cod landings per year have been reported since 1994, most of which were taken annually as bycatch in redfish and flounder fisheries. The 1998 landings to date (October 21, 1998) are 46t.

Resource Status

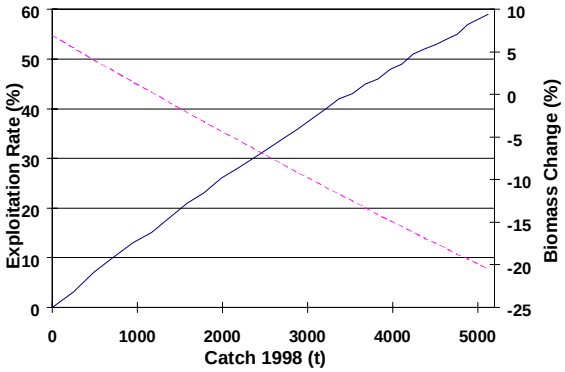
Survey data from 1998 represents new information available since the last SSR. Information on the annual spatial distributions and length frequencies from 1995 to 1998 are contained in Branton and Black (1998).



Outlook

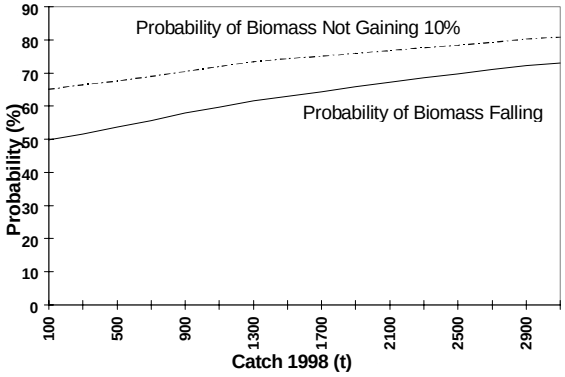
The outlook from the last Stock Status Report (A3-02) for this stock, based on the assessment of the stock (Mohn et al. 1998) was as follows:

"The 1993 and 1994 year-classes are the first good year-classes to enter the fishable population since that of 1987. However, spawning biomass is very low and has not shown any recovery, although the 1997 biomass is slightly larger than the low seen in 1996. This increase is due to the growth of fish in the population and not due to recruitment.



Short term projections are done for a range of catch levels in 1998. For any catch in 1998, the associated exploitation rate is determined by reading up to the solid black line and across to the left. The percentage change in spawning stock biomass can be determined by reading up to the dotted line and then reading across to the right side.

These projections show that the biomass is expected to increase by about 7% if the fishery remains closed. Removals of approximately 1,000 t in 1998 would result in no increase in the spawning stock biomass.



The risk analysis shows a slightly less optimistic situation. When uncertainty in the estimation process is included, it suggests that even with no fishery in 1998 there is almost a 50% chance of the biomass falling and a 65% probability that the biomass will not increase by 10%.

Although the fishery has been closed since September, 1993, total mortality rates estimated from the research survey are high, indicating that there are other sources of mortality that are affecting stock rebuilding."

The above outlook from the previous SSR has not been revised.

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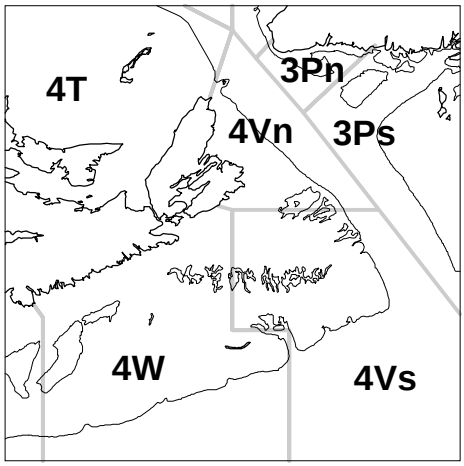
References

Branton, R., and G. Black. 1998. Summer groundfish fish survey update for selected Scotia-Fundy groundfish stocks. DFO Canadian Stock Assessment Secretariat Res. Doc. 98/133.

Mohn, R., T. Lambert, S. Wilson, and G. Black 1998. Update of the status of 4Vn cod: 1997. DFO Canadian Stock Assessment Secretariat Research Document 98/09.

Eastern Scotian Shelf Haddock



Background

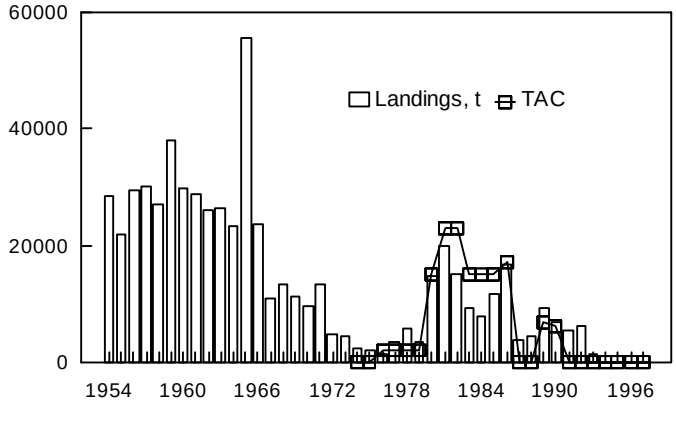
This document repeats the outlook for this stock based on a previous assessment contained in SSR A3-06 (1997). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

The Fishery

Landings, t

Year	1992	1993	1994	1995	1996	1997	1998
TAC*	--**	--**	--**	--**	--**	--**	--**
Total	6,231	1,351	103	135	133	152	

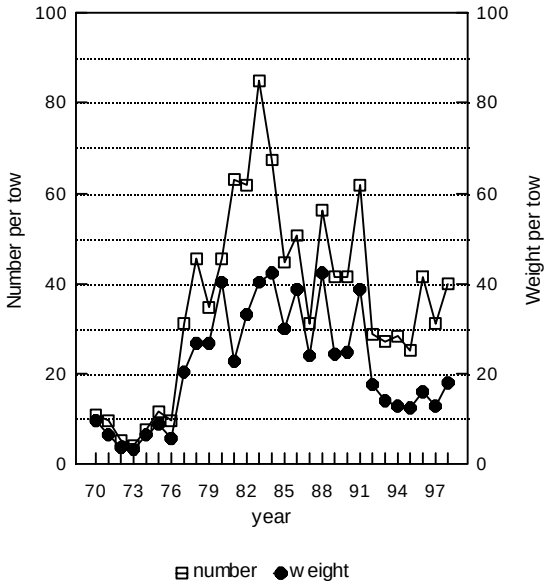
** = by-catch only



Landings data from 1997 represents additional information since the last SSR (DFO, 1997). The 1998 landings until August equals 54t. Detailed historical information on the haddock fishery is contained in Frank et al. (1997).

Resource Status

Survey data from 1998 represent new information available since the last SSR. Information on the annual spatial distributions and length frequencies from 1995 to 1998 are contained in Branton and Black (1998).



Outlook

The outlook from the last Stock Status Report (DFO, 1997) for this stock, based on assessment of the stock (Frank et al. 1997) was as follows:

"The **short-term prospects** for this stock are not encouraging. The adult population biomass is presently low and recruitment has been below average since the mid-1980s with the exception of the 1988 year-class. Some improvement in recruitment has been seen in the most recent years in the summer survey series to levels only slightly below average (1993 and 1994 year-classes). These year-classes could contribute to stock rebuilding. However, the current growth, condition and reproductive potential of the stock appears to be quite low and the population may not respond as expected to a regime of little or no commercial exploitation. It is expected that the stock will decline given recent low recruitment levels and the disappearance of the last large year-class produced in 1988. A reversal of recent changes in the ecosystem of the eastern Scotian Shelf that have occurred, such as the significant cooling of the bottom waters, increases in capelin and shrimp stocks, and the collapse of cod in the area, may be necessary for improvement in the status of the 4TVW haddock stock."

The above outlook from the previous SSR has not been revised.

For more Information

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References

Branton, R., and G. Black. 1998. 1998 summer groundfish fish survey update for selected Scotia-Fundy groundfish stocks. DFO Canadian Stock Assessment Secretariat Res. Doc. 98/133.

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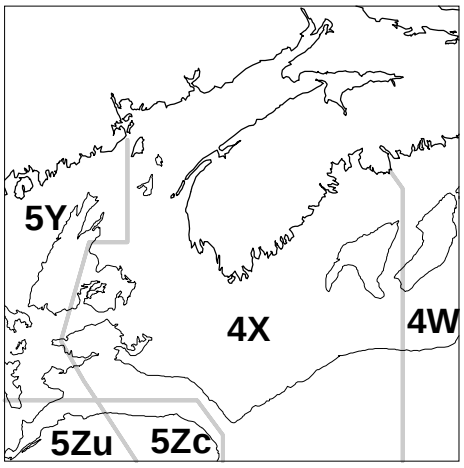
Frank, K.T., R.K. Mohn, and J.E. Simon. 1997. Assessment of 4TVW haddock in 1996. DFO Canadian Stock Assessment Secretariat Res. Doc. 97/107.

Southwest Nova Winter Flounder, American Plaice and Yellowtail Flounder



Background

This document repeats the outlook for these stocks based on a previous assessment contained in SSR A3-21 (1997). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

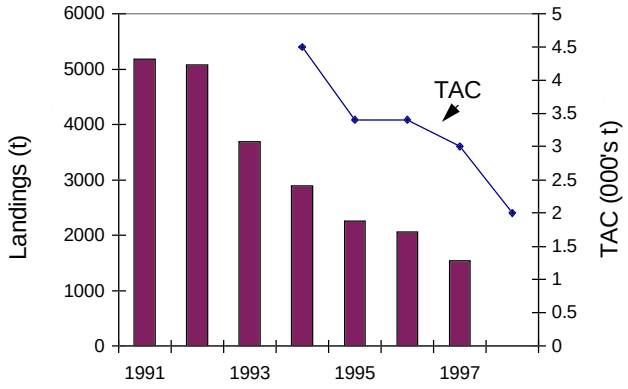
The Fishery

Canadian landings (thousands of tonnes)

Year	1992	1993	1994	1995	1996	1997	1998
TAC*			4.5	3.4	3.4	3.0	2.0
Flatfish**	5.1	3.7	2.9	2.3	2.1	1.5	
Witch	.8	.4	.4	.3	.4	.4	
TOTAL	5.9	4.1	3.3	2.6	2.4	1.9	

* - The TAC includes witch flounder.

** - Winter flounder, yellowtail flounder, American plaice and unidentified flatfish

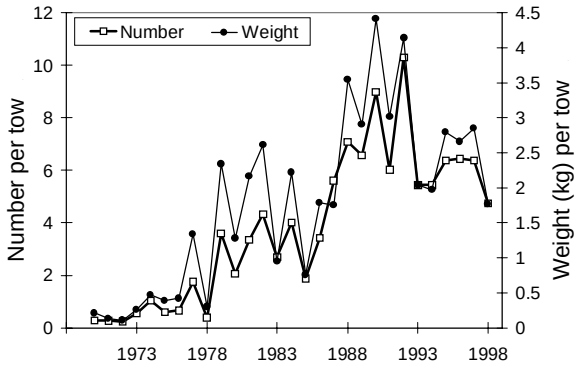


Landings data from 1997 represents additional information since the last SSR (DFO, 1997). The 1998 landings of all flatfish (including witch flounder) in 4X+5Y to October 7, 1998, are 1,361t. Historical information on the winter flounder, yellowtail flounder and American plaice is contained in Stobo et al. (1997).

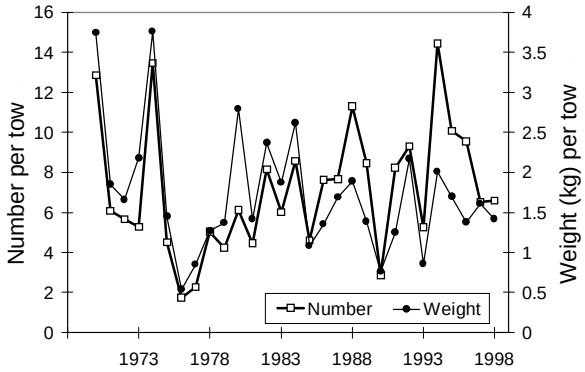
Resource Status

Survey data from 1998 represents new information available since the last SSR. Information on the annual spatial distributions and length frequencies from 1995 to 1998 are contained in Branton and Black (1998).

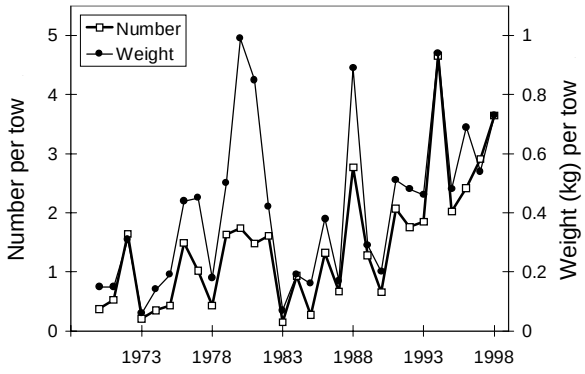
<u>Winter Flounder</u>



American Plaice



Yellowtail Flounder



Outlook

The outlook from the last Stock Status Report (DFO, 1997) for these stocks, based on assessment of the stocks (Stobo et al. 1997) was as follows:

"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. . ." .

The TAC was reduced in 1998 to 2000 tonnes, in response to the need to reduce the fishing effort on 4X flatfish. An insufficient time series of data exists at this catch level to determine if that reduction is sufficient to halt the stock(s) decline.

The above outlook from the previous SSR has not been revised.

For more Information

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References

Branton, R., and G. Black. 1998. 1998 summer groundfish fish survey update for selected Scotia-Fundy groundfish stocks. DFO Canadian Stock Assessment Secretariat Res. Doc. 98/133.

DFO, 1997. Southwest Nova Winter Flounder, American Plaice and Yellowtail Flounder Stock Status Report. A3-21 (1997).

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.

Eastern Scotian Shelf American Plaice, Yellowtail and Winter Flounder

Background

This document repeats the outlook for these stocks based on a previous assessment contained in SSR 96/70E (1996). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

The Fishery

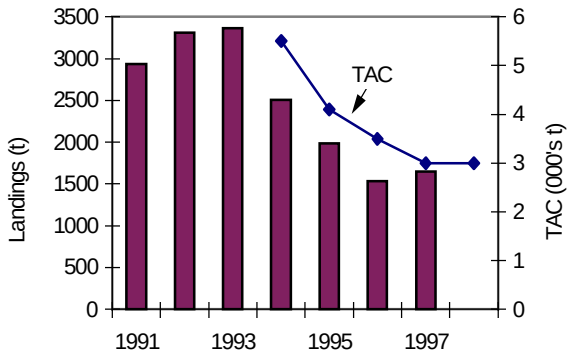
Canadian landings (thousands of tonnes)

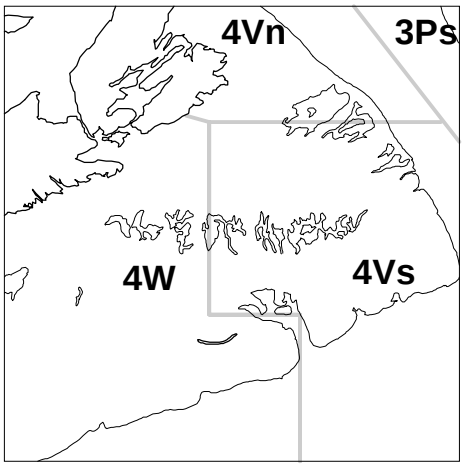
Year	1992	1993	1994	1995	1996	1997	1998
TAC*			5.5	4.1	3.5	3.0	3.0
Flatfish**	3.3	3.4	2.5	2.0	1.5	1.7	
Witch	0.9	0.5	0.3	0.3	0.3	0.1	
TOTAL	4.2	3.9	2.8	2.3	1.8	1.8	

* - The TAC includes witch flounder.

** - Winter flounder, yellowtail flounder, American plaice and unidentified flatfish

Landings data from 1996 and 1997 represents additional information since the last SSR (DFO, 1996). The 1998 landings of all flatfish (including witch flounder) in 4VW to October 7, 1998, are 1,404t. The decrease is attributable in part to the reduction in the TAC. Historical information on the American plaice, yellowtail flounder and winter flounder is contained in Annand and Beanlands (1996).

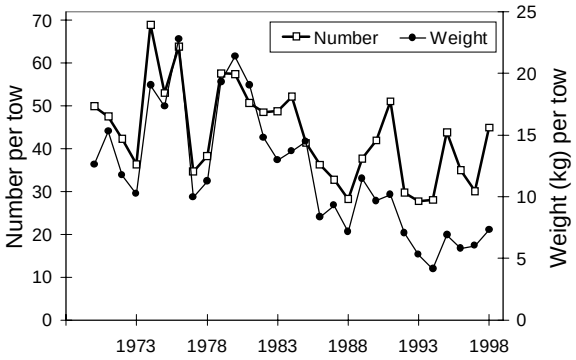




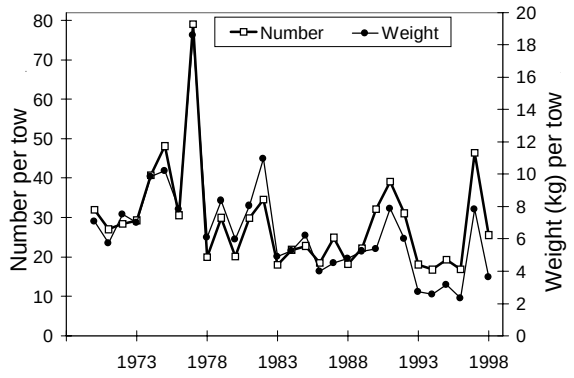
Resource Status

Survey data from 1997 and 1998 represent new information available since the last SSR. Information on the annual spatial distributions and length frequencies from 1995 to 1998 are contained in Branton and Black (1998).

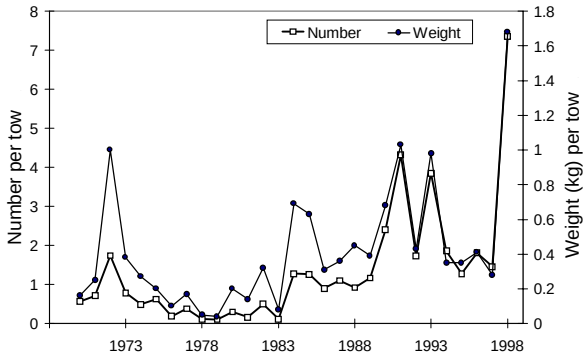
American Plaice



Yellowtail Flounder



Winter Flounder



Outlook

The outlook from the last Stock Status Report (DFO, 1996) for these stocks, based on assessment of the stocks (Annand and Beanlands 1996) was as follows:

"In the last few years, all commercially exploited flatfish have shown a declining biomass, and an absence of larger fish in both the survey and the commercial fishery. In 4V, particularly Banquereau Bank, these signs are most evident. This is especially true for yellowtail where even recruitment prospects appear to be poor. Aside from some modest to good recruitment potential for the other species, resource status appears to have deteriorated over the last few years and is unlikely to improve substantially in the near future. Stable catch rates for flatfish coincident with the overall smaller size would indicate that the fishery is killing more fish to maintain the same catch in weight. The absence of complete catch information by species limits our ability to assess stock status and evaluate the possible consequences of various levels of fishing. What indicators there are suggest a decline in the resource. The appearance of more small fish in the catches, even with the introduction of larger mesh sizes, may result in increased discarding. It is noteworthy however, that the 4W component of the populations also showed some decline in abundance even in the absence of any significant level of fishing. This suggests that the declines observed in 4V may not be entirely related to fishing . . . .

Catch, at or above the 1996 level, would not likely promote recovery of this resource. As stated in previous evaluations, stock rebuilding can only take place if effort is kept at a very low level. Given the continuing declines in flatfish biomass, effort levels to allow rebuilding [need to be] below the levels applied in recent years. Furthermore, there may be serious damage to incoming recruitment if capture, particularly capture and discarding, of small flatfish occurs in 1997."

The above outlook from the previous SSR has not been revised.

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References

Annand, C., and D. Beanlands. 1996. An update of the status of 4VW flatfish stocks. DFO. Atl. Fish. Res. Doc. 96/32.

Branton, R., and G. Black. 1998. 1998 summer grounfish fish survey update for selected Scotia-Fundy groundfish stocks. DFO Canadian Stock Assessment Secretariat Res. Doc. 98/133.

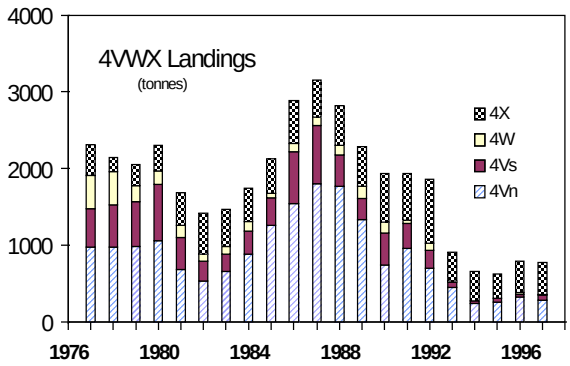
DFO, 1996. Eastern Scotian Shelf Flatfish. DFO Atlantic Fisheries Stock Status Report 96/70E (1996).

Witch Flounder in Div. 4VWX

Background

This document repeats the outlook for this stock based on a previous assessment contained in SSR A3-19 (1997). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

The Fishery



(Landings in thousands of tonnes)

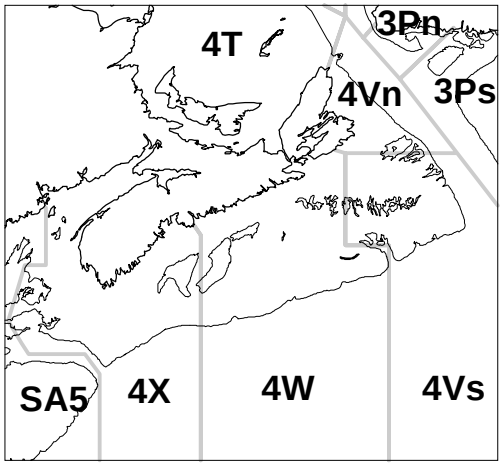
Year	1992	1993	1994	1995	1996	1997
Canada	1.9	0.9	0.7	0.6	0.8	0.8
Foreign	0.1	+	+	+	+	+
Total	1.9	0.9	0.7	0.6	0.8	0.8

\+ values less than 50 tonnes

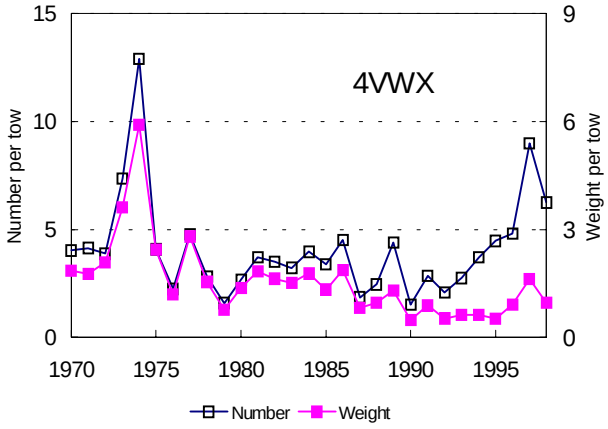
Landings data from 1997 represents additional information since the last SSR (DFO, 1997). The 1998 landings until August equals 456t. Historical information on the witch flounder fishery is contained in McRuer et al. (1997).

Resource Status

Survey data from 1998 represents new information available since the last SSR. Information on the annual spatial distributions and length frequencies from



1995 to 1998 are contained in Branton and Black (1998).



Outlook

The outlook from the last Stock Status Report (DFO, 1997) for this stock, based on assessment of the stock (McRuer et al. 1997) was as follows:

"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."

The above outlook from the previous SSR has not been revised.

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References

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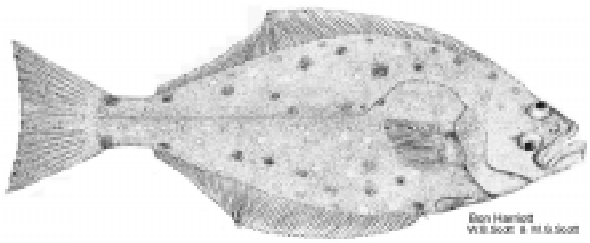
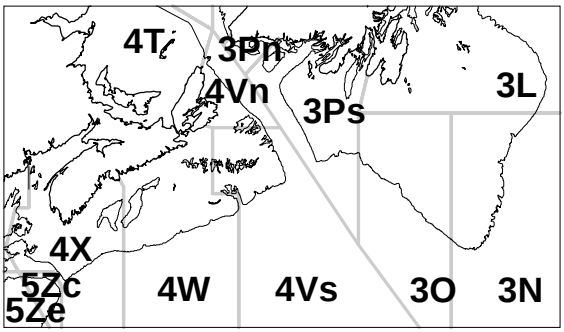


Scotian Shelf and Southern Grand Bank Halibut



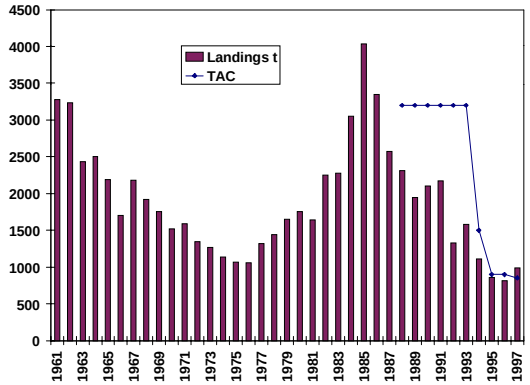
Background

This document repeats the outlook for this stock based on a previous assessment contained in SSR A3-23 (1997). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

The Fishery

Landings (thousands of tonnes)

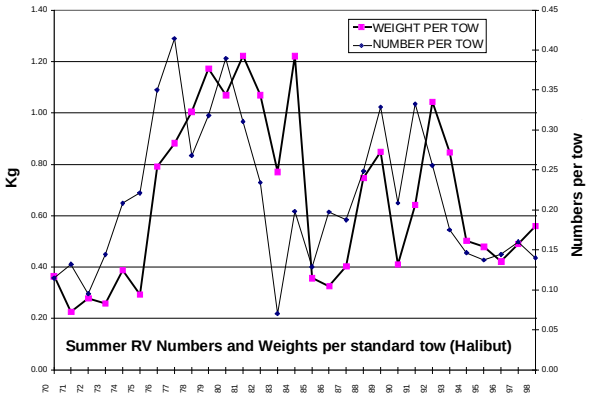
Year	1992	1993	1994	1995	1996	1997	1998
TAC*	3.2	3.2	1.5	0.9	0.9	0.9	0.9
4VWX							
Canada	0.9	0.9	0.9	0.6	0.6	0.8	0.7
Foreign	0.1	0.1	0.1				
3NOPs							
Canada	0.3	0.3	0.2	0.2	0.2	0.1	0.1
Foreign	0.1	0.4	0.1	0.1			
Total							
4VWX	1.0	0.9	1.0	0.6	0.6	0.8	0.7
3NOPs	0.4	0.7	0.3	0.3	0.2	0.1	0.1
TOTAL	1.4	1.6	1.3	0.9	0.8	0.9	0.8



Landings data from 1997 represents additional information since the last SSR (DFO, 1997). The 1998 landings of 685t are to October 7, 1998. Detailed historical information on the halibut fishery is contained in Zwanenburg et al. (1997).

Resource Status

Survey data from 1997 and 1998 represent new information available since the last SSR. Information on the annual spatial distributions and length frequencies from 1995 to 1998 are contained in Branton and Black (1998).



Outlook

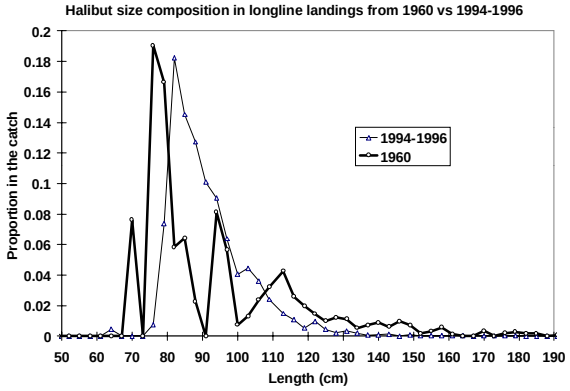
The outlook from the last Stock Status Report (DFO, 1997) for this stock, based on assessment of the stock (Zwanenburg et al. 1997) was as follows:

"The foregoing analyses suggest that halibut **abundance**, as estimated from the results of

research vessel surveys in the management unit, is presently low relative to the available time series. Present landings are also low relative to the long-term (1883 - 1996) history of this resource. Survey results for the geographic range of halibut suggest that declines in abundance have been more evident for the southern Grand Banks than for the Scotian Shelf.

Loss rates [total mortalities + emigration] from the Scotian Shelf have increased since 1971 and are presently at their highest value. The observed increase is likely due to increased mortality since halibut abundance in the northern part of the management unit (3NOPs), where migrating fish are predicted to go, has declined since the early 1980s.

Halibut size compositions show a reduced range of sizes in the present population (1994 - 1996) relative to that for 1960; however, present estimates do not include size information for 3NOPs while the 1960s size composition included data for 3Ps.



Halibut directed CPUE for longliners has declined since 1988 both for the management unit as a whole and for the Scotian Shelf and southern Grand Banks separately. There are some indications of increased CPUE for 1996...

There is no indication that effort on this resource should be increased but rather that the present restrictive measures should be continued."

The above outlook from the previous SSR has not been revised.

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References

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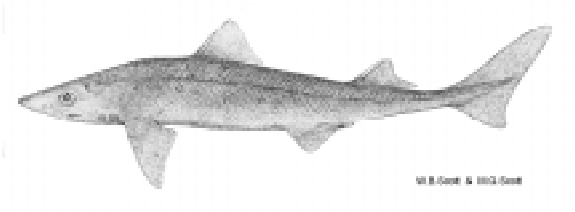
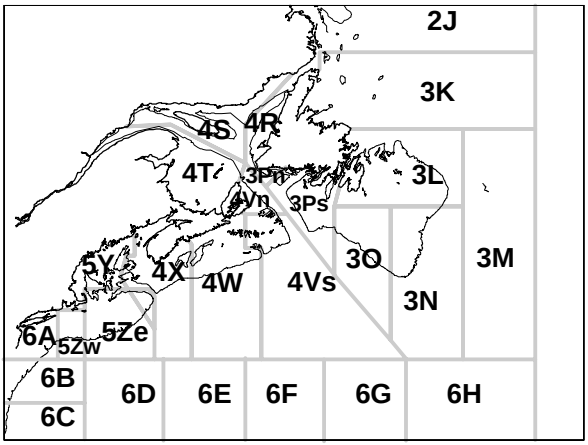


Northwest Atlantic (NAFO Subareas 2 - 6) Spiny Dogfish



Background

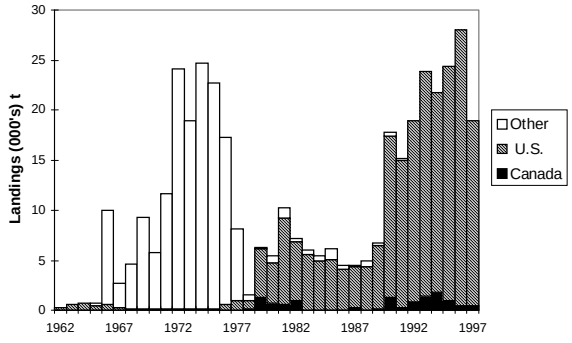
This document repeats the outlook for this stock based on a previous assessment contained in SSR 96/76 (1996). In addition, information is presented on the fishery, the results of the most recent research vessel survey, as well as the conclusions from the latest U.S. assessment of this resource.

The Fishery

(Landings in thousands of tonnes)

Year	1992	1993	1994*	1995*	1996*	1997*
Canada	0.8	1.4	1.8	1.0	0.4	0.5
US	18.1	22.5	19.9	23.4	27.6	18.5
Other	0.1	0.0	0.0	0.0	0.0	n/a
Total	19.0	23.9	21.7	24.4	28.1	18.9

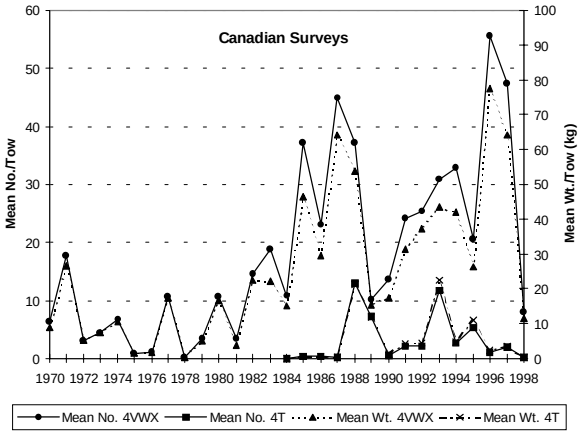
* - preliminary statistics n/a - not available

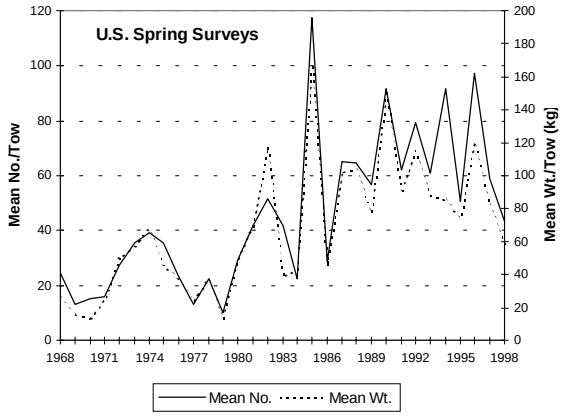


Landings data from 1996-1997 represents new information since the last SSR (DFO, 1996). Preliminary statistics indicate that 29 tonnes of spiny dogfish were landed in Atlantic Canada by the end of October 1998. Preliminary landings by U.S. fisheries for 1998 are not yet available. The Canadian Atlantic dogfish fishery is not under any management control (no TAC's), as is the case throughout the rest of the management unit for spiny dogfish (NAFO subareas 2-6). Detailed historical information on the spiny dogfish fishery is contained in McRuer and Hurlbut (1996).

Resource Status

Survey data from 1996-1998 represents new information available since the last SSR. Since 1995, catch rates in the southern Gulf survey (NAFO 4T) have declined to a very low level and catch rates in the Scotian Shelf survey (NAFO 4VWX) declined sharply in 1998. Information on the spatial distribution of survey catches during recent years are contained in Branton and Black (1998) and Chouinard et al. (1998).





Outlook

The outlook from the last Stock Status Report for this stock (DFO, 1996), based on an assessment of the stock (McRuer and Hurlbut 1996) was as follows:

"Biomass of dogfish is presently high and has expanded into Canadian waters. This has been especially evident in the Gulf of St. Lawrence. If the market expands and handling methods improve, there could be pressure to expand the Canadian fishery. Substantial gains could be realized through better use of fish discarded under current harvesting practices. Not only would there be greater yield from the present level of fishing mortality, but there would be more accurate biological data on true exploitation rates, leading to more accurate assessments. Also, while the Canadian fishery is not yet contributing significant mortality, the low fecundity, slow growth, high proportion of larger females taken by the US fishery, high discards and current level of exploitation all indicate caution. Joint assessment and consistent management of this stock by Canada and the US should be considered".

The current outlook is quite different from that described above. Data and analyses presented during the most recent (1998) assessment of spiny dogfish in NAFO subareas 2-6 by the U.S. National Marine Fisheries Service indicate that "mean lengths in the landings and surveys have begun a rapid decline, minimum biomass estimates of mature females have decreased by nearly 50% since 1990, and that fishing mortality rates are well above those compatible with a sustainable harvest". They concluded that "although the stock is presently at a moderate biomass level, there has been a severe reduction in the mature component of the fishery, which can affect recruitment, and that the stock is over-exploited". The recent low catch rates in the southern Gulf survey and the sharp decline in the Scotian Shelf survey in 1998 are consistent with these findings indicating a decline in abundance in the late 1990s.

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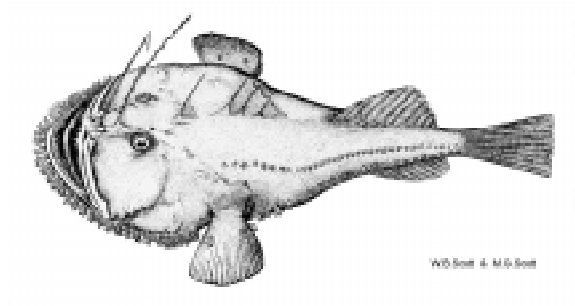
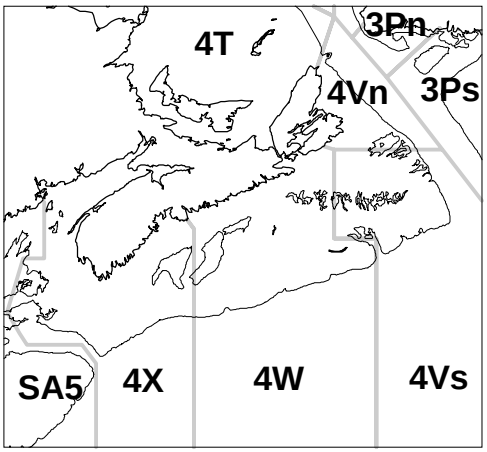
United States National Marine Fisheries Service. Northeast Fisheries Science Centre. 1998. Report of the 26th Northeast Regional Stock Assessment Workshop (26th SAW) - Stock Assessment Review Commitee (SARC) Consensus Summary of Assessments: Spiny Dogfish. CRD 98-03: 283p.



Monkfish on the Scotian Shelf and Northeast Georges Bank



Background

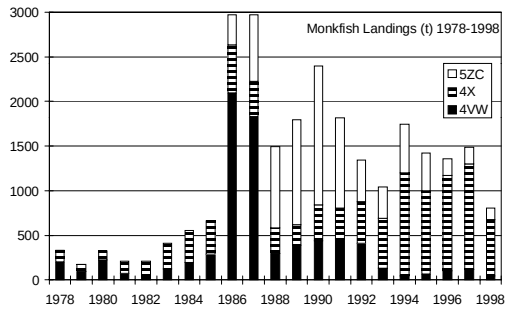
This document repeats the outlook for this stock based on a previous assessment contained in SSR 96/97E (1996). In addition, information is presented on the fishery and the results of the most recent research vessel survey.

The Fishery

Landings (thousands of tonnes)

Year	1992	1993	1994	1995	1996	1997	1998
TAC	-	-	-	0.2*	0.2*	0.2*	0.2*
4VW							
Can	0.37	0.08	0.04	0.06	.11	.11	
For	0.05	.0.04	-	-	-	-	
4X							
Can	0.46	0.55	1.16	0.93	1.07	1.18	
For		0.01	-	-	-	-	
5Zc							
Can	0.47	0.36	0.54	0.42	.18	.19	
Total	1.35	1.04	1.74	1.41	1.36	1.48	

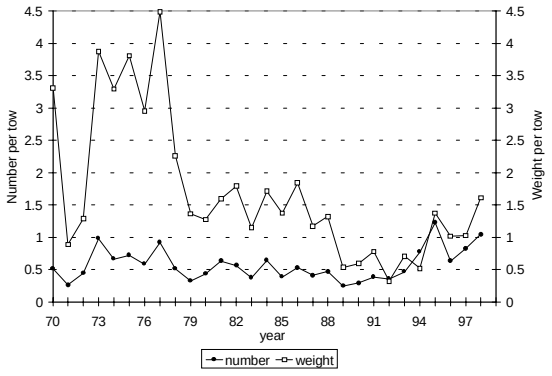
* - study allocation



Landings data from 1996 represents additional information since the last SSR (DFO, 1996). The 1998 landings of 810t are to mid-October. Detailed historical information on the monkfish fishery is contained in Beanlands and Annand (1996).

Resource Status

Survey data from 1997 represents new information available since the last SSR. Information on the annual spatial distributions and length frequencies from 1995 to 1998 are contained in Branton and Black (1998).



Outlook

The outlook from the last Stock Status Report (DFO, 1996) for this stock, based on assessment of the stock (Beanlands and

Annand, 1996) was as follows:

"Because the distribution of monkfish appears to be relatively continuous across 4VW, 4X, 5Y and 5Z, the regulation of the USA fishery could have an impact on the Canadian monkfish fishery. Notwithstanding this, given our lack of understanding of the migratory patterns and reproductive biology of this species, it would be prudent to manage this resource independently in Canadian waters.

The decline of commercial sized fish through the 1970s and 1980s is a concern. Whether this is due to natural causes or related to unreported by-catch taken or discarded by fleets selecting for cod, haddock and pollock, cannot be determined. From a long-term perspective, the survey abundance in the 1990s is at the low end of the range but is increasing, with the best signs of recruitment in 4X.

Currently there is no biological basis for the 20% by-catch limit in the commercial fishery. If the TAC levels for other directed species change, a review of by-catch levels should be undertaken. The relatively large numbers of monkfish taken by scallop dredges on Georges Bank requires documentation, both in terms of size composition and verification of catches.

There is insufficient information at this time to determine appropriate harvesting levels. The joint science/industry study is currently in its second year of the five year program. The continued commitment of both industry and science to provide better information on monkfish and to maintain catches at a low level, is required and will ultimately result in a more reliable assessment and rational development of this resource."

The above outlook from the previous SSR has not been revised.

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References

Beanlands, D., and C. Annand. 1996. The Status of Monkfish in 4VWX5Zc. DFO Atlantic Fisheries Research Document 96/104.

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DFO, 1996. Monkfish on the Scotian Shelf and Northeast Georges Bank. DFO Atlantic Fisheries Stock Status Report. 96/97E.

This report is available from the:

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