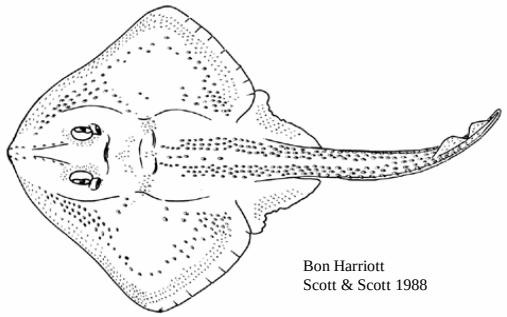
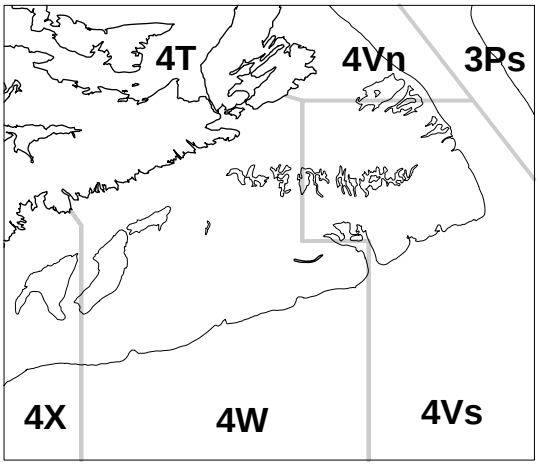


Bon Harriott
Scott & Scott 1988

SCOTIAN SHELF SKATE



Background

Most elasmobranch fisheries have followed a general pattern of high initial exploitation followed by a rapid collapse. It is intended that the developing skate fishery on the eastern Scotian Shelf does not follow this course. There are, however, many limitations to our knowledge of skate on the Scotian Shelf but recent research is increasing our information base. Winter skate flourish in the southern waters of Georges Bank, inner Bay of Fundy and are near their northern limit of distribution on the offshore banks of the eastern Scotian Shelf. This latter area is unique because it is the only region where thorny skate overlap with winter skate, the former being more abundant in northern waters. Length at 50% maturity for female winter skate occurs between 65 and 70 cm while thorny skate mature closer to a length of 50 cm. Recent preliminary ageing of winter skate suggests that the length at 50% maturity coincides with individuals 6-7 years old. Winter skate are the primary focus of the commercial fishery and constitute greater than 90% of the catch. Thorny skate occur as a by-catch in this fishery and only the largest individuals are retained. Historical information shows that skates consume considerable quantities of sand lance. Recent diet information indicates consumption of capelin. Skate predators have yet to be identified.

The Fishery

Landings (thousands of tonnes)

Year	1989	1990	1991	1992	1993	1994	1995	1996
TAC	-	-	-	-	-	2.0	1.6	1.6
Foreign	1.5	2.0	1.8	0.4	0.8	0.0	0.1	
Canada[1]	0.0	0.0	0.0	0.1	0.2	2.2	1.5	
Est. Cdn[2]	2.4	2.4	2.0	1.6	0.9	0.5	0.4	
TOTAL	4.0	4.5	3.9	2.1	1.9	2.8	2.0	

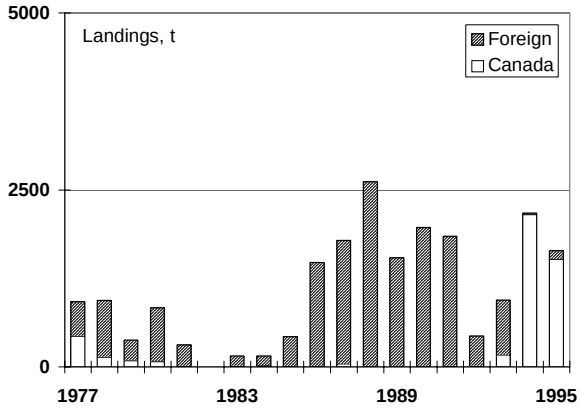
[1] Reported landings by Canadian vessels.

[2] Estimated removals based on by-catch from Canadian groundfish directed fisheries.

There has never been a regulated fishery for skates on the Scotian Shelf, however **landings** data exist since 1961. Canadian landings on the Scotian Shelf have generally been low, but are not reflective of total removals due to unlimited discards. Prior to 1977, reported foreign landings were high and are not considered reliable. After 1977, reported skate landings never exceeded 2,600t and were generally restricted to Division 4W.

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

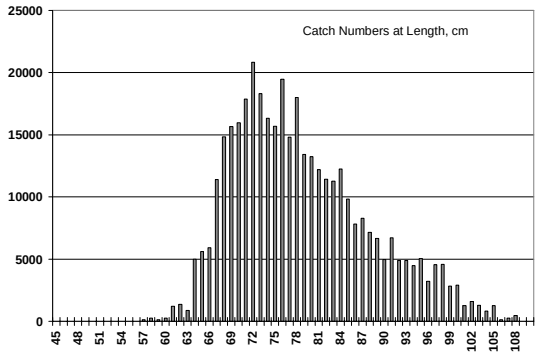
On peut se procurer une version française de ce rapport à l'adresse ci-dessus. September 1996



In 1994, a combination of closures of traditional groundfish fisheries on the Scotian Shelf and openings in the markets for skate wings resulted in the development of a directed Canadian skate fishery. Based on the 1985-94 average summer survey minimum trawlable biomass for all skate species in 4VsW (12,000t), a preliminary TAC of 1,200t was established with an additional 800t allocated to conduct joint industry/science surveys. The fishery landed 2,152t by the end of 1994. The 1995 directed fishery was regulated by a 1,600 TAC with an additional 20% by-catch allowed in the directed flatfish fishery. This was continued in 1996.

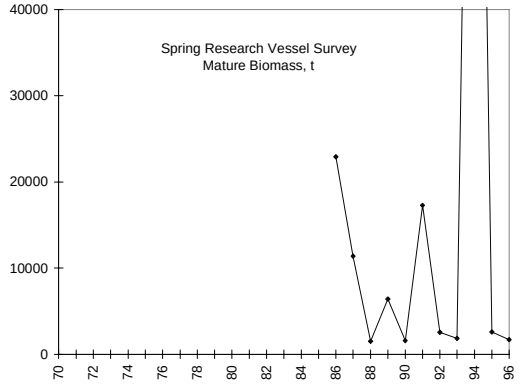
Observation of the directed fishery in 1996 revealed that greater than 90% of the catch was made up of winter skate and the remainder were thorny skate. The directed skate fishery is relatively clean with observed by-catch levels of other groundfish amounting to less than 0.2%. This situation is due to the use of large-mesh gear and the current depressed levels of traditional groundfish on the eastern Scotian Shelf. There are no restrictions on discarding skates in any fishery. Skates less than 60cm are normally discarded in the directed fishery. The occurrence of significant quantities of skates below this size in the 1994 directed fishery suggests that discard rates were in the order of 20 to 25%. In 1995, discard rates were reduced to 8 to 10%.

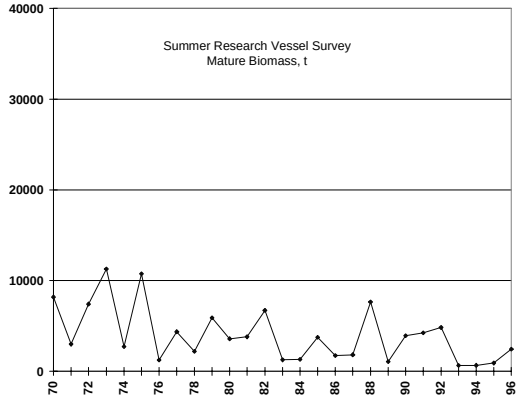
Commercial sampling of winter skates began in 1995 with the collection of 11 length frequency samples. Catches peaked at 70cm and declined steadily towards fish in excess of 100cm in length. The smallest sizes landed were near 60cm. The absence of skate below 60cm is probably the result of discarding and the use of large mesh (255-320mm) cod ends.



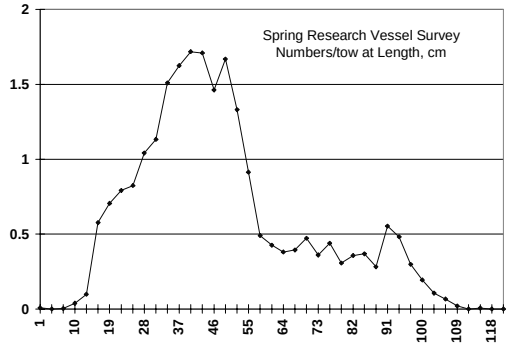
Resource Status

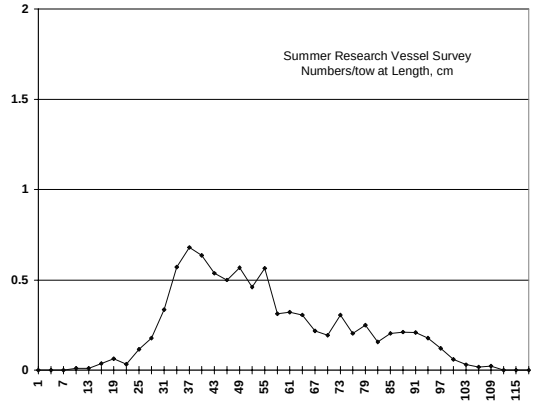
Because the skate fishery targets winter skate, the spring and summer survey **minimum trawlable biomass estimates** for this species alone were considered. The average total mature biomass (greater than 60cm.) from the spring survey for the 1986-95 period, excluding the anomalous high value from 1994, was 7,561t. The equivalent value from the summer survey was 3,000t. Neither survey series revealed any temporal trend in biomass since the early 1980s.





During 1986-95, a broad size range of winter skate was collected during the spring and summer surveys. Winter skate less than 60cm were more abundant in the spring surveys while abundance was similar between the two surveys at sizes exceeding 60cm. A modal size of 37cm was common to both surveys.





As part of the Conservation Harvesting Plan for skates established in 1994, industry agreed to conduct two **industry/science skate directed-surveys** in 4VsW. In 1994, an exploratory skate survey was initiated, with science designating the fishing locations and the use of 155mm mesh gear. In 1995, a random stratified survey design was used with 255mm mesh gear. In 1996, the gear reverted back to 155mm mesh in order to provide more complete sampling of the size range of the population. No further change is expected in future surveys.

A comparison of the relative abundance of winter and thorny skate in the two annual industry surveys and the two DFO research survey surveys in 1995 yielded similar results, with the exception of the summer survey. In the industry surveys and the spring research vessel survey, the abundance of winter skate exceeded that of thorny skate by up to 20-fold and 3-fold respectively. During the summer research vessel survey, the reverse situation occurred with the mean catch rate of thorny skate exceeding winter skate by a factor of seven. The cause of this changing relative abundance is unknown.

Outlook

The originally recommended harvest, based upon the biomass of all skate species, is no longer appropriate given that industry selectively harvests winter skates. Further, the biomass estimate was based on abundance of all size categories and industry is now selecting, through mesh size changes, the largest individuals in the population. Using the criterion of 10% of the mature biomass of only winter skates from spring and summer research vessel surveys as a basis for setting harvest levels, yields a range of 300 and 756t. This range is low relative to the current TAC of 1,600t (plus 20% by-catch in the flatfish fishery). However, it must be kept in mind that our knowledge of the resource is limited and that the survey may be underestimating the mature biomass. There is too much uncertainty in the information at this time to provide harvest advice.

The directed fishery is very localized with respect to the distributional range of the species, and occurs at its northern limit. There have been no declines in catch rates nor obvious changes in the length composition of the landings. While there may be localized depletion of winter skate in the fishing area, this should not result in serious declines of mature skate in the broader distributional range. Also, due to the restrictions on other groundfish fisheries in 4VW, present rates of discarding of winter skate are low compared to the past few decades. Therefore, it is considered that the experimental fishery should continue at a similar level of fishing effort in 1997 to increase our understanding of the resource and to provide the basis for improved future assessment and management.

For More Information

Contact:

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

TEL: (902) 426-4136
FAX: (902) 426-1506
E-mail: j_simon@bionet.bio.dfo.ca

References

Simon, J.E., and K.T. Frank. 1996. An assessment of the skate fishery in Division 4VsW - 1996. DFO Atl. Fish. Res. Doc. 96/105.