Wolffish in Divisions 2GHJ, 3KLNO, and Subdivisions 3Ps/3Pn

Background

The commercial wolffish in Newfoundland waters are made up of two different species; the spotted wolffish (A. minor) and the Atlantic (or striped) wolffish (Anarhichas lupus). A third species, Northern wolffish (A. denticulatus) which is not of commercial importance is also present in Newfoundland waters. All three species are found on both sides of the Atlantic Ocean. In the northwest Atlantic, they are distributed from Davis Strait to the Gulf of Maine.

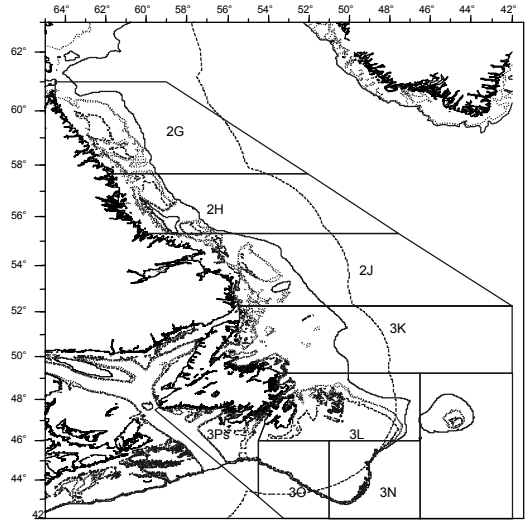
The spotted wolffish inhabits deep waters to beyond 475 m (260 fathoms) and temperatures of 3.1-4.0°C. The Atlantic wolffish is also found further south in shallower depths (100-350 m (55-191 fathoms)) and water temperatures as cold as 0.4°C. Tagging studies conducted on both species indicate some movement between deeper and shallower water by Atlantic wolffish although there is no evidence of long distance migration. None of the species form dense schools in Newfoundland waters.

Wolffish in Newfoundland waters, especially spotted wolffish, are presumed to grow slowly although information is limited. All three species can grow to lengths greater than 100 cm (39 in.).

Atlantic wolffish in Newfoundland waters spawn in September, and the early juvenile stage is spent close to the location of hatching. Information on spotted wolffish is more limited, but they appear to spawn in late autumn or early winter. Limited information suggests that early juvenile stages of all three species are semi-pelagic.

The food of wolffish includes a variety of bottom invertebrates as well as small amounts of fish.

Wolffish are taken as by-catch in various demersal fisheries around Newfoundland. Currently the catches of wolffish are unregulated.



Summary

- Since 1992 landings have been low relative to historic levels.
- Research vessel biomass estimates declined by 87-94% between the 1980-1984 and 1990-1994 periods.
- Both the area occupied and density of wolffish are greatly reduced relative to historic periods.
- Northern and spotted wolffish are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as threatened.

The Fishery

Catches of wolffish in Newfoundland waters (divisions 2GHJ3KLNO and subdivisions 3Ps/3Pn), that are generally considered to be taken as by-catch, ranged from 5000 to 7000 t between 1971 and 1975.

Landings (t)

Year	Avg. 90-96	1997	1998	1999	2000*	2001*
Canadian	289.9	157	155	315	369	160
Non-Canadian	619.4	575	455	0	0	0
Total	909.3	732	610	315	369	160

* 2000 and 2001 are provisional

Canadian catches of wolffish increased from 1600 t in 1978 to over 3000 t in 1983. Since 1983, Canadian catches have not exceeded 1500 t and have declined to 256 t in 1994. From 1985 to 1991, the majority of the catch was reported from the northernmost divisions and in particular Division 3L. Since 1992, catches of wolffish have not exceeded 1100 t. Since 1992, with the closure of many northern groundfish fisheries, the largest catches were reported for NAFO Subdivisions 3Ps/3Pn and Division 3K. Catches of wolffish prior to 1993 occurred primarily in otter trawl fisheries and in recent years, predominately in line trawl fisheries.

Non-Canadian catches of wolffish during the period 1971-1975 ranged from 3100 to 5300 t. Since 1992, non-Canadian catches have not exceeded 800 t.

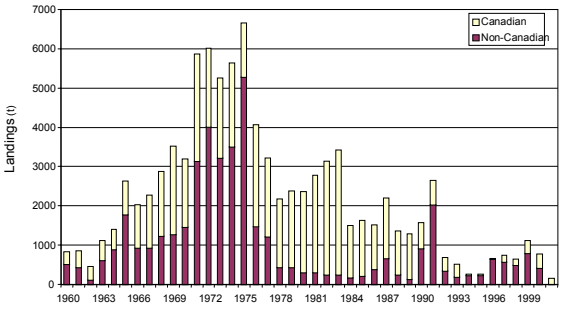


Figure 1: Wolffish landings as reported to NAFO. Canadian landings from 1985-2001 are from the Zonal Interchange Format (ZIF) data. ZIF data for 2000-01 are provisional.

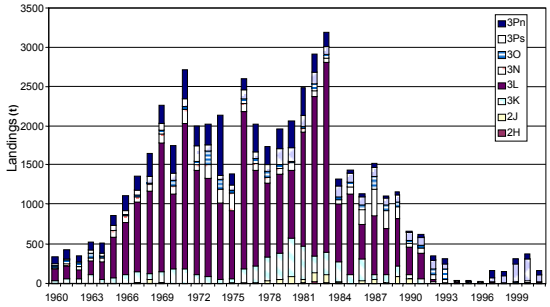


Figure 2: Canadian wolffish landings by division. Data from 1985 are from the ZIF data (2000, 2001 are provisional)

Resource Status

Information on the resource status of wolffish in Newfoundland waters is limited to data collected during the annual DFO research vessel surveys.

Between 1994 and 1995, there was a change in the survey gear catchability coincident with a change from an Engel to Campelen trawl and conversion factors are not available for these species.

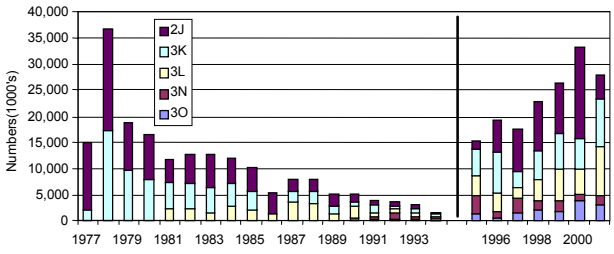


Figure 3: Atlantic wolffish, fall survey abundance.

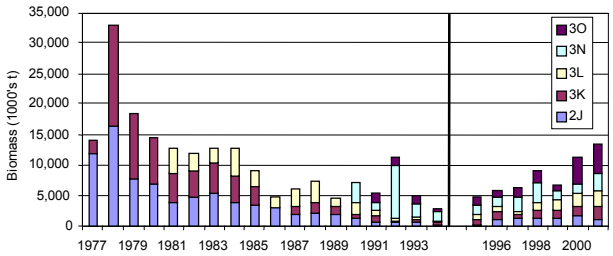


Figure 4: Atlantic wolffish, fall survey biomass.

The fall research vessel abundance estimates indicate that Atlantic and northern wolffish have declined from relatively high levels in the late 1970's to their relatively low levels in 1994. The decline in survey abundance for northern wolffish was less apparent from 1978-1984 than that observed for Atlantic wolffish, although the observed decline in 1994 exceeded that for Atlantic wolffish.

For both species, the greatest biomass reported in the survey estimates occurred in NAFO divisions 2J3K. Based on the survey data the biomass of northern wolffish in 1990-94 was only about 6% of that during 1980-84. Atlantic wolffish was only 11% based on comparisons of estimates from the same two periods.

Since 1995, the abundance of both northern and Atlantic wolffish have increased, the current level cannot be compared to the earlier time series due to the change in survey gear.

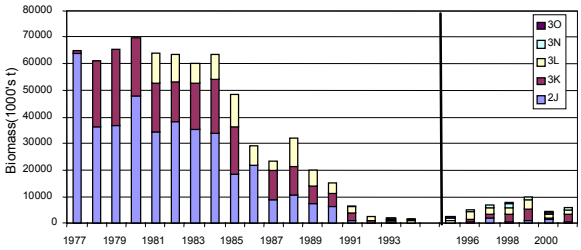


Figure 5: Northern wolffish, fall survey biomass.

Spotted wolffish abundance and biomass as indicated from the fall surveys peaked in 1982 then declined throughout the 1980's and early 1990's until 1994. Similar to the other two species of wolffish, comparing the average biomass of 1980-1984 in division 2J3K, spotted wolffish in NAFO divisions 2J3K declined to 13% in 1990-1994. Since 1995, the abundance of spotted wolffish has increased slightly, again the magnitude of the increase is independent.

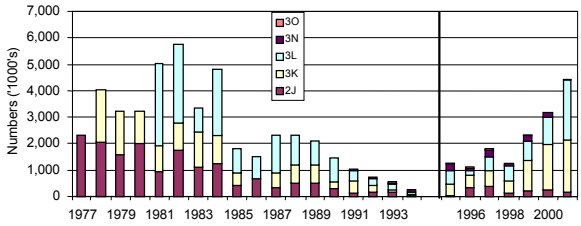


Figure 6: Spotted wolffish, fall survey abundance.

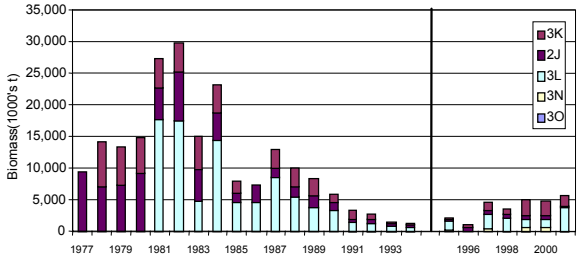


Figure 7: Spotted wolffish, fall survey biomass.

Length frequency data for Atlantic and spotted wolffish from the fall research surveys indicate that the number of mature fish (>55cm) has declined since the early 1980's. An increase in the numbers of small fish since 1995, in the

research surveys probably reflects recruitment into the population.

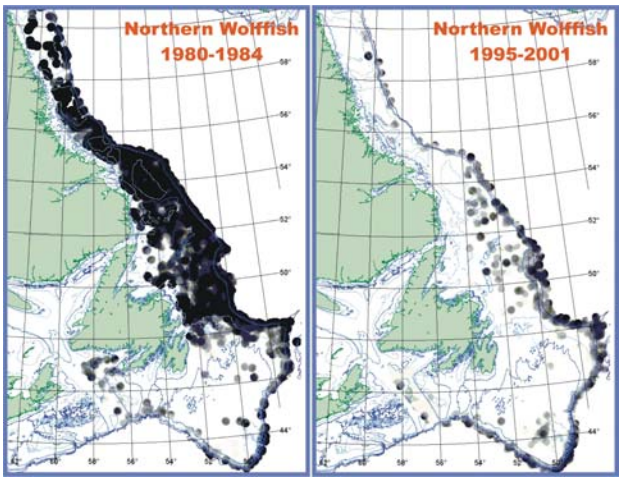


Figure 8: Distribution of Northern wolffish during two time periods, 1980-1984 (high abundance) and 1995-2001 (low abundance). Darker shades of gray indicate higher densities of fish. Within the above year groupings, each NAFO division (2GHJ3KLNOP) was surveyed at least once during the time period.

The distribution of northern wolffish from spring and fall research vessel survey data was previously (1980-1984) concentrated on the northeast Newfoundland and Labrador shelf and banks, south on the southeast and southwest slopes of the Grand Bank and along the Laurentian channel in NAFO subdivision 3Ps. In recent years (1995-2001), both the area occupied and density of northern wolffish have been at relatively low levels in NAFO divisions 2GH2J3KL.

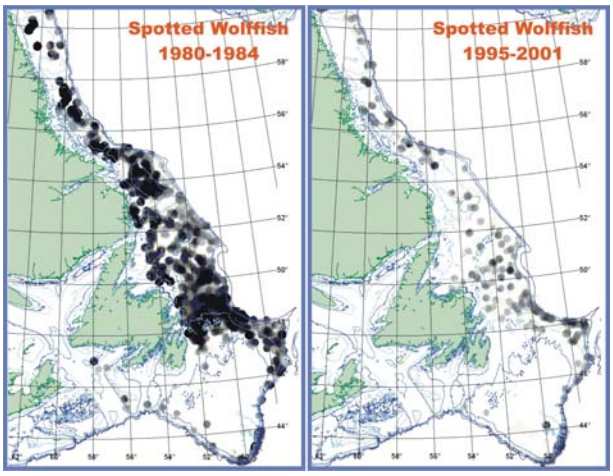


Figure 9: Distribution of Spotted wolffish during two time periods, 1980-1984 (high abundance) and 1995-2001 (low abundance). Darker shades of gray indicate higher densities of fish. Within the above year groupings, each NAFO division (2GHJ3KLNOP) was surveyed at least once during the time period.

Similar to the distribution of northern wolffish, spotted wolffish were concentrated on the northeast Newfoundland and Labrador shelf and banks, south on the southeast and southwest slopes of the Grand Bank during years of higher abundance. In recent years (1995-2001), both the area occupied and density of spotted wolffish have been at relatively low levels on the Newfoundland and Labrador shelves.

The distribution of Atlantic wolffish in periods of higher abundance was similar to that of Northern wolffish, with an additional concentration on the southern Grand Bank. In recent years (1994-2001), both the area occupied and density have been at relatively low levels in the northern part of the surveyed range; however, the distribution on the southern Grand Bank has remained relatively constant.

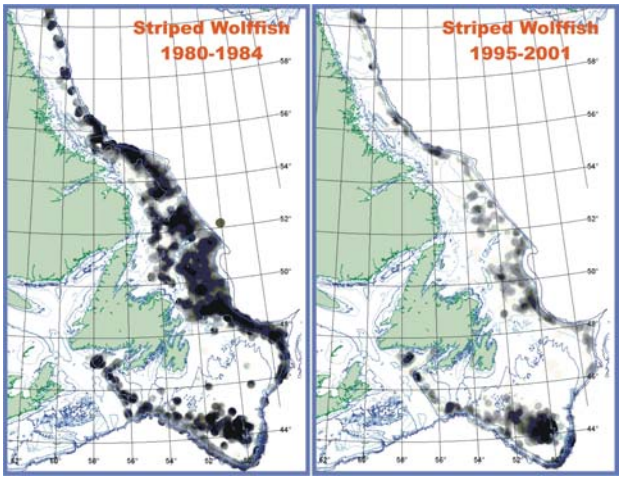


Figure 10: Distribution of Striped wolffish during two time periods, 1980-1984 (high abundance) and 1995-2001 (low abundance). Darker shades of gray indicate higher densities of fish. Within the above year groupings, each NAFO division (2GHJ3KLNOP) was surveyed at least once during the time period.

Sources of uncertainty

To date, there is a paucity of data concerning wolffish in Newfoundland and Labrador waters. Age, growth, reproduction, mortality, movements and stock structure data are not currently available.

Outlook

Research vessel estimates of abundance and biomass in the research area are low relative to historic levels. Furthermore, the areas historically occupied by the stocks have been reduced. A positive sign is the increased abundance observed in recent years. However, the current level cannot be compared to the earlier time series due to the change in survey gear.

Wolffish have historically been reported primarily as by-catch. Reported landings of wolffish are currently low relative to historic levels. At present there are no indications of interest in a directed fishery on these species. Extreme declines, of 87-94% of the 1980-1984 biomass estimates, observed in the research vessel survey, may be due to any combination of fishing and natural mortality.

For more Information

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References

Simpson, M. R., and D. W. Kulka. Status of three Wolffish speices (*Anarhichus lupus, A. minor and A. denticulatus*) in Newfoundland waters (NAFO Division 2GHJ3KLNOP). DFO Canadian Stock Assessment Secretariat Res. Doc. 02/078.

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