

ASMFC Spiny Dogfish Technical Committee Meeting Summary

The Spiny Dogfish Technical Committee met with the Mid-Atlantic and New England Fishery Management Councils' Spiny Dogfish Monitoring Committee on September 24, 2004 in Manchester, New Hampshire to set the specifications for the 2005-2006 fishing year. The Monitoring and Technical Committees reviewed the most recent information on the status of the stock prior to recommending the annual quota and possession limits for the 2005-2006 fishing year.

Attendees

Technical Committee Members Present: Chris Powell (RI DEM), Matt Gates (CT DEP), Alexei Sharov (MD DNR), Jack Musick (VIMS), Chris Batsavage (NC DMF), Wilson Laney (US FWS), and Paul Rago (NEFSC).

Others Present: Eric Dolin (NERO), Jim Armstrong (MAFMC), Megan Gamble (ASMFC), Chris Hickman (NC Industry), and David Pierce (MA DMF).

Review of the Status of the Stock

In 2003, the commercial fishery landed 1,170 mt (2,579,422 pounds) of spiny dogfish. In 2002, the commercial fishery landed 2,195 mt (4,839,097 pounds), almost twice the amount landed in 2003. The decreased commercial landings are proof that the management measures in state and federal waters were adhered to and effective. The 2003 commercial landings came in under the quota due to the lack of processing capacity. NEFSC and MA DMF port sampling reveals about 98% of the landings were females, which is consistent with the past several years.

In 2003, Canadian and US landings were comparable with 1,270 mt (2,799,842 pounds) landed by Canadian fishermen. Canadian landings were also less than the 2002 landings, 3,400 mt (7,495,640 pounds). It was anticipated that Canadian fishermen would ship their landings, fulfilling their quota, to the US for processing.

Massachusetts and New Jersey were the primary source of recreational landings. The sampling intensity by the MRFSS program and number of intercepts are influential to the number of reported recreational catch. There are relatively few spiny dogfish measured by the MRFSS survey. The MRFSS reports significantly lower average weights than the average weights used in the SARC (2.5 kg v. 1.7 kg on average). The MRFSS intercepts for spiny dogfish were negligible with two dogfish measured in 2000, six in 2001, 27 in 2002 and 18 in 2003.

The recreational discard mortality is unknown, so the assessment assumes 100% discard mortality. When encountered by head boats, spiny dogfish are deep hooked and treated poorly. In the assessment spiny dogfish are counted as discards because dogfish are not targeted by size or sex. Most of the dogfish sampled from the recreational fishery are small fish (67 cm), but the number of samples is very small and may not reflect the total recreational catch since dogfish are not targeted by size or sex. The estimated total recreational catch of spiny dogfish in 2003 was 3,027 mt or 6,673,324 pounds (using numbers of fish and the estimated weight from the 37th SARC).

The size composition of commercial landings changed over time. As the fishery progressed the number of females landed above 80 cm declined. As the population declined, the size composition landed was smaller. Now that the fishery is regulated and landings are fewer, the size composition of the catch is increasing. The size composition of the commercial landings is a reflection of gear selectivity and is not correlated with the sizes appearing in the NEFSC trawl survey. Current landings are at about the same magnitude as 1988 landings.

The total removals, landings and dead discards, used to estimate the 2003 fishing mortality rate was 11,429 mt (25.2 million pounds). Dogfish are caught in almost every gear used, but are kept by few. As a result, estimating discards is difficult. In the early part of the time series, there was no commercial fishery, but discards were high and population was still increasing. With the high level of discards and increasing population size, dogfish probably has a high survivability rate. The court mandated increase in observer trips has increased the observation of spiny dogfish discards. Dead discards of spiny dogfish from the commercial fishery in 2003 were estimated at 5,962 mt or 13,143,825 pounds. Dead discards have been relatively constant for the past several years and are on the same level as total landings (US and Canadian commercial landings and total recreational catch A+B1+B2).

Total Spiny Dogfish Removals by Calendar Year for 2003 and 2002.

Commercial discards are the proportion assumed dead. All of the recreational catch is assumed to have 100% discard mortality. Canadian commercial landings are from eastern Canada only.

2003 Total Spiny Dogfish Removals			
United States		metric tons	pounds
Commercial	Landings	1,170	2,579,422
	Discards	5,962	13,143,825
Recreational	Catch	3,027	6,673,324
Canada			
Commercial	Landings	1,270	2,799,842
TOTAL REMOVALS		11,429	25,196,413

2002 Total Spiny Dogfish Removals			
United States		metric tons	pounds
Commercial	Landings	2,195	4,839,097
	Discards	5,658	12,473,627
Recreational	Catch	1,878	4,140,239
Canada			
Commercial	Landings	3,400	7,495,640
TOTAL REMOVALS		13,131	28,948,603

The spring trawl survey is used to evaluate the population abundance because it produces a strong trend. The fall survey trend is poor because most of the resource is in Canadian waters. Overall, the spring survey shows a decline in the average weight per tow. However, the total size of the spiny dogfish population has not changed as dramatically as the abundance of the reproductive females.

The three year moving average of total stock biomass (males and females) decreased from 415,533 mt in 2001-2003 to 388,767 mt in 2002-2004 (Figure 1). The mature female biomass continues to decrease from 65,466 mt in 2001-2003 to 60,033 mt in 2002-2004 (Figure 2). The abundance of the intermediate sizes (36 – 79 cm) continues to be high (310,633 mt), contributing significantly to the overall abundance of the population (Figure 3). There are a lot of dogfish around, but the length-frequency is shifted toward the smaller fish. Immature females also show a decline in abundance. The 36-79 cm males include older, mature fish, which is why the declining trend for males in this size class is not as significant as the trend in the females. The declining trend in the overall stock is attributed to the removal of the larger animals and seven years of low pup production.

The pup abundance has increased for the first time in eight years, showing possible evidence of improved recruitment (Figure 4). In 2001-2003, the pup abundance estimate was 153 mt, whereas in 2002-2004 the pup abundance was 653 mt. The behavior of spiny dogfish might contribute to the selectivity of the survey and could influence the likelihood of being caught by the survey. Juvenile dogfish do not migrate to the bottom; therefore juveniles are not as vulnerable to being caught by the trawl as the larger animals. It may be possible to ascertain where the juveniles reside by studying their diet.

In an attempt to explain the abundance of dogfish encountered by commercial and recreational fishermen, the NEFSC inshore sample sites were examined in comparison to the abundance of dogfish in the offshore sample sites. The inshore sample sites do include state waters. From 1998-2002, there is a high concentration of large spiny dogfish in the Channel and Massachusetts Bay. Reviewing the sample sites further back in the time series shows a similar trend during the 1983 - 1987 time period. The NEFSC trawl survey does not consistently sample the inshore strata. The spring and fall trawl survey data shows a greater proportion of the population in the inshore area since 2000. There needs to be more research on the reason for a shift in the population's distribution. One possible explanation is the shift is in response to an environmental signal such as a change in water temperature.

Additionally, the inshore strata show larger females than in the offshore strata. The males do not show as significant a difference in the sizes in the inshore strata versus the offshore strata. The fall survey does not exhibit as strong a signal in the size differences between inshore and offshore as the spring survey.

Overfishing is not occurring on the spiny dogfish population. The fishing mortality rate in 2003 ($F=0.044$) is below the threshold (0.11) and target (0.08), but F_{rebuild} was not maintained at 0.03, as required in the interstate fishery management plan. The fishing mortality estimate accounts for the uncertainty in the discard estimate and population biomass. The female spawning stock biomass continues to be overfished with the female SSB only 32% of the target. The survey shows minimal evidence of increased recruitment. The overall stock size in 2004 appears to be lower than in 2003, but some of the decline may be attributed to a larger portion of the population inhabiting the inshore strata.

Discussion

There is only one dogfish processor left in Massachusetts (AML of New Bedford). The processor remains in business because he wants to maintain a presence in the overseas market for dogfish. There are many people landing small quantities of spiny dogfish, so a truck can easily be filled at the Gloucester or New Bedford dock.

The increase in recruitment should encourage status quo in the management measures. The uncertainty of the discard mortality rate and low female spawning stock biomass are reasons to support the maintenance of the current management measures. The directed fishery is the one factor most relevant to the reproductive impact on the stock because the directed fishery targets mature females. While discard mortality is high, it probably is not the primary factor affecting the rebuilding of the female spawning stock biomass. Therefore, the greatest benefit to stock restoration would be to maintain the commercial harvest at its present level, rather than attempting to convert commercial discards into commercial landings.

The Technical Committee spent quite a bit of time discussing the possibility of changing the trip limits. In Steinbeck's updated analysis of the spiny dogfish trip limits, a 1,500 pound trip limit would only be profitable for two gear types (gill net and otter trawls) and even then it would be a profit of only \$24-37 per trip. As a result, there is a low probability a 1,500 pound trip limit will induce directed fishing. For most gears, directed fishing on dogfish will not cover the cost of the trip.

The Technical Committee supports the lower trip limit because fishermen's response to the trip limit is not likely to increase the total landings. The Technical Committee supports the idea that the quota is meant to land spiny dogfish bycatch only. Additionally, the dogfish that are landed under the smaller trip limit are the large females, which is the portion of the population the FMP is trying to protect. If a higher trip limit is selected, a greater number of large females are removed from the population. The Steinbeck analysis does not consider all of the possible gill net vessels that could land spiny dogfish, rather it only considers the gill net vessels that have landed spiny dogfish. If a higher trip limit was implemented, more vessels might land dogfish and more large females would be landed because the processors do not accept smaller sizes. If high grading does occur, the mortality will increase.

If the trip limits act to increase the overall landings, then the trip limit is counterproductive to the other measures in the management plan. The point of the trip limit for spiny dogfish is to discourage directed fishing, but allow the retention of small amounts of incidentally caught spiny dogfish. There will not be any massive changes in recruitment because the size of the mature females has not increased. The small mature females in the population are unable to produce as many pups as large females.

Recommendation for the FY2004-2005 Specifications

For the 2005-2006 fishing year, the Technical Committee unanimously recommended:

Management should maintain status quo management measures for the 2005-2006 fishing year.

Quota = 4 million pounds quota and is split between two periods

**Period 1 (May 1 – October 31): 57.9% of quota = 2,316,000 pounds; 600
pound trip limit**

**Period 2 (November 1 – April 30): 42.1% of quota = 1,684,000 pounds; 300
pound trip limit**

The Councils' Spiny Dogfish Monitoring Committee also recommended status quo management measures for the federal fishery with a 4 million pound quota and trip limits of 600 pounds in Period 1 and 300 pounds in Period 2. The quota recommended by the Monitoring Committee is intended to serve as a cap on landings rather than a target. The quota should not be achieved if directed fishing is eliminated in state and federal waters.

Figure 1. Total Stock Biomass, all sizes and sexes, in metric tons, 1968-2004.

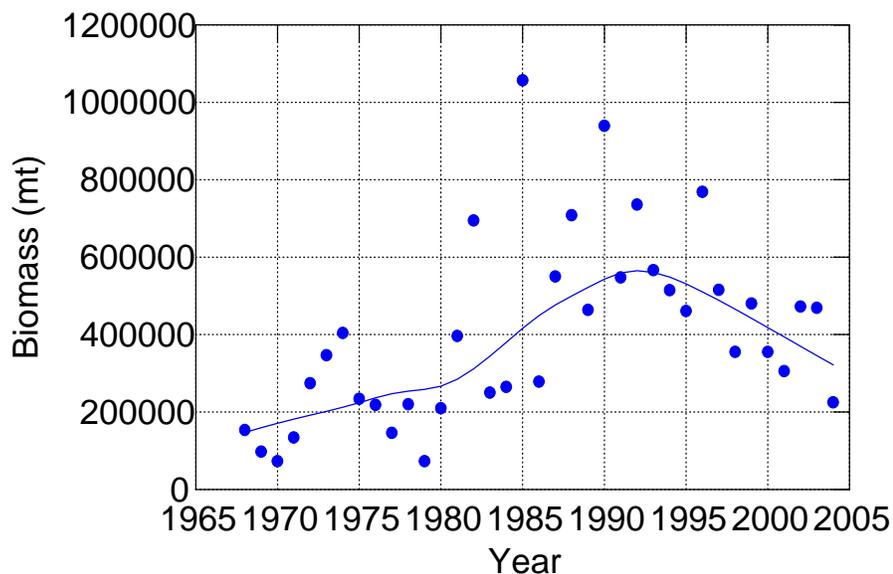


Figure 2. Female Spawning Stock Abundance (>= 80 cm) in metric tons, 1980-2004.

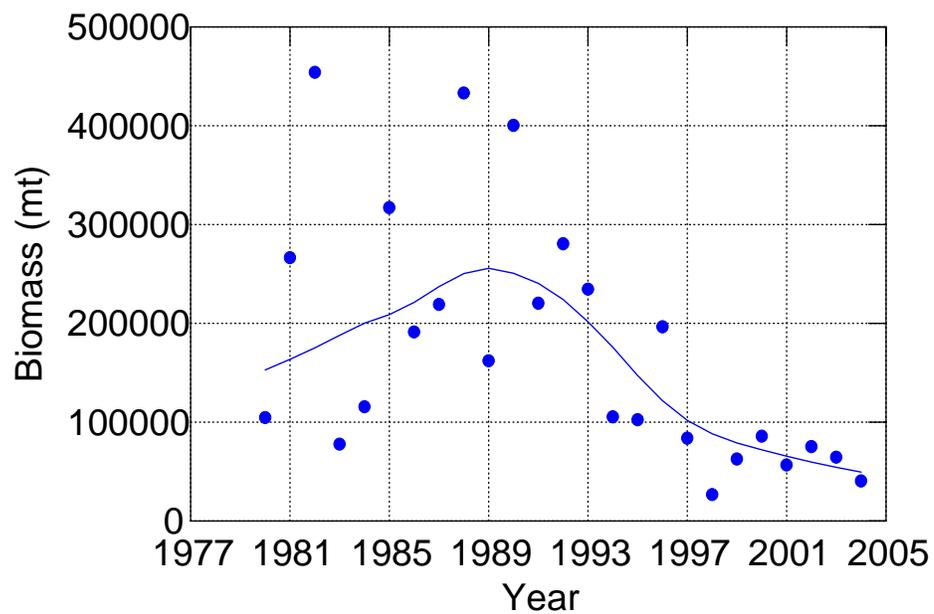


Figure 3. Abundance of Intermediate-Sized Spiny Dogfish (36-79cm) in metric tons.

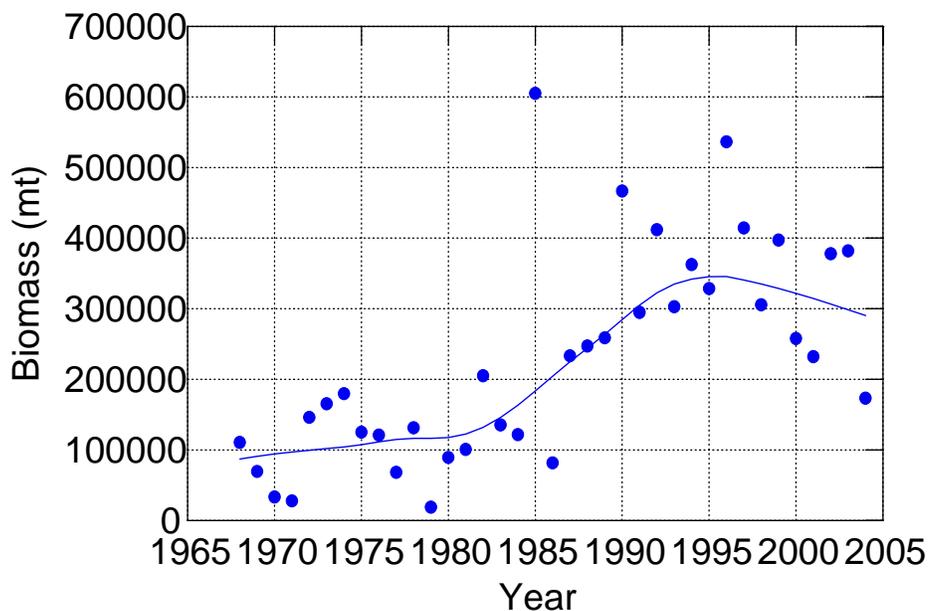


Figure 4. Swept area biomass of pups (< 35 cm) in metric tons, 1968-2004.

