

**Atlantic States Marine Fisheries Commission &
Mid-Atlantic Fishery Management Council**

Joint Spiny Dogfish Technical Committee & Monitoring Committee Meeting

Providence, RI
September 22, 2005

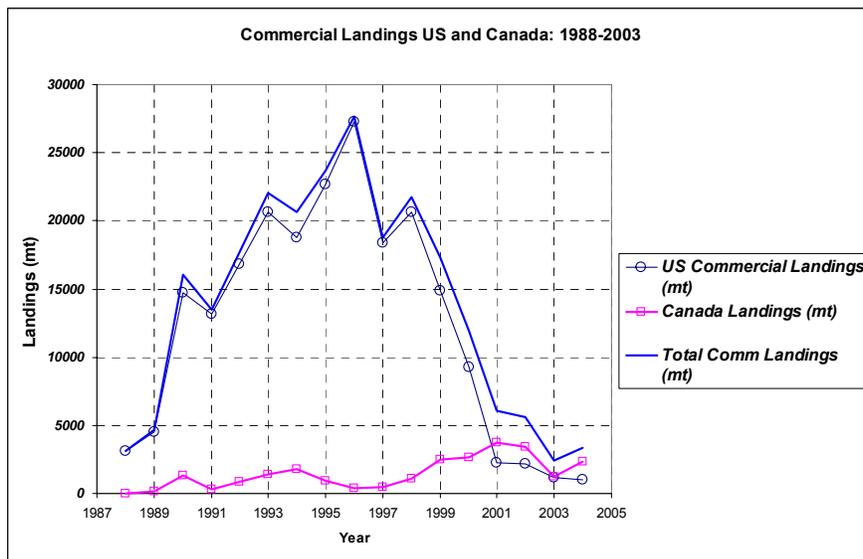
Present: Ruth Christiansen (ASMFC), Jim Armstrong (MAFMC), Chris Batsavage (NCDMF), Wilson Laney (FWS SAFCO), Jack Music (VIMS), Chris Powell (RIDMF), Paul Rago (NMFS NEFSC), Mike Luisi (MDDNR), Eric Dolan (NMFS NERO), and Clare McBane (NHFG).

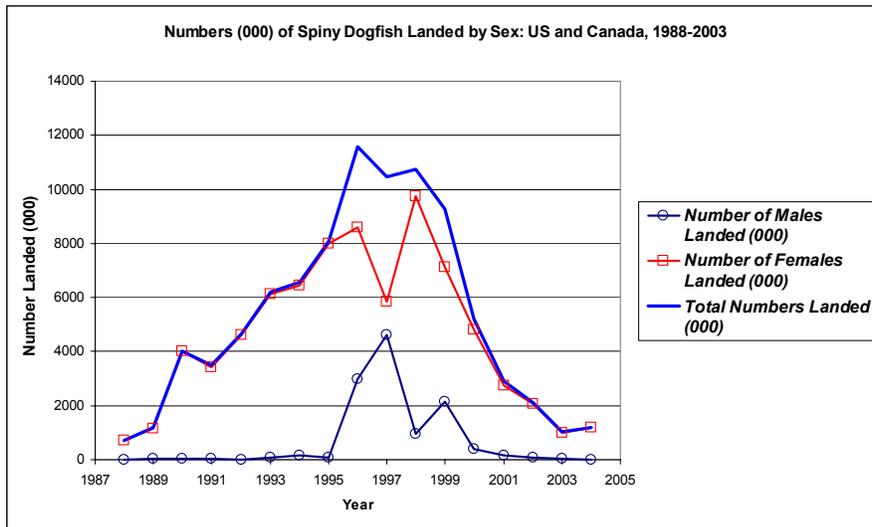
Others: Whitney Grogan (NCDMF), Ben Freitas (Brown University), Melissa Sanderson (Cape Cod Commercial Hook and Line Fishermens' Association) and Paul Parker (Cape Cod Commercial Hook and Line Fishermens' Association)

The purpose of this meeting was to review updated information on the status of the spiny dogfish stock and to recommend management measures consistent with achieving the target fishing mortality rate in the upcoming 2006 fishing year.

Review and Update on the Status of the Stock

US commercial landings of spiny dogfish for 2004 were 980 mt (approximately 2 million pounds). In 2003, the commercial fishery landed 1,170 mt (approximately 2.5 million pounds). Total landings are about 99 percent female. The average size of females landed is increasing over time, primarily due to a shift in fisheries (more gill net and hook, less trawl). This is consistent with the past several years, except during the late 1990's. The ratio of the total landings removed to numbers removed show that the numbers of females landed increased about 16-fold, indicating that the average size greatly decreased. Most of the damage done, in terms of removing large females, was done in the early 1990's.





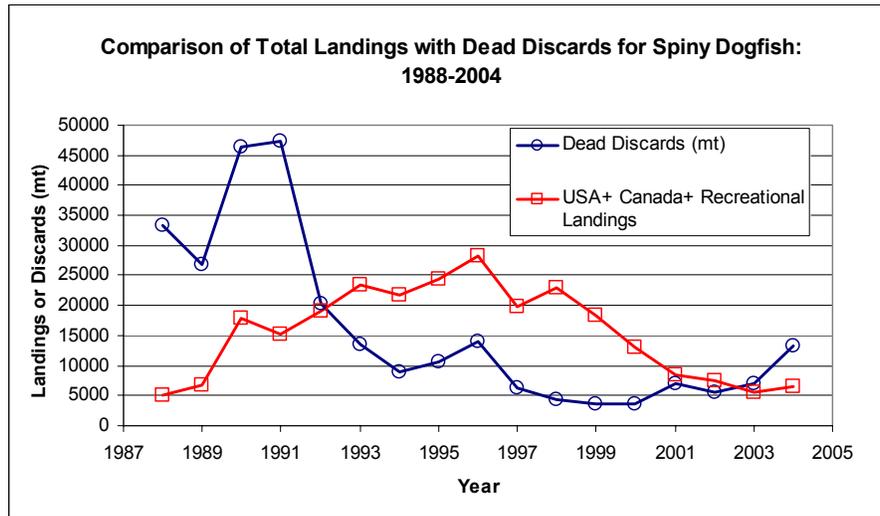
A range of total removal estimates will be used to calculate the likely range for fishing mortality in 2004. At this time, preliminary estimates suggest that overfishing was not occurring in 2004; however, F may be about twice as high as anticipated ($2x$ as high as F_{target} (.03)), under the present level of regulation. Spiny dogfish are scheduled for a full benchmark assessment in June of 2006.

Due to high inter-year variability in the NEFSC spring survey's catches of spiny dogfish, smoothed estimates of biomass are used to characterize population trends. The latest three year moving average of total stock biomass (2003-2005; 835 million pounds) declined slightly compared to the 2002-2004 value (857 million pounds). The moving average of mature female biomass declined from 132 to 118 million pounds. The survey-based estimate of pup biomass which, at 1,560 mt (3.4 million pounds) last year, showed a twelve-fold increase compared to the previous seven years, dropped to about 690 mt (1.5 million pounds), slightly less than half of last year's estimate. The three-year moving average of pup biomass shows an increasing trend, but is still well below pup biomass estimates in the 1980s.

The spiny dogfish fishery escalated in the early 1990s. During this time, Canadian landings were historically quite low. Canadian landings began to increase in 1998 as US regulations were implemented. These landings dropped slightly in 2002 and 2003, but are back up again in 2004. In 2004, Canadian commercial landings totaled 2336 mt (approximately 5 million pounds). Part of this is due to the Canadian quota. Another part is due to a 700-ton research fishery for acquiring biological data and doing some radiometric aging. It was indicated that the Canadians are going to use spiny dogfish from this year and next for scientific purposes, taking 2500 mt (approximately 5.5 million pounds) each year for research.

Discarding in the commercial industry is pervasive. Dead discards from US commercial fisheries were estimated to be between 6,400 to 13,285 mt (14.1 and 29.3 million pounds) depending on the assumed discard mortality by gear type. Much of the estimated commercial discard amount came from the mid water trawl fishery for Atlantic herring. Based on experience with other species, like haddock, in the herring fishery, it is hard to characterize the actual discards. Many of the bigger fish are screened out at the herring processing plants. As with

estimates for recreational discard rates, the important factor for estimating discards is the projected mortality rates. Assumptions for mortality in each fishery were reviewed; trawl mortality is likely higher due to compression of the fish in the tow. If the catches are light, the dogfish are robust. A number of studies have been proposed to address this issue, which is a critical part of the spiny dogfish assessment.

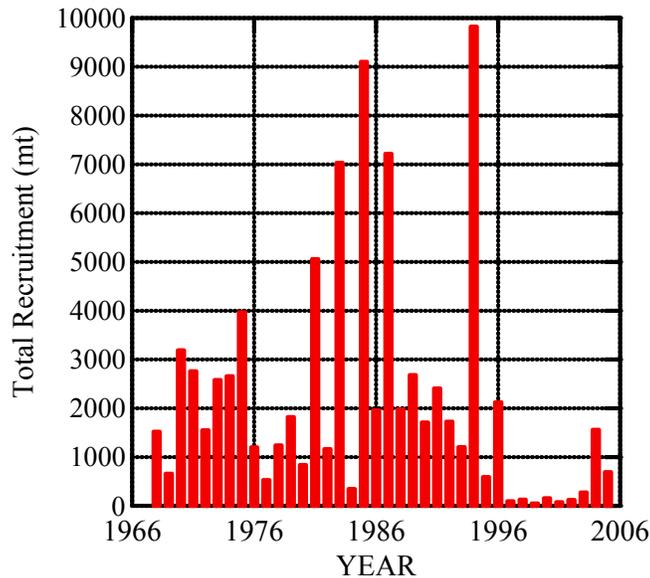


Recreational landings of spiny dogfish increased from a very low number in 2000 to a high value of 81,972 animals in 2002. For 2004, recreational landings were estimated at 42,149 animals. The range of estimated total recreational removal values is dependent upon which combinations of discard mortality and mean weight is assumed (from MRFSS and from SARC 37). The latest stock assessment assumes a 100% discard mortality rate in the recreational fishery. US recreational removals for 2004 ranged from 819 mt (1.8 million pounds) to 3,325 mt (7.3 million pounds). These variable numbers are reflective of a low sample size in the MRFSS survey. The sampling intensity by the MRFSS program and number of intercepts are influential to the number of reported recreational catch. Some smooth dogfish may be inadvertently included in the landings estimates for spiny dogfish. It was suggested that looking at landings by date and area would help to clear these errors.

Recruitment data indicates that smaller dogfish are clearly concentrated offshore at the shelf break. A small increase in biomass estimates was observed in 2005. Historically low recruitment is important in terms of recovery projections that have been done. The sex ratio for spiny dogfish at birth is about 1:1 through the 60 cm range. The sex ratio diverges and becomes more male-dominated at around 80 cm. The females pass through that stage and continue to grow. Above 90 cm, the sex ratio is highly skewed toward females. Looking at the length frequency by sex, the male pattern has stayed about the same, whereas the female curve shows a progressive change. The pre-fishery condition for the females had a higher abundance of fish throughout the size range, but the directed fishery on the mature females and low pup recruitment resulted in a truncated length frequency. Missing pups, from the period 1997 through 2003, clearly shows in the biomass data. While the spiny dogfish stock appears to have

oscillations, recovery level will not be reached at any time in the near future. The absence of pups in recent years is reflected in all biomass projection scenarios by a drop, followed by a rise.

Estimated Recruitment of Spiny Dogfish, <36 cm, Spring Survey, 1968-2005



There are many reports of high densities of spiny dogfish and mismatches between fishermen perceptions and actuality. The perception that there are numerous amounts of dogfish is due to their distribution inshore, which is evident from the trawl survey data. The inshore densities are the very highest in the dataset. There is an absence of dogfish in the central part of the basin, off Massachusetts, with a high concentration in Vineyard Sound and other areas. This is one reason there is a mismatch between the assessment and fishermen perceptions. The fraction of the population in inshore waters does appear to have increased in recent years. During the fall NEFSC survey, a much higher proportion of the stock was found inshore, which is consistent with reports of high density from the fisherman. Larger females tend to be inshore in spring, as well as in the fall. An important question centers on what environmental variables (i.e., temperature, salinity) are causing this observed distribution.

Feasibility of Male-Only Fishery

At the request of the National Fishermen's Association, the Technical Committee discussed the feasibility of allowing for a male-only fishery. Dogfish tend to cluster by size and sex. Looking at historical data reveals that small-sized tows tend to be 50:50. As the fish get larger, there tends to be a greater proportion of male-only schools. Similarly, there are also large clusters of female-only schools. A definite separation of males and females occurs. These data were used to analyze the proportion of schools, which may have exploitable dogfish.

In the earlier period of the fishery, more schools were purely female. That number has dropped. Pure male schools are less common, although they have been increasing. In theory, a school of

dogfish could be checked to see if it was harvestable, based on the sex ratio. Males produce less fish; therefore, many more fish may have to be sorted through in order to get the larger males. As such, there would be an associated incurred cost in terms of mortality of females. The analysis suggests that a male-only fishery would not be better in protecting the female portion of the stock. There may be an increase in male yield, but at a cost in terms of female mortality (conditional on the assumed mortality rates for specific gear types). If mortality rates are lower than assumed, then a male-only fishery may be more feasible.

Efforts to rebuild the SSB for spiny dogfish are doing nothing to address the skewed sex ratio resulting from prosecution of the fishery. Determining where male-only schools might be, thereby targeting those schools, is a testable concept. It was noted that some fishermen have developed sorting tables to segregate females. It may be possible to do the same thing for males so that the females could be kept wet and quickly put back in the water. Tests would need to be conducted to see what the associated discard mortality was and to see if it was worth the cost of fishing to conduct such a fishery.

Recommendations for the FY2005-2006 Specifications

Commercial discards of spiny dogfish are up, given the increase seen in the Atlantic herring mid water trawl fishery (along with mackerel and squid). It was noted, however, that the precision of such discard estimates is uncertain given the limited number of observations. Recreational catch appears to be up as well, even though exact numbers are not solid. As such, rather than continuing to have an annual quota for spiny dogfish, an annual bycatch allowance (lower than the previous quota has been) was discussed. For previous years a dogfish cap has been in place, but observed landings have been consistently less. If the intent of management is to continue discouraging the targeting of large female dogfish, a more reasonable/appropriate cap should be considered. Setting recreational limits on an allowable amount of spiny dogfish for harvest was discussed; however, the current Interstate FMP does not outline any specific recreational management measures. To impose a recreational limit on spiny dogfish was considered a controversial issue.

Eliminating the split trip limit for spiny dogfish was discussed. Currently, because there is no directed fishery, there are more trips keeping dogfish in Period 1 than in Period 2. With a constant limit, the distribution will likely be more equitable. A consistent limit of 500 was suggested. Changing it to a constant 600 pounds goes against not liberalizing the management policy. There was some concern with regard to cutting back the trip limit in the first period and liberalizing it in the second half, especially in view of emerging fisheries, the recreational fishery, as well as the discards in herring, mackerel and squid industries. In addition, there are a few fishermen who use hook and line to take the 600 pounds allotted to them daily. There was some indication that increasing the trip limit would be beneficial to the few boats targeting spiny dogfish since they are targeting them at the lower level and that increasing the trip limit wouldn't automatically result in an increase in mortality. It was noted that in North Carolina, the landings there are primarily large females; therefore, if the trip limits are changed (increased), it would likely result in an increase in the landings of large females. It is recognized that the whole purpose of trip limits is to discourage a directed fishery; however, there may be a range where

some economic benefit could be derived by raising the limit. Given that the status of the stock has remained about the same, the argument was made that there is no really good reason to change the status quo; however, the human behavior dimension of the spiny dogfish fishery was acknowledged, since what is not taken by the U.S, the Canadians are going to take.

Bycatch of spiny dogfish is a problem and reduction is going to be difficult. If the sources of bycatch mortality are ranked, commercial discarding is at the top. For consideration by management, it was suggested that a hard bycatch TAC be placed on the Atlantic herring fishery. It was noted that if the herring industry were shut down when they hit the hard TAC, they would have an incentive to avoid spiny dogfish. In order to enforce a hard dogfish TAC, monitoring was suggested so that the herring industry may be closed when the poundage of dogfish is landed. It was noted that herring has traditionally had a low bycatch, but that bycatch has increased because the gear being used to catch herring has changed to pair trawls. In the groundfish fishery, a couple of bad tows (with large amounts of bycatch) can shut down the fishery. The groundfish industry does extrapolations with regard to the amount of bycatch being harvested and it was suggested that the Atlantic herring industry should be consistent with these practices already in place. It was acknowledged that the focus shouldn't be just on herring, but any emerging fishery that is having an impact on the spiny dogfish rebuilding plan.

With regard to a male-only spiny dogfish fishery, it was felt that a research set-aside would be justified in order to test the feasibility. It was argued that by allowing for a research set-aside, important data on the status of the spiny dogfish stock would be ignored. Allowing for any research would likely result in an increase in female mortality. While the volume of males is high right now, possibly allowing for an increased tolerance in fishing pressure, encountering male-only aggregations is unlikely and targeting males is likely to kill more females. In addition, males display the same hole in age structure as did the females. If the quota/ bycatch cap was going to be reduced from 4 million pounds, it was suggested that a portion of this could be reserved for a set-aside. Any research set-aside proposal would have to undergo thorough review and even if the opportunity was there, no one may apply for it. It was noted that setting some portion of that aside for a research set-aside would not likely result in any increase in landings. It was argued that because the volume of fish required for such a fishery to be successful would be large, there would be no benefit to the stock seen. It was noted that one alternative worth exploring would be to ask how much economic incentive would be needed for such a fishery to be viable. A paper exercise could be preformed using sex ratio data contained in the NEFSC database to document the economic feasibility of such a fishery. Allowing for an experimental research set-aside would serve to demonstrate the economics as well.

Final Recommendations for the FY2005-2006 Specifications

With regard to the upcoming fishing year, a target of $F=0.08$ is specified in the Interstate FMP. This target, however, is (was) based on the expectation that mature female biomass would recover to 90 percent SSB_{max} by 2003. On the other hand, a target of $F=0.03$ ($F_{rebuild}$) was recommended by the 37th SAW based on the 2003 stock assessment, which showed mature female biomass in 2003 at around 30 percent of SSB_{max} . Because the information presented to the Technical Committee indicated no improvement in stock status, the Technical Committee

could find no biological justification for deviating from the advice of the 37th SARC. Accordingly, the Committee recommends management measures for the upcoming fishing year that are consistent with rebuilding the biomass of mature female spiny dogfish.

For the 2006-2007 fishing year, the Technical Committee recommends:

- **Management should adopt a bycatch allowance cap (quota) of 2.0 million pounds to be divided between the periods in accordance with the Interstate FMP (57.9 percent or 1,158,000 pounds to Period 1 and 42.1 percent or 842,000 pounds to Period 2).**

The 2004 fishing year (May 2004 - Apr 2005) was the first complete fishing year in which the highly restrictive trip limits were maintained in both state and Federal waters. Under these conditions, US commercial landings of spiny dogfish were less than 1.5 million pounds. Given this outcome, the majority of the Committee felt that a 2.0 million pound cap on bycatch would adequately allow for the retention of incidentally caught dogfish while maintaining the closure on the directed fishing.

- **Management should maintain the status quo of 600/300 pound trip limits in Periods 1 and 2, respectively.**

The majority of the Technical Committee felt that because status quo trip limits have been effective in eliminating the directed fishery, there would be no added benefit in deviating from these trip limits.

- **Management should allow the bycatch allowance cap and trip limits above to be applied to the 2006-2008 fishing years (multi-year specifications). The cap and trip limits shall be reconsidered in the event that significant changes in stock status occur during the multi-year specification timeframe.**

Currently, Addendum 1 to the Interstate Spiny Dogfish FMP is under review by the Spiny Dogfish and Coastal Sharks Management Board. If implemented, the Addendum would allow the Board to specify management measures up to five years. Implementation of Addendum 1 is anticipated prior to the start of the 2006 fishing year. As such, the Management Board could specify multi-year management measures this year, in anticipation of implementation.

The recovery trajectory is expected to be rather gradual under the most conservative management regime. As such, the Technical Committee does not anticipate needing to adjust the cap and trip limits upward over the next three fishing years.

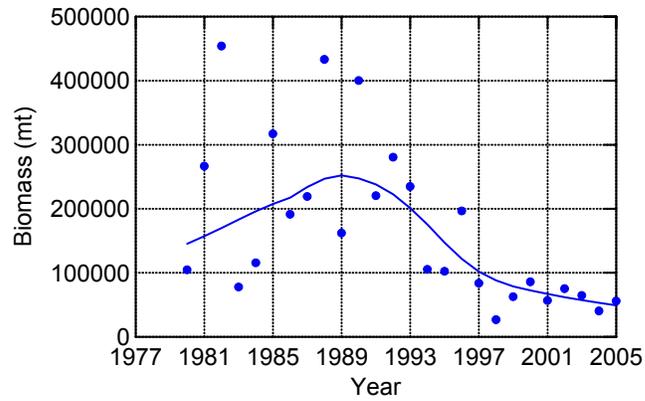
- **Management should allow an experimental fishery permit to be applied for by any fisherman interested in exploring alternative fishing practices that would benefit fishermen while not threatening the recovery of the female spawning stock.**

The Committee is strongly non-supportive of the immediate implementation of a male-only fishery because of concerns that directed fishing would develop and jeopardize recovery of mature female biomass.

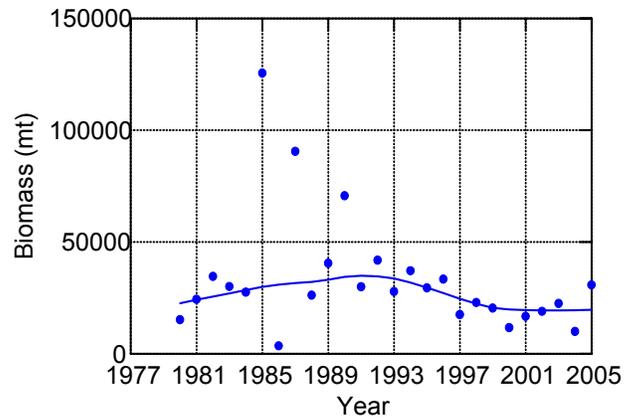
- **Management should give consideration to initiation of regulatory action(s) (i.e., a bycatch cap) on any fishery, which demonstrates significant commercial discards of spiny dogfish.**

The Technical Committee is concerned about the constraining effect that commercial discarding in general, and the directed Canadian fishery, are having on progress toward spiny dogfish stock recovery.

Female Spawning Stock (≥ 80 cm) (mt)



Male Stock (≥ 80 cm) (mt)



Total Stock Biomass, both sexes, all sizes (mt)

