ASMFC Spiny Dogfish Technical Report

The Spiny Dogfish Technical Committee held a conference call on January 27, 2003 to recommend a methodology for determining the annual quota, a quota for the 2003-2004 fishing year and trip limits for the 2003-2004 fishing year. The call commenced at 1 PM. Present on the call were Jim Armstrong (MAFMC), Chris Batsavage (NCDMF, Chair), Eric Dolin (NMFS-NERO), Megan Gamble (ASMFC, Plan Coordinator), Matt Gates (CT DEP), Clare McBane (NH FG), Chris Powell (RI DFW), Najih Lazar (RI DFW), Paul Rago (NEFSC), Rich Seagraves (MAFMC), Alexei Sharov (MDDNR), Mark Terceiro (NMFS), Glen Ulrich (SCDNR), and Byron Young (NY DEC).

Methodologies for Determining Annual Quota
The Technical Committee reviewed Dr. Paul Rago's method of estimating the quota using a projection model and Dr. David Pierce's method of quota estimation using the 2000-2002 three year average of exploitable biomass and applying an F=0.03 to the estimate. A more detailed description and comparison of the two methodologies can be found in Dr. Rago's memo to the Spiny Dogfish Technical Committee dated January 26, 2003 and Dr. Pierce's memo to Red Munden (as chair of the Mid-Atlantic Council's Spiny Dogfish Committee) dated October 1, 2002.

Dr. Rago's projection model uses a fishing mortality estimate based on the Beverton-Holt method which relies on biological growth parameters, the size composition of the population and the average size of spiny dogfish in the landings. Total predicted catch is the sum of landings and discards, and is the product of the fishing mortality rate (F) and the total exploitable biomass. The total predicted catch of spiny dogfish is greater than the observed landings. The ratio of observed landings to total predicted catch results in a rescaling factor of 0.5467 for females and 0.1381 for males. Assuming the biomass estimate is correct, the rescaling factor is equivalent to assuming that the discard mortality rate is proportional to the directed landings. Therefore, the rescaling factors are used to adjust for discards. The projection model estimates a quota of approximately 4 million pounds. Dr. Pierce's methodology of applying F=0.03 to the total exploitable biomass results in a potential catch of 10.37 million pounds. Dr. Pierce's methodology reduces the potential catch down from 10.37 million pounds to 8.8 million pounds. The Technical Committee assumes this reduction is to account for discarding in the fishery. Reducing the potential catch to 8.8 million pounds results in a rescaling factor of 0.8483. If Dr. Rago's rescaling factors were applied to Dr. Pierce's methodology, the projected landings would be about 0.58 million pounds greater than Dr. Rago's projection model.

The Technical Committee notes that both methodologies rely on biomass estimates derived from the NEFSC spring trawl survey, and that there is some uncertainty involved with this biomass estimate. Another area of uncertainty is the level of discards because discards are not well quantified at this time. Both methodologies apply the same fishing mortality rate to determine the proposed allowable landings. The two methodologies differ in the assumptions on the fate of the individuals in the population.

According to the rescaling factor applied in Dr. Pierce's methodology, it is assumed that landings account for approximately 84% of the total catch and discards only 16%. Dr. Rago's methodology accounts for a greater percentage of discards in the total catch because the ratio of observed landings to predicted catch is greater. Anecdotal evidence shows that a significant level of spiny dogfish discarding is occurring in many different fisheries. Therefore, the Technical Committee feels it is appropriate to apply the higher rescaling factor. Additionally, the assumption that the discard mortality rate is proportional to the directed fishing rate results in increased discards as landings increase.

The Technical Committee is also concerned that the size range of landings has expanded during the last few years. The acceptable size for landings has decreased from 95 cm to 75 cm. For example, approximately 40% of the spiny dogfish landed in the Massachusetts directed fishery were between 70-79 cm. This is a concern because harvesting these immature fish will reduce recruitment into the spawning stock biomass. Harvesting a wider range of sizes is risky when there has been very low recruitment of pups for the past six years.

- **The Technical Committee recommends** using Dr. Rago's methodology for determining the annual quota because it accounts for a higher discard component of the total catch and because a significant portion of the spiny dogfish harvested in the directed fishery are immature spiny dogfish.

  The Technical Committee discussed additional analyses that would have been useful in comparing these two approaches (i.e. quantifying uncertainty associated with point estimates from the two methodologies). Also, the Technical Committee noted the need for more information on discarding of spiny dogfish, in order to quantify the level of discards taking place in other fisheries. This information may be available from observer reports.

Quota for 2003-2004 Fishing Year
The committee considered the 8.8 million pound quota proposed by Dr. Pierce's method of quota determination and the 4 million pound quota proposed by Dr. Rago's quota determination method for the 2003-2004 fishing year. The biomass estimates from the NEFSC trawl survey may be an overestimate of the population size due to the behavioral characteristics of spiny dogfish when encountering the trawl nets. The Technical Committee is concerned that if biomass is overestimated then the proposed quota may even be too high. In addition, the Technical Committee is concerned that a higher quota will prolong the rebuilding schedule of the spawning stock biomass and result in more discards.

- **The Technical Committee recommends** taking a risk-averse approach due to the lack of evidence of recruitment and apply a 4 million pound quota for the 2003-2004 fishing year.

Trip Limits
Because of the uncertainty of discard mortality in directed and bycatch fisheries, the Technical Committee spent some time choosing an appropriate trip limit. High trip limits may make it economically feasible for fishermen to land spiny dogfish, but it could result in higher discards. And with an annual quota of only 4 million pounds, high trip limits would result in a very short season. Because of the nature in which spiny dogfish are processed and the location of the processors, low trip limits could result in no spiny dogfish landings. Shipping and processing spiny dogfish requires large volumes of fish in order for it to be a profitable business. As a result, low trip limits could potentially reduce discards. Higher trip limits indicates that a small directed fishery is acceptable, whereas the recent Management Board decisions indicate spiny dogfish are being managed as a bycatch fishery. Dogfish incidentally caught in other fisheries are likely to be a range of sizes, whereas a very small directed fishery would concentrate on targeting the large females that are needed to increase the spawning stock biomass and recruitment. There is bycatch mortality associated with both high and low trip limits, but bycatch mortality will be higher with larger trip limits.

- **The Technical Committee recommends** a 600-pound trip limit in Period 1 and a 300-pound trip limit in Period 2 to prevent directed fishing pressure on the rebuilding stock.

  Although the consensus is for low trip limits, the Technical Committee wants more information on effects of different trip limits and on the biological ramifications of directed and bycatch fisheries.

Other Business

The Technical Committee was informed that spiny dogfish is scheduled to go through the SAW/SARC peer review process in June 2003. In preparation for the stock assessment, the Technical Committee was queried for available state data that could supplement the data already used in the spiny dogfish assessment. State data that will be used for the stock assessment includes Massachusetts port and sea sampling, fishery dependent research projects conducted by Dr. Roger Rulifson (East Carolina University), and fishery independent data collected by NCDMF and East Carolina University during the annual SEAMAP Cooperative Striped Bass Tagging Cruise off the coast of North Carolina. No one had any other sources of data to offer at this time. The Technical Committee was reminded that the Stock Assessment Subcommittee consists of Dr. Paul Rago (unofficially at this time), Alexei Sharov, Dr. Roger Rulifson and Steve Correia. Steve Correia has recently been relieved of his spiny dogfish responsibilities for the Commonwealth of Massachusetts, so the Technical Committee was asked if there were any nominations for his replacement. No nominations were made to replace Steve Correia on the stock assessment subcommittee, and no nominations were made for the vice chair of the Technical Committee.

The meeting adjourned at 2:50 PM.