

## **ASMFC Spiny Dogfish Technical Committee Report**

The Spiny Dogfish Technical Committee met with the Mid-Atlantic and New England Fishery Management Council's Spiny Dogfish Monitoring Committee on September 10, 2003 in Baltimore, Maryland to set the specifications for the 2004-2005 fishing year. The Monitoring and Technical Committees reviewed the results from the 37<sup>th</sup> Stock Assessment Workshop and evaluated the status of the stock prior to recommending the annual quota and possession limits for the 2004-2005 fishing year.

### **Attendees**

The Technical Committee members present were Chris Batsavage (TC Chair and NC DMF), Wilson Laney (USFWS), Jack Musick (VIMS), Chris Powell (RI DFW) and Matt Gates (CT DEP). Others in attendance were Red Munden (Spiny Dogfish Board Chair & NC DMF), Dan Furlong (MAFMC), Rich Seagraves (MAFMC), Jim Armstrong (MAFMC), Kathy Collins (MAFMC), Paul Rago (NEFSC), Eric Dolin (NMFS-NERO), Dan McKiernan (MA DMF), Chris Hickman (NC Fisherman), Megan Gamble (ASMFC), and Sonja Fordham (Ocean Conservancy).

### **Review of Stock Status**

Annual biomass estimates for spiny dogfish are based on area swept spring surveys, 1968-2003. The average total biomass for 2001-2003 is 415,533 mt, which is higher than the average total biomass for 2000-2002 (377,500 mt). The total exploitable biomass (males and females: sizes based on selectivity function) in 2002 was 140,000 mt, with the last four years averaging around 138,000 mt. The Interstate Fishery Management Plan uses the female spawning stock biomass as the target for rebuilding the population. The target set in the current FMP is 167,000 mt. In 2003, the female spawning stock biomass was 64,500 mt, only ~38% of the target. The NMFS trawl surveys also show a 14 cm drop in the average size of adult mature females (greater than 80 cm) since 1980.

### *Recruitment*

Over the last seven years, the spring trawl survey has seen the lowest pup biomass in the time series, 1968-2003 (pups are classified as less than 36 cm). In addition, the average size of the pups from the trawl survey has decreased from about 31 cm to 28 cm. New information from the stock assessment indicates that the weight of the pup increases with increases in the length of the mother. In addition, the mean number of pups produced per mature female has decreased as the mean length of adult females decreased. Modeling a predicted biomass of pups based on the biomass of females at length also reveals low recruitment following the same pattern of pup abundance in the trawl survey. The length of the mature females has significant influence on the survivorship of the pups because the lower weight pups may be more susceptible to a higher level of natural mortality.

There was some speculation that the trawl survey is not capturing the smaller size classes anymore, but the pronounced decrease in dogfish less than 60 cm indicates the low abundance of pups is extending into the intermediate size ranges. As these year classes reach maturity, the stock's spawning potential will be severely compromised and will be a major factor in limiting the population's ability to rebuild to the target biomass.

### *Canadian Dogfish Fishery*

Canadian landings have increased from 700 mt in 1996 to 4,100 mt in 2001 while USA landings have decreased from 27,241 to 2,298 mt. In 2002, Canadians set a spiny dogfish quota at 3,200 mt for Nova Scotia and the Bay of Fundy. The fixed gear fishery quota is 2,500 mt (vessels under 14 meters) and an additional 700 mt has been set aside for a scientific sampling program. Canadian vessels from other fleets were to limit catches consistent with historical landings. The estimate for the Canadian landings in 2002 is about 3,400 mt. The 2003 Canadian spiny dogfish management measures are unknown at this time.

When the projection model was originally developed, Canadian landings were a negligible fraction of the USA landings. Canadian landings were not explicitly included but were modeled in the projected discards. Implied discards were estimated by applying the historical discards to landings ratio to projected landings. It was assumed that the projections based on USA landings were sufficient to characterize the pattern of fishing mortality. The recent increase in Canadian landings violates that assumption. Including Canadian landings leads to longer rebuilding times as the total catch may result in fishing mortality rates higher than those projected for the US quota. Therefore, in the 2003 stock assessment, Canadian landings are directly accounted for in the projection model.

### *Discards*

In the 2003 stock assessment, a new methodology is employed to estimate the amount of spiny dogfish discards in other directed fisheries. The new discard estimation methodology is based on discards recorded by the NMFS observer program and MA DMF discard data. Discard estimates are based on observer data from 1989 to 2002 and over 17,000 observer trips. There is relatively little information on the size composition of discarded dogfish, but the predominant gear types encountering dogfish discards are dredge, gill net, hook and line, shrimp trawls, otter trawls and other gears. Total dead discards from all gear types in 2002 were estimated to be about 5,000 mt (Figure 1). The level of discards has decreased in recent years because of restrictions on other fisheries, i.e. New England groundfish restrictions.

### *Projections*

Eight different scenarios were modeled for the stock assessment; all showing progress towards rebuilding the spawning stock biomass over the next 30 years (Figure 2). Fishing mortality was applied to the exploitable biomass in the population. The exploitable biomass is defined by sex-specific selectivity functions from the commercial catch. The projections also assume Canadian landings will remain at the level harvested in 2002, which is about 3,400 mt. And all but one of the projection scenarios assume a constant sustainable level of pups entering into the population, even though we have seen the 7 lowest years of recruitment in the time series. Under the best-case scenario, the population could rebuild within 15 years, but this assumes no U.S. or Canadian landings, as well as no discarding mortality, and recruitment remains constant. Under a constant  $F=0.03$ , the population could rebuild within 23 years. But, again, this is unrealistic because it does not account for the low recruitment to the population. About half of the projection runs never reach the spawning stock biomass target of 200,000 mt. Those that do reach the target over the course of the 30 years assume there is a constant level of recruitment to the population.

### **Recommendation for the FY2004-2005 Specifications**

In 2002, the fishing mortality on the Northwest Atlantic spiny dogfish population was 0.09 with U.S. commercial landings about 3,000 mt (~4.8 M lbs), Canadian landings about 3,400 mt (~7.5 M lbs.), commercial dead discards about 5,000 mt (~11 M lbs.), and U.S. recreational catch about 1,900 mt (~4.2 M lbs.) for a total estimate of removals from the population around 12,500 mt (~27.6 M lbs.). To achieve an  $F=0.03$  in the 2004-2005 fishing year, the projections indicate the total removals from the stock can yield about 2,960 mt (6.5 M lbs.).

With the 2003 Canadian spiny dogfish management measures an unknown, it was assumed that the Canadian landings would be equivalent to those landed in 2002 (~3,400 mt). The projections estimate 8,692 mt (~19 M lbs.) of discards from the commercial fishery in 2003 with almost half discarded dead (4,644 mt or 10.2 M lbs.). Canadian landings alone exceed the rebuilding fishing mortality rate of 0.03 and the 2,960 mt projected sustainable removals during the 2004-2005 fishing year.

For the 2004-2005 fishing year, the Technical Committee recommends:

**A maximum bycatch quota of 4 million pounds and possession limits of 600 pounds in Period I (May 1 – October 31) and 300 pounds in Period II (November 1 – May 31).**

The basis of the Technical Committee's recommendation is the same as the Technical Committee's April 23, 2003 report, but the 37<sup>th</sup> SARC's draft Advisory Report heightens concern for the stock's ability to meet the target identified in the interstate management plan (Target Female SSB = 167,000 mt; 2003 Female SSB = 64,500 mt or ~38% of the target). The draft Advisory Report indicates another year of recruitment failure, a truncated size range, and no progress on rebuilding the population to the spawning stock biomass target. Given the life history parameters of the spiny dogfish stock, the current level of removals of adult mature females will not allow the stock to rebuild.

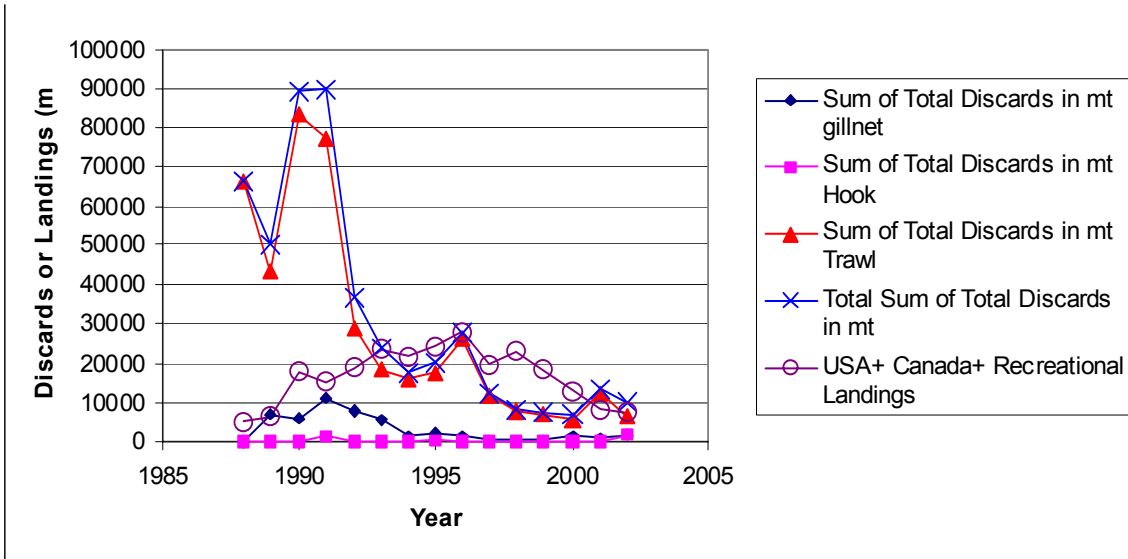
The Technical Committee recommends a 4 million pound bycatch quota for 2004-2005 to allow a portion of the estimated 10.2 million pounds of dead discards to be transformed into landings without increasing the mortality on the population. The objective of a bycatch quota is not to guarantee the entire 4 million pounds is landed, rather it is proposed as a cap beyond which dogfish incidentally caught will no longer be landed. A high proportion of the landings are females, resulting in a marked decline in the mature female biomass (greater than 80 cm) from 114,000 mt in 1996 to 64,500 mt in 2003. In an effort to reduce the fishing mortality on the large adult females, the Technical Committee recommends lower trip limits under a bycatch only quota to allow the impact of fishing mortality to disperse across a broader range of sizes. Higher trip limits, such as 7,000 pounds, allow for a small-scale directed fishery that tends to target and concentrate fishing mortality on the mature females. Spiny dogfish regulations in both state and federal waters should discourage fishing on the large mature female component of the stock.

With the possession limit set as low as 600 pounds in Period I and 300 pounds in the Period II, the Technical Committee recognizes and accepts that it may not be economically feasible to land, ship, and process spiny dogfish. Some preliminary analysis of historical trip limits

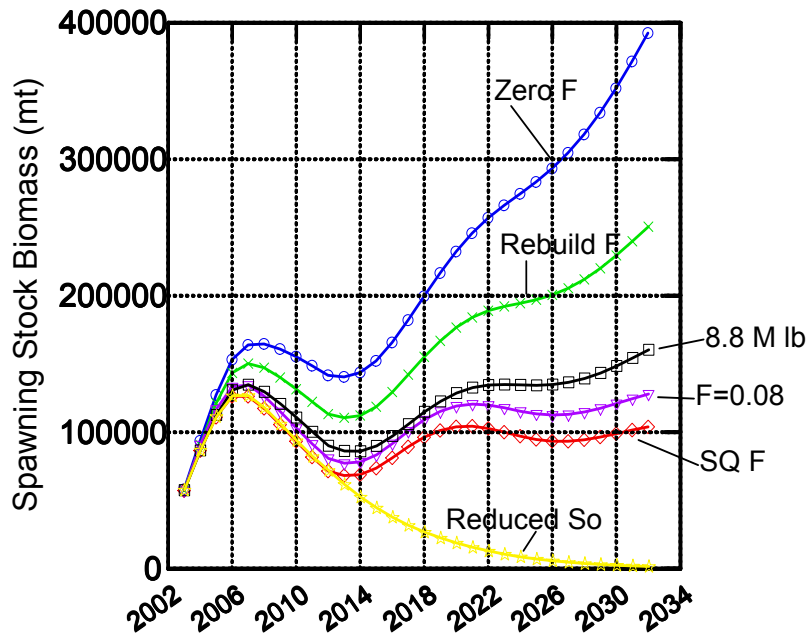
indicates that only 10-15% of the 4 million pounds is likely to be landed. The Technical Committee finds this acceptable because there is no guarantee that the 4 million pounds will actually be caught incidental to other fisheries and it is imperative that spiny dogfish landings do not increase the mortality on the stock.

Given the uncertainty regarding the ability to transform the discard mortality into landings, another option for consideration is a zero quota with a possession limit of zero for the 2004-2005 fishing year. The Technical Committee is concerned about the high level of discards and recognizes the need for a better strategy to avoid the high level of discarding currently taking place. The New England groundfish restrictions should help to reduce discards. Canadian landings are the greatest fraction of the landings and another source of mortality that is of great concern. The Technical Committee recognizes a need for better communication and exchange of information to facilitate the specification setting process. The draft Advisory Report also acknowledges recreational catch as a significant source of landings for the first time. More information needs to be gathered on the sudden increase in recreational catch of spiny dogfish.

**Figure 1. Summary of Total Discards based on Catch-based Ratio Estimators.**  
 Source: Paul Rago, NEFSC, 2003.

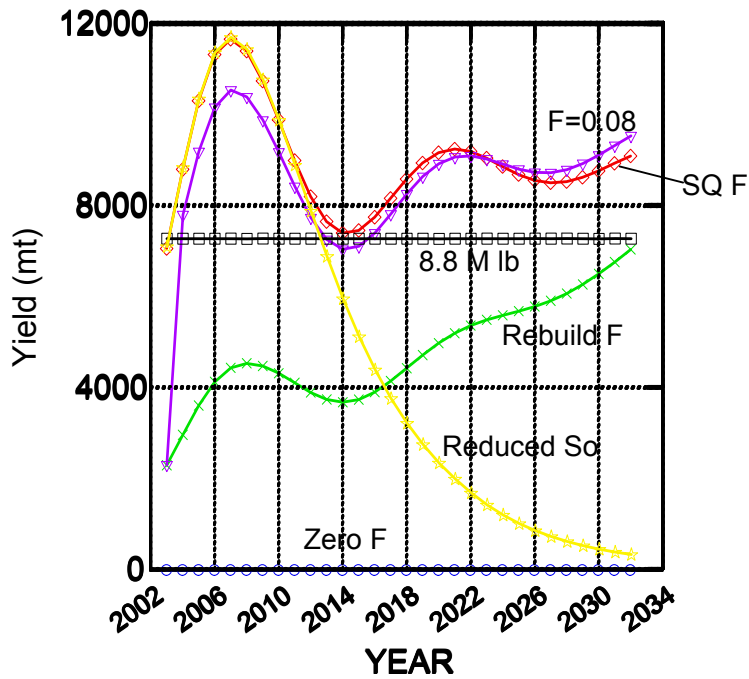


**Figure 2. Spawning Stock Biomass Projection Scenarios.**  
 Source: Dr. Paul Rago, NEFSC, 2003.



**Figure 3. Yield For 6 Different Projection Scenarios.**

Source: Dr. Paul Rago, NEFSC, 2003.



**Figure 4. Total Biomass Projections for 6 Different Scenarios.**

Source: Dr. Paul Rago, NEFSC, 2003.

