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**MID-ATLANTIC FISHERY MANAGEMENT COUNCIL**

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**M E M O R A N D U M**

**TO: Joint Spiny Dogfish Committee**

**FROM: Jim Armstrong (Monitoring Committee Chair)**

**DATE: November 6, 2008**

**SUBJECT: Spiny Dogfish Management Recommendations for the 2009 Fishing Year**

The purpose of this memo is to provide the Councils' Joint Spiny Dogfish Committee with technically-based management recommendations for FY2009 prior to that Committee's November 17, 2008 meeting on the subject. The recommendations contained herein were developed by the Spiny Dogfish Monitoring Committee and the MAFMC's Science and Statistical Committee and are intended to achieve FMP mandates for management of the spiny dogfish stock.

As advertised in the Federal Register (73 CFR 61788), the Spiny Dogfish Monitoring Committee met on October 31, 2008 via conference call. At that meeting, the latest NEFSC survey catches, landings/discard estimates, fishing mortality estimates, and other indicators of spiny dogfish stock status were reviewed. A report compiled by the NEFSC - " Update on the Status of Spiny Dogfish in 2008 and Initial Evaluation of Alternative Harvest Strategies" - was distributed for review on October 16, 2008, and is included as a separate attachment to this memo. Eight of the eleven members of the MC and one of the twelve members of the SSC participated in the conference call. Other members of the SSC communicated their input directly to MAFMC staff.

Attendance:

Jim Armstrong (MAFMC staff, MC Chair)  
Paul Rago (NEFSC, MC)  
Jamie Goen (NERO, MC)  
Angel Bolinger (MD DNR, MC)  
Dan McKiernan (MA DMF, MC)  
Clark Gray (NC DMF, MC)  
Jack Musick (VIMS, MC)  
Eric Brazer (CCCHFA, MC Industry rep)

Tom Miller (UM/CBL, SSC)

Also present:

Hannah Goodale (NERO)  
Chris Batsavage (NC DMF)  
Tina Moore (NC DMF)  
Chris Vonderweidt (ASMFC staff)  
David Kielmeier (Fisherman)



## Condition of the stock:

### Stock Biomass

The updated stochastic estimate of mature female biomass (SSB) for 2008 is about 16% above  $SSB_{max}$ , the proxy for  $B_{msy}$  target. Point estimates of  $SSB_{2008}$  are 194,616 mt under the ASMFC's plan ( $SSB_{max} = 167,800$  mt) and about 232,000 mt under the Federal plan ( $SSB_{max} = 200,000$  mt). The different  $SSB_{2008}$  and  $SSB_{max}$  values reflect different assumptions in the plans about the average size of the survey trawl "footprint" used to estimate total swept area biomass. Because the different footprint assumptions are essentially scaling factors, the associated values are functionally equivalent. In other words, the  $B_{2008}/B_{msy}$  ratio (~116%) is more informative about stock conditions than the trawl footprint assumption. From an administratively perspective, no  $B_{msy}$  target exists in the Federal FMP since the biomass target (90%  $SSB_{max}$ ) proposed by the Councils was subsequently rejected by NMFS in the implementation of the Federal FMP. This technicality is expected to be resolved through Framework Adjustment 2 to the FMP, which will permit automatic incorporation of biological reference points into the FMP as they are recommended through peer-reviewed benchmark assessments (such an assessment is expected to occur in 2009). The current 2008 estimate of SSB appears to have a 75% probability of exceeding  $SSB_{max}$ . In comparison to the FMP's definition of the biomass threshold ( $1/2 SSB_{max}$ ) and within the context of model uncertainty,  $SSB_{2008}$  is associated with a nearly 100% probability that *the stock is not overfished*. (See the attached report)

Nevertheless, other information should be considered in characterizing the current condition of the stock. Pup production from 1997 through 2003 appears to be at a historic low based on survey catches of pups (dogfish <36cm) and sustained low catches in the survey of these age classes. Several explanations have been offered to rationalize low pup production. A primary cause is suspected to be low maternal size. In other words, although the estimate of absolute reproductive biomass has increased markedly in recent years, overall fecundity may be lower than fecundity at  $SSB_{max}$  represented in the 1968-1996 time series (the period used in the Ricker stock-recruit model to establish the  $SSB_{max}$  reference point) where maternal size was generally larger. In terms of long-term future trends in stock condition, declines in SSB are expected as the small 1997-2003 year classes recruit into the SSB. Another potentially important factor in productivity is the survival of pups under current conditions. The overall male to female sex ratio is currently skewed strongly toward males (4:1) compared to the 2:1 ratio expected under more natural conditions. The relationship between mature dogfish sex ratio and pup production is not well understood, however. Finally, as with all species, environmental variables are likely to contribute to recruitment success; however, no specific environmental constraint has been identified for this species. The important point is that a simplistic comparison of the current absolute estimate of SSB against the  $SSB_{max}$  reference point may result in overly optimistic conclusions about the current condition of the stock.

### Fishing Mortality

Several sources of removals contribute to the estimate of fishing mortality for 2007 ( $F_{2007}$ ). These include U.S. commercial landings (3,524 mt; 7.769 M lb), Canadian commercial landings (2,328 mt; 5.132 M lb), U.S. discards (6,247 mt; 13.723 M lb), and U.S. recreational landings (37 mt; 81,571 lb). Total removals in 2007 were approximately 12,136 mt (26.755 M lb) corresponding to an F estimate of 0.1104, well below the overfishing threshold of  $F = 0.39$  and essentially equivalent to  $F_{rebuild} = 0.11$ . The probability that *overfishing is not occurring* ( $F_{2007} < F_{threshold}$ ) is approximately 100%.

### Projections

Six projections scenarios of stock biomass, landings, and fishing mortality rate were reviewed by the MC and SSC. These included landings associated with F-status quo, F-rebuild, F-target (for a rebuilt stock), F-threshold, status quo (2007) landings, and status quo landings plus 5,000 mt. The projection



time frame for each scenario was 2008-2027. As the attached report indicates, all of these long-term projections are characterized by oscillations. A sustained decline in projected SSB after about 2011 is, as noted above, an expected outcome of the small 1997-2003 year classes. According to the projections, SSB will reach a low level in about 2017 after which it will gradually increase. However the projected increase is dependent on the assumption that pup survival rates will also increase. (See attached report)

## **Recommendations**

For the purposes of establishing management recommendations, the reviewing Committees were reluctant to declare the stock to be "officially rebuilt". Instead, they recommended maintaining the rebuilding F value of 0.11 as the target in the 2009 fishing year as opposed to the  $F = 0.28$  target that is associated with a rebuilt stock. The reviewers also agreed that the commercial quota should be set for one fishing year since a benchmark (Trans-Boundary Resource Assessment Committee) assessment is expected to take place in 2009. That assessment is likely to review both the current biological reference points, and the overall stock assessment methodology.

### Commercial Quota Recommendation

The commercial quota that is associated with  $F = 0.11$  ( $F_{\text{rebuild}}$ ) for 2009 is projected to be 12,348,156 lbs, or roughly **12.0 million M lb**. The quota takes in to account Canadian landings of 5.5 M lbs (i.e., the Canadian quota) and status quo U.S. recreational landings 88,000 lbs (see the highlighted cell in Table 3 in attached report).

### Rationale

- This is the first year since the Federal rebuilding plan was implemented in which an assessment update suggests that the stock may be rebuilt. However, uncertainty exists regarding the appropriateness of the proxy for  $B_{\text{msy}}$  ( $SSB_{\text{max}}$ ) given the existing size distribution of mature females compared to the size structure in the time series (1968-1996) used to develop the  $B_{\text{msy}}$  proxy. Therefore, a precautionary management response to the 2008 update is considered to be appropriate for 2009 compared to a major relaxation of regulatory constraints. Nevertheless, in achieving  $F_{\text{rebuild}}$  in 2009, a 50% increase in the ASMFC quota (4 M lb + the current 8 M lb quota) and a 200% increase in the Federal quota (8 M lb + the current 4 M lb quota) would occur.
- Long term projections suggest that harvest at the F target for a rebuilt stock (0.28) would result in the stock *returning to an overfished status* in approximately ten years. Although SSB is projected to increase afterward, the increase is a function of *assumed* increases in pup production, while the decrease is a function of *observed* low pup numbers.
- Continued low pup production when mature female biomass is estimated to have returned to historic levels suggests the presence of some other constraining factor(s) on stock productivity, perhaps the size structure issue mentioned above, the skewed ratio of mature males to females (4:1), and/or other environmental causes.
- A benchmark assessment is anticipated for 2009 with the strong possibility that biological reference points (BRPs) will be addressed. Stock status relative to those BRPs may change compared to what is suggested in this year's stock status update. The new assessment may also address current and projected stock status in a way that takes into account the relationship between maternal size and pup size and related natural mortality issues for pups.



- Although increased removals of male dogfish should not in itself threaten the health of the stock, the reviewers expressed concern about how such a fishery (the perennially proposed male-only fishery) would operate: If regulations are adjusted to allow for either a directed fishery or an unrestricted bycatch fishery for males, it is expected that the discard F would on mature females would increase and thus violate assumed discards used to project total catch.
- On October 22, 2008, the ASMFC adopted a 12 million lb commercial quota for the 2009 fishing year. An equivalent Federal quota is likely to decrease the possibility of closures in the EEZ, such that fishing pressure on the nearshore (mostly female) component of the stock may decrease.

### Trip limits

Federal trip limits should be increased from 600 lbs to **3,000 lbs**.

### Rationale

- A 3,000 lb Federal trip limit (equivalent to the trip limit adopted by the ASMFC for FY2009) would result in consistent state and Federal trip limits, and would allow for increased retention of dogfish incidentally captured in Federal (offshore) waters. NEFSC trawl data suggest that dogfish captured 40nm or more offshore are more likely to be males compared to dogfish caught nearshore. In other words, a relative increase in the male-female sex ratio in dogfish landings may further decrease fishing mortality on mature female spiny dogfish.
- A large increase in the trip limits (e.g., above ASMFC's 3,000 lbs) may accelerate the rate of landings such that the quota is exceeded. Maintaining small (e.g., current 600 lb) trip limits in the EEZ, on the other hand, may result in protracted closures and increased discards. The exact threshold level for either of these outcomes is unknown; however, the reviewers noted that the 3,000 lb trip limit in place in state jurisdictional waters in 2007 coincided with a realized F equivalent to  $F_{\text{rebuild}}$  (0.11).

### Duration for recommended management measures:

One year (compared to the five year maximum specification period allowed for under the Federal FMP)

### Rationale:

- Anticipation of benchmark assessment next year, and uncertainties noted above.

### **Summary of Spiny Dogfish Monitoring Committee Recommendations:**

**Commercial Quota: 12.0 million lbs**

**As per the FMP, the quota will be divided into two semi-annual quota periods:**

**Quota period 1: 57.9% of 12.0 million lb quota (6,948,000 lbs)**

**Quota period 2: 42.1% of 12.0 million lb quota (5,052,000 lbs)**

**Trip Limits (FY2009): 3,000 pounds**

**Multi-year Specifications: No – one year.**

cc: Robins, Pappalardo, Anderson, Munden, Steele

