



## Mid-Atlantic Fishery Management Council

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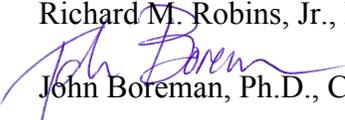
Richard B. Robins, Jr., Chairman | Lee G. Anderson, Vice Chairman

Christopher M. Moore, Ph.D., Executive Director

# MEMORANDUM

**DATE:** 2 October 2012

**TO:** Richard M. Robins, Jr., MAFMC Chairman

**FROM:**  John Boreman, Ph.D., Chair, MAFMC Scientific and Statistical Committee

**SUBJECT:** Report of the September 2012 Meeting of the MAFMC SSC

The SSC met in Baltimore on September 26<sup>th</sup> and 27<sup>th</sup> primarily to develop an ABC recommendation for spiny dogfish. Additional topics on the agenda (Attachment 1) included a special Ecosystems Subcommittee meeting (attended by all SSC members present) to continue development of SSC advice on ecosystems-based fisheries management, further development of proposed rules for setting multi-year ABCs, a presentation by MRAG America on their fisheries monitoring report to the Environmental Defense Fund, and continued discussion of setting research priorities for species managed by the MAFMC. A total of 13 SSC members attended the meeting, which constituted a quorum, as well as representatives from the NMFS Northeast Fisheries Science Center, fishing industry, the Pew Foundation, Rutgers University, the NMFS Office of Habitat Conservation, and MRAG (Attachment 2).

### ABC Recommendation for Spiny Dogfish

All presentations and documents used in the SSC's deliberations are posted on the SSC's website. Paul Rago led off the ABC discussion by presenting the most recent updated assessment information. Jim Armstrong (MAFMC staff) then presented his summary of the stock's status, comments from the Advisory Panel, and his recommendations for consideration by the SSC. The SSC species lead then provided comments. Following comments from the public, the SSC species lead for biology led the SSC discussion on selection of an ABC for the upcoming fishing year and beyond. Once the discussion was completed, the SSC developed the following consensus statements in response to the terms of reference provided by the MAFMC.

#### 1) *The materials considered in reaching its recommendations:*

- MAFMC staff memorandum from Jim Armstrong to Chris Moore: "Spiny dogfish ABC and Management Measures for 2013," dated September 21, 2012. 10 pp.
- MAFMC Staff. 2012. Spiny dogfish AP information document – 2012. 13 pp.
- Rago, P., and K. Sosebee. 2012. Update on the status of spiny dogfish in 2012 and initial evaluation of harvest at the  $F_{msy}$  Proxy. NOAA/NMFS Northeast Fisheries Science Center, Woods Hole, MA. 44 pp.
- Rago, P., and K. Sosebee. 2012. Supplemental Material for Consideration of Multi-year Specifications for Spiny Dogfish with Harvest Rates Corresponding to a Pstar of 40%.

NOAA/NMFS Northeast Fisheries Science Center. 7 pp.

- Rago, P., and K. Sosebee. 2012. Spiny dogfish update 2012. Powerpoint presentation. NOAA/NMFS Northeast Fisheries Science Center, Woods Hole, MA. 36 slides.
- MAFMC staff memorandum from Jim Armstrong to Chris Moore: “Supplemental Spiny dogfish ABC and Management Measures for 2014-2017,” dated September 24, 2012. 3 pp.
- SSC Statistical Uncertainty Subcommittee. Proposed Methods for Setting Multi-year Acceptable Biological Catch Limits. Draft document, dated September 10, 2012. 7 pp.

All materials are available on the MAFMC SSC website.

*2) The level (1-4) that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the version of the proposed Omnibus Amendment submitted to the Secretary of Commerce:*

Level 3. The assessment provides plausible estimates of the absolute levels of biomass and abundances, and the assessment also provides a plausible set of reference points that together represent the best available science.

The SSC notes that the biological reference points were calculated outside of the assessment model. The SSC also believes that important sources of uncertainty were not incorporated into estimates for the biological reference points. Both concerns prevent this assessment from achieving a higher rank.

*3) If possible, the level of catch (in weight) associated with the overfishing limit (OFL) based on the maximum fishing mortality rate threshold or, if appropriate, an OFL proxy:*

The  $F_{msy}$  proxy is calculated from a projection model for which the finite rate of population increase = 1.0. For spiny dogfish, the  $F_{msy}$  proxy = 0.2439. This is equivalent to a catch of 30,652 mt, based on the projected biomass in 2013 and the assumption that the catch in 2012 will be equal to 20,352 mt (the ABC = ACL from last year).

*4) The level of catch (in weight) associated with the acceptable biological catch (ABC) for the stock:*

The SSC applied the Council's risk policy for a typical life history<sup>1</sup>, an estimated  $B_{2013}/B_{msy}$  ratio > 1, and a CV of the OFL distribution of 100% assuming a lognormal distribution. Using these parameters, the Council's risk policy implies a  $P^* = 0.40$ . Applying this  $P^*$  to the OFL produces an ABC = 24,709 mt.

The SSC notes that the stock biomass is projected to decline in the future because of poor recruitment in earlier years, before recovering again. Current projections suggest that the ratio of (median  $B_{current}$ )/ $B_{msy}$  may be <1 for 2018-2023. As a result, the  $P^*$  value developed by the Council's risk policy will be lower, thereby leading to a reduced ABC for these years.

<sup>1</sup> The SSC notes that the assessment for spiny dogfish has been structured to account for many aspects of the unique life history of this species

*5) Specify the number of fishing years for which the OFL and/or ABC specification applies and, if possible, identify interim metrics which can be examined to determine if multi-year specifications need adjustment prior to their expiration:*

The Draft SUN Committee report on setting multi-year ABCs permits multiyear ABC setting if the

stock is not experiencing overfishing and if the stock is not subject to an upcoming assessment. Dogfish is therefore a candidate for multiyear ABC setting.

The SSC recommends a 3-year ABC specification. The SSC recommends that ABC be calculated based on a constant F policy, which translates to ABC in the subsequent years of: 24,709 mt (2013), 25,154 mt (2014), and 25,057 mt (2015).

The SSC will examine spiny dogfish discard rates, survey abundance trends (size composition, sex ratio and pup size), average size and sex in commercial landings, agreement between observed and predicted catch and survey forecasts, changes in Canadian landings, and the spatial distributions of catch and survey abundances each year of the specification to determine if the multiyear ABC should be abandoned.

*6) If possible, the probability of overfishing associated with the OFL and ABC catch level recommendations (if not possible, provide a qualitative evaluation):*

Based on the method applied, the probability of overfishing of the ABC is 40%, conditioned on the assumed lognormal distribution of OFL with an associated CV of 100%.

*7) The most significant sources of scientific uncertainty associated with determination of OFL and ABC:*

- The assessment relies heavily on an assumed efficiency of the survey gear in developing minimal swept area estimates of biomass.
- Inter-annual differences in availability of the stock to the survey gear.
- $F_{msy}$  proxy is based on a projection model that relies on a time-invariant selectivity estimated from data up to 2008. The assessment assumes selectivity has not changed subsequently, but may be variable.
- Both the  $F_{msy}$  proxy and the projections rely on a model that assumes constant pup survival and pup production rates. Empirical evidence suggests pup survival correlates positively with maternal size.
- Inconsistency between the estimation model and the projection model.
- Potential changes in fishery selectivity. Large increases in catches could induce changes in the overall selectivity pattern in the fishery.
- Potential inconsistency between the life history-based estimates of fishing mortality rates and the biomass reference points derived from the Ricker stock recruitment curve.
- Total discard estimates and estimated mortality of discarded dogfish.
- The revised estimate of biomass reference point is uncertain with an asymptotic CV of about 30%.

*8) Ecosystem considerations accounted for in the stock assessment, and any additional ecosystem considerations that the SSC took into account in selecting the ABC, including the basis for those additional considerations:*

No explicit or specific ecosystem considerations were included in the assessment. Furthermore, no additional ecosystem considerations were applied in calculating the ABC.

*9) List high priority research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation:*

- Revise the assessment model to investigate the effects of stock structure or distribution, sex ratio,

and size of pups on birth rate and first year survival of pups.

- Continue large scale (international) tagging programs, including conventional external tags, data storage tags, and satellite pop-up tags, to help clarify movement patterns and migration rates.
- Investigate the distribution of spiny dogfish beyond the depth range of current NEFSC trawl surveys, possibly by using experimental research or supplemental surveys.
- Continue aging studies for spiny dogfish age structures (e.g., fins, spines) obtained from all sampling programs (include additional age validation and age structure exchanges), and conduct an aging workshop for spiny dogfish, encouraging participation by NEFSC, Canada DFO, other interested state agencies, academia, and other international investigators with an interest in dogfish aging (US and Canada Pacific Coast, ICES).
- Evaluate ecosystem effects on spiny dogfish acting through changes in dogfish vital rates.

*10) A certification that the recommendations provided by the SSC represent the best scientific information available:*

To the best of the SSC's knowledge, these recommendations are based on the best available scientific information.

### **Ecosystem Approach to Fisheries Guidance (EAFMG) Document (Ecosystems Subcommittee)**

The SSC discussed the EAFMG Document. A presentation by Rich Seagraves (available for viewing on the SSC website) started the discussion and provided background and context for the SSC's ESC efforts the past two years. The majority of the discussion focused on the scope and intent of the document and its content. There was consensus that this EAFMG document should be thorough, covering major topics influencing fisheries, but not exhaustive nor serve as a source document.

The SSC discussed the Council's desire to begin the EAFM effort by identifying the most important topics, which can reasonably be addressed in the short to mid-term. It was noted that a number of other ecosystem-based efforts have focused on social and economic considerations, especially in Australia. The SSC then discussed the experience many members have had in the Chesapeake Bay Ecosystem planning effort. A notable problem is the one of scale - what is the extent of the ecosystem plan with respect to scale? For some species/issues, the entirety of ecosystem considerations are encompassed within the Mid-Atlantic ecosystem(s), while for others many of the ecosystem drivers act outside of the Mid-Atlantic. In addition, climate and other drivers may cause stock distributions and/or productivity to shift or change, so the current baseline can be expected to change as well. However, there are examples of topics that can be addressed and are within the control and scope of the Mid-Atlantic Council - e.g. habitat for black sea bass.

The sense of the SSC was that, as a practical matter, we could not escape the fact that we are currently operating under a single species assessment/management framework. Thus, the starting point is to examine each ecosystem issue relative to the current single species approach. It was suggested that a reasonable approach would be to focus on areas where immediate progress can be made, while still identifying the range of issues that need to be addressed in a comprehensive fashion. It was generally agreed that a way forward would be to develop a comprehensive list of ecosystem considerations and develop a transition plan to move towards EBFM, starting with a few key issues that can be addressed now or in the near future. A key outcome is the identification of the information necessary to support an ecosystem approach to fisheries management. A risk analysis should be conducted to help prioritize the order in which ecosystem issues are addressed. This will require a collaborative/iterative approach among the Council, the SSC, and the public.