MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901-3910
Phone: 302-674-2331 | Toll Free: 877-446-2362 | FAX: 302-674-5399 |
www.mafmc.org
Richard B. Robins, Jr., Chairman | Lee G. Anderson, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

DATE: October 4, 2012

TO: Joint Spiny Dogfish Committee

FROM: Jim Armstrong, Chair, Spiny Dogfish Monitoring Committee

SUBJECT: Summary of Spiny Dogfish Monitoring Committee Management Measure Recommendations for 2013-2015

The Spiny Dogfish Monitoring Committee (MC) met in Warwick, RI on October 3, 2012 in conjunction with the ASMFC Spiny Dogfish Technical Committee (TC) to develop management measure recommendations for the 2013-2015 fishing years. Monitoring Committee members in attendance included Jim Armstrong (MAFMC staff), Phil Haring (NEFMC staff), Paul Rago, (NEFSC), Eric Brazer (Industry), Tobey Curtis (NERO), Eric Schneider (RI-DEM), Dan McKiernan (MADMF), Holly White (NCDMF) and Angel Willey (MD DNR). Members of the TC (but not the MC) that were in attendance included Danielle Chesky (ASMFC staff), Russ Babb (NJ DEP), Matt Cieri (ME DNR), Matt Gates (CT DEP), and Scott Newlin (DNREC). Others in attendance included Kathy Sosebee (NEFSC), Jay Lugar (Marine Stewardship Council) and John Whiteside (Sustainable Fisheries Association).

Stock Status / OFL / ABC

The MC received an update on the status of the stock as well as the Scientific and Statistical Committee's (SSC's) overfishing limit (OFL) and acceptable biological catch (ABC) recommendations. The status of the stock is summarized in NEFSC 2012 and the staff memo, both of which are included as separate attachments. The SSC's OFL and ABC recommendations are summarized in the SSC memo. To summarize here, the stock is not overfished and overfishing is not occurring. OFL in 2013 is defined as the mean estimate of total catch at a fishing mortality rate, F = 0.2439, and is 30,652 mt (67.576 M lb). ABC in 2013-2015 was set by the SSC based on mean catch estimates that achieve a constant F= 0.19528 in those years and are: 24,709 mt (54.474 M lb) in 2013, 25,154 mt (55.455 M lb) in 2014, and 25,057 mt (55.241 M lb) in 2015.

Calculation of the Federal TAL and commercial quota

The federal spiny dogfish TAL is calculated using the process outlined in Amendment 2 to the Spiny Dogfish FMP (aka, the Omnibus ACL/AM Amendment; see Figure 1 in the staff memo). The values corresponding to the steps in the process are given in Table 1 for each specification year (2013-2014). In general, the TAL and commercial quota are the remaining catch available as landings after accounting for management uncertainty and all other types of removals considered by the assessment. The other types of removals include Canadian commercial landings and U.S. discards (commercial and recreational). The commercial quota is the remaining landings after a further reduction from the TAL to account for U.S. recreational landings.

Canadian Landings and Calculation of the Domestic ACL

Because of a major drop in the magnitude of Canadian landings beginning in 2009 Table 1 in NEFSC 2012), the MC reduced ABC by average Canadian landings in 2009 – 2011. The current period beginning in 2009 is considered by the MC to be a new stanza in Canadian landings. Accordingly, for each year Y,

$$\text{Domestic } ABC_Y = ABC_Y - \text{Canadian landings}_{2009\text{-}2011\text{ave}} = ABC_Y - 81 \text{ mt (179k lb)}.$$

Management Uncertainty and Calculation of the ACT

The various sources of management uncertainty for the spiny dogfish fishery received extensive discussion by the MC and fell into two general categories: 1) the ability of management to constrain landings to specified levels, and 2) the accuracy of past assumptions about other catch components (Canadian landings, recreational landings and discards).

Constraining landings to specified limits.

The staff memo proposed a reduction from the ACL of 3.99% to accommodate a management uncertainty buffer. The MC agreed with the basis for the 3.99% buffer, but determined that it was more appropriate to apply the buffer to landings than to overall catch and that uncertainty in other catch components, i.e., discards should be treated separately. Accordingly, the management uncertainty buffers in Table 1 that were applied for 2013-2015 were calculated based on landings which necessitated a two-step process. In the first step no buffer was applied to establish an initial quota, then in the second step the ACT was calculated by subtracting 3.99% of the initial quota from the ACL. Accordingly,

$$ACT = ACL - \text{Quota Overage Mgmt. Uncert. Buffer (3.99\%)}.$$

Accuracy of Past Assumptions about Other Catch Components

The staff memo indicates that for the recent timeframe (2008-2011) assumed "other" catch (discards, rec landings, Canadian landings) have been overestimated (Figure 3 in the staff memo). The MC noted that the discard to landings ratio (Figure 5 in NEFSC 2012) has generally declined such that landings have increased while discards have remained relatively constant. It was also pointed out, however, that the potential increases in quota that are achievable due to increased stock size may be associated with discards above the average since 2010 – the previous basis for the discard deduction. Although discards in 2011 (4,787 mt) were the third lowest since 2002, they represented an increase from 2010 (4,081 mt). The potential for further decreases in discards due to reduced fishing effort in the NE groundfish fishery was considered as was the potential for decreased regulatory discards as the fishery remains open for a longer period under the larger quotas. A consensus opinion on the general difficulty in adequately anticipating all the contributing factors to future discards resulted in a decision by the MC to minimize their assumptions and base the deduction for discards on what appears to be a fairly stable long term average (10 year). Accordingly, the MC based its expectation of 2013-2015 discards on the 2002-2011 average (5,306 mt; 11.698 M lb).

$$TAL_Y = ACT - Discards_{Ave\ 2002\text{-}2011} = ACT - 5{,}306\ mt\ (11.698\ M\ lb)$$

This larger deduction for discards (relative to the initial staff recommendation) coupled with the explicit management uncertainty buffer and the apparently robust condition of the stock was considered by the MC to be adequately risk-averse in accounting for the various sources of management uncertainty for the fishery.

Recreational Landings and Calculation of the Commercial Quota

A further reduction to account for recreational harvest based on average recreational landings since 2010 was proposed in the staff memo and received no objection by the MC. Generally, recreational harvest is <1% of total removals.

$$Commercial\ Quota = TAL - Rec\ Landings_{\ Ave\ 2010\text{-}2011} = TAL - 26.5\ mt\ (58k\ lb)$$

Trip Limits

The MC did not make a specific recommendation on trip limits for 2013-2015. There was a discussion about the potentially constraining effect of the current 3,000 lb trip limit and that, under the current

landings pace, the 2012 quota may not be completely harvested. It was further pointed out that state trip limits are not constrained under the ISFMP and state water limits have been set as high as 5,000 lbs (e.g., NC). The MC considered this to be a policy decision rather than a biological issue, however, the Councils should be aware that any increase in the trip limit increases the potential for the fishery to be closed prior to the end of the fishing year. Based upon past performance, it is possible for the fishery to land the proposed commercial quotas by the end of the fishing year under the status quo trip limit (3,000 lb). The MC noted that the SSC will evaluate various signposts related to stock condition in the coming year and considered that under an analogous process the MC could review fishery performance relative to the quota to evaluate the appropriateness of its recommendations.

Table 1. Spiny dogfish management measures for 2013-2015 as recommended by the Mid-Atlantic Council's Spiny Dogfish Monitoring Committee.

2013 Measures	Basis	M lb	Mt
OFL	F_{MSY} (0.2439)	67.576	30,652
ABC	Constant F (0.19528)	54.474	24,709
Canadian Landings	= ave 2009-2011	0.179	81.0
Domestic ABC	= ABC - Canadian Landings	54.295	24,628
ACL	= Domestic ABC	54.295	24,628
Mgmt Uncertainty Buffer	Ave of quota overages (pct) in 2010-2011 (3.99%)	1.697	770
ACT	= Domestic ACL - management uncertainty	52.598	23,858
U.S. Discards	= ave 2002-2011	11.698	5,306
TAL	ACT - Discards	40.900	18,552
U.S. Rec Landings	= ave 2010-2011	0.058	26.5
Comm Quota	TAL - Rec Landings	40.841896	18,526

2014 Measures	Basis	M lb	Mt
OFL			
ABC	Constant F (0.19528)	55.455	25,154
Canadian Landings	= ave 2009-2011	0.179	81.0
Domestic ABC	= ABC - Canadian Landings	55.277	25,073
ACL	= Domestic ABC	55.277	25,073
Mgmt Uncertainty Buffer	Ave of quota overages (pct) in 2010-2011 (3.99%)	1.737	788
ACT	= Domestic ACL - management uncertainty	53.540	24,285
U.S. Discards	= ave 2002-2011	11.698	5,306
TAL	ACT - Discards	41.842	18,979
U.S. Rec Landings	= ave 2010-2011	0.058	26.5
Comm Quota	TAL - Rec Landings	41.783807	18,953

2015 Measures	Basis	M lb	Mt
OFL			
ABC	Constant F (0.19528)	55.241	25,057
Canadian Landings	= ave 2009-2011	0.179	81.0
Domestic ABC	= ABC - Canadian Landings	55.063	24,976
ACL	= Domestic ABC	55.063	24,976
Mgmt Uncertainty Buffer	Ave of quota overages (pct) in 2010-2011 (3.99%)	1.728	784
ACT	= Domestic ACL - management uncertainty	53.335	24,192
U.S. Discards	= ave 2002-2011	11.698	5,306
TAL	ACT - Discards	41.637	18,886
U.S. Rec Landings	= ave 2010-2011	0.058	26.5
Comm Quota	TAL - Rec Landings	41.578491	18,860

Sources (These will be made available in the October Council Meeting Briefing Book)

NEFSC. 2012. Update on the status of spiny dogfish and initial evaluation of alternative harvest strategies. Report to MAFMC SSC September 19, 2012. 44 p.

MAFMC staff memorandum from Jim Armstrong to Chris Moore: "Spiny dogfish ABC and Management Measures for 2013," dated September 21, 2012. 10 p.

SSC Report from September 2012. 9 p.

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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 26th and 27th 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[1], 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.

[1] 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 considers 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.

The SSC emphasized the need for a short, focused document, which outlines each issue and potential approaches to address them (1-2 pages per issue). It is also important to note that some issues are scientific in nature while others are strictly grounded in policy - these are critical distinctions that need to be made. The SSC then went through an exercise to identify the universe of ecosystem considerations and to identify where in the current process they should be addressed. Each issue was also binned as to whether it could be addressed in the short-, mid-, or long-term. It may be necessary to create new processes to address some of these issues and the Council will most likely be required to modify and/or expand its current risk policy in this regard. In terms of priorities, the SSC identified the following as important areas to begin addressing: assessment and management considerations for forage/low trophic level species; species interactions (predation, competition, etc.) and their effects on reference points and management objectives; and social/economic considerations. The issue of shifting species distributions as a result of systematic changes in oceanographic conditions within the ecosystem(s) (due to climate change) was also discussed, as well as the need to coordinate management efforts with other Councils, the states, and other nations.

A spreadsheet (also available for viewing on the SSC website) was explored with each of the rows highlighting major issues that could affect or be affected by Mid Atlantic fisheries. The issues range from classical single-species approaches, to EBFM approaches, to full on EBM issues. In the spreadsheet, probable timelines and levels of effort are noted. Also noted is where in the scientific-management process each issue could be addressed (columns). The SSC modified or added several items. These items are now understood to form the basis for a table of contents (TOC) for the document.

Major action items include:

- Review issues and places to address them, updating or adding to them as need be;
- Change each x in the table to x and y, noting what we can do now (x) and what could be done (y) in the future;
- Map the main issues to each of the stocks that the MAFMC manages (second tab of spreadsheet);
- Set up a risk analysis/qualitative ranking approach (vis-à-vis the Australian examples from National SSC IV) to help prioritize issues (criteria are TBD (but many examples are extant), but see third tab of spreadsheet; this is to be done via correspondence at first, but will likely require another meeting before priorities can be noted);
- Categorize issues cognizant of the Millenium Assessment;
- Develop a 1-2 page précis to note the main intent and direction of document, capturing the items noted above in the discussion; and
- Identify those features that are scientific concerns and those that require policy direction, as implemented procedurally.

Timing for these tasks is prior to the December Council meeting, a face-to-face meeting to discuss the risk approach for prioritization will occur early in 2013.

The SSC has the following questions for the Council to help clarify its efforts:

- The SSC is understood to be the primary reviewer of this document, albeit providing guidance as to its contents as the document develops. Who should be the development team?
- The SSC chose to be comprehensive, but not exhaustive, in the development of the draft TOC, based upon guidance from Council leadership. This was in response to how the Council wants to implement the approved forage protocol, i.e., to be placed in a broader context. The SSC concurs with the need to be thorough and simultaneously not exhaustive. The Council needs to

clarify which approach it prefers: a fully developed EAFMG document, or identification of one or two other issues (in addition to forage protocol) to implement in extant processes.

- Many of these issues noted can be addressed in current protocols, but some require a change in the Council's risk policy in order to be implemented. The SSC can identify these protocols relative to the issues noted, but wanted to highlight that a process should be considered or developed (similar to evaluating risk policy) to address any potential procedural changes.

SUN Subcommittee Report - Multi-year ABCs

Mike Wilberg presented the Scientific Uncertainty Subcommittee's next iteration on proposed rules for setting multi-year ABCs for stocks managed by the MAFMC. The draft document prepared by the subcommittee describes the potential trade-offs inherent in providing multi-year ABC recommendations, proposed methods for implementing multi-year ABCs, items to consider when providing multi-year ABCs, recommendations for situations in which the SSC would and would not make multi-year ABC recommendations, and recommendations for situations when the SSC would consider changing multi-year ABCs before their full term. For assessment levels 1-3 (as defined in the current MAFMC ABC control rules), the subcommittee recommends that a multi-year ABC should achieve a *constant fishing mortality rate*, maintaining a constant P* approach consistent with single-year ABC recommendations. For level 4 assessments, the subcommittee recommends that a multi-year ABC maintain a *constant catch*, with the level of constant catch dependent on the information available, as has been done by the SSC in the past for setting single and multi-year ABCs. Multi-year ABC recommendations would not be considered for stocks experiencing overfishing or when an assessment is scheduled within the upcoming year.

The next step is for MAFMC staff to assemble time series of catch and abundance data for the managed species in time for the mid-winter SSC meeting. At that meeting, the SSC will review the series and determine what bounds are reasonable for each species, outside of which multi-year ABCs would need to be adjusted.

Guidelines for Fishery Monitoring

Bob Trumble, Vice President of MRAG Americas, gave a presentation on the project his company undertook for the Environmental Defense Fund, which culminated in guiding principles intended to assist fishery managers in designing effective monitoring programs for all fisheries. To quote from their report:

> "Stakeholder involvement from the outset of planning a monitoring program is crucial in effectively garnering support from diverse constituents and in learning what is feasible and enforceable in a fishery. The design of a monitoring plan will have major impacts on fishermen and buyers; allowing industry to have a key role in determining the strategies that support the goals or requirements of the program will achieve the maximum buy-in from industry while still achieving scientific, management, and enforcement needs. Establishing and implementing effective goals are also necessary in planning for an effective monitoring program. The established goals will inform strategy development and the chosen monitoring techniques, which will depend on the needs and characteristics of a fishery. Monitoring programs should consider a comprehensive suite of monitoring options and should be as thorough as possible at the outset of the program."

The report also stresses the importance of involving fishery enforcement early in the planning process. The report can be found on the MRAG Americas website (www.mragamericas.com).

MAFMC 5-Year Research Plan

Rich Seagraves distributed a revised draft of the MAFMC 5-year research plan, which was based on research recommendations identified by the SSC during the course of development of the most recent ABC specifications for each MAFMC managed species. The draft will be updated to include the research recommendations for spiny dogfish developed at the September SSC meeting and then will be distributed to the SSC for comment (comments to be received by Friday October 19, 2012). He will then work with Mark Holliday and his staff on refining the prioritization scheme used this past year to rank the RSA research priorities for the Council and have the decision tool ready in time to apply the ranking procedure to the updated 5-year research plan for consideration at the mid-winter 2013 SSC meeting.

Attachments

c: SSC members, Lee Anderson, Rich Seagraves, Jim Armstrong

Mid-Atlantic Fishery Management Council
Scientific and Statistical Committee Meeting
September 26-27, 2012
Agenda

Wednesday, September 26

0900 Ecosystems Subcommittee (Link, Seagraves)

1200 Lunch

1300 SUN Subcommittee Report - Multi-year ABCs (Wilberg *et al*)

1600 Spiny Dogfish ABC recommendations for FY 2013-2017 (Armstrong, Rago)

Thursday, September 27

0830 MRAG Americas Presentation on Fishery Monitoring (Trumble)

0900 Dogfish ABC continued

1100 MAFMC 5 year research plan (Seagraves, Holliday)

Adjourn

Attachment 2

MAFMC Scientific and Statistical Committee Meeting
Baltimore, MD

September 26-27, 2012

SSC Members in Attendance

Name	Affiliation
John Boreman (SSC Chairman)	North Carolina State University
Tom Miller (SSC Vice-Chair)	University of Maryland – CBL
Mike Wilberg	University of Maryland - CBL
Brian Rothschild	University of Massachusetts
Doug Lipton	University of Maryland - College Park
Ed Houde	University of Maryland - CBL
Doug Vaughan	NMFS (retired)
Rob Latour	VIMS
Bonnie McCay	Rutgers
Mark Holliday	NMFS/HQ
Jason Link	NMFS/NEFSC
Mike Frisk	SUNY Stony Brook
Yan Jiao	Virginia Tech

Others in attendance

Rich Seagraves	MAFMC staff
Jim Armstrong	MAFMC staff
Greg DiDomenico	Garden State Seafood Association
Kristen Cevoli	Pew Foundation
John Manderson (9/26 only)	NMFS/NEFSC
Terra Lederhouse (9/26 only)	NMFS/Office of Habitat Conservation
Karen Abrams (9/26 only)	NMFS/Office of Habitat Conservation
Bob Trumble	MRAG Americas
Paul Rago	NMFS/NEFSC
Josh Kohut (9/26 only)	Rutgers
Laura Palamara (9/26 only)	Rutgers

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MEMORANDUM

DATE: October 1, 2012

TO: Chris Moore, Executive Director

FROM: Jim Armstrong JLA

SUBJECT: Revised Spiny Dogfish ABC and Management Measures for 2013-2015

A revision to the previously submitted multi-year ABC and management measure recommendations is provided following a correction to the assumed catch in 2012 used in the projections provided by the NEFSC. The corrected projections are distributed in a separate attachment. These revised values replace the recommendations distributed in the "staff memo" dated Sept 21, 2012 and the "supplemental staff memo" dated Sept 24, 2012. In Table 1 below, the revised OFL for 2013 and ABC for 2013-2015 are provided as well as recommended deductions for Canadian landings, management uncertainty, discards, and recreational. As in the previous recommendations, the management uncertainty buffer is a percentage (3.99%) of the domestic ACL, not a static number of pounds as in the other deductions. Additionally, OFL in 2014-2015 is not presented since it was not estimated. The multi-year ABC values are from projected catch at a constant F (0.19528) which was the median F based on P* = 40% in 2013.

Table 1. Proposed management measures for 2013-15.

2013 Measures	Basis	M lb	Mt
OFL	*F_{MSY} (0.2439)*	67.576	30,652
ABC	*Constant F (0.19528)*	54.474	24,709
ACL	*= ABC*	54.474	24,709
Canadian Landings	*= ave 2009-2011*	0.179	81.0
Domestic ACL	*= ACL - Canadian Landings*	54.295	24,628
Mgmt Uncertainty Buffer	*Ave of quota overages (pct) in 2010-2011 (4.0%)*	2.166	983
ACT	*= Domestic ACL - management uncertainty*	52.129	23,645
U.S. Discards	*= ave 2010-2011*	9.775	4,434
TAL	*ACT - Discards*	42.354	19,211
U.S. Rec Landings	*= ave 2010-2011*	0.058	26.5
Comm Quota	*TAL - Rec Landings*	42.295233	19,185

Table 1 cont'd. Proposed management measures for 2014-2015.

2014 Measures	Basis	M lb	Mt
OFL			
ABC	*Constant F (0.19528)*	55.455	25,154
ACL	*= ABC*	55.455	25,154
Canadian Landings	*= ave 2009-2011*	0.179	81.0
Domestic ACL	*= ACL - Canadian Landings*	55.277	25,073
Mgmt Uncertainty Buffer	*Ave of quota overages (pct) in 2010-2011 (4.0%)*	2.206	1,000
ACT	*= Domestic ACL - management uncertainty*	53.071	24,073
U.S. Discards	*= ave 2010-2011*	9.775	4,434
TAL	*ACT - Discards*	43.296	19,639
U.S. Rec Landings	*= ave 2010-2011*	0.058	26.5
Comm Quota	*TAL - Rec Landings*	43.237144	19,612

2015 Measures	Basis	M lb	Mt
OFL			
ABC	*Constant F (0.19528)*	55.241	25,057
ACL	*= ABC*	55.241	25,057
Canadian Landings	*= ave 2009-2011*	0.179	81.0
Domestic ACL	*= ACL - Canadian Landings*	55.063	24,976
Mgmt Uncertainty Buffer	*Ave of quota overages (pct) in 2010-2011 (4.0%)*	2.197	997
ACT	*= Domestic ACL - management uncertainty*	52.866	23,979
U.S. Discards	*= ave 2010-2011*	9.775	4,434
TAL	*ACT - Discards*	43.090	19,545
U.S. Rec Landings	*= ave 2010-2011*	0.058	26.5
Comm Quota	*TAL - Rec Landings*	43.031829	19,519

REVISED Material for Consideration of Multi-year Specifications for Spiny Dogfish with Harvest Rates Corresponding to a Pstar of 40%: Correction for assumed catch in 2012 from 16,191 to 20,352 mt

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Mid Atlantic Fishery Management Council
Scientific and Statistical Committee
September 30, 2012

This information is distributed solely for the purpose of pre-dissemination peer review. It has not been formally disseminated by NOAA. It does not represent any final agency determination or policy.

This report is provided to the Mid Atlantic Fishery Management Council's (MAFMC) Scientific and Statistical Committee (SSC) to supplement the review conducted on September 26-27, 2012 in Baltimore MD. During the review of the earlier reports of Rago and Sosebee (2012a, 2012b) the SSC determined that the projections for OFLs and ABCs were based on an incorrect assumption of total catch in 2012. Rago and Sosebee used the total commercial landings quota of 16,191 mt instead of the Council's recommended overall ACL of 20,352 mt. The SSC recommended that all of the analyses depending on this assumption should be updated. This report summarizes the consequences of this change for future catches and stock status determination. Tables 10 to 16 were revised and reported in this report. The SSC will use these revisions as part of its final report to the MAFMC.

The revised quota has a relatively small effect on the overall catch estimated reviewed on Sep. 26-27. The following text table provides a summary of the primary changes induced by changing the assumed total catch in 2012 from 16,191 to 20,253 mt. The references to Table nn in the following sections refers to the original tables the Update and Supplement, and the Table nn-rev contained herein. There were no changes to the initial sex ratios of the catch or to sex specific discard rates for any of the revised analyses.

All of the relevant changes in stock biomass and candidate catch levels are on the order of $\pm$ 2%. There are no changes with respect of conclusions about overfished or overfishing status.

References

Rago, PJ and KA Sosebee. 2012a. Update on the Status of Spiny Dogfish in 2012 and Initial Evaluation of Harvest at the Fmsy Proxy. Working paper. Northeast Fisheries Science Center. Woods Hole, MA. Report to MAFMC SSC on September 19, 2012. 44 pages

Rago, PJ and KA Sosebee. 2012b. Supplemental Material for Consideration of Multi-year Specifications for Spiny Dogfish with Harvest Rates Corresponding to a Pstar of 40%. Working paper. Northeast Fisheries Science Center. Woods Hole, MA. Report to MAFMC SSC on September 23, 2012. 7pages

	Table	*Estimate*	*Original Value*	*Revised Value*	*%change= (Revised/Original -1)*	*Comment*
1	Model Input	Catch in 2012	16,191	20,352	+25.7%	difference =+4,161 mt
2	Table 10	Median F in 2012	0.148	0.188	+27.0%	
		Median female SSB	215,444	215,444	0	SSB is measured at start of year (~time of survey). Effect of reduction occurs in the SSB for 2013 as in line 3.
3	Table 11	Average SSB in 2013	229,468	225,378	-1.78%	Difference =- 4,090 mt
		Average Catch in 2013 at Fmsy	31,091	30,652	-1.41%	Rago guessed 29,800 for revised value during SSC meeting . (-2.8%)
4	Table 12	Median Catch in 2013	31,063	30,624	-1.41%	
		Median SSB in 2013	229,201	225,108	-1.79%	
5	Model Input	ABC in 2013 corresponding to OFL and P*=40%	25,179	24,823	-1.41%	
6	Table 13	Average F in 2013 given ABC based on P*=40%	0.20446	0.20818	1.82%	
7	Table 14	Median F in 2013 given ABC based on P*=40	0.19235	0.19528	1.52%	
8	Table 15	Average Catch in 2013 using median F based on the 2013 ABC	25,187	24,709	-1.90%	Differences between line 5 and 8 are due to numerical approximations
		Year in which average female SSB falls below SSBmsy proxy	2018	2018	0%	No expected change in the general pattern of population trajectory. The average SSB does not fall below ½ SSBmsy in either the original or revised projections
		Year after 2018 in which average female SSB next exceeds SSBmsy	2023	2023	0%	
9	Table 16	Median Catch in 2013	25165	24686	-1.90%	F for the revised projections is 0.19528 (see line 7). F for the original projection was 0.19235
		Median Catch in 2014	25613	25130	-1.89%	
		Median Catch in 2015	25522	25034	-1.91%	
		Median Catch in 2016	24991	24501	-1.96%	
		Median Catch in 2017	24291	23802	-2.01%	

Table 10-rev. Projected percentiles of fishing mortality rate on females, total catch , landings , discards, female spawning stock and exploitable biomass in 2012. Catches in 2012 are assumed to be equal to MAFMC ACL=20,352 mt.

	2012					
Percentile	*F*	*Catch (mt)*	*Landings (mt)*	*Discards (mt)*	*Female SSB (mt)*	*Exploitable Female Biomass (mt)*
1	0.343	20,209	13,615	6,594	121,496	55,672
2	0.326	20,204	13,612	6,593	127,302	58,332
3	0.314	20,223	13,626	6,597	132,170	60,563
4	0.304	20,228	13,629	6,599	136,394	62,498
5	0.295	20,220	13,623	6,597	140,147	64,218
10	0.266	20,224	13,627	6,598	154,739	70,905
15	0.247	20,229	13,630	6,599	165,635	75,897
20	0.233	20,195	13,605	6,590	174,671	80,038
25	0.223	20,221	13,624	6,597	182,603	83,673
30	0.214	20,227	13,629	6,599	189,826	86,982
35	0.206	20,198	13,607	6,591	196,579	90,077
40	0.200	20,216	13,621	6,596	203,023	93,029
45	0.193	20,184	13,597	6,587	209,278	95,896
50	0.188	20,238	13,637	6,601	215,444	98,721
55	0.182	20,199	13,608	6,591	221,611	101,547
60	0.177	20,204	13,612	6,593	227,866	104,413
65	0.172	20,196	13,606	6,590	234,310	107,366
70	0.167	20,182	13,595	6,587	241,063	110,460
80	0.156	20,174	13,590	6,585	256,218	117,404
85	0.151	20,215	13,620	6,595	265,254	121,545
90	0.145	20,248	13,644	6,604	276,150	126,538
95	0.137	20,183	13,596	6,587	290,742	133,224
96	0.136	20,224	13,626	6,598	294,495	134,944
97	0.134	20,196	13,606	6,590	298,719	136,879
98	0.132	20,197	13,606	6,591	303,587	139,110
99	0.129	20,241	13,639	6,602	309,393	141,770
99	0.102	16,325	10,919	5,406	309,393	141,770

Table 11-rev. Summary of stochastic projections of F, SSB, catch, landings and discards by sex, and comparisons with biomass reference points for spiny dogfish under a constant F harvest strategy equal to the target F=Fmsy proxy = 0.2439 for 2012 to 2039. The estimated F in 2012 is estimated by assuming that the catch in 2012 is equal to MAFMC ACL=20,352 mt. Table entries are means of predicted values.

	Average											Probability			
Year	F on females	F on males	SSB (mt)	Total Catch (mt)	Total Landing (mt)	Female Landings (mt)	Male Landings (mt)	Total Discards (mt)	Female Discards (mt)	Male Discards (mt)	SSB(t)/ SSB_target	SSB<SSB_target	SSB< SSB_thresh	F>=Fthresh	F>=Ftarget
2012	0.197411	0.00559	215,647	20,210	13,616	12,571	1,045	6,594	4,465	2,129	1.354	0.882	1.000	0.160	0.540
2013	0.2439	0.01258	225,378	30,652	19,771	17,477	2,294	10,881	6,208	4,673	1.415	0.890	1.000	1.000	1.000
2014	0.2439	0.01258	208,713	30,572	19,808	17,592	2,216	10,764	6,249	4,516	1.310	0.836	1.000	1.000	1.000
2015	0.2439	0.01258	188,136	29,821	19,328	17,171	2,156	10,493	6,099	4,394	1.181	0.734	1.000	1.000	1.000
2016	0.2439	0.01258	166,870	28,586	18,490	16,393	2,097	10,096	5,823	4,273	1.048	0.572	1.000	1.000	1.000
2017	0.2439	0.01258	150,195	27,233	17,558	15,514	2,044	9,675	5,511	4,165	0.943	0.402	0.992	1.000	1.000
2018	0.2439	0.01258	137,405	25,880	16,623	14,630	1,993	9,257	5,197	4,061	0.863	0.254	0.974	1.000	1.000
2019	0.2439	0.01258	124,818	24,741	15,850	13,912	1,938	8,891	4,942	3,949	0.784	0.120	0.946	1.000	1.000
2020	0.2439	0.01258	112,790	23,977	15,366	13,492	1,874	8,612	4,792	3,819	0.708	0.028	0.898	1.000	1.000
2021	0.2439	0.01258	118,791	23,728	15,271	13,469	1,802	8,457	4,784	3,673	0.746	0.064	0.928	1.000	1.000
2022	0.2439	0.01258	130,454	23,851	15,453	13,724	1,729	8,398	4,875	3,524	0.819	0.168	0.966	1.000	1.000
2023	0.2439	0.01258	145,041	24,259	15,843	14,186	1,658	8,416	5,039	3,378	0.911	0.338	0.990	1.000	1.000
2024	0.2439	0.01258	157,826	24,791	16,322	14,734	1,588	8,469	5,233	3,236	0.991	0.484	1.000	1.000	1.000
2025	0.2439	0.01258	166,329	25,201	16,706	15,185	1,522	8,494	5,394	3,101	1.044	0.570	1.000	1.000	1.000
2026	0.2439	0.01258	170,362	25,430	16,950	15,489	1,461	8,479	5,502	2,978	1.070	0.606	1.000	1.000	1.000
2027	0.2439	0.01258	170,467	25,450	17,031	15,623	1,408	8,418	5,549	2,869	1.070	0.606	1.000	1.000	1.000
2028	0.2439	0.01258	167,509	25,292	16,972	15,609	1,362	8,320	5,544	2,776	1.052	0.580	1.000	1.000	1.000
2029	0.2439	0.01258	162,208	24,956	16,771	15,447	1,324	8,185	5,487	2,698	1.018	0.528	1.000	1.000	1.000
2030	0.2439	0.01258	155,366	24,525	16,492	15,200	1,292	8,033	5,399	2,634	0.975	0.458	0.998	1.000	1.000
2031	0.2439	0.01258	148,904	24,077	16,196	14,931	1,265	7,881	5,303	2,578	0.935	0.386	0.992	1.000	1.000
2032	0.2439	0.01258	144,164	23,690	15,939	14,698	1,241	7,750	5,221	2,530	0.905	0.330	0.986	1.000	1.000
2033	0.2439	0.01258	142,137	23,416	15,764	14,545	1,220	7,652	5,166	2,486	0.892	0.306	0.984	1.000	1.000
2034	0.2439	0.01258	142,457	23,277	15,687	14,488	1,199	7,590	5,146	2,444	0.894	0.310	0.984	1.000	1.000
2035	0.2439	0.01258	144,764	23,263	15,702	14,522	1,180	7,562	5,158	2,403	0.909	0.336	0.988	1.000	1.000
2036	0.2439	0.01258	148,075	23,343	15,784	14,624	1,160	7,558	5,194	2,364	0.930	0.376	0.992	1.000	1.000
2037	0.2439	0.01258	151,673	23,474	15,904	14,763	1,141	7,569	5,244	2,325	0.952	0.416	0.996	1.000	1.000
2038	0.2439	0.01258	154,811	23,610	16,027	14,904	1,123	7,583	5,294	2,289	0.972	0.452	0.998	1.000	1.000
2039	0.2439	0.01258	156,953	23,715	16,125	15,019	1,107	7,590	5,335	2,255	0.985	0.474	1.000	1.000	1.000
2060	0.2439	0.01258	151,529	23,172	15,862	14,866	996	7,309	5,281	2,029	0.951	0.416	0.994	1.000	1.000
2061	0.2439	0.01258	151,538	23,161	15,856	14,861	995	7,305	5,279	2,027	0.951	0.416	0.994	1.000	1.000
Grand Tota	0.24235	0.012347	157,044	24,912	16,502	14,988	1,514	8,409	5,324	3,086	0.986	0.445	0.987	0.972	0.985
Ave '12-21	0.239	0.012	164,874	26,540	17,168	15,222	1,946	9,372	5,407	3,965	1.035	0.478	0.974	0.916	0.954
Ave '22-31	0.244	0.013	157,447	24,783	16,474	15,013	1,461	8,309	5,332	2,977	0.988	0.472	0.995	1.000	1.000
Ave '31-39	0.244	0.013	148,129	23,473	15,867	14,695	1,171	7,607	5,220	2,387	0.930	0.375	0.991	1.000	1.000
Formula	*A*	*B*	*C*	*D=E+H*	*E=F+G*	*F*	*G*	*H=I+J*	*I*	*J*	*K*	*L*	*M*	*N*	*O*

Table 12-rev. Projected percentiles of total catch , landings , discards and female spawning stock biomass in 2013-2015 with an fishing mortality rate equal to the Fmsy proxy of 0.2439. Catches in 2012 are assumed to be equal to MAFMC ACL=20,352 mt (see Table 10).

	2013				2014				2015			
Percentile	*Catch*	*Landings*	*Discards*	*Female SSB*	*Catch*	*Landings*	*Discards*	*Female SSB*	*Catch*	*Landings*	*Discards*	*Female SSB*
1	19,391	11,461	7,930	118,293	19,267	11,466	7,801	109,773	18,801	11,203	7,598	99,161
2	20,086	11,974	8,112	124,897	19,964	11,981	7,984	115,875	19,481	11,705	7,776	104,649
3	20,665	12,401	8,264	130,409	20,546	12,410	8,136	120,968	20,048	12,123	7,925	109,230
4	21,169	12,774	8,396	135,205	21,053	12,784	8,269	125,400	20,542	12,487	8,055	113,216
5	21,619	13,105	8,514	139,481	21,504	13,117	8,387	129,351	20,982	12,811	8,171	116,770
10	23,363	14,392	8,971	156,069	23,255	14,409	8,846	144,678	22,689	14,070	8,619	130,553
15	24,666	15,354	9,312	168,455	24,563	15,374	9,189	156,122	23,963	15,009	8,954	140,845
20	25,751	16,154	9,597	178,773	25,652	16,177	9,475	165,655	25,025	15,792	9,233	149,416
25	26,697	16,852	9,845	187,766	26,602	16,878	9,724	173,964	25,951	16,474	9,476	156,889
30	27,560	17,489	10,071	195,975	27,468	17,518	9,951	181,549	26,795	17,097	9,698	163,710
35	28,371	18,088	10,284	203,692	28,283	18,119	10,164	188,678	27,589	17,683	9,907	170,120
40	29,140	18,655	10,485	211,001	29,055	18,688	10,366	195,431	28,342	18,237	10,104	176,194
45	29,893	19,210	10,682	218,156	29,810	19,245	10,564	202,041	29,078	18,780	10,298	182,137
50	30,624	19,750	10,874	225,108	30,544	19,787	10,757	208,465	29,793	19,308	10,486	187,915
55	31,366	20,298	11,069	232,170	31,289	20,337	10,952	214,988	30,520	19,843	10,677	193,780
60	32,114	20,850	11,265	239,282	32,040	20,891	11,149	221,559	31,252	20,383	10,869	199,688
65	32,886	21,419	11,467	246,624	32,815	21,463	11,352	228,341	32,007	20,940	11,068	205,787
70	33,696	22,017	11,679	254,325	33,628	22,063	11,565	235,455	32,799	21,524	11,276	212,184
75	35,511	23,356	12,155	271,579	35,450	23,407	12,043	251,396	34,575	22,833	11,742	226,519
80	36,587	24,150	12,437	281,815	36,531	24,205	12,326	260,854	35,628	23,609	12,019	235,024
85	37,887	25,110	12,778	294,176	37,836	25,168	12,668	272,274	36,901	24,547	12,353	245,294
90	39,642	26,404	13,238	310,859	39,597	26,467	13,130	287,685	38,617	25,813	12,804	259,151
95	40,086	26,732	13,354	315,083	40,043	26,796	13,247	291,588	39,052	26,133	12,919	262,661
96	40,595	27,108	13,487	319,922	40,554	27,173	13,381	296,058	39,549	26,500	13,049	266,680
97	41,178	27,538	13,640	325,461	41,138	27,605	13,534	301,176	40,119	26,920	13,199	271,282
98	41,867	28,046	13,821	332,018	41,831	28,116	13,715	307,234	40,794	27,418	13,377	276,731
99	42,310	28,371	13,939	336,146	42,262	28,432	13,830	310,944	41,199	27,715	13,484	279,971

Table 13-rev. Summary of stochastic projections of F, SSB, catch, landings and discards by sex, and comparisons with biomass reference points for spiny dogfish under a quota of 24,823 mt in 2013 followed by constant F harvest strategy equal to the target F=Fmsy proxy = 0.2439 for 2014 to 2039. The estimated F in 2012 is estimated by assuming that the catch in 2012 is equal to MAFMC ACL=20,352 mt. Table entries are means of predicted values.

	Average											Probability			
Year	F on females	F on males	SSB (mt)	Total Catch (mt)	Total Landing (mt)	Female Landings (mt)	Male Landings (mt)	Total Discards (mt)	Female Discards (mt)	Male Discards (mt)	SSB(t)/ SSB_target	SSB<SSB_target	SSB< SSB_thresh	F>=Fthresh	F>=Ftarget
2012	0.197411	0.00559	215,647	20,210	13,616	12,571	1,045	6,594	4,465	2,129	1.354	0.882	1.000	0.160	0.540
2013	0.20818	0.00999	225,378	24,717	15,975	14,152	1,823	8,742	5,027	3,715	1.415	0.890	1.000	0.218	0.602
2014	0.2439	0.01258	213,837	31,176	20,246	18,024	2,222	10,930	6,402	4,527	1.342	0.830	1.000	1.000	1.000
2015	0.2439	0.01258	192,632	30,390	19,741	17,579	2,162	10,649	6,244	4,405	1.209	0.740	1.000	1.000	1.000
2016	0.2439	0.01258	170,730	29,106	18,867	16,765	2,102	10,238	5,955	4,284	1.072	0.598	0.996	1.000	1.000
2017	0.2439	0.01258	153,471	27,699	17,895	15,846	2,049	9,804	5,628	4,175	0.963	0.442	0.980	1.000	1.000
2018	0.2439	0.01258	140,140	26,289	16,917	14,918	1,999	9,372	5,299	4,073	0.880	0.300	0.964	1.000	1.000
2019	0.2439	0.01258	127,061	25,097	16,104	14,159	1,945	8,992	5,029	3,963	0.798	0.160	0.936	1.000	1.000
2020	0.2439	0.01258	114,604	24,290	15,587	13,704	1,882	8,703	4,868	3,835	0.719	0.052	0.890	1.000	1.000
2021	0.2439	0.01258	120,253	24,010	15,469	13,658	1,811	8,542	4,851	3,690	0.755	0.088	0.922	1.000	1.000
2022	0.2439	0.01258	131,623	24,117	15,637	13,899	1,739	8,480	4,937	3,543	0.826	0.190	0.962	1.000	1.000
2023	0.2439	0.01258	145,966	24,523	16,025	14,358	1,668	8,498	5,100	3,398	0.916	0.354	0.986	1.000	1.000
2024	0.2439	0.01258	159,310	25,065	16,511	14,912	1,599	8,554	5,297	3,257	1.000	0.500	0.998	1.000	1.000
2025	0.2439	0.01258	168,282	25,492	16,908	15,375	1,533	8,584	5,461	3,123	1.056	0.584	1.000	1.000	1.000
2026	0.2439	0.01258	172,678	25,742	17,167	15,694	1,472	8,575	5,575	3,000	1.084	0.618	1.000	1.000	1.000
2027	0.2439	0.01258	173,017	25,779	17,261	15,841	1,419	8,519	5,627	2,892	1.086	0.620	1.000	1.000	1.000
2028	0.2439	0.01258	170,169	25,633	17,210	15,836	1,373	8,423	5,625	2,799	1.068	0.598	1.000	1.000	1.000
2029	0.2439	0.01258	164,875	25,303	17,014	15,678	1,335	8,290	5,569	2,721	1.035	0.552	0.996	1.000	1.000
2030	0.2439	0.01258	157,964	24,873	16,735	15,431	1,304	8,138	5,481	2,657	0.992	0.486	0.990	1.000	1.000
2031	0.2439	0.01258	151,375	24,422	16,436	15,159	1,277	7,986	5,384	2,602	0.950	0.420	0.984	1.000	1.000
2032	0.2439	0.01258	146,459	24,026	16,173	14,919	1,253	7,853	5,299	2,554	0.919	0.366	0.978	1.000	1.000
2033	0.2439	0.01258	144,226	23,743	15,990	14,758	1,232	7,753	5,242	2,511	0.905	0.340	0.976	1.000	1.000
2034	0.2439	0.01258	144,395	23,595	15,906	14,695	1,212	7,689	5,219	2,469	0.907	0.342	0.978	1.000	1.000
2035	0.2439	0.01258	146,630	23,576	15,916	14,724	1,192	7,659	5,230	2,429	0.921	0.366	0.982	1.000	1.000
2036	0.2439	0.01258	149,950	23,653	15,997	14,824	1,173	7,656	5,265	2,390	0.941	0.402	0.986	1.000	1.000
2037	0.2439	0.01258	153,610	23,785	16,118	14,964	1,154	7,667	5,315	2,352	0.964	0.442	0.990	1.000	1.000
2038	0.2439	0.01258	156,842	23,926	16,244	15,107	1,137	7,682	5,366	2,316	0.985	0.474	0.992	1.000	1.000
2039	0.2439	0.01258	159,084	24,036	16,346	15,226	1,120	7,690	5,408	2,282	0.999	0.498	0.994	1.000	1.000
2060	0.2439	0.01258	153,686	23,500	16,088	15,078	1,010	7,413	5,356	2,057	0.965	0.442	0.988	1.000	1.000
2061	0.2439	0.01258	153,684	23,489	16,081	15,072	1,008	7,408	5,354	2,055	0.965	0.442	0.988	1.000	1.000
Grand Tota	0.24116	0.012261	159,252	25,042	16,606	15,098	1,508	8,436	5,363	3,073	1.000	0.467	0.982	0.946	0.971
Ave '12-21	0.236	0.012	167,375	26,298	17,042	15,138	1,904	9,257	5,377	3,880	1.051	0.498	0.969	0.838	0.914
Ave '22-31	0.244	0.013	159,526	25,095	16,690	15,218	1,472	8,405	5,406	2,999	1.001	0.492	0.992	1.000	1.000
Ave '31-39	0.244	0.013	150,149	23,792	16,086	14,902	1,184	7,706	5,293	2,413	0.943	0.404	0.985	1.000	1.000
Formula	*A*	*B*	*C*	*D=E+H*	*E=F+G*	*F*	*G*	*H=I+J*	*I*	*J*	*K*	*L*	*M*	*N*	*O*

Table 14-rev. Projected percentiles of total catch , landings , discards and female spawning stock biomass in 2013-2015 with an target quoat of 24,823 mt in 2013. The derived median F corresponding to this quota is 0.19528. Catches in 2012 are assumed to be equal to MAFMC ACL=20,352 mt.

	2013					
Percentile	*F*	*Catch (mt)*	*Landings (mt)*	*Discards (mt)*	*Female SSB (mt)*	*Exploitable Female Biomass (mt)*
1	0.389	24,717	15,976	8,742	118,293	56,304
2	0.367	24,736	15,989	8,747	124,897	59,452
3	0.350	24,733	15,987	8,746	130,409	62,079
4	0.336	24,706	15,967	8,739	135,205	64,366
5	0.325	24,712	15,972	8,741	139,481	66,405
10	0.288	24,730	15,985	8,745	156,069	74,312
15	0.266	24,719	15,977	8,742	168,455	80,218
20	0.249	24,728	15,984	8,745	178,773	85,138
25	0.237	24,741	15,993	8,748	187,766	89,425
30	0.226	24,699	15,962	8,737	195,975	93,339
35	0.217	24,717	15,976	8,742	203,692	97,019
40	0.209	24,704	15,965	8,738	211,001	100,504
45	0.202	24,691	15,956	8,735	218,156	103,916
50	0.19528	24,685	15,952	8,733	225,108	107,230
55	0.189	24,719	15,976	8,742	232,170	110,598
60	0.184	24,720	15,978	8,743	239,282	113,988
65	0.178	24,703	15,965	8,738	246,624	117,489
70	0.173	24,754	16,002	8,751	254,325	121,161
80	0.161	24,715	15,974	8,741	271,579	129,389
85	0.155	24,739	15,991	8,748	281,815	134,269
90	0.148	24,757	16,005	8,752	294,176	140,163
95	0.140	24,683	15,950	8,733	310,859	148,119
96	0.138	24,746	15,997	8,749	315,083	150,133
97	0.136	24,741	15,993	8,748	319,922	152,440
98	0.134	24,767	16,012	8,755	325,461	155,082
99	0.131	24,738	15,991	8,747	332,018	158,208

Table 15-rev. Summary of stochastic projections of F, SSB, catch, landings and discards by sex, and comparisons with biomass reference points for spiny dogfish under an F=0.19528 which corresponds to the Pstar quota of 24,832 mt in 2013. Projections are reported for 2014 to 2039. The estimated F in 2012 is estimated by assuming that the catch in 2012 is equal to MAFMC ACL=20,352 mt. Table entries are means of predicted values.

	Average											Probability			
Year	F on females	F on males	SSB (mt)	Total Catch (mt)	Total Landing (mt)	Female Landings (mt)	Male Landings (mt)	Total Discards (mt)	Female Discards (mt)	Male Discards (mt)	SSB(t)/ SSB_target	SSB<SSB_target	SSB< SSB_thresh	F>=Fthresh	F>=Ftarget
2012	0.197411	0.00559	215,647	20,210	13,616	12,571	1,045	6,594	4,465	2,129	1.354	0.882	1.000	0.160	0.540
2013	0.19528	0.00999	225,378	24,709	15,969	14,145	1,824	8,740	5,024	3,716	1.415	0.890	1.000	0.000	1.000
2014	0.19528	0.00999	213,838	25,154	16,368	14,601	1,767	8,786	5,186	3,600	1.342	0.854	1.000	0.000	1.000
2015	0.19528	0.00999	197,751	25,057	16,350	14,627	1,723	8,707	5,195	3,512	1.241	0.788	1.000	0.000	1.000
2016	0.19528	0.00999	180,096	24,524	16,010	14,330	1,680	8,513	5,090	3,423	1.131	0.680	1.000	0.000	1.000
2017	0.19528	0.00999	166,236	23,824	15,542	13,900	1,642	8,282	4,937	3,345	1.044	0.568	1.000	0.000	1.000
2018	0.19528	0.00999	155,467	23,028	14,999	13,394	1,605	8,029	4,757	3,271	0.976	0.460	0.998	0.000	1.000
2019	0.19528	0.00999	144,082	22,315	14,521	12,954	1,567	7,794	4,601	3,193	0.905	0.330	0.986	0.000	1.000
2020	0.19528	0.00999	132,598	21,845	14,230	12,708	1,522	7,615	4,514	3,101	0.832	0.198	0.966	0.000	1.000
2021	0.19528	0.00999	139,415	21,771	14,239	12,768	1,471	7,532	4,535	2,996	0.875	0.272	0.982	0.000	1.000
2022	0.19528	0.00999	152,098	22,008	14,478	13,060	1,419	7,529	4,639	2,891	0.955	0.420	0.998	0.000	1.000
2023	0.19528	0.00999	167,947	22,512	14,913	13,545	1,368	7,599	4,811	2,788	1.054	0.586	1.000	0.000	1.000
2024	0.19528	0.00999	182,931	23,169	15,458	14,139	1,319	7,711	5,022	2,688	1.148	0.706	1.000	0.000	1.000
2025	0.19528	0.00999	194,278	23,771	15,960	14,687	1,273	7,811	5,217	2,594	1.220	0.776	1.000	0.000	1.000
2026	0.19528	0.00999	201,534	24,264	16,375	15,143	1,232	7,889	5,379	2,510	1.265	0.810	1.000	0.000	1.000
2027	0.19528	0.00999	204,950	24,608	16,674	15,478	1,196	7,934	5,498	2,437	1.287	0.826	1.000	0.000	1.000
2028	0.19528	0.00999	205,157	24,820	16,867	15,701	1,166	7,953	5,577	2,376	1.288	0.826	1.000	0.000	1.000
2029	0.19528	0.00999	202,666	24,875	16,937	15,794	1,143	7,939	5,610	2,329	1.272	0.814	1.000	0.000	1.000
2030	0.19528	0.00999	198,196	24,834	16,928	15,803	1,125	7,906	5,613	2,293	1.244	0.794	1.000	0.000	1.000
2031	0.19528	0.00999	193,735	24,756	16,887	15,776	1,111	7,868	5,604	2,265	1.216	0.770	1.000	0.000	1.000
2032	0.19528	0.00999	190,714	24,705	16,863	15,762	1,101	7,842	5,598	2,243	1.197	0.754	1.000	0.000	1.000
2033	0.19528	0.00999	190,299	24,731	16,893	15,800	1,093	7,839	5,612	2,227	1.195	0.752	1.000	0.000	1.000
2034	0.19528	0.00999	192,273	24,863	16,998	15,912	1,086	7,865	5,652	2,213	1.207	0.764	1.000	0.000	1.000
2035	0.19528	0.00999	196,494	25,103	17,183	16,103	1,080	7,920	5,720	2,200	1.234	0.788	1.000	0.000	1.000
2036	0.19528	0.00999	202,058	25,435	17,435	16,361	1,074	8,000	5,811	2,189	1.269	0.814	1.000	0.000	1.000
2037	0.19528	0.00999	208,287	25,833	17,735	16,666	1,069	8,098	5,920	2,178	1.308	0.840	1.000	0.000	1.000
2038	0.19528	0.00999	214,357	26,255	18,052	16,987	1,065	8,203	6,034	2,169	1.346	0.862	1.000	0.000	1.000
2039	0.19528	0.00999	219,606	26,670	18,362	17,300	1,062	8,308	6,145	2,163	1.379	0.880	1.000	0.000	1.000
2060	0.19528	0.00999	276,268	33,781	23,397	22,164	1,233	10,384	7,873	2,512	1.734	0.976	1.000	0.000	1.000
2061	0.19528	0.00999	279,498	34,173	23,669	22,422	1,246	10,504	7,964	2,540	1.755	0.980	1.000	0.000	1.000
Grand Tota	0.195351	0.009843	194,795	24,787	16,664	15,353	1,310	8,123	5,453	2,670	1.223	0.722	0.998	0.005	0.985
Ave '12-21	0.195	0.010	177,051	23,244	15,184	13,600	1,584	8,059	4,831	3,229	1.112	0.592	0.993	0.016	0.954
Ave '22-31	0.195	0.010	190,349	23,962	16,148	14,913	1,235	7,814	5,297	2,517	1.195	0.733	1.000	0.000	1.000
Ave '31-39	0.195	0.010	201,761	25,449	17,440	16,361	1,079	8,009	5,812	2,198	1.267	0.807	1.000	0.000	1.000
Formula	*A*	*B*	*C*	*D=E+H*	*E=F+G*	*F*	*G*	*H=I+J*	*I*	*J*	*K*	*L*	*M*	*N*	*O*

Table 16-rev. Projected percentiles of total catch , landings , discards and female spawning stock biomass in 2013-2017 with an fishing mortality rate equal to the Pstar F of 0.19528. Catches in 2012 are assumed to be equal to MAFMC ACL=20,352 mt.

	2013				2014				2015				2016				2017			
%-ile	Catch (mt)	Landings (mt)	Discards (mt)	Female SSB (mt)	Catch (mt)	Landings (mt)	Discards (mt)	Female SSB (mt)	Catch (mt)	Landings (mt)	Discards (mt)	Female SSB (mt)	Catch (mt)	Landings (mt)	Discards (mt)	Female SSB (mt)	Catch (mt)	Landings (mt)	Discards (mt)	Female SSB (mt)
1	15,595	9,243	6,351	118,293	15,769	9,443	6,326	112,461	15,668	9,428	6,240	104,212	15,306	9,234	6,072	95,124	14,850	8,972	5,878	88,139
2	16,157	9,658	6,499	124,897	16,348	9,870	6,478	118,714	16,247	9,855	6,393	109,982	15,875	9,652	6,223	100,366	15,404	9,377	6,026	92,957
3	16,626	10,004	6,622	130,409	16,831	10,226	6,605	123,932	16,731	10,211	6,520	114,798	16,350	10,001	6,349	104,742	15,866	9,716	6,150	96,979
4	17,034	10,305	6,729	135,205	17,251	10,537	6,715	128,473	17,151	10,521	6,630	118,988	16,763	10,305	6,458	108,549	16,268	10,010	6,258	100,479
5	17,398	10,574	6,824	139,481	17,626	10,813	6,813	132,522	17,526	10,798	6,729	122,723	17,131	10,575	6,555	111,942	16,626	10,272	6,354	103,597
10	18,810	11,616	7,194	156,069	19,080	11,886	7,194	148,225	18,980	11,870	7,111	137,214	18,558	11,625	6,934	125,106	18,017	11,290	6,726	115,696
15	19,864	12,394	7,470	168,455	20,165	12,687	7,479	159,952	20,066	12,671	7,396	148,034	19,625	12,409	7,216	134,935	19,055	12,050	7,005	124,731
20	20,742	13,042	7,701	178,773	21,070	13,354	7,716	169,719	20,971	13,337	7,634	157,045	20,512	13,061	7,451	143,120	19,919	12,683	7,236	132,252
25	21,508	13,606	7,901	187,766	21,858	13,936	7,922	178,233	21,760	13,919	7,841	164,901	21,287	13,631	7,656	150,257	20,673	13,235	7,438	138,812
30	22,206	14,122	8,084	195,975	22,577	14,467	8,111	186,005	22,479	14,450	8,030	172,072	21,993	14,150	7,843	156,771	21,361	13,738	7,622	144,800
35	22,863	14,607	8,257	203,692	23,253	14,966	8,288	193,309	23,156	14,948	8,208	178,811	22,657	14,638	8,019	162,892	22,007	14,211	7,796	150,424
40	23,485	15,066	8,420	211,001	23,894	15,438	8,456	200,229	23,797	15,421	8,376	185,196	23,287	15,101	8,186	168,692	22,620	14,660	7,960	155,756
45	24,094	15,515	8,579	218,156	24,521	15,901	8,620	207,002	24,424	15,883	8,541	191,444	23,902	15,553	8,349	174,367	23,219	15,099	8,120	160,969
50	24,686	15,952	8,734	225,108	25,130	16,351	8,780	213,584	25,034	16,333	8,701	197,518	24,501	15,994	8,507	179,886	23,802	15,526	8,277	166,044
55	25,287	16,395	8,892	232,170	25,749	16,807	8,942	220,268	25,653	16,789	8,863	203,684	25,108	16,440	8,668	185,486	24,393	15,958	8,435	171,189
60	25,893	16,842	9,051	239,282	26,373	17,267	9,106	227,001	26,276	17,249	9,027	209,896	25,720	16,890	8,830	191,129	24,989	16,395	8,595	176,375
65	26,518	17,303	9,214	246,624	27,016	17,742	9,274	233,950	26,920	17,724	9,196	216,308	26,352	17,355	8,998	196,953	25,604	16,845	8,759	181,728
70	27,173	17,787	9,386	254,325	27,691	18,240	9,451	241,240	27,595	18,221	9,374	223,033	27,015	17,842	9,173	203,061	26,249	17,317	8,932	187,341
80	28,642	18,871	9,771	271,579	29,203	19,356	9,847	257,573	29,108	19,337	9,771	238,103	28,500	18,933	9,567	216,750	27,695	18,375	9,320	199,921
85	29,513	19,514	9,999	281,815	30,100	20,018	10,083	267,264	30,005	19,998	10,007	247,044	29,381	19,581	9,800	224,873	28,553	19,004	9,549	207,388
90	30,565	20,290	10,275	294,176	31,184	20,817	10,367	278,965	31,089	20,798	10,292	257,841	30,445	20,364	10,082	234,682	29,589	19,762	9,827	216,403
95	31,985	21,338	10,647	310,859	32,646	21,896	10,750	294,757	32,552	21,876	10,676	272,409	31,880	21,419	10,462	247,912	30,986	20,785	10,201	228,560
96	32,345	21,603	10,742	315,083	33,016	22,169	10,847	298,756	32,922	22,149	10,773	276,099	32,244	21,686	10,558	251,266	31,340	21,044	10,296	231,643
97	32,757	21,907	10,850	319,922	33,440	22,482	10,958	303,336	33,346	22,462	10,885	280,325	32,661	21,992	10,668	255,103	31,745	21,341	10,405	235,169
98	33,228	22,255	10,973	325,461	33,925	22,840	11,085	308,579	33,832	22,820	11,012	285,162	33,137	22,343	10,795	259,497	32,209	21,680	10,529	239,207
99	33,786	22,667	11,119	332,018	34,500	23,264	11,236	314,787	34,407	23,244	11,163	290,891	33,702	22,758	10,944	264,702	32,759	22,083	10,676	243,992

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: September 21, 2012

TO: Chris Moore, Executive Director

FROM: Jim Armstrong JLA

SUBJECT: Spiny Dogfish ABC and Management Measures for 2013

Summary

The latest spiny dogfish assessment update indicates that the spiny dogfish stock is not overfished and that overfishing is not occurring. The estimate of SSB (215,444 mt) is 135.3 % of the Bmsy proxy, SSB_{MAX} (159,288 mt) and F_{2011} (0.114) is estimated at 46.7% of F_{MSY} (0.2439). Rebuilding, initiated in 2000, was officially recognized to have ended in 2010, the fourth consecutive year for which SSB was estimated to have been above SSB_{MAX}. For 2012, the SSC set ABC (20,352 mt) based P* = 40% for a tier-3 assessment on a "typical" stock, where OFL = 25,131 mt.

Applying P* to the projected OFL_{2013} (31,091 mt) from the latest stock assessment update (Rago and Sosebee 2012) corresponds to ABC_{2013} = 25,179 mt. In accordance with the Council's Omnibus ACL/AM Amendment, ACL = ABC for spiny dogfish and that the domestic ACL would be equal to the total ACL minus Canadian landings (81 mt ave 2009-2011). Therefore, the domestic ACL = 25,098 mt. An Annual Catch Target (ACT) that accounts for management uncertainty (24,174 mt; ave quota overage = 4.0% in 2010-2011) and that is equal to the domestic ACL is also recommended. After subtracting estimated discards (4,434 mt; ave 2010-2011) and U.S. recreational landings (26.5 mt; ave 2010-2011) from the ACT, total allowable landings (TAL, i.e., commercial quota) for 2013 is 19,632 mt (43.282 M lb).

Introduction

The specification of spiny dogfish management measures is a joint process conducted annually by the Mid-Atlantic and New England Fishery Management Councils (Councils). A separate specification process is also undertaken by the Atlantic States Marine Fisheries Commission's Spiny Dogfish Management Board (Board). The Northeast Fishery Science Center (Center) updates the spiny dogfish assessment and conducts long-term projections. The Mid-Atlantic Council's Scientific and Statistical Committee (SSC) reviews assessment results and determines the acceptable biological catch (ABC) for the upcoming year or multi-year period (up to five years) as allowed under the Spiny Dogfish Fishery Management Plan (FMP). ABC is a reduction from the overfishing limit (OFL) based on the SSC's consideration of scientific uncertainty and serves as an upper limit on the catch target that management measures attempt to achieve. The Councils' Spiny Dogfish Monitoring Committee (MC) develops and recommends specific coastwide (Maine – Florida) management measures that will achieve target catch and makes further adjustments to total catch as needed based on management uncertainty. Finally, the Councils, at their respective meetings, develop recommendations to be submitted to the National Marine

Fisheries Service.

In this memorandum, information is presented to assist the SSC and MC in their roles in the specification process. Assessment update results are presented briefly and a more detailed *draft* Stock Status Update prepared by the Center is attached under separate cover. That and other listed documents are distributed in conjunction with the staff memo:

Attachment A: Stock Status Update (NEFSC 2012)
Attachment B: SSC Report from 2011
Attachment C: Fishery Performance Report
Attachment D: MADMF Letter

Management History

A long term landings history (1962-2011) is provided in Table 1 of Attachment A. The federal FMP was developed in 1998 and implemented in 2000 in order to halt large scale depletion of reproductively mature female spiny dogfish and allow the stock to recover to a sustainable level. The directed dogfish fishery of the 1990s harvested primarily the largest (80+ cm) spiny dogfish in the stock, and the species' life history is such that these fish are primarily mature females. The FMP eliminated the directed fishery for spiny dogfish beginning in 2000 by instituting a 4 million pound (1,814 mt) commercial quota that essentially served as a bycatch allowance. Substantial increases in SSB followed and an increase commercial quota to 12 million pounds (5,443 mt) in 2009 was possible while continuing to achieve $F_{rebuild}$. The stock was declared rebuilt in 2010 following a report by TRAC reviewers of re-estimated reference points (NEFSC 2010) and commercial quotas have increased markedly since then (15 M lb in 2010; 20 M lb in 2011; 35.694 M lb in 2012).

Regulatory Review (Current Management Measures)

For the current 2012 fishing year, the SSC recommended a reduction from OFL based on a probability of overfishing (P*) of 40%. This probability is in keeping with the SSC's risk policy for a level-3 assessment on a "typical" stock, with typical meaning that life history and/or current population conditions are well characterized by the assessment. The ABC that corresponds to P*=40% in 2012 is 20,352 mt (44.868 M lbs).

Based on recommendations from the spiny dogfish monitoring committee, the Council adopted a commercial quota of 35.694 M lbs (16,191 mt) and trip limits of 3,000 lbs for the 2012 fishing year. The 35.694 M lb commercial quota accommodated a reduction from ABC to allow for discards (4,081 mt), Canadian landings (59.5 mt), and recreational landings (21 mt), values taken from the 2010 assessment update. As per the FMP, the 2012 quota was divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (20.667 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (15.027 M lbs). Period 1 landings for 2012 have not been achieved and federal waters remain open to the possession of spiny dogfish. Based on the current landings trajectory, it is possible that the Period 1 quota will not be harvested (Figure 1).

Biological Reference Points

The B_{MSY} proxy for spiny dogfish is SSB_{MAX}, which is estimated to be 159,288 mt (351.170 M lb, and the level at which the stock is determined to be overfished (½ B_{MSY}) is 79,644 mt (175.585 M lb). The Bmsy proxy was reviewed and accepted by TRAC reviewers in 2010 and is described in Rago and Sosebee (2010).

Overfishing is defined as occurring above the F_{MSY} proxy which is estimated to be 0.2349. In light of the previous year's rejection by the SSC of the established Fmsy proxy (0.325; Attachment B), a revised estimate was needed for the current ABC setting exercise. That estimate (0.2439) was accepted for use as a basis for OFL by an SSC working group on August 19, 2011, and the corresponding report is included as Attachment C.

Stock Biomass

The spiny dogfish stock is not overfished. The updated stochastic estimate of female spawning stock biomass (SSB) for 2010 is about 6% above SSB_{max} (159,288 mt). This is the fourth consecutive year in which the SSB estimate has been above SSB_{max}. The specific estimate of SSB is 215,444 mt. The probability that the SSB_{2012} is below SSB_{max} is estimated to be less than 13%. The probability that SSB_{2012} is above the biomass threshold (79, 644 mt, i.e., 1/2 SSB_{max}) is estimated to be 100%.

Uncertainty in the biomass estimate is accounted for in the underlying variability in the spring trawl survey data as well as uncertainty in the size of the footprint of the average trawl tow. Uncertainty in the Ricker S-R based biomass reference point is accounted for in the confidence interval associated with model fit.

Fishing Mortality

Several sources of removals contribute to the estimate of F for the most recent complete fishing year (2010). These include U.S. commercial landings (9,480 mt), Canadian commercial landings (124 mt), Distant Water Fleet landings (143 mt), U.S. commercial discards (4,787 mt), and U.S. recreational landings (32 mt). Total removals in 2011 were approximately 14,566 mt corresponding to a stochastic F estimate of $F_{2011} = 0.11$, below the overfishing threshold of F = 0.2439 and 634 mt below ABC_{2011} (15,200 mt). The probability that *overfishing is not occurring* ($F_{2011} < F_{threshold}$) is approximately 100%.

Uncertainty is quantified in model estimates of F and is based on uncertainty in biomass as well as variance associated with discard estimates, sex ratio, size composition, selectivity and other parameters (Attachment A). Uncertainty in the fishing mortality reference point corresponding to OFL is also estimated (Attachments A).

Other Sources of Uncertainty

Because spiny dogfish biomass estimates are primarily based on catches in the Center's spring trawl survey, an important source of uncertainty is the calibration between the R/V Albatross and FSV Bigelow. The efficiency of the RV Albatross net is estimated to be approximately 64% that of the FSV Bigelow.

Other important sources of scientific uncertainty:

- Canadian landings
- Changes in selectivity
- Discards
- Scaling with landings
- Fate of discarded fish
- Scale of population—Q
- Sex ratios of landings
- Male dogfish

Projections

As part of the stock status report (Attachment A), long-term stochastic projections were generated that allow transient population conditions to more-or-less fully work their way through for this long-lived species. In Attachment A, a projection based on Fmsy (0.2439) is provided.
Projection results are in Table 11 in Attachment A. This provided the basis for calculation of ABC in 2013. The application of a constant F (extend F corresponding to ABC_{2013}) for multiyear management measures will be discussed when that projection is provided.

OFL, ABC

For OFL and ABC, the following definitions are suggested:

OFL = Total catch at F_{msy}(0.2439) in 2012

ABC = Total catch based on the Council's risk policy for Tier 3, the previously designated assessment level for dogfish. Specifically, an assumed 100% CV for OFL, noting that the ratio of B/BMSY is greater than 1, and that spiny dogfish life history is well accounted for in the assessment (typical), such that P* = 0.40.

The mean estimate of OFL corresponding to F_{msy} proxy (0.2439) is 31,091 mt (68.544 M lb). Using the ABC calculation described, the corresponding ABC is 25,179 mt (55.509 M lb).

Single Year vs. Multi-Year

A staff recommendation for multi-year ABC (up to 5 years) is suggested, however, the specific values will be determined from a constant F projection that is expected to be distributed prior to the SSC meeting.

ACL/ACT

ACL.

According to the specifications process envisioned in the Omnibus ACL/AM Amendment (Amendment 2 to the Spiny Dogfish FMP) the Council's will specify an ACL equal to ABC for a given year (Figure 2). Additionally, a reduction from ACL to accommodate Canadian landings is made to derive the domestic ACL. Canadian landings appear to be holding steady at a low level since 2009. For 2013, it is suggested that the average 2009-2011 Canadian landings (81 mt) be used to calculate the domestic ACL.

Therefore, ABC and ACL = 25,179 mt and Domestic ACL = 25,098 mt.

ACT (Deduction for Management Uncertainty)

According to the Omnibus Amendment, an ACT is set to account for management uncertainty. The Spiny Dogfish Monitoring Committee will characterize and comment on sources of management uncertainty in developing its recommendation to the Councils.

Table 1 provides the specified annual quotas and realized landings since 2003. Although the federal FMP was implemented in 2000, the ASMFC's ISFMP was not developed until 2003 and spiny dogfish landings were generally a reflection of state water quotas. For 2009-2010, after the ASMFC implemented accountability measures for spiny dogfish, total landings were below the federally specified quota. This prompted the Monitoring Committee to propose no deduction for management uncertainty for the 2012 fishing year.

As reported in a letter of July 2012, MADMF (Attachment D) discovered 2.190 M lb of unreported spiny dogfish

that had been sold to an unlicensed transporter in 2011 and had not been counted against state landings. Additionally an overage of 1.359 M lb occurred in the "northern region" as well as overages of 102k lb in NJ and 88k lb in VA. MADMF also reported measures that have been taken to prevent this sort of occurrence from happening again (Attachment D). The allocation of quota to states and regions under the ISFMP includes deductions for the other overages (Table 2). It is suggested that for 2013+ specifications setting, an explicit deduction from the domestic ACL be made to account for management uncertainty associated with the potential for harvest to exceed specified limits.

The Monitoring Committee has used the period beginning in 2010 as the basis for deductions to account for other sources of mortality, most importantly discards. This is rationalized by the shift in overall effort associated with the transition to sectors in New England. To be consistent with that reference timeframe (2010 fwd), it is suggested that the average quota overage for 2010 fwd be considered for calculating the management uncertainty buffer For 2010-2011, the overage (as a percent of the quota) is 3.99%. A deduction of 3.99% from the domestic ACL (1,001 mt; 2.208 M lb) would result in:

ACT = 24,096 mt (53.123 M lb).

Note that other components of the total catch have generally been overestimated since 2008 (top right panel in Figure 3). This has acted as a buffer to the two quota overages that occurred over the same time such that overall catches have not exceeded target levels (bottom left panel in Figure 3). Nevertheless, the uncertainty associated with predicting discards, recreational harvest and Canadian landings should not be used as a cushion for the inability of management to constrain landings.

TAL/Commercial Quota

The TAL and commercial quota are calculated according to the process illustrated in Figure 2. For 2013, the deduction for U.S. discards is 4,434 mt (9.775 M lb; ave 2010-2011) resulting in a TAL of 19,662 mt (43.348 M lb). The deduction for recreational landings is 26.5 mt (58,422 lb) resulting in a commercial quota of 19,636 mt (43.289 M lb). These deductions would be made for each year if multi-year specifications were adopted.

Allocation of the Commercial TAL

Under the FMP's current configuration, the annual commercial TAL is allocated seasonally between Period 1 (May 1 – Oct 31; 57.9%) and Period 2 (Nov 1 – Apr 30; 42.1%). For 2013, this would be 25.064 M lbs in Period 1 and 18.225 M lb in Period 2. The implementation of Amendment 3 would remove this allocation and replace it with either a single coastwide quota (43.289 M lb) or allocate the quota to states and the northern region according to Addendum IV. Applying the percentages from Addendum IV (see column 2 in Table 2) would result in Northern Region: 25.108 M lb; NY 1.172 M lb; NJ: 3.309 M lb; DE: 388k lb;MD: 2.562 M lb; VA: 4.673 M lb; NC: 6.076 M lb.

Trip Limits

No adjustment to the existing 3,000 pound trip limit is recommended. It was suggested at the AP meeting for developing the FPR that an increase to 4,000 pounds would be desirable to many fishermen, while a larger increase may attract fishermen less skilled at preventing protected resource interactions. Given that there is no biological basis for a particular trip limit, no recommendation is made.

Summary

Management measures for 2013 are summarized in Table 3.

The spiny dogfish population is not overfished and overfishing is not occurring for this stock.

For 2013 based on the information provided and the proxy Fmsy reference point, OFL is 31,091 mt (68.544 M

lb), and ABC is 25,179 mt (55.509 M lb).

A deduction for management uncertainty is suggested (1,001 mt; 2.208 M lb) resulting in an ACT of 24,096 mt (53.123 M lb).

Following deductions for discards and recreational landings, the TAL is 19,662 mt (43.348 M lb) and the commercial quota is 19,636 mt (43.289 M lb).

OFL and ABC for 2013 are based on projected catches at Fmsy. Subsequent projections at constant F, when they become available, will provide the basis for multi-year ABC in 2014 fwd.

References

Attachment A. Rago PJ and KA Sosebee. 2012.Update on the status of spiny dogfish and initial evaluation of alternative harvest strategies. Report to MAFMC SSC September 19, 2012. 44 p.

Attachment B. SSC Report from September 2011. 18 p.

Attachment C. 2012 Fishery Performance Report for Spiny Dogfish 2 p.

Attachment D. Letter from MADMF to ASMFC regarding discovery of unreported spiny dogfish sales.

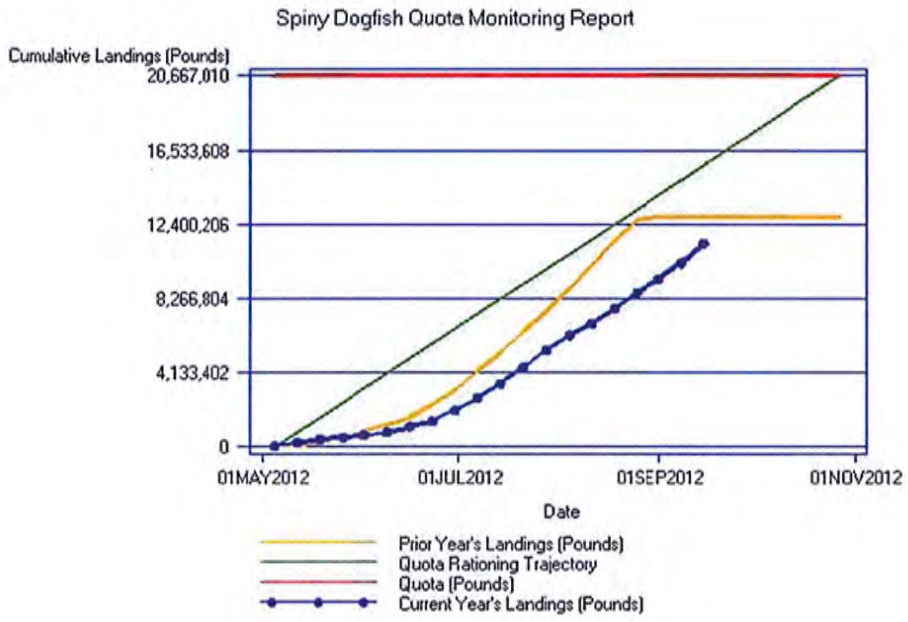

Figure 1. Commercial spiny dogfish landings through mid-September from the NMFS quota monitoring website

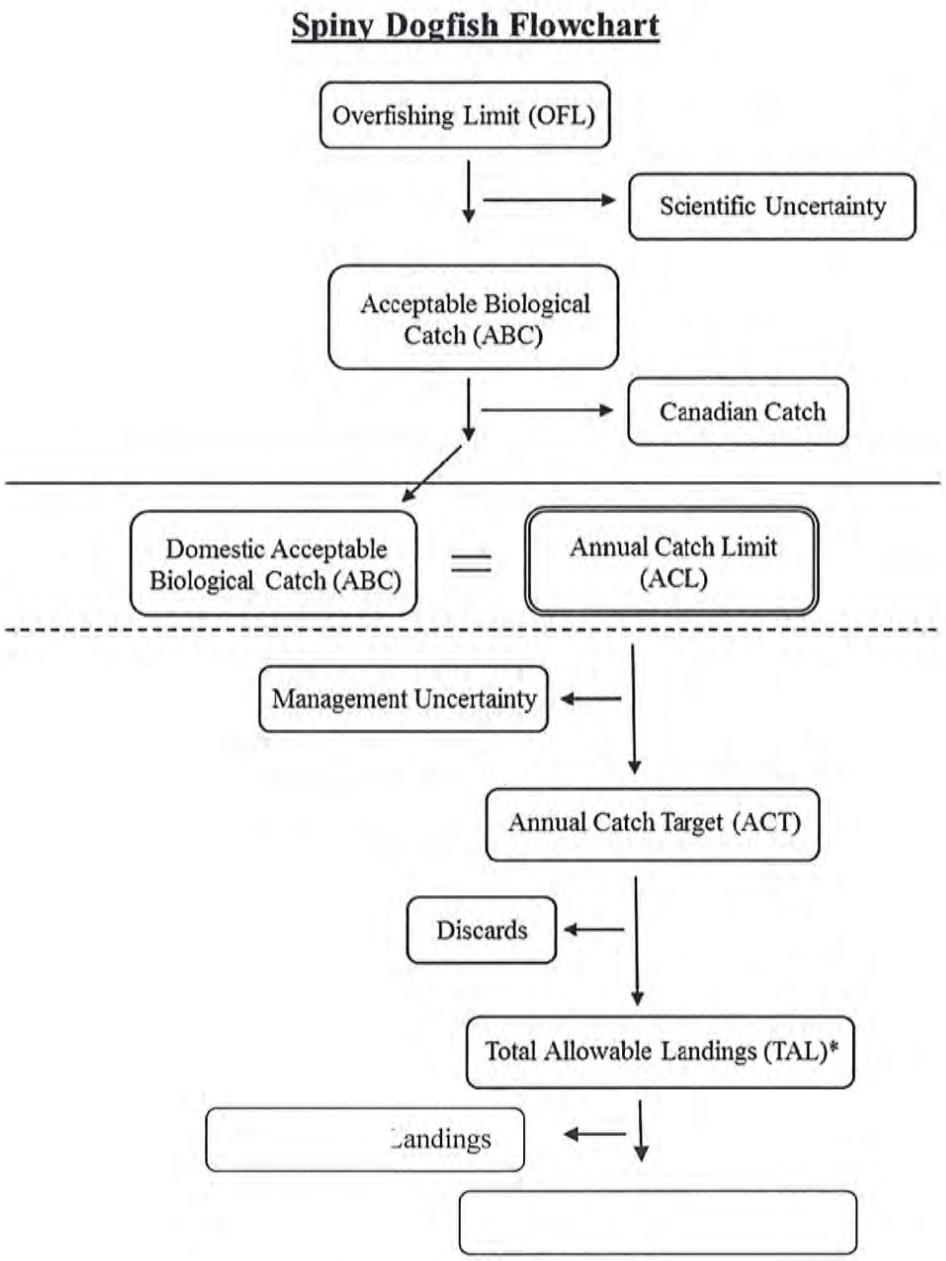

Figure 2. Specification process for spiny dogfish catch regulations as described in the Omnibus ACL/AM Amendment (currently in rulemaking).

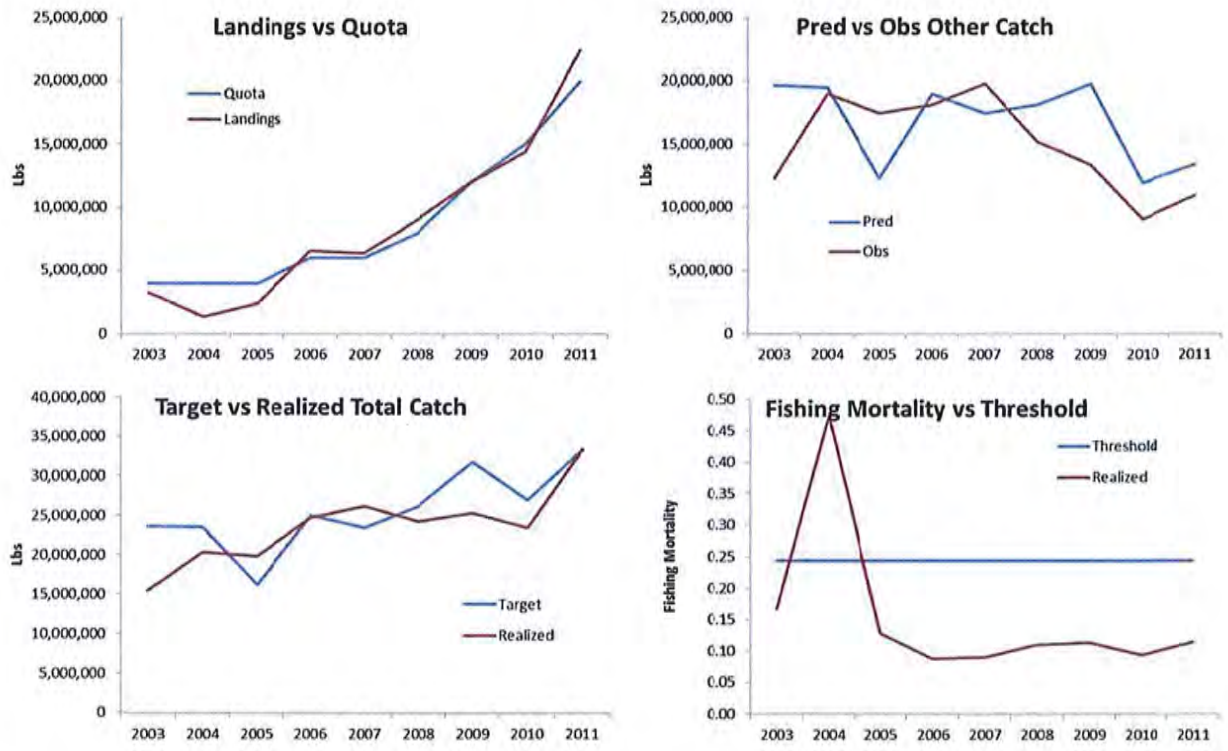

Figure 3. Comparison of various components of the spiny dogfish catch as well as fishing mortality from 2003 – 2011.

Table 1. Federal and State quotas compared to realized landings 2003-2011.

Year	Quota (M lb; larger of either fed or state*)	Landings (M lb)	Difference from quota
2003	4.000	3.244	-0.757
2004	4.000	1.377	-2.623
2005	4.000	2.407	-1.593
2006	6.000*	6.583	0.583
2007	6.000*	6.391	0.391
2008	8.000*	9.028	1.028
2009	12.000	11.957	-0.043
2010	15.000	14.359	-0.641
2011	20.000	22.451	2.451

*Indicates state water quota. The federal quota in 2006-2008 was 4.0 M lb.

Table 2. Allocation of, deductions from the 2013 commercial spiny dogfish quota by the ASMFC.

	2012/2013 % Allocation	2012/2013 Allocation (Pounds)	Adjustments for 2011/2012 Overages (-) and rollovers (+)	Preliminary 2012/2013 Quota (Pounds)
Northern Region (ME - CT)	58.00%	20,702,520	-1,359,053	***19,343,467***
NY	2.707%	966,237	26,935	***993,171***
NJ	7.644%	2,728,449	-101,508	***2,626,941***
DE	0.896%	319,818	3,915	***323,734***
MD	5.920%	2,113,085	13,113	***2,126,197***
VA	10.795%	3,853,167	-88,435	***3,764,732***
NC	14.036%	5,010,010	20,844	***5,030,854***

Table 3. Proposed management measures for 2013.

2013 Measures	Basis	M lb	Mt
OFL	F_{MSY} *(0.2439)*	68.544	31,091
ABC	*P* for Level 3, typical (40% p(overfishing))*	55.509	25,179
ACL	*= ABC*	55.509	25,179
[Canadian Landings]	*= ave 2009-2011*	0.179	81.0
Domestic ACL	*= ACL – Canadian Landings*	55.331	25,098
Mgmt Uncertainty Buffer	*Ave of quota overages (pct) in 2010-2011 (4.0%)*	2.208	1,001
ACT	*= Domestic ACL - management uncertainty*	53.123	24,096
[U.S. Discards]	*= ave 2010-2011*	9.775	4,434
TAL	*ACT - Discards*	43.289143	19,662

2012 Spiny Dogfish
Fishery Performance Report

The Spiny Dogfish Advisory Panel (AP) met from 10 AM – 12:30 AM Sept 18, 2012 in Philadelphia, PA to develop a Fishery Performance Report (FPR) for consideration during the upcoming specification cycle. At the end of its meeting, the AP reviewed and approved the summary below as the FPR.

MAFMC Dogfish Advisers in attendance were: Kevin Wark (NJ commercial fisherman), James Fletcher (NC commercial fishing organization), Jack Musick (VA academic), and James Sulikowski (ME academic). Also in attendance was David Tomberlin of the SSC.

Recreational Fishery Issues

No discussion

Market / Economic Issues

The low value of dogfish constrains the extent to which fishermen are willing to go offshore to fish for them. This may explain the low landings that have been observed thus far via quota monitoring (see Figure 1 in the staff memo). The drop in Canadian landing starting in 2009 is explained by the increased U.S. quotas, cost of shipping to processors (all in New Bedford, MA), and a weak belly flap market. Canadians shifted effort to abundant and more valuable lobsters.

The generally poor economy in Europe where Germany is an important importer of dogfish is constraining demand. The certification of the fishery by the Marine Stewardship Council will likely improve European demand but the economy will likely continue to impose constraints.

The market is not ready right now for huge increases in dogfish but a slow transition to larger scale harvest may be possible. This includes having other processors, perhaps most importantly in the southern end of the range, accepting dogfish.

Environmental Issues

Fish have been offshore this year due to water being warmer earlier in the year than usual. Another environmental factor affecting the drop in dogfish commercial landings in NC is the closure of Oregon Inlet which decreases commercial fishing access/effort off NC.

Spiny dogfish are available year round now in the Gulf of Maine.

Management Issues & Management Induced Effort Shifts

The quota is adequate if in combination with the trip limit, it keeps the fishery open all year. Trip limits should probably be increased to 4,000 pounds but no more than that or it will attract

fishermen into the [open access] fishery that are less skilled at avoiding protected species such as sturgeon and marine mammals.

A limited entry permit would be a good idea to ensure that the fishery is operated by experienced dogfish fishermen who have a history in the fishery and can avoid protected species issues.

There is a perception that the ability to separately account for male and female dogfish would allow for the development of a market for male dogfish which are currently under-exploited. A recommendation was made for developing a management model for administering a male dogfish fishery. Additionally, population modeling associated with a smaller exploitable size may be needed to supplement that effort. It was suggested that the military and prisons may be potential markets for male dogfish.

Longer term specifications would greatly benefit industry in terms of planning.

General Fishing Trends

It was suggested that characterizing the size composition of the population using a trawl survey is problematic since trawl caught dogfish tend to be smaller than gillnet caught dogfish.

The absolute size of the dogfish population was suggested to be underestimated by approximately 50%. This is largely driven by the presence of a separate stock off North Carolina that exhibits east-west rather than north-south migratory behavior. It was suggested that only 20% of that population is covered by the trawl survey.

The recovery of dogfish was suggested to be a major constraint for the viability of other stocks, primarily GOM Gadids.

Other Issues

A statement was made about multiple sources of precaution being applied as the process moves from the assessment to management measure implementation.