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: September 24, 2015

TO: Joint Spiny Dogfish Committee, Council

FROM: Jason Didden

SUBJECT: Spiny Dogfish 2016-2018 Specifications

In this tab please find the following documents to support Council action regarding the 2016-2018 Spiny Dogfish Specifications. Page numbers refer to the centered, underlined page numbers.

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: September 24, 2015

TO: Joint Spiny Dogfish Committee, Council

FROM: Jason Didden

SUBJECT: Spiny Dogfish 2016-2018 Specifications, Monitoring/Technical Committees Summary

On October 6, 2015, the Council will meet as a Joint Spiny Dogfish Committee of the Whole to set Spiny Dogfish Specifications for 2016-2018. This memo summarizes the results of the September 22, 2015 Spiny Dogfish Monitoring Committee (MC) meeting (webinar), which was held in conjunction with the ASMFC's Spiny Dogfish Technical Committee (TC). The purpose of the meeting was to review management measures for the upcoming fishing years and make recommendations as appropriate. Monitoring Committee members in attendance included Jason Didden (MAFMC staff, Chair), Fiona Hogan (NEFMC staff), *Tobey Curtis (NMFS-GARFO), Eric Schneider (RI-DEM), Dan McKiernan (MADMF), Angel Willey (MDDNR), Jack Musick (VIMS), and Chris Hickman (NC, Industry – ex officio/non-voting). Members of the TC (but not on the MC) that were in attendance included* Ashton Harp (ASMFC staff), Greg Hinks (NJ) *Matt Cieri (ME DNR), Greg Skomal (MADMF), and Scott Newlin (DNREC). Others in attendance included Chris Batsavage, Ted Ligenza, Ali Donargo, Greg DiDomenico, John Whiteside, Katie May Laumann, Kevin Wark, and Rob O'Reilly.*

There was also a public informational webinar held in the evening of September 22, 2015. Public comments from both meetings are summarized separately in this tab immediately after this memo.

Stock Status / OFL / ABC

Jason Didden provided an overview of the 2015 spiny dogfish assessment update and the findings of the Council's Scientific and Statistical Committee (SSC). The stock is not overfished and overfishing is not occurring. However, compared to the last update (2013), the stock is estimated to be lower (87% of target in 2015) compared to 2013 (135% of the target). The primary cause of the reduction in the biomass estimate is that the last update was driven by survey data points that were above average (2011), very above average (2012), and near average (2013) while the current update is driven by survey data points that are near average (2013) and below average (2015). There is no NMFS survey value (and therefore no stock size estimate) for 2014 because important spiny dogfish areas were skipped by the Bigelow trawl survey due to a mechanical breakdown.

Discussion during the call highlighted that the 2012 data point, in addition to being extremely high, had a very high variance, and an appropriate interpretation may be that we are moving away from an erroneously estimated increase in estimated stock size tied to the 2012 data point, rather than actually having a rapid increase followed by a rapid decrease. This interpretation would also align with the previously-predicted declines in stock size for the current year given the low pup indices from 1997-2003. As a follow up, Council staff notes that the current estimate in 2015 is somewhat lower but relatively close to the projected stock size for 2015 done in 2011 (before the high 2012 data point began to influence estimates). Discussion also pointed out that after 2019, the spawning stock is still predicted to start increasing due to higher recent pup indices.

Based on the updated assessment, the overfishing level (OFL) catch for 2016 is estimated based on application of Fmsy (F = 0.2439), and is 53,455,485 pounds (24,247 mt). Based on the projections in the assessment using the Council's risk policy, the Acceptable Biological Catches (ABCs) for 2016, 2017, and 2018 would be 37.0 million pounds (16,765 mt), 36.4 million pounds (16,526 mt), and 36.7 million pounds (16,636 mt), respectively. The risk of overfishing in these years from the Council's risk policy would be 33%, 30%, and 28%. The risk of overfishing is less than 40% because the Council's risk policy requires a lower chance of overfishing when stock size is below the reference target for spiny dogfish female spawning stock biomass. Relative to the 2015 ABC, the recommended ABCs represent reductions of 41%, 42%, and 41% for 2016, 2017, and 2018, respectively. Additional details on the

assessment update and recent fishery performance may be found at the SSC meeting site at http://www.mafmc.org/ssc-meetings/2015/sept-16-17 and in the staff memo included later in this tab.

Calculation of Existing 2014 Federal TAL and commercial quota

The federal spiny dogfish TAL is calculated using the process outlined in Amendment 2 to the Spiny Dogfish FMP (i.e., Omnibus Annual Catch Limit (ACL)/ Accountability Measures (AM) Amendment). The current (starting May 2015) fishing year's values corresponding to the steps in the process are given in Table 1. The Total Allowable Landings (TAL) and commercial quota are the remaining catch available for landings after accounting for management uncertainty and all other types of removals specified in the fishery management plan. The other types of removals include Canadian commercial landings and U.S. discards (commercial and recreational). The commercial quota is the remaining landings available after a further reduction from the TAL to account for expected U.S. recreational landings. The recommended values for 2016-2018 are provided in Table 2, and were endorsed by all participating members of the Monitoring Committee except for Chris Hickman, the ex officio industry representative on the Monitoring Committee, who believed that the quotas should not be reduced. He indicated that there are many fewer participants, that the current fleet cannot hurt the spiny dogfish population under the current regulations, and that too many assumptions are being used to make quota decisions.

Several modifications to how the various reductions from ABC were proposed by staff and accepted by the Monitoring Committee. While the absolute quantities for these reductions (discards, recreational landings) did not change appreciably, correlation analysis suggested different methods of using recent years' values were more appropriate for determining the amounts to subtract for expected discards and recreational landings. Additional discussion of these changes can be found in the staff memo to the SSC and MC, which is included later in this tab.

Table 1. Spiny dogfish management measures for 2015 fishing year as currently specified.

Specifications	Basis	2015 (pounds)	2015 (mt)
OFL	Projected Catch at Fmsy		
ABC	Constant F	62,412,866	28,310
Canadian Landings	= avg last 3 years (09,10,11)	143,300	65
Domestic ABC	= ABC – Canadian Landings	62,269,566	28,245
ACL	= Domestic ABC	62,269,566	28,245
Mgmt Uncert. Buffer	Average Overages 2010-11	0	0
ACT	= ACL - mgmt uncertainty	62,269,566	28,245
U.S. Discards	2002-2011 average	11,605,133	5,264
TAL	ACT – Discards	50,664,432	22,981
U.S. Rec Landings	2010-2011 average	52,911	24
Comm Quota	TAL – Rec Landings	50,611,522	22,957

OFL = Overfishing Level

ABC = Acceptable Biological Catch

ACL = Annual Catch Limit

ACT = Annual Catch Target

TAL = Total Allowable Landings

Table 2. Proposed spiny dogfish management measures for 2016-2018 fishing years.

Specifications	Basis	2016 (pounds)	2016 (mt)	2017 (pounds)	2017 (mt)	2018 (pounds)	2018 (mt)
OFL	Projected Catch at Fmsy	53,455,485	24,247	55,313,982	25,090	56,824,148	25,775
ABC	Council Risk Policy	36,960,498	16,765	36,433,593	16,526	36,676,102	16,636
Canadian Landings	= avg last 3 years (10,11,12)	143,300	65	143,300	65	143,300	65
Domestic ABC	= ABC – Canadian Landings	36,817,198	16,700	36,290,293	16,461	36,532,801	16,571
ACL	= Domestic ABC	36,817,198	16,700	36,290,293	16,461	36,532,801	16,571
Mgmt Uncert. Buffer	Ave pct overage since 2011	0	0	0	0	0	0
ACT	= ACL - mgmt uncertainty	36,817,198	16,700	36,290,293	16,461	36,532,801	16,571
U.S. Discards	=3 year average 12-13-14	11,494,167	5,214	11,494,167	5,214	11,494,167	5,214
TAL	ACT – Discards	25,323,030	11,486	24,796,126	11,247	25,038,634	11,357
U.S. Rec Landings	= 2014 estimate	68,343	31	68,343	31	68,343	31
Comm Quota	TAL – Rec Landings	25,254,687	11,455	24,727,782	11,216	24,970,291	11,326

The Monitoring and Technical Committees also reviewed and/or discussed a variety of other issues, as described below.

Management Uncertainty and Calculation of the ACT

Because there have been no recent overages of the ACL in this fishery, and the existing trip limits should allow accurate quota monitoring, no management uncertainty buffer is proposed. Thus the Domestic ABC = ACL = ACT.

Discards

The discard levels recommended by Council staff are slightly different than those used in the assessment update, but total mortality would be the same so the projections would not be impacted. Earlier discussions with Paul Rago suggested that a recent three-year average was a reasonable approach given the strong correlations observed. If discards are higher than predicted this will increase the chance of ACL overages (there is no management uncertainty buffer). In the event that the ACL is exceeded in a given fishing year, the overage is deducted (as soon as possible) from a subsequent single fishing year ACL.

Trip Limits

The MC did not make a recommendation on trip limits. The MC did discuss trip limits at length, but came to the conclusion that there is no biological basis for recommending alternative trip limits at this time. Discussion noted that states can set higher trip limits in state waters, for example North Carolina increased its state trip limit to 20,000 pounds effective February 19, 2015. There was discussion that the current trip limits may not be optimal for some participants but that changing trip limits impacts various fishery participants differently, especially depending on their location relative to processors. Some constituents may want consideration of different trip limits in a separate action (where the impacts throughout the fishery can be more fully evaluated).

Missing 2014 Data Point

The MC discussed whether different approaches to impute/fill-in the missing 2014 data point were considered. Council staff relayed that there were some discussions with Science Center staff but there were concerns that generating and selecting imputation methods were outside the scope of this assessment update. Council staff is recommending that an assessment update be conducted again next year and include additional consideration of ways to impute the missing 2014 data point.

Benchmark

There was discussion of whether the time was right for another benchmark assessment given the current assessment draws heavily on the results of the last peer-reviewed stock assessment vetted at SARC 43 in 2006 and the revised biomass reference points peer-reviewed by the Transboundary Resource

Assessment Committee in April 2010. Council staff noted that spiny dogfish is not currently on the SAW/SARC calendar for assessments.

Management Priorities

There was a discussion whether the MC/TC should flag management priorities other than specifications for managers to consider via a separate action(s). Given that was not the advertised purpose of the call, Council staff was hesitant to conduct such a prioritization exercise during this call but noted that a prioritization process could be conducted/requested by the Council.

Selected References

MAFMC staff memorandum from Jason Didden to Chris Moore: "Spiny Dogfish Specifications for 2016-2018 fishing years," dated September 11, 2015.

NEFSC (Rago & Sosebee). 2015. Update on the Status of Spiny Dogfish in 2015 and Projected Harvests at the Fmsy Proxy and Pstar of 40%. Report to MAFMC SSC, August 26, 2015. Available, with recorded presentation, at http://www.mafmc.org/ssc-meetings/2015/sept-16-17.

Spiny Dogfish Assessment - SARC 43 (2006), available at http://www.nefsc.noaa.gov/saw/reports.html.

Spiny Dogfish Assessment - TRAC 2010, Status Report available at http://www2.mar.dfo-mpo.gc.ca/science/trac/TSRs/TSR_2010_02_E.pdf.

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: September 24, 2015

TO: Joint Spiny Dogfish Committee, Council

FROM: Jason Didden

SUBJECT: Spiny Dogfish 2016-2018 Specifications, Public Comments

During both the Monitoring Committee/Technical Committee meeting on September 22, 2015 as well as a public informational webinar on the evening of September 22, 2015, several members of the public attended and the following summarizes their comments.

During Monitoring Committee Call

Greg DiDomenico stated that it is not believable that this species should experience a 40% ABC reduction and that the responsibility of the Council is to not overfish and that overfishing will not happen based on the current limits on the fishery. He believes that under status quo the potential of overfishing is zero, as is the possibility of impacting the resource even if a small amount of overfishing did occur. Mr. DiDomenico recommended complete status quo for this fishery without reductions until a benchmark assessment is conducted especially in consideration of the pending review/revisions of the Council's risk policy and NMFS's revisiting of National Standard 1,3, and 7 guidelines. He stated that the lack of believability will mean a lack of buy-in until the situation with dogfish biomass estimates is resolved.

John Whiteside concurred with Mr. DiDomenico's and Mr. Hickman's (see Monitoring Committee summary) positions regarding quota reductions and the unlikely potential for overfishing at current quotas and with current regulations. He also highlighted that while recent landings have been below the proposed lower quotas, the market has been constrained by restrictions in the countries to which dogfish

are exported, and that given these restrictions have lifted, the proposed quotas may be substantially constraining on the fishery in 2016-2018. The Monitoring Committee discussion noted that this potential economic impact should be highlighted but that the SSC's binding ABC recommendations are based on the accepted assessment's update of biomass and the Council's tolerance for the potential for overfishing. Mr. Whiteside also noted that if the quota is reduced then increasing the trip limit may exacerbate racing to fish and cause early closures, which may happen with a reduced quota even at the current trip limit. Mr. Whiteside also stated that somewhere along the line substantial mistakes have been made and those mistakes need to be identified and corrected.

Kevin Wark concurred with Mr. Whiteside's comments and noted the fishery is obtaining trip limits with minimal soak times and catching very large females so the concept that there has been a substantial reduction in biomass appears ludicrous. Mr. Wark believes that the trawl survey is inaccurate for spiny dogfish and that the performance of the fishery in terms of catch rates relative to effort should be taken into account. He stated that even small boat fishermen that don't have the kind of range of larger vessels are not having problems finding fish and that we should not rely on one season with one vessel and one gear type to cause major changes in the spiny dogfish fishery.

Ted Ligenza thought it was a good idea to be careful with the dogfish population and while he is not sure whether this large of a cut was warranted and he doesn't trust the data being used, he has been seeing less fish in recent years. His biggest concern is avoiding closed seasons and would not suggest increasing the trip limit if the quota is going to be smaller.

During Evening Public Information Webinar

Participants: Chuck Bangley, Rob O'Reilly, Ted Ligenza, Luther Bates, Ali Donargo

Ted Ligenza stated that he did not agree with the numbers and noted that dogfish appear and disappear and fishing changes rapidly and they are very hard to quantify from an assessment perspective. Overall he thinks dogfish have been getting harder to catch in the recent 3-4 years and that a cautionary approach is appropriate because managers don't really know what's going on and he's seeing less fish. He reiterated that trying to keep the fishery open by not raising the trip limit is very important from his perspective, especially if the quota is being reduced. Mr. Ligenza also recommended analyzing the

trends in distribution of where spiny dogfish have been caught over time as another indicator of whether dogfish populations are expanding or contracting.

Luther Bates asked several questions regarding past estimates of biomass and the confidence intervals for whether the stock was overfished or below the target. Staff noted that those statements are still likely true for past years, but that a related concept to examine is whether we are currently in the predicted range of previous projections. While we are estimating biomass in 2015 as lower than was predicted in 2013 or 2011, the 2015 estimate is within the error range for the possible range of actual biomass predicted for 2015 in previous assessment updates in 2013 or 2011, and is also consistent with the predicted trends. Mr. Bates noted that despite not catching the quotas the stock abundance estimates are declining even more than predicted and recommended caution in managing this fishery. Mr. Bates also stated that the decline in point estimates in biomass from 2012 to 2013 was previously explained away by the lack of decrease in the 3-year average and that may have been an overly optimistic conclusion and that this also suggests a cautious and conservative approach is appropriate. He also observed that in the context of the high 2012 index value no longer being in the mix for the 3-year average, the lack of 2014 data becomes especially meaningful.

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: 22 September 2015

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

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

SUBJECT: Report of the September 2015 Meeting of the MAFMC SSC

The SSC met in Annapolis, MD, on 16-17 September 2015 for the main purpose of developing new ABC recommendations for Spiny Dogfish and revisiting the ABC recommendations for Black Sea Bass. The SSC also reviewed a draft of the MAFMC research plan, discussed establishing clearer criteria for setting the coefficients of variation on overfishing limits (OFLs), discussed the composition of membership of the SSC and participation of SSC members in the SAW/SARC process, and were updated on summer flounder modeling efforts by Pat Sullivan, actions being taken by the South Atlantic Fishery Management Council with regard to Blueline Tilefish, and the status of the report from the most recent National SSC Workshop. The final meeting agenda is attached (Attachment 1).

A total of 13 SSC members were in attendance on September 16th for the discussions on setting ABCs for Black Sea Bass and Spiny Dogfish, which constituted a quorum (Attachment 2). Also in attendance were staff from the NMFS Northeast Fisheries Science Center (by phone), and staff from the Council, NMFS Northeast Regional Office, and ASMFC; no representatives from the fishing industry and general public were in attendance. Discussion of ABC recommendations for each species began with a review of supporting information by the MAFMC staff lead and/or NEFSC assessment lead, then the SSC species leads (Attachment 3), followed by SSC deliberations. Documents cited in this report can be accessed via the MAFMC SSC website (http://www.mafmc.org/council-events/2015/ssc-meeting-2).

Black Sea Bass

The SSC discussion on revisiting the Black Sea Bass ABC recommendation made by the committee at its July 2015 meeting began with a presentation by Tom Miller on the results of the 10 September 2015 peer review of the McNamee et al. (2015) white paper (Miller 2015). Members of the peer review panel were Tom Miller (SSC member and panel chair), Olaf Jensen (SSC member), John Wiedenmann (Rutgers University), and Katie Drew (ASMFC).

The McNamee et al. white paper used the Caruthers (2015) DLMtool in R to develop reference points and catch level recommendations. DLMtool evaluates the performance of 47 different fishery management procedures in an operating model, which is parameterized to represent a particular species defined by a suite of biological and fisheries related parameters. Many of the 47 different management

procedures are alternative "flavors" of the same approach, only with slightly different parameterizations. The selected management procedures are evaluated against a set of user defined performance measures in a closed loop management strategy evaluation (MSE) that projects a population forward under a defined management procedure by sampling from distributions of biological, fishery, and observation processes. The MSE assumes perfect implementation of each management procedure. From the output of the MSE, the management procedures that are determined to perform "best" are identified. The values of these "best" management procedures are then estimated based on the real data.

The white paper applied the DLMtool approach to Black Sea Bass. McNamee et al. used the probability of overfishing < 0.3, the probability that the biomass will be less than 10% of the BMSY < 0.2, and the relative yield should be > 0.5 as performance measures. The closed loop MSE evaluation was undertaken and a suite of "best" management policies identified. The reference points derived from these best management procedures were then estimated for Black Sea Bass by using data from 1982-2014.

The peer review panel concluded, based on the evidence presented in the McNamee et al. white paper, that three methods used to estimate reference points provide a reasonable foundation for providing an ABC for Black Sea Bass. All three methods use recent catch levels combined with the recent trend in stock abundance to derive an ABC recommendation. After a lengthy discussion, the SSC concurred with the panel's recommendation, and added a fourth method that is solely based on a constant catch (the method that the SSC is currently using to develop ABC recommendations for Black Sea Bass) that met the same criteria as the three methods selected by the panel. The SSC determined that using these four methods would provide an ABC recommendation that is based on the best scientific information available. Therefore, the SSC revisited the MAFMC's terms of reference used for its July 2015 deliberations (terms of reference (TORs) provided by the Council are in *italics*).

For Black Sea Bass, the SSC will provide a written report that identifies the following for fishing years 2016-2017:

1) The level of uncertainty that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the Omnibus Amendment.

The SSC determined that the OFL could not be specified given the current state of knowledge.

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

Because no OFL was accepted for this species, the level of catch cannot be derived given the current state of knowledge.

3) The level of catch (in weight) and the probability of overfishing associated with the acceptable biological catch (ABC) for the stock, the number of fishing years for which the ABC specification applies and, if possible, interim metrics that can be examined to determine if multi-year specifications need reconsideration prior to their expiration.

The SSC determined the ABC to be **3,024 MT (6.67 million pounds)**. This value is calculated from the results of the application of data limited approaches given by Caruthers (2015). The approach established three performance measures that each data limited method must achieve (probability of overfishing during any year in the modeled period < 0.3, probability of B

<0.1B_{msy} in the modeled period < 0.2 and the relative yield > 0.5). From the methods that met these criteria, the SSC used only those methods for which values for Black Sea Bass could be reliably determined. For Black Sea Bass, four methods met this standard, each having its own estimate of ABC. One method relies on a constant catch strategy and three combine, in different ways, information on total catch and the NEFSC spring survey to calculate an ABC. Because there was no a reliable foundation on which to weight the alternative methods, the SSC used the simple average of the estimates derived by the four methods to calculate the ABC.

It is not possible to provide an estimate of the probability of overfishing associated with the ABC.

At its July 2016 meeting, the SSC will revisit the ABC for 2017 based on information on the total catch and the spring NEFSC survey index for 2016.

The SSC expects to maintain this approach to setting ABCs until a revised assessment is completed (expected December 2016) that will be reviewed by the SAW/SARC by Spring 2017 in time for ABC determination for 2018.

4) The most significant sources of scientific uncertainty associated with determination of OFL and ABC.

- The application of data limited methods is associated with significant uncertainty;
- The lack of an analytical assessment prevents the estimation of an OFL reference point;
- Lack of data on abundance and fishing mortality rate estimates limited the range of approaches that could be used to generate reference points;
- The reliability of the NEFSC spring survey to serve as an index of abundance for Black Sea Bass is unknown;
- Atypical life history strategy (Black Sea Bass is a protogynous hermaphrodite) means that determination of appropriate reference points is difficult;
- Tagging analyses suggest incomplete mixing throughout the stock range;
- There is evidence of changes in the spatial distribution of the species (Bell et al. 2015), and;
- Uncertainty exists with respect to M — because of the unusual life history strategy the current assumption of a constant M in the model for both sexes may not adequately capture the dynamics in M.

5) 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 additional ecosystem considerations were included in the determination of ABC.

6) Prioritized research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation and/or improve the assessment level.

1. Develop a first principles foundation for establishing reference points and assessment methods to account for Black Sea Bass life history characteristics.
2. Explore the utility of a spatially structured assessment model for Black Sea Bass to address the incomplete mixing in the stock.
3. Continue and expand the application of data limited methods to Black Sea Bass as a default should an accepted analytical assessment model not be available. Specifically, the SSC recommends performance testing of the ensemble of data limited methods used by the SSC.

The committee also reference the recommendations developed by the peer review panel on Data Limited Methods for Black Sea Bass (Miller 2015).

4. Develop a reliable fishery independent index for Black Sea Bass beyond the existing surveys. This may require development and implementation of a new survey.
5. Additional monitoring and compliance investments to control ABCs at recommended levels are necessary if predicted scientific outcomes for future stock biomasses are to be realized.
6. Consider a directed study of the genetic structure in the population north of Cape Hatteras.
7. Evaluate the implications of change in distribution to stock and fishery dynamics.

7) The materials considered in reaching its recommendations.

- McNamee, J., G. Fay, and S. Cadrin. 2015. Data limited techniques for Tier 4 stocks: an alternative approach to setting harvest control rules using closed loop simulations for management strategy evaluation. RI Division of Fish and Wildlife and University of Massachusetts Dartmouth. 57pp.
- J. McNamee, G. Fay, and S. Cadrin. 2015. Memo to SSC, dated 18 July 2015, entitled "Recommendation for an ABC for Black Sea Bass based on the Data Limited analysis." 4 pp.
    - Data and code (zip file)
    - Data Limited Techniques For Level 4 Stocks (PowerPoint presentation by Jason McNamee)
- Miller, T. 2015. Memo to John Boreman, dated 12 September 2015, entitled: "Review of McNamee et al "Data Limited Techniques for Tier 4 Stocks…." 7 pp.
- Bell, R. J., D. E. Richardson, J. A. Hare, P. D. Lynch, and P. S. Frantantoni. 2015. Disentangling the effects of climate, abundance, and size on the distribution of marine fish: an example based on four stocks from the Northeast US shelf. ICES Journal of Marine Science 72(5): 1311-1322.

8) 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.

Spiny Dogfish

Paul Rago (NEFSC) briefed the SSC on the latest update to the Spiny Dogfish assessment, followed by Jason Didden's presentation summarizing recent management actions and the fishery performance report developed by the advisory panel. Since no public were present at the meeting, Yan Jiao (SSC species lead) then led the SSC deliberations in developing ABC recommendations for 2016 and beyond. Deliberations followed the order of the terms of reference provided by the MAFMC (in *italics*).

For Spiny Dogfish, the SSC will provide a written report that identifies the following for fishing years 2016-2018:

1) The level of uncertainty that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the Omnibus Amendment.

The assessment includes an acceptable OFL, but the SSC deemed that the assessment uncertainty

level requires an SSC-derived coefficient of variation (CV) for the OFL. The SSC applied its default assumptions regarding the distribution around the OFL – that is, OFL is lognormally distributed with a mean as specified and a coefficient of variation of 100%.

2) If possible, the level of catch (in weight) and the probability of overfishing 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 **OFL = 24,247 mt**, based on the projected biomass in 2016 and the assumption that the catch in 2015 will be equal to 16,542 mt, which is equal to the 2014 catch.

3) The level of catch (in weight) and the probability of overfishing associated with the acceptable biological catch (ABC) for the stock, the number of fishing years for which the ABC specification applies and, if possible, interim metrics that can be examined to determine if multi-year specifications need reconsideration prior to their expiration.

The SSC recommends a three-year specification of ABC. The SSC applied the Council's risk policy for a typical life history[1], an estimated B_{201x}/B_{msy} ratio < 1 for all three years, and a CV of the OFL distribution of 100% assuming a lognormal distribution. Using these parameters, the P* values and the associated ABC are as follows:

Year	P*	**ABC (mt)**
2016	0.326	**16,765**
2017	0.297	**16,526**
2018	0.282	**16,636**

The SSC notes that the stock biomass is projected to continue to decline from 2016 to 2019 because of poor recruitment in earlier years, before recovering again. This is consistent with the findings of the SSC 2013 determination of Spiny Dogfish stock status.

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.

4) The most significant sources of scientific uncertainty associated with determination of OFL and ABC.

- The incomplete 2014 NEFSC bottom trawl survey. The assessment model uses a three-year running average, and the lack of data for 2014 means that estimates for the years surrounding 2014 are estimated from only two years of data.
- 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.

[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

- 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.

5) 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.

6) Prioritized research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation and/or improve the assessment level.

1. 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.
2. Explore methods of imputing the 2014 survey-based abundance estimate. The 2014 survey was partially completed, but areas of the survey important to the estimate of abundance of Spiny Dogfish were not sampled as a result of vessel mechanical problems. Accordingly, the SSC recommends exploration of model-based methods to derive 2104 survey indices for Spiny Dogfish.
3. 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.
4. Investigate the distribution of Spiny Dogfish beyond the depth range of current NEFSC trawl surveys, possibly by using experimental research or supplemental surveys.
5. 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).
6. Evaluate ecosystem effects on Spiny Dogfish acting through changes in dogfish vital rates.

7) The materials considered in reaching its recommendations.

- Rago, P., and K. Sosebee. 2015. Update on the Status of Spiny Dogfish in 2015 and Projected Harvests at the Fmsy Proxy and Pstar of 40%. Northeast Fisheries Science Center. 73 pp.
- MAFMC Staff. 2015. 2015 Spiny Dogfish Advisory Panel (AP) fishery performance report (FPR). 4 pp.

- MAFMC Staff. 2015. Spiny Dogfish Advisory Panel (AP) Informational Document - August 2015. 7 pp.
- Didden, J. 2015. Memo to Chris Moore, dated 11 September 2015, entitled: "Spiny Dogfish Specifications for 2016-2018 fishing years." 9 pp.

8) 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.

Summary of Species Information Requests

The following is a summary of the information requests made at the meeting by the SSC for next year's round of ABC deliberations. Questions about specifics can be directed to the SSC species leads (Attachment 3).

Black Sea Bass: At its July 2016 meeting, the SSC will revisit the ABC for 2017 based on information on the total catch and the spring NEFSC survey index for 2016. The SSC expects to maintain this approach to setting ABCs until a revised assessment is completed (expected December 2016) that will be reviewed by the SAW/SARC by Spring 2017 in time for ABC determination for 2018.

Spiny Dogfish: 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.

Criteria for OFL CV Specification

An updated document detailing the background on the MAMFC ABC Control Rule and development of the default 100% coefficient of variation (CV) for the overfishing limit (OFL) applied by the SSC (previously termed Level 3 based ABCs) was supplied by Mike Wilberg prior to the meeting. Based on this document, the SSC discussed two related issues: first, how can the SSC clarify criteria for applying OFL CV lower than 100%; and second, what guidance can the SSC give to assessment teams in estimating OFL CV to strive for analytically-based and expert-based OFL probability distributions (what were previously termed Level 1 and Level 2 assessments)? These issues are related and should be consistent.

The SSC has included some or all of the following considerations in estimating the OFL CV:

- Uncertainty in the estimate of current biomass, including observation error and process error carried through the assessment;
- Uncertainty in the estimate of the F_{msy} reference point, including process error estimated at the same time as biomass (B) is estimated in an integrated fashion;
- Covariation in the B and F_{msy} estimates;

- Sources of uncertainty that could not be included in an individual assessment model, which could include:
    - Model structural uncertainty (e.g., structured vs biomass dynamic models; single species vs multispecies models);
    - Parameter uncertainty (e.g., as currently included in sensitivity runs); and
    - Uncertainty in current state of nature (e.g., ecosystem production regime).

The SSC discussed using measures of model forecast error in determining the OFL CV, based upon information provided by NEFSC for several recent assessments, by comparing projected stock status from a past assessment to stock status estimated from a more recent assessment. Differences between past projections and current estimated could be used to derive a "forecast error" that could also be applied in estimating the OFL's CV.

The SSC discussed establishing "bands" of OFL CV levels, associated either with different levels of uncertainty treatment within an assessment and/or with a simulation analysis of the best possible CV expected under certain data availability and stock life history conditions compared with the level of uncertainty treatment within an assessment. Simulation analyses could also address where investments in data or assessment model improvements would be most likely to result in reduced OFL CV.

Based on this discussion, the SSC formed a subcommittee (T. Miller, S. Gaichas, O. Jensen, and B. Rothschild) to develop a white paper for discussion at the March 2016 SSC meeting. This white paper would outline criteria for using different CV levels, as well as a decision table aligning managed species with current forms of assessment, ABC level, and assumed OFL CV. Over the longer term, this subcommittee would outline simulation analyses to investigate appropriate OFL CV levels to achieve the Council's risk policy for each of its managed species, given available information.

Council Research Plan

Rich Seagraves gave an overview of the draft Comprehensive Five Year Research Plan, which will be presented to the Council at its October 2015 meeting. The Council, in consultation with its Scientific and Statistical Committee, first developed a research plan to meet this requirement in 2008 through examination of research needs identified in numerous stock assessments, Council FMP/Amendment documents, and through the Council's Research Set-Aside Program. The revised document was reorganized to address the science and research needs identified by the Council during its recent Visioning Project in its Strategic Plan.

A major SSC criticism of the Council's Strategic Plan (and the associated Research Plan) is that it lacks clear articulation of the Council's fundamental social and economic objectives for MAFMC fisheries. For example, most of the fishermen participating in MAFMC fisheries have access to numerous fisheries. The Council has not explicitly identified measurable social and economic objectives relative to flexibility of participants in multiple fisheries. In addition, the current risk policy was developed almost entirely based on biological considerations with little or no consideration of social and economic factors. Analyses supporting the Councils current risk policy should be greatly expanded to include policy analysis based on social and economic considerations.

The SSC noted that another major topic of research that needs to be addressed relates to the current practice of assessment and management on a single species basis. While the Council has made some in-roads into addressing the need to take an ecosystem approach to assessment and management in its EAFM effort, some fundamental changes to the current paradigm are required. The SSC recommended

that the Council develop an Operational Plan to allow for the transition from the current single-species approach to an ecosystem-based approach. This plan should include the development of Integrated Ecosystem Assessments that include clearly stated social and economic objectives.

The SSC also recommends that the Council consider conducting a thorough evaluation of the management performance of its current FMPs. Research and analyses are needed to define OY using an objective function in the same way other reference points are developed and evaluated. This would allow the Council to evaluate management performance based the objective criteria which define OY.

Finally, the SSC noted that the funding levels that were available through the RSA program are far from adequate relative to addressing the extensive list of research needs identified in the current research plan. Since all of the needs identified cannot be addressed given existing funding, it is critical that the Council prioritize its research needs and leverage funding opportunities with those of its management partners to maximize benefits given the limited pool of available research funds.

Summer Flounder Modeling

Pat Sullivan (Cornell University) briefed the SSC on the status of his summer flounder modeling project. He is attempting to configure a model that incorporates variability in sex, size, and age, with an even longer-term goal of eventually factoring in spatial differences as well. SSC members provided him some feedback and suggestions for consideration as he develops the model. Dr. Sullivan will be making a similar presentation at the upcoming MAFMC meeting in Philadelphia.

Other Business

SSC Membership

Given the likelihood that there may be vacancies on the SSC, the committee discussed future composition of SSC membership. The SSC cautions the Council to make sure there is a role to fill on the SSC before selecting new members with a specific scientific background. There was general agreement that the SSC needs to maintain a strong social sciences component. A sociologist or cultural anthropologist would bring a unique perspective in human dimensions to the SSC, but a lot depends on how the Council envisions utilizing the committee. An expert in quantitative risk assessment would also be a useful addition.

The SSC sees its role as going beyond simply responding to requests from the Council. Many of the SSC members see participation on the committee as a means of providing direction to their own research programs, thus expanding the influence and benefits of participating in the SSC's deliberations. Committee members also expressed interest in adding socio-economics and ecosystems topics as regular agenda items in SSC meetings in order to further engage and benefit from the members who are experts in these disciplines.

NSSC V Report

John Boreman and Rich Seagraves updated the SSC on progress being made on the report of the Fifth National Stock Assessment Workshop, held last February in Honolulu. In an August 12th conference call, the report's authors informed the workshop's steering committee that a draft report is still being

prepared; final comments on the draft meeting summary from the individual SSC's were due in early September.

Blueline Tilefish Update

John Boreman briefed the SSC on the recent SAFMC SSC webinar that reviewed updated projections of the stock status of Blueline Tilefish that were prepared by the Southeast Fisheries Science Center. Given the continued problems with large uncertainty in the data sources, as well as in the assessment itself, the SAFMC SSC decided not to use projections based on the assessment model as a basis for providing an ABC recommendation to the SAFMC, instead choosing to base the ABC recommendation on catch at 75% of F_{msy}. At our next SSC meeting in March 2016, the MAFMC SSC working group on Blueline Tilefish, under the leadership of Doug Vaughan, will be presenting several options for determining the ABC for this species in the mid-Atlantic region.

Participation of SSC members on SAW Working Groups

Olaf Jensen raised concern that SSC members might no longer be allowed to participate on the stock assessment working groups in the SAW/SARC process under the new guidelines developed by the Northeast Region Coordinating Council. MAFMC staff assured the SSC that this is not true. The SSC agreed that SSC members should be allowed to participate on the working groups on a case-by-case basis, depending on their expertise on the species being addressed (as well as continue being able to chair the SARCs).

cc: SSC Members, Lee Anderson, Chris Moore, Rich Seagraves, Kiley Dancy, Jason Didden, Jason McNamee, Kirby Rootes-Murdy, Paul Rago

Attachment 1

Mid-Atlantic Fishery Management Council
Scientific and Statistical Committee Meeting
September 16-17, 2015
Final Agenda

Wednesday, 16 September 2015

0900 Receive Report of Black Sea Bass Data Limited Methods Analysis Review (Miller)

1000 SSC Discussion on data limited methods relative to MAFMC Ad hoc ABC Species
- Consider/recommend alternative ABC specification approaches for Black Sea Bass

1200 Presentation on Status Update for Spiny Dogfish (Rago)

1245 Working Lunch

1300 Continue Discussion on ABCs for Black Sea Bass

1430 2016-2018 Spiny Dogfish ABC Specifications (Didden and Jiao)

1600 Criteria for OFL CV Specification (Boreman)

Thursday, 17 September 2015

0900 AFMC Research Priorities (Seagraves)

1020 Report on Sex-specific Modeling for Summer Flounder

1115 Other Business
- SSC Membership
- NSSC V Report
- Blueline Tilefish Update
- Participation of SSC members on SAW Working Groups

1200 Adjourn

Attachment 2

MAFMC Scientific and Statistical Committee
16-17 September Meeting
Annapolis, MD

Name	Affiliation
SSC Members in Attendance:	
John Boreman (SSC Chairman)	NC State University
Tom Miller (SSC Vice-Chair)	University of Maryland - CBL
Doug Lipton	NMFS
David Tomberlin	NMFS Office of Science and Technology
Mark Holliday	NMFS (Retired)
Doug Vaughan	NMFS (Retired)
Sarah Gaichas	NMFS Northeast Fisheries Science Center
Sunny Jardine (9/16 only)	University of Delaware
Rob Latour	VIMS
Olaf Jensen	Rutgers University
Ed Houde	University of Maryland – CBL
Brian Rothschild	UMass – Dartmouth
Yan Jiao	VA Tech
Others in attendance:	
Rich Seagraves	MAFMC staff
Kiley Dancy (9/16 only)	MAFMC staff
Jason Didden (9/16 only)	MAFMC staff
Paul Rago (by phone, 9/16 only)	NMFS Northeast Fisheries Science Center
Kirby Rootes-Murdy	ASMFC staff
Jason McNamee	RI F&W
Pat Sullivan (9/17 only)	Cornell University
Moira Kelly (by phone, 9/16 only)	NMFS Northeast Regional Office
Tobey Curtis (by phone, 9/16 only)	NMFS Northeast Regional Office

Species and Topic Leads for MAFMC SSC Members

Species/Topic	Biology/Assessment Lead	Socio-economics Lead
Atlantic Mackerel	Dave Secor	Mark Holliday
Atlantic Surfclam	Wendy Gabriel	Bonnie McCay
Ocean Quahog	Ed Houde	Bonnie McCay
Spiny Dogfish	Yan Jiao	David Tomberlin
Bluefish	Cynthia Jones	Doug Lipton
Butterfish	Rob Latour	Mark Holliday
Black Sea Bass	Tom Miller/Olaf Jensen	Marty Smith
Golden Tilefish	Doug Vaughan	Marty Smith
Scup	Wendy Gabriel	Mark Holliday
Summer Flounder	Mike Wilberg	Doug Lipton
Long-finned Squid	Mike Frisk	Sunny Jardine
Short-finned Squid	Tom Miller	Sunny Jardine
Ecosystems	Ed Houde	Doug Lipton
Deep Sea Corals	John Boreman	Bonnie McCay
Blueline Tilefish	Sarah Gaichas	David Tomberlin

MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

M E M O R A N D U M

DATE: September 11, 2015

TO: Dr. Chris Moore, Executive Director

FROM: Jason Didden

SUBJECT: Spiny Dogfish Specifications for 2016-2018 fishing years

Executive Summary

This memorandum has three parts: 1) an introduction with background information; 2) information related to Acceptable Biological Catch (ABC); and, 3) information related to other specifications and management measures. Table 1 summarizes staff's recommendations related to ABC and these specifications.

ABC Setting

The most recent assessment update for spiny dogfish concluded that the stock was not overfished and that overfishing was not occurring. Spawning Stock Biomass (SSB) was estimated to be at 87% of the target Bmsy[1] proxy in 2015 (in 2013 SSB was estimated to be at 135% of the target Bmsy proxy). Based on the Council's risk policy, the ABCs for 2016, 2017, and 2018 would be 37.0 million pounds (16,765 metric tons[2] (mt)), 36.4 million pounds (16,526 mt), and 36.7 million pounds (16,636 mt), respectively. Relative to the 2015 ABC, these represent reductions of 41%, 42%, and 41% for 2016, 2017, and 2018, respectively. The primary cause of the reduction in ABCs is that the last update was driven by survey data points that were above average (2011), very above average (2012), and near average (2013) while the current update is driven by survey data points that are near average (2013) and below average (2015). There is no survey value for 2014 because important spiny dogfish areas were skipped by the Bigelow trawl survey due to a mechanical breakdown.

Other Specifications and Management Measures

Based on these ABCs, staff would recommend commercial quotas for 2016, 2017, and 2018 of 25.3 million pounds (11,455 mt), 24.7 million pounds (11,216 mt), and 25.0 million pounds (11,326 mt), respectively. Given that these values are only 5%-7% greater than the highest recent catches (2012/2014), that the current fishing year is proceeding similarly to the last fishing year, and the "slow and steady" approach advised by several members of the Advisory Panel, staff recommend no changes to other management measures (e.g. trip limits).

[1] Bmsy = Biomass associated with Maximum Sustainable Yield
[2] Conversion to pounds rounded to 0.1 million pounds

Table 1: Staff-recommended multi-year catch and landings limits for spiny dogfish for 2016-2018.

Specifications	Basis	2016 (pounds)	2016 (mt)	2017 (pounds)	2017 (mt)	2018 (pounds)	2018 (mt)
OFL	Projected Catch at Fmsy	53,455,485	24,247	55,313,982	25,090	56,824,148	25,775
ABC	Council Risk Policy	36,960,498	16,765	36,433,593	16,526	36,676,102	16,636
Canadian Landings	= avg last 3 years (10,11,12)	143,300	65	143,300	65	143,300	65
Domestic ABC	= ABC – Canadian Landings	36,817,198	16,700	36,290,293	16,461	36,532,801	16,571
ACL	= Domestic ABC	36,817,198	16,700	36,290,293	16,461	36,532,801	16,571
Mgmt Uncert. Buffer	Ave pct overage since 2011	0	0	0	0	0	0
ACT	= ACL - mgmt uncertainty	36,817,198	16,700	36,290,293	16,461	36,532,801	16,571
U.S. Discards	=3 year average 12-13-14	11,494,167	5,214	11,494,167	5,214	11,494,167	5,214
TAL	ACT – Discards	25,323,030	11,486	24,796,126	11,247	25,038,634	11,357
U.S. Rec Landings	= 2014 estimate	68,343	31	68,343	31	68,343	31
Comm Quota	TAL – Rec Landings	25,254,687	11,455	24,727,782	11,216	24,970,291	11,326

Introduction

Process

The specification of spiny dogfish management measures is a joint process conducted 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 NMFS Northeast Fishery Science Center (Center) generally updates the spiny dogfish assessment annually 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 reviews previous ABC determinations during multi-year specification periods (up to five years). The Magnuson-Stevens Act (MSA) requires that the Council's SSC provide ongoing scientific advice for fishery management decisions, including recommendations for ABC, the prevention of overfishing, and achieving maximum sustainable yield (MSY). The SSC must recommended ABCs that address scientific uncertainty such that overfishing should be avoided. The MSA mandates that the Councils' annual catch limit (ACL) recommendations for the upcoming fishing year(s) cannot exceed the ABC(s) recommended by the SSC.

The Spiny Dogfish Monitoring Committee develops and recommends specific coastwide (Maine – Florida) management measures, including a commercial quota, trip limit, and further adjustments to total catch as needed based on management uncertainty and the provisions of the fishery management plan. The Spiny Dogfish Committee reviews these recommendations and then the Councils, at their respective meetings, develop recommendations to be submitted to the National Marine Fisheries Service for approval/implementation. The process of deriving the commercial quota is described in Figure 2.

In this memorandum, information is presented to assist the SSC and Monitoring Committee in their roles in the specification process. Other documents, including the most recent assessment update, the Advisory

Panel's Fishery Performance Report, and a fishery performance informational document have been posted at http://www.mafmc.org/council-events/2015/ssc-meeting-2.

Management History

A long term landings history (1962-2012) is provided in the assessment update. The federal fishery management plan was developed in 1998 and implemented in 2000 in order to halt depletion of reproductively mature female spiny dogfish and allow the stock to recover. 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 fishery management plan eliminated the directed fishery for spiny dogfish beginning in 2000. Substantial increases in SSB followed and an increase in the commercial quota to 12 million pounds (5,443 mt) in 2009 was possible while continuing rebuilding. The stock was declared rebuilt in 2010 and commercial quotas have increased markedly since then until now, up to 50.6 million pounds (22,957 mt) for the 2015 fishing year (May 1, 2015 to April 30, 2016).

Current Management Measures

At its September 2014 meeting the SSC recommended that the ABC for the 2015 fishing year should remain as previously specified at 62.4 million pounds (28,310 mt). The SSC based the recommendation on the 2013 assessment update. The 2013 assessment found that the stock was at 135% of the target and using the Council risk policy of 40% probability of overfishing (stock size above target and life history is sufficiently addressed in the assessment) led to the 62.4 million pound (28,310 mt) ABC recommendation. The recommendation also assumes a coefficient of variation (CV) of the overfishing level (OFL) distribution of 100% with a lognormal distribution (Level 3 assessment uncertainty). More details on previous SSC decisions are available at: http://www.mafmc.org/ssc-meetings/september-2013 and http://www.mafmc.org/ssc-meetings/2014/september-17-18-2014. The SSC considered the following to be 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.
- Fmsy 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 Fmsy 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%.
- The updated assessment shows a retrospective bias resulting in the model underestimating recruitment by upwards of 50% near the end of the time series.

Based on recommendations from the SSC and the Spiny Dogfish Monitoring Committee, the Councils adopted a commercial quota of 50.6 million pounds (22,957 mt) for 2015. A trip limit of 5,000 lbs was established beginning in 2014 by NMFS after the MAFMC recommended maintaining a 4,000 lb trip limit and the NEFMC recommended eliminating trip limits. There are no recreational regulations. The commercial quotas are based on reductions from ABC to allow for Canadian catch, discards, and recreational landings, which were based on information in the 2013 assessment update. The 2013 and 2014 Monitoring Committee summaries provide further details (https://googledrive.com/host/0B7aKVuJOPoZVSjdvenJQOFFBZXM/Tab_03_Dogfish_Management_Measures.pdf; http://www.mafmc.org/s/MC_Summary_2014-09-30.pdf).

Recent Catch and Landings

Landings and discards are detailed in the stock assessment update provided to the SSC (Tables 1-4). U.S. commercial activity has dominated catch in most years. The fishery operated at a moderate level in the 1980s and at a higher level in the 1990s. Landings were restricted in the 2000s to allow rebuilding and have increased in the later 2000s to current. Discards have been a substantial source of mortality, and were often responsible for more mortality than landings in the 2000s. Discards have decreased as a proportion of mortality in the 2010s as landings have increased while discards remained approximately level. Landings have been below 50% of the commercial quotas for the last two full fishing years and appear to be on a similar trajectory in the current fishing year as the previous fishing year (figure 1). Fishery participants report that reasons landings have been less than the quota are low market demand and associated low prices (see Fishery Performance Report and Informational Document at http://www.mafmc.org/council-events/2015/ssc-meeting-2 for details).

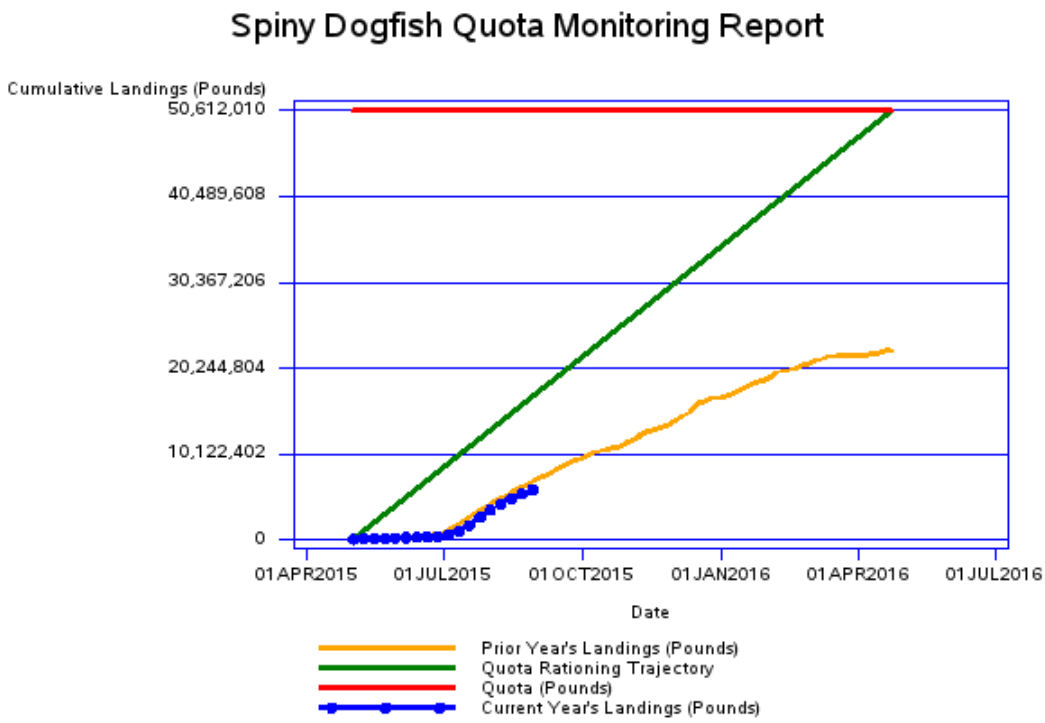

Figure 1. Current (blue dots – starting May 1, 2015) and previous (orange line – starting May 1, 2014) fishing years' spiny dogfish landings trajectories.

ABC Setting

Biological Reference Points

The most recent dogfish assessment update draws heavily on the results of the last peer-reviewed stock assessment vetted at SARC 43 in 2006, the assessment model described in Rago and Sosebee (2009), and a revision of the biological reference points for spiny dogfish described in Rago and Sosebee (2010). The revised biomass reference points, which required an update of the size and sex-based selectivity estimates of the fishery, were peer-reviewed by the Transboundary Resource Assessment Committee in April 2010.

Biological reference points in the 2015 update include:

- A biomass reference point target of SSBmax[3] = 351.2 million pounds (159,288 mt)
- A minimum biomass threshold of ½ SSBmax = 175.6 million pounds (79,644 mt)
- A fishing mortality reference point of $F_{MSY\ proxy}$ = 0.2439 (Rago 2011)

Stock Status

The mean estimate of fully recruited F on the exploitable population in 2014 was 0.214, below the Fmsy proxy of 0.2439, and as such overfishing was not occurring. If catches in 2015 are assumed to be equal

[3] SSBmax, the biomass that results in the maximum projected recruitment, is the proxy for BMSY

to those estimated in 2014, and all other factors are held constant, the projected F in 2015 would approximately equal the Fmsy proxy. The stochastic model estimate of mean female spawning stock biomass in 2015 is 306.4 million pounds (138,997 mt), 87.3% of the target of 351.2 million pounds (159,288 mt) - the stock was below the target but not overfished. Incoming recruitment is expected to build SSB after several years of additional moderate decline.

Projections

Utilizing the standard P* approach in the Council's risk policy with a 100% CV, the ABCs for 2016, 2017, and 2018 would be 37.0 million pounds (16,765 mt), 36.4 million pounds (16,526 mt), and 36.7 million pounds (16,636 mt), respectively. The associated probabilities of overfishing from these catches would be approximately 33% in 2016, 30% in 2017, and 28% in 2018. The lower ABCs are the combined result of the lower biomass, and the Council's risk policy, which requires a lower chance of overfishing when stock size is below the target. The lower chance of overfishing is achieved by increasing the buffer between the regulated catch and the catch associated with overfishing (i.e. by reducing catch).

ABC Recommendations for 2016-2018

Staff recommend that three year specifications be set for spiny dogfish for the 2016 through 2018 fishing years. Staff also recommend that the Council request an assessment update from the NMFS Northeast Fisheries Science Center for next year along with additional investigation of ways to address the missing 2014 data point. Although the assessment update will result in a revisiting of the spiny dogfish specifications for 2017 and 2018, there can be substantial administrative savings if specifications have been set for multiple years, especially if the update results in similar specifications for 2017 and 2018.

Since the implementation of the Council's Omnibus ACLs and AMs Amendment in 2012, the SSC has calculated ABCs for spiny dogfish using the Council's risk policy for a level 3 stock assessment[4] and a species with a typical life history. The lead stock assessment scientist for spiny dogfish used this same approach to derive ABC projections for 2016-2018 using a coefficient of variation (CV) of the overfishing level (OFL) distribution of 100% with a lognormal distribution. The projection each year is updated based on the presumed catch of ABC in the previous year. Given this is consistent with the Council's risk policy and previous SSC determinations regarding uncertainty in this assessment, staff recommend using the resulting ABCs for 2016, 2017, and 2018 of 37.0 million pounds (16,765 mt), 36.4 million pounds (16,526 mt), and 36.7 million pounds (16,636 mt), respectively.

Staff note that it is unlikely that the spiny dogfish stock has fallen by approximately 1/3 from 2012/2013 to 2015 given the biology of the species and recent catches. However, if the unusually high 2012 survey result was an anomaly then the 2012 and 2013 stock size estimates were artificially high and the 2015 estimate (which does not include the 2012 data) would represent a return to a more expected value, especially given the previously predicted short-term decline in the stock due to low pup indices from 1997-2003. While fishing as high as Fmsy is predicted to return the dogfish stock to the biomass target within 7 years due to

[4] In March 2015 the SSC changed the name of the level 3 category to "SSC-modified OFL probability distribution" but the regulations have not been changed to reflect this clarification.

higher incoming recruitment, the Council's risk policy (CFR §648.21(a)(2)) is to always be more conservative than Fmsy, and especially so when biomass is estimated to be below the target. Staff also has concerns about relying on a 2-year average rather than a 3-year average but no other options are available at this time. Staff considered whether using a lower CV for ABC determination might be appropriate (would translate into higher catches), but given the 2014 data gap, uncertainty does not appear to have been reduced.

Other Specifications and Management Measures

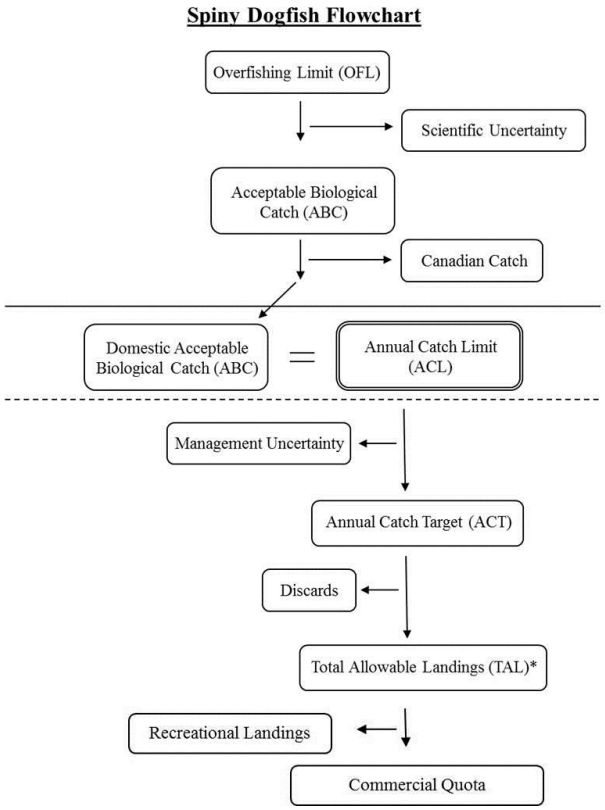

Figure 2: Illustration of how spiny dogfish specifications are determined.

Figure 2 describes the process by which other specifications (ACL, ACT, and commercial quota) are derived based on the ABC recommended from the SSC. The following recommendations assume the SSC adopts the ABCs recommended earlier in this document – if this is not the case then the other specifications will have to be recalculated.

ACL – Annual Catch Limits

According to the fishery management plan, a reduction from ABC to accommodate Canadian landings is made to derive domestic ABC which is defined as equal to the ACL. The recommended deduction for Canadian landings is 0.14 million pounds (65 mt) (average of 2010-2012) which results in ACLs of 36.8 million pounds (16,700 mt), 36.3 million pounds (16,461 mt), and 36.5 million pounds (16,571 mt) for 2016, 2017, and 2018. Staff investigated several ways to specify expected Canadian landings based on correlations of recent years but no strong correlations were found, likely because of the lag in obtaining Canadian landings, which results in using lagged averages for correlation analysis.

ACT – Annual Catch Target

There have been no recent catch overages, so staff recommend setting the Annual Catch Targets (ACTs) for 2016-2018 equal to the ACLs for 2016-2018. Since NMFS will close the spiny dogfish fishery if the commercial quota is achieved, no substantial overages would be expected. Also, given the buffer provided by the Council's risk policy, minor overages of the ACT should not cause overfishing.

TAL – Total Allowable Landings

The TAL is calculated according to the process illustrated in Figure 2. For 2016-2018, the deduction for U.S. discards is recommended as 11.5 million pounds (5,214 mt) which corresponds to TALs of 25.3 million pounds (11,486 mt), 24.8 million pounds (11,247 mt), and 25.0 million pounds (11,357 mt) for 2016, 2017, and 2018 respectively. 11.5 million pounds (5,214 mt) is the 2012-2014 averaged discards, and a 3-year average had a very strong correlation with the following year's discards (r=.85). 5-year and 10-year averages had lower correlation strengths (r=.78 and .68 respectively).

Commercial Quota

The commercial quota is calculated by subtracting expected recreational landings from the TAL. For 2016-2018, the deduction for recreational landings is recommended as 0.07 million pounds (31 mt), which corresponds to commercial quotas of 25.3 million pounds (11,455 mt), 24.7 million pounds (11,216 mt), and 25.0 million pounds (11,326 mt). A total of 0.07 million pounds (31 mt) mt is the 2014 recreational estimate and the most recent year had the best correlation with the following year's recreational landings (r=.59) compared to 2-year or 3-year averages (r=.41 and .33 respectively).

Trip Limits

No adjustment to the existing 5,000 pound trip limit is recommended. There was substantial consideration of trip limit issues when the 5,000 pound trip limit was established in 2014, and given that the 2016-2018 commercial quotas may only be slightly higher than recent landings (5%-7%), there does

not appear to be a reason to change the trip limit, especially given input from several members of the advisory panel to take a slow and steady approach.

Market Issues

The Fishery Performance Report from the Advisory Panel is available at http://www.mafmc.org/council-events/2015/ssc-meeting-2. In general the AP indicated the reason that commercial landings are substantially lower than quotas is the importance of markets, or rather the limited markets for spiny dogfish and not issues related to abundance or availability. Fishery participants indicated they are beginning to discuss the potential benefits of a higher occasional trip limit for larger vessels (possibly seasonally), but no firm proposals were provided.

Selected References and Background Documents

43rd Northeast Regional Stock Assessment Workshop (43rd SAW): 43rd SAW assessment summary report. US Dep. Commer., Northeast Fish. Sci. Cent. Ref. Doc. 06-14; 46 p. Available at: http://www.nefsc.noaa.gov/saw/reports.html.

Rago, P. J. and K. A. Sosebee. 2009 The Agony of Recovery: Scientific Challenges of Spiny Dogfish Recovery Programs. pp 343-372. *In* V. F. Gallucci, G. A. McFarlane and G. G. Bargman eds. Biology and Management of Dogfish Sharks. American Fisheries Society, Bethesda Maryland.

Rago PJ and KA Sosebee. 2010. Biological Reference Points for Spiny Dogfish . Northeast Fish Sci Cent Ref Doc. 10-06; 52 p. http://www.nefsc.noaa.gov/publications/crd/crd1006/

Rago, P.J. 2011. Estimation of an Fmsy proxy reference point for spiny dogfish. Report to the MAFMC SSC, August 10, 2011. 30 p.

Rago PJ and KA Sosebee. 2015. Update on the Status of Spiny Dogfish in 2015 and Projected Harvests at the Fmsy Proxy and Pstar of 40%. Report to MAFMC SSC September 2015. Available at: http://www.mafmc.org/council-events/2015/ssc-meeting-2.

2015 Spiny Dogfish Advisory Panel (AP)
Fishery Performance Report (FPR)

The Spiny Dogfish Advisory Panel (AP) (http://www.mafmc.org/advisory-panels/) met August 18, 2015 to develop the Fishery Performance Report (FPR) below. The meeting was conducted via internet webinar and facilitated by Jason Didden, the Mid-Atlantic Fishery Management Council's Dogfish Fishery Management Plan (FMP) coordinator. The advisors who participated were:

Bonnie Brady
Claire Fitz-Gerald
Greg DiDomenico
Jack Musick
James Fletcher
Jan McDowell
Scott MacDonald
Sonja Fordham
Chris Hickman
Doug Feeney

Additional participants included:

Ashton Harp (ASMFC Dogfish Lead)
David Tomberlin (MAFMC SSC)
Fiona Hogan (NEFMC Dogfish Lead)
Katie Almeida
Rob O'Reilly (MAFMC Dogfish Chair, VA)

The fishery performance report's primary purpose is to contextualize catch histories for the Scientific and Statistical Committee (SSC) because of the potential importance of this and related information for determining Acceptable Biological Catches (ABCs) in cases of fisheries with high levels of assessment uncertainty. The goal is to allow comparing and contrasting of the most recent year's conditions and fishery characteristics with previous years. First an overview of recent fishery data was provided by Jason Didden, and then trigger questions were posed to the AP to generate discussion. The trigger questions were:

*What factors have influenced recent catch?
– Markets/economy? – Environment?
– Fishery regulations? – Other factors?
*Are the current fishery regulations appropriate? How could they be improved?
-Gear regulations and exemptions? -Trip Limits? -Others?
*Where should the Council and Commission focus their research priorities?
*What else is important for the Council and Commission to know?

The input from the AP begins on the following page. The information in this FPR does not represent a consensus, but rather a summary of the perspectives and ideas that were raised at the meeting.

General

- Quality is critical for maintaining price and the existing market. Large trips may have trouble maintaining product quality.
- The regional differences in the fishery mean that any changes (e.g. trip limits) have the potential to differentially impact different areas.
- Flooding processors with lots of spiny dogfish will harm the market.
    - A contrary, minority perspective was also voiced: Developing new markets (Asia/Africa) will require lower, not higher prices, and manipulating price (by limiting catch) to address small boat concerns hinders the possibility of greater overseas markets.

Factors Influencing Catch

- Markets are crucial to getting prices high enough to stimulate fishing activity. Low catches relative to the quota in recent years are due to low prices/effort.
- Abundance does not currently drive catches; boats have no problem obtaining their trip limits.
- There are fewer and fewer boats willing to go out for dogfish at current prices, but a small price increase could change that.
- European markets are shifting away from sharks, limiting US dogfish exports to Europe.
    - The Shark Alliance did not promote European boycotts of US spiny dogfish/other legally caught sharks (though other entities seek/have sought to do this).
    - Europe seems to have the U.S. figured out in terms of pricing, while traditional European demand may be declining due to changing tastes.
- Hurricane Sandy hurt New York landings because the only New York processor closed as a result.
- Virginia had been on pace to increase landings last fishing year, but snow and cold temperatures in January shut things down.
- On Cape Cod:
    - In 2013, the price for dogfish was extremely low (~10 cents/lb) and processors instituted forced days off.
    - In 2014, the price was much better (upper 20s cents/lb) and there were no days off.
    - Currently price is lower again (~16 cents/lb) and there are mandatory Saturdays off.
    - It is not clear what exactly is driving these price changes, but they have a big impact on fishing/total catches.

Input on Regulations

- Some advisors would like to see a slow and steady approach that does not create large changes in catches and/or prices.
- Raising trip limits may collapse prices if additional markets are not developed.
- An occasional trip limit for trawlers (once or twice a month) around 30,000 pounds could help provide fish to any markets that develop.
    - A double limit once a week was raised as an alternative possibility
- Regarding different kinds of trip limits, enforcement/monitoring needs to be ensured.
- Some in Massachusetts are interested in a seasonal (October through December) trip limit increase that would not hurt smaller boats in the summer or crash the market. Discussions are considered preliminary, but may be in the 7,500 – 10,000 pound trip limit range.
    - There was concern that such adjustments could hurt more southern ports, and more details would be needed to evaluate.
- At least one advisor is interested in allowances to harvest male dogfish in excess of the typical trip limit and possibly a separate quota (which is currently made up of mostly female dogfish). Staff will seek input from GARFO on implementation issues regarding a male-only dogfish fishery. Another advisor noted that males can be targeted currently.

Research Priority Ideas

- Domestic and/or non-European markets.
- Separation of spiny and smooth dogfish in NOAA trade database (buyers in particular may want to know) and ground-truthing of this database by NOAA Fisheries/Council, etc.
- Longer term tracking of export trends. https://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/applications/trade-by-product
- Better tracking of dogfish used/sold as fertilizer.
- Exploration of how spiny dogfish recovered so much faster than predicted (Could be useful for managing multiple other shark fisheries).
- Increased engagement with fishermen as part of scientific research.
- Better estimate of the population of male dogfish.

Other Issues Raised

- There needs to be a clear division of male and female dogfish in terms of the assessment versus catch limits versus monitoring.
- The fishery needs a rapid regulatory fix for gear-based limits on dogfishing while monkfishing (being addressed in Monkfish Framework 9).
- A name change for spiny dogfish ("chipfish" has been suggested in addition to "cape shark") could help the market, and could allow access to a prison protein market (http://www.wsj.com/articles/SB122290720439096481).
    - Massachusetts advisers noted that "Cape Shark" is an approved market name (http://www.accessdata.fda.gov/scripts/fdcc/?set=seafoodlist&id=Squalus_acanthias&sort=SLSN&order=ASC&startrow=1&type=basic&search=dogfish)

Additional Advisor Electronic Comments

Two advisors were unable to attend but submitted the following comments to Council staff via email:

From Kevin Wark, F/V Dana Christine

- Dogfish where in great abundance last fall and winter and fishing for them was good and all the boats at Viking Village where able to obtain the trip limit without trouble.
- I do not support any trip limit changes at this point unless someone has marketing information that I am not aware of.
- The fisherman at Viking Village don't want to catch more for less money and would support a small trip limit change if the market would improve.
- As far as any gear questions or problems I will be glad to help in any way but everything looks like it's working well from my view as far as the functioning of the gillnet fishery off New Jersey.

From Dr. James Sulikowski

- I would make the research recommendation of a concurrent coast wide reproductive study. this might provide insight into the question "How was spiny dogfish able to recover so much faster than predicted? The answer could be useful for managing multiple other shark fisheries".
- Also I would suggest investigating ways in which to increase the quality of meat (i.e how can it be processed on deck etc), which in turn would increase the price of the product. There is no shortage of dogfish and if we can get the price higher I think this would have a snow ball effect on the market etc.

NOAA FISHERIES
Sustainable Fisheries

Spiny Dogfish Information Sheet

Spiny dogfish was once considered an incidental species caught in the Northeast (NE) multispecies fishery, but more recently has become a targeted species as groundfish resources have declined and the demand in the European market has risen. The dogfish fishery operates from Maine to North Carolina. The fishing year is May 1 through April 30. Spiny dogfish are managed jointly by the Mid-Atlantic and New England Fishery Management Councils, as well as by NOAA's National Marine Fisheries Service (NMFS), and the Atlantic States Marine Fisheries Commission.

This summary provides a broad overview of restrictions and requirements; the regulations summarized here may be found at 50 CFR part 648. Please contact the Sustainable Fisheries Division at (978) 281-9315 for more information. Updated September 18, 2014

What Federal permits are available for dogfish?

An open access commercial dogfish permit is required to possess, land, or sell dogfish. To obtain a permit application, contact our Permits Office at http://www.greateratlantic.fisheries.noaa.gov/aps/permits/index.html or (978) 281-9370.

What are the permit requirements for dogfish?

In order to possess dogfish in Federal waters, you must have a Federal dogfish permit, and you must also be fishing under one of the following conditions:

- A NE multispecies trip (including day-at-sea (DAS), B DAS, non-DAS sector, Handgear A and B);
- A scallop DAS;
- A monkfish-only DAS (if fishing in a monkfish exemption area as defined in the large mesh information sheet found at http://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/large_mesh_exemption.pdf); or
- An exempted fishery (see Tables 2 and 3 on page 3).

Any catch of allocated groundfish stocks by a NE multispecies sector vessel while targeting spiny dogfish will count against its sector's annual catch entitlement, unless the vessel is fishing in an exempted fishery or with exempted gear outside of the DAS program.

How is the quota allocated and managed in Federal waters?

The quota is established annually based upon the estimated size of the dogfish population and sustainable harvest rates. In Federal waters, the quota is allocated coastwide for the fishing year May 1-April 30. All spiny dogfish landings, whether from Federal or state waters, are counted toward that quota and monitored by NMFS. When the annual quota is fully harvested, the dogfish fishery will be closed for the remainder of the fishing year. Commercial landings are not permitted following a closure announcement. Weekly landings reports are available at http://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/spinydogfish.html.

The Atlantic States Marine Fisheries Commission manages dogfish in a slightly different way by setting its own quota and allocating that quota by state or region. Check with your state's fisheries agency to determine if there is a different season or closure than in

Federal waters for the dogfish fishery.

What is the commercial possession limit?

The dogfish possession limit is 5,000 lb in Federal waters; however, individual states may set more restrictive possession limits. Check with your state's fisheries agency. Only one landing per day is allowed.

What is the minimum fish size?

There is no minimum fish size for spiny dogfish.

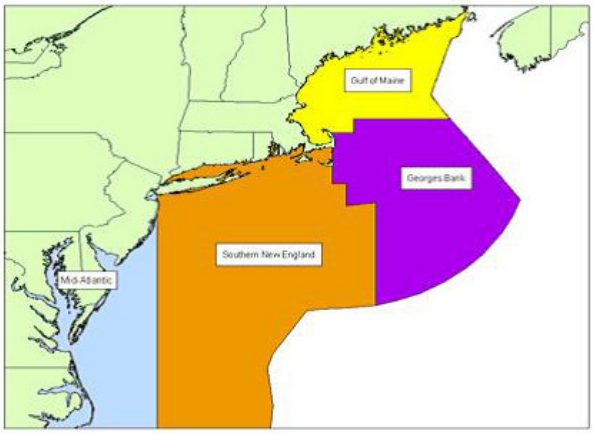

Figure 1. Regulated Mesh Areas

What are the gear requirements?

There are four regulated mesh areas (RMAs) that serve to determine which gear can be used in each of the following areas (Figure 1): Gulf of Maine (GOM); Georges Bank (GB); Southern New England (SNE); and Mid-Atlantic (MA). For coordinates defining these RMAs, see 50 CFR 648.80 or go to http://www.greateratlantic.fisheries.noaa.gov/nero/fishermen/charts/mul3.html. Within these RMAs, if you are fishing with gillnet or trawl gear you must abide by the minimum mesh sizes required by the NE multispecies regulations in Table 1.

If you have a limited access NE multispecies permit, and you are not fishing on a NE multispecies sector trip, you must also comply with the NE multispecies Restricted Gear Areas (RGAs). For coordinates of the RGAs see the Closed Area Information Sheet at http://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/multsclosedareas.pdf.

There are additional gear requirements for some of the exempted fishing areas which are detailed on the following pages for each specific area.

Table 1. Regulated Mesh Area Requirements

Regulated Mesh Area	Gillnet mesh size requirements	Trawl codend mesh size requirements
Gulf of Maine (GOM)	6.5 inches throughout the entire net	6.5-inch square or diamond
Georges Bank (GB)		
Southern New England (SNE)		
Mid-Atlantic (MA)	6.5-inch square or diamond	

What are the gillnet requirements for protected species?

In addition to the gear requirements above, protected species requirements may also apply, depending on the season and area being fished. These additional requirements are to reduce incidental interactions between fishing gear and protected species, such as marine mammals and sea turtles. All vessels fishing with gillnets in Federal waters must comply with the applicable provisions of the:

1. Atlantic Large Whale Take Reduction Plan found in 50 CFR 229.32 and on the internet at http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/. Requirements include time-area closures (with limited exceptions) and gear modifications (e.g., weak links, anchoring requirements, sinking groundline, gear marking) from Maine through the east coast of Florida.

2. Harbor Porpoise Take Reduction Plan found in 50 CFR 229.33 (Gulf of Maine) and 229.34 (Mid-Atlantic) and on the internet at http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/. Requirements include time-area closures and seasonal gear modifications (e.g., pingers in the Gulf of Maine and gear requirements in the Mid-Atlantic) from Maine through North Carolina.

3. Bottlenose Dolphin Take Reduction Plan found in 50 CFR 229.35 and on the internet at http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm. Requirements include time-area closures and gear restrictions (e.g., prohibited night sets, net tending, gear length requirements, etc.) from New Jersey through the east coast of Florida.

4. Gear Restrictions in the NC/VA Large Mesh Gillnet Fishery for the Protection of Sea Turtles found in 50 CFR 223.206 and on the internet at http://www.greateratlantic.fisheries.noaa.gov/Protected/seaturtles/. Requirements include seasonal time-area closures to large-mesh gillnet fishing (≥ 7 inches).

For more information, contact NMFS Greater Atlantic Region's Protected Species Division at (978) 281-9328.

What are the record keeping and reporting requirements?

The owner or operator of any vessel issued a Federal dogfish permit must maintain on board the vessel and submit an accurate Federal fishing vessel trip report (VTR) for all fishing trips (regardless of species retained). For vessels not issued a limited access NE multispecies permit, VTRs must be received by NMFS or postmarked within 15 days after the end of the reporting month. For NE multispecies limited access permit holders, VTRs must be submitted weekly and received by NMFS or postmarked by midnight of the Tuesday following the reporting week. Copies of VTRs must be retained on board the vessel for 1 year after the date of the last entry on the log. If no fishing activity took place during a fishing month, then a VTR must be submitted stating that no fishing trips were taken. Instructions for completing VTRs can be found at http://www.greateratlantic.fisheries.noaa.gov/ro/fso/vtr.htm.

Any change in the permit information such as vessel name, vessel owner, address, etc., must be submitted in writing to NMFS within 15 days of the change, or the permit is void.

If you are a vessel operating a Vessel Monitoring System (VMS), you must make an "out of fishery" declaration through your VMS before starting a trip when fishing for dogfish in an exemption area. If you are fishing on a NE multispecies sector trip, you do not need to declare "out of fishery" to retain dogfish.

All federally permitted seafood dealers are required to report the purchase of dogfish via computer, using one of the approved electronic means, unless otherwise directed by the Regional Administrator. For more information on dealer reporting, please call the dealer electronic reporting help desk at (978) 281-9212 or contact your local NMFS Field Office: http://www.greateratlantic.fisheries.noaa.gov/sed/portagents/index.html.

What are the exempted fishing areas?

Within the GOM and GB RMAs there are six exempted fishing areas that are summarized in Table 2. More specific details for each area can be found on the following pages of this information sheet. A Letter of Authorization (LOA) is required to participate in some of these exempted fishing areas. LOAs can be obtained from our Permits Office at (978) 281-9370 or at http://www.greateratlantic.fisheries.noaa.gov/aps/permits/.

There are two exempted fishing areas in the SNE RMA and one exempted fishing area in the MA RMA that are summarized in Table 3. More specific details for each area can be found on the following pages of this information sheet.

If you are fishing for spiny dogfish in Federal waters, you must also comply with closed areas for other fisheries, including NE multispecies. However, if you are using gear that is defined as not capable of catching NE multispecies, you are exempt from those closed areas and can fish in them. The following is a list of gear defined as not capable of catching NE multispecies: Pelagic hook and line; pelagic longline; spears; rakes; diving gear; cast nets; tong; harpoons; weirs; dipnets; stop nets; pound nets; pelagic gillnets; pots and traps; shrimp trawls (with properly configured grates); and surfclam/ocean quahog dredges.

The NE multispecies Closed Area regulations can be found at http://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/multsclosedareas.pdf. These include seasonal and year-round closures, Essential Fish Habitat (EFH) closures, and transiting/gear stowage requirements.

More information regarding multispecies regulations is available on the NMFS Greater Atlantic Region website at: http://www.greateratlantic.fisheries.noaa.gov/sustainable/species/multispecies/.

Nantucket Shoals Dogfish Fishery Exemption Area (EA) (Figure 2 on pg 4)

Area: The Nantucket Shoals Dogfish Fishery EA is defined by straight lines connecting the following points in the order stated:

N. Latitude	W. Longitude
41°45'	70°00'
41°45'	69°20'
41°30'	69°20'
41°30'	69°23'
41°26.5'	69°20'
40°50'	69°20'
40°50'	70°00'
41°45'	70°00'

Season: June 1 through October 15

Gear: A vessel fishing in this area may use gillnet or trawl mesh smaller than required by the GOM and GB RMAs. Trawl gear is not permitted in the portion of the exemption area that overlaps with the Nantucket Lightship Habitat Closure Area (Figure 2 on pg 4).

Requirements: A vessel fishing this area

Table 2. Exemption Areas (EA) in the Gulf of Maine and Georges Bank

Area Name	Gear Allowed	LOA Required	Page Number
Nantucket Shoals Dogfish Fishery EA	Trawl, Gillnet	Yes	3-4
Cultivator Shoals Whiting Fishery EA	Trawl	Yes	4
Small Mesh Areas 1 & 2	Trawl	No	5
Raised Footrope Trawl Whiting Fishery Areas	Trawl	Yes	5-6
GOM/GB Dogfish Gillnet EA	Gillnet	No	6
Cape Cod Spiny Dogfish EAs	Gillnet, Longline, Handgear	No	6-7

Table 3. Exemption Areas (EA) in Southern New England and Mid-Atlantic

Area Name	Gear Allowed	LOA Required	Page Number
SNE EA (includes part of GB RMA)	Trawl	No	7
SNE Dogfish Gillnet EA	Gillnet	No	7-8
Mid-Atlantic EA (includes part of SNE RMA)	Trawl, Gillnet	No	8

must have on board an LOA issued by the Regional Administrator. LOAs may be obtained from our Permits Office at (978) 281-9370. While fishing in this EA, vessels may not fish for, possess on board, or land any species of fish other than dogfish and the following:

- Longorn sculpin;
- Silver hake (whiting) – up to 200 lb;
- Monkfish and monkfish parts – up to 10 percent, by weight, of all other species on board or up to 50 lb tail weight (166 lb whole weight) of monkfish per trip, whichever is less;
- American lobster – up to 10 percent, by weight, of all other species on board or 200 lobsters, whichever is less; and
- Skate or skate parts – up to 10 percent, by weight, of all other species on board.

Transiting: When transiting the GOM or GB RMAs, any nets with a mesh size smaller than the RMA minimum mesh size must be stowed and unavailable for immediate use.

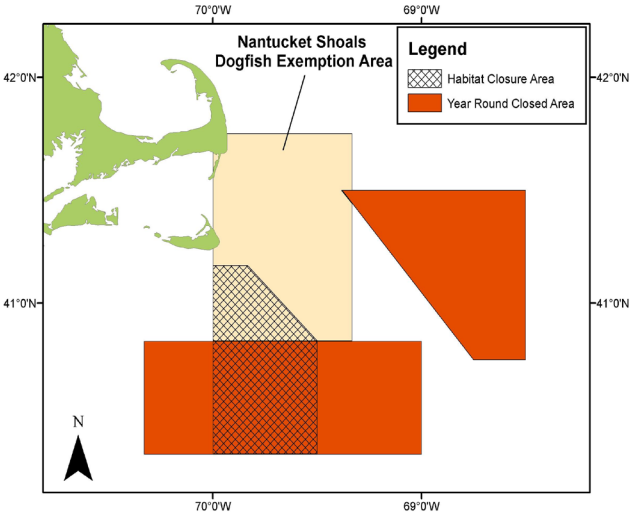

Figure 2. Nantucket Shoals Dogfish EA

Cultivator Shoals Whiting Fishery EA (Figure 3)

Area: This EA is designed for small-mesh multispecies, but spiny dogfish can be possessed or landed incidentally up to the trip possession limit. The EA is defined by straight lines connecting the following points in the order stated:

N. Latitude	W. Longitude
42°10'	68°10'
41°30'	68°41'
41°30'	68°30'
41°12.8'	68°30'
41°05'	68°20'
41°55'	67°40'
42°10'	68°10'

Season: June 15 – October 31, unless otherwise specified by notification in the Federal Register.

Gear: A minimum mesh size of 3-inch square or diamond mesh, applied to the first 100 meshes (200 bars in case of square mesh) for a vessel greater than 60 feet in length, or 50 meshes (100 bars in case of square mesh) for a vessel less than or equal to 60 feet in length, counted from the terminus of the net.

Requirements: A participating vessel must carry an LOA issued by the Regional Administrator, valid for a minimum of 7 days. A participating vessel may withdraw from the program no earlier than 7 days from the date of enrollment. LOAs, and withdrawals, may be obtained from our Permits Office at (978) 281-9370. While fishing in this EA, vessels may not fish for, possess on board, or land any species of fish other than dogfish and the following:

- Silver hake (whiting) and offshore hake, up to 30,000 lb combined;
- Red hake;
- Atlantic herring;
- Longhorn sculpin;
- Squid;
- Butterfish;
- Atlantic mackerel;
- Monkfish and monkfish parts up to 10 percent, by weight, of all other species onboard or 50 lb tail weight (166 lb whole weight) per trip, whichever is less; and
- American lobster up to 10 percent, by weight, of all other species on board or 200 lobsters, whichever is less, unless otherwise restricted.

Transiting: When transiting the GOM or GB RMAs, any nets with a mesh size smaller than the RMA minimum mesh size must be stowed and unavailable for immediate use.

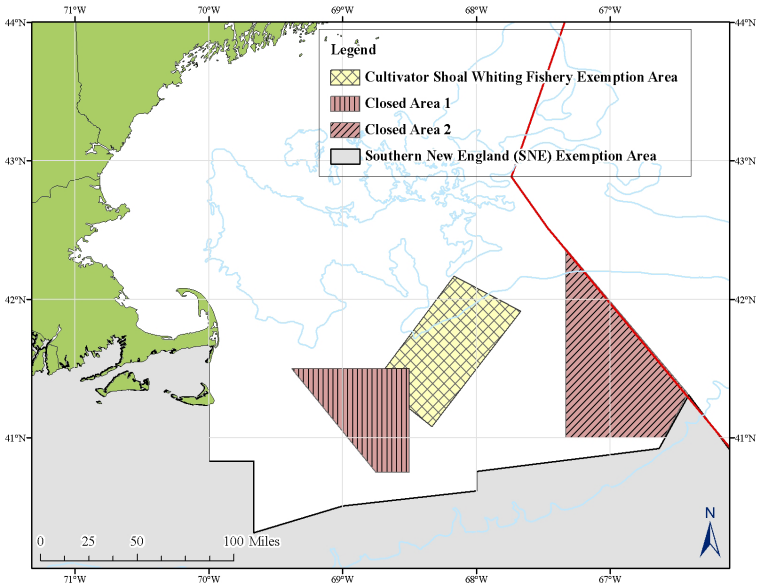

Figure 3. Cultivator Shoals Whiting Fishery EA

Small Mesh Area 1 and 2 EAs (Figure 4)

Areas: These EAs are designed for small-mesh multispecies, but spiny dogfish can be retained incidentally. Small Mesh Areas 1 and 2 are defined by straight lines connecting the following points in the order stated below.

Small Mesh Area 1	
N. Latitude	**W. Longitude**
43°03’	70°27’
42°57’	70°22’
42°47’	70°32’
42°45’	70°29’
42°43’	70°32’
42°44’	70°39’
42°49’	70°43’
42°50’	70°41’
42°53’	70°43’
42°55’	70°40’
42°59’	70°32’

Note: Portions of Small Mesh Area 1 fall within the state jurisdictions of Massachusetts and New Hampshire. When fishing in state waters, a federally permitted vessel is subject to the more restrictive of Federal or state regulations.

Small Mesh Area 2	
N. Latitude	**W. Longitude**
43°05.6’	69°55’
43°10.1’	69°43.3’
42°49.5’	69°40’
42°41.5’	69°40’
42°36.6’	69°55’
43°05.6’	69°55’

Note: Portions of Small Mesh Area 2 are affected by Inshore Closure Areas and are thus closed during these time periods.

Season:

Small Mesh Area 1 Season: July 15 – November 15

Small Mesh Area 2 Season: January 1 – June 30

Gear: A trawl vessel is required to use a raised footrope trawl when fishing in Small Mesh Areas 1 and 2, depending on the species of fish targeted. A description of the raised footrope trawl can be found in the NE Multispecies Small Mesh Fishery Exemptions information sheet: http://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/small_mesh_exemption.pdf.

Requirements: While fishing in these EAs, vessels may not fish for, possess on board, or land any species of fish other than dogfish and the following species:

- Silver hake (whiting) and offshore hake combined;
- Red hake;
- Butterfish;
- Atlantic herring;
- Atlantic mackerel;
- Scup; and
- Squid.

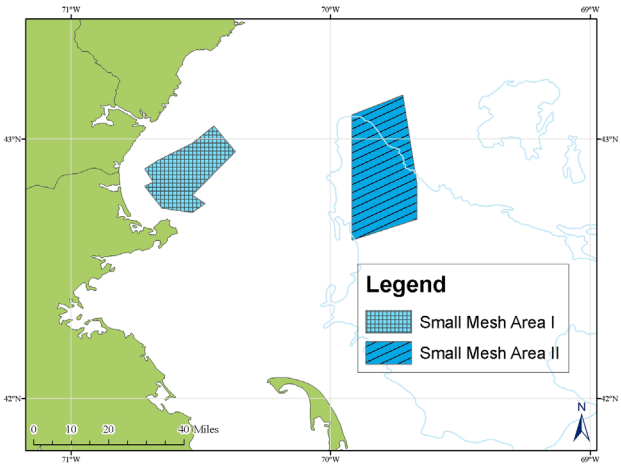

Figure 4. Small Mesh Area 1 & 2 EAs

Raised Footrope Trawl Exempted Whiting Fishery Areas (Figure 5 on pg 6)

Areas and Seasons: This EA is designed for small-mesh multispecies, but spiny dogfish can be retained incidentally. The areas are defined by straight lines connecting the following points in the order stated:

Raised Footrope Trawl Exempted Whiting Fishery Area (September 1 – November 20)	
N. Latitude	**W. Longitude**
42°14.05’	70°08.8’
42°09.2’	69°47.8’
41°54.85’	69°32.5’
41°41.5’	69°32.85’
41°39’	69°44.3’
41°45.6’	69°51.8’
41°52.3’	69°52.55’
41°55.5’	69°53.45’
41°08.35’	70°04.05’
42°04.75’	70°16.95’
42°00’	70°13.2’
42°00’	70°24.1’
42°07.85’	70°30.1’
42°14.05’	70°08.8’

Raised Footrope Trawl Exempted Whiting Fishery Area (September 1 – December 31)	
N. Latitude	**W. Longitude**
42°14.05’	70°08.8’
42°09.2’	69°47.8’
41°54.85’	69°35.2’
41°41.5’	69°35.85’
41°39’	69°44.3’
41°45.6’	69°51.8’
41°52.3’	69°52.55’
41°55.5’	69°53.45’
42°08.35’	70°04.05’
42°14.05’	70°08.8’

Gear: All nets must have a minimum mesh size of 2.5-inch square or diamond mesh and vessel must use a raised footrope trawl. A vessel participating in the Raised Footrope Trawl Exempted Whiting Fishery may not use liners, codend covers, and/or outside net strengtheners.

Requirements: A participating vessel must carry an LOA issued by the Regional Administrator, valid for a minimum of 7 days. A participating vessel may withdraw from the program no earlier than 7 days from the date of enrollment. LOAs, and withdrawals, may be obtained from our Permits Office at (978) 281-9370. While fishing in these EAs, vessels may not fish for, possess on board, or land any species of fish other than dogfish and the following:

- Silver hake (whiting) and offshore hake combined, mesh-size dependent (mesh-size must not be smaller than 2.5 inches):

Codend Mesh Size	Possession Limit
Equal to or greater than 2.5 inches but less than 3.0 inches	7,500 lb
Equal to or greater than 3.0 inches	30,000 lb

- Red hake;
- Butterfish;
- Atlantic herring;
- Atlantic mackerel;
- Squid; and
- Scup.

Note: A vessel participating in the Raised Footrope Trawl Whiting Fishery may participate in other small-mesh exemption areas provided it adheres to the more restrictive gear, possession, landing, and other requirements for the entire participation period specified in the LOA. Also, a vessel participating in this exempted fishery is exempted from Rolling Closure Area V during October through November.

Transiting: When transiting the GOM or GB RMAs, any nets with a mesh size smaller than the RMA minimum mesh size must be stowed and unavailable for immediate use.

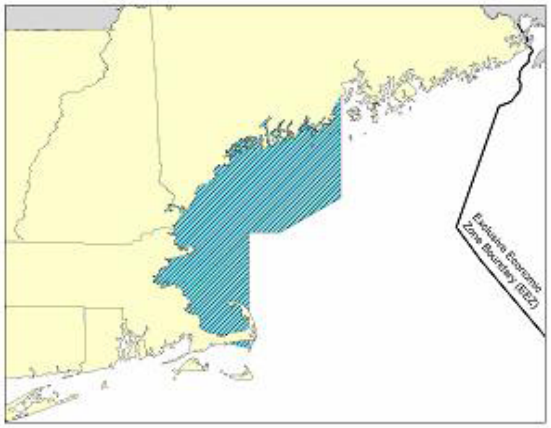

Figure 6. GOM/GB Dogfish Gillnet Fishery EA

GOM/GB Dogfish Gillnet Fishery EA (Figure 6)

Area: The GOM/GB Dogfish Gillnet Fishery EA is defined by straight lines connecting the following points in the order stated:

N. Latitude	W. Longitude
41°35’	70°00’
42°49.5’	70°00’
42°49.5’	69°40’
43°12’	69°00’
Maine Shoreline	69°00’

Season: July 1 through August 31

Gear: This EA does not exempt vessels from the minimum gillnet mesh size of 6.5-inch diamond mesh throughout the net, but does exempt the vessel from the gear requirements of the GOM and GB RMAs described on page 2.

Requirements: A vessel fishing under this exemption may not fish for, harvest, possess, or land any species of fish other than dogfish, or lobsters in an amount not to exceed 10 percent, by weight, of the total catch on board, or 200 lobsters, whichever is less.

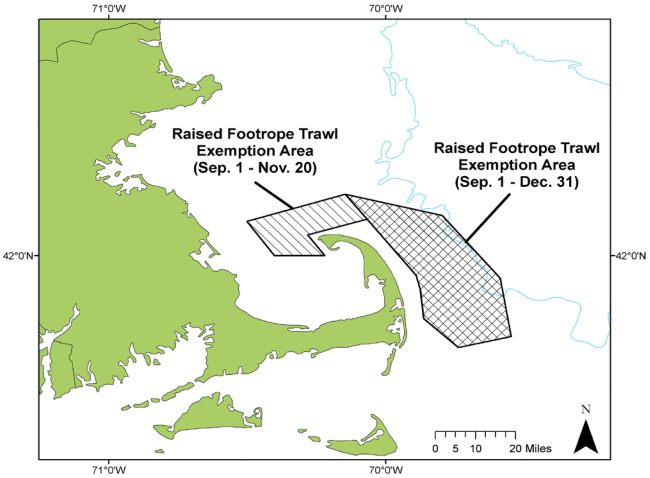

Figure 5. Raised Footrope Trawl Exempted Whiting Fishery Areas

Cape Cod Spiny Dogfish EAs (Figure 7 on pg 7)

Areas: The Eastern Area is defined by straight lines connecting the following points in the order stated here:

N. Latitude	W. Longitude
42°00’	70°00’
42°00’	69°47.5’
41°40’	69°47.5’
41°29.5’	69°35.5’
41°29.5’	69°23’
41°26’	69°20’
41°20’	69°20’
41°20’	(1)
(2)	70°00’
(3)	70°00’
(4)	70°00’
42°00’	70°00’

(1) The eastern coastline of Nantucket, MA at 41°20’ N. latitude
(2) The northern coastline of Nantucket, MA at 70°00’ W. longitude
(3) The southern coastline of Cape Cod, MA at 70°00’ W. longitude, then along the eastern coastline of Cape Cod, MA to the next point.
(4) The northern coastline of Cape Cod, MA at 70°00’ W. longitude

The Western Area is defined as the area bounded on the north by 42°11.5’ N. latitude, bounded on the east by 70°00’ W. longitude, and bounded on the south and west by the coast of Massachusetts.

Seasons: The Eastern Area is open from

June 1 – August 31 for handgear and June 1 – December 31 for gillnets and longlines. The Western Area is open from June 1 – August 31 for longlines and handgear.

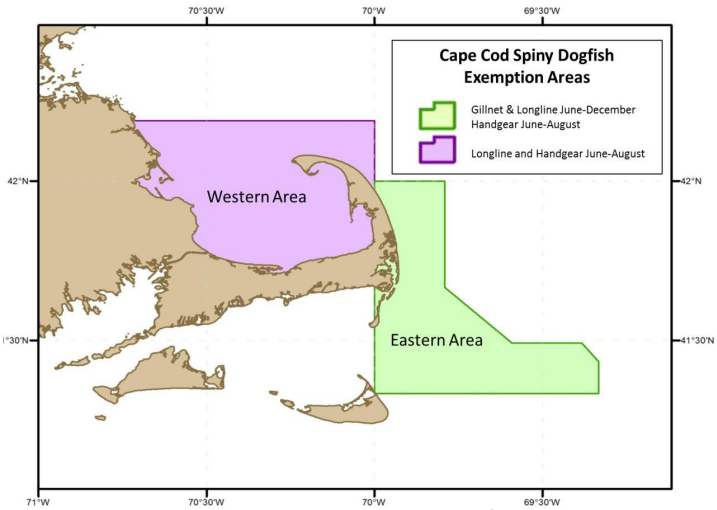

Figure 7. Cape Cod Spiny Dogfish EAs

Gear: In the Eastern Area, you can fish for dogfish for part of the year with handgear, longlines, and gillnets without having to be on a NE multispecies trip. This area does not exempt you from the GOM/GB RMAs minimum mesh sizes for gillnets. In the Western Area, you can fish for dogfish part of the year using longlines and handgear without having to be on a NE multispecies trip.

SNE EA (Figure 8)

Area: The SNE EA is defined by straight lines connecting the following points in the order stated:

N. Latitude	W. Longitude
41°18.6'	66°24.8'
40°55.5'	66°38'
40°45.5'	68°00'
40°37'	68°00'
40°30.5'	69°00'
40°22.7'	69°00'
40°18.7'	69°40'
40°50'	69°40'
40°50'	70°00'
	70°00'[1]

[1]Northward to its intersection with the shoreline of mainland Massachusetts

Season: All year

Gear: A vessel participating in the SNE EA and not fishing under a NE multispecies DAS may use gear with a minimum mesh size smaller than the minimum regulated mesh size to catch exempted species. Minimum mesh size requirements for this area may be determined by other Federal fishing permits that you have. Please check the gear requirements for your other Federal fishing permits.

Requirements: Spiny dogfish (caught with bottom trawl gear only) is included in the list of species that may be caught in this area along with the following*:

- Butterfish;
- Atlantic herring;
- Atlantic mackerel;
- Ocean pout;
- Scup;
- Shrimp;
- Squid;
- Summer flounder;
- Silver hake;
- Offshore hake; and
- Weakfish.

*Incidental species allowed for retention when fishing for the exempted species above include: Conger eels; sea robins; black sea bass; red hake; tautog (blackfish); blowfish; cunner; John Dory; mullet; bluefish; tilefish; longhorn sculpin; fourspot flounder; alewife; hickory shad; American shad; blueback herring; sea raven; Atlantic croaker; spot; swordfish; monkfish and monkfish parts – up to 10%, by weight, of all other species on board or up to 50 lb tail weight (166 lb whole weight) of monkfish per trip, whichever is less; American lobster – up to 10%, by weight, of all other species on board or 200 lobsters, whichever is less; and skate and skate parts – up to 10%, by weight, of all other species on board.

SNE Dogfish Gillnet Fishery EA (Figure 9 on pg 8)

Area: A vessel using gillnet gear can seasonally fish for, possess, and land spiny dogfish without using a DAS or being on a NE multispecies non-DAS sector trip in a portion of the SNE EA. The SNE Dogfish Gillnet Fishery EA is defined by a line running from the Massachusetts shoreline at 41°35' N. lat. and 70°00' W. long., south to it is intersection with the outer boundary of the EEZ, southwesterly along the outer boundary of the EEZ, and bounded on the west by the western boundary of the SNE EA.

Season: May 1 through October 31

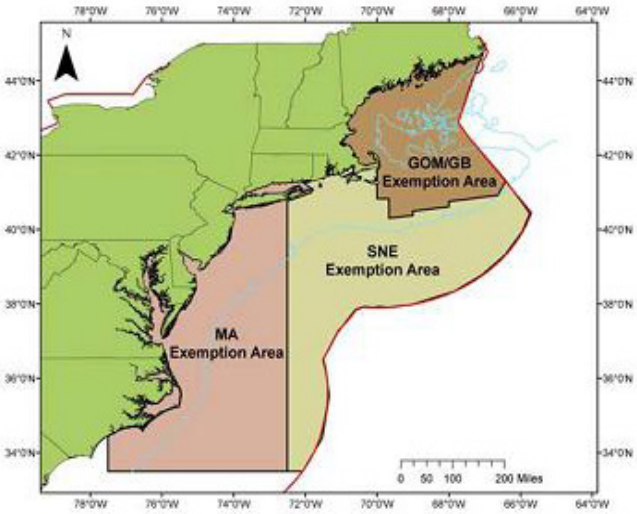

Figure 8. Southern New England EA

Gear: All gillnets must have a minimum mesh size of 6-inch diamond mesh throughout the net.

Requirements: A gillnet vessel may fishing the SNE Dogfish Gillnet Fishery EA when not operating under a NE multispecies DAS. A vessel fishing under this exemption may only fish for, possess on board, or land dogfish and the following*: (continued on pg 8)

- Butterfish;
- Atlantic herring;
- Atlantic mackerel;
- Ocean pout;

- Scup;
- Shrimp;
- Squid;
- Summer flounder;
- Silver hake;
- Offshore hake; and
- Weakfish.

*Incidental species allowed for retention when fishing for the exempted species above include: Conger eels; sea robins; black sea bass; red hake; tautog (blackfish); blowfish; cunner; John Dory; mullet; bluefish; tilefish; longhorn sculpin; fourspot flounder; alewife; hickory shad; American shad; blueback herring; sea raven; Atlantic croaker; spot; swordfish; monkfish and monkfish parts – up to 10%, by weight, of all other species on board or up to 50 lb tail weight (166 lb whole weight) of monkfish per trip, whichever is less; American lobster – up to 10%, by weight, of all other species on board or 200 lobsters, whichever is less; and skate and skate parts – up to 10%, by weight, of all other species on board.

MA EA

Area: In this area, you may fish for dogfish and do not need to be on NE multispecies trip as long as you do not possess or land any regulated multispecies (i.e., American plaice, Atlantic cod, Atlantic halibut, haddock, ocean pout, pollock, redfish, white hake, windowpane flounder, winter flounder, witch flounder, and yellowtail flounder). The MA Exemption is the area that lies west of the SNE EA described on page 7 and in Figure 8.

Season: All year

Gear: In this area you may use mesh smaller than the required 6.5 inches if not fishing on a NE multispecies trip and not retaining regulated multispecies (listed above). Please check the gear requirements for your other Federal fishing permits for the fisheries in which you are participating.

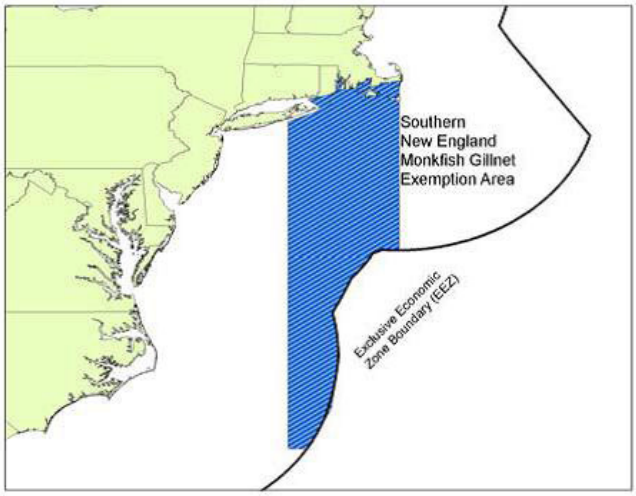

Figure 9. SNE Dogfish Gillnet Fishery EA