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New England Fishery Management Council

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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

MEMORANDUM

DATE: August 26, 2008
TO: Council
FROM: Andrew Applegate
SUBJECT: Amendment 3 change in scope to address smooth skate rebuilding and to stop thorny skate overfishing

The following sections of Draft Amendment 3 pertain to the scope of the amendment and the prospects that the six alternatives with the aggregate skate catch limits would rebuild smooth skate and stop thorny skate overfishing. Portions of the document that directly address these issues have been highlighted.

In the July 30, 2008 memo to the Skate Oversight Committee, the Skate PDT has advised that the Amendment 3 alternatives are likely to be sufficient to address these smooth skate rebuilding and thorny skate overfishing. The PDT, however, also recommends that in a future multispecies action the Council should consider expanding the requirement to use the haddock rope (eliminator) trawl in Gulf of Maine groundfish fisheries where it is practicable.

There is also some evidence that the recent discard reductions may be having a favorable delayed effect on smooth and thorny skate rebuilding, but it would help to have skate discards estimated by region and updated through 2007. Since Amendment 3 was also developed to rebuild thorny skate, its alternatives patently address thorny skate overfishing.

NEW ENGLAND FISHERY MANAGEMENT Council

Skates

I. STATUS

1. Meetings: The Skate PDT met on July 30th to review the Amendment 3 analysis of impacts and SAFE Report updates. Several improvements were recommended and were later incorporated into the final drafts. The Skate Oversight Committee met on August 25th to review the preliminary draft document and approve it for submission to NMFS. At the June 2008 meeting, the Council delegated this detail to the Oversight Committee.
2. Amendment 3 status: Preliminary draft documents for Amendment 3, the DEIS, and the SAFE Report were distributed to the Oversight Committee and the Regional Office for review. A final draft will be completed and submitted to the Regional Office for final review on Sept. 5th and the publication of a Notice of Availability is anticipated on Sept. 26th. The Notice of Availability will start a 45-day public comment period which would end on November 10th, before the November Council meeting.

II. COUNCIL ACTION

1. Approve a change in the scope of Amendment 3 to initiate smooth skate rebuilding and to stop overfishing of thorny skate.

III. INFORMATION

1. Extracted material from Amendment 3 which is related to smooth skate rebuilding and to stopping thorny skate overfishing.
2. July 30, 2008 memo from the Skate PDT providing management advice on “Smooth skate rebuilding potential and rebuilding plan”.

3.0 PURPOSE AND NEED FOR ACTION (AMENDMENT, EIS, RFA)

The Skate FMP was implemented in 2003, after concerns were expressed about the low biomass of barndoor skate and potential overfishing. During the development of the FMP and as a result of a skate stock assessment, barndoor skate and thorny skate were identified as being overfished. In addition, smooth skate was near the minimum biomass threshold and winter skate was thought to be experiencing overfishing, but winter skate fishing mortality could not be estimated with existing data.

The FMP (available at <http://www.nefmc.org/skates/fmp/fmp.htm>) cited a problematic lack of adequate information and could not estimate Maximum Sustainable Yield (MSY) or Optimum Yield (OY), particularly for each species individually. The FMP listed major concerns about this lack of information and concerns for the perceived vulnerability of large skates (barndoor skate, thorny skate, winter skate, and smooth skate) to exploitation. Responding to these concerns, the FMP identified the management unit; established a skate permit; established new reporting requirements including those for landings and discards by individual species; prohibited landings of barndoor, thorny, and smooth skates; set a 10,000 pound per day/20,000 pound per trip possession limit on skate wings (a fishery targeting larger skates); and established a management baseline to evaluate the effect that measures in other FMPs would impact skates.

As described below in this section, reference points defining overfishing and an overfished biomass for all seven skate species were identified in the FMP and approved. Annual status determinations for each of the seven managed skate species (barndoor skate, *Dipturus laevis* (Mitchill 1818); clearnose skate, *Raja eglanteria* (Bosc 1880) little skate, *Leucoraja erinacea* (Mitchill 1825) rosette skate, *Leucoraja garmani virginica* (McEachran 1977); smooth skate, *Malacoraja senta* (Garman 1885) thorny skate, *Amblyraja radiata* (Donovan 1808); and winter skate, *Leucoraja ocellata* (Mitchill 1815)) rely on resource survey catches, based on a three-year biomass moving average and a rate of change for average biomass (see discussion below for more detail).

Skates were re-assessed in 2006, during the 44th Stock Assessment Workshop (documents available through <http://www.nefsc.noaa.gov/nefsc/saw/>). The assessment addressed some, but not all of the lacking information cited in the FMP, including better estimates of skate discards. The discard estimates were however not identified by species and even now nearly 60% of landings are still reported as unclassified species. Making the problem even worse, some dealers landing wings erroneously assume that all landings are of winter skate and some bait dealers erroneously assume that all landings are of little skate. Data taken by trained observers indicate that a significant fraction (but not majority) of landings in the wing fishery are little skate and a significant fraction of landings in the bait fishery are winter skate. Port agents also observe a small amount of landings of smooth and thorny skates, which are prohibited. The SAW 44 assessment evaluated an MSY-based analytical assessment of skate species, but this assessment was not approved on technical grounds. The SAW 44 report concluded that the existing status determinations were adequate until better approaches could be developed and reporting problems were resolved. Skate assessments are scheduled for a "Data Poor Assessment Workshop" to be conducted by the Northeast Fisheries Science Center in December 2008, which may resolve some of the issues or develop better approaches.

Status determination

When the 2006 survey results became available, the Skate Plan Development Team determined that barndoor skate was rebuilding and approaching the target. On the other hand, winter skate biomass had declined below the minimum biomass threshold, thorny skate remained below the minimum biomass threshold and no rebuilding was evident, and little and smooth skates were nearing an overfished condition. Following this determination, NMFS declared that winter skate had become overfished and that little and smooth skate were in danger of becoming overfished. In accordance with the Magnuson Act, NMFS notified the Council of the change in status determination (see Document 1 in Appendix I) and gave the Council one year to develop a plan to address the status of the overfished species and initiate rebuilding for winter skate. Thorny skate had been in a rebuilding plan since the plan inception, but biomass has not increased and the FMP never adopted a rebuilding schedule due to the lack of critical life history information.

While this amendment was being developed, the 2007 survey data became available for analysis (see Document 2 in Appendix I) and while thorny and winter skates remained overfished, the mean biomass estimate for smooth skate ($B=0.14$ kg/tow) slipped under the minimum biomass targets ($B=0.16$ kg/tow). In addition, thorny skate biomass also declined enough that the rate of change exceeded the amount that signified that overfishing was occurring.

Purpose

The purpose of this amendment is therefore to initiate rebuilding smooth, thorny, and winter skate biomass so that the biomass target is achieved within the mandated rebuilding schedule, or earlier if possible, and to end overfishing of thorny skate. To achieve this goal, the Amendment 3 objective is to reduce discards and landings sufficiently to rebuild winter, thorny, and smooth skates, prevent other skates from becoming overfished, and produce optimum yield. This amendment proposes several alternatives to control and reduce catch of skates, focusing on overfished winter, thorny, and smooth skates, but also having benefits for other skates that are in jeopardy of becoming overfished if their biomass index declines slightly, or becoming subject to overfishing if biomass declines too quickly. Although since 2002 discards have declined, increasing skate wing landings and stable landings in the bait fishery (catching a mix of little year around and small winter skates during the spring) is likely to prevent rebuilding. Included in the Amendment 3 alternatives are time/area closures that apply to vessels fishing for skates, wing and skate bait possession limits to keep landings from exceeding the ACL, and a prohibition on the use of Multispecies Category B DAS to fish for skates (a program meant for fishing on healthy groundfish stocks, but had a rapid rise in skate wing landings during 2007).

Another purpose of this amendment is to implement annual catch limits (ACLs) and accountability measures (AMs) to comply with new Magnuson-Stevens Act requirements. Although NMFS has published proposed National Standard 1 guidelines, the Council believes that the organization of the proposed skate catch limits will comply with the final guidelines. The amendment includes an Allowable Biological Catch (ABC) that would prevent overfishing ($\text{catch} > \text{OFL}$) and accounts for scientific uncertainty. The ABC was also set at the catch/biomass median value to promote rebuilding based an analysis on changes in skate biomass at various levels of historic catch. The amendment also specifies an ACL, equal to the ABC, since the ABC accounted for both scientific and management uncertainty, which for skates are sometimes indistinguishable from each other. Furthermore, the amendment includes a catch target equal to 75% of the ACL which applies the precautionary principal to set specifications for

management measures (time/area closures and possession limits). In addition, AMs that will keep the management plan from exceeding the ACLs are included in the alternatives.

A third purpose of this amendment is to provide timelier monitoring and pro-active responses to fishery changes that could cause skate overfishing or cause skates to become overfished. To achieve this goal, the objective of Amendment 3 alternatives is to improve the process for evaluating the effects on the skate resource and on skate catches from new or pending regulations, alternatives under consideration in amendments or framework adjustments for other FMPs, and structural or economic changes in related fisheries that catch or land skates. The existing baseline review process has become obsolete and less meaningful, because the baseline measures have become less relevant to the current effect on skate catches. A new annual review process would be conducted regularly and have a broader scope than a baseline review of a single fishery action. The SAFE Report and bi-annual specification process would allow for more timely changes in skate specifications than currently occurs.

Rebuilding

The Council has determined that rebuilding winter skate in less than 10 years is possible, based on known life history parameters. Rebuilding biomass to the target in 10 years would require an average annual increase of 8.2%. The Skate Plan Development Team (PDT) has estimated that keeping catches below the catch/biomass median will promote rebuilding of winter, thorny, and smooth skates, but not enough is known to predict when or how quickly this would occur. Nonetheless, the estimated maximum intrinsic rate of population growth is 0.23 using the best estimate of winter skate life history parameters (see Section **Error! Reference source not found.** in the SAFE Report), so achieving the biomass target within 10 years is certainly achievable with catches below the median value.

Unlike winter skate, thorny skate will take longer than 10 years to rebuild. Based on new life history parameter estimates, the Council has estimated that it takes a female thorny skate 15 years to replace its own spawning capacity, effectively a mean generation time. Thus the maximum rebuilding period allowed by the MSA is 25 years (10 years plus one mean generation time), or 2028 when counted from the FMP implementation in 2003 which determined that thorny skate was overfished. From the current biomass, it would take an average annual increase of 12% to rebuild thorny skate by 2028. The PDT has advised that the best estimate of the maximum intrinsic rate of population growth is 0.17, so achieving the biomass target within the rebuilding schedule appears to be achievable.

Using best available data for smooth skate (see Document 8 in Appendix I), the best estimate for the maximum intrinsic rate of growth of smooth skate biomass is 0.20. An annual rate of biomass increase of 8 percent is needed to increase biomass from 0.14 to 0.31 kg/tow within 10 years. Therefore, achieving the biomass target within 10 years appears to be achievable with catches below the median value

Although there is insufficient information about skate population dynamics to forecast rebuilding, historic catches that have been below the catch/biomass median have frequently led to increases in smooth, thorny, and winter skate biomass. As more becomes known about skate population dynamics, catch and landings reporting improves, and more data are collected, the Council will re-examine these catch limits and the response of skate populations to the actual catches resulting from this amendment and future actions.

8.3 Impacts on Skates and the Skate Fishery (Biological Impacts)

8.3.1 Impacts from proposed measures

8.3.1.1 Rebuilding

The main purpose of the alternatives being considered in this amendment is to reduce and maintain catch below levels that will rebuild overfished skates (smooth, thorny, and winter skate), achieve the target biomass for species in a rebuilding program (barndoor skate), and prevent overfishing (thorny). Insufficient information about skate population dynamics is presently known to relate future catch levels with predicted fishing mortality rates and biomass changes. Catch history can however serve as a guide to identify levels that are likely to enhance the probability of rebuilding overfished species, particularly when catch is expressed as a ratio to exploitable biomass.

The Council does not have scientific information and analyses to predict when or the rate at which winter, thorny, and smooth skates would rebuild. Since the intrinsic rate of population growth for winter skates (see Document 7 in Appendix I) was estimated to be greater than an annual rate of increase to achieve the biomass target in 10 years (see Document 4 In Appendix I), the Council adopted a 10 year rebuilding plan for winter skate. Conversely, the rate of growth needed to rebuild thorny skate to its biomass target in 10 years substantially exceeded the intrinsic rate of population growth. The Council therefore adopted a 25 year rebuilding schedule for thorny skate, calculated as 10 years plus one generation which was estimated from updated biological parameters. Since thorny skate was overfished in 2003 when the FMP was approved, there will be 19 years left to rebuild assuming this amendment is approved and implemented in 2009.

The PDT attempted to estimate rebuilding via a demographic model (see Document 7 in Appendix I), which associated a rate of rebuilding with various fishing mortality rates. The model estimated a fishing mortality level where the stock was not expected to change under equilibrium conditions. The PDT proposed to associate this mortality rate with the catch levels that were reported when skate biomass varied without trend, but the Council's Scientific and Statistical Committee (SSC) rejected this proposal, since those conditions were unlikely to be in equilibrium (a necessary condition to apply the demographic model estimates). The SSC found that the application of the demographic model to non-equilibrium conditions was not justified and that catch levels consistent with rebuilding could not be estimated using the demographic model.

In place of this proposed method using the demographic model or an analytical (MSY-based) assessment of skate population biology, the PDT evaluated the historic pattern of biomass change with respect to various catch levels (see Document 4 in Appendix I). For some species, including smooth, winter and thorny skate, the PDT found that biomass more frequently increased, and by greater amounts, when the skate catch [expressed as a ratio to the stratified mean survey biomass, averaged over the most recent three years to reduce the influence of

sampling error (noise)] was below the median. For other species, there was either no relationship or the relationship was counter-intuitive (see bottom chart in Figure 1).

Biomass increases tended to be more frequent and higher when catches were historically below the median value for winter and thorny skate. For winter skate, biomass increased 7 of 11 times, for an average increase of 34% when the catch was below the median (Figure 2). When the skate catch was below 75% of the median value (i.e. below the target), biomass increased 4 out of 6 times, with an average annual increase of 30%.

Most (17 of 22 years) of the annual biomass changes for the thorny skate were declines, but the declines were less frequent and biomass was marginally higher (4 of 11 years, +7% average biomass change) when catches were below the median. The relationship with changes in biomass was about the same (3 out of 7, +11% average biomass change) when catches were below the target (75% of the median value). When catches were above the median, declines in biomass were more frequent (10 of 11 years) and with an average 29% annual decline.

The relationship between catch and changes in biomass exhibited a similar pattern for smooth skate (Figure 4), as it did for winter and thorny skates. When skate catch was below the median, smooth skate biomass increased 8 of the 11 years in the time series, with an average 37% annual increase in biomass. The increase in biomass was a little more frequent (5 of 6 years) when catch was below 75% of the median value (i.e. below the target), but the annual increase in biomass was about the same.

For the other four skate species, there was either no relationship between the level of catch and changes in biomass, or counter intuitively the largest catches had the largest increases in biomass. This lack of relationship for four of the seven skate species may be due to uncertainties about species composition of landings and discards, or due to poorly understood population dynamics.

Figure 1. Schematic examples of positive (top) and negative (bottom) relationships between catch and changes in biomass. Patterns that are consistent with the top figure are consistent with rebuilding via catch limits.

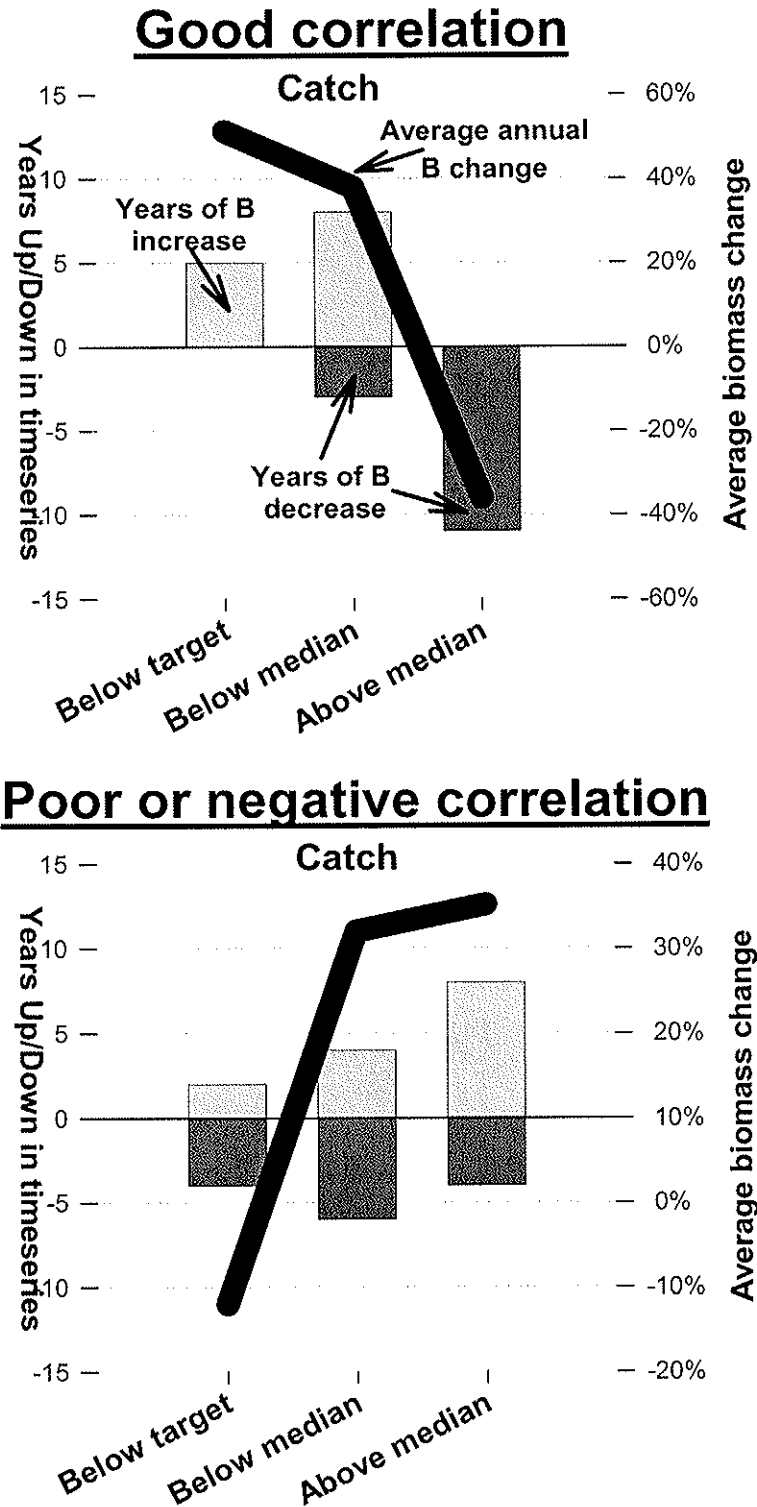


Figure 2. Historic relationship between catch and exploitable biomass for winter (fall survey), thorny (fall survey), and little skates (spring survey). The ‘target catch’ was set at 75% of the median value, taking into consideration scientific uncertainty and variation.

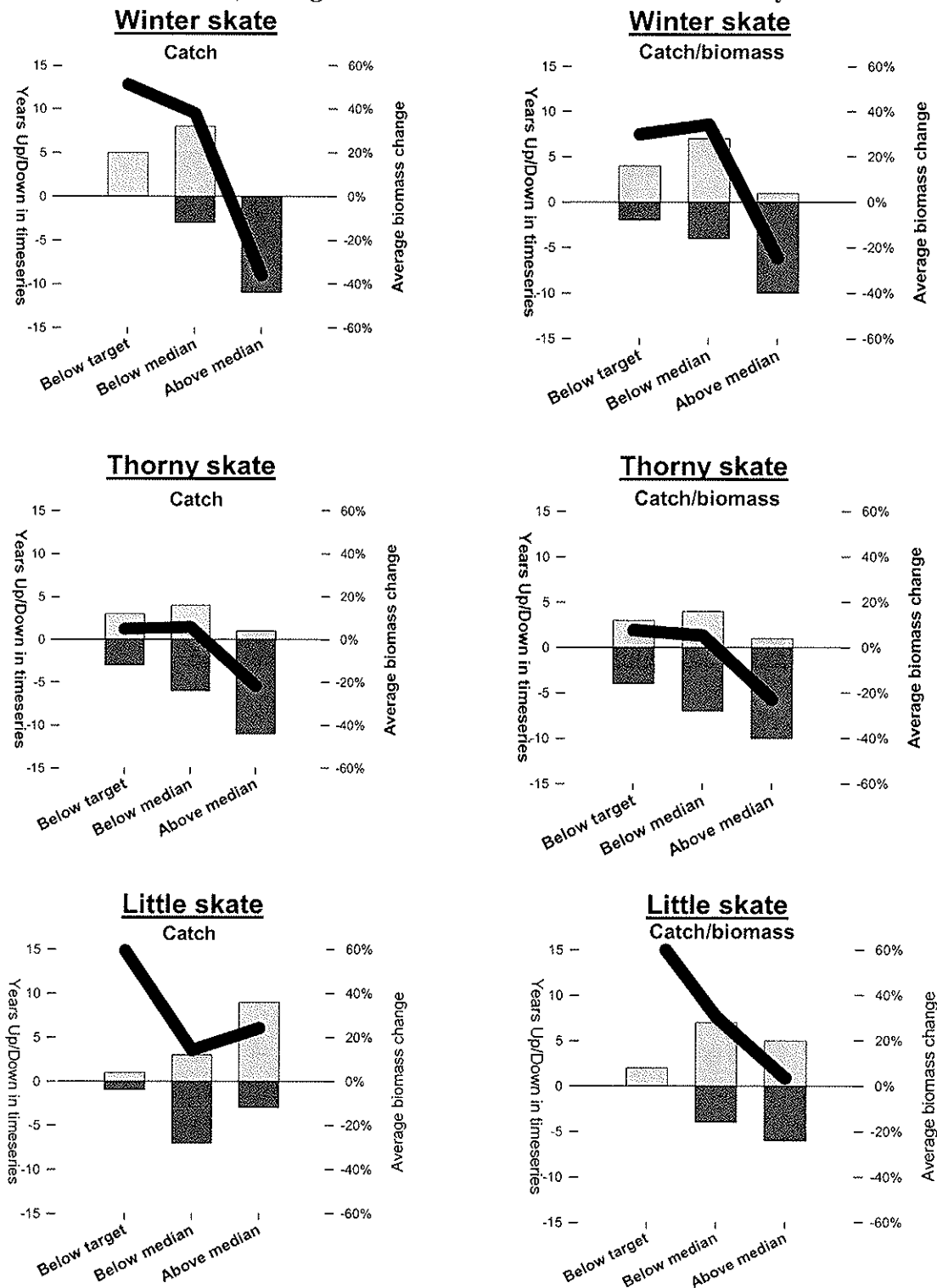


Figure 3. Historic relationship between catch and exploitable biomass in the fall survey for barndoor, clearnose, and rosette skates. The 'target catch' was set at 75% of the median value, taking into consideration scientific uncertainty and variation.

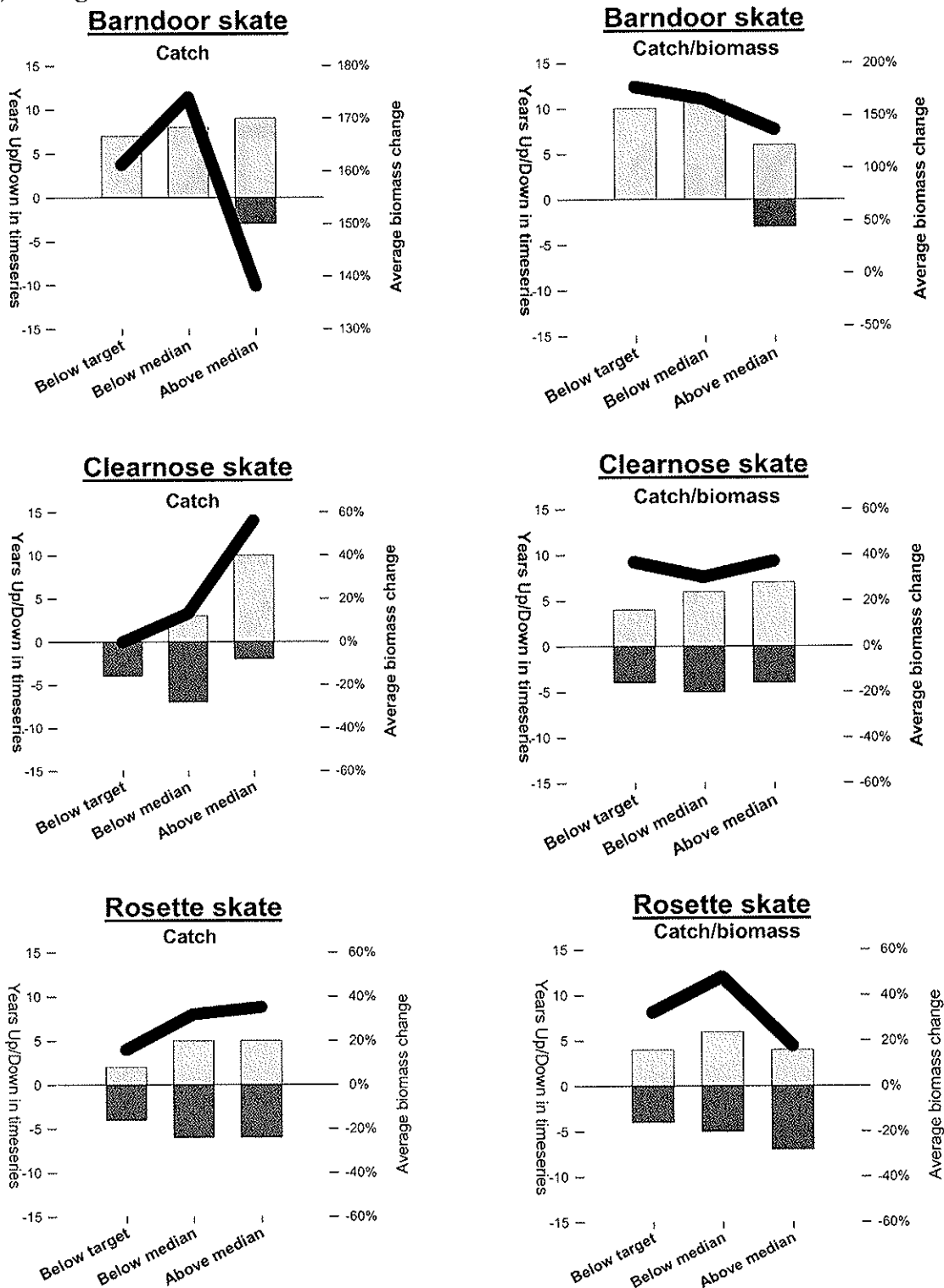
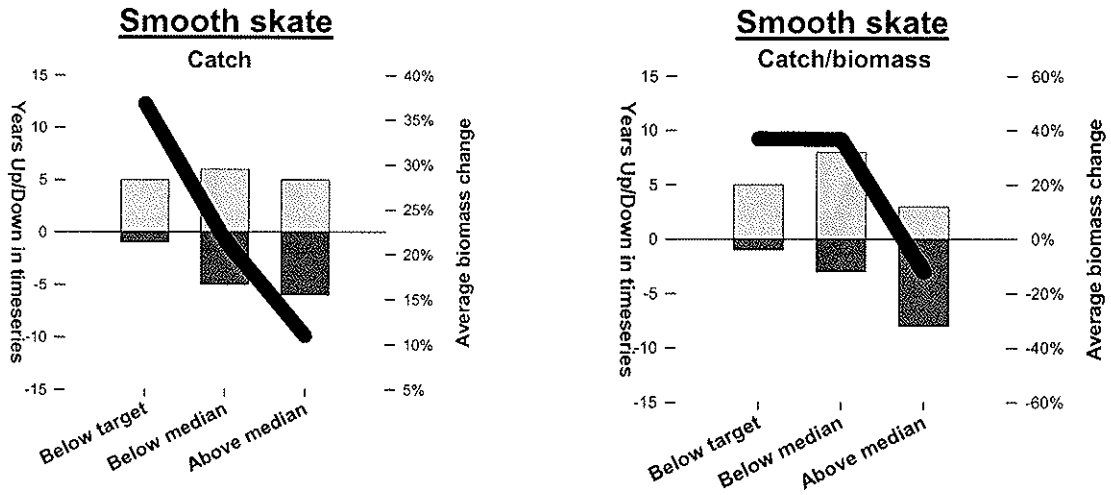


Figure 4. Historic relationship between catch and exploitable biomass in the fall survey for smooth. The ‘target catch’ was set at 75% of the median value, taking into consideration scientific uncertainty and variation.



Thus, although the rebuilding estimates cannot be estimated from current conditions, biomass historically increased when catches were below the median catch/biomass ratio for winter skate, and declined less when catches were below the median catch/biomass ratio for thorny skate¹. Future conditions may however be different than they were historically and the stocks may or may not respond as expected. This amendment includes a review and specification setting process to allow for changes in the TAC to respond to changes in biomass. Moreover, the Council has adopted a risk-adverse policy of setting the target TAC using 75% of the median catch/biomass index. Assuming that skate biomass responds to low catch levels (defined as a catch/biomass exploitation ratio) as it had in the past, this policy should ensure that rebuilding takes place.

8.3.1.2 Overfishing

Skate overfishing is defined as a maximum decline in the three year moving average for survey biomass. Each skate species has a different threshold, chosen based on historical patterns in survey data that indicated when exploitation might be too high. An analytical assessment of skate population dynamics does not exist to associate fishing mortality (and catch levels) with excessive declines in skate biomass. Furthermore, these excessive declines in skate biomass were seen relatively frequently and in an unpredictable sequence during the survey time series (Document 4 in Appendix I).

Nonetheless, keeping skate catches below the median catch/biomass index is likely to reduce the frequency of survey biomass decline and therefore reduce the potential for overfishing as it is currently defined. The Council notes that NMFS has scheduled a skate assessment during the “Data Poor Stock Assessment Workshop” in December 2008. This workshop may result in recommendations for MSY-based reference points using recently available skate biological parameters.

¹ Thorny skate biomass declined during 17 of 22 years in the biomass index time series, so there is little contrast between changes in thorny skate biomass at various catch levels with which to evaluate rebuilding potential.

8.3.1.10 Discards

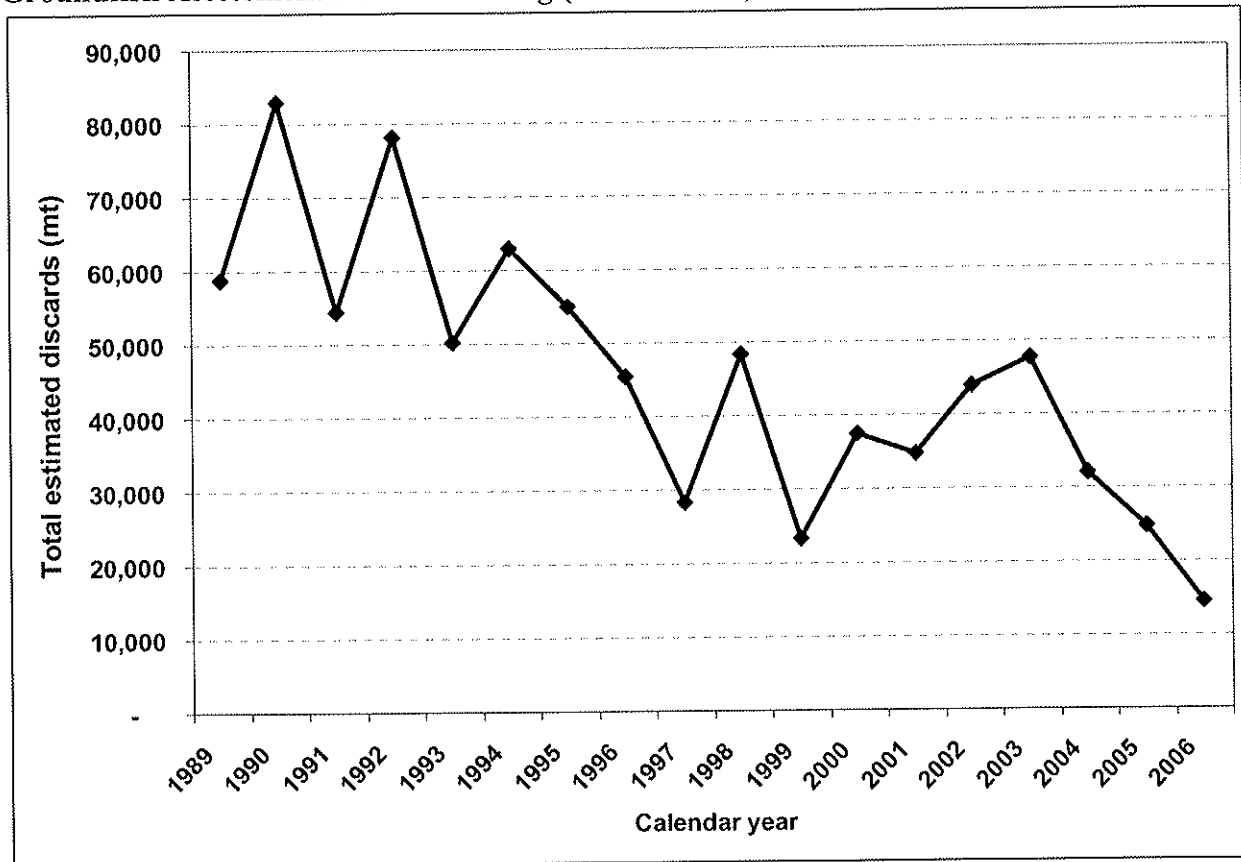
Skate discards are not presently managed by the Skate FMP and this amendment proposes no new regulations to manage skate discards, except by regulating trips that target skates (defined as any trip landing 500 or more lbs. of whole skates or 220 lbs. of skate wings).

Instead, the Skate FMP relies on other fishery regulations to limit or reduce skate discards, such as DAS limits, area restrictions, and mesh limits. The DAS limits control the amount of fishing activity and to some extent where it occurs (vessels may fish closer to port when DAS are reduced). Since skate catch per unit effort is constant, the DAS limits control skate discard mortality. Area restrictions to conserve other species may increase or decrease skate discards. If they coincide with areas of high skate abundance, then the area restrictions could reduce skate discards, and vice versa.

Minimum mesh regulations could reduce the catch of small skates and thereby reduce discards, but increases in the mesh size from present minimums may not improve skate size selectivity due to the peculiar morphology of skates. Quotas (sector or common pool) for other species could reduce or limit skate discards, but they could also increase targeting of skates when vessels cannot fish for other species due to quota restrictions. Possession limits for other species usually would increase targeting skates on DAS that cannot be used to fish for these other species.

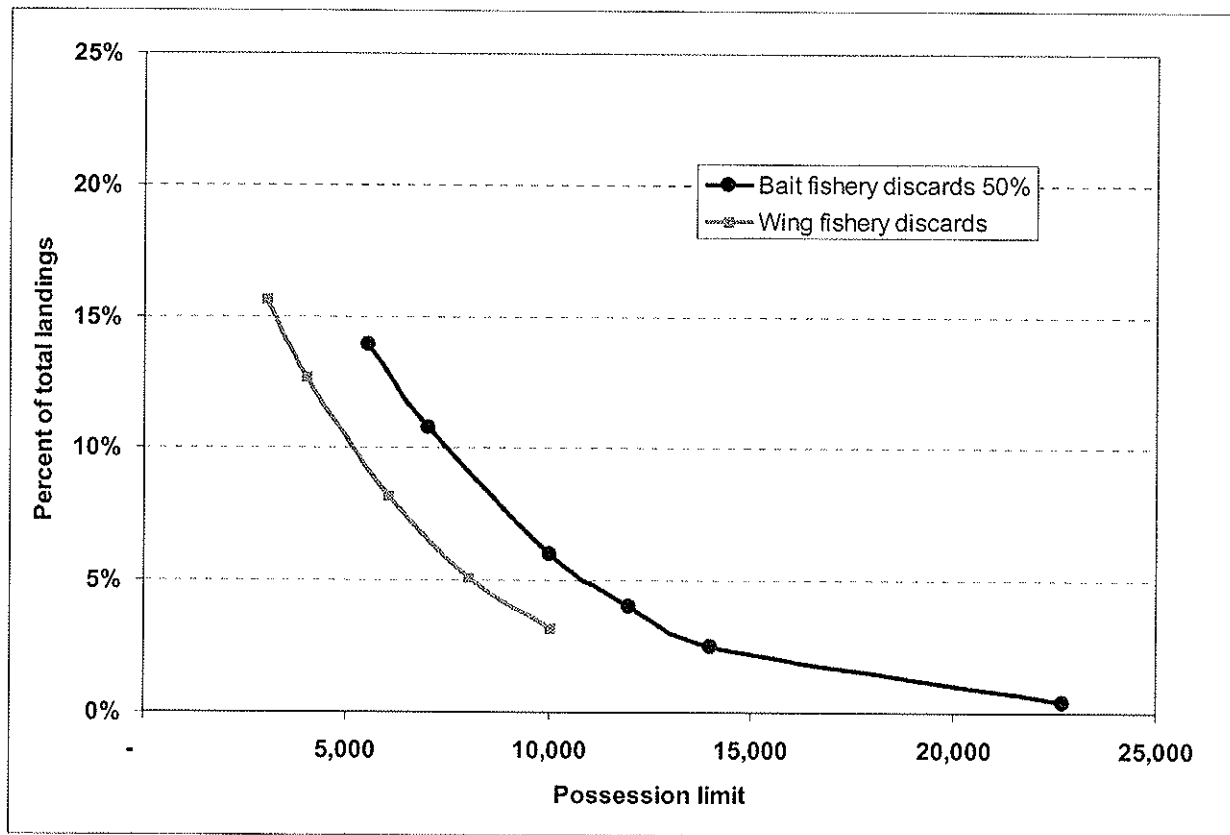
Skate discards (which cannot be estimated by species) declined from an estimated 47,291 mt in 2003 to 14,582 mt in 2006 (Figure 5). This decline is attributable to restrictions in the multispecies, monkfish, and scallop fisheries that all have a significant bycatch of skates. The decline in discards may also be related to an increase in the relative price of skate wings which would cause fishermen to retain more skates for sale and also to restrictions in the multispecies and possibly the monkfish fishery which cause vessels to use more DAS to target skates (a target fishery where skate discards may be less frequent). However, skate discards by fishery have not been estimated and the effect of increasing skate fishing may increase discards because vessels would be fishing in areas where skates of all sizes are likely to be more abundant.

Figure 5. Trend in total estimated skate discards, most recent analysis by the Skate PDT based on SAW 44 approved methods and new area allocation tables prepared for the Groundfish Assessment Review Meeting (GARM 2008).



As a precautionary approach if the relationship between discards and landings in 2006 is anomalously low, the Council applied the 2004-2006 discard/total catch ratio to the TAC to specify a landings threshold (TAL). And although more restrictive skate possession limits would increase discards from trips that continue fishing for other species (see Figure 6 showing estimated conversion of landings to discards as percent of former landings), the possession limit model (see Document 12 in Appendix I) also predicts that many trips targeting skates will be of shorter duration, reducing both skate landings and discards. The Council is unable to predict how likely this will occur, but vessels may nullify the positive effect on discards by fishing for skates on more trips (to the extent possible under DAS limits) or by fishing for other species that co-occur with skates.

Figure 6. Increase in discards as a percent of original landings as predicted by the Two Bin model over a range of potential skate possession limit, by fishery.



MEMORANDUM

#2

DATE: July 30, 2008
TO: Skate Oversight Committee
FROM: Skate PDT
SUBJECT: Smooth skate rebuilding potential and rebuilding plan

This month the Council received notice that based on 2007 trawl survey data, smooth skate has become overfished (i.e. below the minimum biomass target of 0.16 kg/tow) and thorny skate was experiencing overfishing (i.e. the decline in the three year moving average for biomass was greater than 20%). In response, the PDT evaluated the rebuilding potential for smooth skate using available life history and survey information. It also evaluated the likelihood that Amendment 3 alternatives would address thorny skate overfishing and initiate smooth skate rebuilding.

Based on this analysis, the PDT found that to rebuild smooth skate within 6-10 years would require a minimum intrinsic rate of population growth of 0.1 to 0.2. Although critical information on survival and fecundity are missing, the PDTs best estimate of the maximum intrinsic rate (i.e. an average population growth rate with no fishing) of population growth for smooth skate is 0.20 (range 0.00 to 0.35). The PDT notes that when skate catch was below the median, smooth skate biomass increased 8 of the 11 years in the time series, with an average 37% annual increase in biomass. Based on this information rebuilding to the biomass target (0.31 kg/tow) within 10 years is possible.

Although the three year moving average for biomass declined below the threshold, smooth skate abundance has exhibited increases in abundance (0.12/yr) since the late 1990s, but abundance trends have been flat in the fall survey (0.00/yr). The Skate FMP prohibits landings of smooth and thorny skates and there is very little skate fishing that presently occurs in the Gulf of Maine. Furthermore, with catch limits set at or below the median for the time series, Amendment 3 is likely to provide sufficient conservation of smooth skate to initiate or continue smooth skate rebuilding. There is also potential conservation that could be realized through existing or planned regulations for the groundfish and monkfish FMPs. Skate discard estimates for 2007 are however unavailable, which could show the effects of Framework 42 on skate catches. But it is presently unclear what alternatives will emerge from Amendment 16 or how they may affect skate catches.

Nevertheless, the Skate PDT recommends consideration of measures to reduce skate bycatch in other fisheries. Implementing measures to reduce bycatch in the Gulf of Maine would provide conservation benefits for smooth and thorny skate (which are distributed primarily in the Gulf of Maine). An expansion of the required use of the haddock rope ("eliminator") trawl in the Gulf of Maine would provide this conservation benefit to skates (see Beutel et al. and Council analysis URL=).

Although gear restricted areas (GRAs) were not included as a measure in Amendment 3 alternatives, additional analysis may identify well-defined areas where a reduction of fishing

with gears capable of catching skates could have significant conservation benefits for overfished skates. It may be worthy of re-consideration of GRAs in future skate actions, particularly after the data poor assessment workshop has concluded and when the Council will hopefully have a better understanding of skate population dynamics.

Results

Leslie matrix demographic analysis for smooth skate

- Limited information is available on the life history of the smooth skate, with no information on fecundity, first year survival, or egg survival.
- Natural mortality was estimated indirectly from maximum age, age-at-maturity, and the von Bertalanffy growth parameter (Table 1).

Table 1.

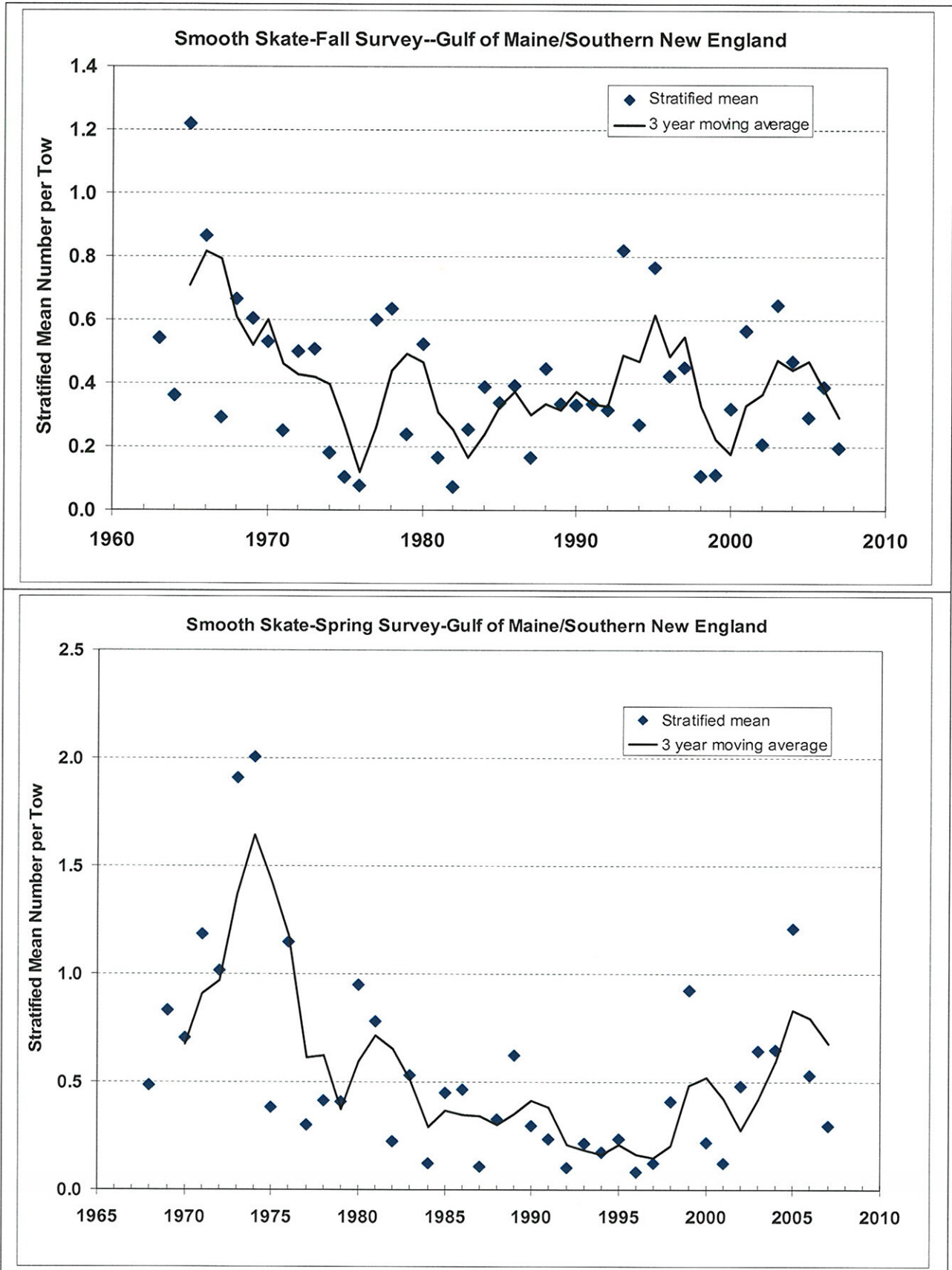
| | Smooth Skate Natural Mortality Estimates | | | |
|------------------|--|---------------------|--------|--------|
| Method: | Hoenig | Pauly | Jensen | Jensen |
| Parameters used: | Max. age | K, Linf, Water temp | (tmat) | (K) |
| Estimates: | 0.167 | 0.199 | 0.183 | 0.180 |

- There is not enough information from the survey indices to provide clear population trends and annual rates of increase that could be used to gain insights and narrow estimates for the unknown life history parameters. Thus, a sensitivity analysis was conducted over a reasonable range of input values.
- The base case scenario (first line in table) predicts a population growth rate of 0.2 yr^{-1} but given the uncertainty in the inputs estimates could range from 0 (clearly infeasible but without additional information it is impossible to determine which input parameters are in error), to a maximum of 0.35 yr^{-1} .
- If the observed growth of 0.12 yr^{-1} in the spring survey is valid (see Survey Trends below) and not simply a result of noisy data then the maximum population growth rate is bound from 0.12 to 0.35. Thus the base case model result of 0.2 seems very reasonable but difficult to support given the limited information.

Population trends of smooth skate from the NEFSC annual surveys

- Survey data is extremely noisy and shows no evidence of a declining population since the mid 1990's (Figures 1).
- The fall survey shows some evidence that population may have declined in the late 1960's but the values are highly variable and there is no evidence for either a declining or increasing abundance. A linear fit to log transformed values suggests the population has been stable (-0.007 yr^{-1}) since 1994.
- The spring survey appears to have a slightly greater catchability for smooth skate than the fall survey (mean of 0.57 versus 0.41 per tow for the entire time series, respectively) but values are also highly variable.
- A log transformation of the spring indices indicates that the population was in decline until the early 1990's with an apparent recovery occurring since around 1994. This would correspond to the timing of the Georges Bank closed areas.
- Since 1994, the spring survey data indicates that the population has been growing at a rate of around 0.12 yr^{-1} .

Figure 1. NMFS trawl survey indices of smooth skate abundance for the autumn survey (top) and spring survey (bottom).





UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 NORTHEAST REGION
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 Gloucester, MA 01930-2298

#3

JUL 21 2008

Paul J. Howard, Executive Director
 New England Fishery Management Council
 50 Water Street, Mill 2
 Newburyport, MA 01950

Dear Paul:

By this letter, NOAA's National Marine Fisheries Service (NMFS), on behalf of the Secretary of Commerce, is notifying the New England Fishery Management Council (Council) that it has been determined that smooth skate (*Malacoraja senta*) is overfished, and thorny skate (*Amblyraja radiata*) is now subject to overfishing (see Attachment).

According to the Northeast Skate Complex Fishery Management Plan (FMP), smooth skate is considered to be in an overfished condition when the 3-year moving average of the autumn trawl survey mean weight per tow falls below $\frac{1}{2}$ of the 75th percentile of the survey time series from 1963-1998 (0.16 kg). Based on information provided by Dr. Nancy Thompson, Director of the Northeast Fisheries Science Center (Center), the 3-year average for 2005-2007 is 0.14 kg/tow, which is less than the 0.16-kg/tow threshold. Smooth skate is therefore considered to be overfished.

Thorny skate is considered to be subject to overfishing when the percent decline between consecutive 3-year moving averages of the autumn trawl survey mean weight per tow is 20 percent or more. Based on information provided by the Center, the 3-year mean weight per tow for thorny skate was 0.42 kg during 2005-2007, which is a 23.7-percent decline from 0.55 kg during 2004-2006. Thorny skate is therefore subject to overfishing.

The Center also provided new preliminary spring trawl survey data for 2006-2008 (5.04 kg/tow), which indicate that overfishing of little skate (*Leucoraja erinacea*) is likely not occurring (see Attachment).

Pursuant to Section 304(e)(3) of the Magnuson-Stevens Fishery Conservation and Management Act, the Council is required, within 1 year of this notice, to prepare an FMP amendment to address the overfished condition of smooth skate and to rebuild the stock, and to develop management measures to end overfishing of thorny skate. However, given that current regulations implemented under the Skate FMP already prohibit the possession of thorny skates throughout the Northeast Region, and smooth skates in the Gulf of Maine Regulated Mesh Area, and that an amendment to the Skate FMP is currently under development (Amendment 3), I recommend that these new stock status determinations be



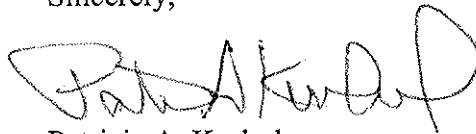
cc: CSR, AA (7/23)

addressed within the scope of the amendment in progress. Specifically, the objectives of Amendment 3, originally intended to implement a rebuilding program for winter skate and contribute to the rebuilding of thorny skate, would now also incorporate a rebuilding program for smooth skate and measures to end overfishing of thorny skate.

Additional analyses may be necessary in order to demonstrate that the alternatives under consideration will address the rebuilding of smooth skates, in addition to the other species in need of rebuilding. The amendment would also be required to formalize the rebuilding schedule for smooth skate. Presumably, these potential changes would not further delay the completion of Amendment 3, and would be reviewed by the Skate Oversight Committee prior to presentation to the Council.

Please contact me if you have any questions with these revised status determinations.

Sincerely,

A handwritten signature in black ink, appearing to read "Patricia A. Kurkul". The signature is fluid and cursive, with a large initial "P" and "K".

Patricia A. Kurkul
Regional Administrator

Attachments

cc: J. Pappalardo
C. Kellogg
A. Applegate

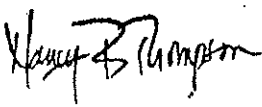


UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 Northeast Fisheries Science Center
 166 Water Street
 Woods Hole, MA 02543-1026

#4

June 27, 2008

MEMORANDUM FOR: Patricia A. Kurkul
 Regional Administrator, NER

FROM: Nancy B. Thompson, Ph.D.
 Science and Research Director 

SUBJECT: Update of Skate Stock Status Based on NEFSC Research
 Vessel Bottom Trawl Survey Data through Autumn 2007

The purpose of this memo is to inform you that the stock status of smooth skate should be changed to "overfished" and the stock status of thorny skate to "overfishing" as a result of including the 2007 autumn survey catch per tow information. For smooth skate, the three-year moving average of 0.14 kg is below the biomass threshold of 0.16 (calculated as $\frac{1}{2}$ the 75th percentile of the survey time series from 1963-1998). The overfishing definition for thorny skates is defined by the percent change between consecutive three-year moving averages. According to the definition, when the percentage goes down by at least 20%, then overfishing is taking place. The 3-year average catch per tow was 0.42 kg during 2005-2007, a 23.7% decline from 0.55 during 2004-2006.

The stock status for the other five species remains unchanged.

As you know, skates will be one of the species that will be addressed at the Northeast Regional Data Poor Working Group which will meet in December 2008. The biological reference points and overfishing definitions for skates may possibly change as a result of analyses and discussions at the Working Group meeting.

Attachment

cc: F. Serchuk
 F. Almeida
 J. Weinberg
 P. Rago
 K. Sosebee



UPDATE OF SKATE STOCK STATUS BASED ON NEFSC SURVEY DATA THROUGH AUTUMN 2007

There are seven species of skates occurring along the North Atlantic coast of the United States: winter skate (*Leucoraja ocellata*), little skate (*L. erinacea*), barndoor skate (*Dipturus laevis*), thorny skate (*Amblyraja radiata*), smooth skate (*Malacoraja senta*), clearnose skate (*Raja eglanteria*), and rosette skate (*L. garmani*). Skates are currently managed under the New England Fishery Management Council's Skate Fishery Management Plan implemented in 2003. This plan includes mandatory reporting by species; possession prohibitions on barndoor, thorny, and smooth skates; trip limits for winter skate; and a suite of measures in other fisheries management plans to aid in the recovery of the overfished skate species.

Indices of relative abundance (stratified mean weight per tow) have been developed from NEFSC bottom trawl surveys for the seven species in the skate complex, and these form the basis for most of the conclusions about the status of the complex. All statistically significant NEFSC gear, door, and vessel conversion factors were applied to little, winter, and smooth skate indices when applicable. The strata sets used for each species are given in Table 1.

Biomass reference points are based entirely on NEFSC survey data since reliable landings and discard information are not available by species. For all species but barndoor, the Bmsy proxy is defined as the 75th percentile of the appropriate survey biomass index time series for that species (Table 1). For barndoor skate, the Bmsy proxy is the average of 1963-1966 autumn survey biomass indices since the survey did not catch barndoor for a protracted period.

The fishing mortality reference points are based on changes in survey biomass indices. If the three-year moving average of the survey biomass index for a skate species declines by more than the average CV of the survey time series, then fishing mortality is assumed to be greater than Fmsy and overfishing is occurring for that skate species. The average CVs of the indices are given by species in Table 1.

For winter skate, the 2005-2007 NEFSC autumn average biomass index of 2.93 kg/tow is below biomass threshold reference point (3.23 kg/tow), and thus the species remains overfished. The 2005-2007 average index is below the 2004-2006 index by 4%, but overfishing is not occurring as this decline is less than the 20% reference decline level.

For little skate, the 2005-2007 NEFSC spring average biomass index of 3.67 kg/tow is above the biomass threshold reference point (3.27 kg/tow), and thus the species is not overfished. The 2005-2007 average index is lower than the 2004-2006 index by 20%, but overfishing is not occurring as this decline is not below 20%.

For barndoor skate, the 2005-2007 NEFSC autumn average survey biomass index of 1.00 kg/tow is above the biomass threshold reference point (0.81 kg/tow), and thus the species is not overfished, but is not yet rebuilt to Bmsy. The 2005-2007 average index is below the 2004-2006 index by 14%, but overfishing is not occurring as this decline is less than the 30% reference decline level.

For thorny skate, the 2005-2007 NEFSC autumn average biomass index of 0.42 kg/tow is well below the biomass threshold reference point (2.20 kg/tow), indicating that the species is in an

overfished condition. The 2005-2007 index is lower than the 2004-2006 index by 24%, therefore overfishing is occurring.

For smooth skate, the 2005-2007 NEFSC autumn average biomass index of 0.14 kg/tow is below the biomass threshold reference point (0.16 kg/tow), and thus the species is now overfished. The 2005-2007 index is below the 2004-2006 index by 22%, but overfishing is not occurring as this decline is less than the 30% reference decline level.

For clearnose skate, the 2005-2007 NEFSC autumn average biomass index of 0.64 kg/tow is above both the biomass threshold reference point (0.28 kg/tow) and the Bmsy proxy (0.56 kg/tow), and hence the species is not overfished. The 2005-2007 index is above the 2004-2006 index, and therefore overfishing is not occurring.

For rosette skate, the 2005-2007 NEFSC autumn average biomass index of 0.06 kg/tow is above both the biomass threshold reference point (0.015 kg/tow) and the Bmsy proxy (0.029 kg/tow), and thus the species is not overfished. The 2005-2007 index is above the 2004-2006 index, and therefore overfishing is not occurring.

| | BARDOOR | CLEARNOSE | LITTLE | ROSETTE | SMOOTH | THORNY | WINTER |
|--|---|---|--|---|--|--|---|
| Survey (kg/tow) | Autumn 1963-1966 Offshore 1-30, 33-40 | Autumn 1975-1998 Offshore 61-76, Inshore 15-44 | Spring 1982-1999 Offshore 1-30, 33-40, 61-76, Inshore 1-66 | Autumn 1967-1998 Offshore 61-76 | Autumn 1963-1998 Offshore 1-30, 33-40 | Autumn 1963-1998 Offshore 1-30, 33-40 | Autumn 1967-1998 Offshore 1-30, 33-40, 61-76 |
| 1997 | 0.11 | 0.61 | 2.71 | 0.01 | 0.23 | 0.85 | 2.46 |
| 1998 | 0.09 | 1.12 | 7.47 | 0.05 | 0.03 | 0.65 | 3.75 |
| 1999 | 0.30 | 1.05 | 9.98 | 0.07 | 0.07 | 0.48 | 5.09 |
| 2000 | 0.29 | 1.03 | 8.60 | 0.03 | 0.15 | 0.83 | 4.38 |
| 2001 | 0.54 | 1.61 | 6.84 | 0.12 | 0.29 | 0.33 | 3.89 |
| 2002 | 0.78 | 0.89 | 6.44 | 0.05 | 0.11 | 0.44 | 5.60 |
| 2003 | 0.55 | 0.66 | 6.49 | 0.03 | 0.19 | 0.74 | 3.39 |
| 2004 | 1.30 | 0.71 | 7.22 | 0.05 | 0.21 | 0.71 | 4.03 |
| 2005 | 1.04 | 0.52 | 3.24 | 0.07 | 0.13 | 0.22 | 2.62 |
| 2006 | 1.17 | 0.53 | 3.32 | 0.06 | 0.21 | 0.73 | 2.48 |
| 2007 | 0.80 | 0.85 | 4.46 | 0.07 | 0.09 | 0.32 | 3.71 |
| 2002-2004 3-year average | 0.88 | 0.75 | 6.72 | 0.044 | 0.17 | 0.63 | 4.34 |
| 2003-2005 3-year average | 0.96 | 0.63 | 5.65 | 0.049 | 0.18 | 0.56 | 3.34 |
| 2004-2006 3-year average | 1.17 | 0.59 | 4.59 | 0.057 | 0.19 | 0.55 | 3.04 |
| 2005-2007 3-year average | 1.00 | 0.64 | 3.67 | 0.064 | 0.14 | 0.42 | 2.93 |
| Percent change 2005- 2007 compared to 2004-2006 | -14.2 | +8.1 | -20.0 | +12.7 | -22.4 | -23.7 | -3.6 |
| Percent change for overfishing status determination in FMP | -30 | -30 | -20 | -60 | -30 | -20 | -20 |
| Biomass Target | 1.62 | 0.56 | 6.54 | 0.029 | 0.31 | 4.41 | 6.46 |
| Biomass Threshold | 0.81 | 0.28 | 3.27 | 0.015 | 0.16 | 2.20 | 3.23 |
| CURRENT STATUS | Not Overfished Overfishing is Not Occurring | Not Overfished Overfishing is Not Occurring | Not Overfished Overfishing is Not Occurring | Not Overfished Overfishing is Not Occurring | Overfished Overfishing is Not Occurring | Overfished Overfishing is Occurring | Overfished Overfishing is Not Occurring |

TABLE 1.

Skate Complex Biomass Indices

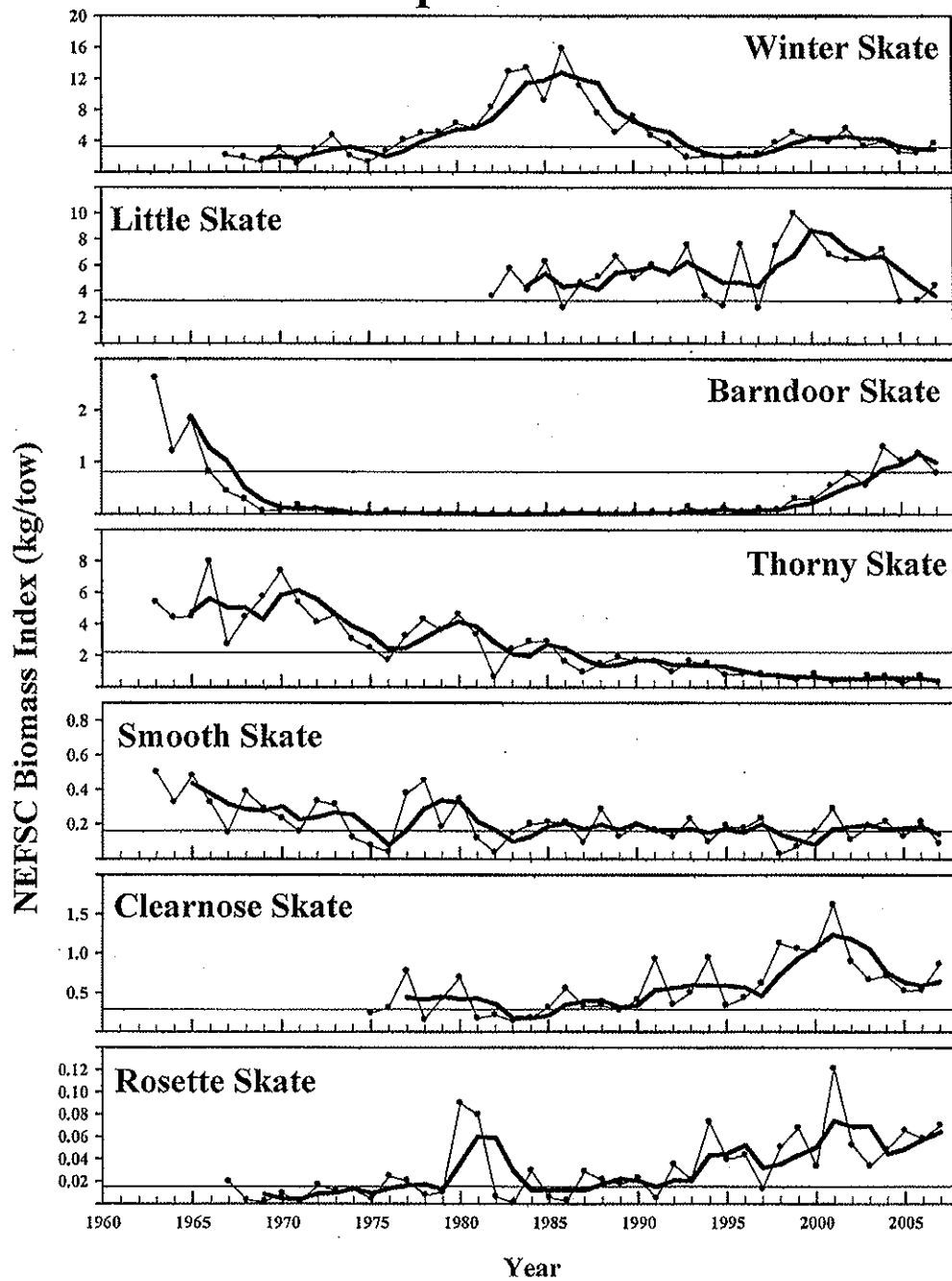


FIGURE 1. NEFSC survey biomass indices (kg/tow). Thin lines with symbols are annual indices, thick lines are 3-year moving averages, and the thin horizontal line are the biomass thresholds.



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#5

July 7, 2008

MEMORANDUM FOR: Patricia A. Kurkul
 Regional Administrator, NER

FROM: Nancy B. Thompson, Ph.D.
 Science and Research Director

SUBJECT: Stock Status of Little Skate

This memo provides the clarification requested in your July 2, 2008, letter regarding status determination of little skate.

The overfishing definition for little skate is based on the percent change between consecutive three-year moving averages of the NEFSC Spring research vessel bottom trawl survey, which for this stock is a change of -20%. The observed percentage change (-20.0%) reported in my memo of June 27, 2008, is equal to the overfishing threshold. The little skate evaluation was based on survey data through the Spring 2007 survey.

Your memo suggested that it might be worthwhile to update little skate status using data from the Spring 2008 survey. These data have not been fully audited yet, but staff conducted an evaluation using the provisional (unaudited) survey data. Based on the provisional 2008 Spring survey data, the 2006-2008 three-year average is 5.041 kg/tow, which is an increase of about 37% from the 2005-2007 three-year average of 3.674 kg/tow. Thus, when the final, audited 2008 Spring survey data are used, the status of little skate will most likely be that overfishing is not occurring.

cc: F. Serchuk
 F. Almeida
 J. Weinberg
 P. Rago
 K. Sosebee

JUL 11 2008



New England Fishery Management Council
Skate Oversight Committee and Advisory Panel Meeting

DRAFT Meeting Summary
August 25, 2008

The Skate Committee met in Peabody, MA to continue development of Amendment 3 to the Skate Fishery Management Plan. Committee members present were Mr. John Pappalardo, (Chair), Mr. Mike Leary (Vice-Chair), Mr. Terry Stockwell, and Mr. Rodney Avila. Staff members supporting the meeting were Mr. Andrew Applegate (NEFMC), Mr. Tobey Curtis, and Mr. Mike Pentony (NMFS - NERO).

The meeting focused on approving a change in the scope of Amendment 3 to add initiating a rebuild program for smooth skate and stopping thorny skate overfishing, in response to a July 2008 letter from NMFS notifying the Council of a change in status determination for these two skate species. The meeting also reviewed and finalized the preliminary draft Amendment 3 documents for submissions to NMFS.

PDT analysis and recommendations

The Skate PDT met on July 30th to evaluate the rebuilding potential of smooth skate and recommend management measures, if any, that would address the overfished condition while stopping overfishing of thorny skate. The PDT concluded that smooth skate could rebuild to the biomass target within 10 years and that keeping aggregate skate catches below the median catch/biomass exploitation ratio would enhance the probability of smooth skate biomass increasing. It also concluded that recent decreases in estimated discards could be contributing to a delayed rebuilding of smooth and thorny skate, but the situation should be monitored. The PDT advised the Oversight Committee that no new measures or alternatives were needed in Amendment 3 to address the new status determinations, but the Council should consider expanding the required use of the haddock rope (“eliminator”) trawl in the Gulf of Maine, via a future multispecies management action.

Discussion

The Oversight Committee accepted the PDT recommendations and thought that the change in scope within the Amendment 3 Purpose and Need section and analysis in the Biological Impact section were satisfactory. Also the committee agreed that there was sufficient reason to believe that Amendment 3 measures would allow rebuilding of smooth skate biomass and stop overfishing of thorny skate. The committee passed the following motion to be brought forth at next week’s Council meeting, approving the change in scope of the amendment.

1. Mr. Leary/Mr. Avila: ***To approve the modification of the Amendment 3 purpose and need, to address rebuilding of smooth skate and to stop overfishing of thorny skate.*** The motion carried 3-0

Mr. Applegate presented a summary of the Amendment 3 timeline for document submission and public hearings, followed by an overview of the document organization and a summary of general conclusions from the analysis of impacts. Certain new issues, including numeric specification of MSY and OY, plus a trip declaration provision were also discussed.

Submission of the final drafts on Sept. 5th to NMFS for review would allow publication of the Notice of Availability on Sept. 26th, with the 45 day public comment period ending on November 10th. This tight schedule would allow the Council to hold public hearings during the last week in October, hold a Skate Oversight Committee meeting after the public comment period ends, and make a decision on the final alternative at the November Council meeting. The schedule is very tight and any slippage would mean that a final decision could not be made in November.

The Amendment 3 document included an Executive Summary, a Purpose and Need discussion, a Management Background summary, a description of measures and alternatives under consideration, an integrated SAFE Report which also served to describe the Affected Environment, and an Analysis of Impacts, including a discussion of Cumulative Effects. The analysis indicates that there would be a substantial reduction in landings and revenue for ports and vessels that rely on skates for a significant portion of revenue (Chatham and Point Judith). The time/area closures and skate possession limits were set to achieve the landings reduction targets, but there appeared to be plenty of opportunity for vessels to mitigate the effects by fishing nearby around closed skate areas or by fishing shorter and more frequent trips. On the other hand, the landings will be monitored as they approach the ACLs and changes in the skate possession limits would keep landings from exceeding the thresholds. The 25% buffer will help to keep catches from exceeding the ABC/ACL (i.e. the median catch/biomass exploitation ratio).

New or important issue for the committee to consider were quantification of MSY and OY, two options for trip declaration and monitoring, a biennial specification and annual review process, the biological impacts on skate landings and other related species, and the effect on total and net revenue, as well as effects on lobster fishery profits. Mr. Applegate suggested that the committee categorize any issues as those being critical that had to be addressed before the document could be submitted, issues that it would be preferable to address if there is available time and resources, and issues that could be addressed later when the final amendment is submitted in late November.

2. Mr. Stockwell/Mr. Avila: ***To approve the Amendment 3 document for submission to NMFS for review and publication of Draft Amendment 3 and the DEIS.*** The motion carried 3-0.

The committee weighed the pros and cons of a biennial specification process, versus a longer duration between changes in specifications. If the Council adopts a biennial specification process, the catch limits could be adjusted more quickly in response to changes in skate biomass. Taking longer would mean that the plan would be well into a 10-year rebuilding period before the specifications would be modified and those changes would take effect. With a three-year (triennial) schedule, changes in specifications would take effect during the 2012 fishing year. A longer period would mean that the changes would be less sensitive to statistical uncertainty in survey results. Concern was expressed whether the Council had sufficient resources to support

biennial monitoring and analysis. Concluding the debate, the committee decided to retain a biennial specification setting process in the document.

The committee asked for clarification about the trip declaration options. Mr. Applegate explained that the trip declaration was needed to monitor the TALs by (wing and bait) fishery, without interfering with the marketing of skates and skate parts. In both cases, a vessel operator that intended to land more than 500 lbs. of whole skates (220 lbs. of skate wings) would be required to declare a wing or bait skate trip via VMS or IVR system. Most vessels that land skates utilize VMS equipment. Vessels on a declared skate trip would be prohibited from fishing in the skate management areas when they are closed, improving enforceability of the closed areas.

One ACL monitoring approach would follow procedures that currently exist for some FMPs that have quota monitoring. In those programs, NMFS relies on weekly IVR reports by vessel operators, but the reports are adjusted post hoc to account for usual differences between IVR and dealer reports. This adjustment factor was based on past history and could be inaccurate in the current year (using an historic-based adjustment factor), but the adjusted IVR data would be the official report for monitoring landings and/or catch. In a second approach, vessel operators would communicate with dealers about the type of skate trip declaration that was made (wings or bait) and the dealer report would be the official record for TAL monitoring. No adjustment factor would be needed, but accurate communication between the vessel operator and dealer is needed. Staff recommended that both procedures should be included in the document for public comment and the Oversight Committee agreed with this recommendation.

The document also included a range, expressed as a percentage of the TAL or ACL when in-season accountability measures would be invoked. Under the Hard TAC approach, the skate possession limit would be reduced to zero. Under the target TAC approach, the skate possession limit would be reduced to the 500 lbs. incidental limit when landings approach the TAL. Under one alternative, the skate management areas would also close to skate fishing. The document includes a range of 80-100% of the TAL or ACL when the accountability measures would be invoked. The Oversight Committee decided to take the 80-100% range to public hearings to get comment on this issue.

One advisor asked if there was any opposition to the three season quota option in Alternative 4 and also asked how he could comment in favor of that option. He was told that there was no preferred alternative that had been identified and that he should comment during the public comment period between Sep. 26th and Nov. 10th. He was also encouraged to submit his comment in writing.

No further issues were raised and NMFS staff had no further comments pending the internal Regional Office review. The Oversight Committee commended the PDT on the quick turn around and voted to approve the draft document for submission; pending final clean up, response to NMFS comments, and formatting.