



New England Fishery Management Council

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MEMORANDUM

DATE: April 19, 2002
TO: Groundfish Oversight Committee
FROM: Groundfish Plan Development Team
SUBJECT: Calculation of Area-Species Specific TACs

1. The Groundfish PDT met April 15, 2002, to review a preliminary attempt to calculate area and species specific TACs for the area management alternative. The PDT also planned to review recreational TACs for stocks other than GOM cod, but the meeting ended early due when two participants were called away to work on the FW 33 lawsuit. Participants were Tom Nies (NEFMC), John Walden and Eric Thunberg (NEFSC), Dan Holland (SMASST-Dartmouth), Steve Correia (Massachusetts DMF), and Regina Spallone (NMFS NERO).

2. The PDT reviewed the current status of the development of area management alternatives. The PDT notes its concern over allowing vessels to fish in any area without any limits. While recognizing the Committee's desire not to constrain the opportunities for fishermen, the PDT notes that this complicates the development of management measures. It will be possible for some vessels to fish in one area until TACs are reached, and then move into other areas. Those vessels without the ability to move to other areas will be disadvantaged. This will also tend to undermine one of the goals of area management – creating a sense of stewardship in an area. If vessels that are limited in their ability to fish in more than one area cannot be certain they will benefit from conservation efforts, there will be little likelihood that stewardship concepts will develop. The Committee may wish to highlight this issue when holding its area management meetings. Possible approaches to resolving this issue include limiting vessels to an area or areas, or requiring vessels to declare in advance the amount of effort they will expend in each management area.

3. The PDT also notes that there has been little recent development of other management alternatives for Amendment 13. While the PDT suggested several alternatives that are based on controlling DAS and using closed areas, the Committee has not adopted any of these for further

development. The only other alternative that has seen considerable work is the sector allocation alternative.

Area/Species Specific TACs

4. The PDT reviewed an outline (enclosure (1)) for developing area and species specific TACs. The process uses a combination of landings from VTRs (1996-1998 and 1996-2000) and trawl survey observations (fall and spring) to estimate the relative distribution of stocks. This is applied to species specific TACs to determine a TAC for each area and species. The PDT believes the process as outlined provides reasonable preliminary estimates of TACs for each species and area. The following issues were noted and need to be examined further by the PDT in addition to those noted in the outline:

- The process as outlined does not take into account survey observations outside the proposed management areas. Most of these observations are in Canadian waters. This may not be an issue for sedentary stocks such as GB yellowtail, but may be for cod and haddock. The TAC calculations attempt to take this into account by only applying the relative distributions to the U.S. portion of the TAC.
- The average (mean) weight per tow of adults is used to estimate relative distribution of the stocks based on survey data. The PDT noted that there are a number of tows with no catch of some species, and that the positive tows have considerable variation. As a result, the average may not be the appropriate measure of central tendency. The PDT will examine other measures, such as the Delta distribution, to evaluate whether there is a better estimator available. This will take some time and may not be completed for the current round of Committee meetings.
- The distribution based on survey tows does not take into account closed areas. As a result, it is possible that TACs calculated using this information may not reflect the availability of the species to the fishery. Using landings data from the VTR may partially compensate for this.
- There are some minor inaccuracies caused by misreporting of positions in VTRs or inaccurate recording of statistical areas. For example, using statistical areas as reported in VTRs, some landings of Mid-Atlantic yellowtail flounder are attributed to trips that are reported to have taken place outside the stock boundaries (on eastern Georges Bank, for example) based on the lat/lon assigned to the trip. These inaccuracies are minor compared to the overall landings, but the PDT agreed to correct for these errors. If the statistical area as reported on the VTR does not match the statistical area of the plotted position, the landings will not be assigned to a stock complex.

Subsequent to the meeting, it was discovered that there are many records for which the recorded statistical area does not match the recorded lat/lon of the trip. Consistent with the PDT's decision, these records were ignored in the calculation of the area specific TACs. To determine if this will affect TAC distribution, cod and yellowtail TACs were calculated using the recorded statistical areas for all trips, the statistical areas of the recorded lat/lon for all trips, and the statistical area for only those trips that the two match. There are differences in the results from these three methods, ranging up to ten percent for the distribution of some stocks in certain areas.

- The PDT discussed whether the relative distribution based on VTRs should be based on landings or catch (incorporating discards as reported in the VTRs). They also considered basing the estimates only on those VTR trips that match closely with reported dealer landings. There was no clear consensus. Ideally, the distribution should be based on catch (including discards), but there is little confidence in using the raw discard reports in VTRs (i.e. without expansion to those trips for which discards are not recorded). For now, the PDT will continue to use landings as reported in the VTR.
- The PDT noted the TACs are not very sensitive to the period used for the VTRs (1996 – 1998 or 1996 – 2000), but do appear sensitive to the weighting of VTR vs. survey information.

Recreational TACs

5. The PDT's discussion on recreational TACs ended prematurely when two members departed to address FW 33 lawsuit issues. These issues will be addressed by a conference call prior to the April 30, 2002 meeting with the recreational sector. Issues to be addressed include determining whether the GOM cod recreational TAC includes is limited to cod kept, or all cod caught, and how to calculate TACs for other stocks (such as GOM haddock, GB cod, and SNE/MA winter flounder).

Enclosure (1) - Outline of Area/Stock Specific TAC Estimation

I. Survey Data

1. Spring and fall trawl surveys, 1998 through 2000
2. Successful tows only.
3. Following info from each tow collected for each groundfish species:

Position
Number at length in cm.
Total number
Total observed weight
Year

4. Weight at length estimated by applying a length/weight formula. (No consideration given to sex).
5. Weight of juveniles and adults estimated by summing weights based on length. Criteria for length is based on same criteria used to identify EFH (can provide if desired).
6. Each survey tow was plotted to determine the statistical area and the groundfish management area for its location.
7. The average catch/tow for a species was calculated for all survey tows that fall within a management area (not all survey tows do – some are in Delaware Bay, some east of the Hague Line, etc.). Average was calculated for estimated adult weight, estimated juvenile weight, and observed weight. These weights were calculated based on both stock area and management area.
8. The average weight per tow was weighted by the relative area of the stock area that falls within the management areas. For the SNE/MA area, only the area between the shoreline and roughly 300 m was used to estimate the area.
9. The weighted averages were then used to determine relative distribution. This was calculated for the fall and spring surveys, with all three years of data pooled (not averaged).

Known sources of error:

- Estimation of weight of adults and juveniles ignores sex differences. Calculated weights, though, are close to the observed weights so these errors are relatively minor.
- Possible errors in estimation of the size of the management areas and the amount of stock area in each management area.
- Possible projection errors in GIS
- Survey strata were not used. An implicit assumption is that the distribution of survey points in the management areas does not introduce bias into the estimates.
- Others?

II. Landings data

1. VTRS from fishing years 1996 through 2000.

2. All trips that landed one of the ten regulated groundfish species (cod, haddock, pollock, yellowtail, witch, winter, plaice, white hake, redfish, windowpane).
3. The stock areas for each trip (yellowtail, cod, haddock, winter, and windowpane) were assigned based on statistical area as reported on the VTR (note: NOT as the position plots. There are sometimes differences).
4. Each trip was plotted and the management area that it is within identified.
5. The percentage of landings in each management area from each stock was calculated using a pivot table. These were done for two different time periods: 1996 through 1998 fishing years, and 1996 through 2000 fishing years. In both cases, the data was pooled over the time period and averaged (the distribution was not determined for each year, and then averaged over the three or five year period).

Known sources of error:

- Errors in reporting of VTR positions or statistical areas
- Positions that lie outside a management area are not included in the estimates of landings (e.g. positions in Vermont) in a management area, but are included in estimates of landings by stock.
- Minor GIS projection or drawing errors

III. Calculation of TACs

1. The relative distribution from the surveys and from the VTRs was combined to apply to the stock specific TACs in order to estimate an area-stock specific TAC.
2. In all cases, the spring and fall survey were equally weighted (averaged).
3. The combined survey and VTR information was weighted two ways:
 - 50% VTR/50% Survey
 - 80% VTR/20% Survey
4. These distributions were applied to the TACs found in the NMFS court filing for FY 2002. Assumptions were made for Canadian quotas for GB cod, haddock, and yellowtail flounder. No deduction was made for recreational catch for GOM cod (this can be easily changed).

Stock	2000 B (B/Btarget)	Current F	Frebuild or F _{MSY}	Change in F	Rebuild By Year	Comments
<u>GB Cod</u>	<u>< 25%</u>	<u>0.22</u>	<u>0.17</u>	<u>-23%</u>	<u>Est. 2019</u>	<u>2009 plus one generation</u>
GOM Cod	< 25%	0.73	0.17	-76%	2009	Continue formal rebuilding program
GB Haddock	24%	0.19	0.21	+10%	2009	Continue formal rebuilding program
<u>GOM Haddock</u>	<u>30%</u>	<u>0.179 C/I</u>	<u>0.21 C/I</u>		<u>2009</u>	
<u>Pollock</u>	<u>35%</u>		<u>4.21 C/I</u>		<u>2009</u>	
<u>Redfish</u>	<u>50%</u>	<u>.003</u>	<u>0.0145</u>			<u>2009 plus one mean generation</u>
<u>White Hake</u>	<u>20%</u>	<u>0.85</u>	<u>0.323 C/I</u>		<u>2009</u>	<u>Formal rebuilding program required. Frebuild is based on an index and is not directly comparable to current F.</u>
GB Yellowtail	70%	0.14	0.22	+57%	2009	No formal rebuilding program required
SNE Yellowtail	< 25%	0.30	0.22	-27%	Unk.	Continue formal rebuilding program
<u>MA Yellowtail</u>	<u>2%</u>		<u>0.104 C/I</u>		<u>Unk.</u>	<u>Formal rebuilding program required.</u>
Cape Cod Yellowtail	< 25%	1.39	0.14	-90%	2009	Continue formal rebuilding program
Windowpane (north)	> 100%	0.14 C/I	1.11 C/I		N/A	Rebuilt.
<u>Windowpane (south)</u>	<u>< 25%</u>	<u>0.7 C/I</u>	<u>0.53 C/I</u>	<u>-24%</u>	<u>2009</u>	<u>Maintain current exploitation, formal rebuilding program</u>
GB Winter Flounder	65%	0.21 (bw)	0.32 (bw)		Unk.	Maintain F below F _{msy} . Formal rebuilding program not required
GOM Winter Flounder	Unk	Unk	Unk	Unk	Unk.	
SNE/MA Winter Flounder	45%	0.31	0.30	-3%	2009	Continue formal rebuilding program
Plaice	55%	0.31	0.13	-58%	2009	Continue formal rebuilding program
<u>Witch Flounder</u>	<u>85%</u>	<u>0.20</u>	<u>0.164</u>	<u>-18%</u>	<u>N/A</u>	<u>Maintain F below F_{msy}. Formal rebuilding program not required.</u>
<u>Halibut</u>	<u>Depleted</u>			<u>0</u>	<u>Unk.</u>	<u>No ability to estimate rebuilding time..</u>
<u>Ocean Pout</u>	<u>40%</u>		<u>.003 C/I</u>		<u>Unk.</u>	

Based on revised reference points. Underlined information updated since March 7, 2002.

Species/Stock	U.S. Commercial Landings			Estimated Catch Calendar Year 2001	Projected TAC (Total Catch) FY 2002/2003
	Fishing Year				
	1998/1999	1999/2000	2000/2001		
Cod, GOM	3,164	1,388	3,488	7,994 CL: 4,016 CD: 1,362 Rec: 2,616	3,540*
Cod, GB	7,572	7,934	9,093	12,765 CL: 10,631 CA: 2,134	4,793*
Cod, Other	13	3	6		
Cod, Total	10,749	9,325	12,587		
Haddock, GOM	967	525	718	946	3,228
Haddock, GB	1,734	3,516	3,995	11,554	17,337*
Haddock, Other	23	26	34		
Haddock, Total	2,724	4,067	4,747		
Yellowtail, CCB	761	1,281	1,891	2,571 CL: 2,224 CD: 347	292
Yellowtail, GB	2,369	3,048	3,829	7,740 CL: 4,172 CD: 2,890 CA: 678	9,394*
Yellowtail, SNE	709	565	1,030	1,033 CL: 830 CD: 203	1,250
Yellowtail, MA	444	261	245	206	2
Yellowtail, Other	57	105	209		
Yellowtail, Total	4,340	5,260	7,204		
Plaice, GM-GB	3,516	3,174	4,504	5,370	2,589
Plaice, Other	16	2	2		
Plaice, Total	3,532	3,176	4,506		
Witch, GM-GB	1,776	2,159	2,604		4,223
Witch, Other	60	61	78		
Witch, Total	1,836	2,220	2,682	3,459	
Winter, GOM	374	338	515		
Winter, GB	1,249	1,015	1,905	2,670	6,182
Winter, SNE/MA	3,494	3,337	3,747	4,746	6,631
Winter, Other	0	2	6		
Winter, Total	5,117	4,692	6,173		
Windowpane, North	132	149	63		1,556
Windowpane, South	146	123	123		131
Windowpane, Other	0	0	0		
Windowpane, Total	278	272	186		
White Hake	2,565	2,685	3,143	3,560	1,052
Redfish, SA5	353	304	326	325	2,089
Redfish, Other	3	3	1		
Redfish, Total	356	307	327		
Pollock, SA 4&5	5,463	3,919	3,849	3,901	4,429
Pollock, Other	29	14	1		
Pollock, Total	5,492	3,933	3,851		

Commercial landings from MSMC, 2001, Table 2.2

TACs based on new reference points, rebuilding programs

GOM cod TAC includes recreational landings, commercial landings and discards

GB cod, haddock, and yellowtail TACs include Canadian landings

Composition of estimated catches for 2001 is consistent with most recent assessment (i.e. GOM cod includes commercial catch and rec landings, GOM haddock include commercial landings, estimated catch for GB cod, haddock, and yellowtail includes Canadian commercial landings)

CL: U.S. commercial landings. CD: U.S. commercial discards CA: Canadian landings Rec: U.S. recreational harvest

Area/Species Specific TAC Estimates

The following pages contain preliminary estimates of area specific TACs for the major groundfish species. These should be considered preliminary estimates. As directed by the Groundfish Committee, the estimates were calculated four ways: using two different periods for VTR information, and using two different weights for survey and VTRs. Generally, the change in survey weighting appears to have more impact on the TACs than the changes in the years of VTRs that were used.

The first pages summarized the TACs by species and area for the Western Georges Bank and Eastern Georges Bank management areas, showing the range of possible TACs. The following pages compare the different TAC results for each species, area, and stock.

Management Area: Inshore Gulf of Maine

Stock	Estimated Status*
GOM Cod	Overfished
CC Yellowtail	Overfished
GOM Haddock	Overfished
Plaice	Overfishing
Witch Flounder	Overfishing
White Hake	Overfished
GOM Winter Flounder	N/A
Redfish	
Pollock	
Windowpane (North)	
Halibut	Depleted

Estimated status based on new reference points

Species	2002/2003 TAC
Cod (commercial)	2,016 – 2,139
Haddock	1,226 – 1733
Yellowtail	211 - 229
Plaice	685 - 861
Witch	604 - 746
Winter	6 – 10*
White Hake	72 - 77
Redfish	173 - 211
Pollock	509 - 588
Windowpane	
Halibut	
Ocean Pout	

Cod TAC is commercial only (landings and discards)

*Winter flounder does not include GOM winter flounder – TAC is not defined for this stock.

Management Area: Offshore Gulf of Maine

Stock	Estimated Status*
GOM Cod	Overfished / <i>overfishing</i>
CC Yellowtail	Overfished / <i>overfishing</i>
GOM Haddock	Overfished
Plaice	Overfishing
Witch Flounder	Overfishing
White Hake	Overfished / <i>overfishing</i>
GOM Winter Flounder	N/A
Redfish	
Pollock	Overfished
Windowpane (North)	
Halibut	Depleted

Estimated status based on new reference points

Species	2002/2003 TAC
Cod (commercial)	736 – 863
Haddock	1,789 – 2,325
Yellowtail	1 - 2
Plaice	928 - 966
Witch	1,909 – 2,399
Winter	5 – 10*
White Hake	492 - 617
Redfish	1,172 – 1,355
Pollock	2,728 – 2,932
Windowpane	
Halibut	
Ocean Pout	

*Cod TAC is commercial TAC only (landings and discards).

Winter flounder does not include GOM winter flounder – TAC not defined for this stock.

Management Area: Western Georges Bank

Stock	Estimated Status*
GB Cod	Overfished
CC Yellowtail	Overfished
GB Haddock	Overfished
Plaice	Overfishing
Witch Flounder	Overfishing
White Hake	Overfished
SNE/MA Winter Flounder	Overfished
SNE Yellowtail	Overfished

Estimated status based on new reference points

Species	2002/2003 TAC
Cod	1,214 – 1,374
Haddock	848 – 1,397
Yellowtail	365 – 382
Plaice	67 – 74
Witch	145 – 221
Winter	3,613 – 3,906
White Hake	6 – 7
Redfish	15 – 24
Pollock	132 – 177
Windowpane	
Halibut	
Ocean Pout	

Management Area: Eastern Georges Bank

Stock	Estimated Status*
GB Cod	Overfished
CC Yellowtail	Overfished
GB Haddock	Overfished
Plaice	Overfishing
Witch Flounder	Overfishing
White Hake	Overfished
Redfish	
SNE Yellowtail	Overfished

Estimated status based on new reference points

Species	2002/2003 TAC
Cod	1,201 – 1,378
Haddock	8,592 – 9,174
Yellowtail	5,350 – 5,592
Plaice	704 - 844
Witch	1,019 – 1,300
Winter	6,184 – 6,190
White Hake	159 - 174
Redfish	490 - 732
Pollock	855 - 933
Windowpane	
Halibut	
Ocean Pout	

Management Area: SNE/MA

Stock	Estimated Status*
GB Cod	Overfished
GB Haddock	Overfished
Plaice	Overfishing
Witch Flounder	Overfishing
White Hake	Overfished
SNE/MA Winter Flounder	Overfished
SNE Yellowtail	Overfished

Estimated status based on new reference points

Species	2002/2003 TAC
Cod	50 - 72
Haddock	19 - 30
Yellowtail	1,304 - 1,551
Plaice	17 - 34
Witch	47 - 59
Winter	2,749 - 3,906
White Hake	187 - 308
Redfish	18 - 29
Pollock	1 - 3
Windowpane	
Halibut	
Ocean Pout	