New England Fishery Management Council
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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

MEMORANDUM

DATE: October 24, 2008

TO: Groundfish Oversight Committee

FROM: Groundfish Plan Development Team

SUBJECT: **Amendment 16 Development – Effort Controls**

1. The Groundfish PDT held two conference calls (October 15, and October 22, 2008) to discuss rebuilding programs for newly overfished stocks, effort control measures, and recreational measures. Participating in the calls were Tom Nies and Anne Hawkins (NEFMC), Steve Correia (Mass. DMF), Dan Holland (GMRI), Doug Christel and Jen Anderson (NMFS NERO), Eric Thunberg, John Walden, and Paul Nitchske (NMFS NEFSC), and Paul Parker (Groundfish AP Chair).

Rebuilding Programs for Newly Overfished Stocks

1. The Council directed the PDT to prepare example rebuilding trajectories for newly overfished stocks. This can only be done for those stocks with age-based projections (GB winter flounder and witch flounder). Rebuilding projections were not developed for pollock based on a letter from NERO that revised the status of that stock to approaching an overfished condition (pending results of the 2008 fall trawl survey). A rebuilding trajectory was not prepared for GOM winter flounder due to uncertainty over status and the GARM III advice that the assessment analysis could not be used to provide management advice nor stock projections. For Northern Windowpane Flounder, a rebuilding trajectory was not calculated because the GARM III recommended against the Frebuild scenario because there is no directed fishery.

2. According to the projection results, both GB winter flounder and witch flounder can rebuild in less than ten years in the absence of fishing mortality (Table 1). The PDT next examined several scenarios as directed by the Council: the year the stock would rebuild with a 75 percent probability at F=0, the rebuilding F at a median probability and a maximum time period of 10

years (2020[1]), the rebuilding F at a 75 percent probability and a maximum time period of 10 years, and a rebuilding date between these two end points with the stock rebuilding at a 75 percent probability. The Council suggested this interim period should be based on the biology of the stock, so the PDT considered mean generation times on the theory that it may be advantageous to rebuild within one mean generation time of the start of rebuilding. This did not suggest any clear ending date: for the two stocks examined, the mean generation time added to the start of the rebuilding period resulted in an ending date of 2022 for witch flounder (beyond the ten-year maximum) and 2018 for GB winter flounder.

3. The PDT next considered three alternative ending dates and evaluated which ones would provide the largest net present value (NPV). The dates selected were an early rebuilding date of 2014, a middle date of 2017, and the maximum date of 2020. In all three cases the results are reported for the 75 percent probability of achieving the rebuilding target in the ending year. These analyses suggested that on a single stock basis there was relatively little difference in NPV between the strategies. For both stocks, the analyses suggest that there is increased value with a rebuilding period that is less than the maximum period of ten years.

4. For both stocks, there was very little difference in the mortality targets, catch streams, or SSBs between the trajectories ending in 2020 and in 2017. The mortality target differences are slight enough that effort controls can not be designed to distinguish between the two. The PDT notes that a strategy that targets an earlier rebuilding date provides additional flexibility in the future if rebuilding lags behind the plan. The differences (catch, SSB, mortality targets) are larger between the strategies ending in 2014 and these two later dates.

5. A previous PDT report estimated 2008 mortality after predicting 2008 catch. The mortality change from 2008 to 2010 needed to meet the witch flounder rebuilding strategies ending in 2017 or 2020 is about 45 percent from the estimated 2008 mortality. This is similar to the mortality changes needed for pollock and GB cod, two stocks also caught in the witch flounder stock area (but not necessarily on the same types of trips). The 2008 estimated mortality for GB winter flounder is low and if accurate suggests that mortality could increase on this stock and still meet rebuilding targets. The PDT cautions that this result is driven in part by the large estimate of the 2006 year class. If this year class proves to be weaker, the 2008 mortality will be higher than estimated (even if the catch has been accurately predicted).

[1] Since Amendment 16 will be implemented in 2010, consistent with the current and proposed NSGs that is the starting date for the formal rebuilding period. The ten year maximum period ends at the beginning of 2020.

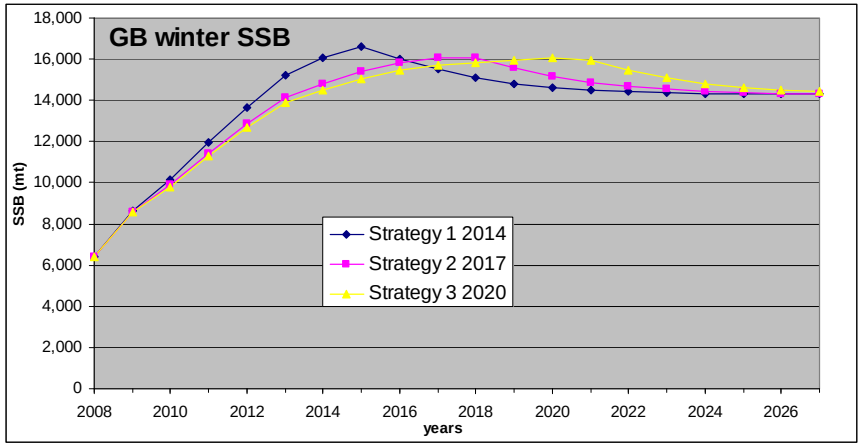
Table 1 – Minimum and maximum rebuilding periods and resulting mortality targets

Species	Stock	Year rebuilt with 75% probability F=0	Freb with 50% proba-bility by 2020	Freb with 75% proba-bility by 2020	mean generation time F=0	2007 Fishing Mortality	2008 Fishing Mortality	Fmsy
Witch Flounder		2013	0.196	0.166	11.7	0.290	0.296	0.200
Winter Flounder	GB	2011	0.257	0.214	8.2	0.280	0.131	0.260

Table 2 – Mortality targets for three alternative rebuilding periods

Species	Stock	Strategy 1 Freb with 75% proba-bility by 2014	Strategy 2 Freb with 75% proba-bility by 2017	Strategy 3 Freb with 75% proba-bility by 2020	2007 Fishing Mortality	2008 Fishing Mortality	Fmsy
Witch Flounder		0.115	0.162	0.166	0.290	0.296	0.200
Winter Flounder	GB	0.167	0.205	0.214	0.280	0.131	0.260

Table 3 – GB winter flounder projected SSB and catch for three different rebuilding periods (SSB in metric tons, catch in 1,000 pounds)



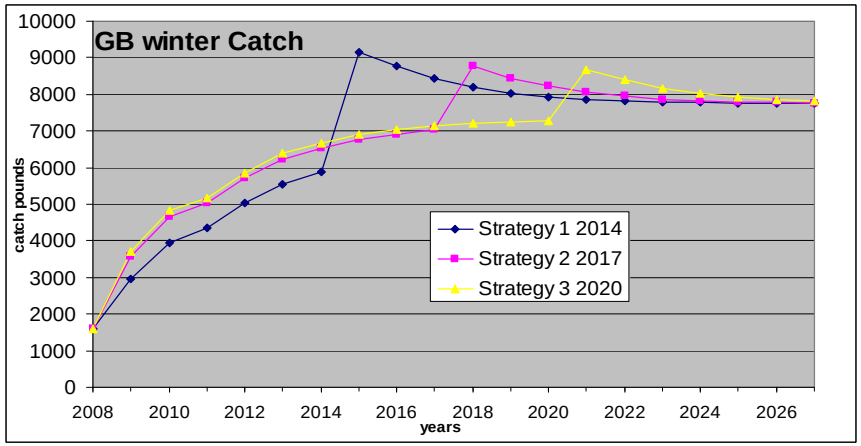
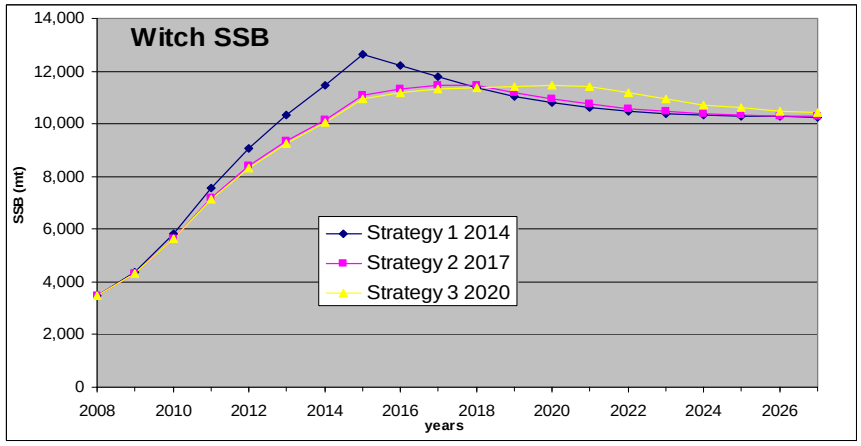
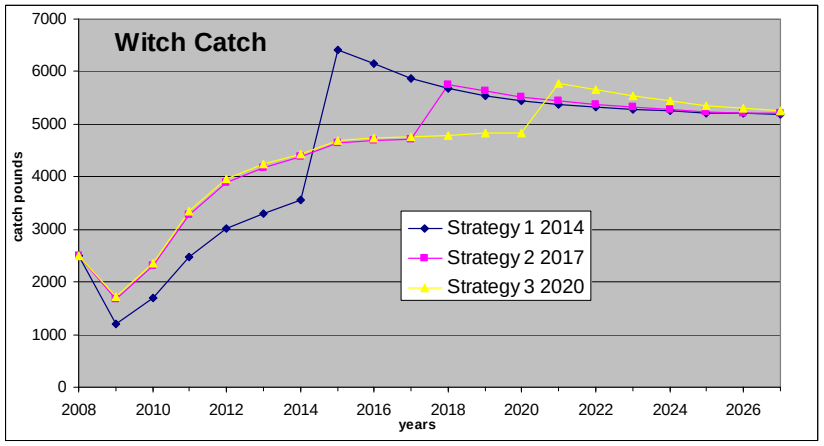


Table 4 – Witch flounder projected SSB and catch for three different rebuilding periods (SSB in metric tons, catch in 1,000 pounds)





Effort Controls

6. The design of effort controls for Amendment 16 is complicated by several factors.

(a) The PDT has not received any guidance on determining the mortality target for SNE/MA winter flounder. The rebuilding period for this stock was scheduled to end in 2014. The adopted strategy was a phased approach, with reductions in mortality planned for 2004, 2006, and 2009. The 2009 target was to be adjusted as necessary to meet the rebuilding date. Projections based on GARM III indicate this stock is unlikely to rebuild by 2014 in the absence of any fishing mortality, but would rebuild by 2015. Fishing mortality could be eliminated only be closing all fisheries (e.g. groundfish, fluke, scallop, recreational groundfish, etc.) in the entire Southern New England/Mid-Atlantic area and the statistical areas immediately east of Cape Cod. The proposed National Standard guidelines provide some guidance on mortality targets when a rebuilding plan is not complete by the ending date, but do not address the current situation for this stock. The alternatives developed below are estimated to reduce exploitation by 65-75 percent on this stock. It is unclear if that will be sufficient to meet legal requirements.

(b) As previously noted, the possible implementation of an additional seventeen sectors complicates effort control development because it is unclear which vessels will be subject to effort controls. Future movement between sectors and the common-pool create additional uncertainty over the effectiveness of the measures into the future. For this reason, the PDT believes effort controls in Amendment 16 need to be relatively simple and focused on broad-scale controls.

(c) The mortality targets and measures that will be adopted by the interim action for FY 2009 are not yet published. These could influence the mortality targets needed for Amendment 16.

7. The Committee directed the PDT to develop an effort control alternative that eliminated trip limits and relied on differential DAS to achieve mortality targets. The PDT interpreted this guidance to mean eliminate most trip limits: the expectation is that the halibut trip limit will remain at one fish per trip, and that possession of windowpane flounder will be prohibited. Three alternatives were developed and are described, with expected changes in exploitation, in enclosure (1). As with other effort control measures designed in the past, all of the alternatives will reduce yields on healthy stocks such as GB haddock. To provide some context to these results, about 33,000 DAS were used in FY 2004. The default DAS reduction in FY 2009 will reduce allocated DAS to about 34,000 DAS. Since almost all areas in the alternatives are subject to differential DAS counting at rates of 1.25:1 to 3:1, the maximum number of DAS that could be used is between 17,000 and 23,000.

8. Development of alternatives without trip limits is subject to additional certainty.

(a) If one of the rationales for developing these approaches is that discards are higher than estimated, then the input data in the model (primarily landings but with an estimate of discard rates from GARM III) may not reflect actual catch rates. As a result, the predicted mortality reductions would be overly optimistic. There is a limited ability to test the model by assuming catch rates are higher than reflected by input data. When this was attempted for the three alternatives shown by multiplying observed catch rates by 1.5, neither GOM cod nor GOM winter flounder objectives were achieved.

(b) The model may not be able to evaluate the behavioral changes that might occur as fishermen adjust to the absence of trip limits. All of the data in the model is from periods with trip limits in place for several stocks and fishing activity may be distributed very differently in the absence of such limits. Other external events (rising fuel prices, permit purchasing programs, etc.) could also result in impacts different than estimated by the model (under an management scenario).

9. After developing these alternatives, the PDT modified them by imposing trip limits on cod, yellowtail flounder, and SNE.MA winter flounder stocks. Because of PDT concerns over discards as stocks increase in size, the trip limits selected were higher than current limits for cod and yellowtail flounder. These alternatives are described, with results, in enclosure (2). The results are similar to the no-trip limit options, suggesting that the trip limits selected do little to constrain catches. None of the alternatives appear sufficient to reduce northern windowpane exploitation to F_{MSY}.

Recreational Measures

10. Example recreational measures were developed for GOM cod and GOM haddock. These measures are described in enclosure (3). The alternatives shown are consistent with the needed reductions and the RAP recommendations that preferred changes in minimum size and bag limits over changes in the season.

Other Issues:

11. Since pollock is approaching an overfished condition, and is subject to overfishing, it should not be targeted in the Category B DAS Program. Incidental catch TACs will need to be specified, as well as appropriate possession limits for this program. One approach would be to use the same limits as for other GOM stocks.

12. The number of stocks that can be targeted with the Category B DAS Program has dropped to three: redfish (difficult to target given current required mesh sizes), GB haddock, and GOM haddock. The Committee may want to consider revising the program to reflect this reality. For example, trawl, longline, and gillnet gear requirements could be specified so the program is

limited to haddock. The Committee may want to consider different rules for the GOM and GB haddock stocks, since the GOM stock cannot support the same level of catches as the GB stock.

13. The Committee may want to recommend ending the SNE/MA winter flounder SAP that allows landing small amounts of winter flounder without fishing on a groundfish DAS.

14. GARM III noted the current minimum size for Atlantic halibut (91 cm.) is less than the median length at maturity for female fish (103 cm.). The Committee may want to consider increasing the minimum size to 40 or 41 inches to more closely match the estimate of L_{50} . The GARM also reported that fish are landed at less than the minimum size, so a size increase may not be completely successful since fish since compliance is an issue.

Enclosure (1): Effort controls using differential DAS and few trip limits

Option 1:

Default DAS Reduction (18%)
No Trip Limits with the exception of a zero-possession limit on Windowpane Flounders.
Differential Days-at-sea areas and rates:

Gulf of Maine Inshore: 115, 116, 124, 125, 132, 133, 139, 140, 144-147, 150-152, 153-155
Rate: 2.5:1
Gulf of Maine Offshore: 118-123, 126-131, 134-138, 141-143, 148, 149
Rate: 1.5:1.
Georges Bank: 75-79, 92-97, 108-114
Rate: 2:1
Southern New England: 72-73, 80-90, 96-107
Rate: 3:1.

Option 2:
Default DAS Reduction (18%)
No Trip Limits with the exception of a zero-possession limit on Windowpane Flounders.
Differential Days-at-sea areas, and rates:

Gulf of Maine Inshore: 115, 116, 123-125, 131-133, 138-140, 146-147
Rate: 2.25:1
Gulf of Maine Offshore: 118-122, 126-130, 134-137, 141-145
Rate: 1.25:1.
Georges Bank: 108-114
Rate: 2:1
Southern New England: 80-91, 97-107
Rate: 3:1.

Option 3:

Default DAS Reduction (18%)
No Trip Limits with the exception of a zero-possession limit on Windowpane Flounders.
Differential Days-at-sea areas, and rates:

Gulf of Maine: 114, 115, 123-125, 132-133, 138-140 (current differential days-at-sea area)
Rate: 2:1.
Gulf of Maine/Georges Combined Region: 108-113, 118_122, 126-131, 134-137, 141-147
Rate: 2.5:1.
Southern New England: 80-91, 97-107
Rate: 3:1.

Table 5 – Changes in exploitation for three options using differential DAS and no trip limits or most stocks

Spec	AREA	Needed Difference based on 2008 Exploitation	No Action % Difference	PDT Option 1 % Difference	PDT Option 2 % Difference	PDT Option 3 % Difference
COD	GBANK	-50%	-17%	-52%	***-42%***	-52%
COD	GM	-19%	-16%	-26%	-23%	-38%
HAD	GBANK	272%	-19%	-51%	-30%	-39%
HAD	GM	59%	-17%	-29%	-24%	-44%
BLACK	GBANK	87%	-19%	-48%	-12%	-23%
BLACK	GM	-9%	-15%	-22%	-14%	-18%
BLACK	SNEMA	-100%	-20%	-71%	-68%	-67%
PL	ALL	83%	-16%	-43%	-34%	-54%
WITCH	ALL	-42%	-16%	-42%	***-33%***	-52%
WHK	ALL	28%	-17%	-42%	-41%	-64%
WIND	NORTH	-75%	-19%	***-41%***	***-19%***	***-28%***
WIND	SOUTH	-21%	-21%	-59%	-37%	-35%
YT	CCGOM	-16%	-18%	-42%	-37%	-39%
YT	GBANK	-15%	-20%	-53%	***-10%***	-15%
YT	SNEMA	-36%	-18%	-49%	-55%	-52%
POL	ALL	-35%	-17%	-41%	-39%	-58%
RED	ALL	368%	-18%	-43%	-41%	-65%

Figure 1

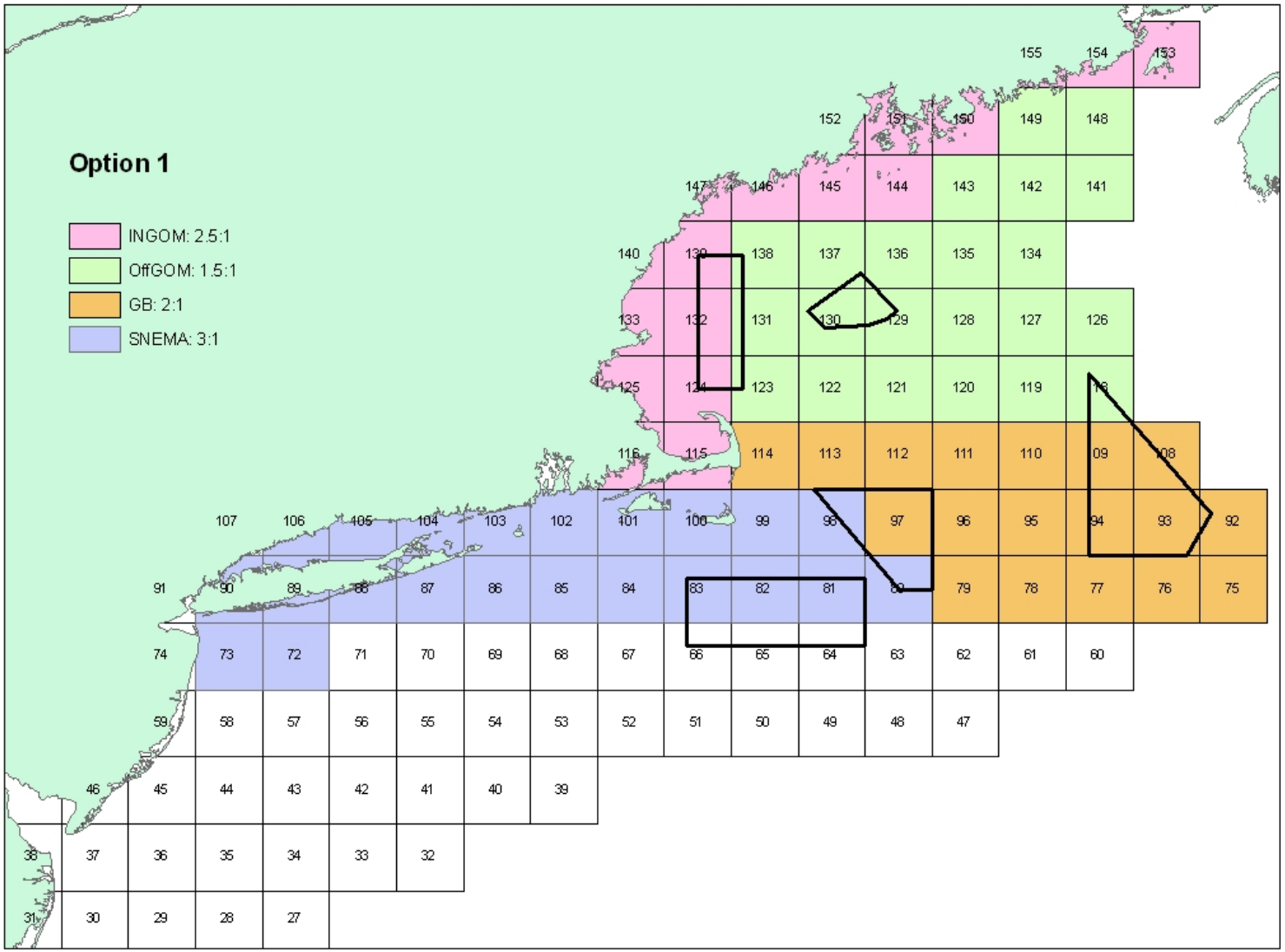


Figure 2

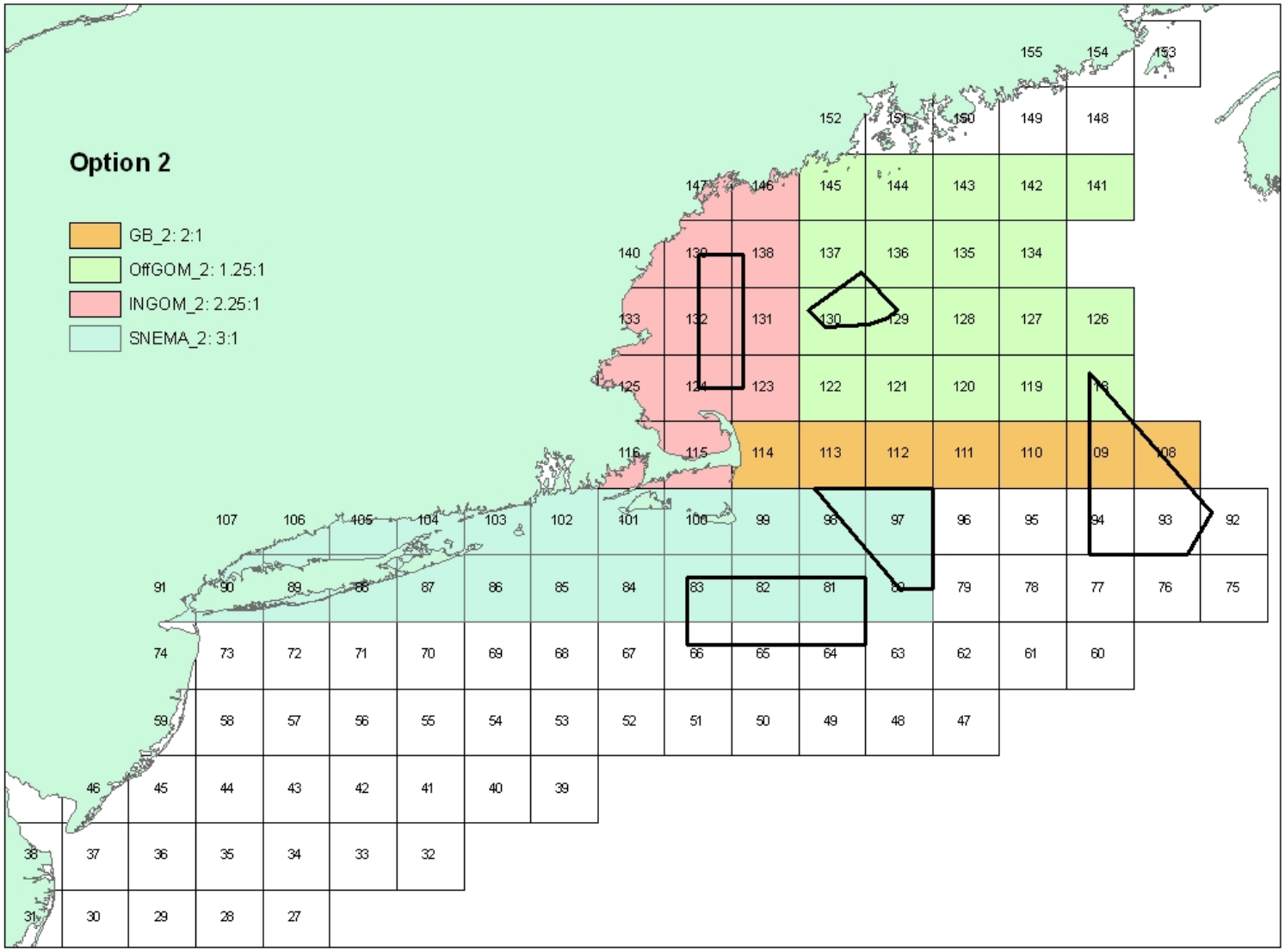
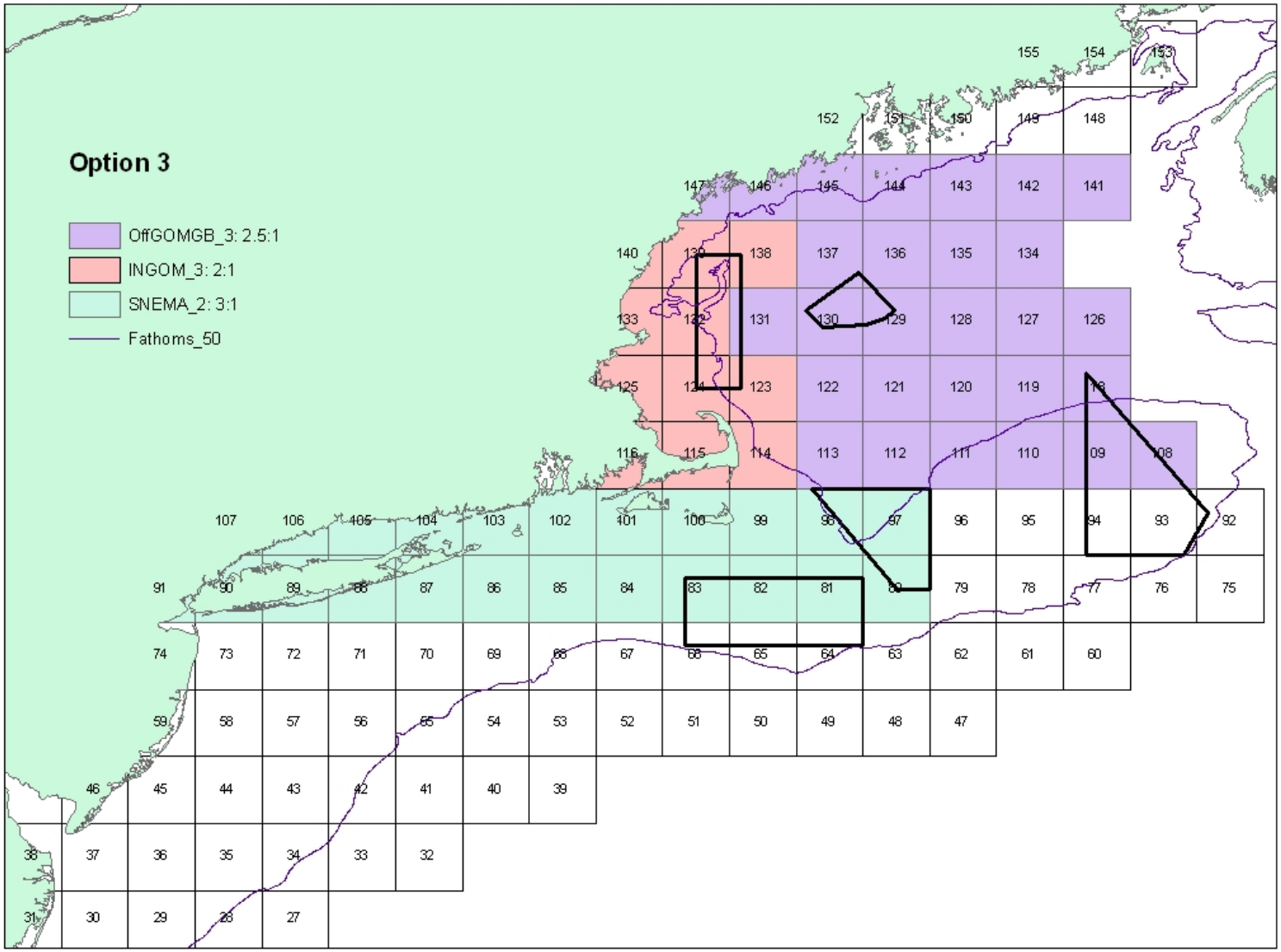


Figure 3



Enclosure (2): Effort controls using differential DAS and trip limits

Differential DAS areas for Options 1 and 3 as the same as for the previous examples. Differential DAS areas for Option 2 are revised to meet GB cod mortality reductions needed. Trip limits are as follows in all options:

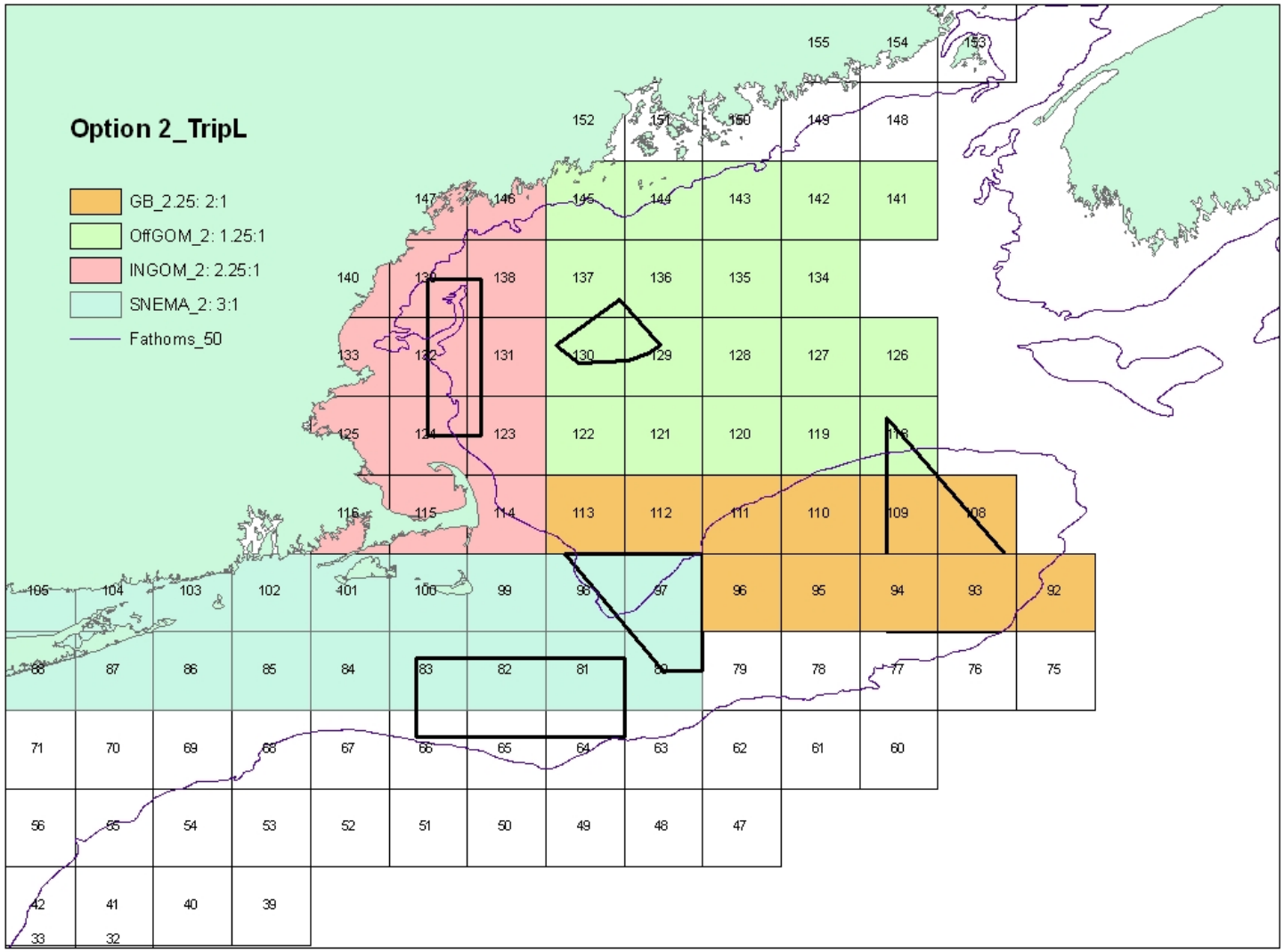
> GOM and GB cod: 2,000 pounds/DAS (except GB cod 500 lbs./DAS in eastern US/CA area)
> SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, SNE/MA winter flounder: 500 lbs/DAS

Option 2a differential DAS area:
Differential Days-at-sea areas, and rates:

Gulf of Maine Inshore: 115, 116, 123-125, 131-133, 138-140, 146-147
Rate: 2.25:1
Gulf of Maine Offshore: 118-122, 126-130, 134-137, 141-145
Rate: 1.25:1.
Georges Bank: 92-96, 108-114
Rate: 2.25:1
Southern New England: 80-91, 97-107
Rate: 3:1.

Spec	AREA	Needed Difference based on 2008 Exploitation	No Action % Difference	PDT Option 1 % Difference	PDT Option 2 % Difference	PDT Option 3 % Difference
COD	GBANK	-50%	-17%	-51%	-51%	-52%
COD	GM	-19%	-16%	-27%	-23%	-39%
HAD	GBANK	272%	-19%	-51%	-46%	-39%
HAD	GM	59%	-17%	-29%	-22%	-44%
BLACK	GBANK	87%	-19%	-48%	-35%	-22%
BLACK	GM	-9%	-15%	-23%	-15%	-20%
BLACK	SNEMA	-100%	-20%	-73%	-68%	-69%
PL	ALL	83%	-16%	-43%	-38%	-54%
WITCH	ALL	-42%	-16%	-42%	***-36%***	-52%
WHK	ALL	28%	-17%	-41%	-40%	-64%
WIND	NORTH	-75%	-19%	***-41%***	***-30%***	***-29%***
WIND	SOUTH	-21%	-21%	-61%	-37%	-37%
YT	CCGOM	-16%	-18%	-44%	-39%	-42%
YT	GBANK	-15%	-20%	-52%	-34%	-14%
YT	SNEMA	-36%	-18%	-49%	-52%	-52%
POL	ALL	-35%	-17%	-41%	-40%	-58%
RED	ALL	368%	-18%	-43%	-41%	-65%

Figure 4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INGOM_2: 2.25:1
SNEMA_2: 3:1
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Enclosure (3) – Example recreational Measures

Table 6 – Impacts of recreational/commercial allocation options on mortality reductions needed for the recreational and commercial components of the groundfish fishery.

Stock	Overall Needed Reduction	Allocation Years 1996-2006		Allocation Years 2001-2006	
		Rec.	Comm.	Rec.	Comm.
GOM cod	-21%	.-27%	-19%	-2%	-28%
Pollock	-48%	-34%	-49%	-29%	-49%
GOM haddock	NA	-18%	Increase	Increase	Increase

GOM Cod Options:

96-06 allocation:

1. 26 inch cod, no season change, 10 fish bag limit

Discard Mortality	Private Boat	Party/Charter	Total
0	**-32.6%**	**-32.0%**	**-32.4%**
0.1	**-29.3%**	**-28.8%**	**-29.2%**
0.2	**-26.1%**	**-25.6%**	**-25.9%**
0.3	**-22.8%**	**-22.3%**	**-22.7%**
0.4	**-19.5%**	**-19.1%**	**-19.4%**
0.5	**-16.3%**	**-15.9%**	**-16.2%**

2. 24 inch cod, no season change, 6 fish bag limit

Discard Mortality	Private Boat	Party/Charter	Total
0	**-30.9%**	**-23.7%**	**-28.9%**
0.1	**-27.8%**	**-21.3%**	**-26.0%**
0.2	**-24.7%**	**-19.0%**	**-23.1%**
0.3	**-21.6%**	**-16.6%**	**-20.2%**
0.4	**-18.5%**	**-14.2%**	**-17.3%**
0.5	**-15.4%**	**-11.9%**	**-14.4%**

3. 24 inch cod, shorten season, 10 fish bag limit

(removing full month of April shown)

Discard Mortality	Private Boat	Party/Charter	Total
0	**-44.1%**	**-28.7%**	**-39.9%**
0.1	**-44.1%**	**-28.7%**	**-39.9%**
0.2	**-44.1%**	**-28.7%**	**-39.9%**
0.3	**-44.1%**	**-28.7%**	**-39.9%**
0.4	**-44.1%**	**-28.7%**	**-39.9%**
0.5	**-44.1%**	**-28.7%**	**-39.9%**

GOM Haddock Options

96-06 allocation:

1. 21 inch minimum size, no change in season, no bag limit
(20 inch falls just short of 18 percent reduction even with no discard mortality)

Discard Mortality	Private Boat	Party/Charter	Total
0	**-38.2%**	**-38.2%**	**-38.2%**
0.1	**-34.4%**	**-34.4%**	**-34.4%**
0.2	**-30.6%**	**-30.6%**	**-30.6%**
0.3	**-26.8%**	**-26.7%**	**-26.8%**
0.4	**-22.9%**	**-22.9%**	**-22.9%**
0.5	**-19.1%**	**-19.1%**	**-19.1%**

2. 19 inch minimum size, 9 fish bag limit, no change in season
(10 fish bag limit achieves -18% only with no discard mortality)

Discard Mortality	Private Boat	Party/Charter	Total
0	**-24.6%**	**-21.6%**	**-23.0%**
0.1	**-22.1%**	**-19.4%**	**-20.7%**
0.2	**-19.7%**	**-17.3%**	**-18.4%**
0.3	**-17.2%**	**-15.1%**	**-16.1%**
0.4	**-14.8%**	**-13.0%**	**-13.8%**
0.5	**-12.3%**	**-10.8%**	**-11.5%**