

## **Alternative Methods for Analyzing Impacts of the Alternatives included in Snapper Grouper Amendment 14**

At their June 2006 meeting the Council's Scientific and Statistical Committee (SSC) reviewed the draft amendment and recommended that a quantitative estimate of impacts be added to the document.

The Southeast Logbook Program provides catch by statistical grid (1 degree squares). Initially impacts were going to be estimated by looking at the total snapper grouper catch in a grid containing an MPA (or any portion of a MPA) and assuming that the catch from the MPA was between zero and the total catch in the grid. This would certainly have placed an upper and lower bound on the level of catch impacted. Another method would have used the percentage of the grid covered by a proposed MPA and assumed that the catch would be reduced by the same percentage. Both of these methods would have resulted in quantitative estimates of the level of potential impact.

Preliminary estimates of these levels of catch were presented during the Information Public Hearings to try and get those attending to further refine our estimates. This effort was not successful.

The Interdisciplinary Team decided to not include these quantitative estimates in favor of including a qualitative discussion of the level of impacts.

The NMFS SERO and SEFSC have been conducting a Delphi study to develop a quantitative estimate of impacts. Results will be reviewed by the SSC and the Council at the December 3-8, 2006 meeting and included in the final EIS and Amendment that will be approved at the March 5-9, 2007 Council meeting.

Acting on direction from the Council the SSC is being presented with the estimates from the logbook data and the results from the Delphi study to determine the best source for estimating impacts of the alternatives.

**Snowy Wreck MPA**

If reported logbook catches are used to choose a lower bound estimate and an upper bound estimate of catches from the proposed MPA alternatives (Table 1) then it can be estimated that from 0 pounds to 48,899 pounds of deepwater snapper grouper were caught from both Snowy Wreck MPA Alternatives 1 and 2. Using the same method it can be estimated that 0 pounds to 908,153 pounds of all snapper grouper species were caught from each alternative.

Using the simple method of calculating the percent area an MPA alternative occupies within a logbook grid and then distributing the catch based on that percentage (Table 2) one can estimate that a total of 1,111 pounds of deepwater snapper grouper species were caught from the proposed Snowy Wreck MPA and 26,718 pounds of all snapper grouper species were caught from that area.

Table 1. Commercial catch reported in area of proposed Snowy Wreck MPA in 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
3377	29,675	3.5%	839,879	164,101	1,003,980
3376	19,224	28.2%	68,274	14,349	82,623
Total	48,899	5.4	908,153	178,450	1,086,603

Table 2. Estimates of snapper grouper catches from the proposed Snowy Wreck MPA based on 2000 logbook data.

MPA Alternative	Logbook Grid (LGB) #	Area of MPA within the LBG (m <sup>2</sup> )	% of LBG that is a proposed MPA	Deepwater snapper grouper catch from entire LBG (in pounds)	Deepwater catch corresponding to percent area of MPA within LBG (in pounds)	All snapper grouper species catch from entire LBG (in pounds)	All snapper grouper catch corresponding to percent area of MPA within LBG (in pounds)
Snowy Wreck # 1	3376	112	3.1	29,675	919	839,879	26,036
	3377	37	1	19,224	192	68,274	683
					Total = 1111		Total= 26,718
Snowy Wreck #2	3376	120	3.3	29,675	979	839,879	27,716
	2277	30	0.8	19,224	153	68,274	546
					Total= 1132		Total=28,262

**Northern South Carolina MPA**

If reported logbook catches are used to choose a lower bound estimate and an upper bound estimate of catches from the proposed MPA alternatives then it can be estimated that from 0 pounds to 29,675 pounds of deepwater snapper grouper were caught from Northern South Carolina MPA Alternatives 1 and 3 (Table 3). Using the same method it can be estimated that 0 pounds to 839,879 pounds of all snapper grouper species were caught from each alternative. For the Northern South Carolina MPA Alternative 2 it could be estimated that from 0 to 184,938 pounds of deepwater snapper grouper species and 0 to 634,253 pounds of all snapper grouper species were caught from this area (Table 4).

Using the simple method of calculating the percent area an MPA alternative occupies within a logbook grid and then distributing the catch based on that percentage (Table 5) one can estimate that a total of 801 pounds of deepwater snapper grouper species were caught from the proposed Northern South Carolina MPA Alternatives 1 and 3 and 22,676 pounds of all snapper grouper species were caught from that area. For the Northern South Carolina MPA Alternative 2 it could be estimated that 4,993 pounds of deepwater snapper grouper species and 17,124 pounds of all snapper grouper species were caught from this area (Table 5).

Table 3. Commercial catch reported in area of Northern South Carolina Proposed MPA/Boundary Options 1 & 3 in 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
3377	29,675	3.5%	839,879	164,101	1,003,980

Table 4. Commercial catch reported in area of the Northern South Carolina Proposed MPA/Boundary Option 2 in 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
3378	184,938	29.2%	634,253	162,087	769,340

Table 5. Estimates of snapper grouper catches from the proposed Northern South Carolina MPA based on logbook data.

MPA Alternative	Logbook Grid (LGB) #	Area of MPA within the LBG (m <sup>2</sup> )	% of LBG that is a proposed MPA	Deepwater snapper grouper catch from entire LBG (in pounds)	Deepwater catch corresponding to percent area of MPA within LBG (in pounds)	All snapper grouper species catch from entire LBG (in pounds)	All snapper grouper catch corresponding to percent area of MPA within LBG (in pounds)
Northern South Carolina #1	3377	100	2.7	29,675	801	839,879	22,676
Northern South Carolina #2	3278	100	2.7	184,938	4993	634,253	17,124
Northern South Carolina #3	3377	100	2.7	29,675	801	839,879	22,676

**Edisto MPA**

If reported logbook catches are used to choose a lower bound estimate and an upper bound estimate of catches from the proposed MPA alternatives (Table 6) then it can be estimated that from 0 pounds to 189,827 pounds of deepwater snapper grouper were caught from both Edisto MPA Alternatives 1 and 2. Using the same method it can be estimated that 0 pounds to 805,758 pounds of all snapper grouper species were caught from each alternative.

Using the simple method of calculating the percent area an MPA alternative occupies within a logbook grid and then distributing the catch based on that percentage (Table 7) one can estimate that a total of 2,467 pounds of deepwater snapper grouper species were caught from the proposed Edisto MPA Alternative 1 and 4,092 pounds of deepwater snapper grouper were caught from Alternative 2. One could estimate that 10,474 pounds and 14,810 pounds of all snapper grouper species were caught from Alternatives 1 and 2 respectively.

Table 6. Commercial catch reported in area of the Proposed Edisto MPA 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
3278	184,938	29.2%	634,253	162,087	796,340
3279	4889	2.9%	171,505	93,713	265,218

Table 7. Estimates of snapper grouper catches from the proposed Edisto MPA based on logbook data.

MPA Alternative	Logbook Grid (LGB) #	Area of MPA within the LBG (m <sup>2</sup> )	% of LBG that is a proposed MPA	Deepwater snapper grouper catch from entire LBG (in pounds)	Deepwater catch corresponding to percent area of MPA within LBG (in pounds)	All snapper grouper species catch from entire LBG (in pounds)	All snapper grouper catch corresponding to percent area of MPA within LBG (in pounds)
Edisto#1	3278	50	1.3	184,938	2404	634,253	8245
	3279	50	1.3	4889	63	171,505	2229
					Total = 2467	Total = 10,474	
Edisto #2	3278	80	2.2	184,938	4068	634,253	13,953
	3279	20	0.5	4889	24	171,505	857
					Total = 4092	Total = 14,801	

### **Georgia/Tilefish MPA**

If reported logbook catches are used to choose a lower bound estimate and an upper bound estimate of catches from the proposed MPA alternatives (Table 8) then it can be estimated that from 0 pounds to 30,237 pounds of deepwater snapper grouper were caught from both Georgia/Tilefish MPA Alternatives 1 and 2. Using the same method it can be estimated that 0 pounds to 164,590 pounds of all snapper grouper species were caught from each alternative.

Using the simple method of calculating the percent area an MPA alternative occupies within a logbook grid and then distributing the catch based on that percentage (Table 9) one can estimate that a total of 816 pounds of deepwater snapper grouper species were caught from the proposed Georgia/Tilefish MPA Alternative 1 and Alternative 2. One could estimate that 4,444 pounds of all snapper grouper species were caught from Alternatives 1 and 2.

Table 8. Commercial catch reported in area of the Georgia Proposed MPA/Boundary Options 1 & 2 in 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
3179	30,237	18.4%	164,590	9,126	173,716

Table 9. Estimates of snapper grouper catches from the proposed Georgia MPA based on logbook data.

MPA Alternative	Logbook Grid (LGB) #	Area of MPA within the LBG (m <sup>2</sup> )	% of LBG that is a proposed MPA	Deepwater snapper grouper catch from entire LBG (in pounds)	Deepwater catch corresponding to percent area of MPA within LBG (in pounds)	All snapper grouper species catch from entire LBG (in pounds)	All snapper grouper catch corresponding to percent area of MPA within LBG (in pounds)
Georgia#1	3179	100	2.7	30,237	816	164,590	4,444
Georgia#2	3179	100	2.7	30,237	816	164,590	4,444

**North Florida MPA\***

If reported logbook catches are used to choose a lower bound estimate and an upper bound estimate of catches from the proposed MPA alternatives (Tables 10 and 11) then it can be estimated that from 0 pounds to 976 pounds of deepwater snapper grouper were caught from the proposed North Florida MPA Alternatives 1 and from 0 to 104,447 pounds of deepwater snapper grouper species were caught from Alternative 2. Using the same method it can be estimated that 0 pounds to 456,401 pounds of all snapper grouper species were caught from Alternative 1 and 309,808 pounds were caught from Alternative 2.

Using the simple method of calculating the percent area an MPA alternative occupies within a logbook grid and then distributing the catch based on that percentage (Table 12) one can estimate that a total of 26 pounds of deepwater snapper grouper species were caught from the proposed North Florida MPA Alternative 1 and 9 pounds of deepwater snapper grouper species were taken from Alternative 2. One could estimate that 12,322 pounds of all snapper grouper species were caught from Alternatives 1 and 9,683 pounds from Alternative 2.

\*The catch information was taken from the Informational Public Hearing Document for Amendment 14. At the time there were only 2 alternatives for the North Florida MPA as opposed to the 6 we have now. Should the SSC choose this method as an appropriate way to analyze the impacts information for the other alternatives will be included.

Table 10. Commercial catch reported in area of the proposed North Florida MPA/Boundary Option 1 in 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
3080	976	0.2%	456,401	112,717	569,118

Table 11. Commercial catch reported in area of the proposed North Florida MPA/Boundary Option 2 in 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
2980	104,447	33.7%	309,808	341,796	651,604

Table 12. Estimates of snapper grouper catches from the proposed North Florida MPA based on logbook data.

MPA Alternative	Logbook Grid (LGB) #	Area of MPA within the LBG (m <sup>2</sup> )	% of LBG that is a proposed MPA	Deepwater snapper grouper catch from entire LBG (in pounds)	Deepwater catch corresponding to percent area of MPA within LBG (in pounds)	All snapper grouper species catch from entire LBG (in pounds)	All snapper grouper catch corresponding to percent area of MPA within LBG (in pounds)
NF#1	3180	100	2.7	976	26	456,401	12,322
NF#2	3080 2980	33 66	0.9 1.8	976 104,447	8.8 1880 Total = 1889	456,401 309,808	4107 5576 Total = 9683

**St. Lucie Hump MPA**

If reported logbook catches are used to choose a lower bound estimate and an upper bound estimate of catches from the proposed MPA alternatives (Table 13) then it can be estimated that from 0 pounds to 102,020 pounds of deepwater snapper grouper were caught from the proposed St. Lucie Hump MPA. Using the same method it can be estimated that 0 pounds to 334,187 pounds of all snapper grouper species were the area.

Using the simple method of calculating the percent area an MPA alternative occupies within a logbook grid and then distributing the catch based on that percentage (Table 14) one can estimate that a total of 204 pounds of deepwater snapper grouper species were caught from the proposed St. Lucie Hump MPA and 262 pounds of all snapper grouper species were caught from the area.

Table 13. Commercial catch reported in area of the proposed St. Lucie Hump MPA/Boundary Option 1 in 2000 (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
2779	102,020	77.8%	131,079	334,187	456,266

Table 14. Estimates of snapper grouper catches from the proposed St. Lucie Hump MPA based on logbook data.

MPA Alternative	Logbook Grid (LGB) #	Area of MPA within the LBG (m <sup>2</sup> )	% of LBG that is a proposed MPA	Deepwater snapper grouper catch from entire LBG (in pounds)	Deepwater catch corresponding to percent area of MPA within LBG (in pounds)	All snapper grouper species catch from entire LBG (in pounds)	All snapper grouper catch corresponding to percent area of MPA within LBG (in pounds)
St. Lucie Hump	2779	8	0.2	102,020	204	131,079	262



**East Hump/Un-named Hump MPA**

If reported logbook catches are used to choose a lower bound estimate and an upper bound estimate of catches from the proposed MPA alternatives (Table 15) then it can be estimated that from 0 pounds to 31,736 pounds of deepwater snapper grouper were caught from the East Hump/Un-named Hump MPA. Using the same method it can be estimated that 0 pounds to 243,132 pounds of all snapper grouper species were the area.

Using the simple method of calculating the percent area an MPA alternative occupies within a logbook grid and then distributing the catch based on that percentage (Table 16) one can estimate that a total of 1301 pounds of deepwater snapper grouper species were caught from the proposed East Hump/Un-named Hump MPA and 9968 pounds of all snapper grouper species were caught from the area.

Table 15. Commercial catch reported in area of the proposed East Hump/Unknown Named Hump MPA (NOAA Fisheries, SEFSC).

Commercial Logbook Statistical Grid	Deepwater snapper grouper catch (lbs.)	Deepwater snapper grouper % of total snapper grouper	Total snapper grouper catch (lbs.)	Non snapper grouper catch (lbs.)	All catch (lbs.)
2480	31,736	5.4%	590,189	243,132	833,321

Table 16. Estimates of snapper grouper catches from the proposed East Hump/Un-named MPA based on logbook data.

MPA Alternative	Logbook Grid (LGB) #	Area of MPA within the LBG (m <sup>2</sup> )	% of LBG that is a proposed MPA	Deepwater snapper grouper catch from entire LBG (in pounds)	Deepwater catch corresponding to percent area of MPA within LBG (in pounds)	All snapper grouper species catch from entire LBG (in pounds)	All snapper grouper catch corresponding to percent area of MPA within LBG (in pounds)
East Hump/Un-named Hump	2480	150	4.1	31,736	1,301	243,132	9,968