

# SNAPPER GROUPE FMP AMENDMENT 17

## OPTIONS PAPER/DECISION DOCUMENT

### August 25, 2008

#### INTRODUCTION

The purpose of this document is to outline alternatives in Amendment 17 and facilitate the Council decision-making process at the September Snapper Grouper Committee meeting. The document is organized in the following manner: (1) List of decisions including page numbers where the decisions are located; (2) list of actions including page numbers where the actions are located; (3) list of actions and alternatives including the pros and cons of each alternative and decisions to be made; and (4) support material in the appendices.

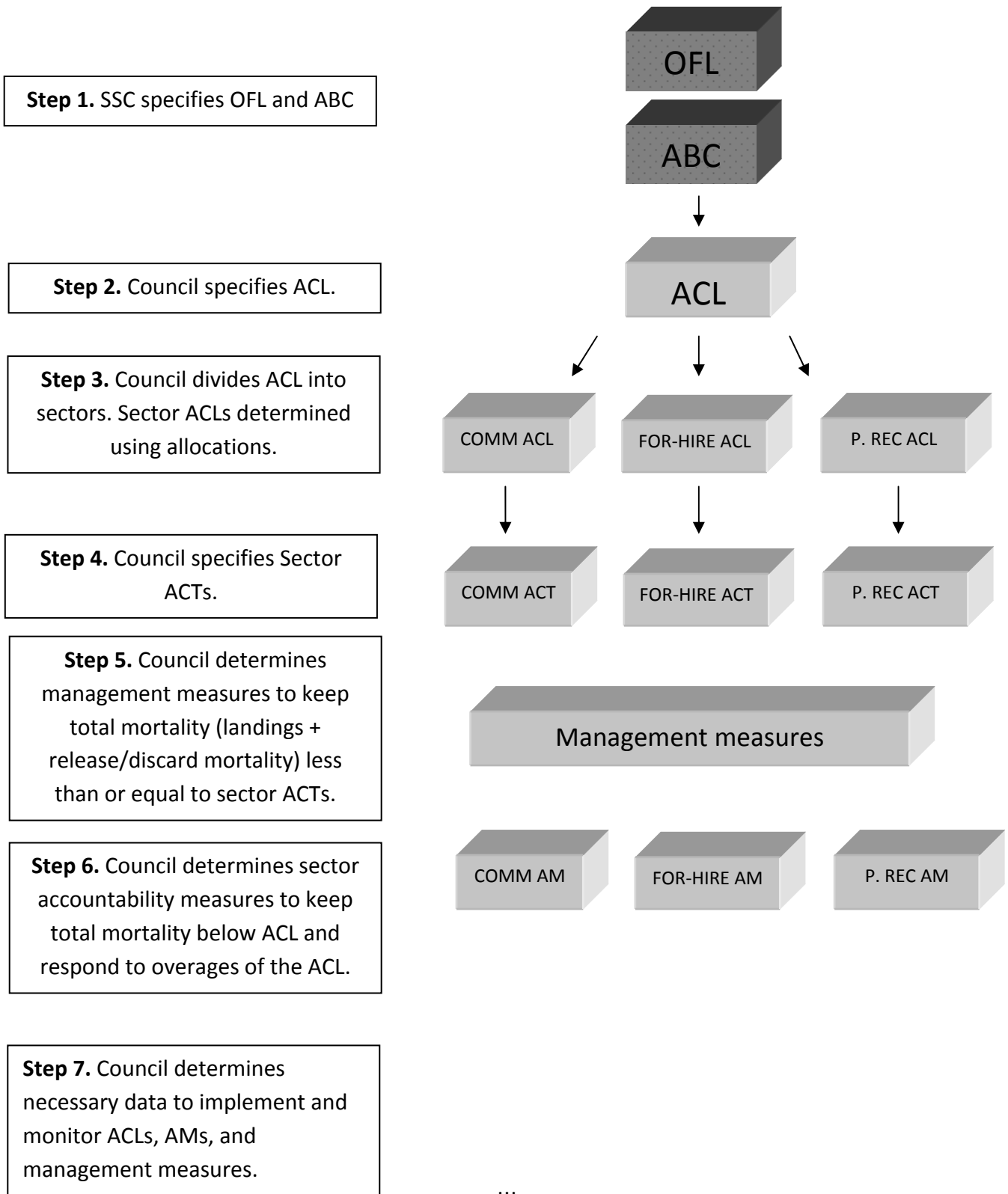
The following acronyms are used in this document.

<b>ABC</b>	Acceptable Biological Catch	<b>FR</b>	For-Hire
<b>ACL</b>	Annual Catch Limit	<b>MSY</b>	Maximum Sustainable Yield
<b>ACT</b>	Annual Catch Target	<b>OFL</b>	Overfishing Level
<b>AM</b>	Accountability Measures	<b>OY</b>	Optimum Yield
<b>CM</b>	Commercial	<b>PR</b>	Private Recreational
<b>FMU</b>	Fishery Management Unit	<b>SSC</b>	Scientific and Statistical Committee

In Amendment 17, the Council must employ a tiering process in the decision-making where a prior decision on preferred alternatives must be made before choosing subsequent alternatives. The Council must take the recommended OFL and ABC values from the Scientific and Statistical Committee and specify ACLs, allocations, sector ACLs, and sector ACTs (Figure 1).

The environmental impact statement to be integrated in this amendment will employ a “tiering” process in analyzing the environmental consequences of these interrelated actions and alternatives. (Note: The use of the word “tiering” in this document does not refer to tiering as used with environmental documentation procedures). While this tiering process does not affect the type, number, or range of alternatives analyzed to accomplish each action, it affects the calculations used in analyzing the environmental consequences of those alternatives. For example, the choice of the ACL for a species needs to be made prior to determining the allocation choice necessary to determine the sector-specific ACLs. This tiering process is intended to streamline and focus the environmental review process, consistent with CEQ regulations for implementing the National Environmental Policy Act at 40 CFR Section 1500. Should any of the preferred choices change before the amendment is finalized, the environmental impact statement would be updated with new calculations and analyses, accordingly.

**Figure 1. The tiering process as recommended for use in Amendment 17.**



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## **LIST OF ACTIONS AND ALTERNATIVES**

### **ABC Control Rule**

The Reauthorized MSA requires that the Council's Scientific and Statistical Committee (SSC) specifies the Overfishing Level (OFL) and the Acceptable Biological Catch (ABC). The proposed rule includes wording that would have the Council specify an ABC Control Rule that will describe how the ABC is to be calculated. This appears to contradict what is specified in the Reauthorized MSA.

#### **Option 1. Include in Snapper Grouper Amendment 17.**

**Pros:** Would follow recommendation from ACL proposed rule. Would provide guidance to SSC in setting ABCs.

**Cons:** The Reauthorized MSA requires that the SSC specifies ABCs. Council would have significant role in setting the ABCs. Would require additional time to develop and analyze alternatives. Would put the Council out in front of the SSC deliberations.

#### **Option 2. Include in Comprehensive Annual Catch Limit (ACL) Amendment.**

**Pros:** Would not require additional time to develop and analyze alternatives for Snapper Grouper Amendment 17. ABC Control Rule alternatives for all snapper grouper species would be evaluated comprehensively in one amendment. Would allow SSC input before the Council took action.

**Cons:** Would delay the implementation of ABC Control Rules.

#### **Decision 1. Determine where to address the ABC Control Rule.**

Note: The issue of bundling ABC, ACL, and ACT was discussed at the last Council meeting and the Committee and Council may want to make a decision about whether or not they want bundling considered in Amendment 17.

**Action 1. Extend FMU.**

**Alternative 1 (no action).** Do not change the current management boundaries of the Snapper Grouper FMU.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** No additional conservation benefits to snapper grouper species north of the Council boundary.

**Alternative 2.** Extend the management boundaries for all species in the Snapper Grouper FMU northward to include the Mid-Atlantic Council's jurisdiction (except for black sea bass, golden tilefish, and scup).

**Pros:** Conservation benefits to snapper grouper species north of the Council boundary.

**Cons:** ACTs could be met earlier in the fishing year.

**Alternative 3.** Extend the management boundaries for all species in the Snapper Grouper FMU northward to include the Mid-Atlantic and New England Council's jurisdiction (except for black sea bass, golden tilefish, and scup).

**Pros:** Conservation benefits to snapper grouper species north of the Council boundary.

**Cons:** ACTs could be met earlier in the fishing year.

**Decision 2. Ensure all reasonable FMU alternatives are included. Pick a preliminary preferred FMU alternative.**

## **Action 2. Thresholds and Benchmarks**

### **Action 2a. Adjust MSY for species in the Snapper Grouper FMU.**

*Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.*

**Alternative 1 (no action).** For gag, golden tilefish, snowy grouper, and vermilion snapper, MSY equals the yield produced by  $F_{MSY}$ . MSY and  $F_{MSY}$  are defined by the most recent SEDAR. For the rest of the species, MSY equals the yield produced by  $F_{MSY}$ .  $F_{30\%SPR}$  is used as the  $F_{MSY}$  proxy.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Would not update a required component of the FMP for red snapper. Would not benefit the biological, ecological, economic, and social environments by influencing the development of fishery management measures. For some species, would not implement biomass-based MSY values.

**Alternative 2.** Following stock assessments, MSY equals the yield recommended by the Council's SSC as defined by the assessments.

**Pros:** Management reference points indirectly benefit the biological, ecological, economic, and social environments by influencing the development of fishery management measures. In the future, could simplify the application of MSY values for all species as the MSY recommended by the SSC would be implemented. For some species, would implement biomass-based MSY values.

**Cons:** None.

**Decision 3. Ensure all reasonable MSY alternatives are included. Pick a preliminary preferred MSY alternative.**

**Action 2b. Adjust OY for [list species].**

*Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.*

Table 1. OY alternatives under consideration for the ten species undergoing overfishing.

Alternatives	OY equation	F <sub>OY</sub> equals
<b>Alternative 1 (no action).</b>	For black sea bass, golden tilefish, and snowy grouper OY equals the yield produced by F <sub>OY</sub> . F <sub>OY</sub> equals (75%)(F <sub>MSY</sub> ). If a stock is overfished, F <sub>OY</sub> equals the fishing mortality rate specified by the rebuilding plan designed to rebuild the stock to SSB <sub>MSY</sub> within the approved schedule. After the stock is rebuilt, F <sub>OY</sub> = a fraction of F <sub>MSY</sub> . F <sub>OY</sub> equals (75%)(F <sub>MSY</sub> ). For the other species, OY equals the yield produced by F <sub>OY</sub> . F <sub>40%SPR</sub> is used as the F <sub>OY</sub> proxy.	Either (75%)(F <sub>MSY</sub> ) or F <sub>40%SPR</sub> depending on the species.
<b>Alternative 2.</b>	OY equals the yield produced by F <sub>OY</sub> . If a stock is overfished, F <sub>OY</sub> equals the fishing mortality rate specified by the rebuilding plan designed to rebuild the stock to SSB <sub>MSY</sub> within the approved schedule. After the stock is rebuilt, F <sub>OY</sub> = a fraction of F <sub>MSY</sub> .	(55%)(F <sub>MSY</sub> )
<b>Alternative 3.</b>		(65%)(F <sub>MSY</sub> )
<b>Alternative 4.</b>		(75%)(F <sub>MSY</sub> )
<b>Alternative 5.</b>		(85%)(F <sub>MSY</sub> )
<b>Alternative 6.</b>		OY equals the total of the sector-specific ACTs.

**Pros for no action:** Would not require additional time to develop and analyze alternatives.

**Cons for no action:** Would not implement a required component of the FMP. Would not benefit the biological, ecological, economic, and social environments by influencing the development of fishery management measures. For some species, would not implement biomass-based OY values. The current buffer between target (OY) and limit (MSY) may be too small to account for management and implementation uncertainties.

**Pros for alternatives 2-6:** Management reference points indirectly benefit the biological, ecological, economic, and social environments by influencing the development of fishery management measures. For some species, would implement biomass-based OY values. Would create a greater separation between the target (OY) and the limit (MSY) and could offer a greater buffer due to management and implementation uncertainties.

**Cons for alternatives 2-6:** None.

**Decision 4. Ensure all reasonable OY alternatives are included. Pick a/multiple preliminary preferred OY alternative(s).**

**Action 2c. Adjust MSST for [list species].**

*Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.*

Table 2. MSST alternatives under consideration for ten species undergoing overfishing.

Alternatives	MSST equation
<b>Alternative 1 (no action)</b>	MSST equals $SSB_{MSY}((1-M)$ or 0.5, whichever is greater). For golden tilefish and snowy grouper, MSST equals $SSB_{MSY}(0.75)$ .
<b>Alternative 2.</b>	MSST equals $SSB_{MSY}(0.5)$ .
<b>Alternative 3.</b>	MSST equals $SSB_{MSY}(0.75)$ .

**Pros for no action:** Would not require additional time to develop and analyze alternatives. For most species, would retain the most conservative MSST definition.

**Cons for no action:** Would not create a greater separation between the MSST and  $B_{MSY}$  values. Natural variation in recruitment could cause stock biomass to more frequently alternate between an overfished and rebuilt condition, requiring fishery managers to apply scarce administrative resources to developing rebuilding plans even when the fishing mortality rate applied to the stock was within the accepted limits.

**Pros for alternatives 2 & 3:** Would create a greater separation between the MSST and  $B_{MSY}$  values. Natural variation in recruitment could cause stock biomass to more frequently alternate between an overfished and rebuilt condition, requiring fishery managers to apply scarce administrative resources to developing rebuilding plans even when the fishing mortality rate applied to the stock was within the accepted limits.

**Cons for alternatives 2 & 3:** Would be less conservative definition of MSST than the no action alternative for most species.

**Decision 5. Ensure all reasonable MSST alternatives are included. Pick a/multiple preliminary preferred MSST alternative(s).**

### **Action 3. ACL**

*Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.*

**Alternative 1.** Do not specify ACLs for 10 species undergoing overfishing.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Out of conformance with MSFCMA. Would not achieve benefits from setting a catch limit.

**Alternative 2.** ACL equals ABC.

**Pros:** Would establish ACL and gain benefits from setting a catch limit (e.g., help managers achieve management goals).

**Cons:** Least conservation benefits of all action alternatives as there would be no buffer between ABC and ACL. However, could address management uncertainty in setting the ACT. Could cause a delay in the rate of rebuilding which could translate into adverse economic and social effects.

**Alternative 3.** ACL equals 90% of the ABC.

**Pros:** Would establish ACL and gain benefits from setting a catch limit (e.g., help managers achieve management goals). Degree of impacts would be intermediate between Alternatives 2 and 4.

**Cons:** Degree of impacts would be intermediate between Alternatives 2 and 4.

**Alternative 4.** ACL equals 80% of the ABC.

**Pros:** Would establish ACL and gain benefits from setting a catch limit (e.g., help managers achieve management goals). Greatest conservation benefits as buffer between ABC and ACL would be the greatest of all alternatives. Could result in stocks that rebuild faster which could translate into beneficial economic and social effects.

**Cons:** Could result in lower allowable harvest than other alternatives which could translate into adverse economic and social effects.

**Decision 6. Ensure all reasonable ACL alternatives are included. Pick a/multiple preliminary preferred ACL alternative(s).**

Table 3. Overfishing Level (OFL) and Acceptable Biological Catch (ABC) recommendations from the SSC and ACL values under each alternative. Values are in lbs whole weight.

Species	Total Landings (2007)	OFL (from SSC)	ABC (from SSC)	ACL		
				Alt. 2; ACL=ABC	Alt. 3; ACL=90%(ABC)	Alt. 4; ACL=80%(ABC)
Golden tilefish	301,121	336,425	326,554	326,554	293,899	261,243
Snowy grouper	135,603	116,845	102,960	102,960	92,664	82,368
Speckled hind	3,023	unknown	0	0	0	0
Warsaw grouper	18,349	unknown	0	0	0	0
Black grouper	143,337	208,552	187,697	187,697	168,927	150,158
Black sea bass	1,022,061	912,713	847,000	847,000	762,300	677,600
Gag	1,105,431	1,065,540	818,920	818,920	737,028	655,136
Red grouper	977,222	783,214	704,893	704,893	634,404	563,914
Vermilion snapper	1,833,801	789,602	629,459	629,459	566,513	503,567
Red snapper	411,042	55,000	42,000	42,000	37,800	33,600

**Note:** The SSC needs to clarify the ABC values specified for speckled hind and warsaw grouper. ABC includes all sources of mortality (landings + discard mortality). If the SSC did not intend for the Council to be required to eliminate all sources of mortality for speckled hind and warsaw grouper, they should develop another number for the ABC. This will be addressed at their December 2008 meeting, and the Council will have the SSC input prior to approving the Amendment 17 document for public hearings.

#### **Action 4. Allocations.**

*Note: The Council's selection of the preferred alternative could vary for the 10 species experiencing overfishing. In other words, the same preferred alternative does not have to be chosen for all 10 species*

**Alternative 1 (no action).** Do not define allocations or retain allocation specified in previous amendments. Currently no allocations have been specified for black grouper, red grouper, speckled hind, warsaw grouper, red snapper, and golden tilefish. Amendment 13C specified interim allocations of 43% commercial and 57% recreational for black sea bass. Amendment 15B proposes interim allocations of 95% commercial and 5% recreational for snowy grouper. Amendment 16 proposes interim allocations of 68% commercial and 32% recreational for vermilion snapper. Amendment 16 proposes interim allocations of 51% commercial and 49% recreational for gag.

**Alternative 2.** Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 1986-2007.

**Alternative 3.** Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 2005-2007.

**Alternative 4.** Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on the following formula for each sector:  
Sector apportionment = (50% \* average of long catch range (lbs) 1986-2007) + (50% \* average of recent catch trend (lbs) 2005-2007)

**Alternative 5.** Split the allocation equally among the three sectors.

**Pros of no action:** Would not require additional time to develop and analyze alternatives.

**Cons of no action:** If an allocation was not specified then it would not be possible to identify the allowable catch.

**Pros of alternatives 2-5:** Would be possible to identify the allowable catch.



**Cons of alternatives 2-5:** Could be economic and social effects to those sectors with interim allocations if allowable harvest is transferred from that sector as a result of changing the allocation determination.

**Decision 7. Ensure all reasonable allocation alternatives are included. Pick a/multiple preliminary preferred allocation alternative(s).**

Table 4. Percent allocations from allocation alternatives for the ten species undergoing overfishing. CM = Commercial, RC = Recreational, FH = For Hire, PR = Private Recreational, NS=Not Specified.

Species	Alt. 1. No Action		Alt. 2. 1986-2007			Alt. 3. 2005-2007			Alt. 4. Equation			Alt. 5. Split Evenly		
	CM	RC	CM	FH	PR	CM	FH	PR	CM	FH	PR	CM	FH	PR
Golden tilefish	NS	NS	98.13%	1.3%	0.57%	89.53%	9.62%	0.85%	93.83%	5.47%	0.71%	33.33%	33.33%	33.33%
Snowy grouper	95%*	5%*	91.2%	3.81%	5.0%	72.82%	26.97%	0.21%	82.01%	15.39%	2.61%	33.33%	33.33%	33.33%
Speckled hind	NS	NS	78.48%	20.8%	0.72%	52.7%	47.3%	0%	65.59%	34.05%	0.36%	33.33%	33.33%	33.33%
Warsaw grouper	NS	NS	11.36%	9.0%	79.64%	8.8%	65.24%	25.95%	10.08%	37.12%	52.79%	33.33%	33.33%	33.33%
Black grouper	NS	NS	78.76%	5.18%	16.06%	72.84%	23.54%	3.62%	75.80%	14.36%	9.84%	33.33%	33.33%	33.33%
Black sea bass	43%	57%	41.26%	27.96%	30.79%	25.02%	51.17%	23.81%	33.14%	39.56%	27.3%	33.33%	33.33%	33.33%
Gag	51%**	49%**	65.34%	16.86%	17.8%	47.56%	32.62%	19.82%	56.45%	24.74%	18.81%	33.33%	33.33%	33.33%
Red grouper	NS	NS	72.44%	11%	16.56%	42.47%	21.82%	35.72%	57.45%	16.4%	26.14%	33.33%	33.33%	33.33%
Vermilion snapper	68%**	32%**	68.06%	27.49%	4.45%	41.54%	55.39%	3.08%	54.8%	41.44%	3.76%	33.33%	33.33%	33.33%
Red snapper	NS	NS	32.33%	26.62%	41.05%	19.46%	50.65%	29.89%	25.89%	38.63%	35.47%	33.33%	33.33%	33.33%

\*Snowy grouper allocations in 15B; submitted to Secretary of Commerce for formal review. \*\*Current preferred alternatives in Amendment 16.

Table 5. The commercial sector ACL that results from each of the allocation alternatives. Values are in lbs whole weight. *Note: This table will be completed once the Council chooses the preferred ACL alternative. Sample figures are provided for red snapper commercial for discussion purposes only, using ACL Alternative 3 and Allocation Alternative 4. ACL equals total mortality.*

Species	Preferred Entire ACL	Commercial Sector ACL			
		Allocation Alt. 2. 1986-2007	Allocation Alt. 3. 2005-2007	Allocation Alt. 4. Equation	Allocation Alt. 5. Split Evenly
Golden Tilefish					
Snowy grouper					
Speckled hind	0	0	0	0	0
Warsaw grouper	0	0	0	0	0
Black grouper					
Black sea bass					
Gag					
Red grouper					
Vermilion snapper					
Red snapper	42,000			10,874	

Table 6. The for-hire sector ACL that results from each of the allocation alternatives. Values are in lbs whole weight. *Note: This table will be completed once the Council chooses the preferred ACL alternative. Sample figures are provided for red snapper for-hire for discussion purposes only, using ACL Alternative 2 and Allocation Alternative 4. ACL equals total mortality.*

Species	Preferred Entire ACL	For-Hire Sector ACL			
		Allocation Alt. 2. 1986-2007	Allocation Alt. 3. 2005-2007	Allocation Alt. 4. Equation	Allocation Alt. 5. Split Evenly
Golden Tilefish					
Snowy grouper					
Speckled hind	0	0	0	0	0
Warsaw grouper	0	0	0	0	0
Black grouper					
Black sea bass					
Gag					
Red grouper					
Vermilion snapper					
Red snapper	42,000			16,225	

Table 7. The private recreational sector ACL that results from each of the allocation alternatives. Values are in lbs whole weight.

*Note: This table will be completed once the Council chooses the preferred ACL alternative. Sample figures are provided for red snapper private recreational for discussion purposes only, using ACL Alternative 2 and Allocation Alternative 4. ACL equals total mortality.*

Species	Preferred Entire ACL	Private Recreational Sector ACL			
		Allocation Alt. 2. 1986-2007	Allocation Alt. 3. 2005-2007	Allocation Alt. 4. Equation	Allocation Alt. 5. Split Evenly
Golden Tilefish					
Snowy grouper					
Speckled hind	0	0	0	0	0
Warsaw grouper	0	0	0	0	0
Black grouper					
Black sea bass					
Gag					
Red grouper					
Vermilion snapper					
Red snapper	42,000			14,897	

## **Action 5. ACT**

### **Action 5a. Commercial Sector ACT**

*Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.*

**Alternative 1.** Do not specify commercial sector ACTs for 10 species undergoing overfishing.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Would not follow the recommendations in the ACL proposed rule. Would not achieve benefits from setting a catch target.

**Alternative 2.** The commercial sector ACT equals the commercial sector ACL.

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals).

**Cons:** Least conservation benefits of all action alternatives as there would be no buffer between ACL and ACT. Could cause a delay in the rate of rebuilding which could translate into adverse economic and social effects.

**Alternative 3.** The commercial sector ACT equals 90% of the commercial sector ACL.

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals). Degree of impacts would be intermediate between Alternatives 2 and 4.

**Cons:** Degree of impacts would be intermediate between Alternatives 2 and 4.

**Alternative 4.** The commercial sector ACT equals 80% of the commercial sector ACL.

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals). Greatest conservation benefits as buffer between ACL and ACT would be the greatest of all alternatives. Could result in stocks that rebuild faster which could translate into beneficial economic and social effects.

**Cons:** Could result in lower allowable harvest than other alternatives which could translate into adverse economic and social effects.

**Decision 8. Ensure all reasonable commercial sector ACT alternatives are included. Pick a/multiple preliminary preferred commercial sector ACT alternatives.**

Table 8. The commercial sector ACT that results from each of the alternatives. Values are in lbs whole weight.

*Note: This table will be completed once the Council chooses the preferred ACL alternative. Sample figures are provided for red snapper commercial for discussion purposes only, using ACL Alternative 2, Allocation Alternative 4, and Commercial Sector ACT Alternative 3. ACT equals total mortality.*

Species	Preferred Commercial ACL	Commercial Sector ACT		
		ACT Alt. 2; ACT=ACL	ACT Alt. 3; ACT=90%(ACL)	ACT Alt. 4; ACT=80%(ACL)
Golden Tilefish				
Snowy grouper				
Speckled hind	0	0	0	0
Warsaw grouper	0	0	0	0
Black grouper				
Black sea bass				
Gag				
Red grouper				
Vermilion snapper				
Red snapper	10,874		9,787	

## **Action 5b. For-Hire Sector ACT**

*Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.*

**Alternative 1.** Do not specify for-hire sector ACTs for 10 species undergoing overfishing.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Would not follow the recommendations in the ACL proposed rule. Would not achieve benefits from setting a catch target.

**Alternative 2.** The for-hire ACT equals the for-hire sector ACL.

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals).

**Cons:** Least conservation benefits of all action alternatives as there would be no buffer between ACL and ACT. Could cause a delay in the rate of rebuilding which could translate into adverse economic and social effects.

**Alternative 3.** The for-hire sector ACT equals 90% of the for-hire sector ACL.

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals). Degree of impacts would be intermediate between Alternatives 2 and 4.

**Cons:** Degree of impacts would be intermediate between Alternatives 2 and 4.

**Alternative 4.** The for-hire sector ACT equals 80% of the for-hire sector ACL.

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals). Greatest conservation benefits as buffer between ACL and ACT would be the greatest of all alternatives. Could result in stocks that rebuild faster which could translate into beneficial economic and social effects.

**Cons:** Could result in lower allowable harvest than other alternatives which could translate into adverse economic and social effects.

**Decision 9. Ensure all reasonable for-hire sector ACT alternatives are included. Pick a/multiple preliminary preferred for-hire sector ACT alternative(s).**

Table 9. The for-hire sector ACT that results from each of the alternatives. Values are in lbs whole weight.

*Note: This table will be completed once the Council chooses the preferred ACL alternative. Sample figures are provided for red snapper for-hire for discussion purposes only, using ACL Alternative 2, Allocation Alternative 4, and For-Hire Sector ACT Alternative 3. ACT equals total mortality.*

Species	Preferred For-Hire Sector ACL	For-Hire Sector ACT		
		ACT Alt. 2; ACT=ACL	ACT Alt. 3; ACT=90%(ACL)	ACT Alt. 4; ACT=80%(ACL)
Golden Tilefish				
Snowy grouper				
Speckled hind	0	0	0	0
Warsaw grouper	0	0	0	0
Black grouper				
Black sea bass				
Gag				
Red grouper				
Vermilion snapper				
Red snapper	16,225		14,603	



## **Action 5c. Private Recreational Sector ACT**

*Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.*

**Alternative 1.** Do not specify private recreational sector ACTs for 10 species undergoing overfishing.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Would not follow the recommendations in the ACL proposed rule. Would not achieve benefits from setting a catch target.

**Alternative 2.** The private recreational sector ACT equals 75% of the private recreational sector ACL.

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals). Greatest conservation benefits as buffer between ACL and ACT would be the greatest of all alternatives. Could result in stocks that rebuild faster which could translate into beneficial economic and social effects.

**Cons:** Could result in lower allowable harvest than other alternatives which could translate into adverse economic and social effects.

**Alternative 3.** The private recreational sector ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater].

**Pros:** Would establish ACT and gain benefits from setting a catch target (e.g., help managers achieve management goals).

**Cons:** Least conservation benefits of all action alternatives as there would be no buffer between ACL and ACT. Could cause a delay in the rate of rebuilding which could translate into adverse economic and social effects.

**Decision 10. Ensure all reasonable private recreational ACT alternatives are included. Pick a/multiple preliminary preferred private recreational sector ACT alternative(s).**

Table 10. The private sector ACT that results from each of the alternatives. Values are in lbs whole weight.

*Note: This table will be completed once the Council chooses the preferred ACL alternative. Sample figures are provided for red snapper for-hire for discussion purposes only, using ACL Alternative 2, Allocation Alternative 4, and Private Recreational Sector ACT Alternatives 2 and 3. ACT equals total mortality.*

Species	Preferred Private Recreational Sector ACL	Private Recreational Sector ACT	
		ACT Alt. 2; ACT=75%(ACL)	ACT Alt. 3; ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater]
Golden Tilefish			
Snowy grouper			
Speckled hind	0	0	0
Warsaw grouper	0	0	0
Black grouper			
Black sea bass			
Gag			
Red grouper			
Vermilion snapper			
Red snapper	14,897		11,933*

\*ACT = (1-0.199)(14,897) = 11,933

Table 10a. 2007 Proportional Standard Errors (PSEs) for the ten species in Amendment 17 from both numbers and weight estimates. Obtained from <http://www.st.nmfs.noaa.gov> on 08.22.08.

Species	2007 PSEs	
	Numbers	Weights
Golden Tilefish	59.8	Not specified
Snowy grouper	44.4	47.6
Speckled hind	59.1	Not specified
Warsaw grouper	62.7	10.6
Black grouper	44.0	60.5
Black sea bass	10.8	11.9
Gag	16.2	16.4
Red grouper	27.3	28.6
Vermilion snapper	10.6	12.5
Red snapper	19.9	29.7

## Action 6. Management Measures – Deepwater Species

### Action 6a. Regulations to End Overfishing of Speckled Hind and Warsaw Grouper

*Note: For Speckled hind: ACT = 0 lbs and for Warsaw grouper: ACT = 0 lbs*

*Goal: Total Mortality (landings + discard/release mortality) less than ACT.*

*Note: Some SEDAR assessed species incorporate estimates of dead discards in estimates of allowable catch based on current management measures. Increased dead discards resulting from new management measures after assessment must be accounted for. Dead discards must be accounted for in species that have not been recently assessed. Need to resolve which do and which don't. Also speckled hind and warsaw grouper have not been assessed through the SEDAR process.*

**Alternative 1 (no action).** Retain existing regulations for speckled hind and warsaw grouper. Current regulation for species in the deepwater fishery are shown in Tables 11 and 12.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Would not achieve ABC = 0 as recommended by SSC.

**Alternative 2.** Prohibit all possession and retention of speckled hind and warsaw grouper.

**Pros:** The allowance for some directed fishing for snowy grouper and golden tilefish could equate to beneficial economic and social effects.

**Cons:** This would not limit mortality below the sector ACTs. Could cause a delay in the rate of rebuilding which could translate into adverse economic and social effects.

**Alternative 3.** Prohibit all fishing for, possession and retention of all deepwater species. Note: Could specify a depth or grid line or latitude/longitude.

**Pros:** This would limit mortality as close to the sector ACTs as possible while allowing fishing for shallow and mid-shelf species. Could increase the rate of rebuilding which could translate into beneficial economic and social effects.

**Cons:** Could result in economic and social adverse effects through the prohibition of fishing activities for deepwater species.

**Alternative 4.** Others???? (e.g., allowable area for golden tilefish with no bycatch of speckled hind/warsaw.

**Decision 11.** Ensure all reasonable management measure alternatives are included to end overfishing of speckled hind and warsaw grouper. Pick a/multiple preliminary preferred alternative(s).

Table 11. Current commercial regulations for deepwater species.

SPECIES	COMMERCIAL REGULATIONS					
	SIZE LIMIT	LIMITED ACCESS <sup>1</sup>	GEAR RESTRICTIONS <sup>2</sup>	ANNUAL QUOTA (gutted weight)	TRIP LIMITS	AREA CLOSURES <sup>3</sup>
Snowy Grouper		√	√	151,000 lbs. year 1 118,000 lbs year 2 84,000 lbs year 3 and onwards until modified	275 lbs year 1, 175 lbs year 2, and 100 lbs year 3 and onwards until modified	√
Golden Tilefish		√	√	295,000 lbs	4,000 lbs until 75% of quota taken; after 75%, trip limit reduced to 300 lbs. Do not adjust trip limit downwards unless percent specified is captured on or before September 1.	√
Blueline Tilefish		√	√			√
Yellowedge Grouper		√	√			√
Warsaw Grouper		√	√		1 per vessel per trip. No sale, trade, or transfer at sea	√
Speckled Hind		√	√		1 per vessel per trip. No sale, trade, or transfer at sea	√
Misty Grouper		√	√			√
Queen Snapper	12" TL	√	√			√
Silk Snapper	12" TL	√	√			√

Table 12. Current recreational regulations for deepwater species.

SPECIES	RECREATIONAL REGULATIONS				
	SIZE LIMIT	GEAR RESTRICTIONS <sup>2</sup>	POSSESSION LIMIT	TRIP LIMITS	AREA CLOSURES <sup>3</sup>
Snowy Grouper		√	1 per person per day. Included in 5 grouper per person per day.		√
Golden Tilefish		√	1 per person per day. Included in 5 grouper per person per day.		√
Blueline Tilefish		√	Included in 5 grouper per person per day.		√
Yellowedge Grouper		√	Included in 5 grouper per person per day.		√
Warsaw Grouper		√	Included in 5 grouper per person per day.	1 per vessel per trip. No sale, trade, or transfer at sea	√
Speckled Hind		√	Included in 5 grouper per person per day.	1 per vessel per trip. No sale, trade, or transfer at sea	√
Misty Grouper		√	Included in 5 grouper per person per day.		√
Queen Snapper	12" TL	√	Included in 10 snapper per person per day.		√
Silk Snapper	12" TL	√	Included in 10 snapper per person per day.		√

**Action 6b. Regulations to End Overfishing of Remaining Deepwater Species**

*Note: The Council must determine what additional regulations are required to end overfishing for the remaining deepwater species. Goal: Total Mortality (landings + discard/release mortality) less than ACT.*

*Note: Some SEDAR assessed species incorporate estimates of dead discards in estimates of allowable catch based on current management measures. Increased dead discards resulting from new management measures after assessment must be accounted for. Dead discards must be accounted for in species that have not been recently assessed. Need to resolve which do and which don't. Also only snowy grouper and golden tilefish have been assessed through the SEDAR process.*

**Alternative 1 (no action).** Retain regulations for deepwater species.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Would be out of conformance with MSFCMA as the Council would not end overfishing.

The following alternatives were previously discussed by the Council:

**Alternative 2.** Restrict the number of hooks in the deepwater recreational fishery to one per line.

**Pros:** Could reduce bycatch of deepwater species.

**Cons:** High-grading could reduce the benefits of this action.

**Alternative 3.** Implement a recreational limit of snowy grouper per vessel per day.

**Pros:** Could reduce bycatch of deepwater species.

**Cons:** High-grading could reduce the benefits of this action.

**Alternative 4.** Divide the commercial quota for snowy grouper by region/state.

**Alternative 4a.** Divide the commercial quota for snowy grouper by region/state. Allocate 0.03% to states in the MAFMC's jurisdiction (excluding North Carolina) (23 pounds gutted weight), 60.26% to North Carolina and South Carolina (50,622 pound gutted weight), and 39.71% to Georgia and Florida (33,355 pounds gutted weight). Each region's directed quota (after adjustment for PQBM) would be tracked by dealer reporting. After the commercial quota is met in either region, all purchase and sale is prohibited in that region and harvest and/or possession is limited to the bag limit in that region.

**Alternative 4b.** Divide the commercial quota for snowy grouper by region/state. Allocate 0.03% to states in the MAFMC's jurisdiction (excluding North Carolina) (23 pounds gutted weight), 35.71% to North Carolina (30,000 pound gutted weight), 24.55% to South Carolina (20,622 lbs gutted weight) and 2.92% to Georgia (2,452 pounds gutted weight), and 36.79% to Florida (30,903 pounds gutted weight). Each state/region's directed quota (after adjustment for PQBM) would be tracked by

dealer reporting. After the commercial quota is met in either region, all purchase and sale is prohibited in that state/region and harvest and/or possession is limited to the bag limit in that state/region.

**Alternative 4c.** Divide the commercial quota for snowy grouper by region/state. Allocate 35.74% to states in the MAFMC's jurisdiction (including North Carolina) (30,023 pounds gutted weight) and 64.26% to South Carolina, Georgia, and Florida (53,977 pounds gutted weight). Each state/region's directed quota (after adjustment for PQBM) would be tracked by dealer reporting. After the commercial quota is met in either region, all purchase and sale is prohibited in that state/region and harvest and/or possession is limited to the bag limit in that state/region.

*Note: states in MAFMC's jurisdiction include New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina.*

**Pros:** Would implement regulations for the deepwater, commercial fishery to increase the probability that there is a portion of the commercial quota available to users of all states/regions before the primary fishing season off each state/region begins.

**Cons:** Increased administrative costs.

**Alternative 5.** Change the golden tilefish fishing year. Note: The committee/Council should provide guidance on whether this alternative should be included.

**Decision 12. Ensure all reasonable management measure alternatives are included to end overfishing of the remaining deepwater species. Pick a/multiple preliminary preferred alternative(s).**

## **Action 7. Management Measures – Shallow Water & Mid-Shelf Fisheries**

### **Action 7a. Regulations to End Overfishing of Red Snapper**

*Note: The Council may choose more than one alternative.*

*Note: In the example used, commercial ACT = 9,787 lbs, for-hire = 14,603 lbs, and private recreational = 10,473 lbs. Goal: Total Mortality (landings + discard/release mortality) less than ACT.*

*Note: Some SEDAR assessed species incorporate estimates of dead discards in estimates of allowable catch based on current management measures. Increased dead discards resulting from new management measures after assessment must be accounted for. Dead discards must be accounted for in species that have not been recently assessed. Need to resolve which do and which don't.*

**Alternative 1 (no action).** This would continue the 20 inch size limit (commercial & recreational) and the recreational 2 fish bag limit.

**Pros:** Would not require additional time to develop and analyze alternatives. Would not translate into economic and social adverse effects from prohibiting harvest.

**Cons:** Would be out of conformance with MSFCMA as the Council would not end overfishing of red snapper. Could result in further biomass decline and continued overfishing. Could delay rebuilding of stock faster which could forgo beneficial economic and social effects.

**Alternative 2.** Modifications to size limit.

**Pros:** Conservation benefits if reducing the size limit reduces discard mortality rates (assessment used 90% commercial and 40% recreational). Could have beneficial economic and social effects if reducing size limit allows fishermen to retain more fish.

**Cons:** Could have adverse effects to the stock if less fish are returned to the water.



**Alternative 3.** Modifications to bag limit.

**Pros:** Conservation benefits from reducing mortality.

**Cons:** Could result in economic and social adverse effects.

**Alternative 4.** Time/Area Closures (seasonal or permanent)

**Pros:** Conservation benefits from reducing mortality. This would limit mortality as close to the sector ACTs as possible while allowing fishing for shallow and mid-shelf species.

**Cons:** Could result in economic and social adverse effects.

**Alternative 5.** Others?????

- A. Low trip limit and end trip when trip limit is reached.
- B. Require full retention and all commercial hooks out of water when ACT is reached.

**Decision 13. Ensure all reasonable alternatives for ending overfishing of red snapper are included. Pick a preliminary preferred alternative.**

**Action 7b. Regulations to End Overfishing for the Remaining Shallow Water/Mid-Shelf Species**

The Council must determine what additional regulations are required to end overfishing for the remaining shallow water/mid-shelf species.

Goal: Total Mortality (landings + discard/release mortality) less than ACT.

*Note: Some SEDAR assessed species incorporate estimates of dead discards in estimates of allowable catch based on current management measures. Increased dead discards resulting from new management measures after assessment must be accounted for. Dead discards must be accounted for in species that have not been recently assessed. Need to resolve which do and which don't.*

**Alternative 1.** No action.

**Pros:** Would not require additional time to develop and analyze alternatives. Would not translate into economic and social adverse effects from prohibiting harvest.

**Cons:** Would be out of conformance with MSFCMA as the Council would not end overfishing. Could result in further biomass decline and continued overfishing. Could delay rebuilding of stock faster which could forgo beneficial economic and social effects.

**Alternative 2.** Others??????

**Decision 14. Ensure all reasonable management measure alternatives are included to end overfishing of the remaining shallow water/mid-shelf species. Pick a/multiple preliminary preferred alternative(s).**

## **Action 8. Accountability Measures**

### **Action 8a. Accountability Measures for the Commercial Sector**

**Alternative 1.** Do not implement Accountability Measures for the commercial sector for species undergoing overfishing.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Out of conformance with MSFCMA. Would not achieve benefits from setting a accountability measures.

**Alternative 2.** Implement Accountability Measures for the commercial sector for species undergoing overfishing. The AM would not vary depending on stock status.

**Sub-alternative 2A.** If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** None.

**Sub-alternative 2B.** If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to recover the overage from the prior fishing year.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** None.

**Alternative 3.** Implement Accountability Measures for the commercial sector for species undergoing overfishing. The AM would vary depending on stock status.

**Sub-alternative 3A.** If the species is overfished or not overfished and the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the species is overfished and the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage. If the species is not overfished and the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to recover the overage from the prior fishing year.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** None.

**Decision 15. Ensure all reasonable alternatives for commercial sector accountability measures are included. Pick a preliminary preferred alternative.**

## **Action 8b. Accountability Measures for the For-Hire Sector**

**Alternative 1.** Do not implement Accountability Measures for the for-hire sector for species undergoing overfishing.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Out of conformance with MSFCMA. Would not achieve benefits from setting a accountability measures.

**Alternative 2.** Implement Accountability Measures for the for-hire sector for species undergoing overfishing. The AM would not vary depending on stock status.

**Sub-alternative 2A.** If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** None.

**Sub-alternative 2B.** If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to recover the overage from the prior fishing year.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** None.

**Alternative 3.** Implement Accountability Measures for the for-hire sector for species undergoing overfishing. The AM would vary depending on stock status.

**Sub-alternative 3A.** If the species is overfished or not overfished and the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the species is overfished and the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage. If the species is not overfished and the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to recover the overage from the prior fishing year.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** None.

**Decision 16. Ensure all reasonable alternatives for for-hire accountability measures are included. Pick a preliminary preferred alternative.**

## **Action 8c. Accountability Measures for the Private Recreational Sector**

**Alternative 1.** Do not implement Accountability Measures for the private recreational sector for species undergoing overfishing.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Out of conformance with MSFCMA. Would not achieve benefits from setting a accountability measures.

**Alternative 2.** Implement Accountability Measures for species undergoing overfishing. The AM would not vary depending on stock status.

**Sub-alternative 2A.** Do not implement AMs if the sector ACT is projected to be met. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACT for the following fishing year.

**Sub-alternative 2B.** Do not implement AMs if the sector ACT is projected to be met. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage.

**Sub-alternative 2C.** If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to recover the overage from the prior fishing year.

**Sub-alternative 2D.** If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** Greatest conservation benefits with Sub-Alternative 2D and least with Sub-Alternative 2D.

**Alternative 3.** Implement Accountability Measures for the recreational sector for species undergoing overfishing. The AM would vary depending on stock status.

**Sub-alternative 3A.** Do not implement AMs if the sector ACT is projected to be met. If the species is overfished and the ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage. If not overfished and the ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACT for the following fishing year.

**Sub-alternative 3B.** If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the species is overfished and the ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage. If not overfished and the ACL is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACT for the following fishing year.

**Pros:** Biological, economic, and social benefits by increase probability that ACT is achieved, ACL is not exceed, and overages are corrected.

**Cons:** Sub-Alternative 3B has greater conservation benefits as it would prohibit harvest and retention of species if sector ACT projected to be met.

**Alternative 4.** Compare ACL in Alternatives 2 and 3 with recreational landings over a range of years. For 2010, use only 2010 landings. For 2011, use the average landings of 2010 and 2011. For 2012 and beyond, use three year running average.

**Pros:** Would offer a buffer against catches that are higher than historical levels due to low sampling size.

**Cons:** Could reduce conservation benefits if catches that are higher than historical levels are actual and not due to low sampling size.

**Decision 17. Ensure all reasonable alternatives for private recreational accountability measures are included. Pick a preliminary preferred alternative.**



## **Action 9. Red Snapper Rebuilding Plan.**

### **Action 9a. Rebuilding Timeframe**

*Note: The SEFSC has been requested to redo projections. Values could change.*

**Alternative 1 (no action).** There currently is not a rebuilding plan for red snapper. Amendment 4 (regulations effective January 1992) implemented a 15-year rebuilding plan beginning in 1991 which has since expired.

**Pros:** Would not require additional time to develop and analyze alternatives.

**Cons:** Biological, economic, and social adverse social effects from not implementing a component of a rebuilding plan.

**Alternative 2.** Define a rebuilding schedule as the shortest possible period to rebuild in the absence of fishing mortality ( $T_{MIN}$ ). This would equal 11 years (SEDAR 15 2007). 2009 is Year 1.

**Pros:**

**Cons:**

**Alternative 3.** Define a rebuilding schedule as the mid-point between shortest possible and maximum recommended period to rebuild. This would equal 22.5 years. 2009 is Year 1.

**Pros:**

**Cons:**

**Alternative 4.** Define a rebuilding schedule as the maximum recommended period to rebuild if  $T_{MIN} > 10$  years. The maximum recommended period equals  $T_{MIN} +$  one generation time. This would equal 34 years (SEDAR 15 2007 was the source of the generation time). 2009 is Year 1.

**Pros:**

**Cons:**

**Decision 18. Ensure all reasonable alternatives for red snapper rebuilding schedule are included. Pick a preliminary preferred alternative.**

## Action 9b. Rebuilding Strategy

*Note: The SEFSC has been requested to redo projections. Alternatives will be developed based on the projections.*

**Alternative 1 (no action).** Do not define a yield-based rebuilding strategy for snowy grouper.

**Alternative 2.** Fixed Exploitation would be  $F=F_{MSY}$  (or  $F<F_{MSY}$ )

**Alternative 3.** Modified Exploitation would be allow for adjustment in  $F\leq F_{MSY}$ , which would allow for the largest landings that would rebuild the stock to  $B_{MSY}$  in the allowable timeframe.

**Alternative 4.** Fixed harvest would be maximum fixed harvest with  $F\leq F_{MSY}$  that would allow the stock to rebuild to  $B_{MSY}$  in the allowable timeframe.

**Pros:**

**Cons:**

**Decision 19. Ensure all reasonable alternatives for red snapper rebuilding strategy are included. Pick a preliminary preferred alternative.**

## **Action 10. Data/Reporting**

*Note: Council staff recommends the addition of the following action(s) to the amendment.*

### **Action 10a. Electronic Dealer Reporting (Commercial)**

#### **Alternative 1.** No Action.

**Pros:** None.

**Cons:** Would have biological, economic, and social adverse effects as it would allow continued overages and underages in the commercial fishery.

**Alternative 2.** Require selected dealers handling snapper grouper species to report electronically (computer or fax) through the SAFIS system; NMFS is authorized to require weekly or daily reporting as required.

**Pros:** Would have biological, economic, and social beneficial effects as it would essentially eliminate overages and underages in the commercial fishery.

**Cons:** Not all dealers would be required to report landings.

**Alternative 3.** Require all dealers handling snapper grouper species to report electronically (computer or fax) through the SAFIS system; NMFS is authorized to require weekly or daily reporting as required.

**Pros:** Would have biological, economic, and social beneficial effects as it would essentially eliminate overages and underages in the commercial fishery. All dealers would be required to report landings.

**Cons:** None.

**Decision 20. Ensure all reasonable alternatives for electronic dealer reporting are included. Pick a preliminary preferred alternative.**

**Action 10b. For-Hire Vessel (Headboats and Charterboats) Reporting**

**Alternative 1.** No Action.

**Pros:**

**Cons:**

**Alternative 2.** Require all For-Hire vessels with snapper grouper permit to report electronically (computer or fax) through the SAFIS system; NMFS is authorized to require weekly or daily reporting as required.

**Pros:**

**Cons:**

**Alternative 3.** Others????

**Pros:**

**Cons:**

**Decision 21.** Ensure all reasonable alternatives for electronic for-hire reporting are included. Pick a preliminary preferred alternative.

**Action 10c. Bycatch Monitoring**

**Alternative 1.** No Action.

**Pros:**

**Cons:**

**Alternative 2.** Electronic logbook tied to the vessel's GPS.

**Pros:**

**Cons:**

**Alternative 3.** Electronic camera monitoring.

**Pros:**

**Cons:**

**Alternative 3.** Require observers.

**Pros:**

**Cons:**

**Alternative 4.** Others????

**Pros:**

**Cons:**

**Decision 22.** Ensure all reasonable alternatives for electronic for-hire reporting are included. Pick a preliminary preferred alternative.

**Note:** Committee/Council should provide guidance, based on input from NOAA GC, on whether or not the framework procedures need to be modified.

## **Appendices**

**Appendix A. Landings and discards for all sectors for the ten species in Amendment 17.**

**Appendix B. Potential Management Measures for Red Snapper.**

**Appendix C. Depth Contours and NMFS Logbook Grids**

**Appendix D. Overfishing Level (OFL) and Acceptable Biological Catch (ABC) recommendations from the SSC. Values are in lbs whole weight.**

**Appendix E. Commercial landings of snowy grouper by state.**

**Appendix A. Landings and discards for all sectors for the ten species in Amendment 17.**

**Landings**

**Commercial landings (lbs gutted weight) for South Atlantic including Atlantic portion of Monroe County. Source ALS.**

Species	2005	2006	2007	Average 05-07
Golden Tilefish	271,554	389,633	296,851	319,346
Snowy Grouper	219,707	213,664	112,390	181,920
Speckled Hind	19,580	3,028	1,625	8,077
Warsaw Grouper	2,650	1,018	515	1,394
Black grouper	156,584	85,434	88,726	110,248
Black sea bass	397,101	474,515	321,620	397,745
Gag	563,620	517,929	604,212	561,920
Red grouper	318,019	254,103	428,831	333,651
Vermilion snapper <sup>2</sup>	1,009,287	764,923	968,253	914,155
Red snapper	118,110	79,351	104,192	100,551

**For-Hire landings (lbs gutted weight) for MRFSS and charter combined. Headboat includes Atlantic portion of Monroe County, MRFSS does not include Monroe County.**

Species	2005	2006	2007	Average 05-07
Golden Tilefish	214,500	39,340	4,270	86,037
Snowy Grouper	28,198	142,008	23,214	64,473
Speckled Hind	734	6,097	1,398	2,743
Warsaw Grouper	1,346	6,121	17,834	8,434
Black grouper	73,012	30,470	54,611	52,698
Black sea bass	767,963	769,939	700,441	746,114
Gag	511,259	471,606	501,219	494,695
Red grouper	239,926	437,606	548,392	408,641
Vermilion snapper <sup>2</sup>	525,444	624,803	865,547	671,931
Red snapper	289,173	253,718	306,850	283,247

**Private Recreational (lbs gutted weight) from MRFSS for South Atlantic. Does not include Monroe County.**

Species	2005	2006	2007	Average 05-07
Golden Tilefish	39,671	9,064	4,270	17,668
Snowy Grouper	0	0	1,001	334
Speckled Hind	0	0	0	0
Warsaw Grouper	0	0	12,335	4,112
Black grouper	50,853	16,512	37,414	34,927
Black sea bass	459,898	480,328	453,938	464,721
Gag	313,453	313,890	323,854	317,066
Red grouper	151,406	354,570	415,664	307,214
Vermilion snapper <sup>2</sup>	36,636	88,893	109,948	78,492
Red snapper	125,714	125,156	219,596	156,822

**For-Hire + Private Rec (lbs gutted weight). Headboat includes landings from Atlantic portion of Monroe County. MRFSS data do not include Monroe County.**

Species	2005	2006	2007	Average 05-07
Golden Tilefish	214,500	39,340	4,270	86,037
Snowy Grouper	28,198	142,008	23,214	64,473
Speckled Hind	734	6,097	1,398	2,743
Warsaw Grouper	1,346	6,121	17,834	8,434
Black grouper	73,012	30,470	54,611	52,698
Black sea bass	767,963	769,939	700,441	746,114
Gag	511,259	471,606	501,219	494,695
Red grouper	239,926	437,606	548,392	408,641
Vermilion snapper <sup>2</sup>	525,444	624,803	865,547	671,931
Red snapper	289,173	253,718	306,850	283,247



**Total recreational and commercial landings (lbs gutted weight).**

Species	2005	2006	2007	Average 05-07
Golden Tilefish	486,054	428,973	301,121	405,383
Snowy Grouper	247,904	355,672	135,603	246,393
Speckled Hind	20,314	9,125	3,023	10,821
Warsaw Grouper	3,996	7,139	18,349	9,828
Black grouper	229,596	115,904	143,337	162,946
Black sea bass	1,165,064	1,244,454	1,022,061	1,143,860
Gag	1,074,880	989,535	1,105,431	1,056,615
Red grouper	557,946	691,709	977,222	742,292
Vermilion snapper <sup>2</sup>	1,534,731	1,389,727	1,833,801	1,586,086
Red snapper	407,283	333,070	411,042	383,798

**Discards**

**Expanded number of discarded species by the commercial sector in the South Atlantic.**

Species	2005	2006	2007	Average 05-07
Golden Tilefish	0	0	0	0
Snowy Grouper	164	6	185	118
Speckled Hind	1,164	734	259	719
Warsaw Grouper	22	0	7	10
Black grouper	4,168	1,295	1,601	2,355
Black sea bass	12,756	13,709	20,571	15,679
Gag	2,759	472	2,506	1,912
Red grouper	3,595	1,710	5,358	3,554
Vermilion snapper <sup>2</sup>	56,214	44,386	62,024	54,208
Red snapper	5,031	3,451	16,417	8,300

**Total number of fish released alive or dead on sampled headboat trips during 2005 - 2007. Average number dead applied by applying SEDAR accepted release mortality rates to average number released alive. Release mortality rates are not known for speckled hind, warsaw grouper, black grouper, and red grouper.**

Species	2005		2006		2007		Avg dead
	Released alive	Released dead	Released alive	Released dead	Released alive	Released dead	
Golden Tilefish	0	0	0	0	0	0	0
Snowy Grouper	58	2	11	0	12	3	27
Speckled Hind	12	0	6	0	173	0	unknown
Warsaw Grouper	37	4	8	1	13	0	unknown
Black grouper	559	13	370	5	529	12	unknown
Black sea bass	52,970	2,337	91,423	2,988	133,142	3,256	13,877
Gag	4,130	53	2,397	49	2,283	67	734
Red grouper	4,914	87	2,740	27	2,264	38	unknown
Vermilion snapper <sup>2</sup>	43,501	1,421	53,740	2,352	83,899	3,349	15,095
Red snapper	8,395	95	15,740	198	64,139	1,366	11,770

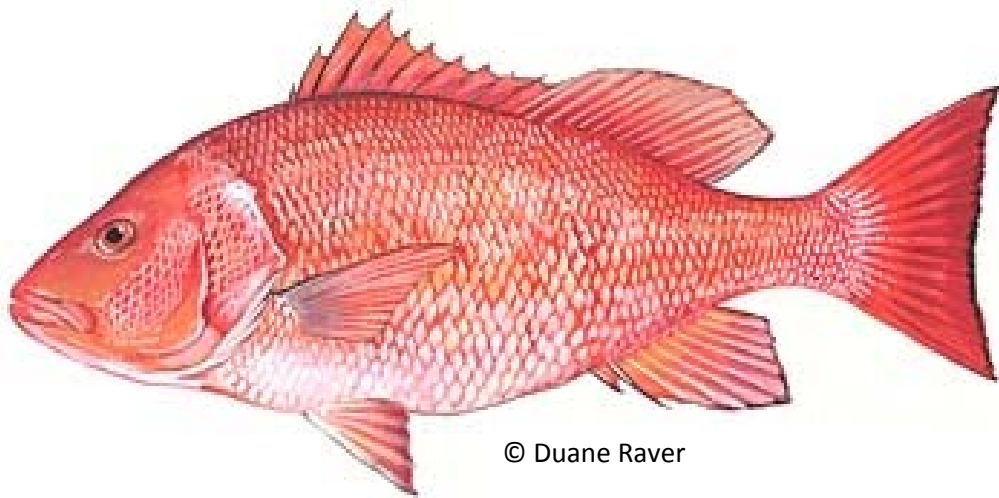
**Total number (A + B1 + B2) of fish caught from MRFSS interviews, estimated total number of fish released (B2), percent released, and estimate total number of dead discards during 2005-2007. Average number dead applied by applying SEDAR accepted release mortality rates to average number released alive. Release mortality rates are not known for speckled hind, warsaw grouper, black grouper, and red grouper.**

Species	Est Total	Est Released	% Released	# dead
Golden Tilefish	86,229	1,036	1.20%	1,036
Snowy Grouper	32,138	3,943	12.27%	3,943
Speckled Hind	7,049	5,717	81.10%	unknown
Warsaw Grouper	2,580	126	4.88%	unknown
Black grouper	58,916	48,977	83.13%	unknown
Black sea bass	11,421,618	9,215,151	80.68%	1,382,273
Gag	567,563	446,070	78.59%	111,518
Red grouper	462,151	312,629	67.65%	unknown
Vermilion snapper <sup>2</sup>	1,333,295	536,008	40.20%	134,002
Red snapper	819,257	715,936	87.39%	286,374

**Estimated release mortality rates from the SEDAR assessments.**

Species	Commercial	Recreational	Assessment
Golden Tilefish	100%	100%	SEDAR 4 (2004)
Snowy Grouper	100%	100%	SEDAR 4 (2004)
Speckled Hind	NA	NA	Unknown
Warsaw Grouper	NA	NA	Unknown
Black grouper	NA	NA	Unknown
Black sea bass	15%	15%	SEDAR Update #1 (2005)
Gag	25%	40%	SEDAR 10 (2007)
Red grouper	NA	NA	Unknown
Vermilion snapper	NA	NA	SEDAR Update #3 (2007)
Red snapper	40%	90%	SEDAR 15 (2008)

## **Potential Management Measures for Red Snapper**



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**June 2008**

## Summary

The base run of the age-structured assessment model indicated that the stock is overfished ( $SSB_{2006}/SSB_{MSY} = 0.037$ ) and that overfishing is occurring ( $F_{2006}/F_{MSY} = 7.513$ ). These results were invariant to the 31 different configurations used in sensitivity runs and retrospective analyses. In addition, the same qualitative findings resulted from the age-aggregated surplus production model and its various sensitivity runs (SEDAR 15 2008).

Estimates of annual biomass have been well below  $B_{MSY}$  since the mid-1960s, with possibly some small amount of recovery since implementation of current size limits in 1992. The estimate of  $F_{2006}/F_{MSY}$  does not indicate severe overfishing in the terminal year; however, estimates of annual  $F$  have exceeded  $F_{MSY}$  substantially and regularly over the last half century. Sensitivity analyses indicated that qualitative results were invariant to assumptions about starting biomass and discards.

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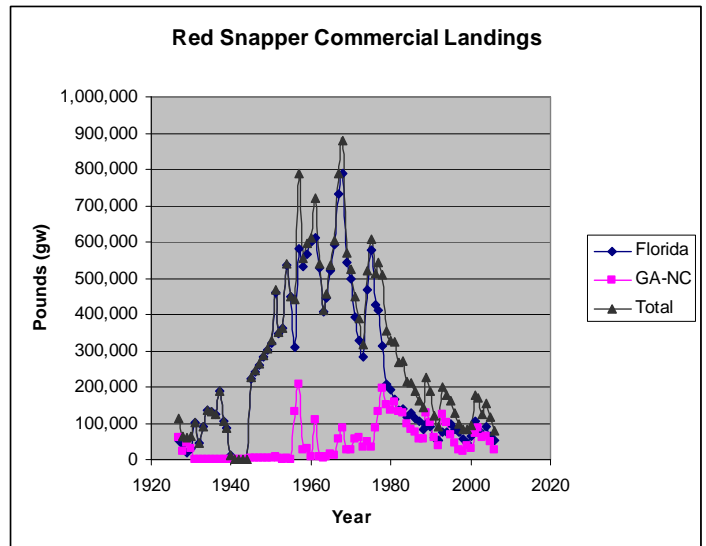
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# 1 Red Snapper Landings

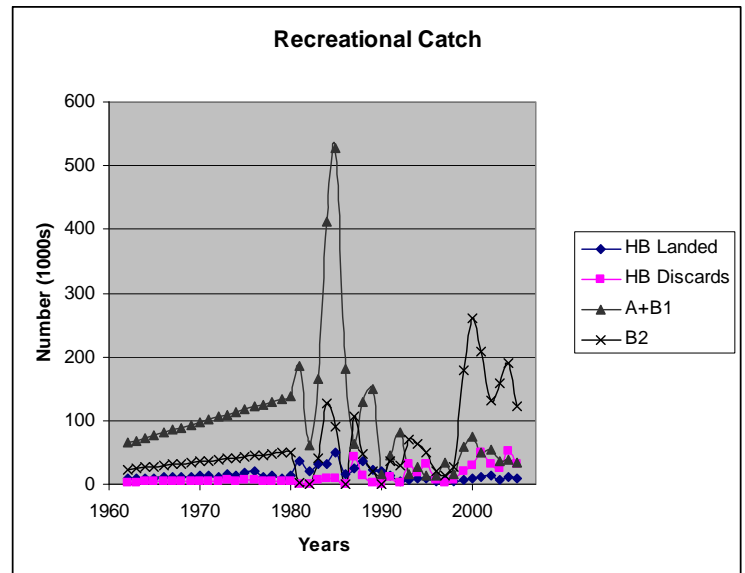
## 1.1 Red Snapper Commercial Landings (lbs gutted weight) From Assessment

Table 1. Table 3.2 from SEDAR 15 2008 assessment.

Year	Florida	GA-NC	Total
1927	53,153	58,584	111,737
1928	42,342	21,672	64,014
1929	17,117	43,619	60,736
1930	30,631	31,657	62,287
1931	100,901	1,852	102,753
1932	44,144	0	44,144
1933	90,541	0	90,541
1934	136,937	0	136,937
1935	131,532	0	131,532
1936	126,126	0	126,126
1937	189,189	0	189,189
1938	105,405	926	106,331
1939	86,486	1,852	88,338
1940	12,613	0	12,613
1941	0	0	0
1942	0	0	0
1943	0	0	0
1944	0	0	0
1945	221,622	3,704	225,325
1946	241,802	3,863	245,665
1947	261,982	4,022	266,004
1948	282,162	4,181	286,344
1949	302,342	4,341	306,683
1950	322,523	4,500	327,023
1951	459,459	6,944	466,404
1952	345,946	4,630	350,576
1953	362,162	1,802	363,964
1954	536,937	2,703	539,640
1955	448,649	0	448,649
1956	308,108	131,541	439,649
1957	579,279	209,326	788,605
1958	530,631	25,648	556,279
1959	566,667	30,459	597,126
1960	600,901	9,285	610,186
1961	610,811	109,866	720,676
1962	529,584	9,155	538,739
1963	406,379	3,839	410,218
1964	446,717	8,203	454,920
1965	519,844	14,670	534,515



Year	Florida	GA-NC	Total
1966	591,835	10,090	601,925
1967	733,301	55,863	789,164
1968	789,871	88,235	878,106
1969	544,517	27,023	571,540
1970	498,012	25,034	523,046
1971	391,932	56,029	447,962
1972	326,597	60,947	387,544
1973	284,717	33,488	318,205
1974	469,280	50,080	519,360
1975	576,252	32,654	608,906
1976	426,995	85,044	512,038
1977	409,869	131,921	541,790
1978	312,475	197,387	509,862
1979	206,477	149,680	356,157
1980	192,773	137,314	330,087
1981	166,062	158,669	324,731
1982	134,104	133,455	267,559
1983	141,099	130,138	271,237
1984	118,516	98,282	216,799
1985	127,659	83,071	210,730
1986	112,243	75,513	187,755
1987	105,465	56,591	162,056
1988	84,629	57,837	142,465
1989	98,692	129,212	227,904
1990	89,469	100,755	190,224
1991	61,923	60,329	122,252
1992	53,534	37,168	90,702
1993	74,326	124,096	198,422
1994	73,633	102,777	176,410
1995	96,745	66,246	162,991
1996	83,144	44,220	127,364
1997	73,618	25,884	99,501
1998	57,436	23,699	81,135
1999	44,352	38,750	83,102
2000	63,706	30,374	94,080
2001	104,467	73,128	177,595
2002	83,596	86,353	169,949
2003	66,078	59,689	125,768
2004	90,741	65,194	155,935
2005	65,890	50,475	116,366
2006	51,147	26,653	77,800



## 1.2 Red Snapper Recreational Landings (lbs gutted weight) From Assessment

Table 2. Red snapper recreational landings from SEDAR 17 assessment.



Year	Number of fish in 1000's										
	Landings			PSE	Discards			PSE	Landings + Discards		
	Headboat	MRFSS	total	MRFSS	Headboat	MRFSS	total	MRFSS	Headboat	MRFSS	total
1962*	8.502	64.8	73.305	25.2	3.1	23.63	26.734	30	11.602	88.437	100.039
1963*	9.033	68.85	77.886	25.2	3.29	25.11	28.405	30	12.327	93.964	106.291
1964*	9.564	72.9	82.468	25.2	3.49	26.59	30.076	30	13.052	99.491	112.544
1965*	10.096	76.95	87.049	25.2	3.68	28.06	31.747	30	13.777	105.019	118.796
1966*	10.627	81	91.631	25.2	3.88	29.54	33.418	30	14.503	110.546	125.049
1967*	11.158	85.05	96.212	25.2	4.07	31.02	35.089	30	15.228	116.073	131.301
1968*	11.69	89.1	100.794	25.2	4.26	32.5	36.759	30	15.953	121.601	137.554
1969*	12.221	93.15	105.376	25.2	4.46	33.97	38.43	30	16.678	127.128	143.806
1970*	12.752	97.2	109.957	25.2	4.65	35.45	40.101	30	17.403	132.655	150.058
1971*	13.284	101.26	114.539	25.2	4.84	36.93	41.772	30	18.128	138.183	156.311
1972*	11.98	105.31	117.285	25.2	4.37	38.4	42.774	30	16.349	143.71	160.059
1973*	15.776	109.36	125.131	25.2	5.75	39.88	45.635	30	21.529	149.237	170.767
1974*	13.689	113.41	127.095	25.2	4.99	41.36	46.351	30	18.681	154.765	173.446
1975*	17.505	117.46	134.961	25.2	6.38	42.84	49.22	30	23.889	160.292	184.181
1976*	19.387	121.51	140.893	25.2	7.07	44.31	51.384	30	26.457	165.819	192.277
1977*	12.379	125.56	137.935	25.2	4.51	45.79	50.305	30	16.894	171.346	188.24
1978*	12.954	129.61	142.56	25.2	4.72	47.27	51.992	30	17.678	176.874	194.552
1979*	9.565	133.66	143.222	25.2	3.49	48.74	52.233	30	13.053	182.401	195.454
1980*	14.511	137.71	152.218	25.2	5.29	50.22	55.514	30	19.803	187.928	207.732
1981	35.719	186.52	222.234	25.1	0.38	2	2.383	100	36.102	188.515	224.617
1982	19.553	60.37	79.926	30.6	0	0	0	0	19.553	60.373	79.926
1983	30.698	165.96	196.66	19.8	7.41	40.04	47.451	38	38.105	206.006	244.111
1984	31.146	412.03	443.174	17.9	9.62	127.31	136.931	29.5	40.769	539.336	580.105
1985	50.336	527.14	577.475	19	8.62	90.29	98.912	43.9	58.958	617.429	676.387
1986	16.625	180.5	197.128	32.2	0	0	0	0	16.625	180.503	197.128
1987	24.996	63.25	88.247	19.7	42.18	106.73	148.906	57.8	67.174	169.979	237.153
1988	36.527	128.99	165.518	28.3	13.7	48.37	62.071	47.3	50.225	177.364	227.589
1989	23.453	149.92	173.368	19.9	3.13	20.04	23.173	41.9	26.588	169.953	196.541
1990	20.919	14.93	35.846	30.6	0	0	0	0	20.919	14.927	35.846
1991	13.857	46.28	60.133	33.1	10.78	35.99	46.771	51.5	24.635	82.269	106.904
1992	5.301	81.28	86.578	18.5	1.92	29.45	31.371	29.4	7.222	110.727	117.949
1993	7.347	16.32	23.67	21.8	31.74	70.51	102.242	28.4	39.082	86.83	125.912
1994	8.225	27.35	35.578	25.9	19.22	63.91	83.129	28.9	27.443	91.264	118.707
1995	8.826	14.01	22.837	29.7	32.05	50.87	82.918	20.2	40.872	64.883	105.755
1996	5.543	14.36	19.899	41.2	7.69	19.93	27.618	38	13.236	34.281	47.517
1997	5.77	34.33	40.097	48.5	2.31	13.74	16.052	26.9	8.08	48.069	56.149
1998	4.741	16.9	21.644	24	7.7	27.46	35.158	32.5	12.442	44.36	56.802
1999	6.836	58.18	65.017	20.9	21.11	179.67	200.775	15.9	27.946	237.846	265.792
2000	8.437	73.77	82.211	20.3	29.67	259.42	289.089	14.8	38.105	333.195	371.3
2001	12.028	50.81	62.842	16.6	49.44	208.89	258.329	13.8	61.472	259.699	321.171
2002	12.931	53.29	66.218	15.8	31.87	131.32	163.19	18.2	44.799	184.609	229.408
2003	5.706	35.66	41.367	16.5	25.47	159.18	184.646	16.2	31.175	194.838	226.013
2004	10.842	38.89	49.728	14.9	52.83	189.48	242.306	14.3	63.671	228.363	292.034
2005	8.907	33.71	42.615	18.2	32.52	123.06	155.576	13.4	41.424	156.767	198.191
2006	5.945	27.02	32.962	18.8	30.32	137.8	168.126	18.2	36.268	164.82	201.088

### 1.3 Red Snapper Landings (ALS), MRFSS, Headboat

Table 3. Red snapper commercial landings from ALS (includes all of Monroe County); MRFSS Web site; Headboat survey. Data do not include dead discards and MRFSS data are A+B1; weight not converted from numbers. Landings converted to gutted weight using factor of 1.11.

Year	ALS	HB	MRFSS
1986	202,468	48,991	102,264
1987	176,866	73,728	120,427
1988	159,443	117,178	202,698
1989	241,755	63,779	242,157
1990	200,742	59,176	103,875
1991	132,881	64,891	118,480
1992	91,926	26,050	556,498
1993	204,283	38,484	127,557
1994	182,043	38,753	180,644
1995	166,342	51,778	59,463
1996	129,789	41,652	95,682
1997	102,111	46,130	80,095
1998	81,463	24,187	103,570
1999	85,786	39,241	152,641
2000	95,214	44,506	450,378
2001	178,579	61,607	318,580
2002	171,686	63,780	352,170
2003	146,579	37,255	233,616
2004	154,419	72,380	264,790
2005	118,924	52,878	236,294
2006	81,000	37,325	216,393
2007	91,475	0	266,008

#### 1.4 Red Snapper Recreational Landings in Number

Table 4. Red Snapper Landings – Pounds Gutted Weight. Source: MRFSS Web site; Headboat survey. Data do not include dead discards and MRFSS data are A+B1; weight not converted from numbers.

Year	HB	MRFSS A+B1	PSE	Total
1986	16,625	113,513	27.3	130,138
1987	24,996	133,674	20	158,670
1988	36,527	224,995	23.4	261,522
1989	23,453	268,794	28.2	292,247
1990	20,919	115,301	7.9	136,220
1991	13,857	131,513	34.2	145,370
1992	5,301	617,713	38.3	623,014
1993	7,347	141,588	26.6	148,935
1994	8,225	200,515	35.9	208,740
1995	8,826	66,004	28	74,830
1996	5,543	106,207	50.2	111,750
1997	5,770	88,905	43.6	94,675
1998	4,741	114,963	31.7	119,704
1999	6,836	169,432	17.9	176,268
2000	8,437	499,920	23.9	508,357
2001	12,028	353,624	18.8	365,652
2002	12,931	390,909	16.9	403,840
2003	5,706	259,314	18	265,020
2004	10,842	293,917	15.3	304,759
2005	8,907	262,286	17	271,193
2006	5,945	240,196	24.4	246,141
2007		295,269	29.7	295,269

Table 5. Red Snapper Landings – MRFSS Discards (B2). Source: MRFSS Web site.

Year	MRFSS B2s	PSE
1986	0	0
1987	106,728	57.8
1988	100,493	54.2
1989	26,738	40.1
1990	2,498	100
1991	44,619	43.8
1992	34,712	26.4
1993	70,507	28.4
1994	67,266	27.7
1995	54,796	19.4
1996	19,925	38
1997	15,011	26
1998	28,767	31.2
1999	182,436	15.7
2000	269,489	14.5
2001	210,793	13.7
2002	131,322	18.2
2003	160,229	16.1
2004	203,273	13.6
2005	125,739	13.3
2006	134,692	18.5
2007	448,144	12.7

## 1.5 Red snapper Landings by State

Table 6. Commercial landings (pounds) of red snapper by state, 2001-2006. Source ALS. Monroe County not divided into Atlantic and Gulf.

State	2001-2006	Avg ww	Avg GW	Percent
FL	518,166	86,361	77,803	55.06%
Monroe	25,335	4,223	3,804	2.69%
Georgia	108,047	18,008	16,223	11.48%
NC	80,616	13,436	12,105	8.57%
SC	208,902	34,817	31,367	22.20%

Table 7. Headboat landings (pounds) of red snapper by state, 2001-2006.

State	2001-2006	Avg ww	Avg GW	Percent
South FL	11,805	1,968	1,773	3.27%
GA & NFL	223,507	37,251	33,560	61.91%
SC	84,416	14,069	12,675	23.38%
NC	41,272	6,879	6,197	11.43%

Table 8. MRFSS landings (pounds) of red snapper by state, 2001-2006.

State	2001-2006	Avg ww	Avg GW	Percent
FL	1,563,204	260,534	234,715	86.83%
Georgia	99,494	16,582	14,939	5.53%
SC	69,668	11,611	10,461	3.87%
NC	67,880	11,313	10,192	3.77%

Table 9. MRFSS landings (number A+B1) of red snapper by state, 2001-2006.

State	2001-2006	Avg ww	Avg GW	Percent
FL	206,489	34,415	31,004	86.05%
Georgia	10,591	1,765	1,590	4.41%
SC	9,526	1,588	1,430	3.97%
NC	13,363	2,227	2,006	5.57%

Table 10. MRFSS number of red snapper released alive (B2) among states, 2001-2006.

MRFSS	2001-2006	avg	percent
FL	623,153	124,631	89.62%
GA	5,878	1,176	0.85%
SC	24,128	4,826	3.47%
NC	42,161	8,432	6.06%

Table 11. Percentage of red snapper MRFSS B2s by state. Average 2001-2006.

MRFSS	A+B1	B2	A+B1+B2	% B2
FL	29,396	124,631	154,027	80.92%
GA	1,089	1,176	2,265	56.60%
SC	2,136	4,826	6,962	62.40%
NC	12,849	8,432	21,281	40.50%
Total	45,470	139,065	184,535	75.36%

## 1.6 Red Snapper Landings by Month and State

### 1.6.1 Commercial 2001-2006

Table 12. Average red snapper commercial landings 2001-2006 (lbs gutted weight) by state and month. Includes Monroe County South Atlantic landings.

Month	Total	FL	GA	SC	NC
1	12,023	7,296	1,254	2,627	847
2	12,250	7,485	1,979	2,121	665
3	13,175	8,542	1,235	2,370	1,029
4	14,061	8,024	1,867	2,871	1,299
5	15,247	8,531	1,889	3,106	1,720
6	15,810	10,005	1,333	3,026	1,445
7	11,710	6,535	1,057	2,859	1,259
8	8,716	4,967	765	2,029	955
9	6,466	3,766	837	1,255	609
10	10,582	5,511	1,326	2,948	796
11	12,564	5,818	1,592	4,292	862
12	9,261	5,690	1,091	1,862	618
Total	141,865	82,170	16,223	31,367	12,105

Table 13. Percentage of red snapper (commercial) landed by month in FL, GA, SC, and NC during 2001-2006 (lbs gutted weight) by state and month.

Month	Total	FL	GA	SC	NC
1	8.48%	8.88%	7.73%	8.38%	6.99%
2	8.64%	9.11%	12.20%	6.76%	5.49%
3	9.29%	10.40%	7.61%	7.56%	8.50%
4	9.91%	9.76%	11.51%	9.15%	10.73%
5	10.75%	10.38%	11.65%	9.90%	14.21%
6	11.14%	12.18%	8.22%	9.65%	11.94%
7	8.25%	7.95%	6.52%	9.12%	10.40%
8	6.14%	6.04%	4.72%	6.47%	7.89%
9	4.56%	4.58%	5.16%	4.00%	5.03%
10	7.46%	6.71%	8.17%	9.40%	6.58%
11	8.86%	7.08%	9.81%	13.68%	7.12%
12	6.53%	6.92%	6.72%	5.94%	5.11%

### 1.6.2 Commercial – By Year

Table 14. Average red snapper commercial landings 2001-2006 (lbs gutted weight) by state and month. Includes Monroe County.

Month	2001				2002				2003			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	10,537	1,283	1,219	574	8,143	1,861	2,407	2,136	4,415	740	649	750
2	13,341	3,081	2,914	679	5,434	2,641	2,168	1,168	5,783	3,549	1,157	802
3	8,094	1,059	2,227	1,002	8,845	934	3,175	1,751	7,111	2,073	1,971	1,058
4	10,553	2,858	2,846	1,942	7,555	3,131	3,243	2,511	4,776	2,800	3,216	1,289
5	10,023	4,111	2,859	2,723	5,840	1,951	4,143	2,332	7,223	2,171	3,606	1,682
6	6,922	1,826	2,344	2,157	12,865	2,351	5,032	2,660	21,871	1,413	4,373	1,478
7	5,694	1,351	2,053	1,614	5,541	2,138	3,937	2,257	9,579	558	1,802	968
8	7,143	1,063	1,459	1,924	5,438	1,055	3,287	1,415	3,130	698	1,410	732
9	5,759	2,098	1,237	1,177	3,406	996	2,016	1,188	6,668	1,209	1,530	335
10	6,534	2,549	3,217	1,275	10,092	1,235	3,166	1,051	5,443	1,387	3,277	980
11	9,516	2,157	4,811	1,285	6,771	2,845	7,418	1,550	5,702	1,396	3,306	1,019
12	11,849	1,150	2,932	1,560	5,949	1,636	1,988	1,032	5,494	1,547	1,943	512
	105,963	24,586	30,119	17,911	85,879	22,776	41,981	21,050	87,194	19,541	28,240	11,605
	59.34%	13.77%	16.87%	10.03%	50.02%	13.27%	24.45%	12.26%	59.49%	13.33%	19.27%	7.92%



Month	2004				2005				2006			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	8,884	1,781	6,240	661	4,753	781	1,422	131	43,774	7,523	15,763	5,079
2	5,738	866	2,605	857	8,371	470	768	129	44,912	11,872	12,727	3,990
3	14,189	989	3,343	1,732	6,552	342	1,014	380	51,250	7,407	14,220	6,175
4	11,411	1,545	3,991	1,047	8,510	124	1,169	560	48,142	11,201	17,225	7,795
5	12,341	1,498	3,229	1,673	6,830	491	1,855	866	51,188	11,336	18,636	10,322
6	7,548	1,288	2,241	687	3,346	441	1,444	897	60,032	7,997	18,158	8,672
7	7,471	1,037	3,584	1,206	3,871	391	2,661	640	39,210	6,342	17,155	7,551
8	7,536	582	2,263	705	1,287	307	1,056	543	29,803	4,591	12,171	5,730
9	929	158	822	205	2,210	203	743	278	22,595	5,020	7,529	3,654
10	4,604	1,816	3,712	497	2,497	327	1,367	695	33,068	7,956	17,690	4,777
11	6,347	1,759	5,157	442	2,259	326	1,117	232	34,908	9,551	25,753	5,172
12	3,122	1,874	1,921	286	4,646	329	1,186	178	34,141	6,543	11,173	3,711
	90,119	15,194	39,107	9,999	55,133	4,533	15,803	5,531	493,022	97,340	188,200	72,627
	58.36%	9.84%	25.33%	6.48%	68.07%	5.60%	19.51%	6.83%	57.92%	11.44%	22.11%	8.53%

### 1.6.3 Headboat 2001-2006

Table 14. Average red snapper headboat landings 2001-2006 (lbs gutted weight) by state and month.

Month	Total	South FL	GA - NFL	SC	NC
1	1,555	72	1,402	46	36
2	2,634	654	1,873	38	70
3	4,185	480	3,046	519	140
4	5,691	29	3,965	1,411	285
5	7,857	89	4,719	2,577	472
6	5,775	33	3,475	1,712	554
7	5,578	50	3,501	1,553	474
8	5,623	41	2,390	2,020	1,173
9	2,927	16	1,491	576	844
10	5,110	63	3,493	772	783
11	4,316	155	2,690	1,275	196
12	2,953	91	1,515	177	1,170
	54,204	1,773	33,560	12,675	6,197

Table 15. Average gag headboat landings 2001-2006 (percentage) by state and month.

Month	Total	South FL	GA - NFL	SC	NC
1	2.87%	4.04%	4.18%	0.36%	0.58%
2	4.86%	36.88%	5.58%	0.30%	1.12%
3	7.72%	27.07%	9.08%	4.09%	2.26%
4	10.50%	1.66%	11.81%	11.13%	4.60%
5	14.50%	5.04%	14.06%	20.33%	7.62%
6	10.65%	1.86%	10.36%	13.51%	8.95%
7	10.29%	2.82%	10.43%	12.25%	7.65%
8	10.37%	2.29%	7.12%	15.94%	18.93%
9	5.40%	0.90%	4.44%	4.54%	13.62%
10	9.43%	3.57%	10.41%	6.09%	12.63%
11	7.96%	8.75%	8.02%	10.06%	3.17%
12	5.45%	5.13%	4.51%	1.40%	18.88%

### 1.6.4 Headboat – By Year

Table 16. Average red snapper headboat landings 2001-2006 (lbs gutted weight) by state and month.

Month	2001				2002				2003			
	South FL	GA - NFL	SC	NC	South FL	GA - NFL	SC	NC	South FL	GA - NFL	SC	NC
1	8	222	3	4	14	143	43	3	2	80	0	3
2	22	392	38	41	5	146	0	21	13	139	0	7
3	13	515	100	30	81	433	123	61	5	333	0	26
4	0	715	341	101	0	579	190	116	0	449	291	41
5	56	703	559	81	0	881	480	278	0	579	841	34
6	15	537	229	131	1	819	639	301	8	433	238	34
7	3	606	371	94	3	733	411	286	9	215	177	38
8	5	491	764	361	4	306	212	757	5	139	112	40
9	0	306	149	402	0	244	155	225	3	200	93	186
10	0	160	161	95	14	404	258	54	0	466	64	95
11	148	458	235	96	3	295	736	30	1	312	8	49
12	10	360	131	6	8	121	16	0	0	446	0	0
Total	280	5,466	3,080	1,442	133	5,104	3,262	2,131	45	3,790	1,822	552
Percent	2.73%	53.23%	30.00%	14.04%	1.25%	48.02%	30.69%	20.05%	0.72%	61.04%	29.34%	8.90%

Month	2004				2005				2006			
	South FL	GA - NFL	SC	NC	South FL	GA - NFL	SC	NC	South FL	GA - NFL	SC	NC
1	1	241	0	17	42	322	0	7	4	395	0	2
2	0	211	0	0	550	540	0	0	64	446	0	0
3	12	384	266	15	334	754	21	5	35	627	9	3
4	4	807	424	21	14	792	111	0	12	624	54	7
5	0	705	488	29	11	1,116	130	33	22	735	79	17
6	4	775	374	18	0	465	147	64	5	446	86	7
7	0	1,112	334	15	7	511	116	39	28	324	144	4
8	0	943	80	15	7	340	789	0	20	171	63	0
9	4	44	43	13	2	319	95	5	7	378	42	13
10	34	1,494	189	524	0	405	79	10	15	564	21	6
11	1	777	192	16	0	333	73	5	2	515	32	0
12	70	177	28	1,165	0	221	0	0	3	189	2	0
Total	129	7,670	2,418	1,846	967	6,117	1,561	167	219	5,413	532	58
Percent	1.07%	63.58%	20.04%	15.31%	10.97%	69.41%	17.72%	1.90%	3.52%	87.01%	8.54%	0.93%

### 1.6.5 MRFSS 2001-2006

Table 17. Average red snapper MRFSS landings 2001-2006 (lbs gutted weight) by state and month.

Wave	Total	FL	GA	SC	NC
1	40,764	40,764	0	0	0
2	54,953	50,729	1,212	2,421	591
3	56,191	43,387	6,013	2,694	4,097
4	32,870	28,210	1,309	1,980	1,371
5	34,424	25,023	4,877	934	3,591
6	51,104	46,602	1,528	2,431	543
	270,307	234,715	14,939	10,460	10,192

Table 18. Average red snapper MRFSS landings 2001-2006 (percent lbs gutted weight) by state and month.

Wave	Total	FL	GA	SC	NC
1	15.08%	17.37%	0.00%	0.00%	0.00%
2	20.33%	21.61%	8.11%	23.15%	5.80%
3	20.79%	18.49%	40.25%	25.76%	40.19%
4	12.16%	12.02%	8.76%	18.92%	13.45%
5	12.74%	10.66%	32.65%	8.93%	35.23%
6	18.91%	19.85%	10.23%	23.24%	5.33%

Table 19. Average red snapper MRFSS landings 2001-2006 (A+B1 Number) by state and month.

Wave	Total	FL	GA	SC	NC
1	6,585	6,585	0	0	0
2	7,732	7,096	101	472	64
3	8,143	6,182	740	351	870
4	4,612	3,900	142	240	330
5	5,116	3,477	573	186	880
6	7,807	7,176	208	339	84
	39,995	34,415	1,765	1,588	2,227

Table 20. Average red snapper MRFSS landings 2001-2006 (A+B1 Number, percent) by state and month.

Wave	Total	FL	GA	SC	NC
1	16.47%	19.13%	0.00%	0.00%	0.00%
2	19.33%	20.62%	5.73%	29.70%	2.85%
3	20.36%	17.96%	41.95%	22.12%	39.07%
4	11.53%	11.33%	8.05%	15.13%	14.81%
5	12.79%	10.10%	32.47%	11.73%	39.50%
6	19.52%	20.85%	11.80%	21.32%	3.77%

Table 21. Average red snapper MRFSS landings 2001-2006 (B2 Number) by state and month.

Wave	Total	FL	GA	SC	NC
1	35,161	35,161	0	0	0
2	29,400	28,612	490	297	0
3	17,683	16,076	745	852	11
4	17,590	15,676	1,429	456	29
5	15,557	14,374	857	216	110
6	45,617	44,987	465	165	0
	161,008	154,886	3,986	1,986	149

Table 22. Average red snapper MRFSS landings 2001-2006 (B2 Number, percent) by state and month.

Wave	Total	FL	GA	SC	NC
1	21.84%	22.70%	0.00%	0.00%	0.00%
2	18.26%	18.47%	12.30%	14.96%	0.00%
3	10.98%	10.38%	18.69%	42.87%	7.04%
4	10.92%	10.12%	35.84%	22.96%	19.55%
5	9.66%	9.28%	21.50%	10.89%	73.41%
6	28.33%	29.04%	11.67%	8.32%	0.00%



### 1.6.6 MRFSS – By Year

Table 23. Average red snapper MRFSS landings 2001-2006 (lbs gutted weight) by state and month.

Wave	2001				2002				2003			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	62,677	0	0	0	90,770	0	0	0	13,095	0	0	0
2	30,992	377	0	0	78,840	0	0	0	61,961	656	10,580	0
3	67,061	935	0	8,541	65,389	638	0	4,908	37,164	163	14,150	1,293
4	18,669	0	0	1,901	54,684	0	0	2,940	22,806	1,479	6,493	2,206
5	5,484	107	0	133	26,606	1,192	3,942	12,876	20,846	600	371	6,048
6	113,362	0	12,020	0	9,019	295	71	0	34,847	1,357	0	0
Total	298,245	1,420	12,020	10,575	325,308	2,125	4,014	20,723	190,719	4,255	31,594	9,547
Percent	92.55%	0.44%	3.73%	3.28%	92.37%	0.60%	1.14%	5.88%	80.77%	1.80%	13.38%	4.04%

Wave	2004				2005				2006			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	10,087	0	0	0	19,248	0	0	0	48,708	0	0	0
2	32,334	1,309	1,347	0	53,950	4,930	1,042	3,545	46,298	0	1,559	0
3	44,104	7,877	467	514	38,013	3,317	1,019	4,467	8,594	23,149	531	4,858
4	35,452	1,297	570	0	24,753	5,078	4,814	1,177	12,895	0	0	0
5	28,171	11,414	1,291	0	22,070	15,949	0	0	46,958	0	0	2,488
6	77,050	7,514	1,649	3,259	30,984	0	648	0	20,155	0	198	0
Total	227,198	29,411	5,323	3,774	189,017	29,274	7,523	9,189	183,608	23,149	2,288	7,346
Percent	85.51%	11.07%	2.00%	1.42%	80.43%	12.46%	3.20%	3.91%	84.85%	10.70%	1.06%	3.39%



Table 24. Average red snapper MRFSS landings 2001-2006 (A+B1 Number) by state and month.

Wave	2001				2002				2003			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	11,501	0	0	0	12,916	0	0	0	2,811	0	0	0
2	5,348	66	0	0	11,804	0	0	0	7,039	96	1,426	0
3	9,248	123	0	2,098	11,872	86	0	795	4,007	21	1,867	256
4	5,584	0	0	379	6,562	0	0	429	2,767	90	892	862
5	1,109	17	0	21	3,795	190	923	2,054	2,647	91	0	2,971
6	14,978	0	1,608	0	1,759	72	31	0	5,102	162	0	0
Total	47,768	206	1,608	2,498	48,708	348	954	3,278	24,373	460	4,185	4,089
Percent	91.72%	0.40%	3.09%	4.80%	91.41%	0.65%	1.79%	6.15%	73.62%	1.39%	12.64%	12.35%

Wave	2004				2005				2006			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	1,827	0	0	0	4,368	0	0	0	6,088	0	0	0
2	5,994	110	179	0	6,890	335	103	381	5,501	0	1,121	0
3	5,672	1,037	64	71	5,413	408	88	468	878	2,767	88	1,533
4	4,102	262	75	0	3,308	500	474	309	1,074	0	0	0
5	4,531	1,064	47	0	5,488	1,815	147	0	3,289	262	0	233
6	12,668	1,016	255	504	5,332	0	113	0	3,218	0	24	0
Total	34,794	3,489	620	575	30,799	3,058	925	1,158	20,048	3,029	1,233	1,766
Percent	88.14%	8.84%	1.57%	1.46%	85.70%	8.51%	2.57%	3.22%	76.88%	11.62%	4.73%	6.77%

Table 25. Average red snapper MRFSS landings 2001-2006 (B2 Number) by state and month.

Wave	2001				2002				2003			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	79,799	0	0	0	54,344	0	0	0	34,643	0	0	0
2	18,502	242	0	0	14,662	0	0	0	26,882	0	1,783	0
3	18,549	0	0	0	8,366	0	0	63	26,022	192	3,361	0
4	17,086	0	0	175	21,123	0	158	0	16,746	365	0	0
5	10,020	356	969	138	15,949	152	0	0	7,050	31	0	0
6	63,932	621	402	0	16,398	76	31	0	42,593	560	85	0
Total	207,888	1,219	1,371	313	130,842	228	189	63	153,936	1,148	5,229	0
Percent	98.62%	0.58%	0.65%	0.15%	99.63%	0.17%	0.14%	0.05%	96.02%	0.72%	3.26%	0.00%

Wave	2004				2005				2006			
	FL	GA	SC	NC	FL	GA	SC	NC	FL	GA	SC	NC
1	18,967	0	0	0	9,958	0	0	0	13,255	0	0	0
2	39,647	290	0	0	42,839	206	0	0	29,140	2,204	0	0
3	22,070	1,367	0	0	10,921	2,911	1,660	0	10,528	0	88	0
4	21,475	1,563	0	0	4,953	102	2,333	0	12,673	6,543	245	0
5	26,063	2,229	0	0	18,668	616	329	0	8,496	1,758	0	519
6	68,193	1,323	474	0	29,719	50	0	0	49,084	161	0	0
Total	196,415	6,772	474	0	117,058	3,885	4,322	0	123,176	10,666	333	519
Percent	96.44%	3.33%	0.23%	0.00%	93.45%	3.10%	3.45%	0.00%	91.45%	7.92%	0.25%	0.39%

## 1.7 Red Snapper Commercial Percentage

Table 26. Red Snapper % Commercial. Source ALS.

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1986	57.2%	52.3%	44.7%	44.6%	46.4%	45.8%	38.8%	40.6%	41.1%	42.3%	42.7%	42.8%	42.6%	42.0%	39.3%	38.7%	37.9%	37.7%	37.3%	36.9%	36.4%
1987		47.7%	39.5%	41.3%	44.2%	43.9%	36.5%	38.7%	39.4%	40.9%	41.4%	41.6%	41.5%	40.9%	38.2%	37.6%	36.8%	36.7%	36.4%	36.0%	35.5%
1988			33.3%	39.1%	43.3%	43.0%	34.7%	37.5%	38.5%	40.2%	40.8%	41.0%	40.9%	40.3%	37.5%	36.9%	36.2%	36.1%	35.8%	35.4%	34.9%
1989				44.1%	48.5%	46.9%	35.1%	38.4%	39.4%	41.3%	41.9%	42.1%	41.9%	41.2%	37.9%	37.2%	36.4%	36.3%	36.0%	35.6%	35.0%
1990					55.2%	49.1%	31.4%	36.5%	38.2%	40.7%	41.5%	41.7%	41.5%	40.7%	37.0%	36.4%	35.6%	35.5%	35.2%	34.8%	34.3%
1991						42.0%	22.7%	31.5%	34.7%	38.1%	39.3%	39.8%	39.7%	38.9%	35.2%	34.8%	34.1%	34.2%	33.9%	33.6%	33.1%
1992							13.6%	28.4%	33.1%	37.4%	38.9%	39.5%	39.4%	38.6%	34.6%	34.2%	33.5%	33.7%	33.5%	33.1%	32.7%
1993								55.2%	50.1%	52.7%	51.8%	50.8%	49.4%	46.8%	39.9%	38.5%	37.1%	36.9%	36.3%	35.7%	35.0%
1994									45.3%	51.3%	50.5%	49.4%	47.8%	45.0%	37.4%	36.3%	35.1%	35.1%	34.7%	34.2%	33.5%
1995										59.9%	54.4%	51.5%	48.8%	44.9%	35.7%	34.8%	33.7%	33.9%	33.6%	33.2%	32.5%
1996											48.6%	46.8%	44.5%	40.6%	31.4%	31.6%	31.1%	31.6%	31.6%	31.3%	30.8%
1997												44.7%	42.0%	37.7%	27.9%	29.1%	29.2%	30.0%	30.2%	30.1%	29.6%
1998													38.9%	34.4%	24.4%	27.0%	27.6%	28.8%	29.2%	29.2%	28.7%
1999														30.9%	20.9%	25.2%	26.4%	27.9%	28.5%	28.6%	28.2%
2000															16.1%	23.8%	25.7%	27.5%	28.2%	28.3%	27.9%
2001																32.0%	30.6%	31.8%	31.7%	31.3%	30.4%
2002																	29.2%	31.7%	31.6%	31.1%	30.0%
2003																		35.1%	33.1%	31.9%	30.3%
2004																			31.4%	30.4%	28.7%
2005																				29.1%	26.9%
2006																					24.2%

## 1.8 Red Snapper Recreational Percentage

Table 27. Red Snapper % Recreational. Source MRFSS Web site, NMFS Headboat survey.

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1986	42.8%	47.7%	55.3%	55.4%	53.6%	54.2%	61.2%	59.4%	58.9%	57.7%	57.3%	57.2%	57.4%	58.0%	60.7%	61.3%	62.1%	62.3%	62.7%	63.1%	63.6%
1987		52.3%	60.5%	58.7%	55.8%	56.1%	63.5%	61.3%	60.6%	59.1%	58.6%	58.4%	58.5%	59.1%	61.8%	62.4%	63.2%	63.3%	63.6%	64.0%	64.5%
1988			66.7%	60.9%	56.7%	57.0%	65.3%	62.5%	61.5%	59.8%	59.2%	59.0%	59.1%	59.7%	62.5%	63.1%	63.8%	63.9%	64.2%	64.6%	65.1%
1989				55.9%	51.5%	53.1%	64.9%	61.6%	60.6%	58.7%	58.1%	57.9%	58.1%	58.8%	62.1%	62.8%	63.6%	63.7%	64.0%	64.4%	65.0%
1990					44.8%	50.9%	68.6%	63.5%	61.8%	59.3%	58.5%	58.3%	58.5%	59.3%	63.0%	63.6%	64.4%	64.5%	64.8%	65.2%	65.7%
1991						58.0%	77.3%	68.5%	65.3%	61.9%	60.7%	60.2%	60.3%	61.1%	64.8%	65.2%	65.9%	65.8%	66.1%	66.4%	66.9%
1992							86.4%	71.6%	66.9%	62.6%	61.1%	60.5%	60.6%	61.4%	65.4%	65.8%	66.5%	66.3%	66.5%	66.9%	67.3%
1993								44.8%	49.9%	47.3%	48.2%	49.2%	50.6%	53.2%	60.1%	61.5%	62.9%	63.1%	63.7%	64.3%	65.0%
1994									54.7%	48.7%	49.5%	50.6%	52.2%	55.0%	62.6%	63.7%	64.9%	64.9%	65.3%	65.8%	66.5%
1995										40.1%	45.6%	48.5%	51.2%	55.1%	64.3%	65.2%	66.3%	66.1%	66.4%	66.8%	67.5%
1996											51.4%	53.2%	55.5%	59.4%	68.6%	68.4%	68.9%	68.4%	68.4%	68.7%	69.2%
1997												55.3%	58.0%	62.3%	72.1%	70.9%	70.8%	70.0%	69.8%	69.9%	70.4%
1998													61.1%	65.6%	75.6%	73.0%	72.4%	71.2%	70.8%	70.8%	71.3%
1999														69.1%	79.1%	74.8%	73.6%	72.1%	71.5%	71.4%	71.8%
2000															83.9%	76.2%	74.3%	72.5%	71.8%	71.7%	72.1%
2001																68.0%	69.4%	68.2%	68.3%	68.7%	69.6%
2002																	70.8%	68.3%	68.4%	68.9%	70.0%
2003																		64.9%	66.9%	68.1%	69.7%
2004																			68.6%	69.6%	71.3%
2005																				70.9%	73.1%
2006																					75.8%

## 2 Monthly catch and reduction provided by seasonal closure

### 2.1 Commercial

Table 28. Monthly catch (pounds gutted weight) of red snapper 2001-2006 (average). Data are from ALS.

Month	Total
1	12,023
2	12,250
3	13,175
4	14,061
5	15,247
6	15,810
7	11,710
8	8,716
9	6,466
10	10,582
11	12,564
12	9,261
Total	141,865

### 2.1.1 Effectiveness of Commercial Closure

Five steps were taken to determine the effectiveness of a commercial closure. Logbook data from 2001-2006 were examined to identify species most commonly caught on trips with red snapper by restricting trips to those that caught at least 1 lb of red snapper. Incidental catch during a seasonal closure was determined by identifying trips that targeted (caught at least 100 lbs) of co-occurring species; and calculating the catch of red snapper on those trips. Trips targeting red snapper were removed from analyses assuming that targeting would not occur in the future. A trip would be considered to be targeting red snapper if greater than 300 lb whole weight of the landings on a trip included the species. In addition, trips that employed diving gear, were not considered in analyses since fishermen can recognize a species before it is captured.

There is a possibility some trips would not be taken during a seasonal closure for species such as gag or vermilion snapper. However, it was assumed that there would not be any reduction in trips made if red snapper was closed. The ability to avoid red snapper was considered by adjusting values by 0 to 60% to account for fishermen’s ability to avoid red snapper by changing hook size, location, and fishing methods. Dead discards were determined by applying a 90% release mortality rate for red snapper (SEDAR 15 2008). Effectiveness of closure was determined by comparing the magnitude of dead discards to actual landings. Effectiveness of a seasonal closure for red snapper could be increased through seasonal closures of co-occurring species.

#### STEP 1 - Determine landings of red snapper during 2001-2006

Table 29. Landings of red snapper during 2001-2006 from logbook.

Month	Tot WW	Tot GW	Avg GW
1	77,834	70,120	11,687
2	80,182	72,236	12,039
3	75,730	68,226	11,371
4	84,599	76,215	12,703
5	107,954	97,256	16,209
6	82,833	74,625	12,437
7	68,230	61,468	10,245
8	60,277	54,303	9,051
9	41,581	37,460	6,243
10	70,417	63,439	10,573
11	81,736	73,636	12,273
12	60,763	54,741	9,124
		sum	133,954

#### STEP 2 - Identify most common species taken with red snapper

Table 30. Species most commonly taken on trips where at least 1 lb of red snapper was caught.

Species	sum	percent	cum %
SNAPPER,VERMILION	1,196,673	29.48%	29.48%
GROUPE,GAG	536,337	13.21%	42.69%
SCAMP	350,126	8.62%	51.31%
AMBERJACK,GREATER	266,201	6.56%	57.87%
TRIGGERFISH,GRAY	235,453	5.80%	63.67%
SNAPPER,RED	206,503	5.09%	68.75%
GROUPE,RED	197,286	4.86%	73.61%
JACK,ALMACO	138,184	3.40%	77.02%
GROUPE,BLACK	102,904	2.53%	79.55%
GROUPE,SNOWY	68,959	1.70%	81.25%
KING MACKEREL	61,016	1.50%	82.75%
SEA BASSE,ATLANTIC,BLACK,UNC	60,606	1.49%	84.24%
DOLPHINFISH	50,162	1.24%	85.48%
PORGY,RED,UNC	47,059	1.16%	86.64%
SNAPPER,MUTTON	45,057	1.11%	87.75%
SHARK,SANDBAR	44,004	1.08%	88.83%
GRUNTS	36,828	0.91%	89.74%
PORGY,JOLTHEAD	29,657	0.73%	90.47%
GRUNT,WHITE	27,815	0.69%	91.16%

STEP 3 – Identify trips that target co-occurring species.

Identify trips that caught at least 100 lbs (directed catch) of co-occurring species during a seasonal closure.

STEP 4 - Determine incidental catch.

This step determines the incidental catch red snapper during a seasonal closure. Trips that use diving gear or target red snapper (where > 300 lbs ww are caught) are dropped. This step does not take into consideration trips that will not be taken during a closure or ability of fishermen to avoid red snapper.

Table 31. Incidental catch of red snapper during a seasonal closure. Dead discards determined by applying 40% release mortality rate. Not adjusted for behavior.

Month	Tot WW	Tot GW	Avg GW	Dead discards
1	43,001	38,740	6,457	5,811
2	41,160	37,081	6,180	5,562
3	39,223	35,336	5,889	5,300
4	48,137	43,366	7,228	6,505
5	60,886	54,852	9,142	8,228
6	53,904	48,562	8,094	7,284
7	41,600	37,477	6,246	5,622
8	34,415	31,004	5,167	4,651
9	24,182	21,785	3,631	3,268
10	40,176	36,194	6,032	5,429
11	46,262	41,677	6,946	6,252
12	30,651	27,614	4,602	4,142
		sum	75,615	68,053

STEP 5 – Determine incidental catch for reduced trips after quota.

Assumption is that no trips would be reduced because of complete closure for red snapper since it is not likely that this is the primary species taken on trips.

Table 32. Dead discards (lbs gutted weight) of red snapper during a seasonal closure (Average 2001-2006). Dead discards determined by applying 90% release mortality rate. Assumes fishermen can avoid 0-60% of red snapper by fishing differently.

Month	Reduction			
	0%	20%	40%	60%
1	5,811	4,649	3,487	2,324
2	5,562	4,450	3,337	2,225
3	5,300	4,240	3,180	2,120
4	6,505	5,204	3,903	2,602
5	8,228	6,582	4,937	3,291
6	7,284	5,827	4,371	2,914
7	5,622	4,497	3,373	2,249
8	4,651	3,721	2,790	1,860
9	3,268	2,614	1,961	1,307
10	5,429	4,343	3,257	2,172
11	6,252	5,001	3,751	2,501
12	4,142	3,314	2,485	1,657
Total removals	68,053	54,443	40,832	27,221
Reduction in total removals (Effectiveness of closure)	49.2%	59.4%	69.5%	79.7%



### 2.1.2 Monthly reduction in total removals from commercial seasonal closure

Table 33. Monthly reduction in take based on 2001-2006 data if a seasonal closure is 100% effective.

Month	1	2	3	4	5	6	7	8	9	10	11	12
1	0.09	0.18	0.26	0.36	0.48	0.57	0.65	0.71	0.76	0.84	0.93	1.00
2		0.09	0.17	0.27	0.39	0.48	0.56	0.63	0.67	0.75	0.84	0.91
3			0.08	0.18	0.30	0.39	0.47	0.54	0.58	0.66	0.75	0.82
4				0.09	0.22	0.31	0.39	0.45	0.50	0.58	0.67	0.74
5					0.12	0.21	0.29	0.36	0.40	0.48	0.58	0.64
6						0.09	0.17	0.24	0.28	0.36	0.45	0.52
7							0.08	0.14	0.19	0.27	0.36	0.43
8								0.07	0.11	0.19	0.28	0.35
9									0.05	0.13	0.22	0.29
10										0.08	0.17	0.24
11											0.09	0.16
12												0.07

Table 34. Monthly reduction in take based on 2001-2006 data if a seasonal closure is 59% effective.

Month	1	2	3	4	5	6	7	8	9	10	11	12
1	0.05	0.11	0.16	0.21	0.28	0.34	0.38	0.42	0.45	0.50	0.55	0.59
2		0.05	0.10	0.16	0.23	0.29	0.33	0.37	0.40	0.45	0.50	0.54
3			0.05	0.11	0.18	0.23	0.28	0.32	0.35	0.39	0.45	0.49
4				0.06	0.13	0.18	0.23	0.27	0.30	0.34	0.40	0.44
5					0.07	0.13	0.17	0.21	0.24	0.29	0.34	0.38
6						0.06	0.10	0.14	0.17	0.22	0.27	0.31
7							0.05	0.09	0.11	0.16	0.21	0.26
8								0.04	0.07	0.11	0.17	0.21
9									0.03	0.07	0.13	0.17
10										0.05	0.10	0.14
11											0.05	0.09
12												0.04

## 2.2 Recreational

Table 35. Commercial, headboat, and MRFSS (A+B1) landings in pounds whole weight.

Year	ALS	HB	MRFSS
1986	202,468	48,991	102,264
1987	176,866	73,728	120,427
1988	159,443	117,178	202,698
1989	241,755	63,779	242,157
1990	200,742	59,176	103,875
1991	132,881	64,891	118,480
1992	91,926	26,050	556,498
1993	204,283	38,484	127,557
1994	182,043	38,753	180,644
1995	166,342	51,778	59,463
1996	129,789	41,652	95,682
1997	102,111	46,130	80,095
1998	81,463	24,187	103,570
1999	85,786	39,241	152,641
2000	95,214	44,506	450,378
2001	178,579	61,607	318,580
2002	171,686	63,780	352,170
2003	146,579	37,255	233,616
2004	154,419	72,380	264,790
2005	118,924	52,878	236,294
2006	81,000	37,325	216,393
2007	91,475	0	266,008

### 2.2.1 Headboat

Six steps were taken to determine the effectiveness of a closure for the headboat fishery. Headboat data from 2001-2006 were examined to identify species most commonly caught on trips with red snapper by restricting trips to those that caught at least 1 of red snapper. Incidental catch during a seasonal closure was determined by identifying trips that caught co-occurring species; and calculating the catch of red snapper on those trips.

There is a possibility some trips would not be taken during a seasonal closure for species such as gag or vermilion snapper. However, it was assumed that there would not be any reduction in trips made if red snapper was closed. The ability to avoid red snapper was considered by adjusting values by 0 to 60% to account for fishermen's ability to avoid red snapper by changing hook size, location, and fishing methods. Dead discards were determined by applying a 40% release mortality rate for red snapper (SEDAR 15 2008). Effectiveness of closure was determined by comparing the magnitude of dead discards to actual landings. Effectiveness of a closure for red snapper could be increased by closing co-occurring species.

STEP 1 - Determine landings of red snapper during 2001-2006

Table 36. Landings of red snapper during 2001-2006 from headboat.

Month	tot ww	tot gw	avg gw
1	10,355	9,329	1,555
2	17,546	15,807	2,634
3	27,872	25,109	4,185
4	37,900	34,144	5,691
5	52,331	47,145	7,857
6	38,459	34,648	5,775
7	37,148	33,466	5,578
8	37,448	33,737	5,623
9	19,491	17,560	2,927
10	34,035	30,662	5,110
11	28,747	25,898	4,316
12	19,669	17,719	2,953

54,204

STEP 2 - Identify most common species taken with red snapper

Table 37. Species most commonly taken on trips where at least 1 red snapper was caught. Represents sample (catch in numbers) during 2001-2005 not total catch.

Species	sum	Percent	Cum %
Vermilion Snapper	405,485	50.34%	50.34%
Black Sea Bass	98,090	12.18%	62.52%
Tomtate	48,416	6.01%	68.53%
White Grunt	31,711	3.94%	72.46%
Gray Triggerfish	27,885	3.46%	75.93%
Red Porgy	25,053	3.11%	79.04%
Red Snapper	20,870	2.59%	81.63%
Spottail Pinfish	20,388	2.53%	84.16%
Banded Rudderfish	11,744	1.46%	85.62%
Scamp	11,643	1.45%	87.06%
Mutton Snapper	10,955	1.36%	88.42%
Sharpnose Shark	10,893	1.35%	89.77%
Lane Snapper	8,367	1.04%	90.81%
Knobbed Porgy	7,954	0.99%	91.80%

STEP 3 – Identify trips that target co-occurring species.

Identify trips that caught of co-occurring species during a seasonal closure.

STEP 4 - Determine incidental catch.

This step determines the incidental catch red snapper during a seasonal closure. This step does not take into consideration trips that will not be taken during a closure or ability of fishermen to avoid red snapper.

Table 38. Incidental catch (numbers) of red snapper during a seasonal closure. Dead discards determined by applying 40% release mortality rate. Value represents sample, not total catch.

Species	sum	dead discards
Red Snapper	20,265	8,106

STEP 5 – Determine effectiveness of closure.

A comparison of the estimate of dead discards (8,106) in step 4 to sampled catch in step 2 (20,870) indicates during a complete prohibition in catch of red snapper by headboat 38.8% would be discarded and die due to incidental catch.

STEP 6 – Determine dead discards for reduced trips and behavior after quota. This step assumes that fishermen could have the ability to avoid red snapper by fishing differently.

Table 39. Dead discards (lbs gutted weight) of red snapper during a seasonal closure (Average 2001-2006). Dead discards determined by applying 40% release mortality rate. Assumes fishermen can avoid 0-60% of red snapper by fishing differently.

Month	Reduction			
	0%	20%	40%	60%
1	604	483	362	242
2	1,023	819	614	409
3	1,625	1,300	975	650
4	2,210	1,768	1,326	884
5	3,052	2,442	1,831	1,221
6	2,243	1,794	1,346	897
7	2,166	1,733	1,300	867
8	2,184	1,747	1,310	874
9	1,137	909	682	455
10	1,985	1,588	1,191	794
11	1,677	1,341	1,006	671
12	1,147	918	688	459
Number that die	21,053	16,843	12,632	8,421
Percent that live	61.2%	68.9%	76.7%	84.5%
Percent that die	38.8%	31.1%	23.3%	15.5%

## 2.2.2 Monthly reduction in total removals from headboat seasonal closure

Table 40. Monthly reduction in take based on 2001-2006 data if a seasonal closure is 100% effective.

Month	1	2	3	4	5	6	7	8	9	10	11	12
1	0.03	0.08	0.15	0.26	0.40	0.51	0.61	0.72	0.77	0.87	0.95	1.00
2		0.05	0.13	0.23	0.38	0.48	0.59	0.69	0.74	0.84	0.92	0.97
3			0.08	0.18	0.33	0.43	0.54	0.64	0.69	0.79	0.87	0.92
4				0.10	0.25	0.36	0.46	0.56	0.62	0.71	0.79	0.85
5					0.14	0.25	0.35	0.46	0.51	0.61	0.69	0.74
6						0.11	0.21	0.31	0.37	0.46	0.54	0.60
7							0.10	0.21	0.26	0.35	0.43	0.49
8								0.10	0.16	0.25	0.33	0.39
9									0.05	0.15	0.23	0.28
10										0.09	0.17	0.23
11											0.08	0.13
12												0.05

Table 41. Monthly reduction in take based on 2001-2006 data if a seasonal closure is 69% effective.

Month	1	2	3	4	5	6	7	8	9	10	11	12
1	0.02	0.05	0.11	0.18	0.28	0.35	0.42	0.49	0.53	0.60	0.65	0.69
2		0.03	0.09	0.16	0.26	0.33	0.40	0.47	0.51	0.58	0.63	0.67
3			0.05	0.13	0.23	0.30	0.37	0.44	0.48	0.54	0.60	0.64
4				0.07	0.17	0.25	0.32	0.39	0.43	0.49	0.55	0.58
5					0.10	0.17	0.24	0.32	0.35	0.42	0.47	0.51
6						0.07	0.14	0.22	0.25	0.32	0.37	0.41
7							0.07	0.14	0.18	0.24	0.30	0.34
8								0.07	0.11	0.17	0.23	0.27
9									0.04	0.10	0.16	0.19
10										0.06	0.12	0.16
11											0.05	0.09

### 2.2.3 MRFSS

Six steps were taken to determine the effectiveness of a closure for the recreational (MRFSS) fishery. MRFSS data from 2001-2006 were examined to identify species most commonly caught on trips with red snapper by restricting trips to those that caught at least 1 red snapper. Incidental catch during a seasonal closure was determined by identifying trips that caught co-occurring species; and calculating the catch of red snapper on those trips.

There is a possibility some trips would not be taken during a seasonal closure for species such as gag or vermilion snapper. However, it was assumed that there would not be any reduction in trips made if red snapper was closed. The ability to avoid red snapper was considered by adjusting values by 0 to 60% to account for fishermen’s ability to avoid red snapper by changing hook size, location, and fishing methods. Dead discards were determined by applying a 40% release mortality rate for red snapper (SEDAR 15 2008). Effectiveness of closure was determined by comparing the magnitude of dead discards to actual landings.

#### STEP 1 - Determine landings of red snapper during 2001-2006

Table 42. Landings of red snapper during 2001-2006 from MRFSS Web site.

Month	tot ww	tot gw	avg gw
1	135,745	122,292	20,382
2	135,745	122,292	20,382
3	182,995	164,860	27,477
4	182,995	164,860	27,477
5	187,118	168,574	28,096
6	187,118	168,574	28,096
7	109,456	98,609	16,435
8	109,456	98,609	16,435
9	114,634	103,273	17,212
10	114,634	103,273	17,212
11	170,176	153,312	25,552
12	170,176	153,312	25,552

270,307

#### STEP 2 - Identify most common species taken with red snapper

Table 43. Species most commonly taken on trips where at least 1 red snapper was caught. Represents sample (A+B1 in numbers) during 2001-2005 not total catch.

Species	sum	percent	cum per
vermillion snapper	4,278	26.91%	26.91%
black sea bass	3,271	20.58%	47.49%
red snapper	1,300	8.18%	55.66%
white grunt	903	5.68%	61.34%
gray triggerfish	804	5.06%	66.40%
greater amberjack	386	2.43%	68.83%
red porgy	351	2.21%	71.04%
Gag	345	2.17%	73.21%
Tomtate	341	2.15%	75.35%
king mackerel	335	2.11%	77.46%
gray snapper	330	2.08%	79.54%
atlantic sharpnose shark	308	1.94%	81.47%
round scad	297	1.87%	83.34%
Scamp	210	1.32%	84.66%
lane snapper	209	1.31%	85.98%
Dolphin	198	1.25%	87.22%
spanish sardine	171	1.08%	88.30%
spottail pinfish	142	0.89%	89.19%
red grouper	126	0.79%	89.99%
almaco jack	109	0.69%	90.67%

STEP 3 – Identify trips that target co-occurring species.

Identify trips that caught of co-occurring species during a seasonal closure.

STEP 4 - Determine incidental catch.

This step determines the incidental catch red snapper during a seasonal closure. This step does not take into consideration trips that will not be taken during a closure or ability of fishermen to avoid red snapper.

Table 44. Incidental catch (numbers) of red snapper during a seasonal closure. Dead discards determined by applying 40% release mortality rate. Value represents sample, not total catch.

Species	sum	dead discards
Red Snapper	1,166	466.4

STEP 5 – Determine effectiveness of closure.

A comparison of the estimate of dead discards (466) in step 4 to sampled catch in step 2 (1,300) indicates during a complete prohibition in catch of red snapper by recreational fishermen 35.9% could still die when due to incidental catch.

STEP 6 – Determine dead discards for reduced trips and behavior after quota. This step assumes that fishermen could have the ability to avoid red snapper by fishing differently.

Table 45. Dead discards (lbs gutted weight) of red snapper during a seasonal closure (Average 2001-2006). Dead discards determined by applying 40% release mortality rate. Assumes fishermen can avoid 0-60% of red snapper by fishing differently.

Month	Reduction			
	0%	20%	40%	60%
1	7,312	5,850	4,387	2,925
2	7,312	5,850	4,387	2,925
3	9,858	7,886	5,915	3,943
4	9,858	7,886	5,915	3,943
5	10,080	8,064	6,048	4,032
6	10,080	8,064	6,048	4,032
7	5,896	4,717	3,538	2,359
8	5,896	4,717	3,538	2,359
9	6,175	4,940	3,705	2,470
10	6,175	4,940	3,705	2,470
11	9,167	7,334	5,500	3,667
12	9,167	7,334	5,500	3,667
Number that die	96,978	77,582	58,187	38,792
Percent that live	64.1%	71.3%	78.5%	85.6%
Percent that die	35.9%	28.7%	21.5%	14.4%

### 2.2.4 Monthly reduction in total removals from MRFSS seasonal closure

Table 46. Monthly reduction in take based on 2001-2006 data if a seasonal closure is 100% effective.

Month	1	2	3	4	5	6	7	8	9	10	11	12
1	0.08	0.15	0.25	0.35	0.46	0.56	0.62	0.68	0.75	0.81	0.91	1.00
2		0.08	0.18	0.28	0.38	0.49	0.55	0.61	0.67	0.74	0.83	0.92
3			0.10	0.20	0.31	0.41	0.47	0.53	0.60	0.66	0.75	0.85
4				0.10	0.21	0.31	0.37	0.43	0.49	0.56	0.65	0.75
5					0.10	0.21	0.27	0.33	0.39	0.46	0.55	0.65
6						0.10	0.16	0.23	0.29	0.35	0.45	0.54
7							0.06	0.12	0.19	0.25	0.34	0.44
8								0.06	0.12	0.19	0.28	0.38
9									0.06	0.13	0.22	0.32
10										0.06	0.16	0.25
11											0.09	0.19
12												0.09



Table 47. Monthly reduction in take based on 2001-2006 data if a seasonal closure is 71.3% effective.

Month	1	2	3	4	5	6	7	8	9	10	11	12
1	0.05	0.11	0.18	0.25	0.33	0.40	0.44	0.49	0.53	0.58	0.65	0.71
2		0.05	0.13	0.20	0.27	0.35	0.39	0.43	0.48	0.52	0.59	0.66
3			0.07	0.14	0.22	0.29	0.34	0.38	0.43	0.47	0.54	0.61
4				0.07	0.15	0.22	0.26	0.31	0.35	0.40	0.47	0.53
5					0.07	0.15	0.19	0.23	0.28	0.33	0.39	0.46
6						0.07	0.12	0.16	0.21	0.25	0.32	0.39
7							0.04	0.09	0.13	0.18	0.24	0.31
8								0.04	0.09	0.13	0.20	0.27
9									0.05	0.09	0.16	0.23
10										0.05	0.11	0.18
11											0.07	0.13
12												0.07

### 2.3 Reduction in total removals from prohibition in catch of red snapper

Methodology is similar to determining effectiveness of seasonal closure with exception that reductions are applied to landings and discards in numbers for the sectors.

STEP 1 - Determine landings in numbers for red snapper during 2001-2006 using information from SEDAR 15 (2008).

STEP 2 – Determine average landings in lbs from logbook and average sampled landings from Headboat and MRFSS in numbers for 2001-2006.

STEP 3 - Identify most common species taken with red snapper.

- Logbook data from 2001-2006 were examined to identify species most commonly caught on trips with red snapper by restricting trips to those that caught at least 1 lb of red snapper.
- Headboat and MRFSS data from 2001-2006 were examined to identify species most commonly caught on trips with red snapper by restricting trips to those that caught at least 1 red snapper.

STEP 4 – Identify trips that target co-occurring species.

STEP 5 - Determine incidental catch.

- For the commercial sector, incidental catch during a seasonal closure was determined by identifying trips that targeted (caught at least 100 lbs) of co-occurring species; and calculating the catch of red snapper on those trips. Trips targeting red snapper were removed from analyses assuming that targeting would not occur in the future. A trip would be considered to be targeting red snapper if greater than 300 lb whole weight of the landings on a trip included the species. In addition, trips that employed diving gear, were not considered in analyses since fishermen can recognize a species before it is captured.
- For the recreational sector, incidental catch during a seasonal closure was determined by identifying trips that caught co-occurring species; and calculating the catch of red snapper on those trips.

- STEP 6 – Determine total removals for reduced trips and behavior after quota. This step assumes that fishermen could have the ability to avoid red snapper by fishing differently.
- STEP 7 – Compare estimate of total removals in step 6 to landings for database in step 2.
- STEP 8 – Apply reduction in total removals to landings and discards in step 1.

Landings and discards in numbers is provided by the SEDAR 15 (2008) stock assessment. The stock assessment provides the number of dead discards that could be taken and allow the stock to rebuild if there was no allowable catch. This value is 37,000 individuals (Table 48). A lower value would be needed if rebuilding at Foy or F40%.

Table 48. Table 3.24 from red snapper SEDAR 15 (2008) stock assessment

*Table 3.24. Red snapper: Projection results under scenario 11—Discard-only projection with fishing rate fixed at  $F = F_{rebuild}$ , given release mortality rates of 0.9 in the commercial sector and 0.4 in the headboat and general recreational sectors.  $F$  = fishing rate (per year),  $F_{mort}$  = fishing rate leading to discard mortality (a portion of  $F$ ),  $SSB$  = mid-year spawning stock biomass (mt),  $R$  = recruits (1000 fish),  $L$  = landings (1000 lb whole weight), and  $D$  = discard mortalities (1000 fish). For reference, the target for rebuilding is  $SSB_{MSY} = 5184$ .*

Year	F(per yr)	Fmort (per yr)	SSB(mt)	R(1000)	L(1000 lb)	D(1000)
2007	0.998	0.998	161	269	562	130
2008	0.998	0.998	125	273	420	123
2009	0.262	0.189	106	233	0	37
2010	0.262	0.189	262	208	0	47
2011	0.262	0.189	394	354	0	59
2012	0.262	0.189	556	421	0	78
2013	0.262	0.189	760	473	0	99
2014	0.262	0.189	1003	514	0	117
2015	0.262	0.189	1278	545	0	135
2016	0.262	0.189	1575	568	0	151
2017	0.262	0.189	1884	586	0	166
2018	0.262	0.189	2195	598	0	179
2019	0.262	0.189	2501	608	0	190
2020	0.262	0.189	2794	615	0	200
2021	0.262	0.189	3071	621	0	209
2022	0.262	0.189	3329	625	0	217
2023	0.262	0.189	3565	629	0	223
2024	0.262	0.189	3781	632	0	229
2025	0.262	0.189	3975	634	0	234
2026	0.262	0.189	4148	636	0	238
2027	0.262	0.189	4303	637	0	242
2028	0.262	0.189	4440	638	0	245
2029	0.262	0.189	4560	640	0	248
2030	0.262	0.189	4666	640	0	250
2031	0.262	0.189	4759	641	0	252
2032	0.262	0.189	4839	642	0	254
2033	0.262	0.189	4910	642	0	256
2034	0.262	0.189	4971	643	0	257
2035	0.262	0.189	5024	643	0	258
2036	0.262	0.189	5070	643	0	259
2037	0.262	0.189	5110	644	0	260
2038	0.262	0.189	5145	644	0	261
2039	0.262	0.189	5174	644	0	261
2040	0.262	0.189	5200	644	0	262

Table 49 indicates the average catch of red snapper during 2001-2006 was 65,115 individuals and the total number of discards (live and dead) was 214,155. If all catch of red snapper was prohibited and there was no reduction in fishing effort the total removals, which would be dead discards, would be 129,016 individuals. Projections from SEDAR 15 (2008) indicate if all catch of red snapper was prohibited, the allowable number of dead discards would be 37,000 individuals. A lower number would be required to achieve the yield at Foy or F40%.

Table 49. Number of red snapper landed and discarded by sector during 2001-2006 and number of dead discards that would occur if all catch of red snapper was prohibited.

Item	Comm	MRFSS	HB	Total
Current landings	15,825	39,897	9,393	65,115
Current discards	18,792	158,288	37,075	214,155
Current landings and all discards	34,617	198,185	46,468	279,270
Dead discards	31,155	79,274	18,587	129,016

Although a large number of red snapper are probably taken when targeting co-occurring species, there is probably some degree of targeting. If one assumes that during a closure red snapper are only taken when targeting major co-occurring species, some trips will not be taken during a seasonal closure for gag, and fishermen have some ability to avoid red snapper by avoiding locations and changing fishing gear, then the number of dead discards would be expected to be lower (Table 50).

Table 50. Current total removals (landings and dead discards) of red snapper by sector in number during 2001-2006, total removals (number) assuming fishermen cannot avoid red snapper incidental catch, and reduction in total removals assuming fishermen can avoid 20% of red snapper incidental catch.

Item	Comm	MRFSS	HB	Total
Current landings and dead discards	32,737	103,212	24,223	160,173
Total removals assuming 0% avoidance	18,480	37,029	9,408	64,917
Total removals assuming 20% avoidance	14,784	29,624	7,527	51,934

Table 51. Current total removals (landings and dead discards) of red snapper by sector in number during 2001-2006, total removals (number) assuming fishermen cannot avoid red snapper incidental catch, and reduction in total removals assuming fishermen can avoid 20% of red snapper incidental catch. This assumes there would be a January-April seasonal closure for gag and 20% of the trips would not be made during vermilion snapper and gag seasonal closures.

Item	Comm	MRFSS	HB	Total
Current landings and dead discards	32,737	103,212	24,223	160,173
Dead discards assuming 0% avoidance	13,358	33,419	9,408	56,186
Dead discards assuming 20% avoidance	10,686	26,736	7,527	44,948

## 2.4 Locations where red snapper are caught

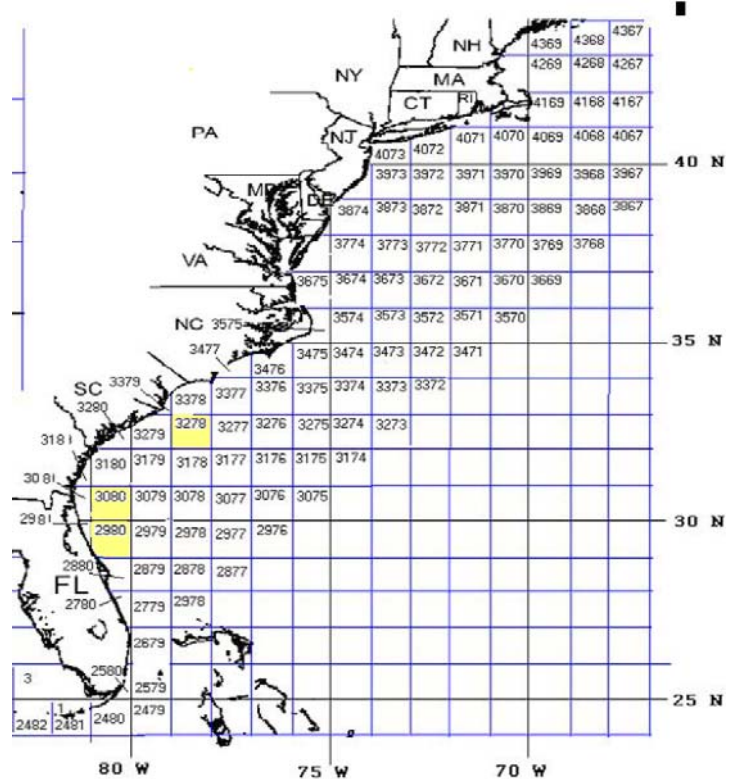
### 2.4.1 Commercial

Table 52. Commercial landings (pounds whole weight) of red snapper by statistical grid 2001-2006. Shaded area represents locations where 53% of the red snapper were caught.

Grid	Average	2001-06	Percent
2479	6	37	0.00%
2480	485	2,912	0.36%
2481	1,054	6,323	0.79%
2482	1,490	8,941	1.12%
2579	104	621	0.08%
2580	192	1,153	0.14%
2679	347	2,084	0.26%
2680	24	145	0.02%
2779	210	1,257	0.16%
2780	450	2,698	0.34%
2878	13	80	0.01%
2879	1,198	7,187	0.90%
2880	5,813	34,880	4.36%
2978	39	235	0.03%
2979	253	1,520	0.19%
2980	23,489	140,932	17.63%
2981	499	2,995	0.37%
3076	89	535	0.07%
3079	1,333	8,000	1.00%
3080	33,068	198,408	24.83%
3081	5,282	31,694	3.97%
3174	2	13	0.00%
3175	28	167	0.02%
3177	411	2,467	0.31%
3178	550	3,299	0.41%
3179	11,234	67,402	8.43%
3180	6,469	38,816	4.86%
3181	31	189	0.02%
3275	5	32	0.00%
3276	101	606	0.08%
3277	334	2,005	0.25%
3278	13,375	80,250	10.04%
3279	10,221	61,327	7.67%
3280	781	4,684	0.59%
3372	11	66	0.01%
3374	27	164	0.02%
3375	132	789	0.10%
3376	556	3,334	0.42%
3377	3,767	22,604	2.83%
3378	9,494	56,963	7.13%

Grid	Average	2001-06	Percent
3472	112	675	0.08%
3473	1	9	0.00%
3474	695	4,172	0.52%
3475	142	851	0.11%
3476	7,092	42,553	5.32%
3477	972	5,835	0.73%
3571	14	87	0.01%
3572	242	1,451	0.18%
3573	59	355	0.04%
3574	2,821	16,929	2.12%
3575	98	591	0.07%
3576	1	3	0.00%
3674	3	16	0.00%

799,207



3379	231	1,385	0.17%
3471	1	9	0.00%

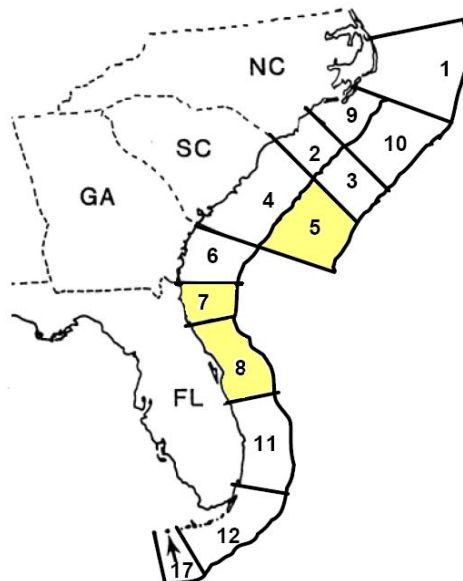
## 2.4.2 Headboat

Table 53. Headboat landings (pounds whole weight) of red snapper by area code 2001-2006. Shaded area represents locations where 74% of the red snapper were caught.

Area Code	Description	Average	2001-2006	Percentage
3	CAPE FEAR, NC (OFFSHORE) TOPSAIL ISLAND - OCEAN ISLE BEACH, NC	1,957	11,742	3.25%
4	SOUTH CAROLINA (INSHORE)	1,409	8,454	2.34%
5	SOUTH CAROLINA (OFFSHORE)	12,660	75,962	21.04%
6	GEORGIA	5,627	33,759	9.35%
7	FERNANDINA BEACH -ST. AUGUSTINE, FL	14,250	85,498	23.68%
8	DAYTONA BEACH - SEBASTIAN, FL	17,375	104,250	28.88%
9	CAPE LOOKOUT (INSHORE) MOREHEAD CITY - SNEADS FERRY, NC	44	262	0.07%
10	CAPE LOOKOUT (OFFSHORE) MOREHEAD CITY - SNEADS FERRY, NC	4,878	29,268	8.11%
11	FORT PIERCE - MIAMI, FL	1,706	10,238	2.84%
12	KEY LARGO - KEY WEST, FL	135	807	0.22%
17	DRY TORTUGAS, FLORIDA (Vessels docked in FL Keys)	127	760	0.21%

361,000

3



### 3.1.1 MRFSS

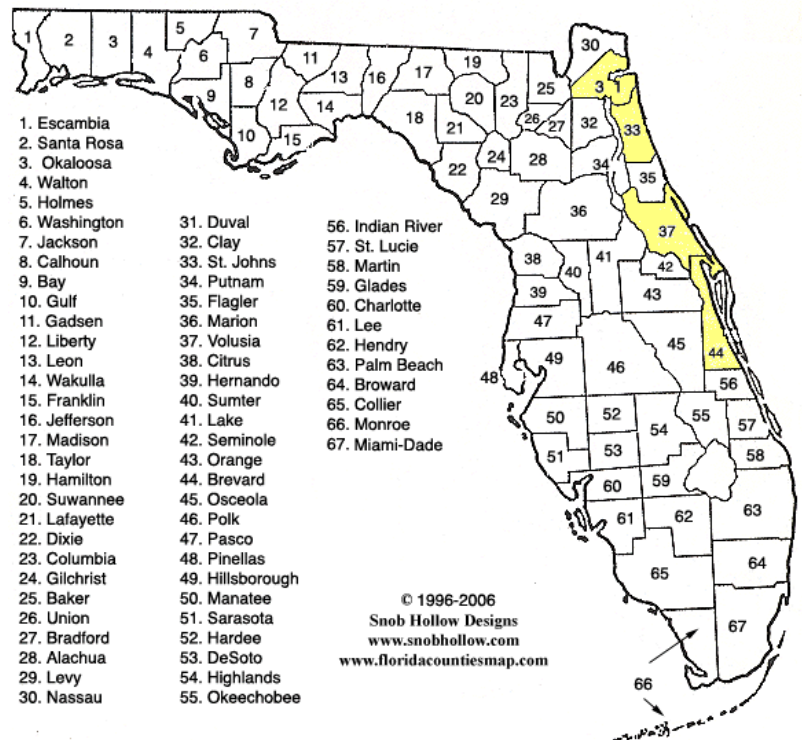
Table 54. Locations where red snapper were caught during 2001-2005. Represents sample and not adjusted for effort. Shaded area represents locations where 69% of the red snapper were taken.

East FL Counties	unadjusted number	percent
Dade	3.17	0.61%
Broward	0	0.00%
Palm Beach	2.7	0.52%
Martin	4.75	0.92%
Indian River	7.67	1.49%
Brevard	59.1	11.45%
Volusia	123.03	23.83%
St. Johns	58.87	11.40%
Duval	61.1	11.84%
Nassau	4.53	0.88%

Georgia	unadjusted number	percent
Bryan	0	0.00%
Camden	1	0.19%
Clay	45.9	8.89%
Glynn	14.48	2.80%
Early	0.2	0.04%
McIntosh	0	0.00%

South Carolina	unadjusted number	percent
Beaufort	5	0.97%
Charleston	5.85	1.13%
Georgetown	53.27	10.32%
Horry	16.33	3.16%

North Carolina	unadjusted number	percent
Brunswick	1.53	0.30%
Carteret	35.47	6.87%
Dare	0.5	0.10%
Davie	4.9	0.95%



516.23

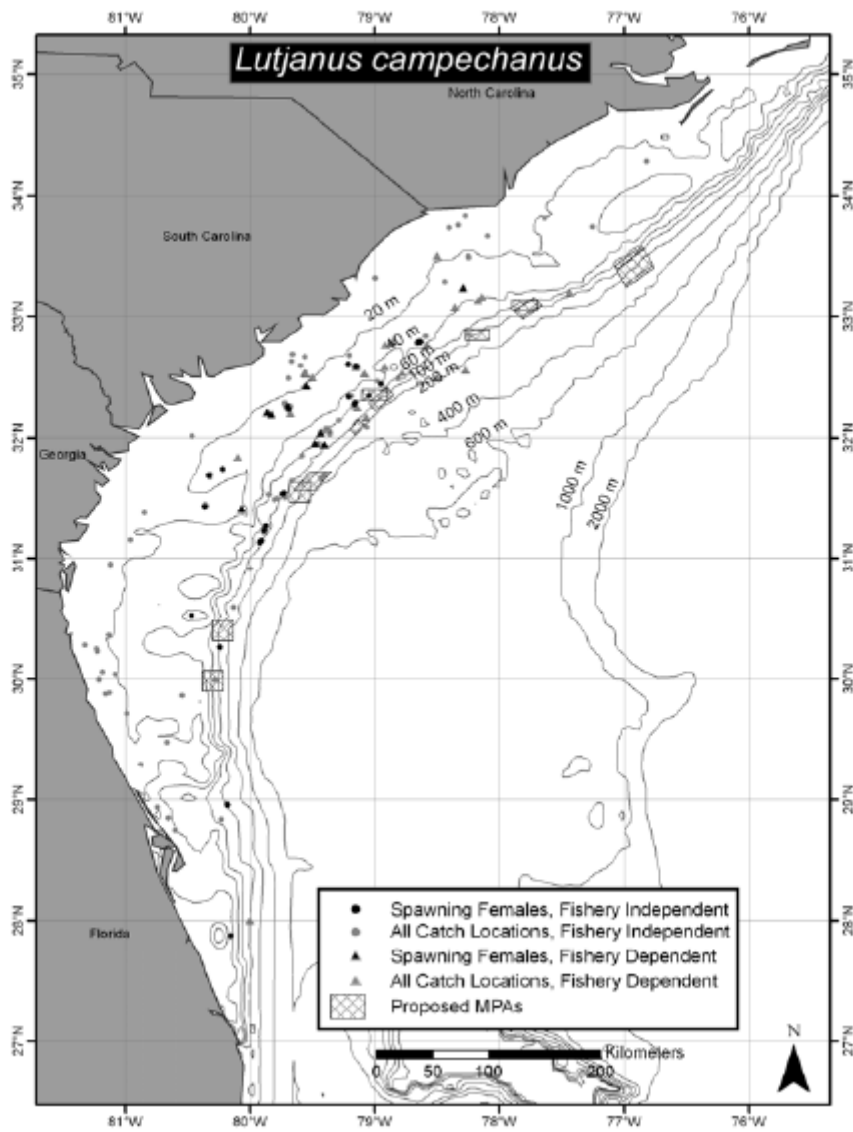


## 4 Commercial Trip Limit Analysis

Table 55. Trip limit analysis for red snapper data from 2001-2006.

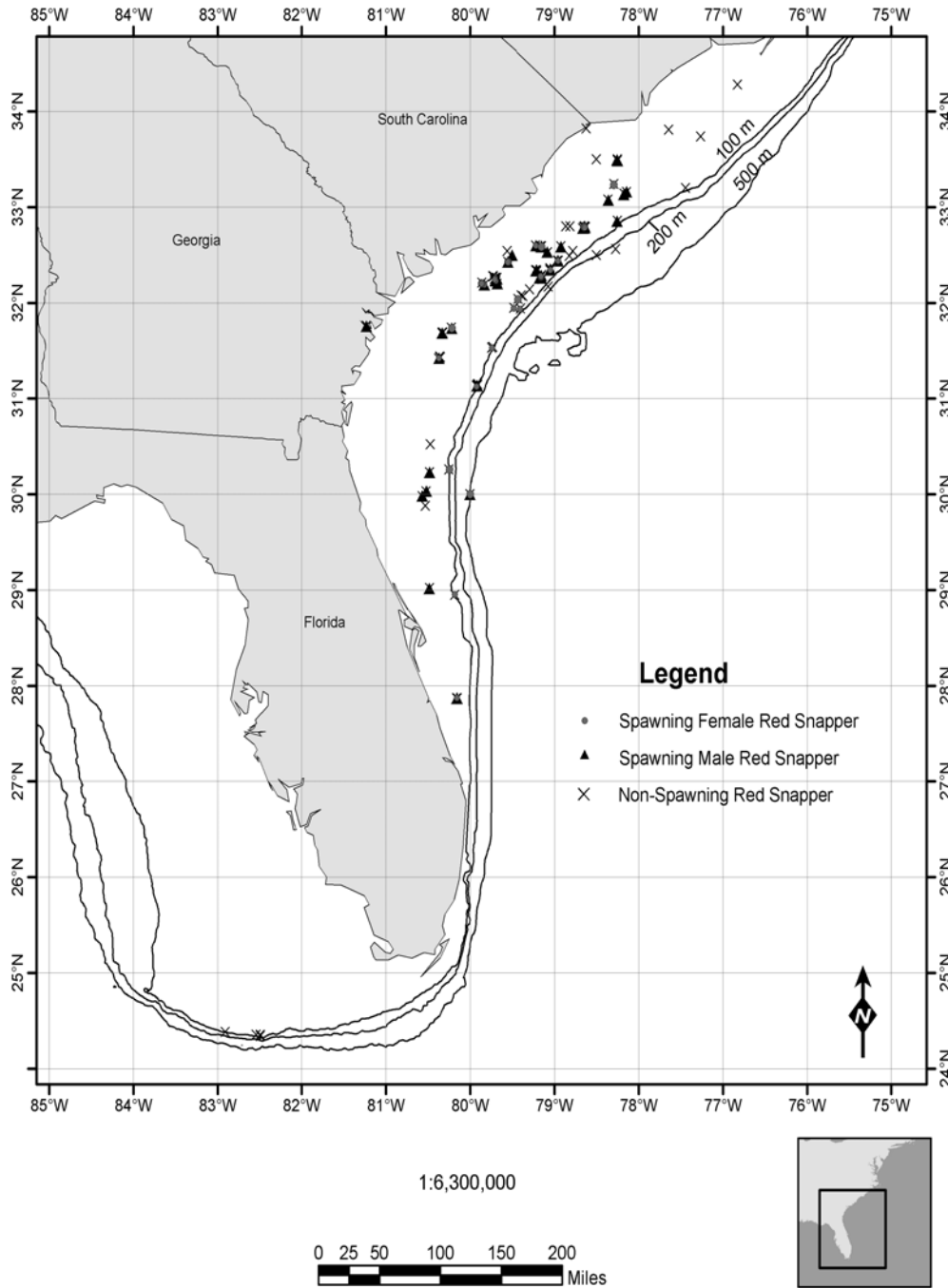
Avg 2001-2006					
Trip Limit (lbs gutted weight)	Avg no. trips	Avg pounds over limit	Expected catch	% trips over limit	% reduction in catch from limit
0	1,751.2	148,689	0	100.0%	100.0%
23	1,028.7	113,738	34,952	58.7%	76.5%
45	689.5	92,679	56,010	39.4%	62.3%
68	505.7	77,849	70,840	28.9%	52.4%
90	386.7	66,826	81,863	22.1%	44.9%
135	256.7	51,019	97,671	14.7%	34.3%
225	136.8	32,205	116,484	7.8%	21.7%
270	102.7	26,241	122,448	5.9%	17.6%
450	41.3	12,926	135,763	2.4%	8.7%
541	26.7	9,568	139,122	1.5%	6.4%
631	17.7	7,329	141,360	1.0%	4.9%
721	12.7	5,805	142,885	0.7%	3.9%
811	9.8	4,675	144,014	0.6%	3.1%
901	7.7	3,793	144,896	0.4%	2.6%
991	5.8	3,145	145,544	0.3%	2.1%
1,081	4.3	2,650	146,039	0.2%	1.8%
1,171	3.3	2,278	146,411	0.2%	1.5%
1,261	2.8	1,965	146,724	0.2%	1.3%
1,351	2.2	1,732	146,957	0.1%	1.2%
1,441	1.8	1,533	147,156	0.1%	1.0%
1,532	1.8	1,350	147,339	0.1%	0.9%
1,622	1.5	1,193	147,496	0.1%	0.8%
1,712	1.2	1,048	147,641	0.1%	0.7%
1,802	1.2	932	147,758	0.1%	0.6%
2,027	0.8	695	147,994	0.0%	0.5%
2,252	0.5	513	148,177	0.0%	0.3%
2,477	0.3	394	148,296	0.0%	0.3%
2,703	0.3	310	148,379	0.0%	0.2%
2,928	0.2	258	148,431	0.0%	0.2%
3,153	0.2	217	148,472	0.0%	0.1%
3,378	0.2	175	148,514	0.0%	0.1%
3,604	0.2	133	148,556	0.0%	0.1%
3,829	0.2	92	148,597	0.0%	0.1%
4,054	0.2	50	148,639	0.0%	0.0%
4,279	0.2	8	148,681	0.0%	0.0%
4,505	0.0	0	148,689	0.0%	0.0%

## 5 Spawning locations for red snapper



From Sedberry et al. (2006)

## 6 Locations where Red Snapper Were Collected



## 7 Species descriptions of red snapper

The red snapper is found from North Carolina to the Florida Keys, and throughout the Gulf of Mexico to the Yucatan (Robins and Ray 1986). It can be found at depths from 10 to 190 m (33-623 ft). Adults usually occur over rocky bottoms. Juveniles inhabit shallow waters and are common over sandy or muddy bottom habitat (Allen 1985).



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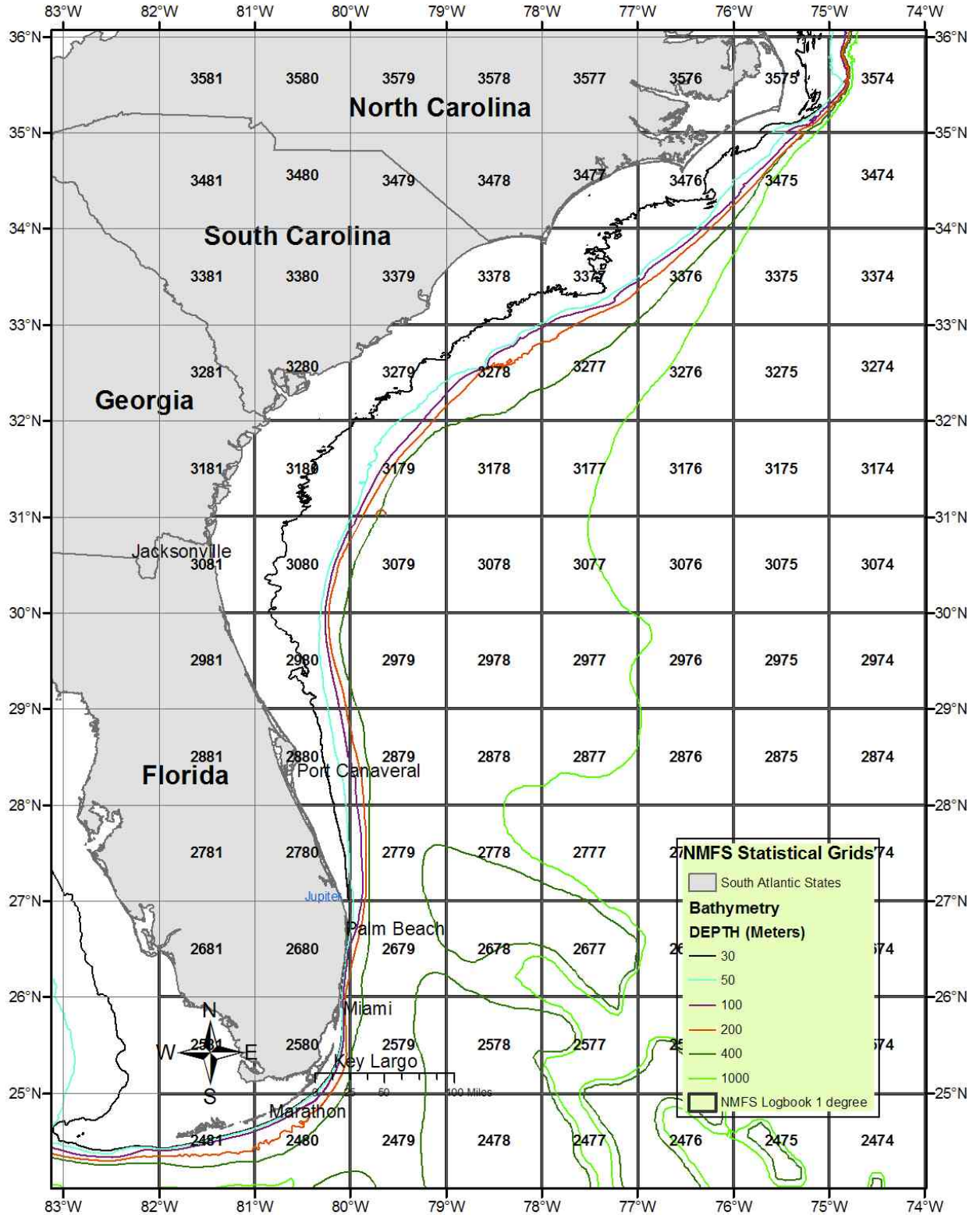
The maximum size reported for this species is 100 cm (39.7 in) TL (Allen 1985, Robins and Ray 1986) and 22.8 kg (50 lbs) (Allen 1985). Maximum reported age in the Gulf of Mexico is reported as 53 years by Goodyear (1995) and 57 years by Allman et al. (2002). For samples collected from North Carolina to eastern Florida, maximum reported age is 45 years (White and Palmer 2004). McInerny (2007) reports a maximum age of 54 years red snapper in the South Atlantic. Natural mortality (M) is estimated to be 0.078 using the Hoenig (1983) method with a maximum age of 53 years (SEDAR 15 2008). Manooch et al. (1998) estimated M at 0.25 but the maximum age in their study was 25 years (Manooch and Potts 1997).

Red snapper are gonochorists. In the U.S. South Atlantic Bight and in the Gulf of Mexico, Grimes (1987) reported that size at first maturity is 23.7 cm (9.3 in) FL. For red snapper collected along the Southeastern United States, White and Palmer (2004) found that the smallest mature male was 20.0 cm (7.9 in) TL, and the largest immature male was 37.8 cm (15 in) TL. 50% of males are mature at 22.3 cm (8.8 in) TL, while 50% of females are mature at 37.8 cm (15 in) TL. Males are present in 86% of age 1, 91% of age 2, 100% of age 3, 98% of age 4, and 100% of older age fish. Mature females are present in 0% of age 1, 53% of age 2, 92% of age 3, 96% of age 4, and 100% of older age individuals. Grimes (1987) found that the spawning season of this species varies with location, but in most cases occurs nearly year round. White and Palmer (2004) reported that the spawning season for female red snapper off the southeastern United States extends from May to October, peaking in July through September. Red snapper eat fishes, shrimps, crabs, worms, cephalopods, and some planktonic items (Szedlemayr and Lee 2004).

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# Appendix C. Depth Contours and NMFS Logbook Grids



Prepared by Roger Pugliese, SAFMC (8/18/08)

**Appendix D. Overfishing Level (OFL) and Acceptable Biological Catch (ABC) recommendations from the SSC. Values are in lbs whole weight.**

Species	OFL	ABC
Black grouper <sup>1</sup>	208,552	187,697
Black sea bass <sup>2</sup>	912,713 <sup>3</sup>	847,000 <sup>4</sup>
Gag <sup>2</sup>	1,065,540 <sup>5</sup>	818,920 <sup>6</sup>
Golden tilefish <sup>2</sup>	336,425 <sup>7</sup>	326,554 <sup>7</sup>
Red grouper <sup>1</sup>	783,214	704,893
Red snapper <sup>2</sup>	55,000 <sup>8</sup>	42,000 <sup>8</sup>
Snowy grouper <sup>2</sup>	116,845 <sup>9</sup>	102,960 <sup>10</sup>
Speckled hind <sup>11</sup>	unknown	0
Vermilion snapper <sup>2</sup>	789,602 <sup>12</sup>	629,459 <sup>13</sup>
Warsaw grouper <sup>11</sup>	unknown	0

1. SSC recommended OFL based on average landings during 2003-2007 and ABC is 90% OFL. Landings include the Atlantic portion of Monroe County from ALS.
2. SSC recommended OFL = Yield at MFMT, ABC = Yield at 75%  $F_{MSY}$ .
3. From Amendment 15A based on projection from SEDAR 1 (2005). This would be the yield at  $F_{msy}$  in 2009 but would approximate the yield at Foy in 2010. Value adjusted for PQBM. (871,231 lbs ww when adjusted for dead discards.)
4. No value for the yield at Foy for 2009 is available. However, the 847,000 lbs ww value adopted by Amendment 15A is likely a good approximation of the yield at Foy for 2009. Value adjusted for PQBM (increased dead discards). This value represents TAC specified in Amendment 15A
5. From SEDAR 10 (2007), Table 40, converted to whole weight. Not adjusted for PQBM. Amendment 16 adjusts quota for PQBM. Recreational management measures includes expected dead discards as part of harvest using SEDAR accepted release mortality rates.
6. From SEDAR 10 (2007). Table 44, converted to whole weight. Not adjusted for PQBM. Amendment 16 adjusts quota (based on yield at Foy) for PQBM. Recreational management measures includes expected dead discards as part of harvest using SEDAR accepted release mortality rates. Proposed TAC for Amendment 16.
7. Values from SEDAR 4 (2004). Assumes stock is at equilibrium as assessment indicated biomass was very close to  $B_{MSY}$ .
8. From SEDAR 15 (2008) based on Tables 3.12 and 3.18. Does not adjust for PQBM. Not based on  $F_{40\%}$  as recommended at SEDAR 15 (2008). New values will be provided by Science Center.
9. Yield at  $F_{MSY}$  in 2010 from SEDAR 4 (2004) projection, not adjusted for increased dead discards. (109,890 lbs whole weight when adjusted for dead discards.)
10. TAC from Amendment 15A adjusted for dead discards based on SEDAR 4 (2004) projections. Would be yield at  $F_{MSY}$  in 2008 but would likely be close to yield at  $F_{OY}$  by 2010. Value adjusted for increased dead discards.
11. The SSC recommended no allowable harvest for speckled hind and warsaw grouper. SSC did not recommend fishing mortality be set to 0 for these species.
12. Calculated from Baranov equation where 04-06 avg landings = 1,611,433 lbs ww,  $m = 0.25$ , avg  $F = 0.9098$ . Not adjusted for PQBM. Amendment 16 adjusts quota for PQBM. Recreational management measures considers expected dead discards as part of harvest using SEDAR accepted release mortality rates. New benchmark assessment scheduled for 2008 so values could be considered to be placeholder.

13. Yield at OY recommended by SSC for Amendment 16 and proposed TAC. Amendment 16 adjusts quota (based on yield at Foy) for PQBM. Recreational management measures considers expected dead discards as part of harvest using SEDAR accepted release mortality rates. New benchmark assessment scheduled for 2008 so values could be considered to be placeholder.



**Appendix E. Commercial landings of snowy grouper by state.**

Table E-1. Average monthly commercial landings (lbs whole weight) of snowy grouper by state during 2001-2006. Note: Landings by month not reported for GA due to potential data confidentiality.

Month	FL	GA	SC	NC
1	8,066		2,539	2,604
2	9,631		4,068	5,527
3	9,145		8,992	6,549
4	10,470		10,603	14,337
5	10,097		8,075	18,118
6	10,192		9,484	13,556
7	5,477		7,972	10,011
8	6,699		3,996	7,204
9	5,483		3,085	4,496
10	7,372		3,500	1,969
11	4,061		3,698	800
12	4,426		2,324	675
Total	91,120	3,258	68,336	85,844
Percent	37%	1%	27%	35%

Table E-2. Percentage of snowy grouper landings by month for each state during 2001-2006. Note: Landings by month not reported for GA due to potential data confidentiality.

Month	FL	GA	SC	NC
1	9%		4%	3%
2	11%		6%	6%
3	10%		13%	8%
4	11%		16%	17%
5	11%		12%	21%
6	11%		14%	16%
7	6%		12%	12%
8	7%		6%	8%
9	6%		5%	5%
10	8%		5%	2%
11	4%		5%	1%
12	5%		3%	1%

Table E-3. Commercial lbs whole weight of snowy grouper. FL-NC landings from ALS. NJ landings from Web

Year	Florida	Georgia	South Carolina	North Carolina	New Jersey
1986	208,640	60,333	112,420	93,617	
1987	126,742	22,397	122,535	123,607	
1988	136,844	13,465	121,528	63,871	
1989	143,566	17,528	212,895	147,062	
1990	122,374	15,146	229,759	237,327	
1991	172,633	12,392	106,469	208,299	
1992	167,666	16,518	88,857	304,021	
1993	197,754	14,419	98,158	158,347	
1994	107,135	19,270	74,365	121,340	
1995	189,860	6,936	58,864	140,227	
1996	145,832	5,756	64,948	123,223	
1997	266,948	10,453	116,607	162,933	
1998	147,342	1,918	65,375	123,209	
1999	162,889	7,429	73,965	217,494	1,677
2000	137,698	3,599	71,390	186,787	625
2001	130,453	4,957	97,279	106,742	
2002	110,758	2,055	93,261	110,334	
2003	106,175	7,585	79,843	104,645	
2004	103,731	3,837	63,112	97,470	70
2005	102,856	2,549	71,952	86,021	
2006	91,158	2,083	78,373	102,567	
2007	80,690	63	6,555	48,281	

Table E-4. Headboat lbs whole weight for snowy grouper.

Year	South FL	GA and NFL	South Carolina	North Carolina
1986	351	26	3,571	283
1987	424	42	3,863	86
1988	238	55	2,930	57
1989	1,674		1,790	563
1990	723	22	1,939	162
1991	844	4	1,183	155
1992	195	35	413	234
1993	230	3	620	234
1994	112	5	525	88
1995	174	11	413	130
1996	732	11	2,471	208
1997	603	114	1,298	194
1998	507	51	177	563
1999	344	39	109	23
2000	417	41	13	42
2001	175	21	495	261
2002	147	17	313	101
2003	34	26	245	163
2004	262	26	2	97
2005	1,034	210	303	70
2006	42	33		594
2007	Not available			

Table E-5. MRFSS lbs whole weight for snowy grouper. There are no landings from MRFSS from the Mid-Atlantic States.

Year	Florida	Georgia	South Carolina	North Carolina
1986	0	0	0	0
1987	0	0	0	3,404
1988	3,578	0	0	99
1989	0	0	0	0
1990	0	0	0	287
1991	0	0	0	284
1992	0	0	0	0
1993	87,498	1,431	0	0
1994	0	0	0	0
1995	13,192	0	0	0
1996	0	0	0	1,005
1997	157,748	0	0	1,470
1998	5,814	0	0	0
1999	14,978	0	0	0
2000	963	0	0	0
2001	11,111	0	0	28,137
2002	130	0	0	8,382
2003	2,269	0	0	11,146
2004	22,516	0	0	4,010
2005	2,606	0	0	29,050
2006	152,997	0	0	13,904
2007	185	0	0	26,764