

## Appendix G. Bycatch Practicability Analysis

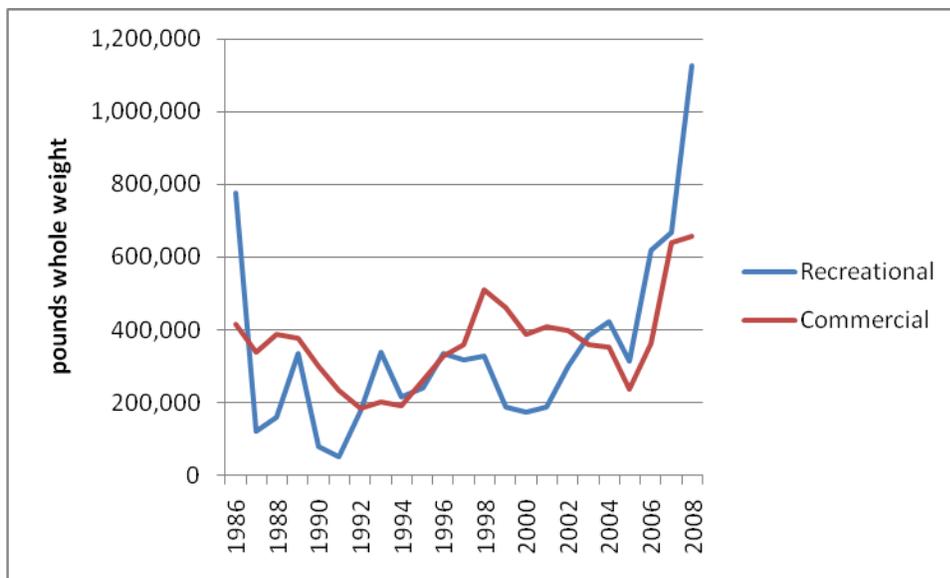
### 1. Population Effects for Bycatch Species

#### Background

The red grouper stock in the south Atlantic was assessed through the Southeast, Data, Assessment, and Review process in 2010. The assessment indicates the stock is experiencing overfishing and is overfished. The proposed actions in Amendment 24 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 24) includes the specification of the following: rebuilding plan; maximum sustainable yield; optimum yield; annual catch limits; annual catch targets; accountability measures; and allocations among sectors.

Red grouper is part of a multi-species fishery. Other species that are most likely to co-occur with red grouper in the landings databases include the following: gag, gray triggerfish, greater amberjack, red snapper, scamp, and vermilion snapper (SERO 2011).

During 2006-2008, the commercial sector accounted for 41% of the landings for red grouper, the recreational sector 59%. Landings for both sectors increased through 2008 (**Figure G-1**); however, a substantial decrease in 2010 landings was reported for commercial and recreational landings, which may be in response to the management measures enacted through Amendment 16 in July 2009. After confidential data are removed, 2010 commercial landings were 307,381 lbs whole weight ([http://www.st.nmfs.noaa.gov/pls/webpls/MF\\_ANNUAL\\_LANDINGS.RESULTS](http://www.st.nmfs.noaa.gov/pls/webpls/MF_ANNUAL_LANDINGS.RESULTS)). Non-confidential recreational landings for 2010 red grouper are 82,300 lbs whole weight ([http://www.st.nmfs.noaa.gov/pls/webpls/MR\\_CATCH\\_TIME\\_SERIES.RESULTS](http://www.st.nmfs.noaa.gov/pls/webpls/MR_CATCH_TIME_SERIES.RESULTS)).



**Figure G-1.** Reported landings of red grouper between 1986 and 2008 in the South Atlantic waters. Source: SEDAR 19 Assessment

The commercial sector landed the majority of scamp and vermilion snapper, while the recreational sector landed the majority of greater amberjack and red snapper (**Table G-1**).

**Table G-1.** Percentage of landings among the commercial, for-hire, private recreational sectors during 2005-2010.

Taxon	Commercial	For Hire	Private Recreational
gag	55%	13%	32%
gray triggerfish	44%	23%	33%
greater amberjack	48%	27%	24%
red snapper	26%	28%	46%
scamp	70%	18%	12%
speckled hind	52%	46%	2%
vermilion snapper	65%	28%	7%

Source: SEFSC ACL Dataset dated September 2011

### Commercial Fishery

During 2005 to 2010, approximately 20% of snapper grouper permitted vessels from the Gulf of Mexico and South Atlantic were randomly selected to fill out supplementary logbooks. The average number of trips per year during 2005 to 2010 was 14,372 (**Table G-2**). Fishermen spent an average of 1.68 days at sea per trip.

**Table G-2.** Snapper grouper fishery effort for South Atlantic.

YEAR	Trips	Days	Days per Trip
2005	13,766	22,846	1.66
2006	13,264	23,324	1.76
2007	14,886	24,510	1.65
2008	14,781	25,023	1.69
2009	15,888	26,580	1.67
2010	13,649	22,143	1.62
Mean	14,372	24,071	1.68

Source: NMFS SEFSC Logbook Program.

For species in snapper grouper fishery management unit (FMU), the number of commercial trips that reported discards was greatest for yellowtail snapper, red pogy, vermilion snapper, scamp, and black sea bass (**Table G-3**). **Table G-3** indicates many other species not included in the snapper grouper FMU including mackerel species, sharks, dolphin, and others are discarded by fishermen with federal commercial snapper grouper permits.

**Table G-3.** The 70 most commonly discarded species during 2005-2009 for the South Atlantic. Snapper grouper species are shaded in gray. Note: Represents total of unexpanded data during 2005-2009. 2010 data not available.

Species	Number of trips reported discarding the species	Number discarded
red porgy, unc	1,449	128,197
vermilion snapper	1,272	89,156
black sea bass, unc	896	69,027
knobbed porgy	503	27,924
yellowtail snapper	2,058	21,420
rough skin dogfish	85	14,807
red snapper	634	11,340
scamp	969	8,703
king mackerel	1,415	7,917
mangrove snapper	416	7,230
spottail pinfish	113	7,194
smooth dogfish	43	5,456
Atlantic sharpnose	204	5,055
menhaden	50	4,880
little tunny	140	4,189
greater amberjack	361	4,163
gag	618	4,045
grunts	181	3,517
dogfish shark	54	3,435
bluefish	77	3,092
red grouper	559	3,045
white grunt	168	2,695
gray triggerfish	233	2,508
scups or porgies, unc	73	2,495
blue runner	303	2,332
triggerfish	168	2,274
blacktip shark	161	2,098
amberjack	262	1,818
sandbar shark	129	1,810
black grouper	381	1,723
tomtate	22	1,703
tiger shark	115	1,506
mutton snapper	296	1,347
dolphin	214	1,270
unc, finfish for food	86	1,167
Atlantic bonito	218	1,049
speckled hind	122	817

<b>Species</b>	<b>Number of trips reported discarding the species</b>	<b>Number discarded</b>
remora	270	815
snappers, unc	36	681
barracuda	75	668
Spanish mackerel	106	651
ballyhoo	18	600
lane snapper	73	582
groupers	67	396
chubs	8	364
caribbean sharpnose	13	361
stingrays	29	335
hake	35	333
rays, unc	46	324
snowy grouper	59	319
margate	17	313
cobia	182	304
needlefish	72	299
cero	98	288
lesser amberjack	12	282
sand tilefish	35	264
spinner shark	33	245
hammerhead shark	69	218
almaco jack	20	203
sheepshead	21	201
sea catfish	69	188
rudderfish	33	181
black margate	3	161
yellowfin tuna	36	161
banded rudderfish	14	159
mahogany snapper	13	133
rock sea bass	11	131
squirrelfish	18	131
silky shark	13	114
Atlantic spadefish	21	107

## Recreational Fishery

For the recreational fishery, estimates of the number of recreational discards are available from MRFSS and the NMFS headboat survey. The MRFSS system classifies recreational catch into three categories:

- Type A - Fishes that were caught, landed whole and available for identification and enumeration by the interviewers.
- Type B - Fishes that were caught but were either not kept or not available for identification:
  - Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2.
  - Type B2 - Fishes that were caught and released alive.

For species most affected by the actions in Amendment 24, the number of fish released alive, as reported by charterboat and private recreational fishermen, was greatest for red snapper (**Table G-4**).

**Table G-4.** Estimated number of fish most affected by the actions in Amendment 24 released alive (B2) in numbers in the South Atlantic during 2005-2010 as reported by charterboat and private recreational fishermen.

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009		Year: 2010	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE						
gag	112,352	13.1	117,752	13	315,966	12.7	185,597	10.5	109,998	12.4	98,545	14.7
gray triggerfish	182,794	12.1	165,872	15.7	216,609	10.5	189,478	11.1	176,643	14.3	110,240	12.8
red grouper	182,798	11	103,459	11.3	26,372	26	50,526	17.2	94,072	15.2	94,606	17.4
red snapper	125,739	13.3	134,692	18.5	455,405	12.8	403,244	10.5	210,279	12.4	93,654	17.5
scamp	6,348	30.7	7,073	26.8	20,296	41.9	7,327	23.9	7,745	45.9	6,128	37.7
speckled hind	5,121	50.4	596	77.3	0	0	5,519	46.6	None reported		69	63.7
vermilion snapper	140,356	13.2	102,219	34.3	293,433	12.9	246,103	14.2	226,125	11.6	131,392	24.2

Source: Marine Recreational Fisheries Statistics Survey Data Query Assessed November 20, 2011

The number of released fish for other species managed by the South Atlantic Council, as reported by charterboat and private recreational fishermen, varied by species (**Table G-5**).

**Table G-5.** Estimated number of fish released (B2) fish in numbers for the South Atlantic during 2005-2009.

Source: MRFSS Web Site <http://www.st.nmfs.noaa.gov/st1/recreational/overview/overview.html>.

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009		Year: 2010	
	RELEASED ALIVE (TYPE B2)	PSE	RELEASED ALIVE (TYPE B2)	PSE								
<b>BARRACUDAS</b>												
BARRACUDAS	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8	153,535	9
-- Species Group Subtotal --	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8	153,535	9
<b>BLUEFISH</b>												
BLUEFISH	3,004,781	6.1	3,707,415	5.7	4,539,620	6	3,440,594	5	2,337,256	5.4	4,226,412	5
-- Species Group Subtotal --	3,004,781	6.1	3,707,415	5.7	4,539,620	6	3,440,594	5	2,337,256	5.4	4,226,412	5
<b>CARTILAGINOUS FISHES</b>												
DOGFISH SHARKS	151,502	28.1	91,248	17.4	132,366	42.2	129,161	22.3	92,811	24.9	158,920	15
OTHER SHARKS	2,888,895	5.1	2,770,853	6.8	3,128,079	4.5	2,925,490	4.4	2,638,748	5.5	2,891,631	6
SKATES/RAYS	1,387,330	6.9	1,059,210	6.7	1,183,040	5.3	1,070,743	6.2	1,431,617	10.8	1,132,737	6
-- Species Group Subtotal --	4,427,727	4.1	3,921,311	5.1	4,443,485	3.7	4,125,394	3.6	4,163,176	5.1	4,183,288	4
<b>CATFISHES</b>												
FRESHWATER CATFISHES	64,895	28.1	40,805	30.2	20,552	25.6	45,502	28	12,530	35.4	23,634	33
SALTWATER CATFISHES	1,775,623	6.2	1,362,776	5.8	2,473,885	7.1	1,912,040	6.5	1,016,001	6.6	1,903,731	6
-- Species Group Subtotal --	1,840,518	6	1,403,581	5.7	2,494,437	7	1,957,542	6.3	1,028,531	6.6	1,927,365	6
<b>CODS AND HAKES</b>												
OTHER CODS/HAKES	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9	12,729	44
-- Species Group Subtotal --	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9	12,729	44
<b>DOLPHINS</b>												
DOLPHINS	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14	95,769	13
-- Species Group Subtotal --	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14	95,769	13
<b>DRUMS</b>												
ATLANTIC CROAKER	2,153,037	6.6	3,439,549	6.4	2,540,696	7	2,372,758	5.9	3,113,213	5.5	2,469,631	6

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009		Year: 2010	
	RELEASED ALIVE (TYPE B2)	PSE	RELEASED ALIVE (TYPE B2)	PSE								
BLACK DRUM	190,110	11.4	312,415	9.7	820,032	10.2	640,413	7.7	293,214	8.8	369,539	9
KINGFISHES	2,226,960	6.8	3,582,622	7.7	3,309,945	5.9	2,902,539	6.1	2,710,822	6.8	2,861,064	6
OTHER DRUM	581,461	11	834,383	8.8	1,049,974	10.9	1,173,266	9.5	900,754	12.3	241,704	16
RED DRUM	2,412,470	5.8	2,111,089	5.6	2,070,575	5.6	2,333,096	6.1	1,979,705	5.6	2,932,869	5
SAND SEATROUT	0	0	9,401	72	11,324	45.8	27,367	42.5	110,534	48.4	11,380	50
SILVER PERCH	480,503	13.2	726,915	11.5	584,828	12.1	491,659	15.6	595,518	15.6	434,418	14
SPOT	1,728,002	9.9	3,851,795	9.6	1,732,440	9.9	1,713,571	7.6	1,798,841	8.8	1,219,043	9
SPOTTED SEATROUT	5,336,913	5.3	4,988,541	4.7	6,114,718	5	4,715,679	5.5	3,782,693	5.4	5,193,793	5
WEAKFISH	438,519	11	538,799	11.4	346,898	14	265,383	14.1	189,614	21.8	289,290	17
-- Species Group Subtotal --	15,547,975	2.8	20,395,509	2.9	18,581,430	2.6	16,635,731	2.5	15,474,908	2.7	16,022,731	3
<b>EELS</b>												
EELS	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3	39,006	19
-- Species Group Subtotal --	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3	39,006	19
<b>FLOUNDERS</b>												
GULF FLOUNDER	4,932	64	10,047	58.5	32,472	49.1	6,181	51.8	964	100	4,362	54
OTHER FLOUNDERS	1,214,700	6.3	1,201,665	5.6	1,689,592	5.8	1,900,658	5.9	1,577,521	6.8	2,161,196	5
SOUTHERN FLOUNDER	131,274	17.9	257,712	13.7	190,340	13	125,290	14.8	104,871	23.9	6,485	32
SUMMER FLOUNDER	83,320	22.4	139,805	20.5	10,815	38.6	5,715	38	35,632	27.3	27,741	38
-- Species Group Subtotal --	1,434,226	5.7	1,609,229	5	1,923,219	5.4	2,037,844	5.6	1,718,988	6.4	2,199,784	5
<b>GRUNTS</b>												
OTHER GRUNTS	905,462	8.2	790,470	8.4	1,561,407	8.3	903,581	7.7	1,219,001	8.5	1,034,807	19
PIGFISH	743,829	7.8	553,384	9.6	868,092	10.3	821,930	8.4	841,230	10.1	1,062,295	7
WHITE GRUNT	195,770	14.8	274,926	15	241,875	11.3	434,040	14.5	148,501	24.3	43,267	16
-- Species Group Subtotal --	1,845,061	5.3	1,618,780	5.8	2,671,374	6	2,159,551	5.4	2,208,732	6.3	2,140,369	10
<b>HERRINGS</b>												
HERRINGS	1,243,180	17.4	2,640,817	12.5	1,203,718	16.9	512,502	31.7	1,698,306	15.3	2,121,775	14

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009		Year: 2010	
	RELEASED ALIVE (TYPE B2)	PSE	RELEASED ALIVE (TYPE B2)	PSE								
-- Species Group Subtotal --	1,243,180	17.4	2,640,817	12.5	1,203,718	16.9	512,502	31.7	1,698,306	15.3	2,121,775	14
<b>JACKS</b>												
BLUE RUNNER	661,888	9.6	822,370	9.2	1,159,991	11.7	796,058	11.1	705,910	24.5	499,651	10
CREVALLE JACK	1,362,086	6.7	1,264,018	6.5	1,634,661	6	1,097,877	7	1,139,832	7.9	1,032,042	8
FLORIDA POMPANO	693,755	12.5	1,007,541	20.1	605,621	12	696,269	10.7	345,791	21.5	347,629	12
GREATER AMBERJACK	16,687	25.1	19,234	19.6	30,752	20.8	80,931	19.8	71,802	16.1	26,242	23
OTHER JACKS	332,217	17.4	180,298	14	326,798	15.8	433,050	12.2	352,874	16	243,164	18
-- Species Group Subtotal --	3,066,633	5	3,293,461	7.1	3,757,823	5.1	3,104,185	4.8	2,616,209	8.3	2,148,728	6
<b>MULLETS</b>												
MULLETS	1,384,536	13.7	1,801,720	11.3	2,263,848	9.4	1,091,237	10.7	1,367,241	11.1	2,641,902	24
-- Species Group Subtotal --	1,384,536	13.7	1,801,720	11.3	2,263,848	9.4	1,091,237	10.7	1,367,241	11.1	2,641,902	24
<b>OTHER FISHES</b>												
OTHER FISHES	2,965,704	4.8	2,882,611	4.7	4,518,284	3.7	2,828,534	4.2	2,751,240	5.7	2,871,776	7
-- Species Group Subtotal --	2,965,704	4.8	2,882,611	4.7	4,518,284	3.7	2,828,534	4.2	2,751,240	5.7	2,871,776	7
<b>PORGIES</b>												
OTHER PORGIES	72,379	20.1	150,357	20.4	139,040	21.4	116,266	19.5	65,856	19.2	92,406	28
PINFISHES	3,917,568	5.8	5,056,606	6.2	4,960,818	5.1	5,040,941	6	3,588,516	5.8	5,080,786	5
RED PORGY	27,514	19.2	16,636	15.8	30,085	19	44,154	30	18,089	55.8	5,525	30
SCUP	1,620	46.5	7,721	44	5,729	30.6	9,755	36	3,293	25.3	1,417	29
SHEEPSHEAD	436,207	9.6	437,836	9.3	603,767	10.7	773,720	8	520,600	9.1	536,490	9
-- Species Group Subtotal --	4,455,288	5.2	5,669,156	5.6	5,739,439	4.5	5,984,836	5.2	4,196,354	5.1	5,716,624	5
<b>PUFFERS</b>												
PUFFERS	425,264	7.7	635,341	8.5	1,152,418	6.6	1,341,422	6.7	912,983	7.6	573,280	11
-- Species Group Subtotal --	425,264	7.7	635,341	8.5	1,152,418	6.6	1,341,422	6.7	912,983	7.6	573,280	11
<b>SEA BASSES</b>												
BLACK SEA BASS	2,483,947	5.5	2,967,099	5.6	3,764,105	7.3	2,940,795	6.2	2,716,240	6.2	3,270,077	6

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009		Year: 2010	
	RELEASED ALIVE (TYPE B2)	PSE	RELEASED ALIVE (TYPE B2)	PSE								
EPINEPHELUS GROUPERS	254,936	9.1	165,261	9.1	107,240	17.6	97,808	11.9	128,065	11.9	118,264	15
MYCTEROPERCA GROUPERS	145,222	11	152,123	10.7	302,398	11.2	252,309	8.9	142,865	10.6	121,698	13
OTHER SEA BASSES	324,893	11.5	797,375	11.3	910,942	8.7	801,710	9.1	499,275	10.4	217,610	15
-- Species Group Subtotal --	3,208,998	4.5	4,081,858	4.6	5,084,685	5.7	4,092,622	4.8	3,486,445	5.1	3,727,649	5
<b>SEAROBINS</b>												
SEAROBINS	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5	139,435	10
-- Species Group Subtotal --	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5	139,435	10
<b>SNAPPERS</b>												
GRAY SNAPPER	1,228,211	7.8	1,457,251	5.9	2,936,755	6	1,839,406	6.5	1,725,889	7.4	585,571	10
LANE SNAPPER	111,276	22.7	137,572	16.8	330,770	14.1	227,775	18.4	157,594	16.6	74,057	22
OTHER SNAPPERS	242,324	10.6	280,948	10.1	426,284	10.4	557,020	10	314,681	10.1	155,776	12
RED SNAPPER	125,739	13.3	134,692	18.5	455,405	12.8	403,244	10.5	210,279	12.4	93,654	18
VERMILION SNAPPER	140,356	13.2	102,219	34.3	293,433	12.9	246,103	14.2	226,125	11.6	131,392	24
YELLOWTAIL SNAPPER	258,606	17.7	344,982	11.7	402,201	12.5	319,239	11.1	221,836	22.6	117,970	14
-- Species Group Subtotal --	2,106,512	5.5	2,457,664	4.5	4,844,848	4.3	3,592,787	4.3	2,856,404	5.2	1,158,420	7
<b>TEMPERATE BASSES</b>												
STRIPED BASS	136,536	16.3	85,438	19.4	50,735	18.2	86,858	19.6	93,353	21	74,856	19
WHITE PERCH	0	0	46,904	38.1	7,339	56.8	1,397	58.5	0	0	5,353	63
-- Species Group Subtotal --	136,536	16.3	132,342	18.4	58,074	17.5	88,255	19.4	93,353	21	80,209	18
<b>TOADFISHES</b>												
TOADFISHES	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2	480,589	8
-- Species Group Subtotal --	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2	480,589	8
<b>TRIGGERFISHES/FILEFISHES</b>												
TRIGGERFISHES/FILEFISHES	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14	133,118	13

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009		Year: 2010	
	RELEASED ALIVE (TYPE B2)	PSE	RELEASED ALIVE (TYPE B2)	PSE								
-- Species Group Subtotal --	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14	133,118	13
<b>TUNAS AND MACKERELS</b>												
ATLANTIC MACKEREL	67,658	81.9										
KING MACKEREL	207,618	13.7	195,618	9.8	303,008	9.4	166,716	9.7	127,316	13.4	82,557	14
LITTLE TUNNY/ATLANTIC BONITO	288,459	8.5	476,296	7	780,193	8.4	511,878	7.6	585,015	8.3	369,128	8
OTHER TUNAS/MACKERELS	66,422	24.6	43,933	13.7	58,912	16.3	121,352	17.4	93,887	17	48,253	15
SPANISH MACKEREL	704,569	12.9	321,860	11.9	586,722	9.4	994,693	10.4	466,681	9.4	659,992	10
-- Species Group Subtotal --	1,334,726	8.5	1,037,707	5.3	1,728,835	5.3	1,794,639	6.3	1,272,899	5.4	1,159,930	7
<b>WRASSES</b>												
OTHER WRASSES	2,966	53.3	2,079	50.4	10,386	41.8	13,203	51.5	2,977	42.4	9,296	36
TAUTOG	2,885	100	5,185	52	2,905	60.9	1,755	58.9	1,922	62.6	2,907	44
-- Species Group Subtotal --	5,851	56.2	7,264	39.8	13,291	35.3	14,958	46	4,899	35.6	12,203	29
-- Grand Total --	49,741,568	1.4	58,765,863	1.6	66,691,933	1.3	56,515,888	1.3	49,238,778	1.5	53,966,626	2

For species most affected by the actions in Amendment 24, the number of released fish, as reported by headboat operators, was greatest for gray triggerfish (**Table G-6**).

**Table G-6.** Number of fish most affected by the actions in Amendment 24 released fish in numbers for the South Atlantic during 2005-2010 as reported headboat operators.

Species	# trips reporting discards	released	sum
gag	11,845	rel_dead	387
		rel_live	25,059
gray triggerfish	19,193	rel_dead	441
		rel_live	32,954
red grouper	10,546	rel_dead	382
		rel_live	41,680
red snapper	11,281	rel_dead	3,604
		rel_live	250,600
scamp	5,730	rel_dead	327
		rel_live	18,968
speckled hind	533	rel_dead	3
		rel_live	299
vermilion snapper	14,443	rel_dead	22,109
		rel_live	503,194

Source: NMFS Headboat survey

The number of discarded species, for other fish managed by the South Atlantic Council, as reported by headboat operators, varied by species (**Table G-7**).

**Table G-7.** The 25 most commonly discarded species from headboats in South Atlantic. Total fish reported released alive or dead on sampled headboat trips during 2005-2010. Data are not expanded to all trips.

Species	# trips reporting discards	released	sum
black sea bass	22,221	rel_dead	26,188
		rel_live	1,095,014
vermilion snapper	14,443	rel_dead	22,109
		rel_live	503,197
tomtate	10,227	rel_dead	43,916
		rel_live	302,959
red snapper	11,281	rel_dead	3,604
		rel_live	250,600
white grunt	16,578	rel_dead	3,761
		rel_live	125,624
red porgy	4,768	rel_dead	2,490

Species	# trips reporting discards	released	sum
		rel_live	123,025
yellowtail snapper	13,719	rel_dead	505
		rel_live	102,353
pinfish	3,850	rel_dead	6,115
		rel_live	92,772
red grouper	10,546	rel_dead	382
		rel_live	41,680
spottail pinfish	4,383	rel_dead	257
		rel_live	41,236
gray triggerfish	19,193	rel_dead	411
		rel_live	32,954
gag	11,845	rel_dead	387
		rel_live	25,059
lane snapper	9,389	rel_dead	654
		rel_live	19,631
gray snapper	13,280	rel_dead	162
		rel_live	19,006
scamp	5,730	rel_dead	327
		rel_live	18,968
bank sea bass	3,695	rel_dead	822
		rel_live	166,601
mutton snapper	12,244	rel_dead	575
		rel_live	16,206
squirrelfish	4,041	rel_dead	168
		rel_live	12,428
blue runner	5,917	rel_dead	298
		rel_live	10,894
little tunny	5,927	rel_dead	580
		rel_live	10,300
greater amberjack	5,386	rel_dead	116
		rel_live	9,723
scup	1,498	rel_dead	974
		rel_live	8,884
king mackerel	13,918	rel_dead	246
		rel_live	8,566
smooth dogfish	1,066	rel_dead	39
		rel_live	8,479

Source: NMFS Headboat survey.

### Finfish Bycatch Mortality

Release mortality rates are unknown for most snapper grouper species. Recent SEDAR assessments include estimates of release mortality rates based on published studies. Stock assessment reports can be found at <http://www.sefsc.noaa.gov/sedar/>. Release mortality rates for species most affected by the actions in Amendment 24 that have had SEDAR assessments vary by species (**Table G-8**).

**Table G-8.** Release mortality rates as reported by the SEDAR assessments.

Species	release mortality rates		
	commercial	recreational	source
gag	40%	25%	SEDAR 10
red grouper	20%	20%	SEDAR 19
red snapper	48%	39% private rec. 41% for-hire	SEDAR 24
vermilion snapper	41%	38%	SEDAR 17

### Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality

**Tables G-3 through G-7** list the species that are most commonly discarded by commercial and recreational fishermen.

The purpose of Amendment 24 is to implement a rebuilding plan for red grouper. The allowable fishing mortality rate will be specified throughout the rebuilding timeframe.

Snapper Grouper Amendment 14 implemented deepwater MPAs that contain many species, including blueline tilefish, speckled hind, and warsaw grouper. Snapper Grouper Amendment 16 required the use of dehooking devices, which could help reduce release mortality of snapper grouper species. Dehooking devices can allow fishermen to remove hooks with greater ease and more quickly from snapper grouper species without removing the fish from the water. If a fish does need to be removed from the water, dehookers could still reduce handling time in removing hooks, thus increasing survival (Cooke *et al.* 2001). Furthermore, Snapper Grouper Amendment 17A required circle hooks for snapper-grouper species north of 28 degrees latitude, which is also expected to reduce bycatch mortality of snapper grouper species. Recent amendments have

reduced the recreational bag limit of snowy grouper to one per vessel per day and implemented a 100 pound gutted weight commercial trip limit for snowy grouper. Such measures could be expected to decrease the incentive to fish in areas where snowy groupers are encountered. Snapper Grouper Amendment 18A, which is being developed by the South Atlantic Council, is considering measures that could reduce bycatch of black sea bass including: endorsements that could limit number of individuals who can fish black sea bass pots; a limit on the number of black sea bass pots that can be fished; and a possible requirement that black sea bass pots be returned to shore at the end of a trip.

## **2. Ecological Effects Due to Changes in the Bycatch**

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Actions proposed in Amendment 24 could increase bycatch of red grouper if fishermen continue to encounter red grouper if the annual catch limit is reached and the fishery is closed to possession and retention. Many of the species in the snapper grouper fishery management unit have spatial and temporal coincidence and the benefits could be shared among them. The estimated release mortality of red grouper is 20%. However, fishermen may fish in specific areas to avoid red grouper if the annual catch limit is reached.

## **3. Changes in the Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects**

Actions proposed in Amendment 24 could increase bycatch of red grouper if fishermen continue to encounter red grouper if the annual catch limit is reached and the fishery is closed to possession and retention. The estimated release mortality of red grouper is 20%. However, fishermen may fish in specific areas to avoid red grouper once if the annual catch limit is reached. Many of the species in the snapper grouper fishery management unit have spatial and temporal coincidence and the benefits could be shared among them. Ecological changes in the community structure of reef ecosystems through the proposed actions could be expected to occur. These ecological changes could affect the nature and magnitude of bycatch over time.

## **4. Effects on Marine Mammals and Birds**

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to marine mammals. The southeast U.S. Atlantic black sea bass pot fishery is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2010 proposed List of Fisheries classifies as a Category II (74 FR 27739; June 11, 2009). Gear types used in these fisheries are determined to have occasional incidental mortality and serious injury of marine mammals. For the snapper grouper fishery, the best available data on protected species interactions are from the Southeast Fisheries Science

Center (SEFSC) Supplementary Discard Data Program (SDDP) initiated in July of 2001 and subsamples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each released alive (McCarthy SEFSC database). The bottom longline/hook-and-line component of the South Atlantic snapper grouper fishery remains a Category III under the LOF.

Although the black sea bass pot fishery can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot fishery operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina in waters ranging from 70-120 feet deep (21.3-36.6 meters). There are no known interactions between the black sea bass pot fishery and large whales. NOAA Fisheries Service's biological opinion on the continued operation of the South Atlantic snapper grouper fishery determined the possible adverse effects resulting from the fishery are extremely unlikely. Thus, the continued operation of the snapper grouper fishery in the southeast U.S. Atlantic EEZ is not likely to adversely affect sperm, fin, sei, and blue whales (NMFS 2006).

North Atlantic right and humpback whales may overlap both spatially and temporally with the black sea bass pot fishery. Recent revisions to the Atlantic Large Whale Take Reduction Plan have folded the Atlantic mixed species trap/pot fisheries into the plan (72 FR 193; October 5, 2007). The new requirements will help further reduce the likelihood of North Atlantic right and humpback whale entanglement in black sea bass pot gear.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North Carolina and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished USFWS data). Interaction with fisheries has not been reported as a concern for either of these species.

Fishing effort reductions have the potential to reduce the amount of interactions between the fishery and marine mammals and birds. Although, the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the snapper grouper fishery. Thus, it is believed that the snapper grouper fishery is not likely to negatively affect the Bermuda petrel and the roseate tern.

## **5. Changes in Fishing, Processing, Disposal, and Marketing Costs**

Actions in Amendment 24 would be expected to affect the cost of fishing operations. It is likely that all four states (NC, SC, GA, and FL) would be affected by the regulations. Additionally, factors such as waterfront property values, availability of less expensive imports, etc. may affect economic decisions made by recreational and commercial fishermen. Amendment 18A (under development) proposes to enhance current data collection programs. This might provide more insight in calculating the changes in fishing, processing, disposal and marketing costs.

## **6. Changes in Fishing Practices and Behavior of Fishermen**

Actions proposed in Amendment 24 could result in a modification of fishing practices by commercial and recreational fishermen, thereby affecting the magnitude of discards. However, it is difficult to quantify any of the measures in terms of reducing discards until the magnitude of bycatch has been monitored over several years.

## **7. Changes in Research, Administration, and Enforcement Costs and Management Effectiveness**

Research and monitoring is needed to understand the effectiveness of proposed management measure in reducing bycatch. Additional work is needed to determine the effectiveness of measures in Amendment 24, recently implemented amendments, and by future actions being proposed by the South Atlantic Council to reduce bycatch. Amendment 18A is being developed, which proposes to enhance current data collection programs. Some observer information has recently been provided by MARFIN and Cooperative Research Programs but more is needed. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. The use of electronic logbooks could be enhanced to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Additional administrative and enforcement efforts will be needed to implement and enforce these regulations. NOAA Fisheries Service established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast US waters, addressing both immediate (e.g., red snapper) and long-term fishery-independent data needs, with an overarching goal of improving fishery-independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

## **8. Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources**

Preferred management measures, including those that are likely to increase or decrease discards could result in social and/or economic impacts as discussed in **Section 4**.

## **9. Changes in the Distribution of Benefits and Costs**

The economic effects of all the management measures, including those most likely to reduce bycatch, are described in **Section 4**.

## **10. Social Effects**

The social effects of all the management measures, including those most likely to reduce bycatch, are described in **Section 4**.

## **11. Conclusion**

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, the actions in Amendment 24 could increase bycatch of red grouper if fishermen continue to encounter red grouper if the annual catch limit is reached and the fishery is closed to possession and retention. The estimated release mortality of red grouper is 20%. However, fishermen may fish in specific areas to avoid red grouper once if the annual catch limit is reached. Recently implemented regulations including the requirements of dehooking devices, circle hooks, a recreational/commercial seasonal closure for shallow water groupers, reduction of recreational bag limits, and closing all shallow water groupers when a gag quota is met, could also help to reduce bycatch of red grouper.