Appendix H. 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 has increased in recent years (**Figure G-1**).

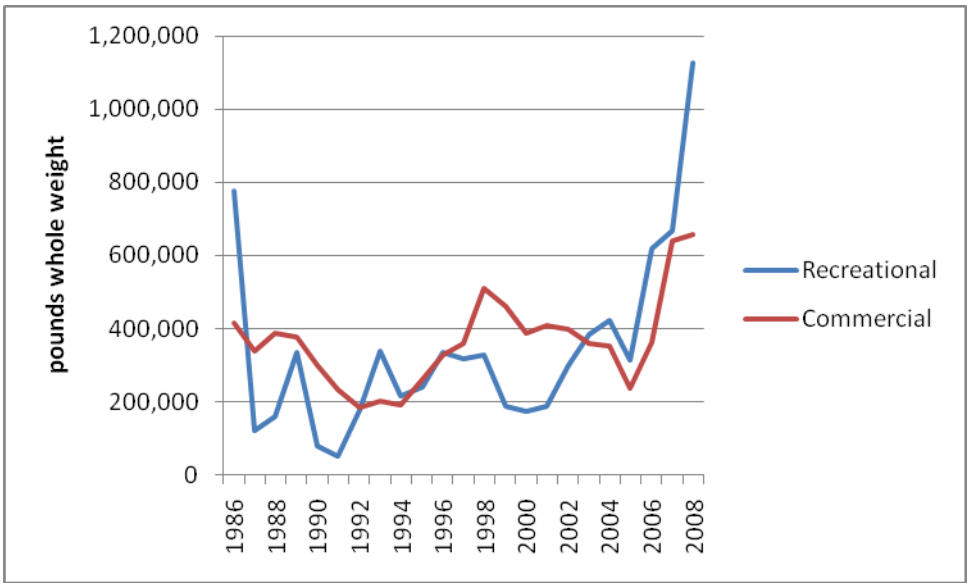

Figure G-1. Reported landings of red grouper between 1986 and 2008 in the South Atlantic waters. Source: SEDAR 19 Assessment

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 2005-2009.

Taxon	Commercial	For Hire	Private Recreational
gag	53%	14%	43%
gray triggerfish	0%	42%	58%
greater amberjack	40%	32%	28%
red snapper	25%	29%	46%
scamp	69%	18%	13%
speckled hind	51%	47%	2%
vermilion snapper	63%	30%	7%

Source: SEFSC ACL Dataset dated June 14, 2011

Commercial Fishery

During 2005 to 2009, 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 2009 was 13,973 (**Table G-2**). Fishermen spent an average of 1.69 days at sea per trip.

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

YEAR	Trips	Days	Days per Trip
2005	13,771	22,855	1.66
2006	13,264	23,324	1.76
2007	14,885	24,509	1.65
2008	14,781	25,023	1.69
2009	15,345	25,487	1.66
Mean	13,973	23,563	1.69

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 porgy, 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.

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

Species	Number of trips reported discarding the species	Number discarded
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	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. ADD 2010

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
BARRACUDAS										
BARRACUDAS	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8
-- Species Group Subtotal --	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8
BLUEFISH										
BLUEFISH	3,004,781	6.1	3,707,415	5.7	4,539,620	6	3,440,594	5	2,337,256	5.4
-- 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
CARTILAGINOUS FISHES										
DOGFISH SHARKS	151,502	28.1	91,248	17.4	132,366	42.2	129,161	22.3	92,811	24.9
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
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
-- 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
CATFISHES										
FRESHWATER CATFISHES	64,895	28.1	40,805	30.2	20,552	25.6	45,502	28	12,530	35.4
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
-- 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
CODS AND HAKES										
OTHER CODS/HAKES	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9
-- Species Group Subtotal --	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9
DOLPHINS										
DOLPHINS	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14
-- Species Group Subtotal --	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14
DRUMS										
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
BLACK DRUM	190,110	11.4	312,415	9.7	820,032	10.2	640,413	7.7	293,214	8.8
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
OTHER DRUM	581,461	11	834,383	8.8	1,049,974	10.9	1,173,266	9.5	900,754	12.3
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

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
SAND SEATROUT	0	0	9,401	72	11,324	45.8	27,367	42.5	110,534	48.4
SILVER PERCH	480,503	13.2	726,915	11.5	584,828	12.1	491,659	15.6	595,518	15.6
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
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
WEAKFISH	438,519	11	538,799	11.4	346,898	14	265,383	14.1	189,614	21.8
-- 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
EELS										
EELS	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3
-- Species Group Subtotal --	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3
FLOUNDERS										
GULF FLOUNDER	4,932	64	10,047	58.5	32,472	49.1	6,181	51.8	964	100
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
SOUTHERN FLOUNDER	131,274	17.9	257,712	13.7	190,340	13	125,290	14.8	104,871	23.9
SUMMER FLOUNDER	83,320	22.4	139,805	20.5	10,815	38.6	5,715	38	35,632	27.3
-- 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
GRUNTS										
OTHER GRUNTS	905,462	8.2	790,470	8.4	1,561,407	8.3	903,581	7.7	1,219,001	8.5
PIGFISH	743,829	7.8	553,384	9.6	868,092	10.3	821,930	8.4	841,230	10.1
WHITE GRUNT	195,770	14.8	274,926	15	241,875	11.3	434,040	14.5	148,501	24.3
-- 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
HERRINGS										
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
-- 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
JACKS										
BLUE RUNNER	661,888	9.6	822,370	9.2	1,159,991	11.7	796,058	11.1	705,910	24.5
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
FLORIDA POMPANO	693,755	12.5	1,007,541	20.1	605,621	12	696,269	10.7	345,791	21.5
GREATER AMBERJACK	16,687	25.1	19,234	19.6	30,752	20.8	80,931	19.8	71,802	16.1
OTHER JACKS	332,217	17.4	180,298	14	326,798	15.8	433,050	12.2	352,874	16
-- 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
MULLETS										
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

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
-- 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
OTHER FISHES										
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
-- 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
PORGIES										
OTHER PORGIES	72,379	20.1	150,357	20.4	139,040	21.4	116,266	19.5	65,856	19.2
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
RED PORGY	27,514	19.2	16,636	15.8	30,085	19	44,154	30	18,089	55.8
SCUP	1,620	46.5	7,721	44	5,729	30.6	9,755	36	3,293	25.3
SHEEPSHEAD	436,207	9.6	437,836	9.3	603,767	10.7	773,720	8	520,600	9.1
-- 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
PUFFERS										
PUFFERS	425,264	7.7	635,341	8.5	1,152,418	6.6	1,341,422	6.7	912,983	7.6
-- 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
SEA BASSES										
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
EPINEPHELUS GROUPERS	254,936	9.1	165,261	9.1	107,240	17.6	97,808	11.9	128,065	11.9
MYCTEROPERCA GROUPERS	145,222	11	152,123	10.7	302,398	11.2	252,309	8.9	142,865	10.6
OTHER SEA BASSES	324,893	11.5	797,375	11.3	910,942	8.7	801,710	9.1	499,275	10.4
-- 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
SEAROBINS										
SEAROBINS	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5
-- Species Group Subtotal --	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5
SNAPPERS										
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
LANE SNAPPER	111,276	22.7	137,572	16.8	330,770	14.1	227,775	18.4	157,594	16.6
OTHER SNAPPERS	242,324	10.6	280,948	10.1	426,284	10.4	557,020	10	314,681	10.1
RED SNAPPER	125,739	13.3	134,692	18.5	455,405	12.8	403,244	10.5	210,279	12.4
VERMILION SNAPPER	140,356	13.2	102,219	34.3	293,433	12.9	246,103	14.2	226,125	11.6
YELLOWTAIL SNAPPER	258,606	17.7	344,982	11.7	402,201	12.5	319,239	11.1	221,836	22.6
-- 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

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
TEMPERATE BASSES										
STRIPED BASS	136,536	16.3	85,438	19.4	50,735	18.2	86,858	19.6	93,353	21
WHITE PERCH	0	0	46,904	38.1	7,339	56.8	1,397	58.5	0	0
-- Species Group Subtotal --	136,536	16.3	132,342	18.4	58,074	17.5	88,255	19.4	93,353	21
TOADFISHES										
TOADFISHES	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2
-- Species Group Subtotal --	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2
TRIGGERFISHES/FILEFISHES										
TRIGGERFISHES/FILEFISHES	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14
-- Species Group Subtotal --	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14
TUNAS AND MACKERELS										
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
LITTLE TUNNY/ATLANTIC BONITO	288,459	8.5	476,296	7	780,193	8.4	511,878	7.6	585,015	8.3
OTHER TUNAS/MACKERELS	66,422	24.6	43,933	13.7	58,912	16.3	121,352	17.4	93,887	17
SPANISH MACKEREL	704,569	12.9	321,860	11.9	586,722	9.4	994,693	10.4	466,681	9.4
-- 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
WRASSES										
OTHER WRASSES	2,966	53.3	2,079	50.4	10,386	41.8	13,203	51.5	2,977	42.4
TAUTOG	2,885	100	5,185	52	2,905	60.9	1,755	58.9	1,922	62.6
-- Species Group Subtotal --	5,851	56.2	7,264	39.8	13,291	35.3	14,958	46	4,899	35.6
-- 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

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

For species most affected by the actions in Amendment 24,, the number of released fish, as reported by headboat operators, was XXXXXXXXXXXXXXXXX (**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		rel_dead	
		rel_live	
gray triggerfish		rel_dead	
		rel_live	
red grouper		rel_dead	
		rel_live	
red snapper		rel_dead	
		rel_live	
scamp		rel_dead	
		rel_live	
speckled hind		rel_dead	
		rel_live	
vermilion snapper		rel_dead	
		rel_live	

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. Most commonly discarded species from headboats in South Atlantic. Total fish reported released alive or dead on sampled headboat trips during 2005-2009. Data are not expanded to all trips. NEED TO ADD 2010

Species	# trips reporting discards	released	sum
black sea bass	17,087	rel_dead	18,316
		rel_live	721,640
vermilion snapper	11,601	rel_dead	19,013
		rel_live	413,854
tomtate	7,801	rel_dead	34,943
		rel_live	243,869
red snapper	9,198	rel_dead	3,214
		rel_live	212,572
red porgy	3,848	rel_dead	2,400
		rel_live	110,940
yellowtail snapper	11,797	rel_dead	3,005
		rel_live	103,625

Species	# trips reporting discards	released	sum
		rel_dead	3,154
white grunt	12,917	rel_live	91,647
		rel_dead	2,850
pinfish	3,000	rel_live	81,423
		rel_dead	477
sharpnose shark	10,928	rel_live	82,816
		rel_dead	199
spottail pinfish	3,450	rel_live	35,381
		rel_dead	317
red grouper	7,885	rel_live	27,527
		rel_dead	339
gag	9,520	rel_live	20,393
		rel_dead	380
gray triggerfish	14,291	rel_live	18,599
		rel_dead	591
lane snapper	7,506	rel_live	17,561
		rel_dead	275
scamp	4,809	rel_live	16,123
		rel_dead	763
bank sea bass	2,903	rel_live	13,725
		rel_dead	137
gray snapper	10,376	rel_live	13,744
		rel_dead	513
mutton snapper	8,907	rel_live	13,030
		rel_dead	155
squirrelfish	3,012	rel_live	9,688
		rel_dead	298
bluerunner	3,958	rel_live	8,439
		rel_dead	865
scup	1,187	rel_live	7,402
		rel_dead	104
greater amberjack	4,438	rel_live	8,155
		rel_dead	31
smooth dogfish	865	rel_live	6,830
		rel_dead	219
little tunny	4,019	rel_live	6,620
		rel_dead	232
king mackerel	10,764	rel_live	5,913
		rel_dead	31
banded rudderfish	2,333	rel_live	5,426
inshore lizardfish	1,126	rel_dead	53

Species	# trips reporting discards	released	sum
		rel_live	4,804
		rel_dead	154
spanish mackerel	2,117	rel_live	4,380
		rel_dead	65
remora	1,408	rel_live	4,139
		rel_dead	412
bluefish	1,420	rel_live	3,728
		rel_dead	173
bluestriped grunt	2,283	rel_live	3,650
		rel_dead	18
blacktip shark	1,001	rel_live	3,729
		rel_dead	67
porkfish	1,645	rel_live	3,429
		rel_dead	49
black grouper	2,530	rel_live	3,026
		rel_dead	64
nurse shark	1,730	rel_live	2,964
		rel_dead	213
graysby	2,736	rel_live	2,699
		rel_dead	17
cobia	3,925	rel_live	2,771
		rel_dead	195
sand perch	1,017	rel_live	2,279
		rel_dead	290
rock hind	1,998	rel_live	1,663
		rel_dead	60
doctorfish	873	rel_live	1,790
		rel_dead	24
almaco jack	2,652	rel_live	1,768
		rel_dead	1
sandbar shark	393	rel_live	1,694
		rel_dead	75
margate	744	rel_live	1,540
		rel_dead	45
dolphin	3,087	rel_live	1,370
		rel_dead	39
bigeye	2,098	rel_live	1,231
		rel_dead	32
whitebone porgy	4,480	rel_live	1,204
		rel_dead	0
spiny dogfish	58	rel_live	1,201

Species	# trips reporting discards	released	sum
		rel_dead	80
jolthead porgy	3,667	rel_live	1,054
		rel_dead	47
great barracuda	2,085	rel_live	1,079
		rel_dead	11
pigfish	1,072	rel_live	996
		rel_dead	55
rainbow runner	669	rel_live	811
		rel_dead	40
sand tilefish	872	rel_live	823
		rel_dead	0
atlantic croaker	39	rel_live	843
		rel_dead	26
knobbed porgy	3,890	rel_live	554
		rel_dead	0
crevalle jack	265	rel_live	564

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.

	release mortality rates		
Species	**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 bycatch of species caught. 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 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 limt for snowy grouper. Such measures could be expected to decrease the incentive to fish in areas where snowy groupers are encountered.

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.

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 sub-samples 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 & 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. 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. 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 deepwater species, particulary those fish at younger life stages.