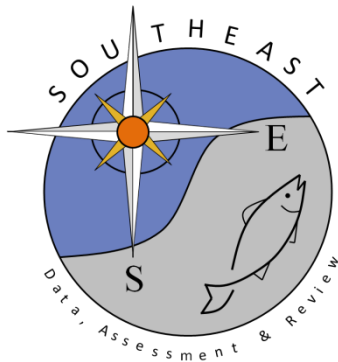


Calculated discards of snowy grouper from US South Atlantic commercial fishing vessels

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Introduction

In August 2001, the Southeast Fisheries Science Center (SEFSC) initiated a program to collect commercial fishing vessel discard data from South Atlantic fisheries. A reporting form was developed that supplements the existing vessel coastal logbook forms that are currently mandatory for those fisheries (Poffenberger and McCarthy, 2004). Data from the SEFSC coastal fisheries discard logbook program were used to calculate the number of snowy grouper discarded from commercial vertical line (handline and electric/hydraulic reel, aka bandit rig) and bottom longline vessels. Approximately 90 percent of snowy grouper discards were reported from vertical line vessels with the remaining 10 percent of discards reported from longline vessels.

Data collection for the discard logbook program involves, each year, a 20% random sample of vessels with South Atlantic snapper-grouper, king mackerel, Spanish mackerel, dolphin/wahoo, and shark permits selected to report the number of animals discarded by species. To assure that the sample was representative of vessels with those Federal permits fishing in the South Atlantic, the universe of permitted vessels was stratified by gear fished. Fishing gear strata included handline, bandit rig, trolling, longline, fish trap, gillnet, and diving. A random sample (weighted by effort reported by each vessel during the prior year) was selected from each stratum. The selected fishers were instructed to complete a supplemental discard form for each fishing trip. Trips with no discards were reported as such.

Reported data included the numbers of discards by species, estimated condition of the fish when released, reason for release (due to regulations or unmarketable/unwanted), and the fishing area where the animal was discarded. There are six options for the condition of released fish: all animals are dead, majority of the animals are dead, all animals are alive when released, majority of animals are alive, the fish are kept but not sold, and the condition of the animals is unknown. To calculate species specific discard rates, discard data were matched to the landings and effort data reported to the coastal logbook program.

Methods

The objective of these analyses was to calculate the numbers of snowy grouper discarded by vessels that fish commercially for species other than shrimp or other shellfish. Data from fishing activity for the analyses did not include those reported from the surface longline vessels that typically fish for swordfish, pelagic sharks, and tunas. The data set included all commercial vertical line and longline fishing trips from federally permitted vessels that reported discards between January 1, 2002 and December 31, 2012 in the US South Atlantic (statistical areas 2300-3700; Figure 1). Data from 2012 may have been incomplete when the analyses were conducted. Data were filtered to include only those trips with landings that included species that co-occurred with snowy grouper. Co-occurrence was defined as species that were reported on one percent or more of trips landings snowy grouper. This data filter was used to limit the discard logbook data set and total effort data set (derived from the coastal logbook data) to data reported by those trips that targeted snowy grouper habitat.

Due to the limited available discard data, discard rates were calculated as the mean nominal discard rate, by gear, over all trips that reported to the discard logbook program during the period 2002-2012. Discard rates were then applied to the yearly gear specific total fishing effort (vertical line: total hook-hours fished; longline: total number of hooks fished) reported to the coastal logbook program to calculate total discards per year/fishing gear combination. Discards were calculated separately for those fish reported as discarded and those that were reported as “kept as bait or eaten”.

Commercial discards may be under reported. If selected, fishers are required to report to the discard logbook program in order to renew their federal fishing permits. Fishers remain in reporting compliance by returning discard logbooks with reports of “no discards”. The percentage of discard reports returned with “no discards” has increased from 33 to 66 percent of vertical line trips and from 27 to 65 percent of longline trips in the US South Atlantic over the period 2002-2012. To examine the affect of discard under reporting on the calculation of total discards, discard rate was calculated using two separate data filters: including all records in the discard data set and filtering the data set of records with no discards of any species reported.

Discard logbook and coastal logbook data were also filtered to remove clearly erroneous data (values of gear-specific effort data beyond the 99.9 percentile of the data). Discard logbook data with multiple gears fished on a trip were also excluded because discards could not be unambiguously attributed to a gear. That data filtering step was not necessary when summing total effort from the logbook data because reported effort data was gear-specific.

Results and Discussion

The number of trips from 2002-2012 with reported discards of snowy grouper in the South Atlantic (77 trips) was very low, severely limiting any analysis. Snowy grouper were reported as discards exclusively from vertical line (69 trips) and longline (8 trips) trips. Snowy grouper accounted for 0.06% (424 fish) of all reported vertical line discards and 1.3% (235 fish) of discards reported from longlines.

During the period 2002-2012, trips with reported snowy grouper landings to the coastal logbook program included 5.6% (10,637) of all vertical line trips, 11.4% (913) of all longline trips, and 0.05% (66) of trips by all other gears. Snowy grouper landings included 1.7% (1,438,213 pounds) of all reported vertical line landings, 2.1% (393,164 pounds) of all longline landings, and 0.02% (8,185 pounds) of total landings by all other gears combined.

Calculated snowy grouper discards, discard rates, discard rate coefficients of variation, and total effort (vertical line: hook hours and longline: hooks fished reported to the coastal logbook program) are provided in Tables 1-2. Calculated total snowy grouper kept as bait are provided in Tables 3-4. No snowy grouper were reported as kept as bait in the longline fishery. Very low mean discard rates, coupled with a few highly variable trips reporting discards resulted in the very large coefficients of variation observed.

Approximately 41% of snowy grouper discarded in the vertical line fishery were reported as “alive” or “majority alive” (Table 5). Half of the snowy grouper discarded were reported as “dead” or the “majority” of discarded fish were dead. A small percentage (8.5%) of vertical line snowy grouper was reported as ‘kept for bait or eaten’. The disposition of snowy grouper discards from the longline fishery confidential due to very few vessels reporting to the discard logbook program.

Snowy grouper were discarded in the vertical line fishery most frequently due to regulations: 79.9% due to other regulations (Table 6). Prior to 2008 the reason for discarding could be reported as either due to regulations or due to market conditions. Beginning in 2008 the discard reporting form was expanded to include discarded due to the fish being under legal size or due to closed season. Reports from 2002-2007 citing regulations may have been reclassified as ‘other regulations’ because discards due to closed season and due to legal size could not be determined. Market conditions were cited for an additional 11.8% of snowy grouper vertical line discards. Discarded due to regulations (other) was indicated as the reason all snowy grouper discarded in the longline fishery.

The number of trips reporting snowy grouper discards in the US South Atlantic was very low and the number of individuals of those species reported as discarded was also low. Stratification of the available data was limited because of the small sample sizes and, therefore, the discard analyses described here likely do not capture much of the variation in numbers of discards within the snowy grouper fishery. Variation in the number of discards among years was entirely driven by the effort reported from the fisheries (vertical line and longline).

Of additional concern is the increase in the number of trips reported as having 'no discards'. Inclusion of data from those trips may result in an underestimate of discard rates. Further discussion with commercial fishers regarding the likelihood that most commercial fishing trips have no discards of any species is necessary to corroborate the high percentage of no discard trips reported.

Literature Cited

Poffenberger, J. and K. McCarthy. 2004. Estimates of red snapper discards by vessels with Federal permits in the Gulf of Mexico. SEDAR 7-DW-22.

Table 1. Yearly discards of snowy grouper from US South Atlantic vertical line commercial fishing vessels. Discard rates were the mean rates over the years 2002-2012. Discard rate was calculated using all data reported to the discard logbook program after removing data from trips with no snowy grouper associated species landed. Discard rate (filtered) was calculated using discard logbook data filtered to remove records with no discards of any species reported. Number of trips reporting to the discard logbook program was summed across the years 2002-2012. Effort = hook hours fished. Discards are reported as number of fish.

Year	Trips (reporting discards)	Filtered trips (reporting discards)	Trips (reporting effort)	Total Effort	Discard Rate	Discard Rate CV	Calculated Discards	Discard Rate (filtered)	Discard Rate (filtered) CV	Calculated Discards (filtered)
1993	26,241	10,799	10,070	1,309,684	0.000161	30.98	211	0.000391	19.86	512
1994	26,241	10,799	12,421	1,639,881	0.000161	30.98	264	0.000391	19.86	641
1995	26,241	10,799	12,659	1,625,222	0.000161	30.98	262	0.000391	19.86	636
1996	26,241	10,799	14,100	1,612,296	0.000161	30.98	259	0.000391	19.86	631
1997	26,241	10,799	15,268	1,742,284	0.000161	30.98	280	0.000391	19.86	681
1998	26,241	10,799	15,047	1,297,160	0.000161	30.98	209	0.000391	19.86	507
1999	26,241	10,799	12,580	1,087,031	0.000161	30.98	175	0.000391	19.86	425
2000	26,241	10,799	11,659	1,133,847	0.000161	30.98	182	0.000391	19.86	443
2001	26,241	10,799	12,723	1,184,143	0.000161	30.98	191	0.000391	19.86	463
2002	26,241	10,799	13,033	1,120,939	0.000161	30.98	180	0.000391	19.86	438
2003	26,241	10,799	13,687	976,511	0.000161	30.98	157	0.000391	19.86	382
2004	26,241	10,799	12,500	867,386	0.000161	30.98	140	0.000391	19.86	339
2005	26,241	10,799	10,971	805,032	0.000161	30.98	130	0.000391	19.86	315
2006	26,241	10,799	11,775	869,390	0.000161	30.98	140	0.000391	19.86	340
2007	26,241	10,799	12,147	917,156	0.000161	30.98	148	0.000391	19.86	359
2008	26,241	10,799	12,565	918,013	0.000161	30.98	148	0.000391	19.86	359
2009	26,241	10,799	14,418	994,039	0.000161	30.98	160	0.000391	19.86	389
2010	26,241	10,799	12,441	820,409	0.000161	30.98	132	0.000391	19.86	321
2011	26,241	10,799	11,738	756,995	0.000161	30.98	122	0.000391	19.86	296
2012	26,241	10,799	10,016	633,828	0.000161	30.98	102	0.000391	19.86	248

Table 2. Yearly discards of snowy grouper from US South Atlantic bottom longline commercial fishing vessels. Discard rates were the mean rates over the years 2002-2012. Discard rate was calculated using all data reported to the discard logbook program after removing data from trips with no snowy grouper associated species landed. Discard rate (filtered) was calculated using discard logbook data filtered to remove records with no discards of any species reported. Number of trips reporting to the discard logbook program was summed across the years 2002-2012. Bottom longline effort = hooks fished. Discards are reported as number of fish.

Year	Trips (reporting discards)	Filtered trips (reporting discards)	Trips (reporting effort)	Total Effort	Discard Rate	Discard Rate CV	Calculated Discards	Discard Rate (filtered)	Discard Rate (filtered) CV	Calculated Discards (filtered)
1993	1,091	414	837	4,364,897	0.00001797	18.6	78	0.000047	11.44	207
1994	1,091	414	963	5,193,755	0.00001797	18.6	93	0.000047	11.44	246
1995	1,091	414	765	3,998,978	0.00001797	18.6	72	0.000047	11.44	189
1996	1,091	414	943	3,372,504	0.00001797	18.6	61	0.000047	11.44	160
1997	1,091	414	656	3,266,783	0.00001797	18.6	59	0.000047	11.44	155
1998	1,091	414	693	3,030,875	0.00001797	18.6	54	0.000047	11.44	144
1999	1,091	414	707	2,702,681	0.00001797	18.6	49	0.000047	11.44	128
2000	1,091	414	711	3,638,798	0.00001797	18.6	65	0.000047	11.44	172
2001	1,091	414	651	3,080,820	0.00001797	18.6	55	0.000047	11.44	146
2002	1,091	414	789	2,888,243	0.00001797	18.6	52	0.000047	11.44	137
2003	1,091	414	675	2,771,276	0.00001797	18.6	50	0.000047	11.44	131
2004	1,091	414	512	2,106,282	0.00001797	18.6	38	0.000047	11.44	100
2005	1,091	414	448	1,275,590	0.00001797	18.6	23	0.000047	11.44	60
2006	1,091	414	584	2,009,137	0.00001797	18.6	36	0.000047	11.44	95
2007	1,091	414	458	705,008	0.00001797	18.6	13	0.000047	11.44	33
2008	1,091	414	411	766,007	0.00001797	18.6	14	0.000047	11.44	36
2009	1,091	414	738	1,199,476	0.00001797	18.6	22	0.000047	11.44	57
2010	1,091	414	628	1,323,322	0.00001797	18.6	24	0.000047	11.44	63
2011	1,091	414	450	823,604	0.00001797	18.6	15	0.000047	11.44	39
2012	1,091	414	650	1,255,504	0.00001797	18.6	23	0.000047	11.44	59

Table 3. Yearly totals of snowy grouper reported as kept as bait from US South Atlantic vertical line commercial fishing vessels. Kept rate was calculated using all data reported to the discard logbook program after removing data from trips with no snowy grouper associated species landed. Kept rate (filtered) was calculated using discard logbook data filtered to remove records with no discards of any species. Number of trips reporting to the discard logbook program was summed across the years 2002-2012. Vertical line effort = hook hours fished. Kept as bait are reported as number of fish.

Year	Trips (reporting discards)	Filtered trips (reporting discards)	Trips (reporting effort)	Total Effort	Kept Rate	Kept Rate CV	Calculated Kept as Bait	Discard Kept as Bait (filtered)	Discard Kept as Bait (filtered) CV	Calculated Kept as Bait (filtered)
1993	26,241	10,799	10,070	1,309,684	0.0000354	77.71	46	0.000086	49.85	113
1994	26,241	10,799	12,421	1,639,881	0.0000354	77.71	58	0.000086	49.85	141
1995	26,241	10,799	12,659	1,625,222	0.0000354	77.71	57	0.000086	49.85	140
1996	26,241	10,799	14,100	1,612,296	0.0000354	77.71	57	0.000086	49.85	139
1997	26,241	10,799	15,268	1,742,284	0.0000354	77.71	62	0.000086	49.85	150
1998	26,241	10,799	15,047	1,297,160	0.0000354	77.71	46	0.000086	49.85	112
1999	26,241	10,799	12,580	1,087,031	0.0000354	77.71	38	0.000086	49.85	93
2000	26,241	10,799	11,659	1,133,847	0.0000354	77.71	40	0.000086	49.85	97
2001	26,241	10,799	12,723	1,184,143	0.0000354	77.71	42	0.000086	49.85	102
2002	26,241	10,799	13,033	1,120,939	0.0000354	77.71	40	0.000086	49.85	96
2003	26,241	10,799	13,687	976,511	0.0000354	77.71	35	0.000086	49.85	84
2004	26,241	10,799	12,500	867,386	0.0000354	77.71	31	0.000086	49.85	75
2005	26,241	10,799	10,971	805,032	0.0000354	77.71	28	0.000086	49.85	69
2006	26,241	10,799	11,775	869,390	0.0000354	77.71	31	0.000086	49.85	75
2007	26,241	10,799	12,147	917,156	0.0000354	77.71	32	0.000086	49.85	79
2008	26,241	10,799	12,565	918,013	0.0000354	77.71	32	0.000086	49.85	79
2009	26,241	10,799	14,418	994,039	0.0000354	77.71	35	0.000086	49.85	85
2010	26,241	10,799	12,441	820,409	0.0000354	77.71	29	0.000086	49.85	71
2011	26,241	10,799	11,738	756,995	0.0000354	77.71	27	0.000086	49.85	65
2012	26,241	10,799	10,016	633,828	0.0000354	77.71	22	0.000086	49.85	54

Table 4. Yearly totals of snowy grouper reported as kept as bait from US South Atlantic bottom longline commercial fishing vessels. Kept rate was calculated using all data reported to the discard logbook program after removing data from trips with no snowy grouper associated species landed. Kept rate (filtered) was calculated using discard logbook data filtered to remove records with no discards of any species. Number of trips reporting to the discard logbook program was summed across the years 2002-2012. Bottom longline effort = hooks fished. Kept as bait are reported as number of fish.

Year	Trips (reporting discards)	Filtered trips (reporting discards)	Trips (reporting effort)	Total Effort	Kept as Bait Rate	Kept as Bait Rate CV	Calculated Kept as Bait	Discard Kept as Bait (filtered)	Discard Kept as Bait (filtered) CV	Calculated Kept as Bait (filtered)
1993	1,091	414	837	4,364,897	0		0	0		0
1994	1,091	414	963	5,193,755	0		0	0		0
1995	1,091	414	765	3,998,978	0		0	0		0
1996	1,091	414	943	3,372,504	0		0	0		0
1997	1,091	414	656	3,266,783	0		0	0		0
1998	1,091	414	693	3,030,875	0		0	0		0
1999	1,091	414	707	2,702,681	0		0	0		0
2000	1,091	414	711	3,638,798	0		0	0		0
2001	1,091	414	651	3,080,820	0		0	0		0
2002	1,091	414	789	2,888,243	0		0	0		0
2003	1,091	414	675	2,771,276	0		0	0		0
2004	1,091	414	512	2,106,282	0		0	0		0
2005	1,091	414	448	1,275,590	0		0	0		0
2006	1,091	414	584	2,009,137	0		0	0		0
2007	1,091	414	458	705,008	0		0	0		0
2008	1,091	414	411	766,007	0		0	0		0
2009	1,091	414	738	1,199,476	0		0	0		0
2010	1,091	414	628	1,323,322	0		0	0		0
2011	1,091	414	450	823,604	0		0	0		0
2012	1,091	414	650	1,255,504	0		0	0		0

Table 5. Reported disposition of snowy grouper discards and kept discards (bait).

Species	Gear	All or majority dead	All or majority alive	Kept as bait/eaten, undetermined, or not reported	N fish
Snowy grouper	Vertical line	50.2%	41.3%	8.5%	424
	Longline	Confidential	Confidential	Confidential	235

Table 6. Reported reasons for discarding snowy grouper. Totals may not sum to 100 percent due to data confidentiality constraints.

Species	Gear	Regulations not legal size	Regulations out of season	Regulations other	Market conditions	Not reported	N fish
Snowy grouper	Vertical line	Confidential	Confidential	79.9%	11.8%	Confidential	424
	Longline			100%			235

Figure 1. Coastal logbook statistical areas.

