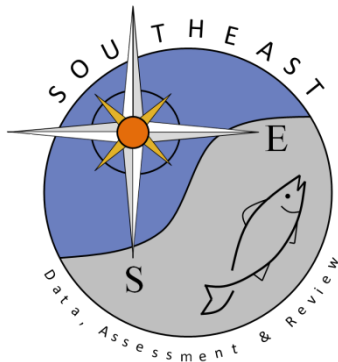


A Summary of Data on the Size Distribution and Release Condition of Gray Triggerfish Discards from Recreational Fishery Surveys in the Atlantic Ocean

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A Summary of Data on the Size Distribution and Release Condition of Gray Triggerfish Discards from Recreational Fishery Surveys in the Atlantic Ocean

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Detailed information on the size and release condition of discarded fish is not collected in traditional dockside surveys of recreational fisheries. At-sea observer surveys provide valuable information on the size and condition of discarded fish, and such surveys have been conducted on headboat vessels in the Atlantic Ocean since 2004. This report provides a summary of available information on the size, release condition, and disposition of gray triggerfish collected from headboats from the Florida Keys through North Carolina.

At-Sea Observer Survey Coverage

In 2004, at-sea observer surveys were conducted on headboats from North Carolina and South Carolina, and coverage was extended to east Florida in 2005. In the Florida Keys, the at-sea headboat survey was funded by the Gulf Fisheries Information Network (Gulf FIN) from 2005 until 2007. In 2010, the state of Florida secured alternative funds to continue limited at-sea observer coverage in the Keys.

At-Sea Observer Survey Methods

Headboat vessels in each state were randomly selected each week. The state of Florida was stratified into three regions: Northeast (Nassau through Brevard Counties, sub-region=5), Southeast (Indian River through Dade Counties, sub-region=4), and Keys (Monroe County, sub-region=3). Operators from selected vessels were contacted by state biologists and one or two observers were scheduled to sample a single trip in a selected week. For trips with 15 or less passengers in Florida, only one observer accompanied passengers during the scheduled trip. The captain and mates cooperated by making sure fish caught by their anglers were observed by one of the biologists before they were stored in the fish hold or released overboard. Biologists would assist with dehooking fish for data collection, but were not permitted to influence the decision to keep or release a fish. For each fish, biologists recorded the species, disposition, size (fork length in mm), and the condition (Florida only) of fish that were released. Disposition was coded as:

- 1: thrown back alive, legal;
- 2: thrown back alive, not legal;
- 3: plan to eat;

- 4: used for bait or plan to use for bait;
- 5: sold or plan to sell;
- 6: thrown back dead or plan to throw away.

Release condition was coded as:

- Good = 1: fish swam toward bottom immediately upon entry into the water;
Fair = 2: fish was disoriented upon release and slowly swam towards the bottom;
Poor = 3: fish was very disoriented upon release and remained at the surface;
Dead = 4: fish was either dead or unresponsive upon entering the water;
Eaten = 5: fish was eaten by a bird, another fish, or a marine mammal;
Unobserved = 9: unable to observe fish, not applicable.

Trip level information for each trip included the area fished, duration of fishing (to the nearest half hour), number of anglers, and minimum and maximum depths (feet, collected in Florida only) of the fishing sites. Area fished was as:

- 1: 3 miles or less from shore; or
- 2: more than 3 miles from shore.

A brief interview with each angler observed during a trip was also conducted to collect information on primary and secondary target species, angler avidity, and state and county of residence.

Florida, 2011-2012

Additional information was collected in Florida beginning in 2010 in the Keys and 2011 on the east coast of Florida. Additional information collected for each fish includes:

- Hook type (circle, J, other)
- Hook size (based on a sizing chart)
- Anatomical location of embedded hooks (lip, mouth, throat, gill, gut, eye, external)
- Method of hook removal (easy or difficult; by hand, dehooking tool, pliers, or left in place)
- Barotrauma symptoms (inflated bladder, everted stomach, extruded intestines, exophthalmia)
- Venting method (released without venting, bladder vented, stomach vented)

Additional information collected for each fishing location within a sampled trip includes:

- Location coordinates in degrees and minutes latitude/longitude (when provided by vessel operator)
- Depth in meters

Characterization of Trips:

Sampled trips were categorized into the following trip-types based on the duration of the trip:

- Half-Day: < 6 hours
- Three-Quarter-Day: 6 – 8 hours
- Full-day: 9 – 14 hours

Characterization of Discards:

Fish mid-line lengths were assigned to one cm length bin categories (40 cm bin = fish 39.6 cm to 40.5 cm) and the number of lengths in each length bin category were summed by year and disposition (harvested, released).

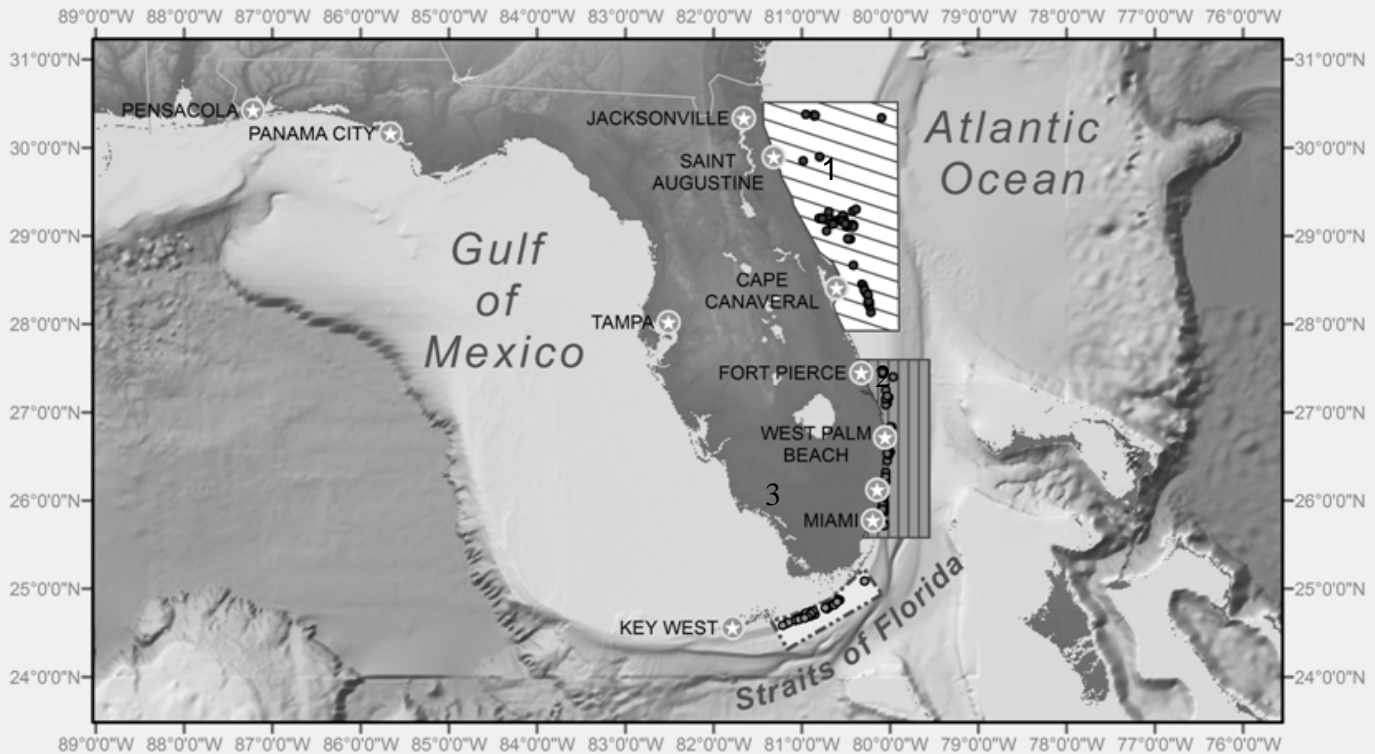


Figure 1. Areas in Florida with at-sea observer coverage. Area 1 is the northeast region, area 2 is the southeast region, and area 3 is the Key West Region. Individual points are station locations for trips sampled between 2010-2012.

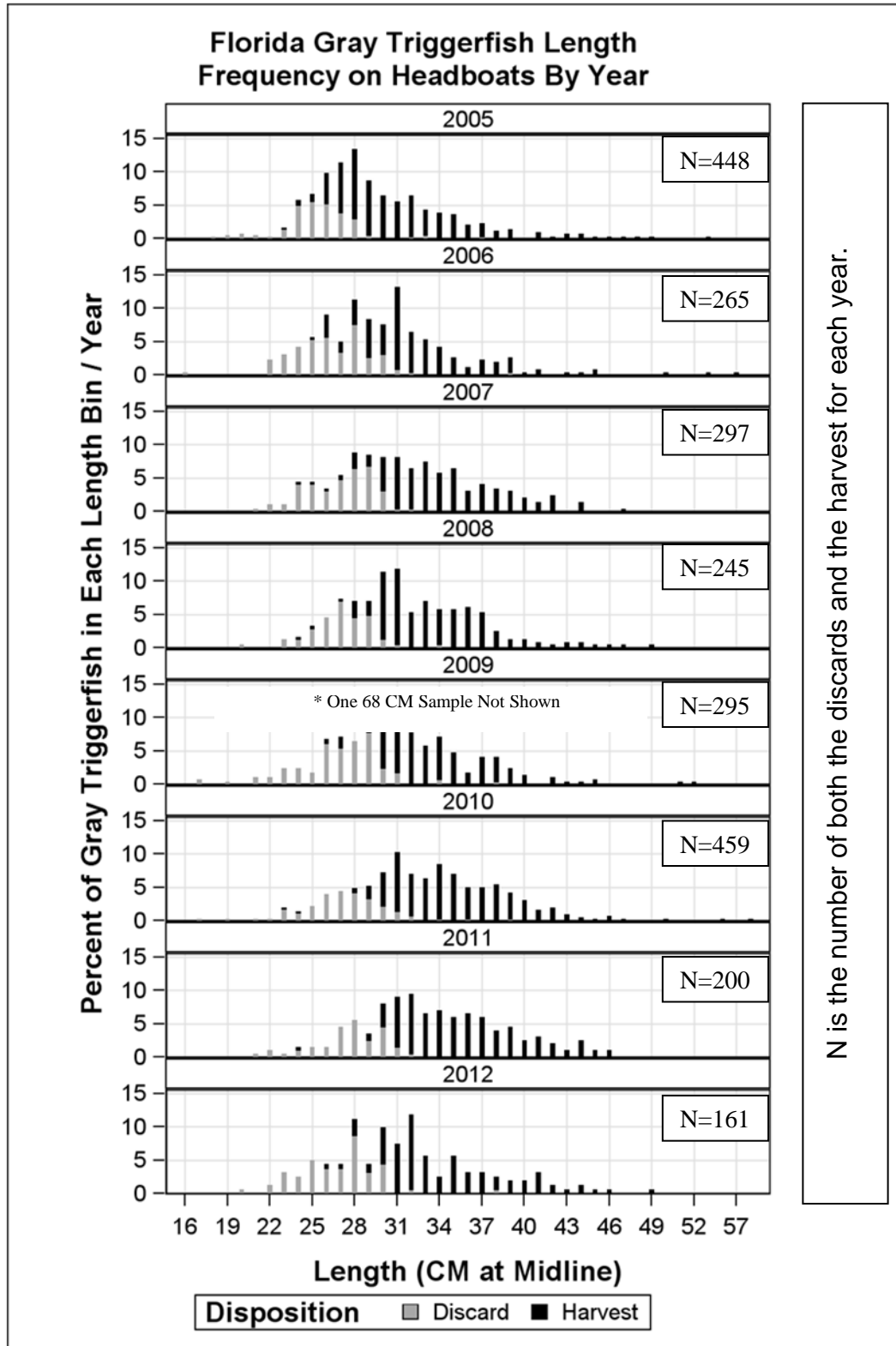


Figure 2. Length frequencies of harvested and released Gray Triggerfish measured by at-sea observers on headboats in Florida 2005-2012. Harvest includes fish that were released dead.

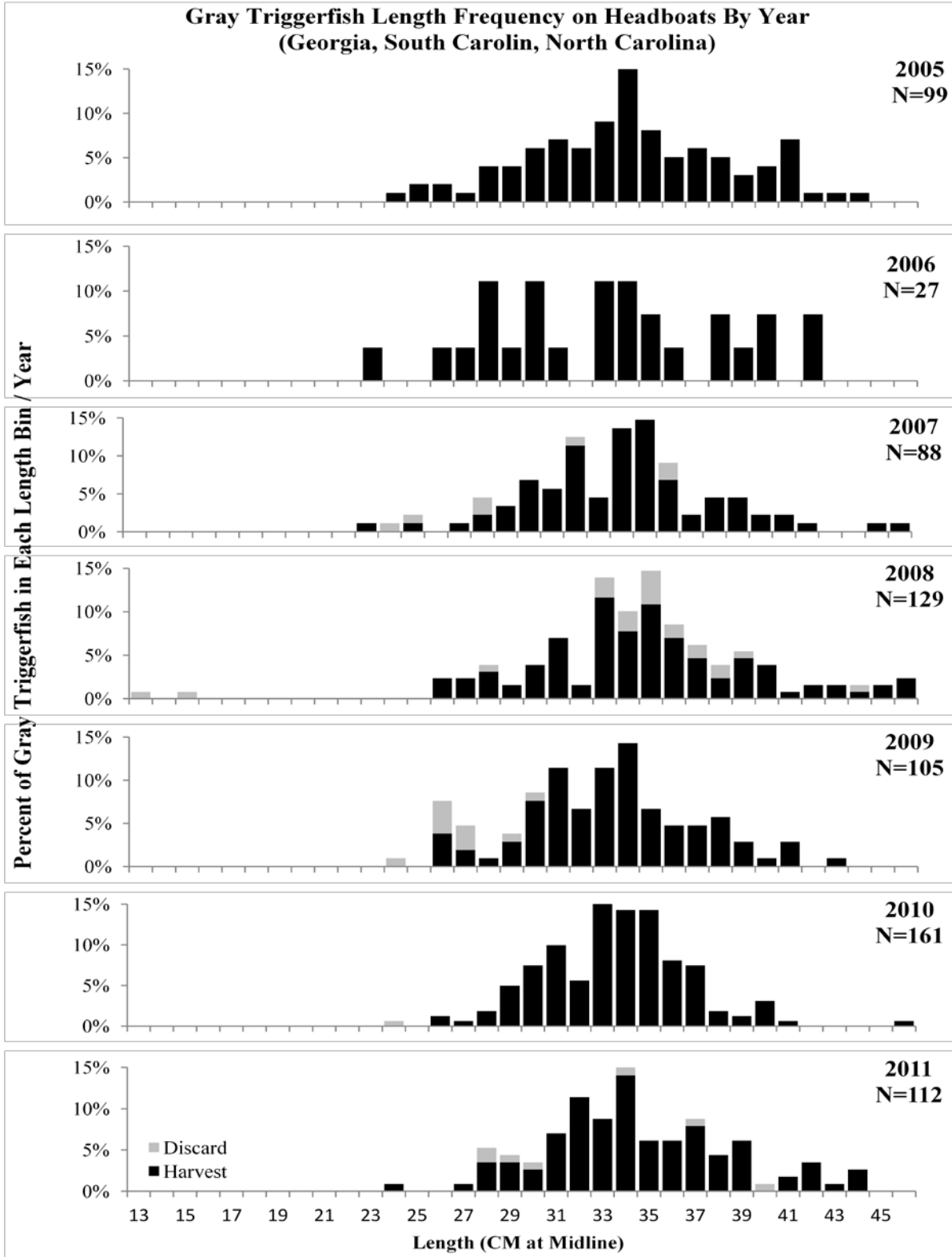


Figure 3. Length frequencies of harvested and released Gray Triggerfish measured by at-sea observers on headboats in Georgia, South Carolina and North Carolina, 2005-2012. Harvest includes fish that were released dead.

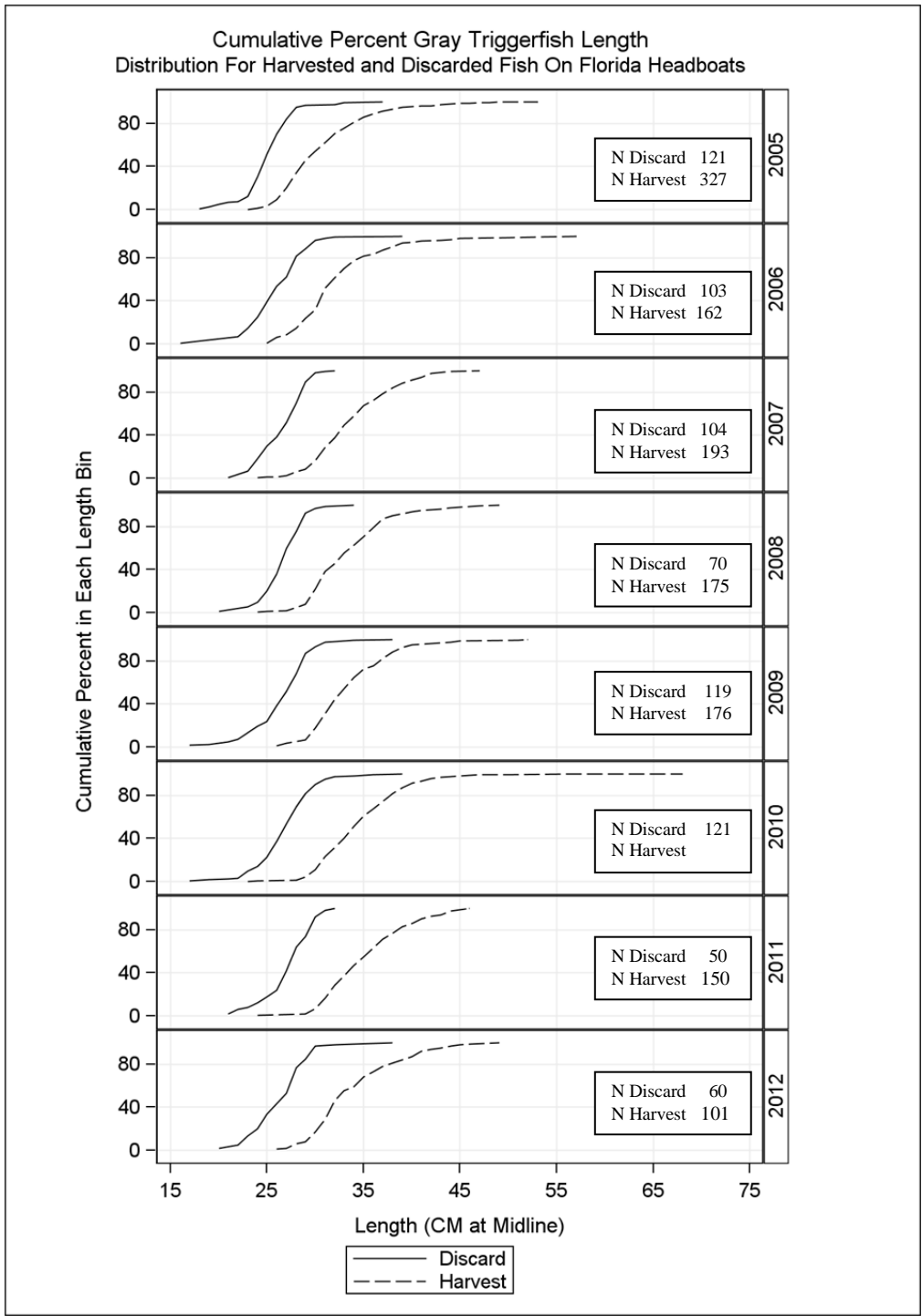


Figure 4. Cumulative length frequency of harvested and released Gray Triggerfish measured by at-sea observers on headboats in Florida. Harvest includes fish that were released dead.

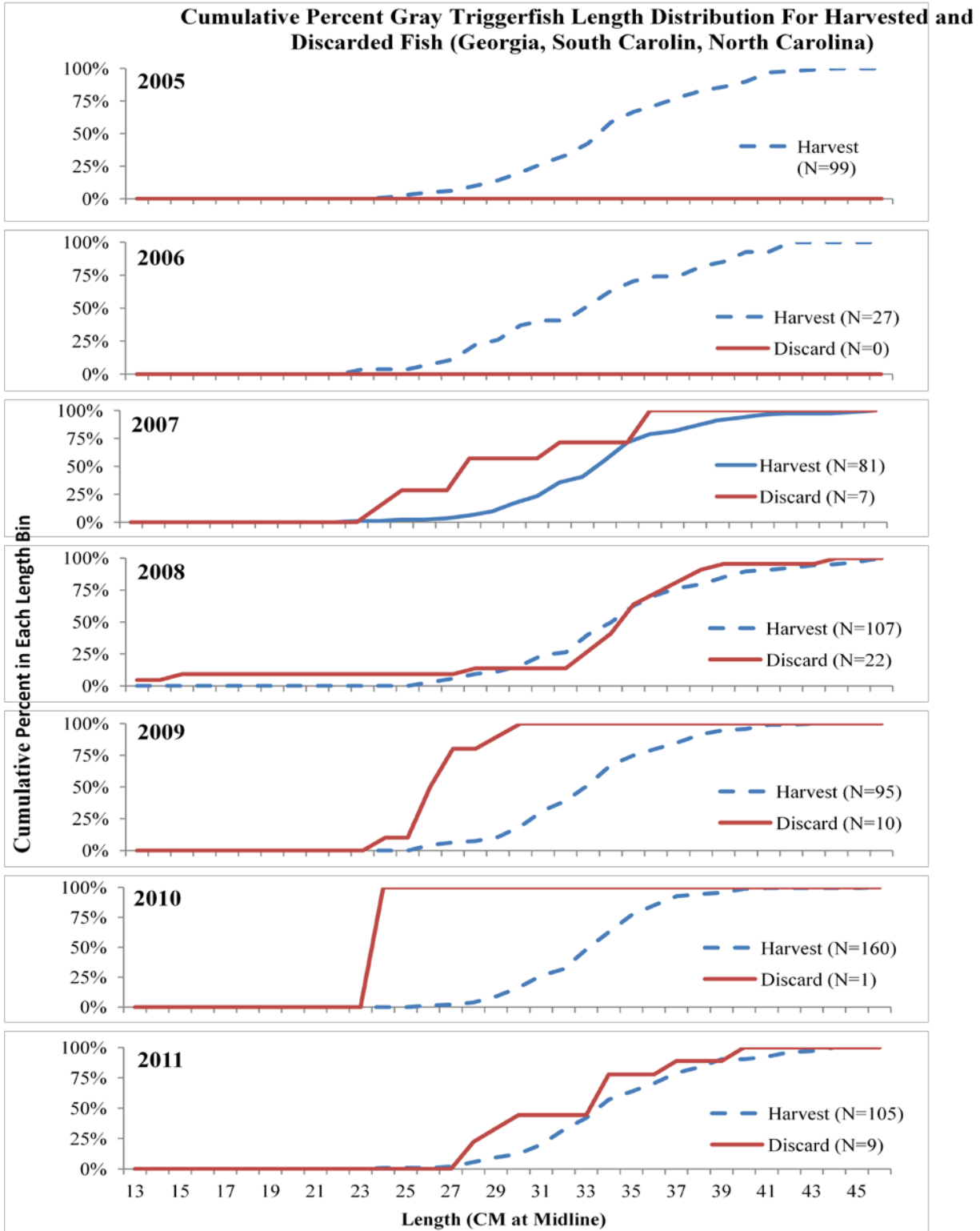


Figure 5. Cumulative length frequency of harvested and released Gray Triggerfish measured by at-sea observers on headboats in Georgia, South Carolina, and North Carolina. Harvest includes fish that were released dead.

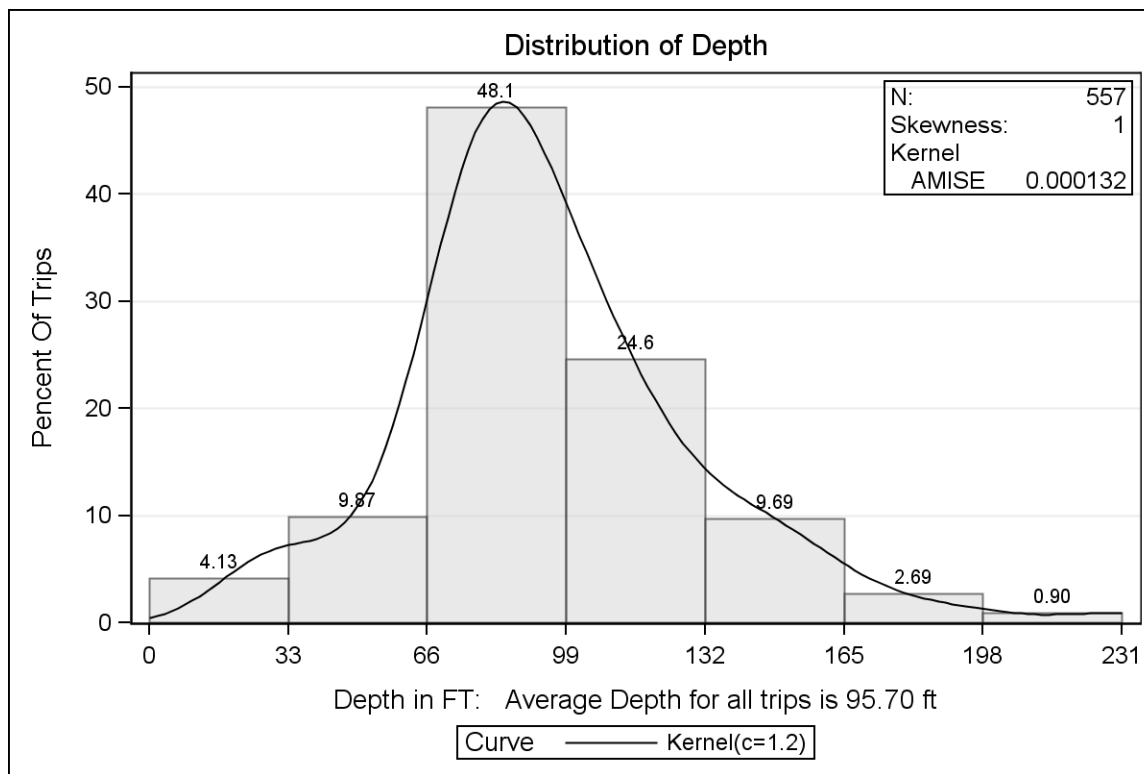


Figure 6. Distribution of depths (in feet) of positive gray triggerfish headboat trips in Florida, 2005-2012. The last depth category is a plus group that includes four trips with depths of 265, 300, 448 and 474 feet.

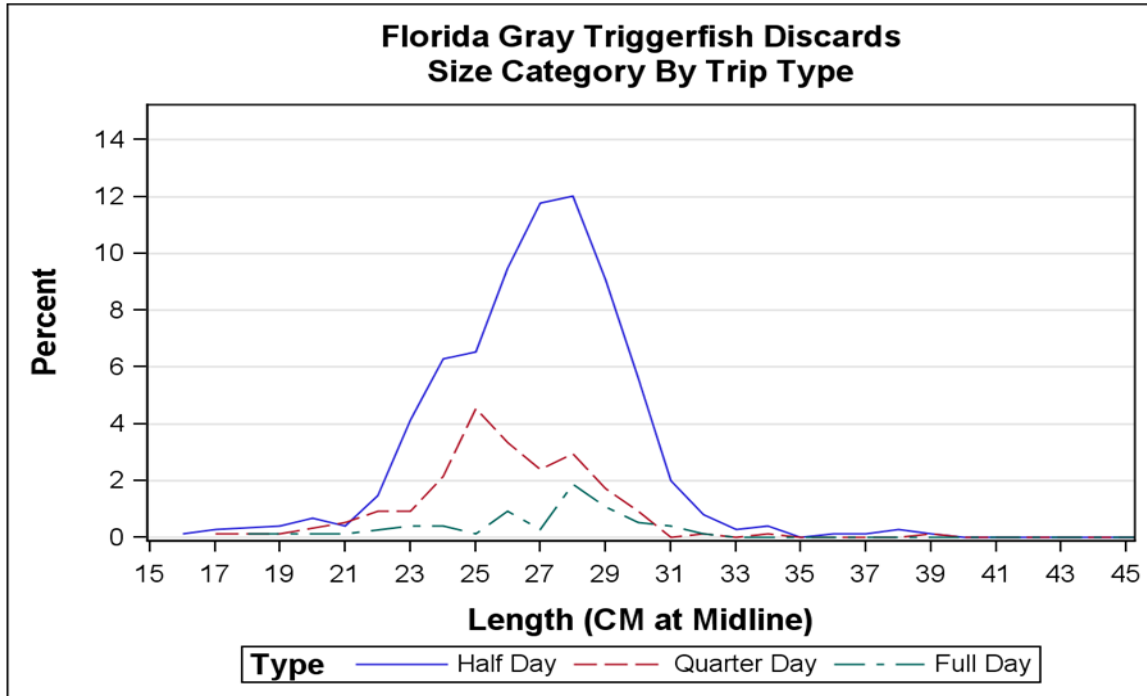


Figure 7. Percent of gray triggerfish discards by size category and trip type from headboat at-sea surveys conducted in Florida, pooled for all years. Half-day trips account for 72.46%, three-quarter-day trips account for 21.12%, and full-day trips account for 6.42% of the total releases.

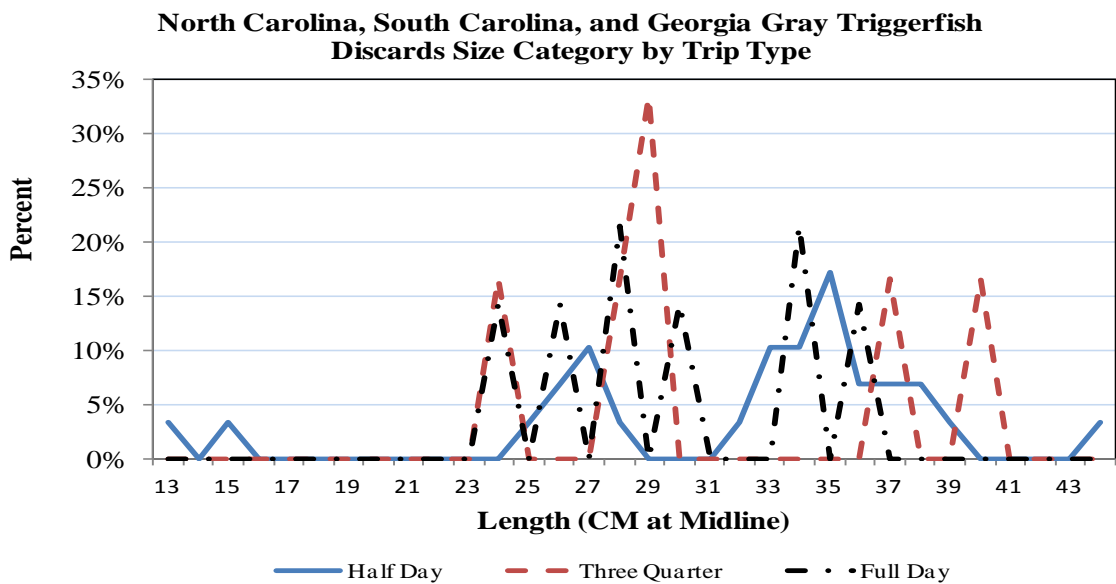


Figure 8. Percent of gray triggerfish discards by size category and trip type from headboat at-sea surveys conducted in Georgia, South Carolina and North Carolina, pooled for all years. Half-day trips account for 59%, three-quarter-day trips account for 12%, and full-day trips account for 29% of the total releases.

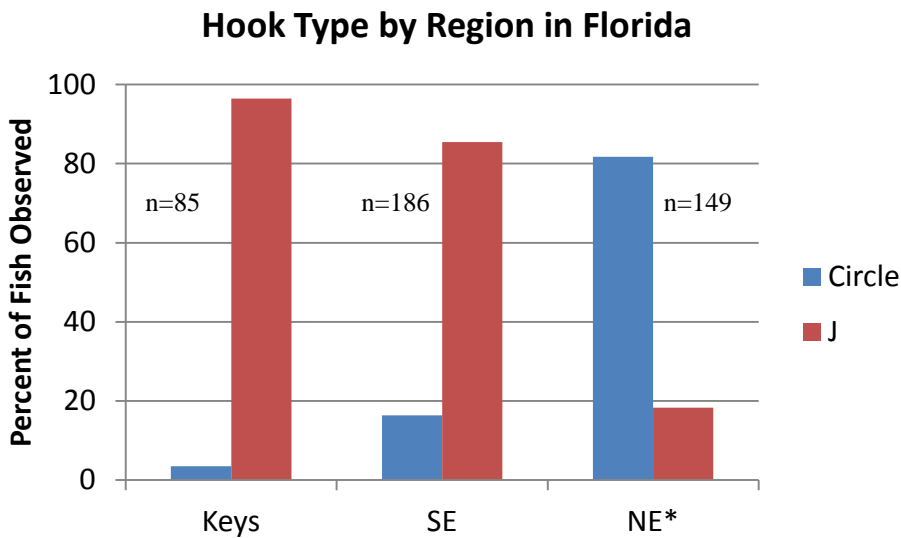


Figure 9. Percent of fish observed that were caught with circle hooks versus J hooks by region in Florida. *Note, in northeast region, circle hooks are required when fishing in EEZ and NE only includes trips sampled since the circle hook rule went into effect in March, 2011 (only seven fish were observed by hook type in this region prior to the rule taking effect).

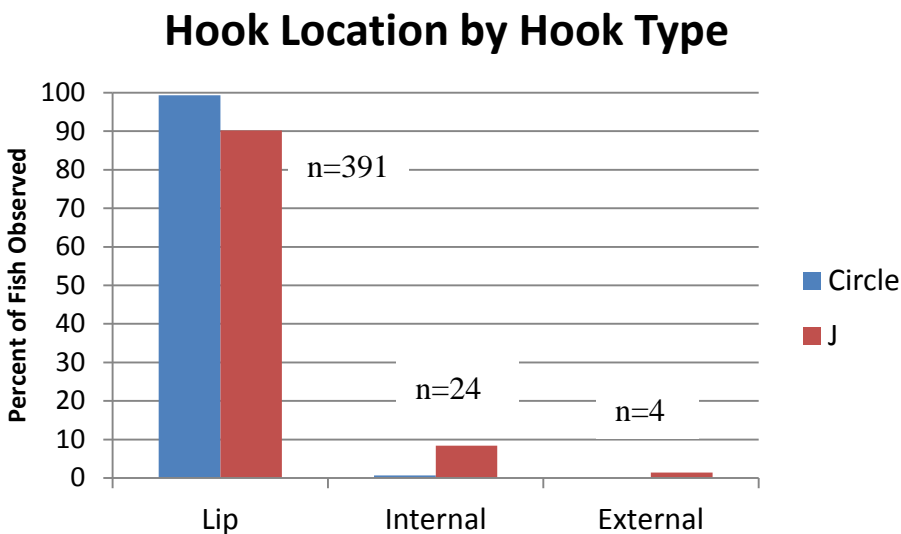


Figure 10. Percent of fish observed in Florida by hook type for which hooks were embedded in the lip versus internally (in the mouth, throat, or gut) or externally (in the eye or foul hooked).

Table 1. Florida headboat at-sea observer trips sampled by month, year, and trip duration.

FL Trips		Month												Total
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Year	Trip Type	1	1	8	13	10	12	13	13	15	11	12	16	125
2005	Half Day	0	1	1	1	2	1	1	3	3	8	2	3	26
	Three/Quarter Day	0	1	2	2	2	4	1	1	1	3	4	1	22
	Full Day	0	0	0	0	0	0	0	0	0	0	1	0	1
	Multiday	1	3	11	16	14	17	15	17	19	22	19	20	174
	Total	7	10	14	11	11	11	16	10	7	9	9	7	122
2006	Half Day	2	2	1	2	6	1	5	2	0	4	3	1	29
	Three/Quarter Day	0	1	1	1	1	1	0	0	2	0	1	2	10
	Full Day	1	1	1	1	0	0	0	0	0	0	1	0	5
	Multiday	10	14	17	15	18	13	21	12	9	13	14	10	166
	Total	11	10	9	11	10	9	8	11	7	9	7	5	107
2007	Half Day	1	3	2	4	3	5	5	1	6	4	3	5	42
	Three/Quarter Day	1	1	2	3	1	1	0	2	1	1	1	1	15
	Full Day	1	1	0	1	0	0	1	0	0	0	2	1	7
	Multiday	14	15	13	19	14	15	14	14	14	14	13	12	171
	Total	4	5	5	8	7	8	10	7	6	6	5	5	76
2008	Half Day	4	2	3	3	3	2	1	4	3	2	2	2	31
	Three/Quarter Day	0	1	2	1	2	2	1	1	3	3	2	1	19
	Full Day	0	0	0	0	0	0	0	0	0	0	0	0	0
	Multiday	8	8	10	12	12	12	12	12	12	11	9	8	126
	Total	4	5	5	8	7	8	10	7	6	6	5	5	76

Table 1, continued.

FL Trips		Month												Total
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Year	Trip Type	6	6	6	9	8	7	6	7	6	7	5	5	78
2009	Half Day	2	3	4	3	3	4	4	4	5	3	1	3	39
	Three/Quarter Day	0	0	1	0	1	1	1	2	1	1	2	1	11
	Full Day	0	0	0	0	0	0	0	0	0	0	0	0	0
	Multiday	8	9	11	12	12	12	11	13	12	11	8	9	128
	Total	6	6	8	9	9	12	8	8	7	9	6	7	95
2010	Half Day	1	3	1	3	2	1	4	5	1	3	2	2	28
	Three/Quarter Day	0	0	2	2	2	3	1	2	3	2	1	1	19
	Full Day	0	0	0	0	0	0	0	0	0	0	0	0	0
	Multiday	7	9	11	14	13	16	13	15	11	14	9	10	142
	Total	8	3	7	8	8	10	10	10	7	8	5	6	90
2011	Half Day	2	4	2	3	2	5	3	1	2	2	2	3	31
	Three/Quarter Day	2	1	0	3	2	0	1	2	2	1	1	0	15
	Full Day	0	0	0	0	0	0	0	0	0	0	0	0	0
	Multiday	12	8	9	14	12	15	14	13	11	11	8	9	136
	Total	5	4	10	8	13	7	11	10	7	9	6	5	95
2012	Half Day	2	1	3	6	2	6	8	4	4	1	4	3	44
	Three/Quarter Day	0	1	1	1	3	1	2	2	1	0	0	0	12
	Full Day	0	0	0	0	0	0	0	0	0	0	0	0	0
	Multiday	7	6	14	15	18	14	21	16	12	10	10	8	151
	Total													

Table 2. Georgia, South Carolina and North Carolina headboat at-sea observer trips sampled by month, year, and trip duration.

Year	Trip Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2005	Full Day	2	3	8	8	7	6	11	8	6		59
	Half Day	1	10	6	12	16	10	4	8	3		70
	Three/Quarter Day			9	6	7	7			3		32
	Total	3	13	23	26	30	23	15	16	12		161
2006	Full Day	2	7	12	9	11	5	3	1	2	1	53
	Half Day	2	3	7	11	8	10	11	8	6		66
	Three/Quarter Day	1	1	2	4	7		2	3	1		21
	Total	5	11	21	24	26	15	16	12	9	1	140
2007	Full Day	2	1	2	6	7	10	2	4	4	1	39
	Half Day	6	7	9	15	17	15	10	10	6	3	98
	Three/Quarter Day	4	4	3	2				1			14
	Total	12	12	14	23	24	25	12	15	10	4	151
2008	Full Day	1	6	6	5	7	4	1	2	3		35
	Half Day	6	8	8	10	10	14	12	10	3		81
	Three/Quarter Day			1		3						4
	Total	7	14	15	15	20	18	13	12	6		120
2009	Full Day		2	2	1	3	4	3		1		16
	Half Day	4	8	11	14	12	12	10	5	4		80
	Three/Quarter Day	1	2	2	4	2	4		1			16
	Total	5	12	15	19	17	20	13	6	5		112
2010	Full Day	2	4	3	2	4	4	3	2	2		26
	Half Day	2	4	11	10	9	12	9	5	8	2	72
	Three/Quarter Day	3		1	4	3	2		1			14
	Total	7	8	15	16	16	18	12	8	10	2	112
2011	Full Day	1	3	3	1	3	5	2	1	2		21
	Half Day	5	1	6	11	7	14	10	3	2	2	61
	Three/Quarter Day	1	1	3	4	4	3	2	3	1		22
	Total	7	5	12	16	14	22	14	7	5	2	104

Table 3. Sample sizes for gray triggerfish lengths in Florida.

Florida Gray Triggerfish Statistics by Year					
Year	Disposition	N	Min	Max	Mean
2005	Discard	121	18	37	25
	Harvest	327	23	53	31
2006	Discard	103	16	39	26
	Harvest	162	25	57	33
2007	Discard	104	21	32	27
	Harvest	193	24	47	34
2008	Discard	70	20	34	27
	Harvest	175	24	49	34
2009	Discard	119	17	38	27
	Harvest	176	26	52	34
2010	Discard	121	17	39	27
	Harvest	338	23	68	35
2011	Discard	50	21	32	28
	Harvest	150	24	46	36
2012	Discard	60	20	38	27
	Harvest	101	26	49	34

Table 4. Sample sizes for Gray Triggerfish lengths in Georgia, South Carolina, and North Carolina.

Year	Disposition	Number	Minimum	Maximum	Mean
2005	Discard	-	-	-	-
	Harvest	99	24	44	34
2006	Discard	-	-	-	-
	Harvest	27	23	42	33
2007	Discard	7	24	36	30
	Harvest	81	23	46	34
2008	Discard	22	13	44	33
	Harvest	107	26	46	35
2009	Discard	10	24	30	27
	Harvest	95	26	43	33
2010	Discard	1	24	24	24
	Harvest	160	26	46	34
2011	Discard	9	28	40	33
	Harvest	105	24	44	34

Table 5. Release conditions of gray triggerfish in Florida. No fish were observed to be eaten by predators.

	Release Condition Florida									
	Good		Fair		Poor		Dead		Unable to Observe Fish	
	N	%	N	%	N	%	N	%	N	%
2005	109	90.08	6	4.96	3	2.48	1	0.83	2	1.65
2006	95	92.23	6	5.83	1	0.97	1	0.97	0	0
2007	95	91.35	3	2.88	6	5.77	0	0	0	0
2008	62	88.57	2	2.86	5	7.14	1	1.43	0	0
2009	105	88.24	7	5.88	5	4.20	0	0	2	1.68
2010	110	91.67	4	3.33	6	5.00	0	0	0	0
2011	46	92.00	2	4.00	2	4.00	0	0	0	0
2012	56	96.55	1	1.72	1	1.72	0	0	0	0

Table 6. Numbers of harvested and discarded fish in Florida and discard percentage.

Year	N Harvest	N Discards	% Discards
2005	327	121	27.01
2006	162	103	38.87
2007	193	104	35.02
2008	175	70	28.57
2009	176	119	40.34
2010	338	121	26.36
2011	150	50	25.00
2012	101	60	37.27

Table 7. Numbers of harvested and discarded fish and discard percentage in Georgia, South Carolina, and North Carolina.

Year	N Harvest	N Discard	% Discards
2005	99	0	0.00
2006	27	0	0.00
2007	81	7	-7.95
2008	107	22	-17.05
2009	95	10	-9.52
2010	160	1	-0.62
2011	105	9	-7.89

Table 8. Mean depth fished in feet (calculated as sum of median depth for sampled trips divided by total number of trips) and range by year for Florida trips.

Year	Number of Trips	Mean Depth	Min Depth	Max Depth
2005	83	104	29	448
2006	65	96	34	179
2007	58	88	32	168
2008	60	96	35	215
2009	74	96	55	195
2010	90	96	20	475
2011	62	88	22	194
2012	65	96	24	172