Size Distribution of Red Grouper Observed in For-Hire Recreational Fisheries in the Gulf of Mexico

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SEDAR 42-DW-14

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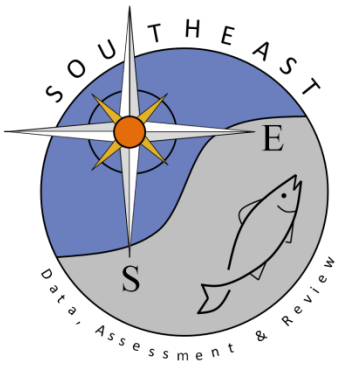

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Red Grouper Size Distribution and Standardized CPUE Observed in For-Hire Recreational Fisheries in the Gulf of Mexico

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Detailed information on the size 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. Such surveys have been conducted on headboat vessels in the eastern Gulf of Mexico since 2005. Coverage was expanded in June of 2009 to include charter vessels on the east coast of Florida, and this coverage continued through 2013. This report provides a summary of available information on the size and catch-per-unit-effort for Red Grouper collected from headboats and charter boats from the Gulf coast of Florida. For detailed methods and results, refer also to Sauls et al. (2014), which was provided as a reference document for this data workshop (SEDAR42-RD01).

Coverage

Fishery observer coverage for headboats and charter boats operating on the Gulf coast of Florida is summarized in Table 1. From 2005-2007, at-sea observer surveys were conducted on headboats only from Alabama through Southwest Florida (Figure 1); however, funding was discontinued in 2008. A new funding source allowed coverage to resume on both headboats and charter boats over a reduced area (A, B and C in Figure 1 and Table 1) from June 2009 through December 2013.

Table 1. Fishery observer coverage for headboats (H) and charter vessels (C) on the Gulf coast of Florida. Refer to figure 1 for areas.

Area	2005	2006	2007	2008	2009*	2010	2011	2012	2013
NW panhandle (A)	H	H	H		H, C	H, C	H, C	H, C	H, C
TB nearshore (B)	H	H	H		H, C	H, C	H, C	H, C	H, C
TB offshore (C)	H	H	H		H	H	H	H	H
Naples/Ft. Meyers (E)	H	H	H						

*Sampling did not resume until June.

Cooperative vessels were randomly selected year-round for observer coverage, and samples were stratified by region (Figure 1). 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. Monthly

sample quotas were assigned to two trip types in areas A and B: 1) single day charter trips and 2) single day headboat (large party boat) trips. Monthly sample quotas for a third trip type, multi-day (>24 hour) headboat trips, were assigned in area C. For trips with 15 or less passengers, only one observer accompanied passengers during the scheduled trip. Area D, the Big Bend region, was not routinely sampled due to the small number of charter boats (and no headboats) that target reef fishes offshore and the infrequent nature of trips; however, observers were able to conduct a small number of trips in this region.

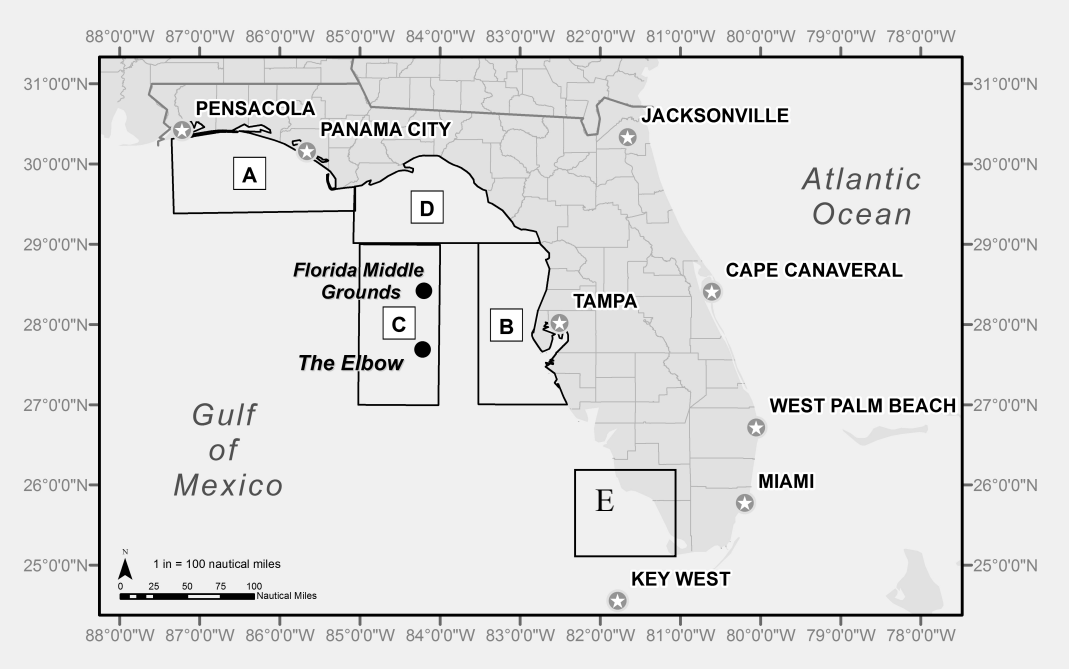


Figure 1. Study areas in Florida. Box A represents the area where half-day and full-day trips originating from the northwest panhandle region (NW) took place, Box B represents the area where half-day and full-day trips originating from the Tampa Bay region (TB) took place, Box C represents the area where multi-day trips originating from the Tampa Bay region (TB) took place. Box E is the area where headboats based in Naples/Fort Meyers operate.

Data Elements:

All sampled trips
Trip level data are available for all regions and years of observer coverage (Table 1). Trip level information for each sampled trip includes:

- Year, month and day of trip
- duration of trip (to the nearest half hour)
- duration of time spent fishing (to the nearest half hour)
- total number of anglers on board

- number of anglers observed
- minimum and maximum depths fished

For each location fished during a sampled trip, the following station-level information was recorded:

- latitude and longitude (degrees and minutes)
- fishing zone and subzone (same as commercial zones)
- bottom depth (meters)
- up to three target species and percentage of time targeting each

For each angler observed during a sampled trip, the following information was collected:

- total number of fish retained by species
- total number of fish discarded alive by species
- total number of fish discarded dead by species

For each rod fished by an observed angler at a given station, the following information was recorded:

- leader type and strength
- hook type (circle hook, J hook, kahle hook, treble hook, other)
- hook offset (yes or no)
- hook size (using a standard hook sizing chart)
- bait type (live, whole dead fish, cut fish, squid, cocktail, artificial)

For each fish observed from a given rod at a given station, the following information was recorded:

- species
- mid-line length (mm)
- disposition, 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
    - 7: other
- method of hook removal (easy or difficult; by hand, dehooking tool, pliers, or left in place)
- presence of barotrauma symptoms (inflated bladder, everted stomach, extruded intestines, exopthalmia)
- venting method (released without venting, bladder vented, stomach vented)
- presence of gill injury (visible bleeding from gills)

Sample Weights for Size Distribution:

To generate weighting factors for different trip-types, fishing effort data for the years 2009 through 2013 were used to calculate proportional effort by trip-type. Headboat vessels report fishing effort in logbook trip reports, and effort data from the two study regions in the Gulf of Mexico were provided by the NMFS Southeast Fisheries Science Center in Beaufort, NC. Effort data for charter vessels is collected through the For-Hire Survey component of the Marine Recreational Information Program, which a weekly vessel directory telephone survey of charter boat operators (Van Voorhees et al. 2002). Proportional fishing effort was calculated as the total numbers of trips in the Gulf of Mexico reported for a given trip-type divided by the total number of Gulf trips reported. To obtain the sample weight (W_t), proportional effort was then divided by the proportion of a given trip type in the sample population:

$$W_t = (N_t/N) / (n_t/n) \qquad \text{Equation 1}$$

Where N_t/N is the number of trips of type t divided by total trips reported, and n_t/n is the number of trips of type t in the sample population divided by the total number of sampled trips. Trip-types with $W_t < 1$ are down weighted to account for oversampling and trip-types with $W_t > 1$ are inflated to account for undersampling.

Numbers of charter and headboat trips sampled per year are provided in Table 2.1 and 2.2. Total number of fish sampled on headboats for this project are given in Table 3.1, while number sampled on charter vessels are given in Table 3.2. Sample weights are provided in Table 4.1 and 4.2. Headboat trip type (e.g., half day, full day, etc.) was recorded differently in 2013 compared to prior years; however, trip type was standardized across all years to produce the sample weights provided here. Finally, a distribution of sampled trips by trip duration per year is given in Figure 2.1 and 2.2.

Table 2.1. Numbers of headboat trips sampled each year by region. Regions shaded in gray represent the area with most consistent coverage throughout the time series.

Area	2005	2006	2007	2008	2009	2010	2011	2012	2013
Alabama	48	55	37						
NW FL (A)	55	46	52		28	32	52	49	39
TB FL (B-C)	53	64	63		35	49	48	44	48
SW FL (D)	36	39	26						

Table 2.2. Charter at-sea observer trips sampled per year.

Year	Trips
2009	32
2010	52
2011	70
2012	58
2013	52

Table 3.1. Sample sizes of Red Grouper length measurements from headboats.

Year	Disposition	Region A	Region B-C	Total
2005	Discard	163	963	1126
	Harvest	15	32	47
2006	Discard	54	1004	1058
	Harvest	26	67	93
2007	Discard	19	1614	1633
	Harvest	19	142	161
2009	Discard	27	1707	1734
	Harvest	3	40	43
2010	Discard	21	1571	1592
	Harvest	4	9	13
2011	Discard	33	1023	1056
	Harvest	13	37	50
2012	Discard	19	616	635
	Harvest	9	31	40
2013	Discard	8	764	772
	Harvest	3	36	39

Table 3.2. Sample sizes of Red Grouper length measurements from charter boats.

Year	Disposition	Region A	Region B-C	Total
2009	Discard	46	983	1029
	Harvest	7	35	42
2010	Discard	145	2168	2313
	Harvest	27	75	102
2011	Discard	76	1758	1834
	Harvest	39	75	114
2012	Discard	16	1308	1324
	Harvest	37	134	171
2013	Discard	5	1190	1195
	Harvest	15	160	175

Table 4.1. Sample weights (W_{ay}) by year and trip type for Charter vessels.

Region	Year	Half day	3/4 day	Full day	Multi-day
NW charter	2009	4.880992	0.759578	0.512414	
	2010	2.721536	0.601878	0.962257	
	2011	3.522423	0.562034	1.267357	
	2012	2.253355	0.620278	0.977800	
	2013	1.332341	0.754993	1.262676	
TB charter	2009	9.409514	0.843459	0.203723	
	2010	2.199546	0.916811	0.378559	0.037793
	2011	1.336384	1.071163	0.287683	
	2012	2.864030	0.679953	0.271719	
	2013	1.435865	0.655321	1.02407	

Table 4.2. Sample weights (W_{ay}) by year and trip type for Headboat vessels.

Year	Half day	3/4 day	Full day	Multi-day
2005	4.3929	0.8497	1.3905	0.0786
2006	2.6677	1.0168	0.8960	0.1097
2007	2.5789	0.9907	1.2222	0.0490
2009	4.5287	0.9898	0.3112	0.0676
2010	2.6680	1.0916	0.3111	0.0906
2011	1.5677	1.1018	0.6231	0.0643
2012	1.2124	1.2423	0.6996	0.0945
2013	1.0571	3.0613	0.8487	0.1001

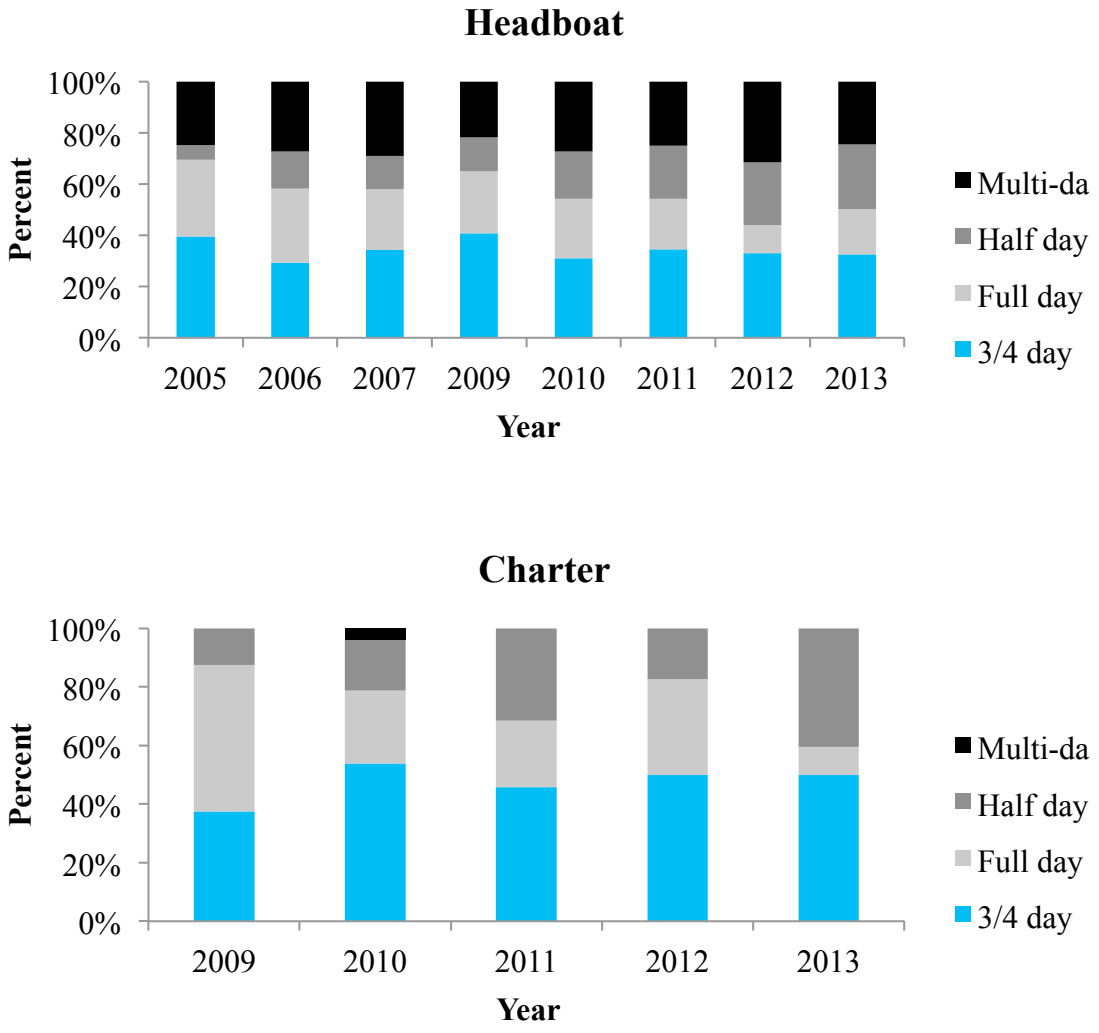


Figure 2. Distribution of sampled trips by trip type and year.

Size Distribution of Discards

Individual fish were assigned to one cm length bin categories (40 cm bin = fish 39.5 cm to 40.4 cm). The numbers of fish in each length bin category were summed by disposition (harvested, released), and multiplied by appropriate sample weights. Discard length distributions from head boats are shown in Figure 3 and discard length distributions from charter vessels are shown in Figure 4.

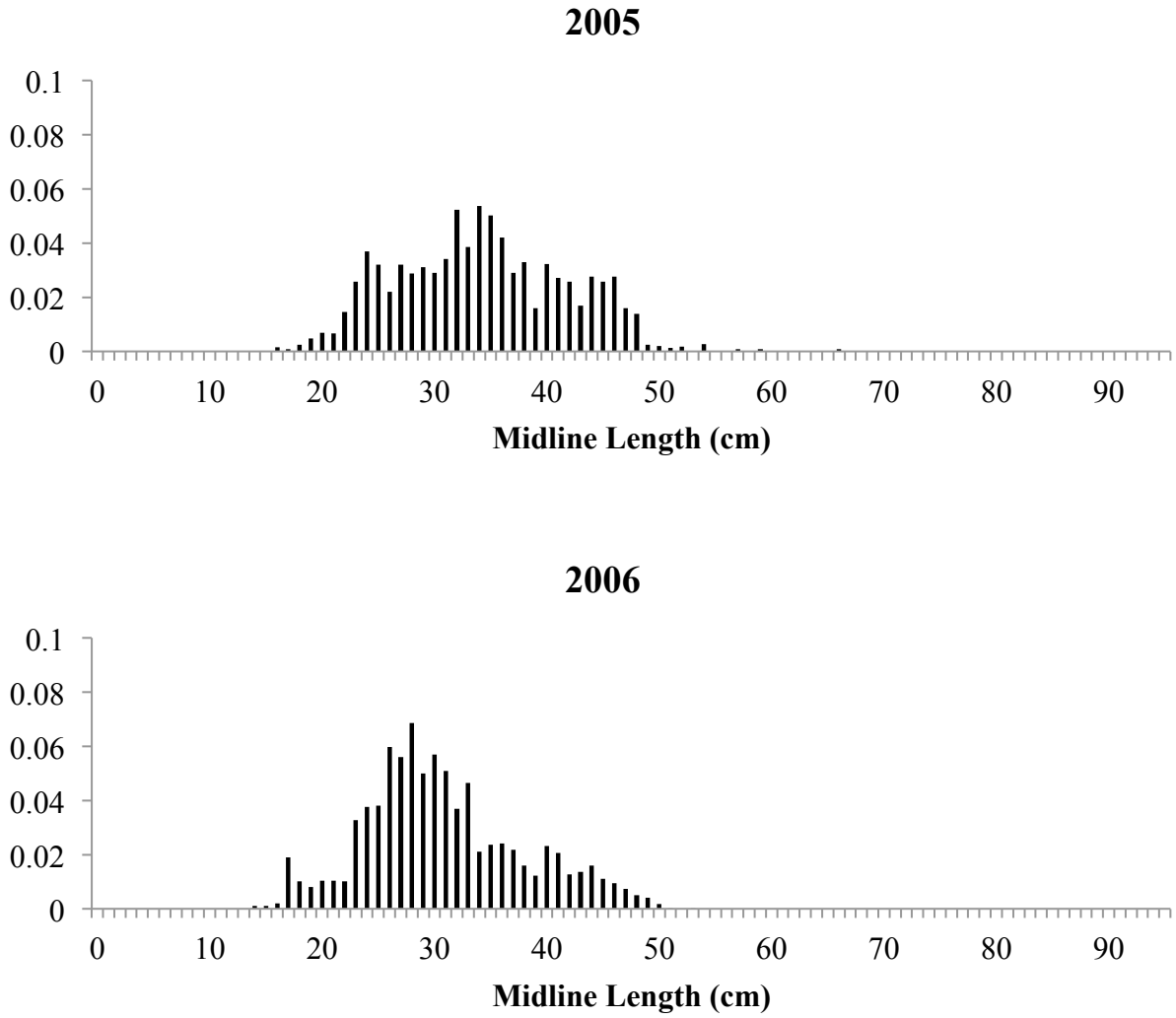
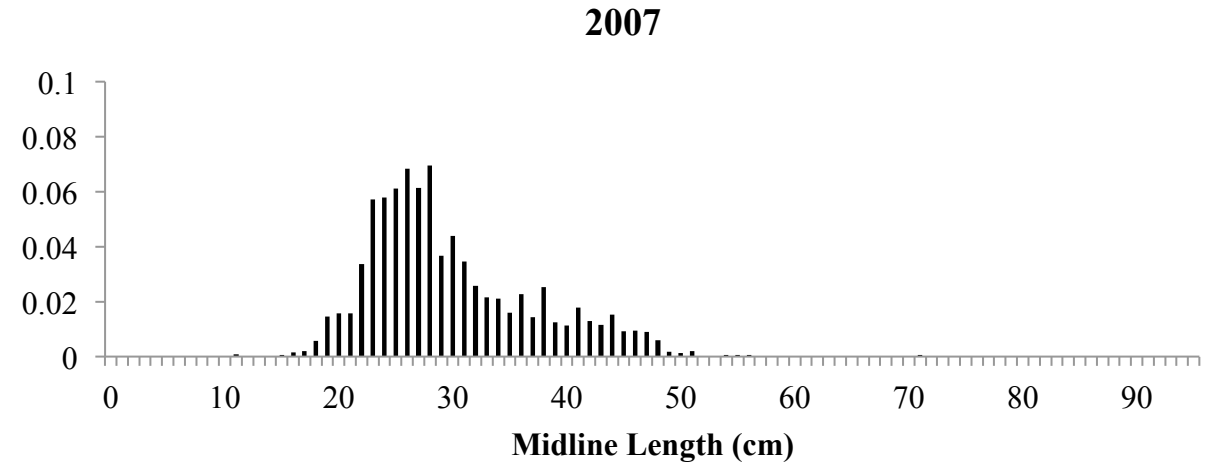
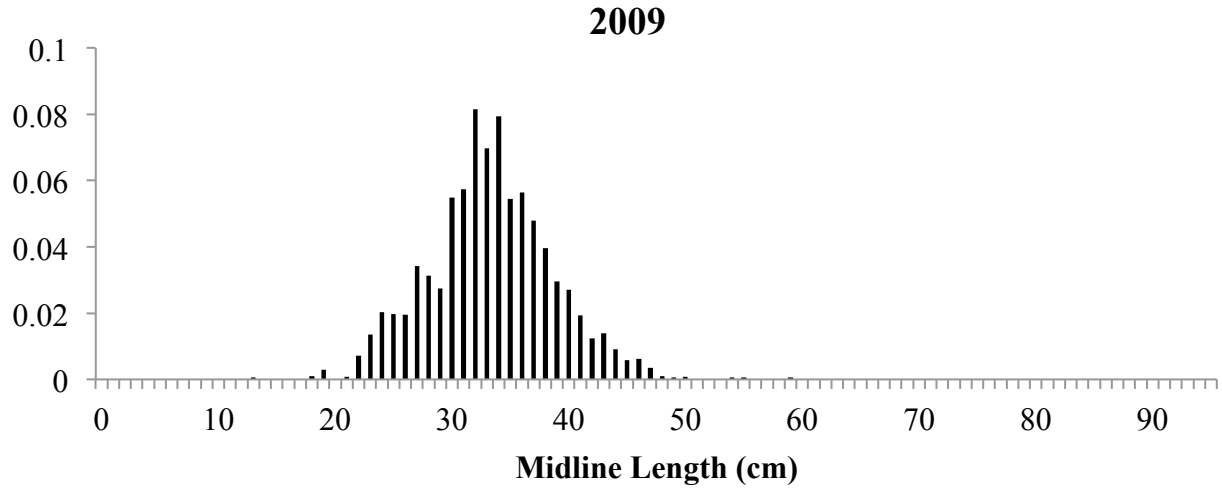


Figure 3. Weighted length frequencies (expressed as proportions) of red grouper discards from head boat vessels. The minimum size limit for harvest is 20" total length (50.8 cm TL).





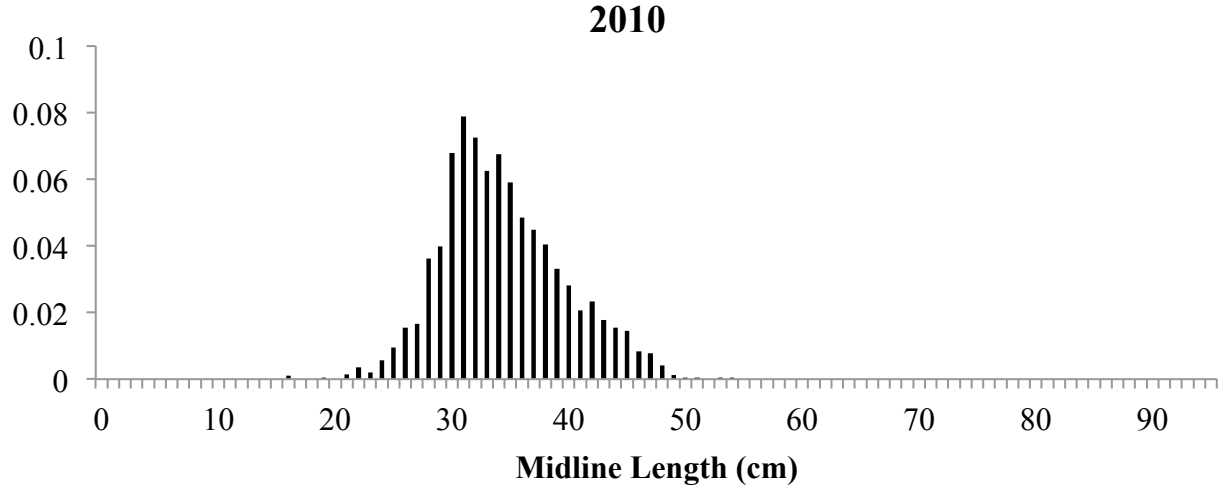
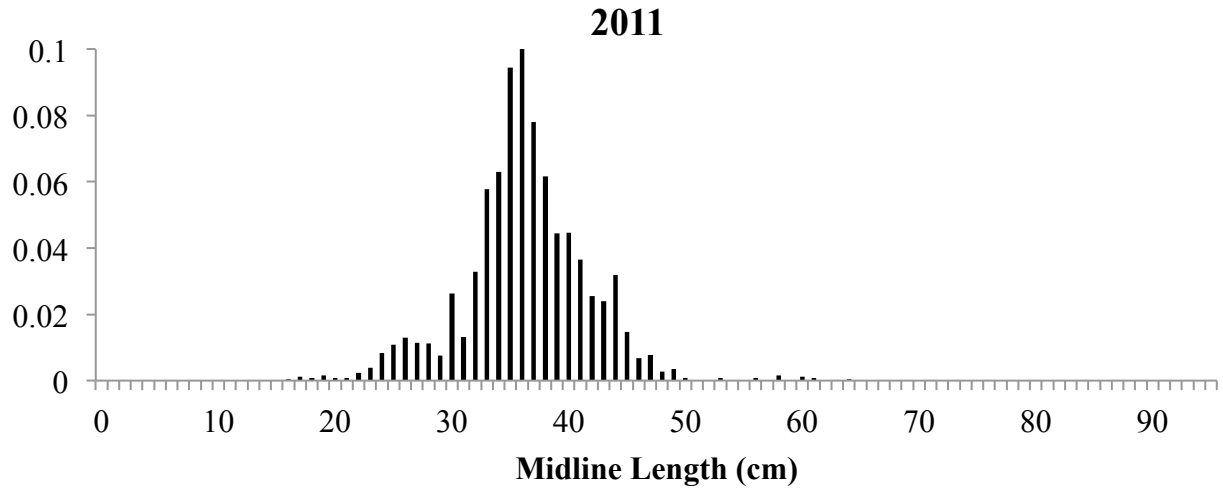
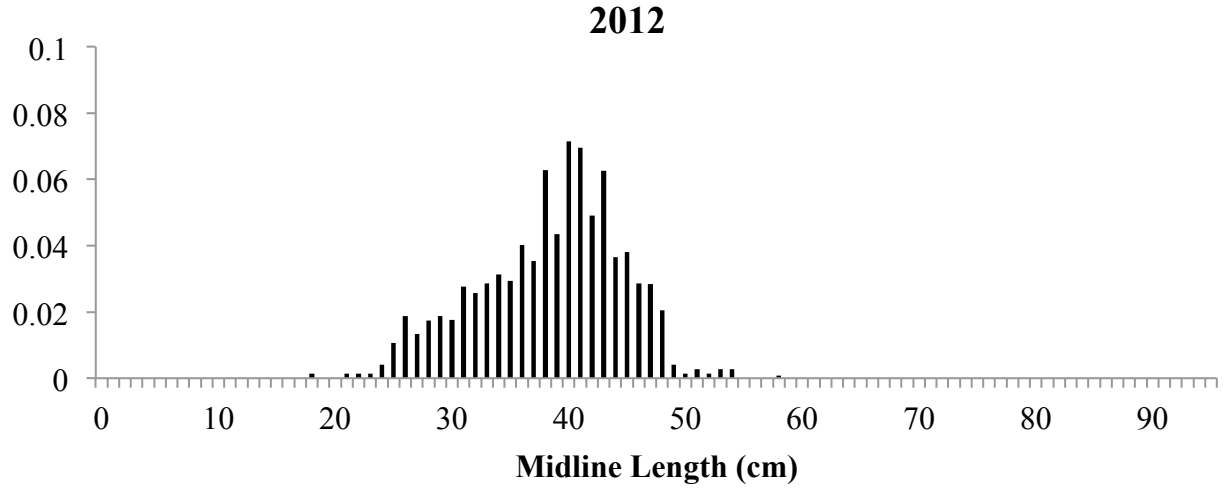


Figure 3 continued





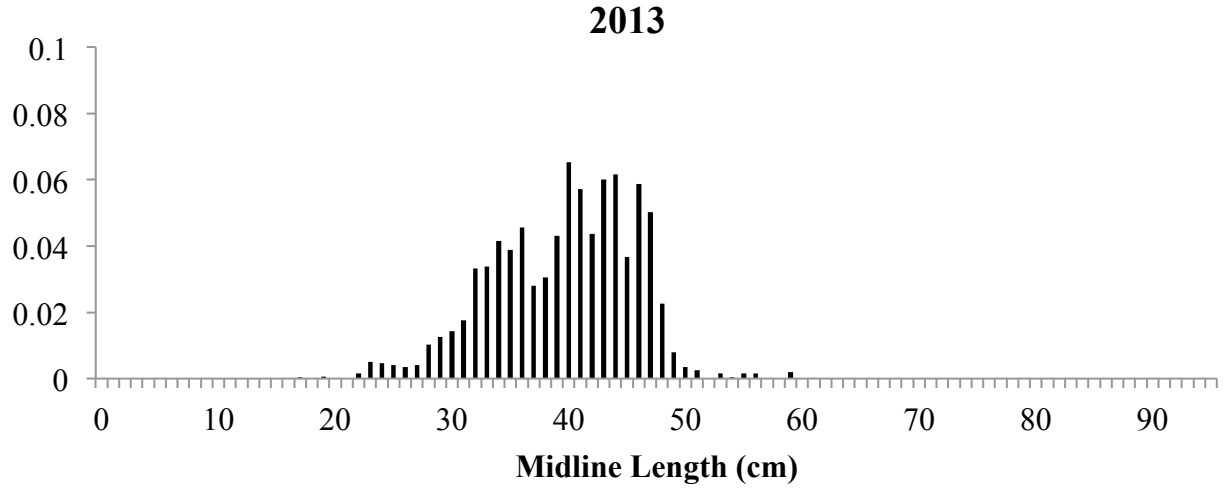
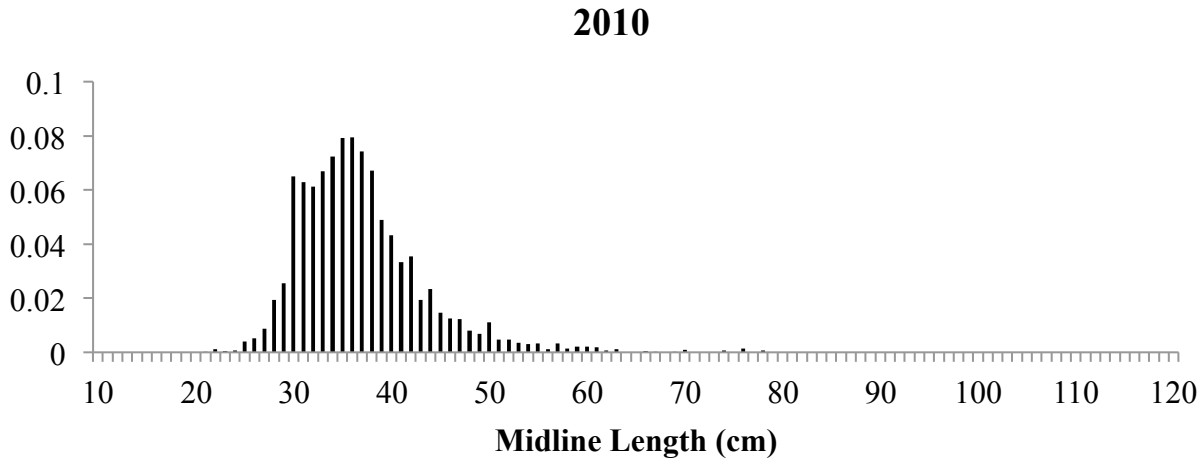
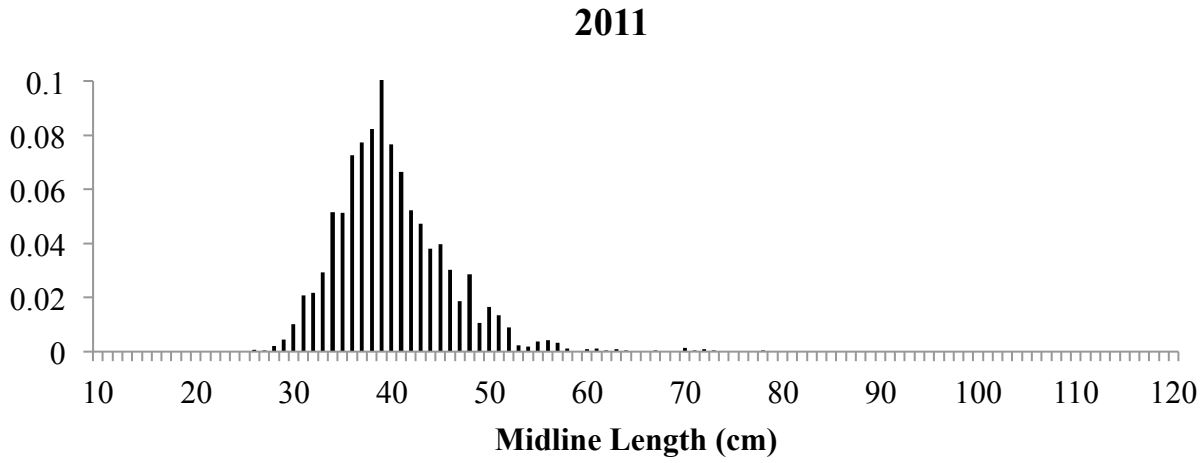


Figure 3 continued





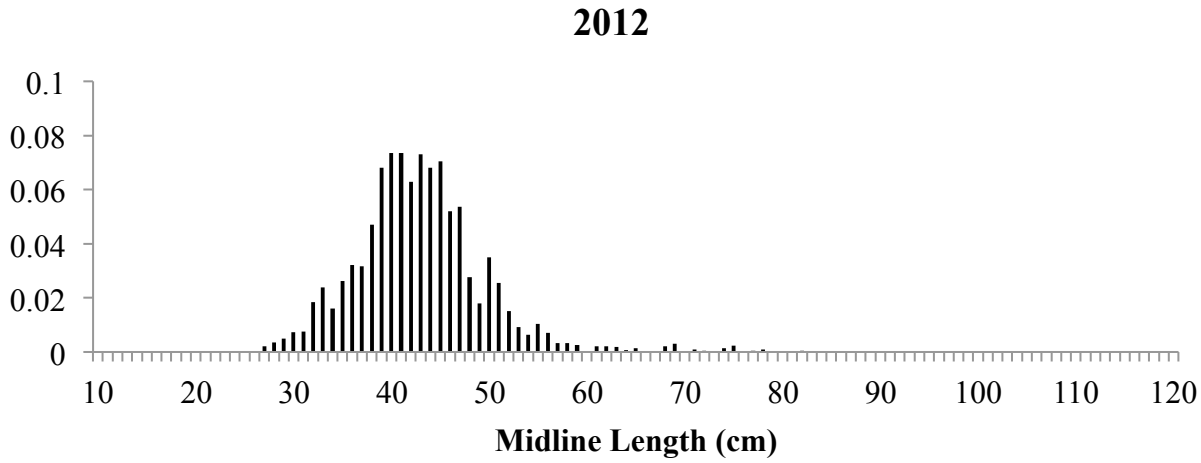


Figure 4. Weighted length frequencies (expressed as proportions) of red grouper discards from charter vessels. The minimum size limit for harvest is 20" total length (50.8 cm TL).

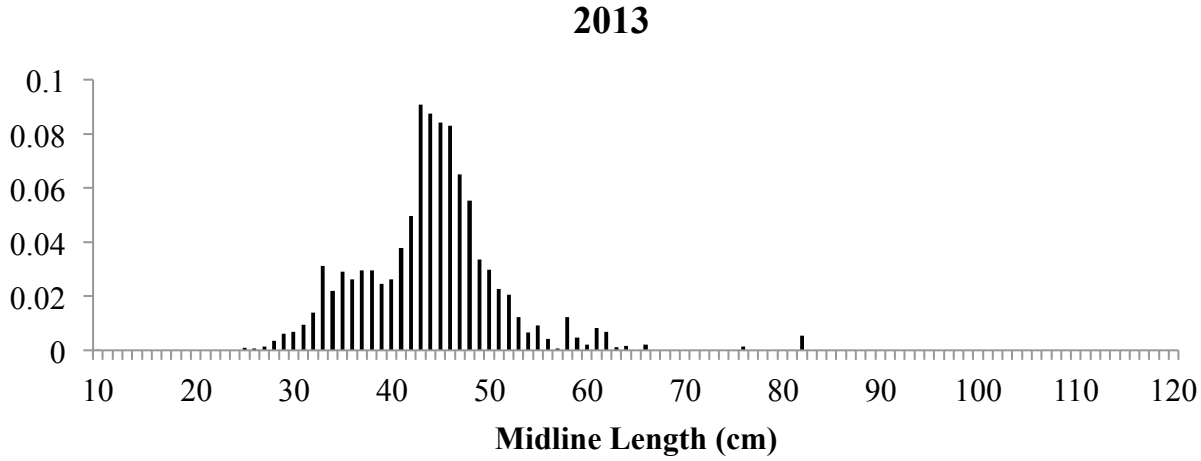


Figure 4. continued.

Standardized Catch-per-Unit-Effort (CPUE)

Observer data were used to construct an index of abundance from standardized catch-per-unit effort data collected from headboats. The effort unit for this index was numbers of red grouper discards observed per angler hour.

Methods

Harvested red grouper were excluded from this index to avoid overlap with other fisheries-dependent indices that measure abundance of legal-sized harvested fish and provide a longer time series. Only single day headboat trips sampled from the two regions with the most consistent observer coverage throughout the time series were included in this index (Table 2.1). Other regions in Florida and Alabama that have had inconsistent observer coverage are not included in this index. Multi-day trips from the Tampa Bay region (TB FL in Table 2.1) were also excluded since the majority of red grouper caught during these trips are legal sized.

In the Tampa Bay region, red grouper were present on 89% of trips; therefore, all trips in this region were considered potential red grouper trips. In the Panhandle, no red grouper were observed from the majority of trips sampled (Table 5), and clustering methods were explored to determine the subset of trips from this region to include in an index. The Stephens and McCall (2004) method was explored; however, due to the frequency of false negatives (positive trips with a low estimated probability for red grouper presence), this was not a reliable method for identifying red grouper trips in the region. Hierarchical cluster analysis revealed close association between red grouper and numerous reef associated fishes that are abundant in the panhandle (including vermilion snapper, red snapper, and porgies). The species composition for clustering was sensitive to Morisita and Horn-Morisita aggregation indices, and both methods included the most frequently caught species in the panhandle region (red snapper, vermilion, gray triggerfish, red porgy). So in both cases, no trips were dropped from consideration for a red grouper index. Therefore, all single-day headboat trips sampled from the Tampa Bay and panhandle regions were included in this index, regardless of red grouper presence.

Separate GLMs were constructed for the binomial presence/absence of red grouper discards and CPUE for positive trips (expressed as the log of discards per observed angler hour). The GLMs were constructed using the GLIMMIX procedure in SAS. A total of 33 unique headboat vessels were sampled repeatedly throughout the time series, and CPUE is likely correlated with the region where individual vessels operate from, patterns in the types of trips offered, locations vessel operators choose to fish, and other potential factors. Correlation within repeated observations on the same vessels was accounted for with a generalized estimating equation (GEE) using the random statement in GLIMMIX. To insure that similar types of trips were clustered together, clusters were defined by vessel and trip type, with trip types defined as half-day (<6 hours), three-quarter-day (6 to <9 hours), or full day (9 hours or longer). Year and region were included as covariates in the model. One other covariate, depth fished, improved the model fit but was not included due to missing values for a large portion of trips in one year (2007) that impacted sample size.

Results

Nominal CPUE (measured as catch per observed angler-hour) by year is provided in Table 5. Figures 5 and 6 summarize the distribution of proportion positive trips and CPUE for positive trips. Results for the binomial and lognormal models are provided in Figures 7 and 8. Results for the standardized index of abundance are provided in Figure 9.

Table 5. Frequency of total and positive trips (N_obs and N_pp), proportion positive trips (PP_obs), and nominal catch per observed angler hour (mean_CPUE).

Factor	*Level*	*N_OBS*	*N_PP*	*PP_OBS*	*Mean_CPUE*
YEAR	2005	90	62	0.68889	0.09984
YEAR	2006	103	56	0.54369	0.04027
YEAR	2007	107	60	0.56075	0.08977
YEAR	2009	62	43	0.69355	0.38711
YEAR	2010	78	49	0.62821	0.41891
YEAR	2011	103	59	0.57282	0.25459
YEAR	2012	92	47	0.51087	0.15249
YEAR	2013	88	48	0.54545	0.18316
flreg	NW	348	92	0.26437	0.01751
flreg	TB	375	332	0.88533	0.34585
YEAR	2005	90	62	0.68889	0.09984
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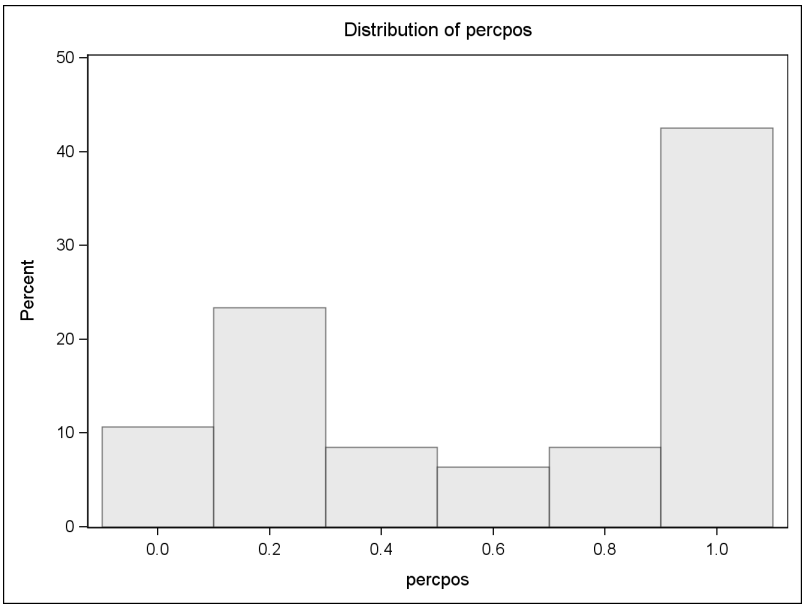
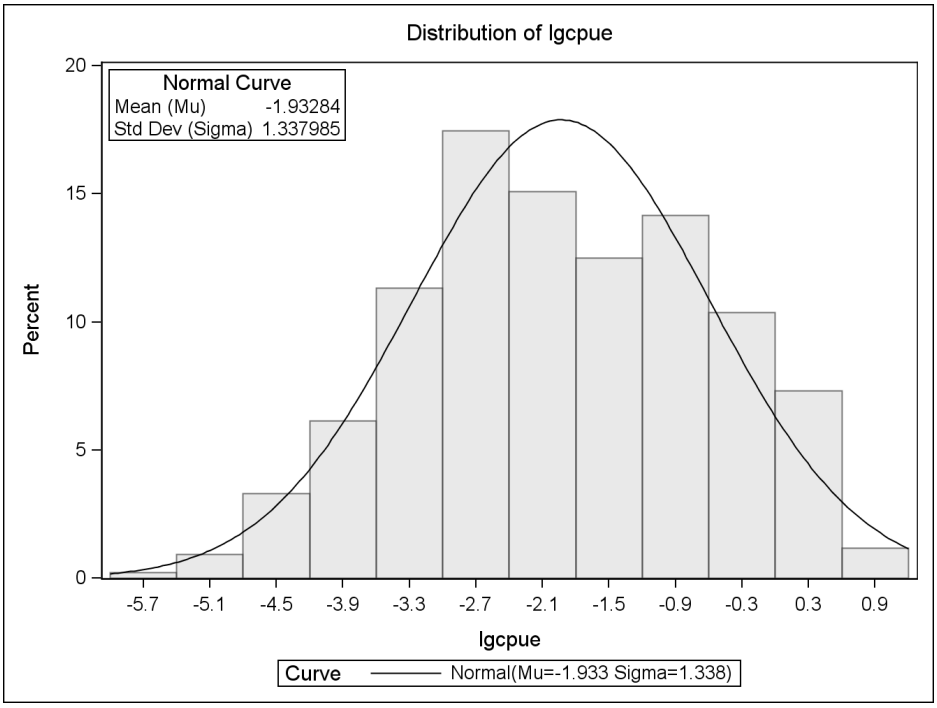


YEAR OF DATA	N	Mean	Std Dev	Minimum	Maximum
2005	6	0.6343776	0.3635292	0.1428571	1.0000000
2006	6	0.5210573	0.3514806	0.0833333	1.0000000
2007	6	0.5503350	0.3469643	0.1666667	1.0000000
2009	5	0.6750000	0.4643544	0	1.0000000
2010	6	0.5755952	0.4415905	0.1250000	1.0000000
2011	6	0.6566783	0.3577519	0.1707317	1.0000000
2012	6	0.6893143	0.4603655	0.0833333	1.0000000
2013	6	0.5178571	0.5296081	0	1.0000000

Figure 5. Distribution of percent positive trips by year, region and trip type.



Parameters for Normal Distribution		
Parameter	*Symbol*	*Estimate*
Mean	Mu	-1.93284
Std Dev	Sigma	1.337985

Goodness-of-Fit Tests for Normal Distribution				
Test	*Statistic*		*p Value*	
Kolmogorov-Smirnov	*D*	0.04740369	*Pr > D*	0.021
Cramer-von Mises	*W-Sq*	0.21600604	*Pr > W-Sq*	<0.005
Anderson-Darling	*A-Sq*	1.37052286	*Pr > A-Sq*	<0.005

Figure 6. Distribution of log cpue for positive trips.

Model Information	
Data Set	WORK.ANALYSIS
Response Variable	success
Response Distribution	Binomial
Link Function	Logit
Variance Function	Default
Variance Matrix Blocked By	triptype*fdmvesselid
Estimation Technique	Residual PL
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Solutions for Fixed Effects

Effect	*triptype*	*YEAR OF DATA*	*flreg*	*Estimate*	*Standard Error*	*DF*	*t Value*	*Pr > |t|*	*Alpha*	*Lower*	*Upper*
Intercept				2.1892	0.4141	101.6	5.29	<.0001	0.05	1.3678	3.0105
YEAR		2005		0.8222	0.3981	700	2.07	0.0393	0.05	0.04054	1.6039
YEAR		2006		-0.7614	0.3836	704.3	-1.98	0.0475	0.05	-1.5144	-0.00830
YEAR		2007		-0.4404	0.3856	708.3	-1.14	0.2538	0.05	-1.1974	0.3166
YEAR		2009		0.7413	0.4377	691.9	1.69	0.0908	0.05	-0.1181	1.6007
YEAR		2010		-0.2164	0.4260	708.2	-0.51	0.6117	0.05	-1.0527	0.6200
YEAR		2011		0.4015	0.3706	690.1	1.08	0.2790	0.05	-0.3261	1.1292
YEAR		2012		0.03905	0.3713	674.9	0.11	0.9163	0.05	-0.6899	0.7680
YEAR		2013		0	.	.	.	.	.	.	.
triptype	Full			2.0336	0.4760	45.92	4.27	<.0001	0.05	1.0754	2.9919
triptype	Half			-0.9058	0.3764	29.52	-2.41	0.0226	0.05	-1.6751	-0.1365
triptype	Three-quarter			0	.	.	.	.	.	.	.
flreg			1	-3.5484	0.3474	35.96	-10.21	<.0001	0.05	-4.2530	-2.8438
flreg			2	0	.	.	.	.	.	.	.

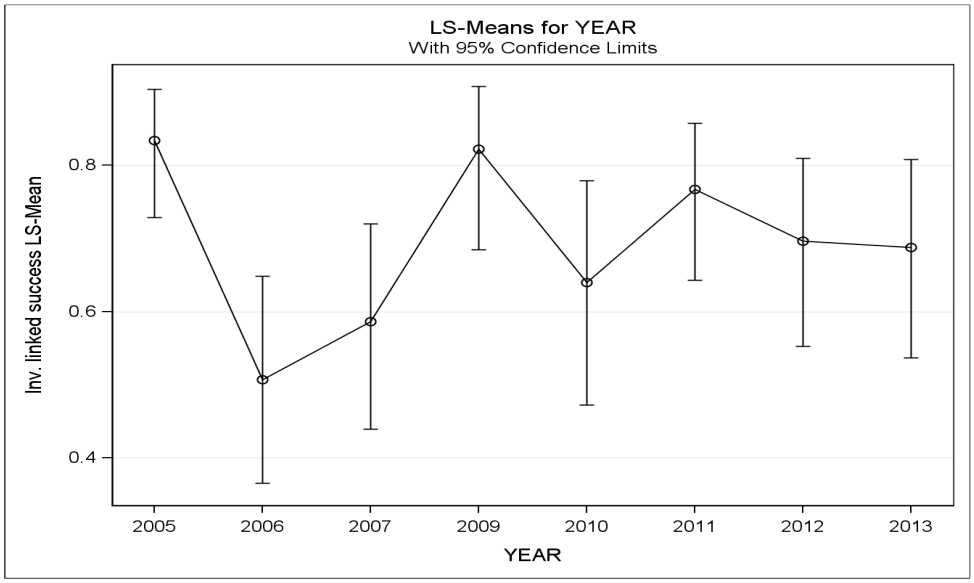
Type III Tests of Fixed Effects

Effect	*Num DF*	*Den DF*	*Chi-Square*	*F Value*	*Pr > ChiSq*	*Pr > F*
YEAR	7	703	26.27	3.75	0.0004	0.0005
triptype	2	38.36	30.77	15.37	<.0001	<.0001
flreg	1	35.96	104.31	104.31	<.0001	<.0001

Figure 7. Results of the GLIMMIX procedure for bi-nomial proportion positive trips.

YEAR Least Squares Means

YEAR OF DATA	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper	Mean	Standard Error Mean	Lower Mean	Upper Mean
2005	1.6131	0.3184	237.5	5.07	<.0001	0.05	0.9858	2.2405	0.8338	0.04412	0.7283	0.9038
2006	0.02953	0.2947	184.8	0.10	0.9203	0.05	-0.5519	0.6110	0.5074	0.07366	0.3654	0.6482
2007	0.3505	0.3009	218.3	1.16	0.2454	0.05	-0.2425	0.9436	0.5867	0.07296	0.4397	0.7198
2009	1.5322	0.3847	454.1	3.98	<.0001	0.05	0.7761	2.2883	0.8223	0.05621	0.6848	0.9079
2010	0.5745	0.3479	255.6	1.65	0.0998	0.05	-0.1105	1.2596	0.6398	0.08017	0.4724	0.7790
2011	1.1924	0.3072	223.5	3.88	0.0001	0.05	0.5870	1.7979	0.7672	0.05488	0.6427	0.8579
2012	0.8299	0.3143	218.2	2.64	0.0089	0.05	0.2105	1.4494	0.6963	0.06646	0.5524	0.8099
2013	0.7909	0.3272	263	2.42	0.0163	0.05	0.1465	1.4352	0.6880	0.07024	0.5366	0.8077



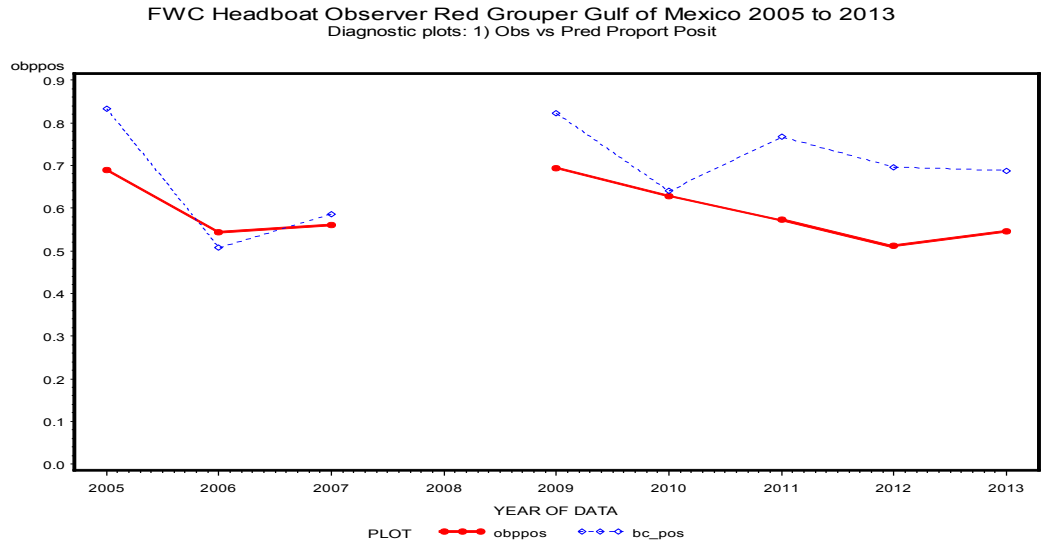


Figure 7 (continued).

Model Information	
Data Set	WORK.POSIT
Response Variable	lgcpue
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix Blocked By	triptype*fdmvesselid
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Containment

Convergence criterion (GCONV=1E-8) satisfied.

Fit Statistics	
-2 Res Log Likelihood	996.84
AIC (smaller is better)	1014.84
AICC (smaller is better)	1015.36
BIC (smaller is better)	1032.22
CAIC (smaller is better)	1041.22
HQIC (smaller is better)	1021.48
Generalized Chi-Square	358.00
Gener. Chi-Square / DF	1.00

Effect	*Estimate*	*Standard Error*	*DF*	*t Value*	*Pr > |t|*	*Alpha*	*Lower*	*Upper*
Intercept	-1.3724	0.2086	49	-6.58	<.0001	0.05	-1.7915	-0.9532
2005	-0.5174	0.1910	309	-2.71	0.0071	0.05	-0.8933	-0.1415
2006	-1.2357	0.2038	309	-6.06	<.0001	0.05	-1.6368	-0.8346
2007	-1.5016	0.2170	309	-6.92	<.0001	0.05	-1.9285	-1.0746
2009	0.6900	0.1862	309	3.71	0.0002	0.05	0.3237	1.0563
2010	0.6593	0.1797	309	3.67	0.0003	0.05	0.3056	1.0130
2011	0.3542	0.1620	309	2.19	0.0295	0.05	0.03546	0.6729
2012	-0.01118	0.1642	309	-0.07	0.9458	0.05	-0.3343	0.3119
2013	0	.	.	.	.	.	.	.
NW region	-0.8970	0.2396	309	-3.74	0.0002	0.05	-1.3684	-0.4256
TB region	0	.	.	.	.	.	.	.
depth	-0.00453	0.002511	309	-1.80	0.0724	0.05	-0.00947	0.000413

Figure 8. Results from GLIMMIX procedure on log cpue for positive trips.

Type III Tests of Fixed Effects

Effect	Num DF	Den DF	Chi-Square	F Value	Pr > ChiSq	Pr > F
YEAR	7	309	189.21	27.03	<.0001	<.0001
flreg	1	309	14.02	14.02	0.0002	0.0002
DEPTH_SH	1	309	3.25	3.25	0.0714	0.0724

YEAR	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper	Mean	Standard Error Mean	Lower Mean	Upper Mean
2005	-2.4025	0.1605	309	-14.97	<.0001	0.05	-2.7182	-2.0868	-2.4025	0.1605	-2.7182	-2.0868
2006	-3.1208	0.1761	309	-17.73	<.0001	0.05	-3.4672	-2.7744	-3.1208	0.1761	-3.4672	-2.7744
2007	-3.3867	0.1975	309	-17.15	<.0001	0.05	-3.7753	-2.9981	-3.3867	0.1975	-3.7753	-2.9981
2009	-1.1951	0.1610	309	-7.42	<.0001	0.05	-1.5118	-0.8784	-1.1951	0.1610	-1.5118	-0.8784
2010	-1.2258	0.1602	309	-7.65	<.0001	0.05	-1.5411	-0.9105	-1.2258	0.1602	-1.5411	-0.9105
2011	-1.5309	0.1363	309	-11.23	<.0001	0.05	-1.7991	-1.2627	-1.5309	0.1363	-1.7991	-1.2627
2012	-1.8963	0.1494	309	-12.69	<.0001	0.05	-2.1902	-1.6023	-1.8963	0.1494	-2.1902	-1.6023
2013	-1.8851	0.1516	309	-12.44	<.0001	0.05	-2.1833	-1.5869	-1.8851	0.1516	-2.1833	-1.5869

Obs	YEAR	cpue	lcpu	selcpu	mc	margPos	vposcatch	cvposcatch
1	2005	0.09166	-2.40250	0.16046	309	WORK.POSIT	0.025746	-0.06679
2	2006	0.04481	-3.12081	0.17606	309	WORK.POSIT	0.030998	-0.05642
3	2007	0.03449	-3.38669	0.19748	309	WORK.POSIT	0.039000	-0.05831
4	2009	0.30662	-1.19510	0.16097	309	WORK.POSIT	0.025911	-0.13469
5	2010	0.29732	-1.22580	0.16025	309	WORK.POSIT	0.025679	-0.13073
6	2011	0.21836	-1.53091	0.13631	309	WORK.POSIT	0.018581	-0.08904
7	2012	0.15181	-1.89629	0.14939	309	WORK.POSIT	0.022318	-0.07878
8	2013	0.15357	-1.88511	0.15156	309	WORK.POSIT	0.022969	-0.08040

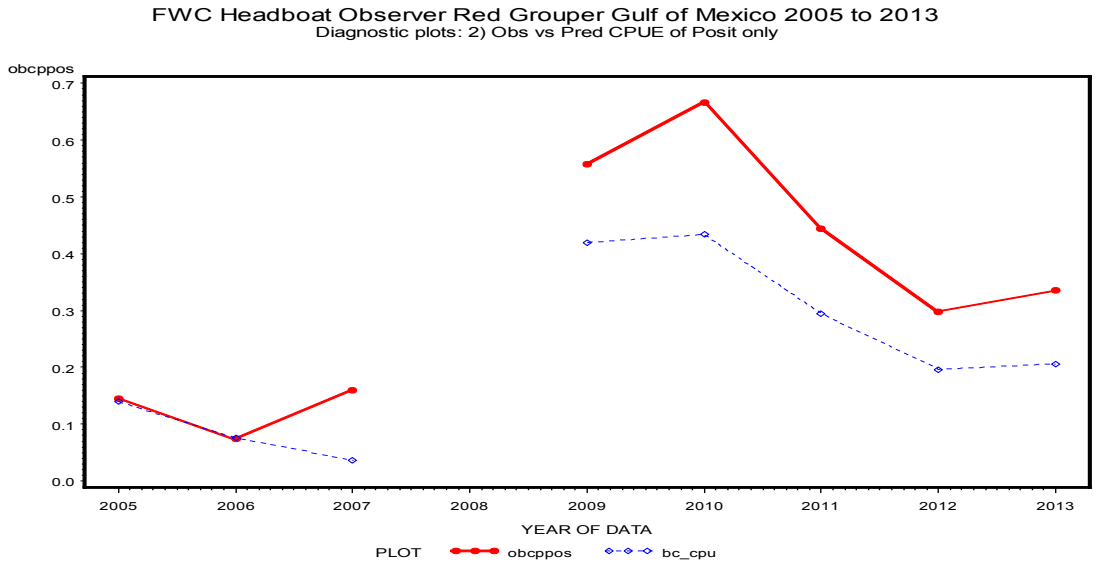
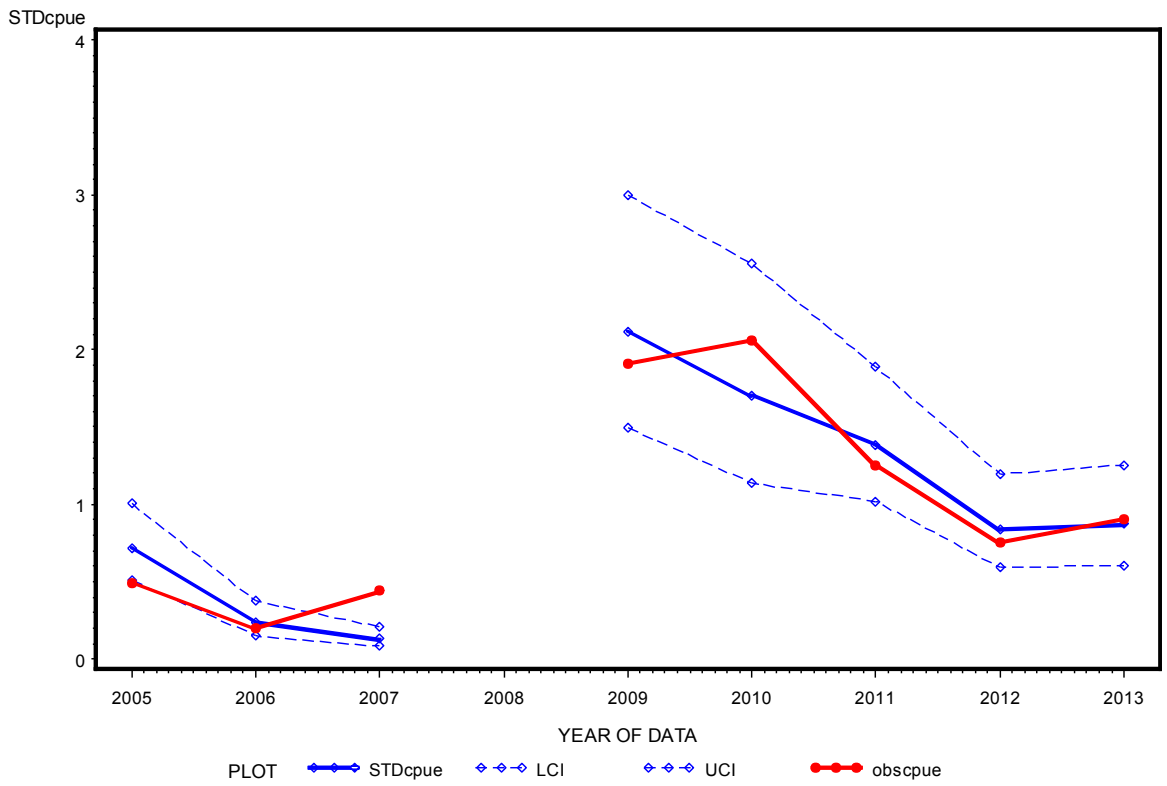


Figure 8 (continued).



SurveyYear	*NominalFrequency*	*N*	*LoIndex*	*ScaledLoIndex*	*CV*	*LCL*	*UCL*
2005	0.68889	90	0.11637	0.71381	0.17102	0.50829	1.00244
2006	0.54369	103	0.03857	0.23661	0.23070	0.15005	0.37310
2007	0.56075	107	0.02143	0.13145	0.23177	0.08319	0.20770
2009	0.69355	62	0.34522	2.11753	0.17554	1.49456	3.00016
2010	0.62821	78	0.27766	1.70310	0.20465	1.13581	2.55373
2011	0.57282	103	0.22606	1.38662	0.15510	1.01869	1.88744
2012	0.51087	92	0.13684	0.83936	0.17765	0.58998	1.19414
2013	0.54545	88	0.14208	0.87152	0.18340	0.60575	1.25389

Figure 9. Standardized index results.

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