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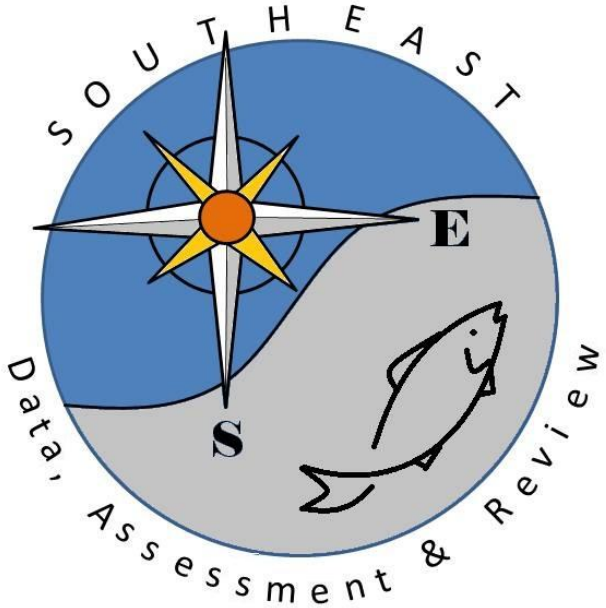

Using a Censored Regression Modeling Approach to Standardize Red Snapper Catch per Unit Effort Using Recreational Fishery Data Affected by a Bag Limit

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Keywords

Catch per unit effort (CPUE), standardization, censoring, generalized linear model, red snapper, bag limit

Abstract

It is sometimes the case with fisheries dependent data that the true value of a variable cannot be fully observed. This is often the case with trip limits, which affect the amount of catch that is observed per unit of fishing effort. Developing an index of abundance using data collected from a fishery with a trip limit could lead to a biased index, if the effect of the trip limit on the collection of the data is not properly taken into account. This study applies a censored regression approach as one possible way to statistically calculate an unbiased standardized index of abundance using data collected from a fishery with trip limits. In order to demonstrate this, a Delta censored lognormal regression approach is applied to catch and effort data from the recreational fishery for red snapper (*Lutjanus Canpechanus*) in the Gulf of Mexico. Indices are calculated for the headboat and private/for hire sectors of this fishery with and without the censored approach and compared. Results suggest that indices from a fishery with a bag limit that don't properly account for the effect of this regulation on landed catch and fishing behavior, can produce an index that is under dispersed.

Introduction

It is often the case that the true value of a variable cannot be fully observed. Such a situation can occur when the sampling resolution is such that it can only register values above a certain level (left censoring), when the range of the observed data is limited by an upper limit (right censoring) or when the data is limited both above and below (interval censoring) (Amemiya 1985). Truncation represents a similar form of incomplete observation of a variable and arises when values of the dependent variable above or below the cutoff are simply not observed so that they are not components of the sample. Censoring and truncation of variables commonly occur in economics where they are called limited dependent variable analyses (Tobin 1958), clinical trials where subjects commonly drop out of survival analyses (Lee and Wang 2003) and in numerous other fields of study. In all situations, because the entire range of the

censored or truncated variable is not observed, conventional estimates of its mean and variance, as well as ordinary least squares estimates of regression parameters, will be biased.

It is quite easy to find examples of censored variables in fisheries applications. Many estimation problems in fisheries can be treated as censored variables. This is particularly true for situations when catch or catch per unit effort (CPUE) data contains unreported or under-reported zero catches. This situation is analogous to Tobin's (1958) seminal example where household expenditures were only observed when they are positive. In this case, left censoring or censoring from below produced estimates of expenditure per subject that were biased high because only the positive observations contributed to the estimate. In other instances fisheries catches (or CPUE) may be censored from above either due to vessel, gear or processing capacity (Kirkley et al., ?), regulations such as bag limits (McCarthy et al 2008), or in the case of Hammond and Trenkel (2005), due to discarding where the observed catch is biased low because discards are not recorded. Equally common in fisheries are situations of truncation. Size limits where fish above or below a certain size are not observed in the sample, represent a form of truncation that biases mortality rate estimates from mean size (Beverton and Holt 1956). Earhardt and Ault (1992) provide a deterministic solution for size-based mortality estimates in the presence of truncation, however the problem could equally be posed as a limited dependent variable problem (Ameniya 1985).

Despite the widespread occurrence of censoring and truncation in fisheries data, for which we will borrow from the economics literature the more general term of limited dependent variables, relatively few papers have been published that explicitly deal with censoring (Hammond and Trenkel 2005) or appear to address the problem from a general likelihood-based approach. As a result, the objectives of this paper are to expose the generality of the limited dependent variable problem in fisheries and demonstrate the application of censored regression for standardization of fisheries CPUE data in the presence of trip limit regulations. One similar application of a censored regression to constructing an abundance index was done using visual count data of fish from recreational SCUBA divers (Porch and Eklund 2004). In this study, a censored regression approach is used to develop standardized indices of abundance from fishery dependent data for the recreational red snapper (*Lutjanus Canpechanus*) fishery in the Gulf of Mexico, which has experienced increasingly restrictive trip limit regulations.

Methodology

Data

The recreational fisheries in the Gulf of Mexico are surveyed by three programs:

- Marine Recreational Fishery Statistics Survey (MRFSS) conducted by the NOAA Fisheries (NMFS).
- Texas Marine Sport-Harvest Monitoring Program by the Texas Parks and Wildlife Department (TPWD).
- Headboat Survey (HBS) conducted by NMFS, Southeast Fisheries Science Center, Beaufort, NC.

These three surveys together provide information on catch in numbers, fishing effort, and length and weight samples. The MRFSS and the TPWD survey are both sampling-based, while the Headboat Survey is a census of headboats using logbooks provided to all headboats to report total landings per trip and fishing effort. MRFSS was conducted in TX through 1985, after

which the Texas Parks and Wildlife Department covered surveying efforts. In addition, starting in 1986, MRFSS no longer covered headboats in the Gulf of Mexico and instead this sector of the recreational fishery was covered by the Headboat Survey. MRFSS provides information on participation, effort, and species-specific catch. Data are collected to provide catch and effort estimates in two-month periods ("waves") for each recreational fishing mode (shore fishing, private/rental boat, charterboat, or headboat/charterboat combined) and area of fishing (inshore, state Territorial Seas, U.S. Exclusive Economic Zone) in each Gulf of Mexico state (except Texas). Total catch information is collected by MRFSS on fish landed whole and observed by the interviewers ("Type A"), fish reported as killed by the fishers ("Type B1") and fish reported as released alive by the fishers ("Type B2"). Similar to MRFSS, the Texas Parks and Wildlife survey also, provides information on participation, effort and species-specific landings however no discards are reported in this dataset.[1]

This work uses the catch and effort observations from MRFSS, TPWD, and HBS to develop standardized catch per unit effort (CPUE) indices of abundance for two sectors of the recreational fishery: the headboat sector and the private/for hire sector. Throughout the time series of the data, various increasingly strict trip limits were imposed on the recreational fishing sector (Figure 1).

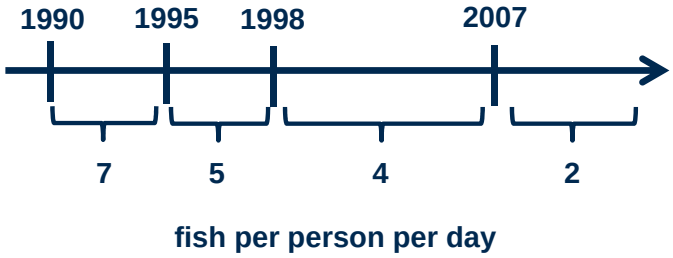

Figure 1: Red snapper recreational bag limit history.

Fishery dependent data collected on a fishery with a bag limit make it impossible on those trips that reached the bag limit, to observe the actual amount of red snapper that each unit of fishing effort on that trip could have caught. Calculating an index of abundance using landings information from the red snapper recreational fishery, which experienced increasingly strict bag limits across time, will produce under-dispersed indices, thus providing the signal that abundance is decreasing.

Although an unbiased index could theoretically be estimated for trip limit restricted fisheries where catch and discard information is known, such as is the case with the MRFSS database, in practice, this index may still contain bias caused by the regulation. For species like red snapper that are predominantly recreationally fished to bring home and eat (rather than fished exclusively for sport), once anglers fill their bag limit, they will typically shift target and direct their fishing effort toward another species. In some cases, anglers will actively try and avoid areas with known high concentrations of red snapper because bait is wasted on a fish that cannot be kept. As a result, when fisher behavior is shifted away from red snapper once the limit is reached, it is hard to determine what component of a trip's fishing effort was expended on

[1] General overview of the recreational surveys from the following: Recreational Survey Data for Gag and Black Grouper in the Gulf of Mexico. Patty Phares, Vivian Matter, and Steve Turner. National Marine Fisheries Service, Southeast Fisheries Science Center, Sustainable Fisheries Division, January, 2006. Sustainable Fisheries Division Contribution No. SFD-2006-008.

fishing for red snapper, verses targeting other species. Anglers may change fishing location, fishing gear (like hook size), or bait size in order to target another species and/or to avoid or limit the number of red snapper that they encounter. Each of these changes clearly affects catchability and thus, if not properly dealt with, violates the assumption of constant catchability across the time series. Finally, since the discards are self-reported, and not seen by the observer, the accuracy of the discarded values cannot be verified.

As a result, only the landings information ("A" catch) from the MRFSS dataset was used to construct an index, and the MRFSS data was combined with the TPWD survey in order to develop indices for the private/for hire sector that geographically cover the entire U.S. coastline in the Gulf of Mexico. The MRFSS/Texas and Headboat Survey data sets were looked at across different strata to assess the sample size of total trips and positive trips within each of the strata. In order to avoid double counting, any data from Texas, present in the MRFSS dataset between the years 1981 through 1985, were removed from the MRFSS data because the State of Texas has its own survey. In addition, data from the headboat mode in MRFSS, also present in the years 1981 through 1985, were removed because this information was covered by the Headboat Survey program. The shore mode was removed from the MRFSS data as well as trips taken in inshore waters because less than 0.1 percent of such trips caught red snapper. Datasets were partitioned at the Mississippi River and separate Eastern and Western indices were estimated.

Trip Selection and Continuity CPUE Indices

Four sub-setting approaches were explored in order to try and identify trips that could have caught red snapper:

- Stephens and MacCall Approach: uses the species composition of each trip in a logistic regression of species presence/absence to infer if effort on that trip occurred in similar habitat to red snapper habitat. If effort on a trip was determined to occur in similar habitat to red snapper, than that trip was used in the analysis (Stephens and MacCall 2004).
- Association Statistic – this approach was used during the 2009 red snapper update assessment, as well as the SEDAR 7 benchmark assessment to select trips. Values large than one indicate a species co-occurs with red snapper more often than expected, and values less than one indicate that a species co-occurs with red snapper less often than expected. As done during SEDAR 7, trips with species that had an association statistic larger than 3.0 were included in the analysis.
- Guild Approach – includes trips in the analysis if those trips also caught species determined to be in the reef fish guild. The list of species in the reef fish guild was defined by NMFS.
- All trips – no sub-setting applied.

The SEDAR 7 benchmark assessment of red snapper and the 2009 update assessment both constructed a recreational index of abundance for the east and west using only the MRFSS data, applying the association statistic trip selection approach, and excluded shore mode and inshore fishing trips. The recreational indices were fit to total catch, including landings ("A"), and discards, both dead and alive ("B1" and "B2" catch). For the MRFSS data, if there were anglers on a trip that actively fished but were not interviewed, the data were adjusted to account for the catch and effort of these non-interviewed anglers. This adjustment was made by dividing the total catch made by those individuals who were interviewed by the number of people

interviewed. This average catch per person was then multiplied by the number of anglers that were not interviewed and the resulting catch was then added to the total catch for that trip (Cass-Calay 2004 SEDAR 7-AW-4).

An eastern and western continuity index was estimated in the same manner as the indices constructed in SEDAR 7-AW-4 for continuity purposes. In addition, each of the three trip selection approaches was used to see if there were differences. The resulting indices were compared to the index estimated for the 2009 update assessment. From this exercise, it was determined that the three trip selection approaches perform very similarly to one another, and the Stephens and MacCall approach was determined to be used for all subsequent indices since it is the convention accepted by SEDAR. A delta lognormal modeling approach was used to develop these indices.

Delta Lognormal Modeling Approach

The Delta lognormal modeling approach combines separate generalized linear model (GLM) analyses of the proportion of successful trips (trips that landed red snapper) and the catch rates on successful trips to construct a single standardized CPUE index (Lo et al. 1992, Hinton and Maunder 2004, Maunder and Punt 2004). Parameterization of each model was accomplished using a stepwise approach and Akaike's information criteria (AIC). For each GLM procedure of proportion positive trips, a type-3 model was fit, a binomial error distribution was assumed, and the logit link was selected. The response variable was the proportion of successful trips across strata. During the analysis of catch rates on successful trips, a type-3 model assuming lognormal error distribution was examined. The linking function selected was "normal", and the response variable was calculated as the natural log of CPUE. The catch per unit effort was calculated on an individual trip basis and was equal to the number of fish caught on a given trip divided by the effort, where effort was the product of the number of anglers in the group that was interviewed and the total hours fished.

A stepwise approach was used to quantify the relative importance of the explanatory factors. First a GLM model was fit to the null model (only the intercept) and the AIC, deviance and degrees of freedom were calculated. Next, a suite of models was tested where each potential explanatory factor was added to the null model. Again, the AIC, deviance, and degrees of freedom were calculated. The model with the factor that had the lowest AIC became the new base model and the process was repeated adding factors individually until either the AIC was no longer further reduced or the all he factors were added to the model. In addition to screening using AIC, factors were also screened and not added to the model if the reduction in deviance per degree of freedom was less than one percent. This screening was implemented in order to fit a more parsimonious model, given the fact that factors which reduce the deviance by so little exert little influence on the index trend. Two-way interactions among significant main effects were not examined because many of these interactions were confounded with one another (such as the interaction of year and month confounding with the regulatory season factor). The final delta-lognormal model was fit using a SAS macro, GLIMMIX (Russ Wolfinger, SAS Institute). To facilitate visual comparison, a relative standardized index and relative nominal CPUE series were calculated by dividing each value in the series by the mean value of the entire time-series.

Censored Delta Lognormal Modeling Approach

The censored Delta lognormal modeling approach also combines separate generalized linear model (GLM) analyses of the proportion of successful trips (trips that landed red snapper) and the catch rates on successful trips to construct a single standardized CPUE index (Lo et al. 1992, Hinton and Maunder 2004, Maunder and Punt 2004). The main distinction is that analysis of catch rates on successful trips assumes a censored lognormal error distribution. Parameterization of each censored regression model was also accomplished using a stepwise approach and Akaike's information criteria (AIC), along with screening out factors if the reduction in deviance per degree of freedom was less than one percent. Two-wave interactions were also not examined among significant main effects, and the final censored lognormal model was fit using the SAS procedure "proc lifereg."

This algorithm its parameteric models to failure time data that can be uncensored, right censored, left censored, or interval censored. The model for the response variable is a linear effect composed of the covariates and a random disturbance term, which, for the model used in this work, is taken from the lognormal distribution. The model for the response variable is

$$y = \mathbf{X\beta} + \boldsymbol{\sigma\varepsilon}$$

where *y* is the vector of response values, **X** is the design matrix, β is a vector of unknown regression parameters, σ is an unknown scale parameter, and ε is a vector of errors assumed to come from a lognormal distribution. The procedure estimates the parameters of this model using maximum likelihood with a Newton-Raphson algorithm (SAS 9.22 User's Guide 2010).

Results and Discussion

When red snapper had been assessed before, recreational index of abundance was calculated using the MRFSS data, but not using the NMFS Headboat Survey or the Texas Parks and Wildlife dataset. As a result, the first step was to prepare a continuity index of abundance using the same methodology as was used during the last benchmark assessment (SEDAR 7) and update assessment in 2009. In addition, the continuity index was fit using various data trip selection approaches in order see how they perform. The index from the last assessment used the Association Statistic to select trips. Results show that the updated indices fit using the Association Statistic (red line) were able to closely match the indices that were prepared for the last update assessment in 2009 (light blue line) (Figure 2).

In addition, the results in Figure 2 suggest that the three trip selection procedures generate indices that are very similar (Figure 2). Each trip selection approach chose about the same number of positive trips (Figure 3), however they varied in the number of trips that were retained from the database (Figure 4), and thus, in the proportion of positive trips (Figure 5). Since major differences were not detected in the indices that were calculated using each approach, it was decided that subsequent analysis will only use the Stephens and MacCall (2004) procedure for subsetting the data, as this is the methodology that has been most accepted by SEDAR.

Once the continuity index was established and the Stephens and MacCall (2004) trip selection approach was decided on, new indices of abundance were estimated for the private/for hire mode and headboat mode of the recreational sector. Both the Delta censored lognormal regression approach and the uncensored Delta methods were used and the resulting indices were compared. As done in the continuity case, separate indices are calculated for the eastern and western Gulf of Mexico. The private/for hire mode indices for the eastern Gulf of Mexico

contain strictly MRFSS data, while the private/for hire mode indices for the western Gulf of Mexico contain a combination of MRFSS data (to cover Louisiana) and data from the Texas Parks and Wildlife Survey. The headboat mode indices for each region of the Gulf of Mexico were estimated from the NMFS Headboat Survey. Both the private/for hire and headboat mode indices were fit to landings only (referred to as "A" catch in MRFSS) data and these indices do not include any discards. Sample size tables detailing the number of total trips and positive trips, as well as the proportion of positive trips, across various strata, can be found in Appendix B. Deviance tables for each of these final models are included in Tables 1-8. The deviance tables contain a list of the factors that were included in each model in the order in which they were added, and the resulting AIC of the model when that factor was added.

As the bag limit became smaller and smaller over the time series (as per Figure 1), the fraction of censored observations increased, with a doubling in the number of censored observations starting in 2007, when the bag limit went from four fish to two fish per person per day (Figure 6). In correlation with this, the indices fitted using the censored regression show a departure from the indices fitted using the typical regression technique in 2007, where the censored model estimated a higher abundance index in those years than the uncensored model (Figure 7). Diagnostic plots for these uncensored and censored regression fits can be found in Appendix A.

Conclusions and Recommendations

We recommend that the censored regression approach be used for these indices due to the effect that the implementation of the size limit has had on being able to properly observe the full potential of red snapper that could be caught for a given unit of fishing effort. In addition, despite the fact that we have information on discards, we do not recommend that this information be used to generate an index due to the fact that anglers may be altering their fishing behavior after catching their limit of red snapper, which would bias their discards. Future research will simulation test the censored regression technique in order to better understand the utility and limitations of the algorithm.

References

Amemiya, T. (1973). Regression analysis when the dependent variable is truncated normal. Econometrica 41(6):997–1016.

Amemiya, T. (1984). Tobit models: A survey. J. Econometrics 24:3–61.

Amemiya, T. (1985). Advanced Econometrics. Oxford: Basil Blackwell.

Ault J.S. and Ehrhardt N.M. (1991) Correction to the Beverton and Holt Z-estimator for truncated catch length-frequency distributions. ICLARM Fishbyte 9:137–39.

Beverton, R. J. H., and S. J. Holt. 1956. A review of methods for estimating mortality rates in

exploited fish populations, with special reference to sources of bias in catch sampling. Rapports et Proces-Verbaux des Reunions, Conseil International pour Exploration de la Mer 140:67-83.

Cass-Calay, S.L. 2004. Revised catch rate indices for red snapper (*Lutjanus Canpechanus*) landed during 1981-2003 by the U.S. Gulf of Mexico recreational fishery. National Marine Fisheries Service, Southeast Data Assessment and Review. SEDAR 7-AW-4.

Ehrhardt, N.M., and J.S. Ault. 1992. Analysis of two length-based mortality models applied to bounded catch length frequencies. Transactions of the American Fisheries Society 121(1):115-122.

Hammond, T. and V. M. Trenkel. 2005. Censored catch data in fisheries stock assessment. ICES Journal of Marine Science: Journal du Conseil 62(6):1118-1130.

Hinton, Michael G. and M.N. Maunder. 2004. Methods for standardizing CPUE and how to select among them. Col. Vol. Sci. Pap. ICCAT 56(1): 169-177.

Lee, E. T. and J. W. Wang. 2003. Statistical methods for survival data analysis. 3rd edition. Hoboken, NJ: Wiley & Sons.

Maunder, M.N. and A.E. Punt. 2004. Standardizing catch and effort data: a review of recent approaches. Fisheries Research 70: 141-159.

Porch, C. E. and A.M. Eklund. 2004. Standardized visual counts of goliath grouper off South Florida and their possible use as indices of abundance. Gulf of Mex. Sci. 22:155- 163.

Stephens, A. and A. MacCall. 2004. A multispecies approach to subsetting logbook data for purposes of estimating CPUE. Fisheries Research 70: 299-310.

Tobin, J. (1958) Estimation of relationships for limited dependent variables. Econometrica, 26, 24-36.

Tables

Table 1: Index values, upper confidence limits, lower confidence limits, and coefficient of variation for the recommended censored regression fit private/for hire mode index for red snapper.

	EASTERN GULF				WESTERN GULF			
Year	Index	UCI	LCI	CV	Index	UCI	LCI	CV
1981	0.499	1.684	0.148	0.669	0.251	1.125	0.056	0.869
1982	0.308	1.042	0.091	0.670	0.514	1.300	0.203	0.490
1983	1.074	3.380	0.341	0.624	1.188	2.114	0.667	0.294
1984	0.662	2.955	0.148	0.866	0.569	1.080	0.300	0.329
1985	0.805	2.655	0.244	0.654	0.249	0.482	0.128	0.340
1986	0.310	0.978	0.098	0.625	0.518	0.975	0.275	0.324
1987	0.520	0.978	0.276	0.324	0.618	1.222	0.313	0.351
1988	0.160	0.337	0.076	0.386	0.603	1.162	0.313	0.337
1989	0.094	0.207	0.043	0.411	0.561	1.133	0.278	0.363
1990	0.103	0.247	0.043	0.461	0.380	0.716	0.201	0.325
1991	0.255	0.528	0.123	0.377	0.918	1.747	0.483	0.330
1992	0.534	0.940	0.303	0.289	0.968	1.661	0.564	0.275
1993	0.455	0.865	0.240	0.329	1.033	1.810	0.590	0.286
1994	0.281	0.560	0.141	0.355	1.151	1.986	0.667	0.278
1995	0.281	0.592	0.133	0.386	1.311	2.161	0.795	0.254
1996	0.374	0.798	0.175	0.393	1.005	1.664	0.607	0.256
1997	1.010	1.821	0.560	0.301	0.879	1.459	0.530	0.257
1998	1.565	2.395	1.023	0.215	0.911	1.512	0.549	0.257
1999	1.252	1.799	0.871	0.183	0.549	0.916	0.329	0.260
2000	1.188	1.785	0.791	0.206	0.671	1.124	0.401	0.262
2001	0.976	1.510	0.631	0.221	0.637	1.087	0.374	0.272
2002	1.490	2.279	0.974	0.215	0.800	1.334	0.479	0.260
2003	1.293	1.968	0.850	0.212	0.664	1.104	0.399	0.259
2004	1.097	1.602	0.751	0.191	0.615	1.014	0.373	0.254
2005	0.865	1.302	0.575	0.207	0.889	1.472	0.536	0.257
2006	1.004	1.558	0.646	0.223	0.711	1.125	0.449	0.233
2007	2.920	4.576	1.864	0.227	1.880	3.069	1.151	0.249
2008	2.783	4.020	1.926	0.185	1.790	2.915	1.100	0.247
2009	1.679	2.757	1.022	0.252	2.266	3.735	1.374	0.254
2010	3.439	5.567	2.124	0.244	3.354	6.162	1.825	0.311
2011	1.726	2.829	1.053	0.251	2.549	4.285	1.516	0.264

Table 2: Index values, upper confidence limits, lower confidence limits, and coefficient of variation for the recommended censored regression fit headboat mode index for red snapper.

	EASTERN GULF				WESTERN GULF			
Year	Index	UCI	LCI	CV	Index	UCI	LCI	CV
1986	0.115	0.312	0.043	0.530	0.485	0.863	0.273	0.294
1987	0.131	0.309	0.055	0.451	0.418	0.721	0.242	0.278
1988	0.195	0.388	0.098	0.355	0.580	0.997	0.338	0.276
1989	0.207	0.407	0.105	0.348	0.547	0.953	0.314	0.283
1990	0.221	0.394	0.124	0.294	0.370	0.617	0.221	0.261
1991	0.269	0.473	0.154	0.287	0.768	1.333	0.443	0.281
1992	0.399	0.694	0.229	0.282	1.339	2.265	0.791	0.268
1993	0.547	0.976	0.307	0.296	1.305	2.164	0.787	0.257
1994	0.417	0.721	0.241	0.279	0.988	1.585	0.615	0.240
1995	0.386	0.663	0.225	0.276	1.101	1.844	0.658	0.262
1996	0.571	1.129	0.289	0.351	1.224	2.214	0.677	0.303
1997	0.964	2.238	0.415	0.440	1.407	2.405	0.823	0.273
1998	1.531	3.590	0.653	0.446	1.142	1.899	0.687	0.259
1999	1.286	2.605	0.635	0.364	0.347	0.601	0.200	0.280
2000	1.265	2.321	0.689	0.311	0.501	0.818	0.306	0.249
2001	1.128	2.016	0.631	0.297	0.689	1.140	0.416	0.256
2002	1.826	3.355	0.994	0.311	0.687	1.129	0.418	0.252
2003	1.575	2.889	0.859	0.310	0.613	1.047	0.359	0.272
2004	1.214	2.232	0.660	0.312	0.506	0.861	0.297	0.271
2005	1.256	2.466	0.640	0.347	0.587	0.991	0.348	0.266
2006	0.761	1.510	0.383	0.353	0.671	1.088	0.414	0.245
2007	1.729	3.716	0.805	0.397	1.389	2.209	0.873	0.235
2008	1.784	2.987	1.066	0.262	2.462	4.118	1.472	0.261
2009	2.817	4.446	1.785	0.231	1.826	2.807	1.188	0.217
2010	1.514	2.727	0.841	0.301	1.622	2.541	1.035	0.227
2011	1.891	3.049	1.173	0.242	2.425	3.762	1.563	0.222

Table 3: Final deviance table for the recommended eastern Gulf of Mexico censored regression for the private/for hire mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	16370.20	14362	16370.20	16372.20	-	-8185.10	-
reg_season	1	5031.83	14361	11338.37	11342.37	30.74	-5670.19	5029.83
year	30	988.88	14331	10349.49	10413.49	6.04	-5176.75	986.88
area	4	414.93	14327	9934.56	10006.56	2.53	-4999.28	354.93
contb_bin	9	380.33	14318	9554.23	9644.23	2.32	-4813.12	372.33
wave	5	163.71	14313	9390.52	9490.52	1.00	-4740.26	145.71
CENSORED LOGNORMAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	48101.46	10671	48101.46	16072.71	-	-8034.36	-
year	30	2754.89	10642	45346.57	15503.30	5.73	-7719.65	629.41
mode	1	1454.19	10671	43892.38	15157.46	3.02	-7545.73	347.84
state	2	1999.17	10670	41893.20	14663.96	4.16	-7296.98	497.50
wave	5	836.09	10667	41057.11	14458.82	1.74	-7189.41	215.14

Table 4: Final deviance table for the recommended western Gulf of Mexico censored regression for the private/for hire mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	10230.36	9088	10230.36	10232.36	-	-5115.18	-
area	3	562.11	9085	9668.25	9676.25	5.49	-4835.12	560.11
reg_season	1	353.09	9084	9315.16	9325.16	3.45	-4661.58	347.09
contb_bin	9	196.13	9075	9119.03	9147.03	1.92	-4564.52	194.13
year	30	206.14	9045	8912.89	9000.89	2.02	-4470.44	188.14
CENSORED LOGNORMAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	18661.39	6812	18661.39	6868.94	-	-3432.47	-
year	30	980.74	6783	17680.66	6561.14	5.26	-3248.57	367.80
mode	1	709.87	6812	16970.79	6283.96	3.80	-3108.98	279.18
wave	5	289.14	6808	16681.64	6176.88	1.55	-3050.44	117.08

Table 5: Final deviance table for the eastern Gulf of Mexico regression for the private/for hire mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	16370.20	14362	16370.20	16372.20	-	-8185.10	-
reg_season	1	5031.83	14361	11338.37	11342.37	30.74	-5670.19	5029.83
year	30	988.88	14331	10349.49	10413.49	6.04	-5176.75	986.88
area	4	414.93	14327	9934.56	10006.56	2.53	-4999.28	354.93
contb_bin	9	380.33	14318	9554.23	9644.23	2.32	-4813.12	372.33
wave	5	163.71	14313	9390.52	9490.52	1.00	-4740.26	145.71
LOGNORMAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	11261.08	10671	11261.08	30863.22	NA	-15430.61	NA
year	30	440.41	10641	10820.67	30497.47	3.91	-15218.74	423.75
state	2	320.90	10639	10499.77	30180.19	2.85	-15088.10	261.28
mode	1	473.66	10638	10026.11	29689.57	4.21	-14843.78	488.63
wave	5	193.27	10633	9832.84	29491.83	1.72	-14740.92	205.73

Table 6: Final deviance table for the western Gulf of Mexico regression for the private/for hire mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	10230.36	9088	10230.36	10232.36	-	-5115.18	-
area	3	562.11	9085	9668.25	9676.25	5.49	-4835.12	560.11
reg_season	1	353.09	9084	9315.16	9325.16	3.45	-4661.58	347.09
contb_bin	9	196.13	9075	9119.03	9147.03	1.92	-4564.52	194.13
year	30	206.14	9045	8912.89	9000.89	2.02	-4470.44	188.14
LOGNORMAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	9090.88	6812	9090.88	21303.59	NA	-10650.79	NA
mode	1	461.29	6811	8629.58	20950.80	5.07	-10474.40	352.79
year	30	323.68	6781	8305.90	20750.34	3.56	-10345.17	258.46
wave	5	169.84	6776	8136.06	20619.58	1.87	-10304.79	80.76

Table 7: Final deviance table for the recommended eastern Gulf of Mexico censored regression for the headboat mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	58041.76	49403	58041.76	58043.76	-	-29020.88	-
reg_season	1	15233.95	49402	42807.81	42811.81	26.25	-21404.90	15231.95
year	25	5835.96	49377	36971.85	37025.85	10.05	-18487.93	5833.96
CENSORED LOGNORMAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	11624.16	35855	11624.16	20194.55	-	-40385.11	-
year	25	2227.44	35831	9396.72	24008.29	19.16	-47962.59	7627.48
month	11	525.57	35845	8871.15	25040.16	4.52	-50004.33	2063.74
area	3	328.84	35853	8542.31	25717.35	2.83	-51352.70	1354.37

Table 8: Final deviance table for the recommended western Gulf of Mexico censored regression for the headboat mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	33112.39	45959	33112.39	33114.39	-	-16556.19	-
reg_season	1	12651.95	45958	20460.44	20464.44	38.21	-10231.22	12649.95
area	3	1368.62	45955	19091.82	19101.82	4.13	-9547.91	1366.62
month	11	587.06	45944	18504.76	18536.76	1.77	-9257.38	581.06
year	25	910.88	45919	17593.87	17675.87	2.75	-8812.94	888.88
CENSORED LOGNORMAL								
Factor	**Df**	**Deviance**	**Resid. Df**	**Resid. Dev**	**AIC**	**% Dev. Red.**	**log_likelihood**	**like_ratio**
Null	1	182973.51	40597	61129.26	182973.51	-	-30562.63	-
year	25	12401.18	40573	58330.02	170572.32	6.78	-29138.01	2849.25
month	11	8836.04	40587	56192.52	161736.29	4.83	-28058.26	2159.50

Table 9: Final deviance table for the eastern Gulf of Mexico uncensored regression for the headboat mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	Df	Deviance	Resid. Df	Resid. Dev	AIC	% Dev. Red.	log_likelihood	like_ratio
Null	1	58041.76	49403	58041.76	58043.76	-	-29020.88	-
reg_season	1	15233.95	49402	42807.81	42811.81	26.25	-21404.90	15231.95
year	25	5835.96	49377	36971.85	37025.85	10.05	-18487.93	5833.96
LOGNORMAL								
Factor	Df	Deviance	Resid. Df	Resid. Dev	AIC	% Dev. Red.	log_likelihood	like_ratio
Null	1	80550.07	35855	80550.07	130779.62	-	-65388.81	-
year	25	14190.50	35830	66359.56	123881.05	17.62	-61915.52	6946.57
month	11	3684.28	35819	62675.29	121854.93	4.57	-60916.47	1998.12
area	3	2575.46	35816	60099.83	120356.41	3.20	-60175.20	1482.52

Table 10: Final deviance table for the western Gulf of Mexico uncensored regression for the headboat mode using landings only ("A") catch. The table shows the order of the factors as they were added sequentially to the model such that fit diagnostics listed for each factor were the diagnostics from a model that included that factor and all of the factors listed above it in the table.

BINOMIAL								
Factor	Df	Deviance	Resid. Df	Resid. Dev	AIC	% Dev. Red.	log_likelihood	like_ratio
Null	1	33117.68	45964	33117.68	33119.68	-	-16558.84	-
reg_season	1	12656.35	45963	20461.33	20465.33	38.22	-10231.66	12654.35
area	3	1368.74	45960	19092.59	19102.59	4.13	-9548.30	1366.74
month	11	586.94	45949	18505.65	18537.65	1.77	-9257.82	580.94
year	25	910.77	45924	17594.87	17676.87	2.75	-8813.44	888.77
LOGNORMAL								
Factor	Df	Deviance	Resid. Df	Resid. Dev	AIC	% Dev. Red.	log_likelihood	like_ratio
Null	1	50489.79	40601	50489.79	124076.85	-	-62037.42	-
year	25	5331.61	40576	45158.18	119595.67	10.56	-59772.84	4529.17
area	3	4099.01	40573	41059.16	115738.09	8.12	-57866.05	3813.58
month	11	2712.15	40562	38347.01	112985.46	5.37	-56481.73	2768.63

Figures

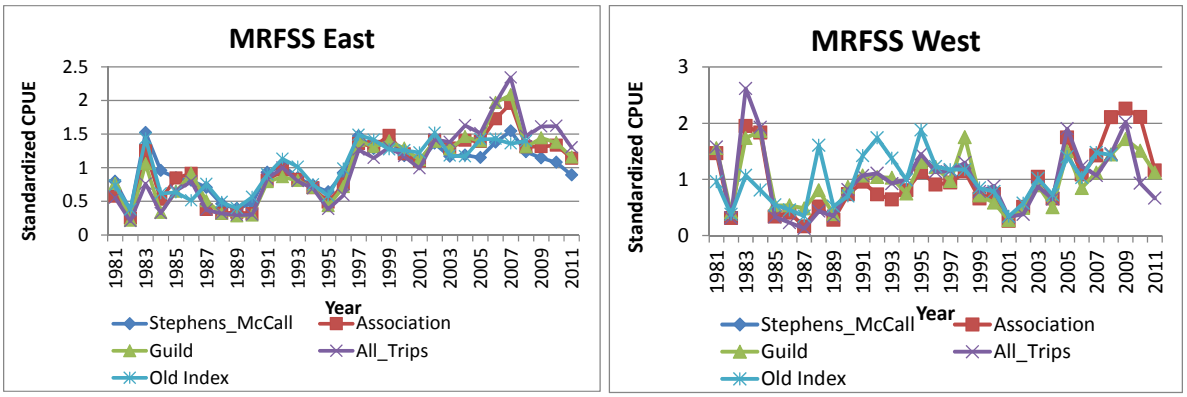

Figure 2: Continuity indices of abundance using the MRFSS data and performance comparison of different trip selection algorithms.

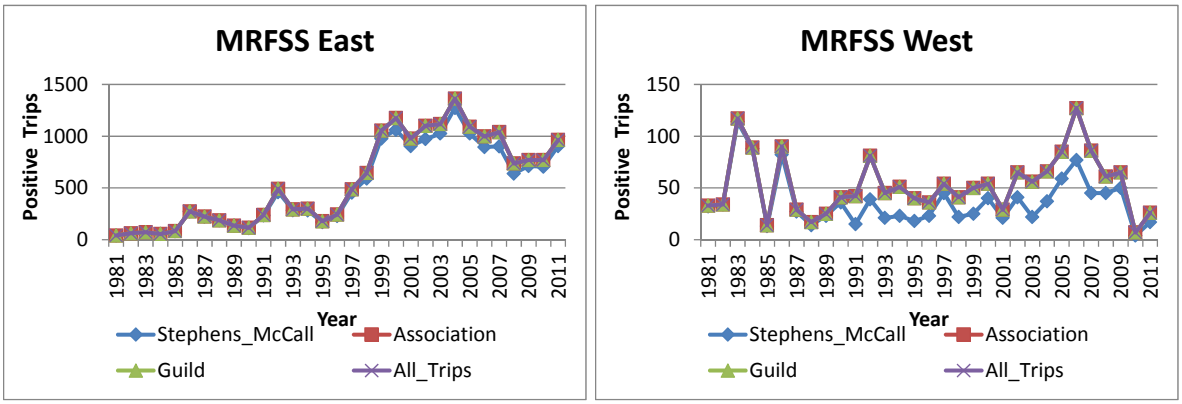

Figure 3: Comparison of the number of positive trips for each subset of the data using the three trip selection procedures and no trip selection procedure (all of the data).

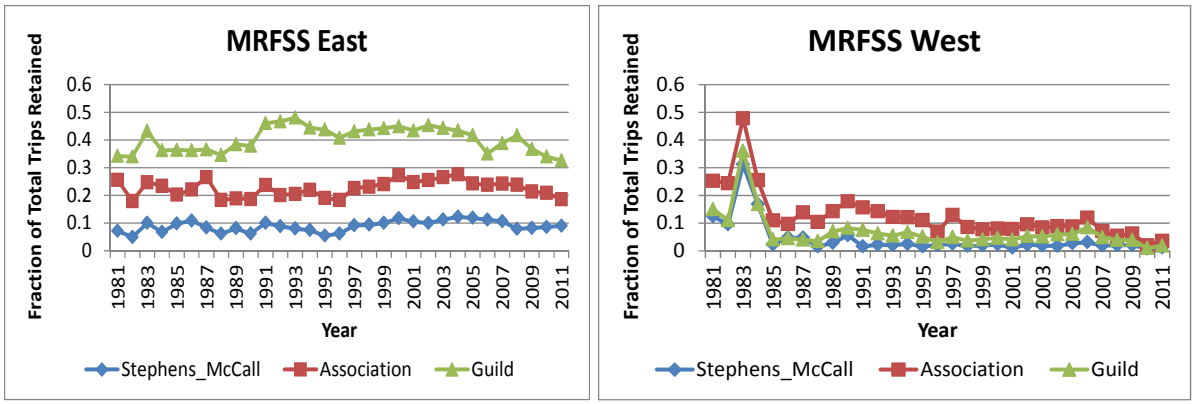

Figure 4: The fraction of trips retained from the total dataset for each subset of the data using the three trip selection procedures.

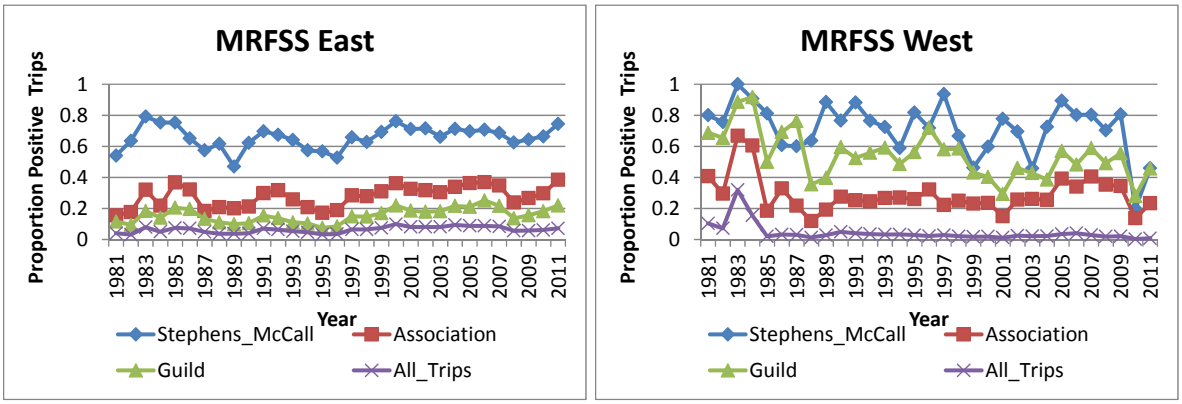

Figure 5: The proportion of positive trips for the data subsets obtained from the three trip selection procedures and for no trip selection procedure.

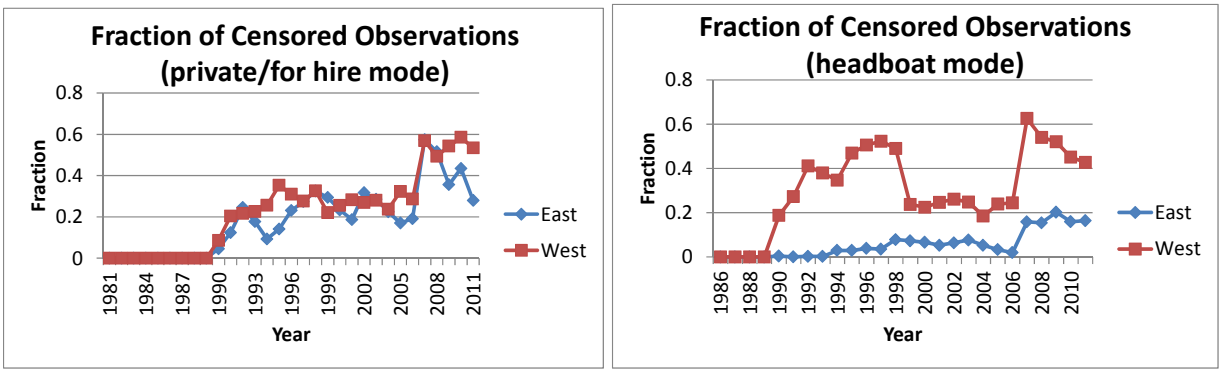

Figure 6: Fraction of censored observations from the private/for hire and headboat modes.

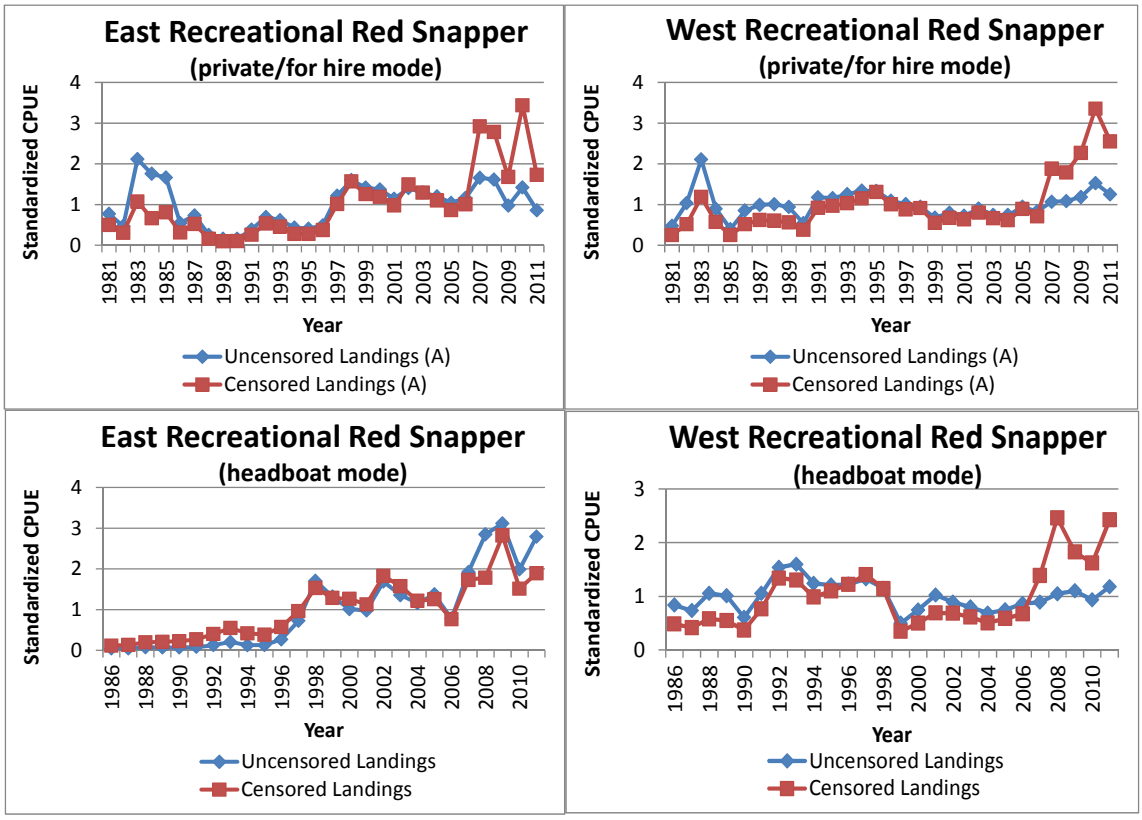

Figure 7: Comparison of censored and uncensored standardization techniques for red snapper indices of abundance from the private/for hire and headboat modes.

Appendix A: Diagnostic Index Plots for Censored and Uncensored Fits for Charter/Private Mode Indices from MRFSS/Texas Parks and Wildlife

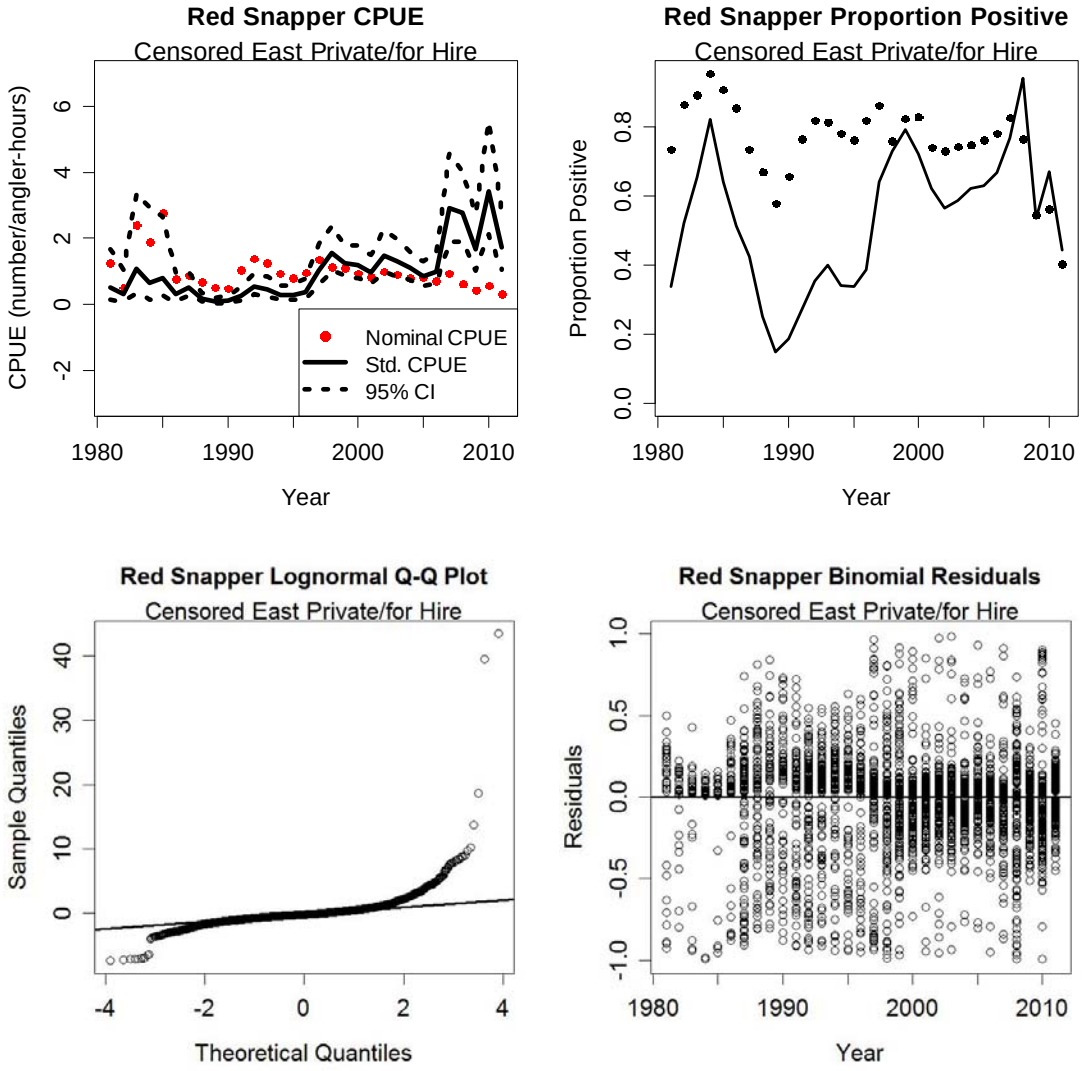

Figure 8: Model fit and diagnostics for the recommended eastern Gulf of Mexico censored regression for the private/for hire mode using landings only ("A") catch.

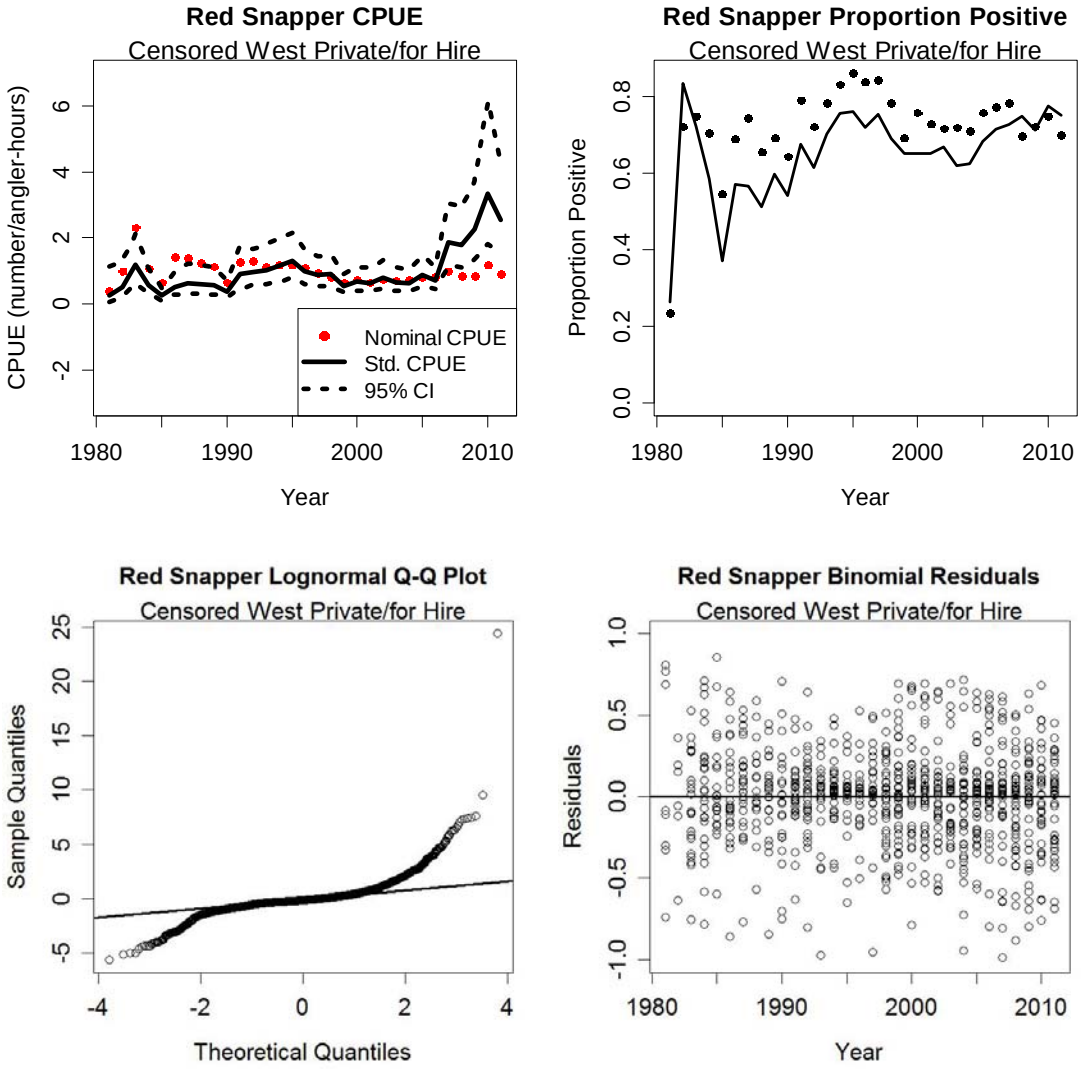

Figure 9: Model fit and diagnostics for the recommended western Gulf of Mexico censored regression for the private/for hire mode using landings only ("A") catch.

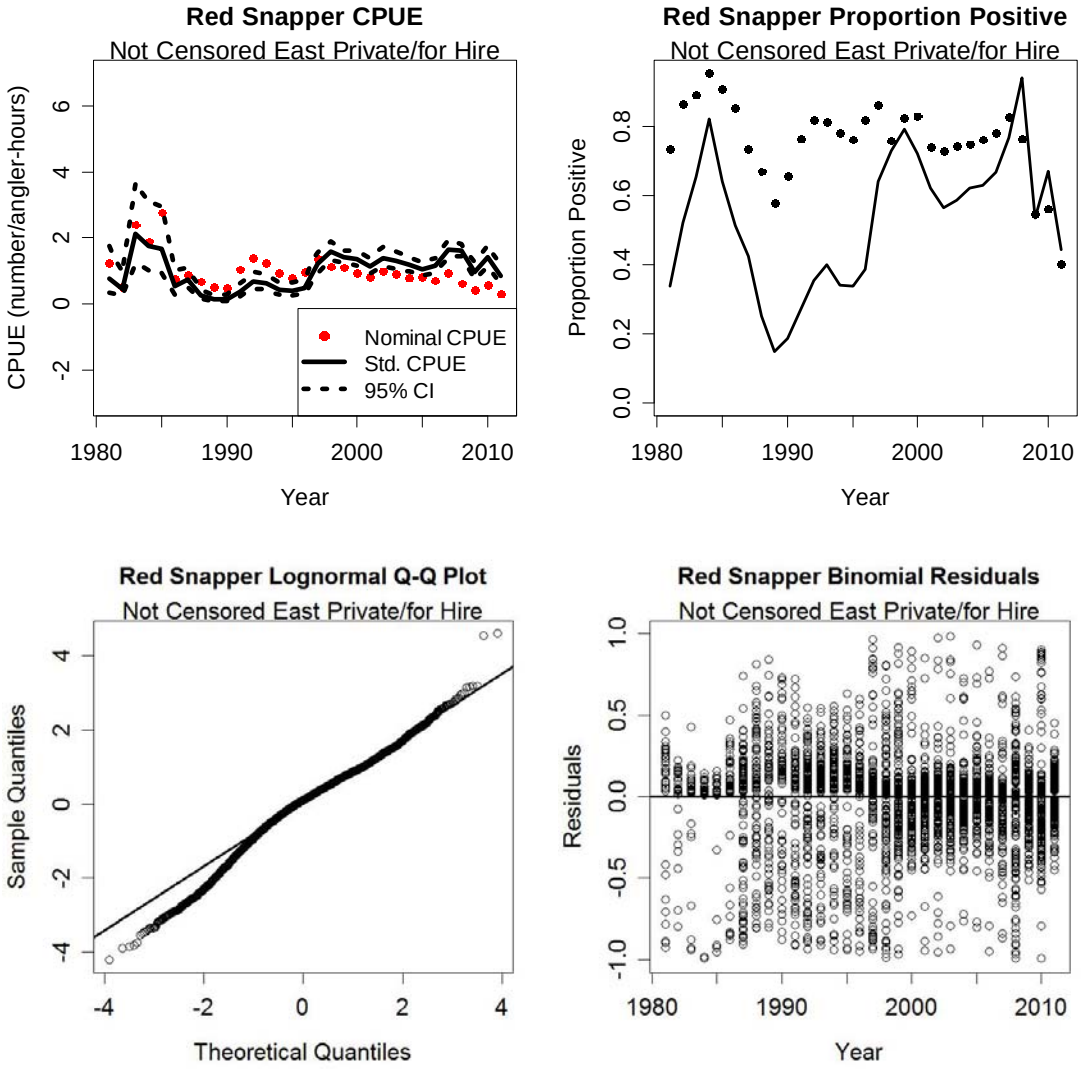

Figure 10: Model fit and diagnostics for the eastern Gulf of Mexico uncensored regression for the private/for hire mode using landings only ("A") catch.

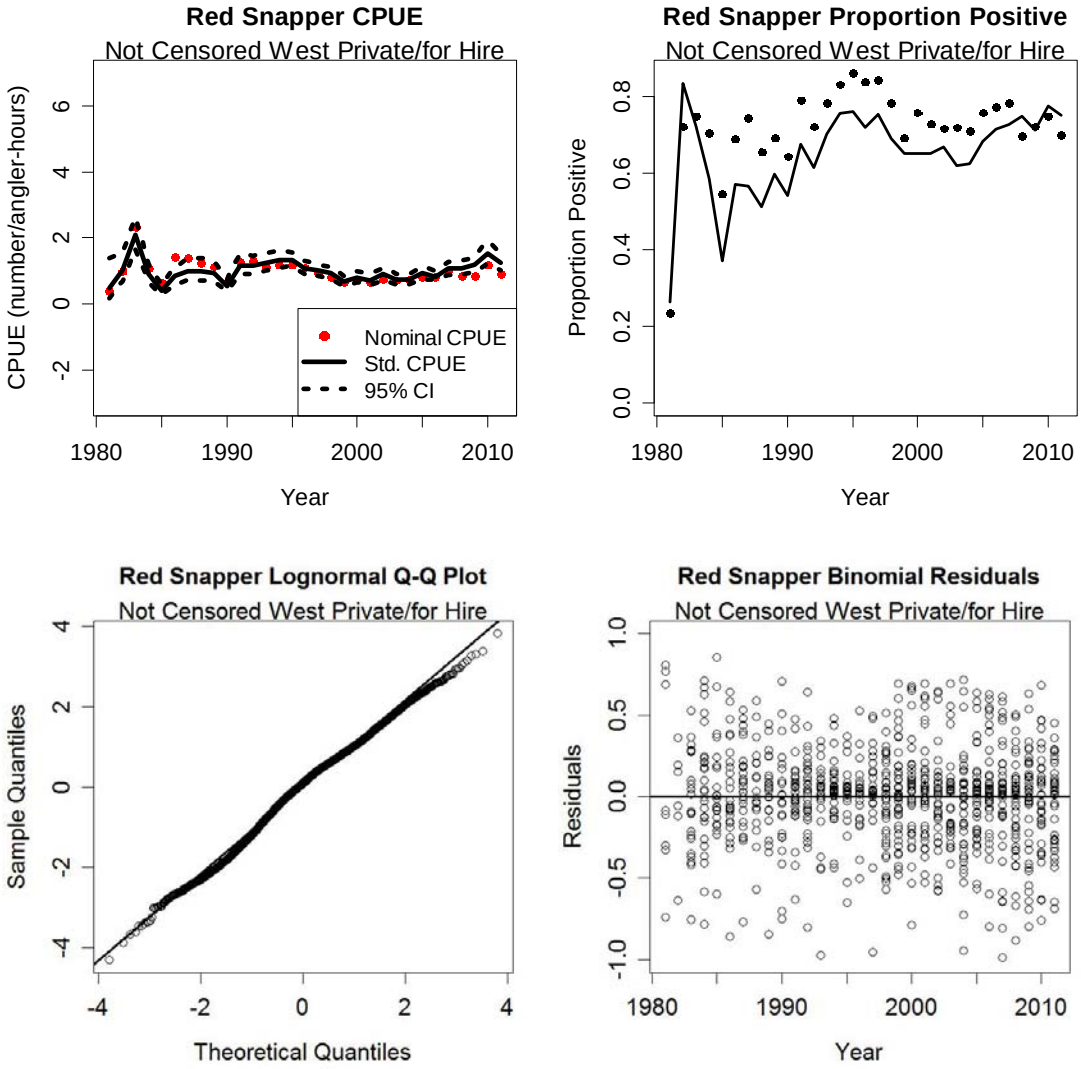

Figure 11: Model fit and diagnostics for the western Gulf of Mexico uncensored regression for the private/for hire mode using landings only ("A") catch.

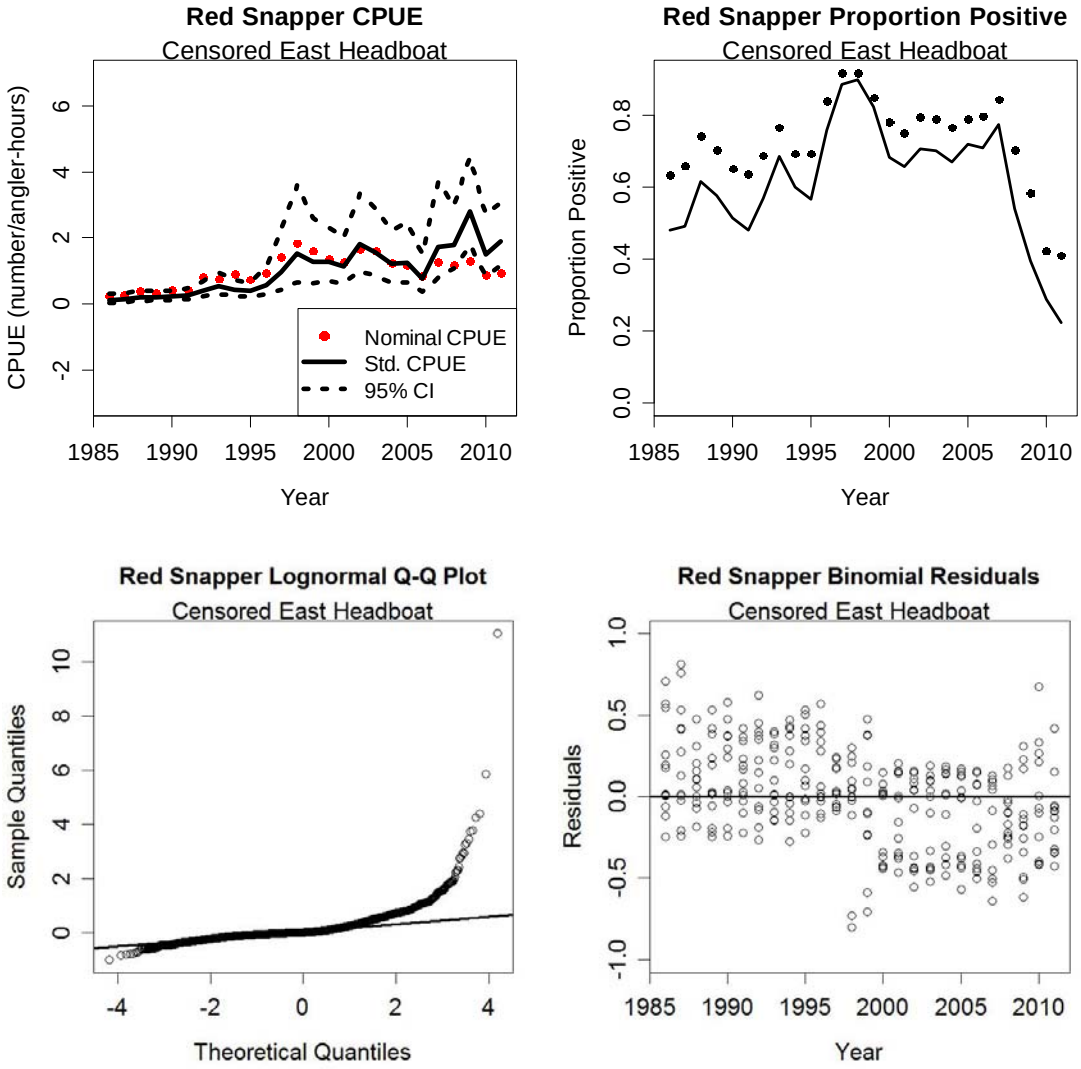

Figure 12: Model fit and diagnostics for the recommended eastern Gulf of Mexico censored regression for the headboat mode using landings only ("A") catch.

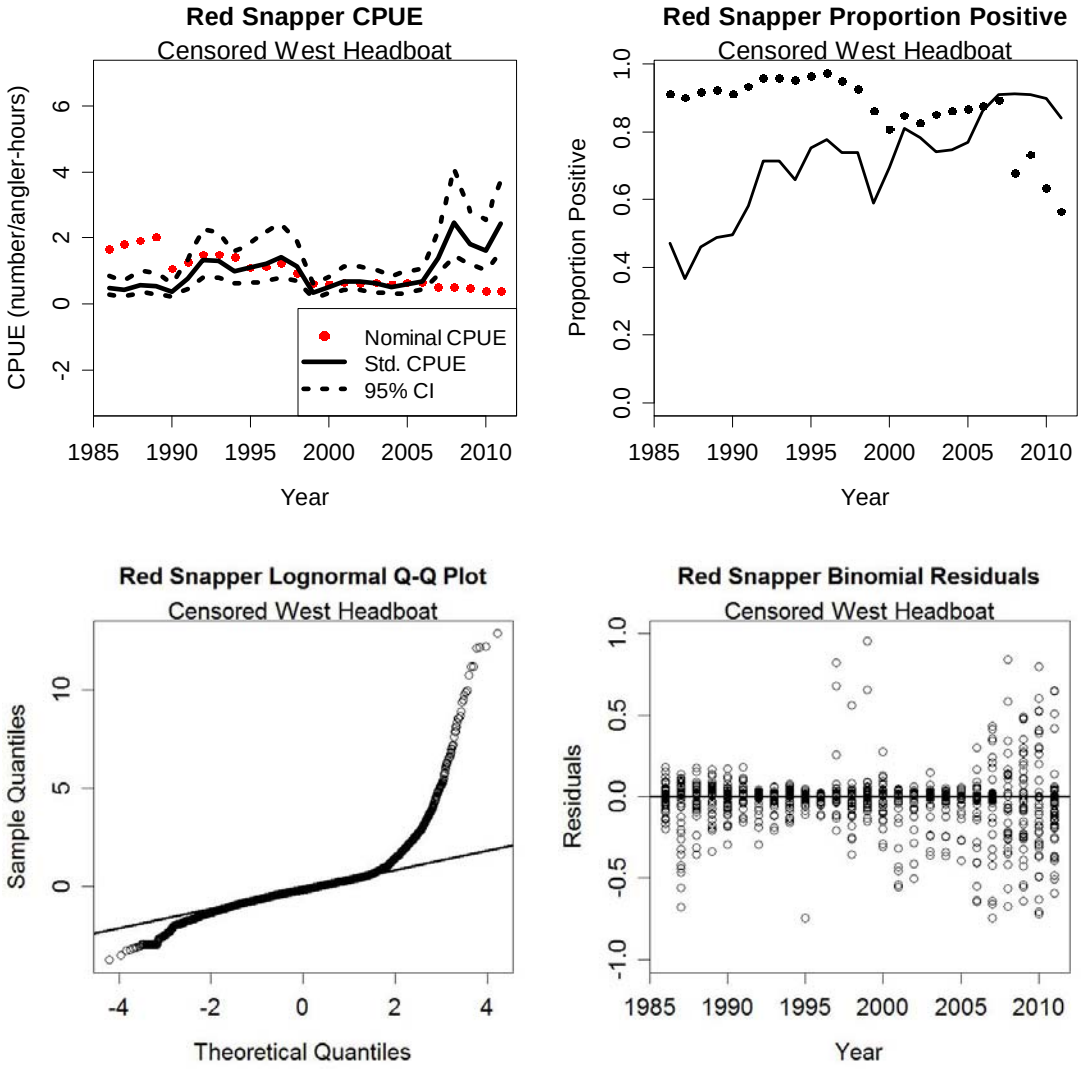

Figure 13: Model fit and diagnostics for the recommended western Gulf of Mexico censored regression for the headboat mode using landings only ("A") catch.

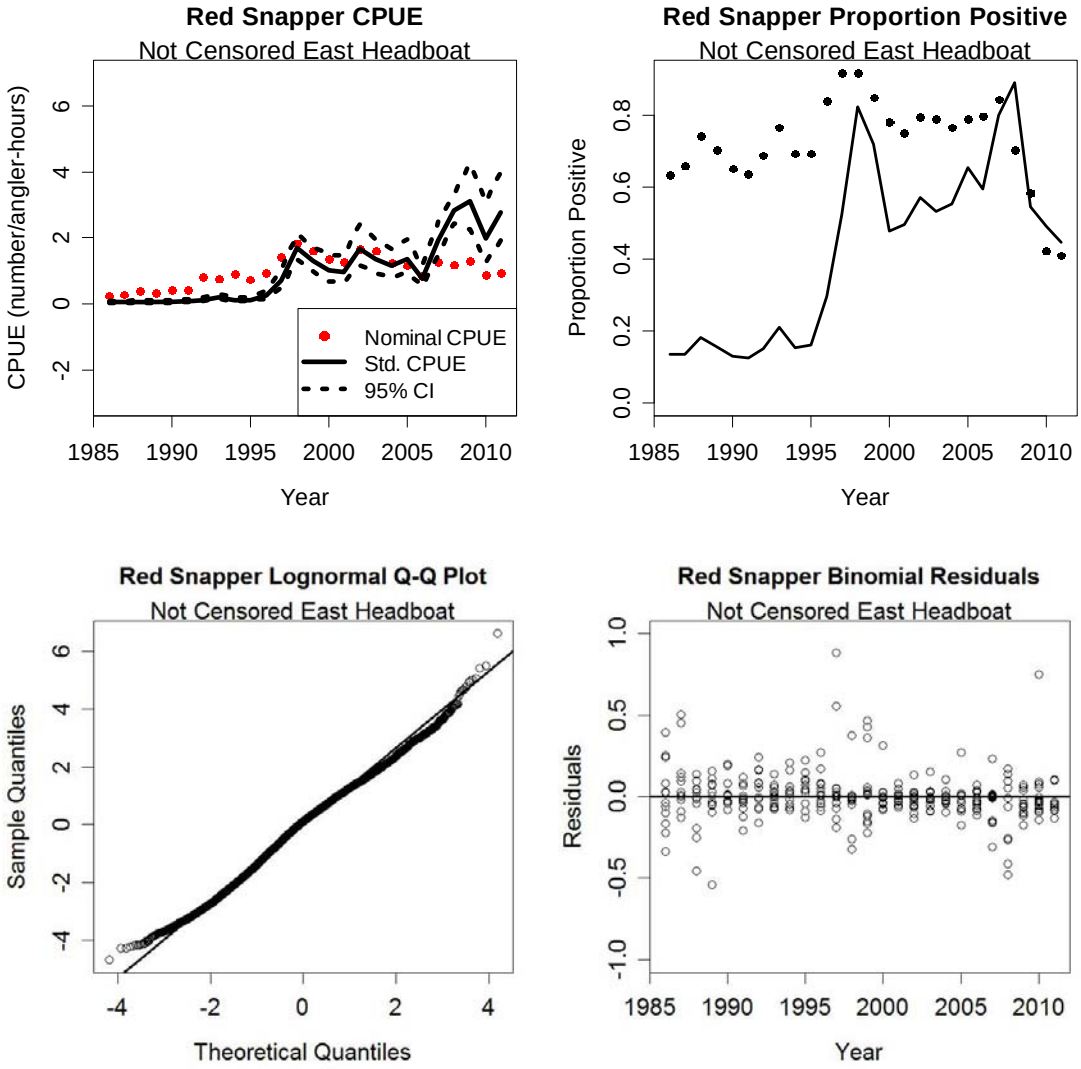

Figure 14: Model fit and diagnostics for the eastern Gulf of Mexico uncensored regression for the headboat mode using landings only ("A") catch.

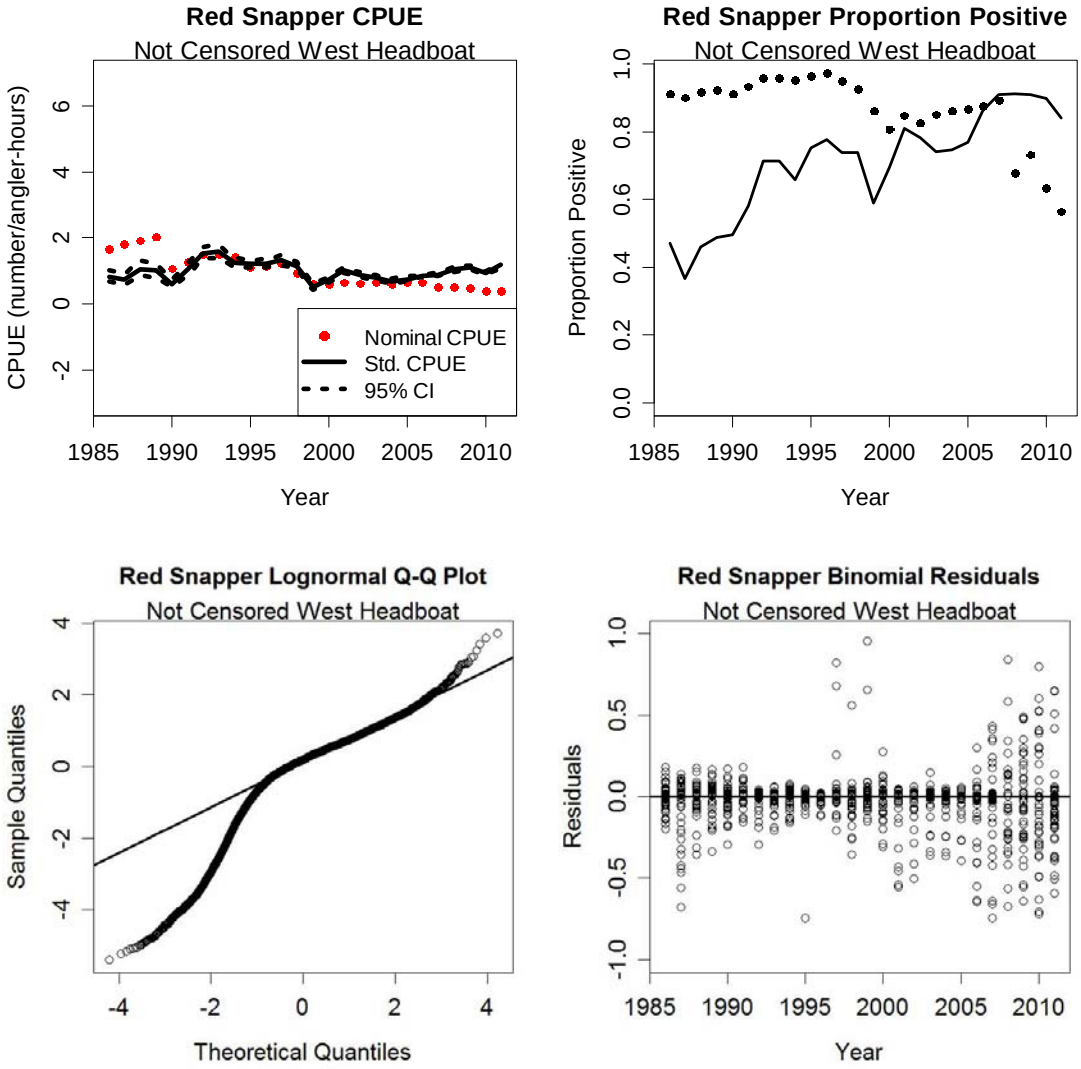

Figure 15: Model fit and diagnostics for the western Gulf of Mexico uncensored regression for the headboat mode using landings only ("A") catch.

Appendix B: Number of total trips, Stephens and MacCall Selected Trips, and Positive Trips That Caught Red Snapper across Strata

Table 11: The total trips, positive trips, and percentage of positive trips by year for an all trips dataset and Stephens and MacCall selected trips dataset, as well as the percentage of trips retained by the Stephens and MacCall trip selection procedure for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	totalTrips_all	posTrips_all	ppos_all	totalTrips_subset	posTrips_subset	ppos_subset	Percent_Trips_Retained
1981	332	33	9.94	47	33	70.21	14.16
1982	727	45	6.19	51	45	88.24	7.02
1983	409	58	14.18	64	58	90.62	15.65
1984	484	41	8.47	43	41	95.35	8.88
1985	374	59	15.78	65	59	90.77	17.38
1986	909	51	5.61	60	51	85	6.6
1987	1790	166	9.27	224	166	74.11	12.51
1988	1222	102	8.35	150	102	68	12.27
1989	799	78	9.76	131	78	59.54	16.4
1990	814	71	8.72	110	71	64.55	13.51
1991	1002	149	14.87	194	149	76.8	19.36
1992	1940	328	16.91	399	328	82.21	20.57
1993	1285	213	16.58	260	213	81.92	20.23
1994	1411	162	11.48	205	162	79.02	14.53
1995	1353	125	9.24	163	125	76.69	12.05
1996	1486	149	10.03	182	149	81.87	12.25
1997	2017	332	16.46	380	332	87.37	18.84
1998	2816	449	15.94	585	449	76.75	20.77
1999	4312	837	19.41	1013	837	82.63	23.49
2000	4066	865	21.27	1047	865	82.62	25.75
2001	3755	661	17.6	899	661	73.53	23.94
2002	3789	690	18.21	943	690	73.17	24.89
2003	3732	730	19.56	974	730	74.95	26.1
2004	3811	927	24.32	1243	927	74.58	32.62
2005	3286	746	22.7	984	746	75.81	29.95
2006	2760	623	22.57	794	623	78.46	28.77
2007	2725	646	23.71	775	646	83.35	28.44
2008	2764	451	16.32	586	451	76.96	21.2
2009	2281	287	12.58	520	287	55.19	22.8
2010	2185	274	12.54	483	274	56.73	22.11
2011	2554	259	10.14	644	259	40.22	25.22

Table 12: The total trips, positive trips, and percentage of positive trips by mode (two month period) for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	ALL TRIPS						POSITIVE TRIPS						PERCENT POSITIVE TRIPS					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1981	0	21	61	107	96	47	0	4	7	9	6	7	0	19.05	11.48	8.41	6.25	14.89
1982	0	119	279	237	44	48	0	7	19	15	2	2	0	5.88	6.81	6.33	4.55	4.17
1983	16	86	136	89	62	20	1	30	19	4	0	4	6.25	34.88	13.97	4.49	0	20
1984	68	63	187	84	52	30	4	5	19	3	2	8	5.88	7.94	10.16	3.57	3.85	26.67
1985	28	65	92	57	81	51	1	28	17	3	7	3	3.57	43.08	18.48	5.26	8.64	5.88
1986	71	147	194	156	206	135	2	11	12	7	11	8	2.82	7.48	6.19	4.49	5.34	5.93
1987	142	326	435	470	339	78	3	27	30	75	26	5	2.11	8.28	6.9	15.96	7.67	6.41
1988	58	81	182	319	406	176	3	10	15	17	48	9	5.17	12.35	8.24	5.33	11.82	5.11
1989	155	115	135	195	157	42	1	21	8	12	27	9	0.65	18.26	5.93	6.15	17.2	21.43
1990	23	178	149	218	129	117	0	6	12	18	27	8	0	3.37	8.05	8.26	20.93	6.84
1991	121	140	227	154	235	125	6	12	33	20	44	34	4.96	8.57	14.54	12.99	18.72	27.2
1992	201	417	348	304	436	234	36	51	49	45	112	35	17.91	12.23	14.08	14.8	25.69	14.96
1993	138	190	212	276	234	235	6	22	42	43	60	40	4.35	11.58	19.81	15.58	25.64	17.02
1994	178	217	270	272	238	236	16	31	37	26	30	22	8.99	14.29	13.7	9.56	12.61	9.32
1995	148	243	275	262	252	173	16	23	34	15	15	22	10.81	9.47	12.36	5.73	5.95	12.72
1996	112	177	303	261	416	217	17	19	35	21	32	25	15.18	10.73	11.55	8.05	7.69	11.52
1997	181	317	329	317	536	337	16	27	38	44	147	60	8.84	8.52	11.55	13.88	27.43	17.8
1998	332	382	551	542	339	670	66	80	110	96	95	2	19.88	20.94	19.96	17.71	28.02	0.3
1999	709	965	769	789	550	530	141	206	208	153	128	1	19.89	21.35	27.05	19.39	23.27	0.19
2000	421	719	1105	761	673	387	1	90	299	209	266	0	0.24	12.52	27.06	27.46	39.52	0
2001	437	855	762	682	550	469	2	71	192	203	191	2	0.46	8.3	25.2	29.77	34.73	0.43
2002	428	821	763	654	640	483	2	66	232	188	201	1	0.47	8.04	30.41	28.75	31.41	0.21
2003	394	763	900	660	574	441	1	52	259	205	213	0	0.25	6.82	28.78	31.06	37.11	0
2004	397	746	877	768	588	435	2	84	330	297	214	0	0.5	11.26	37.63	38.67	36.39	0
2005	371	660	1055	587	335	278	1	51	353	204	132	5	0.27	7.73	33.46	34.75	39.4	1.8
2006	277	572	657	534	453	267	0	49	246	176	152	0	0	8.57	37.44	32.96	33.55	0
2007	249	551	657	521	409	338	1	66	255	195	128	1	0.4	11.98	38.81	37.43	31.3	0.3
2008	334	570	621	447	426	366	3	43	169	124	112	0	0.9	7.54	27.21	27.74	26.29	0
2009	221	415	603	405	361	276	0	0	141	146	0	0	0	0	23.38	36.05	0	0
2010	183	423	602	352	326	299	0	0	115	45	71	43	0	0	19.1	12.78	21.78	14.38
2011	250	522	596	492	410	284	0	0	183	76	0	0	0	0	30.7	15.45	0	0

Table 13: The total trips, positive trips, and percentage of positive trips by state for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Mississippi Total	Alabama Total	Florida Total	Mississippi Positive	Alabama Positive	Florida Positive	Mississippi Ppos	Alabama Ppos	Florida Ppos
1981	37	48	247	0	16	17	0	33.33	6.88
1982	179	123	425	4	13	28	2.23	10.57	6.59
1983	91	78	240	1	46	11	1.1	58.97	4.58
1984	100	95	289	1	31	9	1	32.63	3.11
1985	48	145	181	1	52	6	2.08	35.86	3.31
1986	93	167	649	6	22	23	6.45	13.17	3.54
1987	191	248	1351	3	50	113	1.57	20.16	8.36
1988	202	99	921	11	38	53	5.45	38.38	5.75
1989	152	79	568	7	40	31	4.61	50.63	5.46
1990	165	123	526	3	46	22	1.82	37.4	4.18
1991	120	241	641	14	118	17	11.67	48.96	2.65
1992	219	364	1357	72	204	52	32.88	56.04	3.83
1993	51	226	1008	26	112	75	50.98	49.56	7.44
1994	54	213	1144	21	102	39	38.89	47.89	3.41
1995	46	201	1106	11	96	18	23.91	47.76	1.63
1996	103	242	1141	17	103	29	16.5	42.56	2.54
1997	149	275	1593	27	134	171	18.12	48.73	10.73
1998	139	361	2316	18	141	290	12.95	39.06	12.52
1999	315	690	3307	32	306	499	10.16	44.35	15.09
2000	174	588	3304	11	229	625	6.32	38.95	18.92
2001	109	611	3035	10	213	438	9.17	34.86	14.43
2002	68	508	3213	20	206	464	29.41	40.55	14.44
2003	50	432	3250	14	182	534	28	42.13	16.43
2004	47	401	3363	5	168	754	10.64	41.9	22.42
2005	33	348	2905	1	136	609	3.03	39.08	20.96
2006	66	273	2421	4	98	521	6.06	35.9	21.52
2007	52	294	2379	2	103	541	3.85	35.03	22.74
2008	59	209	2496	3	68	380	5.08	32.54	15.22
2009	41	243	1997	8	82	197	19.51	33.74	9.86
2010	27	183	1975	1	37	236	3.7	20.22	11.95
2011	36	256	2262	1	86	172	2.78	33.59	7.6

Table 14: The total trips, positive trips, and percentage of positive trips by location from shore (MRFSS area) for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Less Than 3 Miles	Greater Than 3 Miles	Less Than 10 Miles	Greater Than 10 Miles	Less Than 3 Miles Pos	Greater Than 3 Miles Positive	Less Than 10 Miles Positive	Greater Than 10 Miles Positive	Less Than 3 Miles Proport. Positive	Greater Than 3 Miles Proport. Positive	Less Than 10 Miles Proport. Positive	Greater Than 10 Miles Proport. Positive
1981	48	37	182	65	7	9	11	6	14.58	24.32	6.04	9.23
1982	188	114	359	66	9	8	17	11	4.79	7.02	4.74	16.67
1983	52	117	187	53	9	38	3	8	17.31	32.48	1.6	15.09
1984	72	123	243	46	7	25	3	6	9.72	20.33	1.23	13.04
1985	93	100	142	39	0	53	1	5	0	53	0.7	12.82
1986	135	125	482	167	1	27	9	14	0.74	21.6	1.87	8.38
1987	189	250	894	457	6	47	29	84	3.17	18.8	3.24	18.38
1988	149	152	567	354	7	42	13	40	4.7	27.63	2.29	11.3
1989	89	142	348	220	2	45	11	20	2.25	31.69	3.16	9.09
1990	133	155	334	192	5	44	8	14	3.76	28.39	2.4	7.29
1991	143	218	463	178	6	126	12	5	4.2	57.8	2.59	2.81
1992	133	450	909	448	8	268	19	33	6.02	59.56	2.09	7.37
1993	69	208	587	421	3	135	24	51	4.35	64.9	4.09	12.11
1994	58	209	783	361	4	119	13	26	6.9	56.94	1.66	7.2
1995	62	185	757	349	3	104	12	6	4.84	56.22	1.59	1.72
1996	105	240	731	410	0	120	10	19	0	50	1.37	4.63
1997	112	312	978	615	13	148	64	107	11.61	47.44	6.54	17.4
1998	147	353	1223	1093	18	141	93	197	12.24	39.94	7.6	18.02
1999	411	594	1645	1662	15	323	234	265	3.65	54.38	14.22	15.94
2000	263	499	1469	1835	3	237	225	400	1.14	47.49	15.32	21.8
2001	279	441	1289	1746	3	220	155	283	1.08	49.89	12.02	16.21
2002	178	398	1333	1880	3	223	136	328	1.69	56.03	10.2	17.45
2003	177	305	1242	2008	4	192	162	372	2.26	62.95	13.04	18.53
2004	164	284	1367	1996	4	169	229	525	2.44	59.51	16.75	26.3
2005	138	243	1176	1729	5	132	170	439	3.62	54.32	14.46	25.39
2006	141	198	1067	1354	5	97	136	385	3.55	48.99	12.75	28.43
2007	190	156	1180	1199	8	97	264	277	4.21	62.18	22.37	23.1
2008	152	116	1245	1251	6	65	227	153	3.95	56.03	18.23	12.23
2009	124	160	1043	954	2	88	66	131	1.61	55	6.33	13.73
2010	120	90	979	996	0	38	152	84	0	42.22	15.53	8.43
2011	131	161	1173	1089	4	83	73	99	3.05	51.55	6.22	9.09

Table 15: The total trips, positive trips, and percentage of positive trips by fishing mode for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Charter	Private	Charter Positive	Private Positive	Charter Proportion Positive	Private Proportion Positive
1981	83	249	14	19	16.87	7.63
1982	85	642	20	25	23.53	3.89
1983	138	271	46	12	33.33	4.43
1984	191	293	32	9	16.75	3.07
1985	106	268	51	8	48.11	2.99
1986	272	637	39	12	14.34	1.88
1987	460	1330	104	62	22.61	4.66
1988	372	850	85	17	22.85	2
1989	332	467	68	10	20.48	2.14
1990	280	534	45	26	16.07	4.87
1991	328	674	106	43	32.32	6.38
1992	562	1378	228	100	40.57	7.26
1993	395	890	148	65	37.47	7.3
1994	360	1051	111	51	30.83	4.85
1995	323	1030	64	61	19.81	5.92
1996	346	1140	86	63	24.86	5.53
1997	839	1178	261	71	31.11	6.03
1998	1438	1378	398	51	27.68	3.7
1999	2243	2069	662	175	29.51	8.46
2000	2639	1427	752	113	28.5	7.92
2001	2112	1643	523	138	24.76	8.4
2002	2192	1597	554	136	25.27	8.52
2003	2330	1402	587	143	25.19	10.2
2004	2322	1489	772	155	33.25	10.41
2005	2019	1267	643	103	31.85	8.13
2006	1496	1264	514	109	34.36	8.62
2007	1546	1179	534	112	34.54	9.5
2008	1551	1213	348	103	22.44	8.49
2009	1227	1054	178	109	14.51	10.34
2010	1337	848	191	83	14.29	9.79
2011	1554	1000	140	119	9.01	11.9

Table 16: The total trips, positive trips, and percentage of positive trips by open and closed red snapper fishing season for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proportion Positive	Open Proportion Positive
1981	0	332	0	33		9.94
1982	0	727	0	45		6.19
1983	0	409	0	58		14.18
1984	0	484	0	41		8.47
1985	0	374	0	59		15.78
1986	0	909	0	51		5.61
1987	0	1790	0	166		9.27
1988	0	1222	0	102		8.35
1989	0	799	0	78		9.76
1990	0	814	0	71		8.72
1991	0	1002	0	149		14.87
1992	0	1940	0	328		16.91
1993	0	1285	0	213		16.58
1994	0	1411	0	162		11.48
1995	0	1353	0	125		9.24
1996	0	1486	0	149		10.03
1997	143	1874	19	313	13.29	16.7
1998	899	1917	62	387	6.9	20.19
1999	1108	3204	136	701	12.27	21.88
2000	1364	2702	38	827	2.79	30.61
2001	1608	2147	20	641	1.24	29.86
2002	1550	2239	14	676	0.9	30.19
2003	1478	2254	10	720	0.68	31.94
2004	1431	2380	46	881	3.21	37.02
2005	1142	2144	30	716	2.63	33.4
2006	1010	1750	19	604	1.88	34.51
2007	1050	1675	40	606	3.81	36.18
2008	2168	596	261	190	12.04	31.88
2009	1687	594	0	287	0	48.32
2010	1629	556	46	228	2.82	41.01
2011	2045	509	1	258	0.05	50.69

Table 17: The total trips, positive trips and percentage of positive trips by mode (two month period) for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	ALL TRIPS						POSITIVE TRIPS						PERCENT POSITIVE TRIPS					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1981	0	4	11	13	8	11	0	4	7	9	6	7	0	100	63.64	69.23	75	63.64
1982	0	8	23	16	2	2	0	7	19	15	2	2	0	87.5	82.61	93.75	100	100
1983	2	33	20	4	0	5	1	30	19	4	0	4	50	90.91	95	100	0	80
1984	4	5	19	3	4	8	4	5	19	3	2	8	100	100	100	100	50	100
1985	1	30	17	4	8	5	1	28	17	3	7	3	100	93.33	100	75	87.5	60
1986	4	12	14	8	14	8	2	11	12	7	11	8	50	91.67	85.71	87.5	78.57	100
1987	5	43	49	89	30	8	3	27	30	75	26	5	60	62.79	61.22	84.27	86.67	62.5
1988	5	14	20	27	69	15	3	10	15	17	48	9	60	71.43	75	62.96	69.57	60
1989	3	30	22	19	45	12	1	21	8	12	27	9	33.33	70	36.36	63.16	60	75
1990	1	9	30	23	35	12	0	6	12	18	27	8	0	66.67	40	78.26	77.14	66.67
1991	9	19	40	28	53	45	6	12	33	20	44	34	66.67	63.16	82.5	71.43	83.02	75.56
1992	39	69	66	52	129	44	36	51	49	45	112	35	92.31	73.91	74.24	86.54	86.82	79.55
1993	8	31	50	55	72	44	6	22	42	43	60	40	75	70.97	84	78.18	83.33	90.91
1994	19	38	49	34	42	23	16	31	37	26	30	22	84.21	81.58	75.51	76.47	71.43	95.65
1995	19	27	41	19	25	32	16	23	34	15	15	22	84.21	85.19	82.93	78.95	60	68.75
1996	18	26	45	26	37	30	17	19	35	21	32	25	94.44	73.08	77.78	80.77	86.49	83.33
1997	18	38	44	49	158	73	16	27	38	44	147	60	88.89	71.05	86.36	89.8	93.04	82.19
1998	75	88	120	110	111	81	66	80	110	96	95	2	88	90.91	91.67	87.27	85.59	2.47
1999	158	228	226	179	168	54	141	206	208	153	128	1	89.24	90.35	92.04	85.47	76.19	1.85
2000	48	152	317	216	280	34	1	90	299	209	266	0	2.08	59.21	94.32	96.76	95	0
2001	47	163	205	213	212	59	2	71	192	203	191	2	4.26	43.56	93.66	95.31	90.09	3.39
2002	57	134	246	214	214	78	2	66	232	188	201	1	3.51	49.25	94.31	87.85	93.93	1.28
2003	35	125	274	233	238	69	1	52	259	205	213	0	2.86	41.6	94.53	87.98	89.5	0
2004	44	194	367	338	240	60	2	84	330	297	214	0	4.55	43.3	89.92	87.87	89.17	0
2005	39	143	395	226	148	33	1	51	353	204	132	5	2.56	35.66	89.37	90.27	89.19	15.15
2006	15	120	269	194	163	33	0	49	246	176	152	0	0	40.83	91.45	90.72	93.25	0
2007	17	107	269	213	134	35	1	66	255	195	128	1	5.88	61.68	94.8	91.55	95.52	2.86
2008	25	102	187	132	121	19	3	43	169	124	112	0	12	42.16	90.37	93.94	92.56	0
2009	13	52	205	176	54	20	0	0	141	146	0	0	0	0	68.78	82.95	0	0
2010	3	48	176	84	114	58	0	0	115	45	71	43	0	0	65.34	53.57	62.28	74.14
2011	7	65	242	179	125	26	0	0	183	76	0	0	0	0	75.62	42.46	0	0

Table 18: The total trips, positive trips, and percentage of positive trips by state for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Mississippi Total	Alabama Total	Florida Total	Mississippi Positive	Alabama Positive	Florida Positive	Mississippi Proport. Positive	Alabama Proport. Positive	Florida Proport. Positive
1981	0	18	29	0	16	17		88.89	58.62
1982	4	15	32	4	13	28	100	86.67	87.5
1983	1	46	17	1	46	11	100	100	64.71
1984	1	33	9	1	31	9	100	93.94	100
1985	1	52	12	1	52	6	100	100	50
1986	6	24	30	6	22	23	100	91.67	76.67
1987	3	59	162	3	50	113	100	84.75	69.75
1988	11	39	100	11	38	53	100	97.44	53
1989	9	49	73	7	40	31	77.78	81.63	42.47
1990	3	59	48	3	46	22	100	77.97	45.83
1991	14	139	41	14	118	17	100	84.89	41.46
1992	74	225	100	72	204	52	97.3	90.67	52
1993	26	121	113	26	112	75	100	92.56	66.37
1994	21	110	74	21	102	39	100	92.73	52.7
1995	12	107	44	11	96	18	91.67	89.72	40.91
1996	17	113	52	17	103	29	100	91.15	55.77
1997	27	140	213	27	134	171	100	95.71	80.28
1998	18	180	387	18	141	290	100	78.33	74.94
1999	33	336	644	32	306	499	96.97	91.07	77.48
2000	13	291	743	11	229	625	84.62	78.69	84.12
2001	11	261	627	10	213	438	90.91	81.61	69.86
2002	21	289	633	20	206	464	95.24	71.28	73.3
2003	14	228	732	14	182	534	100	79.82	72.95
2004	6	214	1023	5	168	754	83.33	78.5	73.7
2005	1	172	811	1	136	609	100	79.07	75.09
2006	5	116	673	4	98	521	80	84.48	77.41
2007	3	120	652	2	103	541	66.67	85.83	82.98
2008	3	84	499	3	68	380	100	80.95	76.15
2009	9	114	397	8	82	197	88.89	71.93	49.62
2010	1	66	416	1	37	236	100	56.06	56.73
2011	1	125	518	1	86	172	100	68.8	33.2

Table 19: The total trips, positive trips and percentage of positive trips by location from shore (MRFSS area) for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Less Than 3 Miles	Greater Than 3 Miles	Less Than 10 Miles	Greater Than 10 Miles	Less Than 3 Miles Positive	Greater Than 3 Miles Positive	Less Than 10 Miles Positive	Greater Than 10 Miles Positive	Less Than 3 Miles Proport. Positive	Greater Than 3 Miles Proport. Positive	Less Than 10 Miles Proport. Positive	Greater Than 10 Miles Proport. Positive
1981	8	10	20	9	7	9	11	6	87.5	90	55	66.67
1982	10	9	18	14	9	8	17	11	90	88.89	94.44	78.57
1983	9	38	5	12	9	38	3	8	100	100	60	66.67
1984	7	27	3	6	7	25	3	6	100	92.59	100	100
1985	0	53	6	6	0	53	1	5		100	16.67	83.33
1986	1	29	10	20	1	27	9	14	100	93.1	90	70
1987	6	56	51	111	6	47	29	84	100	83.93	56.86	75.68
1988	7	43	28	72	7	42	13	40	100	97.67	46.43	55.56
1989	3	55	30	43	2	45	11	20	66.67	81.82	36.67	46.51
1990	6	56	18	30	5	44	8	14	83.33	78.57	44.44	46.67
1991	6	147	23	18	6	126	12	5	100	85.71	52.17	27.78
1992	10	289	35	65	8	268	19	33	80	92.73	54.29	50.77
1993	3	144	38	75	3	135	24	51	100	93.75	63.16	68
1994	5	126	32	42	4	119	13	26	80	94.44	40.62	61.9
1995	4	115	21	23	3	104	12	6	75	90.43	57.14	26.09
1996	1	129	23	29	0	120	10	19	0	93.02	43.48	65.52
1997	13	154	82	131	13	148	64	107	100	96.1	78.05	81.68
1998	22	176	140	247	18	141	93	197	81.82	80.11	66.43	79.76
1999	16	353	292	352	15	323	234	265	93.75	91.5	80.14	75.28
2000	4	300	259	484	3	237	225	400	75	79	86.87	82.64
2001	4	268	212	415	3	220	155	283	75	82.09	73.11	68.19
2002	5	305	190	443	3	223	136	328	60	73.11	71.58	74.04
2003	8	234	206	526	4	192	162	372	50	82.05	78.64	70.72
2004	7	213	288	735	4	169	229	525	57.14	79.34	79.51	71.43
2005	6	167	218	593	5	132	170	439	83.33	79.04	77.98	74.03
2006	5	116	165	508	5	97	136	385	100	83.62	82.42	75.79
2007	12	111	300	352	8	97	264	277	66.67	87.39	88	78.69
2008	6	81	248	251	6	65	227	153	100	80.25	91.53	60.96
2009	5	118	128	269	2	88	66	131	40	74.58	51.56	48.7
2010	1	66	222	194	0	38	152	84	0	57.58	68.47	43.3
2011	7	119	163	355	4	83	73	99	57.14	69.75	44.79	27.89

Table 20; The total trips, positive trips, and percentage of positive trips by fishing mode for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Charter	Private	Charter Positive	Private Positive	Charter Proport. Positive	Private Proport. Positive
1981	21	26	14	19	66.67	73.08
1982	23	28	20	25	86.96	89.29
1983	51	13	46	12	90.2	92.31
1984	33	10	32	9	96.97	90
1985	54	11	51	8	94.44	72.73
1986	46	14	39	12	84.78	85.71
1987	134	90	104	62	77.61	68.89
1988	120	30	85	17	70.83	56.67
1989	101	30	68	10	67.33	33.33
1990	73	37	45	26	61.64	70.27
1991	142	52	106	43	74.65	82.69
1992	261	138	228	100	87.36	72.46
1993	170	90	148	65	87.06	72.22
1994	134	71	111	51	82.84	71.83
1995	83	80	64	61	77.11	76.25
1996	102	80	86	63	84.31	78.75
1997	290	90	261	71	90	78.89
1998	496	89	398	51	80.24	57.3
1999	786	227	662	175	84.22	77.09
2000	917	130	752	113	82.01	86.92
2001	700	199	523	138	74.71	69.35
2002	740	203	554	136	74.86	67
2003	773	201	587	143	75.94	71.14
2004	1024	219	772	155	75.39	70.78
2005	836	148	643	103	76.91	69.59
2006	651	143	514	109	78.96	76.22
2007	619	156	534	112	86.27	71.79
2008	452	134	348	103	76.99	76.87
2009	369	151	178	109	48.24	72.19
2010	354	129	191	83	53.95	64.34
2011	487	157	140	119	28.75	75.8

Table 21: The total trips, positive trips, and percentage of positive trips by open and closed red snapper fishing season for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proport. Positive	Open Proport. Positive
1981	0	47	0	33		70.21
1982	0	51	0	45		88.24
1983	0	64	0	58		90.62
1984	0	43	0	41		95.35
1985	0	65	0	59		90.77
1986	0	60	0	51		85
1987	0	224	0	166		74.11
1988	0	150	0	102		68
1989	0	131	0	78		59.54
1990	0	110	0	71		64.55
1991	0	194	0	149		76.8
1992	0	399	0	328		82.21
1993	0	260	0	213		81.92
1994	0	205	0	162		79.02
1995	0	163	0	125		76.69
1996	0	182	0	149		81.87
1997	26	354	19	313	73.08	88.42
1998	156	429	62	387	39.74	90.21
1999	231	782	136	701	58.87	89.64
2000	176	871	38	827	21.59	94.95
2001	213	686	20	641	9.39	93.44
2002	210	733	14	676	6.67	92.22
2003	184	790	10	720	5.43	91.14
2004	252	991	46	881	18.25	88.9
2005	186	798	30	716	16.13	89.72
2006	136	658	19	604	13.97	91.79
2007	128	647	40	606	31.25	93.66
2008	389	197	261	190	67.1	96.45
2009	221	299	0	287	0	95.99
2010	242	241	46	228	19.01	94.61
2011	380	264	1	258	0.26	97.73

Table 22: The total trips, positive trips, and percentage of positive trips by year for an all trips dataset and Stephens and MacCall selected trips dataset, as well as the percentage of trips retained by the Stephens and MacCall trip selection procedure for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Total Trips	Positive Trips	Total Proport. Positive	Total Trips Subset	Positive Trips Subset	Proport. Positive Trips Subset	Percent of Trips Retained
1981	100	7	7	30	7	23.33	30
1982	184	34	18.48	47	34	72.34	25.54
1983	520	178	34.23	238	178	74.79	45.77
1984	666	127	19.07	180	127	70.56	27.03
1985	785	104	13.25	190	104	54.74	24.2
1986	1261	134	10.63	194	134	69.07	15.38
1987	812	122	15.02	164	122	74.39	20.2
1988	637	112	17.58	171	112	65.5	26.84
1989	498	95	19.08	137	95	69.34	27.51
1990	655	120	18.32	186	120	64.52	28.4
1991	761	147	19.32	186	147	79.03	24.44
1992	1015	213	20.99	295	213	72.2	29.06
1993	718	218	30.36	278	218	78.42	38.72
1994	789	273	34.6	328	273	83.23	41.57
1995	1117	429	38.41	498	429	86.14	44.58
1996	951	387	40.69	462	387	83.77	48.58
1997	1242	379	30.52	449	379	84.41	36.15
1998	896	327	36.5	417	327	78.42	46.54
1999	994	233	23.44	336	233	69.35	33.8
2000	801	285	35.58	376	285	75.8	46.94
2001	690	238	34.49	326	238	73.01	47.25
2002	812	266	32.76	371	266	71.7	45.69
2003	762	280	36.75	389	280	71.98	51.05
2004	862	275	31.9	388	275	70.88	45.01
2005	749	289	38.58	381	289	75.85	50.87
2006	1185	425	35.86	549	425	77.41	46.33
2007	832	318	38.22	406	318	78.33	48.8
2008	670	223	33.28	320	223	69.69	47.76
2009	710	237	33.38	328	237	72.26	46.2
2010	399	141	35.34	188	141	75	47.12
2011	631	197	31.22	281	197	70.11	44.53

Table 23: The total trips, positive trips, and percentage of positive trips by mode (two month period) for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	TOTAL TRIPS						POSITIVE TRIPS						PROPORTION POSITIVE TRIPS					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1981	0	8	24	43	23	2	0	2	0	3	2	0	0	25	0	6.98	8.7	0
1982	0	8	20	88	42	26	0	5	4	15	7	3	0	62.5	20	17.05	16.67	11.54
1983	5	17	185	225	74	14	2	10	77	52	29	8	40	58.82	41.62	23.11	39.19	57.14
1984	18	25	140	354	103	26	9	6	26	55	21	10	50	24	18.57	15.54	20.39	38.46
1985	3	32	243	387	65	55	1	7	36	42	8	10	33.33	21.88	14.81	10.85	12.31	18.18
1986	30	48	325	476	223	159	5	15	40	48	19	7	16.67	31.25	12.31	10.08	8.52	4.4
1987	29	57	220	351	124	31	8	14	26	48	19	7	27.59	24.56	11.82	13.68	15.32	22.58
1988	7	17	148	361	78	26	4	1	27	50	25	5	57.14	5.88	18.24	13.85	32.05	19.23
1989	3	40	99	255	87	14	2	8	20	48	13	4	66.67	20	20.2	18.82	14.94	28.57
1990	8	43	119	302	133	50	2	6	12	59	32	9	25	13.95	10.08	19.54	24.06	18
1991	20	34	133	448	103	23	0	11	27	70	28	11	0	32.35	20.3	15.62	27.18	47.83
1992	32	119	196	469	162	37	15	19	28	107	34	10	46.88	15.97	14.29	22.81	20.99	27.03
1993	29	42	114	387	115	31	17	10	36	119	29	7	58.62	23.81	31.58	30.75	25.22	22.58
1994	33	37	189	355	139	36	13	18	58	118	53	13	39.39	48.65	30.69	33.24	38.13	36.11
1995	32	26	193	610	205	51	26	16	77	229	67	14	81.25	61.54	39.9	37.54	32.68	27.45
1996	17	23	211	478	174	48	10	6	74	201	73	23	58.82	26.09	35.07	42.05	41.95	47.92
1997	28	70	316	609	202	17	10	33	74	168	84	10	35.71	47.14	23.42	27.59	41.58	58.82
1998	44	16	102	589	125	20	16	11	44	202	54	0	36.36	68.75	43.14	34.3	43.2	0
1999	32	46	204	594	97	21	19	27	50	113	23	1	59.38	58.7	24.51	19.02	23.71	4.76
2000	17	53	99	540	91	1	0	27	48	178	32	0	0	50.94	48.48	32.96	35.16	0
2001	9	32	232	321	73	23	4	4	83	102	36	9	44.44	12.5	35.78	31.78	49.32	39.13
2002	38	635	53	66	16	4	0	232	15	10	9	0	0	36.54	28.3	15.15	56.25	0
2003	23	647	34	36	20	2	0	246	17	14	3	0	0	38.02	50	38.89	15	0
2004	15	701	49	74	18	5	0	238	11	19	7	0	0	33.95	22.45	25.68	38.89	0
2005	14	646	27	52	9	1	0	262	10	14	3	0	0	40.56	37.04	26.92	33.33	0
2006	31	971	57	99	25	2	0	372	23	18	12	0	0	38.31	40.35	18.18	48	0
2007	20	665	44	80	13	10	0	270	19	23	6	0	0	40.6	43.18	28.75	46.15	0
2008	10	390	189	67	13	1	0	130	77	16	0	0	0	33.33	40.74	23.88	0	0
2009	3	3	655	45	4	0	0	0	217	20	0	0	0	0	33.13	44.44	0	0
2010	5	7	375	6	4	2	0	0	138	2	0	1	0	0	36.8	33.33	0	50
2011	1	8	558	42	18	4	0	0	189	8	0	0	0	0	33.87	19.05	0	0

Table 24: The total trips, positive trips, and percentage of positive trips by state for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Texas Total	Louisiana Total	Texas Positive	Louisiana Positive	Texas Proport. Positive	Louisiana Proport. Positive
1981	38	62	0	7	0	11.29
1982	0	184	0	34		18.48
1983	322	198	76	102	23.6	51.52
1984	478	188	85	42	17.78	22.34
1985	658	127	95	9	14.44	7.09
1986	404	857	76	58	18.81	6.77
1987	467	345	93	29	19.91	8.41
1988	403	234	97	15	24.07	6.41
1989	301	197	73	22	24.25	11.17
1990	413	242	93	27	22.52	11.16
1991	468	293	109	38	23.29	12.97
1992	547	468	153	60	27.97	12.82
1993	473	245	178	40	37.63	16.33
1994	588	201	230	43	39.12	21.39
1995	883	234	397	32	44.96	13.68
1996	763	188	355	32	46.53	17.02
1997	895	347	333	46	37.21	13.26
1998	732	164	293	34	40.03	20.73
1999	791	203	198	35	25.03	17.24
2000	629	172	250	35	39.75	20.35
2001	561	129	223	15	39.75	11.63
2002	606	206	232	34	38.28	16.5
2003	631	131	244	36	38.67	27.48
2004	671	191	235	40	35.02	20.94
2005	629	120	259	30	41.18	25
2006	943	242	365	60	38.71	24.79
2007	640	192	260	58	40.62	30.21
2008	541	129	196	27	36.23	20.93
2009	624	86	209	28	33.49	32.56
2010	366	33	137	4	37.43	12.12
2011	548	83	187	10	34.12	12.05

Table 25: The total trips, positive trips, and percentage of positive trips by location from shore (MRFSS area) for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Less Than 3 Miles	Greater Than 3 Miles	Less Than 10 Miles	Greater Than 10 Miles	Less Than 3 Miles Positive	Greater Than 3 Miles Positive	Less Than 10 Miles Positive	Greater Than 10 Miles Positive	Less Than 3 Miles Proport. Positive	Greater Than 3 Miles Proport. Positive	Less Than 10 Miles Proport. Positive	Greater Than 10 Miles Proport. Positive
1981	18	44	35	3	0	7	0	0	0	15.91	0	0
1982	103	81	0	0	5	29	0	0	4.85	35.8		
1983	50	148	167	155	5	97	26	50	10	65.54	15.57	32.26
1984	110	78	225	253	9	33	22	63	8.18	42.31	9.78	24.9
1985	97	30	350	308	1	8	24	71	1.03	26.67	6.86	23.05
1986	661	196	167	237	5	53	16	60	0.76	27.04	9.58	25.32
1987	263	82	240	227	2	27	20	73	0.76	32.93	8.33	32.16
1988	144	90	250	153	0	15	35	62	0	16.67	14	40.52
1989	130	67	151	150	0	22	23	50	0	32.84	15.23	33.33
1990	169	73	176	237	2	25	36	57	1.18	34.25	20.45	24.05
1991	227	66	231	237	2	36	42	67	0.88	54.55	18.18	28.27
1992	315	153	325	222	7	53	45	108	2.22	34.64	13.85	48.65
1993	147	98	248	225	1	39	55	123	0.68	39.8	22.18	54.67
1994	113	88	322	266	8	35	61	169	7.08	39.77	18.94	63.53
1995	179	55	424	459	2	30	98	299	1.12	54.55	23.11	65.14
1996	129	59	315	448	1	31	63	292	0.78	52.54	20	65.18
1997	246	101	445	450	5	41	67	266	2.03	40.59	15.06	59.11
1998	92	72	282	450	5	29	25	268	5.43	40.28	8.87	59.56
1999	105	98	396	395	3	32	52	146	2.86	32.65	13.13	36.96
2000	93	79	267	362	7	28	47	203	7.53	35.44	17.6	56.08
2001	55	74	260	301	3	12	39	184	5.45	16.22	15	61.13
2002	91	115	278	328	1	33	42	190	1.1	28.7	15.11	57.93
2003	41	90	292	339	0	36	44	200	0	40	15.07	59
2004	84	107	340	331	0	40	52	183	0	37.38	15.29	55.29
2005	36	84	332	297	0	30	84	175	0	35.71	25.3	58.92
2006	81	161	530	413	2	58	111	254	2.47	36.02	20.94	61.5
2007	64	128	387	253	1	57	96	164	1.56	44.53	24.81	64.82
2008	65	64	333	208	2	25	86	110	3.08	39.06	25.83	52.88
2009	36	50	368	256	3	25	79	130	8.33	50	21.47	50.78
2010	22	11	197	169	0	4	58	79	0	36.36	29.44	46.75
2011	36	47	341	207	0	10	82	105	0	21.28	24.05	50.72

Table 26: The total trips, positive trips, and percentage of positive trips by fishing mode for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Charter	Private	Charter Positive	Private Positive	Charter Proport. Positive	Private Proport. Positive
1981	24	76	3	4	12.5	5.26
1982	17	167	3	31	17.65	18.56
1983	156	364	80	98	51.28	26.92
1984	68	598	31	96	45.59	16.05
1985	54	731	8	96	14.81	13.13
1986	152	1109	40	94	26.32	8.48
1987	121	691	32	90	26.45	13.02
1988	56	581	8	104	14.29	17.9
1989	49	449	9	86	18.37	19.15
1990	117	538	23	97	19.66	18.03
1991	85	676	39	108	45.88	15.98
1992	121	894	54	159	44.63	17.79
1993	72	646	26	192	36.11	29.72
1994	73	716	31	242	42.47	33.8
1995	59	1058	25	404	42.37	38.19
1996	80	871	33	354	41.25	40.64
1997	144	1098	40	339	27.78	30.87
1998	116	780	42	285	36.21	36.54
1999	104	890	26	207	25	23.26
2000	101	700	37	248	36.63	35.43
2001	112	578	31	207	27.68	35.81
2002	162	650	55	211	33.95	32.46
2003	124	638	60	220	48.39	34.48
2004	142	720	59	216	41.55	30
2005	112	637	51	238	45.54	37.36
2006	201	984	84	341	41.79	34.65
2007	154	678	82	236	53.25	34.81
2008	94	576	40	183	42.55	31.77
2009	83	627	36	201	43.37	32.06
2010	40	359	15	126	37.5	35.1
2011	89	542	16	181	17.98	33.39

Table 27: The total trips, positive trips, and percentage of positive trips by open and closed red snapper fishing season for all of the data (not trip selected) for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proport. Positive	Open Proport. Positive
1981	0	100	0	7		7
1982	0	184	0	34		18.48
1983	0	520	0	178		34.23
1984	0	666	0	127		19.07
1985	0	785	0	104		13.25
1986	0	1261	0	134		10.63
1987	0	812	0	122		15.02
1988	0	637	0	112		17.58
1989	0	498	0	95		19.08
1990	0	655	0	120		18.32
1991	0	761	0	147		19.32
1992	0	1015	0	213		20.99
1993	0	718	0	218		30.36
1994	0	789	0	273		34.6
1995	0	1117	0	429		38.41
1996	0	951	0	387		40.69
1997	1	1241	0	379	0	30.54
1998	32	864	0	327	0	37.85
1999	36	958	0	233	0	24.32
2000	287	514	113	172	39.37	33.46
2001	590	100	223	15	37.8	15
2002	677	135	232	34	34.27	25.19
2003	669	93	244	36	36.47	38.71
2004	535	327	174	101	32.52	30.89
2005	28	721	0	289	0	40.08
2006	53	1132	0	425	0	37.54
2007	47	785	3	315	6.38	40.13
2008	605	65	196	27	32.4	41.54
2009	650	60	209	28	32.15	46.67
2010	388	11	138	3	35.57	27.27
2011	605	26	187	10	30.91	38.46

Table 28: The total trips, positive trips and percentage of positive trips by mode (two month period) for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	TOTAL TRIPS						POSITIVE TRIPS						PROPORTION POSITIVE TRIPS					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1981	0	6	6	14	4	0	0	2	0	3	2	0	0	33.33	0	21.43	50	0
1982	0	5	6	22	8	6	0	5	4	15	7	3	0	100	66.67	68.18	87.5	50
1983	2	11	106	76	33	10	2	10	77	52	29	8	100	90.91	72.64	68.42	87.88	80
1984	11	7	43	83	26	10	9	6	26	55	21	10	81.82	85.71	60.47	66.27	80.77	100
1985	1	12	68	82	15	12	1	7	36	42	8	10	100	58.33	52.94	51.22	53.33	83.33
1986	11	16	63	71	24	9	5	15	40	48	19	7	45.45	93.75	63.49	67.61	79.17	77.78
1987	12	14	41	69	21	7	8	14	26	48	19	7	66.67	100	63.41	69.57	90.48	100
1988	4	4	47	81	29	6	4	1	27	50	25	5	100	25	57.45	61.73	86.21	83.33
1989	2	14	30	65	20	6	2	8	20	48	13	4	100	57.14	66.67	73.85	65	66.67
1990	3	8	26	88	51	10	2	6	12	59	32	9	66.67	75	46.15	67.05	62.75	90
1991	1	12	35	91	33	14	0	11	27	70	28	11	0	91.67	77.14	76.92	84.85	78.57
1992	16	30	52	133	54	10	15	19	28	107	34	10	93.75	63.33	53.85	80.45	62.96	100
1993	18	20	48	142	40	10	17	10	36	119	29	7	94.44	50	75	83.8	72.5	70
1994	13	19	77	138	67	14	13	18	58	118	53	13	100	94.74	75.32	85.51	79.1	92.86
1995	26	22	94	262	78	16	26	16	77	229	67	14	100	72.73	81.91	87.4	85.9	87.5
1996	12	6	90	233	98	23	10	6	74	201	73	23	83.33	100	82.22	86.27	74.49	100
1997	12	36	92	199	99	11	10	33	74	168	84	10	83.33	91.67	80.43	84.42	84.85	90.91
1998	25	12	49	241	78	12	16	11	44	202	54	0	64	91.67	89.8	83.82	69.23	0
1999	25	29	69	162	41	10	19	27	50	113	23	1	76	93.1	72.46	69.75	56.1	10
2000	6	37	58	234	41	0	0	27	48	178	32	0	0	72.97	82.76	76.07	78.05	0
2001	7	22	103	129	49	16	4	4	83	102	36	9	57.14	18.18	80.58	79.07	73.47	56.25
2002	32	20	106	153	48	12	2	5	84	125	42	8	6.25	25	79.25	81.7	87.5	66.67
2003	26	22	112	161	66	2	5	16	83	125	51	0	19.23	72.73	74.11	77.64	77.27	0
2004	14	28	117	158	61	10	1	11	84	117	56	6	7.14	39.29	71.79	74.05	91.8	60
2005	14	16	77	209	52	13	3	9	64	160	44	9	21.43	56.25	83.12	76.56	84.62	69.23
2006	30	45	168	204	93	9	2	28	149	159	80	7	6.67	62.22	88.69	77.94	86.02	77.78
2007	22	25	103	182	67	7	2	15	85	150	59	7	9.09	60	82.52	82.42	88.06	100
2008	13	7	62	195	34	9	4	6	45	143	19	6	30.77	85.71	72.58	73.33	55.88	66.67
2009	4	9	78	199	30	8	1	7	66	144	13	6	25	77.78	84.62	72.36	43.33	75
2010	5	10	65	65	40	3	1	7	53	41	37	2	20	70	81.54	63.08	92.5	66.67
2011	8	14	91	135	26	7	8	9	76	92	10	2	100	64.29	83.52	68.15	38.46	28.57

Table 29: The total trips, positive trips, and percentage of positive trips by state for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Texas Total	Louisiana Total	Texas Positive	Louisiana Positive	Texas Proport. Positive	Louisiana Proport. Positive
1981	7	23	0	7	0	30.43
1982	0	47	0	34		72.34
1983	124	114	76	102	61.29	89.47
1984	124	56	85	42	68.55	75
1985	171	19	95	9	55.56	47.37
1986	107	87	76	58	71.03	66.67
1987	127	37	93	29	73.23	78.38
1988	149	22	97	15	65.1	68.18
1989	99	38	73	22	73.74	57.89
1990	142	44	93	27	65.49	61.36
1991	138	48	109	38	78.99	79.17
1992	205	90	153	60	74.63	66.67
1993	207	71	178	40	85.99	56.34
1994	262	66	230	43	87.79	65.15
1995	451	47	397	32	88.03	68.09
1996	416	46	355	32	85.34	69.57
1997	384	65	333	46	86.72	70.77
1998	351	66	293	34	83.48	51.52
1999	259	77	198	35	76.45	45.45
2000	314	62	250	35	79.62	56.45
2001	268	58	223	15	83.21	25.86
2002	278	93	232	34	83.45	36.56
2003	309	80	244	36	78.96	45
2004	293	95	235	40	80.2	42.11
2005	312	69	259	30	83.01	43.48
2006	418	131	365	60	87.32	45.8
2007	312	94	260	58	83.33	61.7
2008	268	52	196	27	73.13	51.92
2009	290	38	209	28	72.07	73.68
2010	176	12	137	4	77.84	33.33
2011	243	38	187	10	76.95	26.32

Table 30: The total trips, positive trips and percentage of positive trips by location from shore (MRFSS area) for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Less Than 3 Miles	Greater Than 3 Miles	Less Than 10 Miles	Greater Than 10 Miles	Less Than 3 Miles Positive	Greater Than 3 Miles Positive	Less Than 10 Miles Positive	Greater Than 10 Miles Positive	Less Than 3 Miles Proport. Positive	Greater Than 3 Miles Proport. Positive	Less Than 10 Miles Proport. Positive	Greater Than 10 Miles Proport. Positive
1981	1	22	7	0	0	7	0	0	0	31.82	0	
1982	10	37	0	0	5	29	0	0	50	78.38		
1983	8	106	51	73	5	97	26	50	62.5	91.51	50.98	68.49
1984	14	42	44	80	9	33	22	63	64.29	78.57	50	78.75
1985	8	11	65	106	1	8	24	71	12.5	72.73	36.92	66.98
1986	25	62	22	85	5	53	16	60	20	85.48	72.73	70.59
1987	8	29	29	98	2	27	20	73	25	93.1	68.97	74.49
1988	1	21	68	81	0	15	35	62	0	71.43	51.47	76.54
1989	5	33	29	70	0	22	23	50	0	66.67	79.31	71.43
1990	7	37	59	83	2	25	36	57	28.57	67.57	61.02	68.67
1991	8	40	58	80	2	36	42	67	25	90	72.41	83.75
1992	16	74	70	135	7	53	45	108	43.75	71.62	64.29	80
1993	9	62	70	137	1	39	55	123	11.11	62.9	78.57	89.78
1994	15	51	78	184	8	35	61	169	53.33	68.63	78.21	91.85
1995	7	40	126	325	2	30	98	299	28.57	75	77.78	92
1996	3	43	88	328	1	31	63	292	33.33	72.09	71.59	89.02
1997	14	51	87	297	5	41	67	266	35.71	80.39	77.01	89.56
1998	13	53	39	312	5	29	25	268	38.46	54.72	64.1	85.9
1999	8	69	69	190	3	32	52	146	37.5	46.38	75.36	76.84
2000	8	54	69	245	7	28	47	203	87.5	51.85	68.12	82.86
2001	6	52	54	214	3	12	39	184	50	23.08	72.22	85.98
2002	4	89	60	218	1	33	42	190	25	37.08	70	87.16
2003	2	78	76	233	0	36	44	200	0	46.15	57.89	85.84
2004	5	90	67	226	0	40	52	183	0	44.44	77.61	80.97
2005	0	69	108	204	0	30	84	175		43.48	77.78	85.78
2006	3	128	139	279	2	58	111	254	66.67	45.31	79.86	91.04
2007	1	93	125	187	1	57	96	164	100	61.29	76.8	87.7
2008	3	49	125	143	2	25	86	110	66.67	51.02	68.8	76.92
2009	4	34	121	169	3	25	79	130	75	73.53	65.29	76.92
2010	3	9	66	110	0	4	58	79	0	44.44	87.88	71.82
2011	1	37	111	132	0	10	82	105	0	27.03	73.87	79.55

Table 31; The total trips, positive trips, and percentage of positive trips by fishing mode for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Charter	Private	Charter Positive	Private Positive	Charter Proport. Positive	Private Proport. Positive
1981	18	12	3	4	16.67	33.33
1982	3	44	3	31	100	70.45
1983	90	148	80	98	88.89	66.22
1984	42	138	31	96	73.81	69.57
1985	9	181	8	96	88.89	53.04
1986	47	147	40	94	85.11	63.95
1987	33	131	32	90	96.97	68.7
1988	11	160	8	104	72.73	65
1989	9	128	9	86	100	67.19
1990	28	158	23	97	82.14	61.39
1991	41	145	39	108	95.12	74.48
1992	56	239	54	159	96.43	66.53
1993	38	240	26	192	68.42	80
1994	39	289	31	242	79.49	83.74
1995	29	469	25	404	86.21	86.14
1996	40	422	33	354	82.5	83.89
1997	45	404	40	339	88.89	83.91
1998	65	352	42	285	64.62	80.97
1999	44	292	26	207	59.09	70.89
2000	58	318	37	248	63.79	77.99
2001	63	263	31	207	49.21	78.71
2002	105	266	55	211	52.38	79.32
2003	101	288	60	220	59.41	76.39
2004	96	292	59	216	61.46	73.97
2005	77	304	51	238	66.23	78.29
2006	137	412	84	341	61.31	82.77
2007	115	291	82	236	71.3	81.1
2008	63	257	40	183	63.49	71.21
2009	41	287	36	201	87.8	70.03
2010	25	163	15	126	60	77.3
2011	36	245	16	181	44.44	73.88

Table 32: The total trips, positive trips, and percentage of positive trips by open and closed red snapper fishing season for Stephens and MacCall (2004) selected trips, for the private/for hire sector of the recreational fishery in the western Gulf of Mexico.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proport. Positive	Open Proport. Positive
1981	0	30	0	7		23.33
1982	0	47	0	34		72.34
1983	0	238	0	178		74.79
1984	0	180	0	127		70.56
1985	0	190	0	104		54.74
1986	0	194	0	134		69.07
1987	0	164	0	122		74.39
1988	0	171	0	112		65.5
1989	0	137	0	95		69.34
1990	0	186	0	120		64.52
1991	0	186	0	147		79.03
1992	0	295	0	213		72.2
1993	0	278	0	218		78.42
1994	0	328	0	273		83.23
1995	0	498	0	429		86.14
1996	0	462	0	387		83.77
1997	1	448	1	378	100	84.38
1998	31	386	1	326	3.23	84.46
1999	61	275	31	202	50.82	73.45
2000	18	358	3	282	16.67	78.77
2001	40	286	14	224	35	78.32
2002	60	311	11	255	18.33	81.99
2003	37	352	10	270	27.03	76.7
2004	49	339	15	260	30.61	76.7
2005	39	342	18	271	46.15	79.24
2006	60	489	15	410	25	83.84
2007	45	361	15	303	33.33	83.93
2008	131	189	75	148	57.25	78.31
2009	89	239	46	191	51.69	79.92
2010	71	117	38	103	53.52	88.03
2011	121	160	58	139	47.93	86.88

Table 33: The total trips, positive trips, and percentage of positive trips by year for an all trips dataset and Stephens and MacCall selected trips dataset, as well as the percentage of trips retained by the Stephens and MacCall trip selection procedure for the headboat sector of the recreational fishery in the eastern Gulf of Mexico.

Year	Total Trips	Positive Trips	Total Proport. Positive	Total Trips Subset	Positive Trips Subset	Proport. Positive Trips Subset	Percent of Trips Retained
1986	2833	275	9.71	435	275	63.22	15.35
1987	2639	407	15.42	618	407	65.86	23.42
1988	4144	965	23.29	1302	965	74.12	31.42
1989	4856	873	17.98	1241	873	70.35	25.56
1990	8254	1103	13.36	1691	1103	65.23	20.49
1991	7262	1118	15.4	1761	1118	63.49	24.25
1992	7627	1366	17.91	1985	1366	68.82	26.03
1993	7977	1685	21.12	2204	1685	76.45	27.63
1994	7419	1431	19.29	2062	1431	69.4	27.79
1995	5911	1469	24.85	2116	1469	69.42	35.8
1996	5747	1699	29.56	2027	1699	83.82	35.27
1997	5667	2114	37.3	2310	2114	91.52	40.76
1998	4910	2127	43.32	2321	2127	91.64	47.27
1999	4478	1807	40.35	2129	1807	84.88	47.54
2000	4412	1622	36.76	2074	1622	78.21	47.01
2001	4238	1570	37.05	2093	1570	75.01	49.39
2002	4218	1742	41.3	2192	1742	79.47	51.97
2003	4346	1708	39.3	2161	1708	79.04	49.72
2004	4797	1524	31.77	1992	1524	76.51	41.53
2005	4540	1363	30.02	1725	1363	79.01	38
2006	3711	1334	35.95	1676	1334	79.59	45.16
2007	4260	1399	32.84	1657	1399	84.43	38.9
2008	5741	1679	29.25	2388	1679	70.31	41.6
2009	6566	1638	24.95	2808	1638	58.33	42.77
2010	5071	689	13.59	1632	689	42.22	32.18
2011	6565	1149	17.5	2804	1149	40.98	42.71

Table 34: The total trips by month for an all trips dataset for the headboat sector of the recreational fishery in the eastern Gulf of Mexico.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	203	191	263	234	157	345	430	246	180	193	196	195
1987	144	175	205	291	354	330	351	250	139	114	132	154
1988	147	172	301	418	539	568	633	502	186	264	182	232
1989	300	347	408	491	506	506	551	552	359	372	253	211
1990	459	499	763	806	715	892	927	891	638	592	557	515
1991	529	557	609	676	584	804	861	709	548	515	422	448
1992	455	489	737	731	756	780	973	760	531	534	402	479
1993	561	535	658	722	724	895	1060	823	593	563	443	400
1994	359	533	741	796	779	801	870	786	497	472	412	373
1995	308	373	606	705	645	754	852	603	427	200	250	188
1996	185	286	344	539	557	731	843	786	514	373	262	327
1997	366	448	561	447	523	658	662	705	461	371	290	175
1998	250	204	443	478	547	634	805	535	246	352	242	174
1999	196	361	428	444	486	545	586	518	269	254	187	204
2000	182	297	389	462	491	584	636	460	276	336	168	131
2001	132	308	339	531	497	525	628	445	272	269	145	147
2002	202	224	377	450	407	547	645	455	221	322	197	171
2003	187	252	367	393	470	545	648	457	281	343	215	188
2004	297	354	600	602	637	682	643	345	109	244	155	129
2005	289	300	393	477	613	630	556	401	210	264	212	195
2006	204	238	432	336	444	485	464	356	209	206	206	131
2007	211	257	463	416	471	638	606	380	189	247	169	213
2008	165	291	460	639	648	859	932	512	231	401	286	317
2009	327	350	544	590	621	980	1089	756	364	386	282	277
2010	225	229	487	651	548	604	528	402	332	511	337	217
2011	228	353	571	611	591	1059	1099	632	382	377	326	336

Table 35: The positive trips by month for an all trips dataset for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	8	12	26	14	28	53	76	34	16	5		
1987	5	6		50	99	62	70	52	30	16	13	
1988			35	139	141	137	155	140	81	117	13	
1989			47	103	111	121	106	151	111	93	20	6
1990	4	11	71	108	135	175	169	163	133	77	40	17
1991	7	24	48	97	108	200	236	150	104	102	28	14
1992	8	21	88	115	135	200	218	170	164	170	33	44
1993	37	33	94	135	205	250	314	187	185	148	63	34
1994	16	40	69	141	173	170	216	204	147	126	84	45
1995	20	27	72	151	188	240	301	250	130	49	30	11
1996	12	32	47	131	218	312	282	274	183	120	43	45
1997	13	36	125	131	222	328	317	400	256	173	78	35
1998	42	61	168	206	292	346	467	270	133	140		
1999	35	115	175	233	282	283	276	230	102	75		
2000				148	273	346	340	207	138	165		
2001				123	295	307	328	227	156	127		
2002				136	261	369	452	266	115	142		
2003				106	266	352	373	264	177	168		
2004				127	344	388	345	170	43	100		
2005			11	111	298	303	236	183	93	126		
2006				72	250	279	310	217	107	93		
2007				93	257	355	339	166	91	95		
2008				86	163	510	556	159	79	122		
2009					15	645	669	298				
2010						287	148			185	55	
2011						700	448					

Table 36: The percent of positive trips by month for an all trips dataset for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	3.94	6.28	9.89	5.98	17.83	15.36	17.67	13.82	8.89	2.59		
1987	3.47	3.43		17.18	27.97	18.79	19.94	20.8	21.58	14.04	9.85	
1988			11.63	33.25	26.16	24.12	24.49	27.89	43.55	44.32	7.14	
1989			11.52	20.98	21.94	23.91	19.24	27.36	30.92	25	7.91	2.84
1990	0.87	2.2	9.31	13.4	18.88	19.62	18.23	18.29	20.85	13.01	7.18	3.3
1991	1.32	4.31	7.88	14.35	18.49	24.88	27.41	21.16	18.98	19.81	6.64	3.12
1992	1.76	4.29	11.94	15.73	17.86	25.64	22.4	22.37	30.89	31.84	8.21	9.19
1993	6.6	6.17	14.29	18.7	28.31	27.93	29.62	22.72	31.2	26.29	14.22	8.5
1994	4.46	7.5	9.31	17.71	22.21	21.22	24.83	25.95	29.58	26.69	20.39	12.06
1995	6.49	7.24	11.88	21.42	29.15	31.83	35.33	41.46	30.44	24.5	12	5.85
1996	6.49	11.19	13.66	24.3	39.14	42.68	33.45	34.86	35.6	32.17	16.41	13.76
1997	3.55	8.04	22.28	29.31	42.45	49.85	47.89	56.74	55.53	46.63	26.9	20
1998	16.8	29.9	37.92	43.1	53.38	54.57	58.01	50.47	54.07	39.77		
1999	17.86	31.86	40.89	52.48	58.02	51.93	47.1	44.4	37.92	29.53		
2000				32.03	55.6	59.25	53.46	45	50	49.11		
2001				23.16	59.36	58.48	52.23	51.01	57.35	47.21		
2002				30.22	64.13	67.46	70.08	58.46	52.04	44.1		
2003				26.97	56.6	64.59	57.56	57.77	62.99	48.98		
2004				21.1	54	56.89	53.65	49.28	39.45	40.98		
2005			2.8	23.27	48.61	48.1	42.45	45.64	44.29	47.73		
2006				21.43	56.31	57.53	66.81	60.96	51.2	45.15		
2007				22.36	54.56	55.64	55.94	43.68	48.15	38.46		
2008				13.46	25.15	59.37	59.66	31.05	34.2	30.42		
2009					2.42	65.82	61.43	39.42				
2010						47.52	28.03			36.2	16.32	
2011						66.1	40.76					

Table 37: All trips, positive trips, and the percent of positive trips by area for an all trips dataset for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

	TOTAL TRIPS				POSITIVE TRIPS			
Year	Dry Tortugas	SW Florida	FL Middle Grouds	NW Florida and Alabama	Dry Tortugas	SW Florida	FL Middle Grouds	NW Florida and Alabama
1986		2337		459			19	232
1987		1866		769				384
1988		2309		1807			6	942
1989		3165		1681				854
1990	25	6112	65	2052			20	1062
1991	13	5192	70	1987			11	1089
1992	10	5336	34	2247	6			1356
1993	24	5225	126	2602			47	1625
1994		4873		2486			14	1406
1995		3257		2653				1468
1996		3203		2544				1689
1997		3010		2630			7	2103
1998		2260		2619			17	2106
1999		2230		2189			41	1725
2000		2046		2319			21	1594
2001		1859		2308			30	1537
2002		1917		2233			28	1713
2003		2113		2187			24	1676
2004		2705		2041			33	1480
2005		2787		1698			53	1277
2006		2021		1657			17	1282
2007		2521		1710			10	1368
2008	15	3357	48	2321			17	1620
2009	25	3812	51	2678	7	55	31	1545
2010	25	3430	28	1588	7	34	17	631
2011	24	3682	48	2811			18	1108

Table 38: The total trips, positive trips, and percent of positive trips by red snapper season for an all trips dataset for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proport. Positive	Open Proport. Positive
1986	0	2833	0	275		9.71
1987	0	2639	0	407		15.42
1988	0	4144	0	965		23.29
1989	0	4856	0	873		17.98
1990	0	8254	0	1103		13.36
1991	0	7262	0	1118		15.4
1992	0	7627	0	1366		17.91
1993	0	7977	0	1685		21.12
1994	0	7419	0	1431		19.29
1995	0	5911	0	1469		24.85
1996	0	5747	0	1699		29.56
1997	212	5455	39	2075	18.4	38.04
1998	770	4140	142	1985	18.44	47.95
1999	942	3536	186	1621	19.75	45.84
2000	1453	2959	53	1569	3.65	53.02
2001	1439	2799	38	1532	2.64	54.73
2002	1449	2769	32	1710	2.21	61.76
2003	1452	2894	30	1678	2.07	57.98
2004	1937	2860	40	1484	2.07	51.89
2005	1687	2853	52	1311	3.08	45.95
2006	1446	2265	27	1307	1.87	57.7
2007	1647	2613	60	1339	3.64	51.24
2008	3839	1902	563	1116	14.67	58.68
2009	4002	2564	27	1611	0.67	62.83
2010	3616	1455	72	617	1.99	42.41
2011	4843	1722				

Table 39: The total trips by month for Stephens and MacCall (2004) selected trips dataset for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	9	15	33	36	44	93	119	53	20	7		
1987	5	6		68	129	101	134	81	51	22	15	
1988		9	53	176	199	196	236	189	92	128	14	
1989		8	67	131	168	179	175	207	154	117	24	
1990	7	20	96	149	197	294	288	262	198	105	55	20
1991	20	37	79	142	168	336	359	251	165	130	42	32
1992	13	28	133	195	215	335	347	265	181	185	41	47
1993	56	52	116	178	253	305	429	285	232	181	76	41
1994	23	50	112	183	235	282	313	323	220	159	103	59
1995	26	40	111	237	277	376	430	325	194	52	33	15
1996	12	34	59	165	255	375	358	316	220	139	45	49
1997	19	38	138	161	256	369	346	421	269	177	80	36
1998	43	62	176	210	297	363	483	289	135	166	54	43
1999	35	117	177	236	286	328	326	292	157	109	33	33
2000	26	48	97	220	288	378	380	249	161	179	35	13
2001	33	50	128	261	315	338	383	244	162	130	31	18
2002	25	48	118	224	268	384	486	296	122	146	49	26
2003	38	48	110	185	283	368	420	290	180	176	37	26
2004	38	45	128	239	353	419	390	183	46	102	34	15
2005	39	52	108	161	304	331	253	191	95	127	44	20
2006	30	44	96	148	256	313	321	225	112	99	18	14
2007	29	49	105	140	259	361	344	172	93	96		
2008	11	29	94	181	315	521	569	273	123	185	41	46
2009	52	51	110	196	267	652	670	417	174	154	39	26
2010	21	43	139	208	199	289	187	102	123	238	65	18
2011	17	41	141	199	273	701	693	320	171	179	40	29

Table 40: The positive trips by month for Stephens and MacCall selected trips (2004) set for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	8	12	26	14	28	53	76	34	16	5		
1987	5	6		50	99	62	70	52	30	16	13	
1988			35	139	141	137	155	140	81	117	13	
1989			47	103	111	121	106	151	111	93	20	6
1990	4	11	71	108	135	175	169	163	133	77	40	17
1991	7	24	48	97	108	200	236	150	104	102	28	14
1992	8	21	88	115	135	200	218	170	164	170	33	44
1993	37	33	94	135	205	250	314	187	185	148	63	34
1994	16	40	69	141	173	170	216	204	147	126	84	45
1995	20	27	72	151	188	240	301	250	130	49	30	11
1996	12	32	47	131	218	312	282	274	183	120	43	45
1997	13	36	125	131	222	328	317	400	256	173	78	35
1998	42	61	168	206	292	346	467	270	133	140		
1999	35	115	175	233	282	283	276	230	102	75		
2000				148	273	346	340	207	138	165		
2001				123	295	307	328	227	156	127		
2002				136	261	369	452	266	115	142		
2003				106	266	352	373	264	177	168		
2004				127	344	388	345	170	43	100		
2005			11	111	298	303	236	183	93	126		
2006				72	250	279	310	217	107	93		
2007				93	257	355	339	166	91	95		
2008				86	163	510	556	159	79	122		
2009					15	645	669	298				
2010						287	148			185	55	
2011						700	448					

Table 41: The percent positive trips by month for Stephens and MacCall (2004) selected trips for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	88.89	80	78.79	38.89	63.64	56.99	63.87	64.15	80	71.43		
1987	100	100		73.53	76.74	61.39	52.24	64.2	58.82	72.73	86.67	
1988			66.04	78.98	70.85	69.9	65.68	74.07	88.04	91.41	92.86	
1989			70.15	78.63	66.07	67.6	60.57	72.95	72.08	79.49	83.33	85.71
1990	57.14	55	73.96	72.48	68.53	59.52	58.68	62.21	67.17	73.33	72.73	85
1991	35	64.86	60.76	68.31	64.29	59.52	65.74	59.76	63.03	78.46	66.67	43.75
1992	61.54	75	66.17	58.97	62.79	59.7	62.82	64.15	90.61	91.89	80.49	93.62
1993	66.07	63.46	81.03	75.84	81.03	81.97	73.19	65.61	79.74	81.77	82.89	82.93
1994	69.57	80	61.61	77.05	73.62	60.28	69.01	63.16	66.82	79.25	81.55	76.27
1995	76.92	67.5	64.86	63.71	67.87	63.83	70	76.92	67.01	94.23	90.91	73.33
1996	100	94.12	79.66	79.39	85.49	83.2	78.77	86.71	83.18	86.33	95.56	91.84
1997	68.42	94.74	90.58	81.37	86.72	88.89	91.62	95.01	95.17	97.74	97.5	97.22
1998	97.67	98.39	95.45	98.1	98.32	95.32	96.69	93.43	98.52	84.34		
1999	100	98.29	98.87	98.73	98.6	86.28	84.66	78.77	64.97	68.81		
2000				67.27	94.79	91.53	89.47	83.13	85.71	92.18		
2001				47.13	93.65	90.83	85.64	93.03	96.3	97.69		
2002				60.71	97.39	96.09	93	89.86	94.26	97.26		
2003				57.3	93.99	95.65	88.81	91.03	98.33	95.45		
2004				53.14	97.45	92.6	88.46	92.9	93.48	98.04		
2005			10.19	68.94	98.03	91.54	93.28	95.81	97.89	99.21		
2006				48.65	97.66	89.14	96.57	96.44	95.54	93.94		
2007				66.43	99.23	98.34	98.55	96.51	97.85	98.96		
2008				47.51	51.75	97.89	97.72	58.24	64.23	65.95		
2009					5.62	98.93	99.85	71.46				
2010						99.31	79.14			77.73	84.62	
2011						99.86	64.65					

Table 42: All trips, positive trips, and the percent of positive trips by area for Stephens and MacCall (2004) selected trips for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	TOTAL TRIPS				POSITIVE TRIPS			
	Dry Tortugas	SW Florida	FL Middle Grouds	NW Florida and Alabama	Dry Tortugas	SW Florida	FL Middle Grouds	NW Florida and Alabama
1986		57		358			19	232
1987		27		588				384
1988		27		1263			6	942
1989		40		1195				854
1990	4	47	55	1585			20	1062
1991	5	55	40	1661			11	1089
1992	6	48	24	1907	6			1356
1993	7	45	89	2063			47	1625
1994			37	2001	0	11	14	1406
1995								
1996		19		2008	0	10	0	1689
1997		18		2283			7	2103
1998	0	12	19	2290			17	2106
1999	0	42	44	2043	0	41	41	1725
2000			28	2038			21	1594
2001			58	2032			30	1537
2002			58	2131			28	1713
2003	0	12	39	2110			24	1676
2004	0	12	43	1937	0	11	33	1480
2005	0	43	54	1628	0	33	53	1277
2006	0	52	23	1601	0	35	17	1282
2007	0	36	11	1610	0	21	10	1368
2008	7	90	41	2250	5	37	17	1620
2009	14	137	50	2607	7	55	31	1545
2010	8	58	26	1540	7	34	17	631
2011	5	27	48	2724	5	18	18	1108

Table 43: The total trips, positive trips, and percent of positive trips by red snapper season for Stephens and MacCall (2004) selected trips dataset for the headboat sector of the recreational fishery in the eastern Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proport. Positive	Open Proport. Positive
1986	0	435	0	275		63.22
1987	0	618	0	407		65.86
1988	0	1302	0	965		74.12
1989	0	1241	0	873		70.35
1990	0	1691	0	1103		65.23
1991	0	1761	0	1118		63.49
1992	0	1985	0	1366		68.82
1993	0	2204	0	1685		76.45
1994	0	2062	0	1431		69.4
1995	0	2116	0	1469		69.42
1996	0	2027	0	1699		83.82
1997	42	2268	39	2075	92.86	91.49
1998	263	2058	142	1985	53.99	96.45
1999	345	1784	186	1621	53.91	90.86
2000	336	1738	53	1569	15.77	90.28
2001	428	1665	38	1532	8.88	92.01
2002	382	1810	32	1710	8.38	94.48
2003	364	1797	30	1678	8.24	93.38
2004	404	1588	40	1484	9.9	93.45
2005	350	1375	52	1311	14.86	95.35
2006	299	1377	27	1307	9.03	94.92
2007	296	1361	60	1339	20.27	98.38
2008	1244	1144	563	1116	45.26	97.55
2009	1177	1631	27	1611	2.29	98.77
2010	974	658	72	617	7.39	93.77
2011	1653	1151				

Table 44: The total trips, positive trips, and percentage of positive trips by year for an all trips dataset and Stephens and MacCall selected trips dataset, as well as the percentage of trips retained by the Stephens and MacCall trip selection procedure for the headboat sector of the recreational fishery in the western Gulf of Mexico.

Year	Total Trips	Positive Trips	Total Proport. Positive	Total Trips Subset	Positive Trips Subset	Proport. Positive Trips Subset	Percent of Trips Retained
1986	1626	1134	69.74	1243	1134	91.23	76.45
1987	1958	1340	68.44	1486	1340	90.17	75.89
1988	2146	1462	68.13	1590	1462	91.95	74.09
1989	2064	1417	68.65	1533	1417	92.43	74.27
1990	2085	1460	70.02	1600	1460	91.25	76.74
1991	1852	1423	76.84	1523	1423	93.43	82.24
1992	2652	2103	79.3	2194	2103	95.85	82.73
1993	2791	2362	84.63	2462	2362	95.94	88.21
1994	3300	2664	80.73	2791	2664	95.45	84.58
1995	3105	2506	80.71	2596	2506	96.53	83.61
1996	2673	2207	82.57	2269	2207	97.27	84.89
1997	2693	2069	76.83	2175	2069	95.13	80.76
1998	2771	2079	75.03	2243	2079	92.69	80.95
1999	2196	1353	61.61	1567	1353	86.34	71.36
2000	2015	1262	62.63	1562	1262	80.79	77.52
2001	2010	1462	72.74	1720	1458	84.77	85.57
2002	2212	1522	68.81	1842	1522	82.63	83.27
2003	1998	1388	69.47	1631	1388	85.1	81.63
2004	2026	1510	74.53	1747	1510	86.43	86.23
2005	1987	1513	76.14	1743	1513	86.8	87.72
2006	2185	1599	73.18	1826	1599	87.57	83.57
2007	2144	1672	77.99	1873	1672	89.27	87.36
2008	881	526	59.7	777	526	67.7	88.2
2009	1835	1058	57.66	1445	1058	73.22	78.75
2010	1555	792	50.93	1249	792	63.41	80.32
2011	1619	719	44.41	1273	719	56.48	78.63

Table 45: The total trips by month for an all trips dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	15	20	64	86	158	249	332	321	162	107	75	37
1987	61	71	136	127	178	245	302	312	184	158	103	81
1988	78	111	137	164	218	324	369	277	123	181	83	81
1989	81	90	134	153	204	222	340	308	200	172	110	50
1990	84	103	144	142	180	270	324	313	197	183	99	46
1991	54	81	103	113	213	258	329	306	162	139	52	42
1992	41	84	98	133	269	369	453	455	271	254	138	87
1993	89	142	200	165	283	306	503	408	273	239	91	92
1994	104	150	230	237	353	385	506	476	327	262	157	113
1995	104	167	186	198	287	469	545	453	327	152	129	88
1996	115	131	153	127	288	386	484	366	275	171	102	75
1997	83	115	174	99	230	413	463	421	289	194	187	25
1998	217	188	199	227	378	336	512	403	137	81	51	42
1999	130	193	189	189	286	325	360	229	102	93	73	27
2000	57	84	115	181	259	325	366	271	147	139	42	29
2001	41	59	94	133	245	264	383	326	222	171	57	15
2002	51	71	101	156	227	349	436	377	187	183	48	26
2003	36	66	103	153	293	346	310	309	168	165	30	19
2004	26	39	91	119	200	317	426	345	219	182	26	36
2005	44	42	91	124	310	354	350	297	141	152	52	30
2006	77	95	133	173	267	326	362	256	229	155	73	39
2007	52	77	150	136	217	378	405	303	214	130	53	29
2008	13	37	44	39	64	192	193	150	47	54	27	21
2009	54	56	104	89	176	379	427	301	107	75	52	15
2010	46	60	101	75	96	313	318	218	95	141	71	21
2011	61	66	113	60	100	363	400	223	98	74	46	15

Table 46: The positive trips by month for an all trips dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	13	18	63	80	113	156	162	176	144	100	74	35
1987	57	66	116	117	109	128	135	163	131	150	96	72
1988	76	108	127	127	102	183	175	143	98	169	76	78
1989	81	86	119	136	106	105	189	163	136	150	100	46
1990	84	95	127	99	82	172	183	173	148	162	90	45
1991	50	80	96	95	139	194	201	205	145	128	50	40
1992	41	83	97	112	204	257	272	339	234	241	138	85
1993	87	137	196	160	246	275	356	295	211	218	89	92
1994	104	149	229	219	289	272	315	310	267	251	149	110
1995	101	166	186	190	210	330	371	300	288	148	129	87
1996	115	131	153	123	235	300	339	240	230	169	98	74
1997	82	114	174	97	216	262	269	230	242	188	177	18
1998	214	184	197	220	317	229	337	269	105			
1999	129	183	179	163	200	194	176	129				
2000				117	209	247	222	202	117	136		
2001				85	235	218	284	250	206	169		
2002				90	219	283	309	267	172	174		
2003				95	264	255	215	238	155	150		
2004				85	193	261	335	281	193	155		
2005				86	293	301	293	251	128	135		
2006	25	30	20	128	247	274	314	217	189	141	4	10
2007	13	24	21	101	214	355	326	253	200	127	22	16
2008	8	12	16	19	10	186	176	51	12	19	7	10
2009	21	33	41	33	30	337	368	167	5			15
2010	25	22	23	14	6	292	228			116	59	7
2011	29	22	34	10		344	266					11

Table 47: The percent positive trips by month for an all trips dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	86.67	90	98.44	93.02	71.52	62.65	48.8	54.83	88.89	93.46	98.67	94.59
1987	93.44	92.96	85.29	92.13	61.24	52.24	44.7	52.24	71.2	94.94	93.2	88.89
1988	97.44	97.3	92.7	77.44	46.79	56.48	47.43	51.62	79.67	93.37	91.57	96.3
1989	100	95.56	88.81	88.89	51.96	47.3	55.59	52.92	68	87.21	90.91	92
1990	100	92.23	88.19	69.72	45.56	63.7	56.48	55.27	75.13	88.52	90.91	97.83
1991	92.59	98.77	93.2	84.07	65.26	75.19	61.09	66.99	89.51	92.09	96.15	95.24
1992	100	98.81	98.98	84.21	75.84	69.65	60.04	74.51	86.35	94.88	100	97.7
1993	97.75	96.48	98	96.97	86.93	89.87	70.78	72.3	77.29	91.21	97.8	100
1994	100	99.33	99.57	92.41	81.87	70.65	62.25	65.13	81.65	95.8	94.9	97.35
1995	97.12	99.4	100	95.96	73.17	70.36	68.07	66.23	88.07	97.37	100	98.86
1996	100	100	100	96.85	81.6	77.72	70.04	65.57	83.64	98.83	96.08	98.67
1997	98.8	99.13	100	97.98	93.91	63.44	58.1	54.63	83.74	96.91	94.65	72
1998	98.62	97.87	98.99	96.92	83.86	68.15	65.82	66.75	76.64			
1999	99.23	94.82	94.71	86.24	69.93	59.69	48.89	56.33				
2000				64.64	80.69	76	60.66	74.54	79.59	97.84		
2001				63.91	95.92	82.58	74.15	76.69	92.79	98.83		
2002				57.69	96.48	81.09	70.87	70.82	91.98	95.08		
2003				62.09	90.1	73.7	69.35	77.02	92.26	90.91		
2004				71.43	96.5	82.33	78.64	81.45	88.13	85.16		
2005				69.35	94.52	85.03	83.71	84.51	90.78	88.82		
2006	32.47	31.58	15.04	73.99	92.51	84.05	86.74	84.77	82.53	90.97	5.48	25.64
2007	25	31.17	14	74.26	98.62	93.92	80.49	83.5	93.46	97.69	41.51	55.17
2008	61.54	32.43	36.36	48.72	15.62	96.88	91.19	34	25.53	35.19	25.93	47.62
2009	38.89	58.93	39.42	37.08	17.05	88.92	86.18	55.48	4.67			100
2010	54.35	36.67	22.77	18.67	6.25	93.29	71.7			82.27	83.1	33.33
2011	47.54	33.33	30.09	16.67		94.77	66.5					73.33

Table 48: All trips, positive trips, and the percent of positive trips by area for an all trips dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico.

Year	TOTAL TRIPS				POSITIVE TRIPS			
	Louisiana	NE Texas	Port Aransas, TX	Port Isabel, TX	Louisiana	NE Texas	Port Aransas, TX	Port Isabel, TX
1986	263	621	578	164	225	565	223	121
1987	186	691	790	291	85	653	381	221
1988	202	639	991	314	173	578	462	249
1989	198	597	973	296	159	567	465	226
1990	322	453	1037	273	261	423	561	215
1991	408	495	677	272	369	475	385	194
1992	494	757	1050	351	439	739	658	267
1993	457	822	1143	369	423	813	825	301
1994	581	897	1320	502	540	884	815	425
1995	537	781	1366	421	503	772	905	326
1996	410	784	1056	423	386	773	673	375
1997	531	610	1108	444	518	609	576	366
1998	531	613	1304	323	471	602	718	288
1999	325	447	1157	267	253	426	454	220
2000	230	540	1198	47	209	476	554	23
2001	202	420	1217	171	201	379	762	120
2002	0	450	1366	396	0	413	763	346
2003	42	425	1128	403	41	389	612	346
2004	0	418	1058	550	0	390	621	499
2005	0	485	986	516	0	462	596	455
2006	0	550	1132	503	0	527	647	425
2007	83	392	1115	554	82	366	773	451
2008	184	109	262	326	146	85	92	203
2009	188	207	1025	415	135	166	439	318
2010	13	216	955	371	5	128	389	270
2011	117	213	918	371	84	95	296	244

Table 49: The total trips, positive trips, and percent of positive trips by red snapper season for an all trips dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proport. Positive	Open Proport. Positive
1986	0	1626	0	1134		69.74
1987	0	1958	0	1340		68.44
1988	0	2146	0	1462		68.13
1989	0	2064	0	1417		68.65
1990	0	2085	0	1460		70.02
1991	0	1852	0	1423		76.84
1992	0	2652	0	2103		79.3
1993	0	2791	0	2362		84.63
1994	0	3300	0	2664		80.73
1995	0	3105	0	2506		80.71
1996	0	2673	0	2207		82.57
1997	37	2656	24	2045	64.86	77
1998	176	2595	7	2072	3.98	79.85
1999	309	1887				
2000	392	1623	18	1244	4.59	76.65
2001	317	1693	19	1443	5.99	85.23
2002	370	1842	16	1506	4.32	81.76
2003	313	1685	17	1371	5.43	81.36
2004	251	1775	9	1501	3.59	84.56
2005	294	1693	27	1486	9.18	87.77
2006	466	1719	94	1505	20.17	87.55
2007	448	1696	148	1524	33.04	89.86
2008	463	418	135	391	29.16	93.54
2009	828	1007	189	869	22.83	86.3
2010	866	689	159	633	18.36	91.87
2011	984	635	110	609	11.18	95.91

Table 50: The total trips by month for Stephens and McCall (2004) selected dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	15	19	64	85	123	172	192	204	153	105	75	36
1987	61	69	134	121	126	148	166	183	143	155	102	78
1988	78	111	137	148	123	196	193	166	105	172	80	81
1989	81	89	133	144	124	144	204	167	137	154	106	50
1990	84	102	141	118	103	202	203	185	158	163	95	46
1991	54	81	102	108	167	215	220	211	146	129	50	40
1992	41	84	98	118	225	277	289	353	238	246	138	87
1993	89	142	200	164	263	290	380	304	222	225	91	92
1994	104	150	229	229	297	289	364	327	276	256	157	113
1995	104	166	186	191	219	351	396	319	297	150	129	88
1996	115	131	153	124	242	315	358	250	233	171	102	75
1997	83	115	174	98	218	288	295	258	248	190	183	25
1998	214	188	199	226	326	249	350	286	111	50	30	14
1999	130	186	180	178	222	213	191	144	38	46	24	15
2000	32	37	85	169	225	270	247	211	120	136	20	10
2001	24	42	82	129	236	228	293	258	208	171	36	13
2002	48	43	91	151	222	297	321	274	178	174	34	9
2003	19	41	77	127	273	270	231	252	158	153	18	12
2004	19	26	77	111	196	277	356	291	196	158	20	20
2005	29	35	64	118	297	319	309	260	131	137	23	21
2006	53	61	80	154	254	286	320	217	192	144	43	22
2007	31	51	83	134	216	364	341	262	203	127	36	25
2008	12	36	43	39	55	188	182	120	29	39	18	16
2009	36	43	67	70	104	347	389	233	67	40	34	15
2010	36	49	64	63	78	299	286	115	50	130	67	12
2011	50	45	77	59	65	351	316	119	78	63	35	15

Table 51: The positive trips by month for Stephens and McCall (2004) selected dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	13	18	63	80	113	156	162	176	144	100	74	35
1987	57	66	116	117	109	128	135	163	131	150	96	72
1988	76	108	127	127	102	183	175	143	98	169	76	78
1989	81	86	119	136	106	105	189	163	136	150	100	46
1990	84	95	127	99	82	172	183	173	148	162	90	45
1991	50	80	96	95	139	194	201	205	145	128	50	40
1992	41	83	97	112	204	257	272	339	234	241	138	85
1993	87	137	196	160	246	275	356	295	211	218	89	92
1994	104	149	229	219	289	272	315	310	267	251	149	110
1995	101	166	186	190	210	330	371	300	288	148	129	87
1996	115	131	153	123	235	300	339	240	230	169	98	74
1997	82	114	174	97	216	262	269	230	242	188	177	18
1998	214	184	197	220	317	229	337	269	105			
1999	129	183	179	163	200	194	176	129				
2000				117	209	247	222	202	117	136		
2001				85	235	216	284	248	206	169		
2002				90	219	283	309	267	172	174		
2003				95	264	255	215	238	155	150		
2004				85	193	261	335	281	193	155		
2005				86	293	301	293	251	128	135	4	7
2006	25	30	20	128	247	274	314	217	189	141	4	10
2007	13	24	21	101	214	355	326	253	200	127	22	16
2008	8	12	16	19	10	186	176	51	12	19	7	10
2009	21	33	41	33	30	337	368	167			5	15
2010	25	22	23	14		292	228			116	59	7
2011	29	22	34	10		344	266					11

Table 52: The percent positive trips by month for Stephens and McCall (2004) selected dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	1	2	3	4	5	6	7	8	9	10	11	12
1986	86.67	94.74	98.44	94.12	91.87	90.7	84.38	86.27	94.12	95.24	98.67	97.22
1987	93.44	95.65	86.57	96.69	86.51	86.49	81.33	89.07	91.61	96.77	94.12	92.31
1988	97.44	97.3	92.7	85.81	82.93	93.37	90.67	86.14	93.33	98.26	95	96.3
1989	100	96.63	89.47	94.44	85.48	72.92	92.65	97.6	99.27	97.4	94.34	92
1990	100	93.14	90.07	83.9	79.61	85.15	90.15	93.51	93.67	99.39	94.74	97.83
1991	92.59	98.77	94.12	87.96	83.23	90.23	91.36	97.16	99.32	99.22	100	100
1992	100	98.81	98.98	94.92	90.67	92.78	94.12	96.03	98.32	97.97	100	97.7
1993	97.75	96.48	98	97.56	93.54	94.83	93.68	97.04	95.05	96.89	97.8	100
1994	100	99.33	100	95.63	97.31	94.12	86.54	94.8	96.74	98.05	94.9	97.35
1995	97.12	100	100	99.48	95.89	94.02	93.69	94.04	96.97	98.67	100	98.86
1996	100	100	100	99.19	97.11	95.24	94.69	96	98.71	98.83	96.08	98.67
1997	98.8	99.13	100	98.98	99.08	90.97	91.19	89.15	97.58	98.95	96.72	72
1998	100	97.87	98.99	97.35	97.24	91.97	96.29	94.06	94.59			
1999	99.23	98.39	99.44	91.57	90.09	91.08	92.15	89.58				
2000				69.23	92.89	91.48	89.88	95.73	97.5	100		
2001				65.89	99.58	94.74	96.93	96.12	99.04	98.83		
2002				59.6	98.65	95.29	96.26	97.45	96.63	100		
2003				74.8	96.7	94.44	93.07	94.44	98.1	98.04		
2004				76.58	98.47	94.22	94.1	96.56	98.47	98.1		
2005				72.88	98.65	94.36	94.82	96.54	97.71	98.54		
2006	47.17	49.18	25	83.12	97.24	95.8	98.12	100	98.44	97.92	9.3	45.45
2007	41.94	47.06	25.3	75.37	99.07	97.53	95.6	96.56	98.52	100	61.11	64
2008	66.67	33.33	37.21	48.72	18.18	98.94	96.7	42.5	41.38	48.72	38.89	62.5
2009	58.33	76.74	61.19	47.14	28.85	97.12	94.6	71.67	7.46			100
2010	69.44	44.9	35.94	22.22		97.66	79.72			89.23	88.06	58.33
2011	58	48.89	44.16	16.95		98.01	84.18					73.33

Table 53: All trips, positive trips, and the percent of positive trips by area for Stephens and MacCall (2004) selected dataset for the headboat sector of the recreational fishery in the western Gulf of Mexico.

Year	TOTAL TRIPS				POSITIVE TRIPS			
	Louisiana	NE Texas	Port Aransas, TX	Port Isabel, TX	Louisiana	NE Texas	Port Aransas, TX	Port Isabel, TX
1986	255	583	269	136	225	565	223	121
1987	168	660	420	238	85	653	381	221
1988	193	602	544	251	173	578	462	249
1989	176	572	556	229	159	567	465	226
1990	297	433	644	226	261	423	561	215
1991	393	485	442	203	369	475	385	194
1992	478	741	707	268	439	739	658	267
1993	452	820	881	309	423	813	825	301
1994	577	891	877	446	540	884	815	425
1995	532	774	961	329	503	772	905	326
1996	409	775	708	377	386	773	673	375
1997	530	610	663	372	518	609	576	366
1998	526	611	814	292	471	602	718	288
1999	319	444	576	228	253	426	454	220
2000	230	536	772	24	209	476	554	23
2001	202	418	972	128	201	379	762	120
2002	0	448	1039	355	0	413	763	346
2003	42	421	802	366	41	389	612	346
2004	0	415	824	508	0	390	621	499
2005	0	483	780	480	0	462	596	455
2006	0	544	795	487	0	527	647	425
2007	83	389	870	531	82	366	773	451
2008	183	109	173	312	146	85	92	203
2009	186	203	671	385	135	166	439	318
2010	11	211	693	334	5	128	389	270
2011	117	205	619	332	84	95	296	244

Table 54: The total trips, positive trips, and percent of positive trips by red snapper season for Stephens and MacCall (2004) selected trips for the headboat sector of the recreational fishery in the western Gulf of Mexico. Cells that are grayed out either had zero positive trips or the number of samples in that cell was confidential information.

Year	Closed	Open	Closed Positive	Open Positive	Closed Proport. Positive	Open Proport. Positive
1986	0	1243	0	1134		91.23
1987	0	1486	0	1340		90.17
1988	0	1590	0	1462		91.95
1989	0	1533	0	1417		92.43
1990	0	1600	0	1460		91.25
1991	0	1523	0	1423		93.43
1992	0	2194	0	2103		95.85
1993	0	2462	0	2362		95.94
1994	0	2791	0	2664		95.45
1995	0	2596	0	2506		96.53
1996	0	2269	0	2207		97.27
1997	35	2140	24	2045	68.57	95.56
1998	95	2148	7	2072	7.37	96.46
1999	128	1439				
2000	240	1322	18	1244	7.5	94.1
2001	244	1476	19	1439	7.79	97.49
2002	294	1548	16	1506	5.44	97.29
2003	200	1431	17	1371	8.5	95.81
2004	189	1558	9	1501	4.76	96.34
2005	202	1541	27	1486	13.37	96.43
2006	289	1537	94	1505	32.53	97.92
2007	311	1562	148	1524	47.59	97.57
2008	376	401	135	391	35.9	97.51
2009	528	917	189	869	35.8	94.77
2010	589	660	159	633	26.99	95.91
2011	654	619	110	609	16.82	98.38