

2014 Gulf of Mexico Red Snapper Recreational Season Length Estimates
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and Gulf of Mexico Fishery Management Council Staff
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Introduction

On October 1, 2013, NOAA Fisheries published a final rule ([Federal Register 57314, V. 78, No. 181](#)) implementing an 11 million pound whole weight (mp ww) total allowable catch for Gulf of Mexico red snapper. This catch level was the highest ever for red snapper and was allocated 51% to the commercial sector (5.61 mp ww) and 49% to the recreational sector (5.39 mp ww). The catch level is expected to remain at 11 mp through the 2014 season, but will be updated following the next stock assessment, which is scheduled for completion in late 2014.

The red snapper recreational fishing season opens each year on June 1 and closes when the recreational quota is met or projected to be reached. Prior to June 1 each year, NOAA Fisheries projects the season closing date based on previous years of data, and notifies the public of the closing date for the upcoming season. If subsequent data indicate that the quota has not been reached, NOAA Fisheries may re-open the season. In 2013, the red snapper federal season was open for 42 days, from June 1-June 28 and October 1-October 14. Additionally, the state of Texas had a year round state waters season with a 4-fish bag limit and 15-inch minimum size limit (MSL). The state of Louisiana had a weekend-only (Fri-Sun + some holidays) state water season with a 3-fish bag limit (2-fish during the federal season) and a 16-inch MSL from mid-April through the end of September. The state of Florida had a 68-day state water season (Jun 1-Jul 14, Oct 1-Oct 14) with a 2-fish bag limit and a 16-inch MSL. The states of Alabama and Mississippi implemented state seasons consistent with the federal season.

Preliminary 2013 catch estimates produced by the Marine Recreational Information Program (MRIP) using a new dockside intercept sampling methodology indicated private and for-hire components of the recreational sector landed 8.90 mp ww. Preliminary 2013 total landings, including estimates from MRIP, Texas Parks and Wildlife Department (TPWD), and the Southeast Headboat Survey (HBS), totaled 9.54 mp ww (**Table 1**). TPWD landings for 2013 were only available through mid-May 2013, so 2012 landings for May through December were used as a proxy to generate the 2013 landings estimate.

Table 1. 2013 preliminary totals for Gulf of Mexico recreational red snapper landings, by wave (pounds whole weight).

Source	1	2	3	4	5	6	Total
MRIP	0	0	6,414,790	31,828	2,454,446	0	8,901,063
TPWD	34,660	3,952	70,621	61,138	21,419	2,938	194,728
HBS	14,093	10,848	323,397	5,128	87,650	4,418	445,535
Total	48,753	14,800	6,748,632	98,094	2,563,515	7,357	9,541,326

Note: TPWD landings for 2013 are not available for Waves 4-6; 2012 used as proxy.

Overall, the new MRIP catch estimates are more accurate and less biased than those produced in past years because MRIP redesigned the Access Point Angler Intercept Survey in March 2013 to provide better coverage of the variety of fishing trips ending at different times of day. Because these estimates may not be directly comparable to how the 2014 quotas or other red snapper management reference points were estimated, NOAA Fisheries previously estimated the 2014 red snapper recreational season length by excluding 2013 MRIP catch estimates. However, a recent federal court ruling concluded that NOAA Fisheries could not disregard the new and improved MRIP survey estimates when projecting the red snapper season length. The court ruling also indicated accountability measures for the recreational sector were insufficient to reasonably prevent the quota from being exceeded. At this time, NOAA Fisheries must consider the MRIP 2013 estimates, along with other available data, when projecting how long it will take the recreational sector to harvest the quota in 2014.

The purpose of this report is to project the length of the 2014 recreational red snapper season length based on various quota buffers and using historical data and 2013 MRIP estimates. This report provides projected 2014 federal season-length estimates for Gulf of Mexico recreational red snapper. Analyses account for a variety of projection scenarios by incorporating uncertainty in the historical time series.

State Regulations

In 2014, as in previous years, Texas will have a 365-day state waters red snapper season with 4-fish bag limit and a 15-inch total length minimum size limit. In 2014, Louisiana will have a 286-day season from February 21 through December 31 with a 2-fish bag limit and a 16-inch total length minimum size limit. In February 2014, the Louisiana Division of Wildlife and Fisheries (LDWF) opened state waters on weekends only from February 21 through April 13. Beginning April 14, LDWF announced state waters would be open year round to the harvest of red snapper. On April 16, the Florida Fish and Wildlife Commission approved a 52-day state waters fishing season beginning Memorial Day weekend (May 24) and ending on July 14. This analysis assumes Alabama and Mississippi will implement regulations consistent with the federal season implemented by NOAA Fisheries, and that seasons, bag limits, and size limits for other Gulf states will be consistent with those summarized in **Table 2** below.

Table 2. Proposed Gulf state water recreational red snapper regulations for 2014. Cells highlighted in gray indicate regulations incompatible with 2014 federal regulations.

State	Size Limit	Bag Limit	Season	Days Open
Florida*	16" TL	2-fish	May 24-July 14*	52
Alabama	16" TL	2-fish	Same as federal season	Same as federal season
Mississippi	16" TL	2-fish	Same as federal season	Same as federal season
Louisiana	16" TL	2-fish	Feb 21-Apr 13 (3-day weekends), Apr 14-Dec 31	286
Texas	15" TL	4-fish	Jan 1-Dec 31	365

Data Sources

Recreational red snapper landings were obtained from four data sources:

1. Marine Recreational Information Program (MRIP), including the For-hire charter survey;
2. Southeast Headboat survey (HBS);
3. LDWF Recreational Creel survey (LA Creel); and,
4. Texas Parks and Wildlife Department (TPWD) charter and private/rental creel survey.

MRIP and For-hire red snapper landings are estimated using a combination of dockside intercepts (landings data) and phone surveys (effort data). Landings are estimated in both numbers and whole weight (lbs) by two-month wave (e.g., Wave 1 = Jan/Feb, ..., Wave 6 = Nov/Dec), area fished (inland, state, and federal waters), mode of fishing (charter, private/rental, shore), and state (west Florida, Alabama, Mississippi, and Louisiana). Uncertainty in MRIP mean estimates in average weights, numbers of fish landed, and pounds of fish landed are expressed as percent standard error (PSE). MRIP has replaced the Marine Recreational Fisheries Statistics Survey (MRFSS) program as the primary methodology for collecting and estimating recreational catches in the Gulf of Mexico.

Headboat landings are collected through logbooks completed by headboat operators. Landings (lbs ww) are reported by vessel, day/month, and statistical reporting area (i.e., area 18 = Dry Tortugas off west coast of Florida, ..., area 27 = Southeast Texas). Landings from vessels participating in the 2014 Headboat Collaborative Exempted Fishing Permit were deducted from the projection inputs, and their harvest was also deducted from the overall recreational quota (http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/reef_fish/2013/headboat_efp/). No estimates of uncertainty are generated by the HBS.

Louisiana's quota monitoring survey was designed to estimate the number of red snapper landed in Louisiana during the 2013 recreational season. Dockside interviews were conducted by state personnel at sites commonly reporting offshore species. To estimate fishing effort of private anglers, LDWF personnel contacted a random portion of those anglers holding a Louisiana Recreational Offshore Landing Permit by phone and/or email on a weekly basis. Permit holders were asked if they fished offshore, how many trips were taken the previous week, if they landed at a public site, what time they returned to the dock, and whether they fished on a paid charter. The randomly selected permit holders were notified by e-mail each Wednesday of their selection to be surveyed. Those selected permit holders had the option to answer the effort survey questions by reply e-mail. If an e-mail was not received, they were contacted by phone. Charter captains holding a Louisiana Recreational Offshore Landing Permit were also contacted by LDWF weekly to collect information on the total number of red snapper caught the previous week. Charter captains had the option to respond via email prior to LDWF personnel contacting them via phone. Estimated landings were produced based on observed catch rates, average weights, and estimated fishing effort (as adjusted for persons

not possessing an offshore landing permit). Weekly estimates of uncertainty in LA Creel average weights, numbers of fish landed, and pounds of fish landed are expressed as PSE. Because this survey was designed specifically to estimate red snapper harvest in Louisiana, it is used as a projection input for these modeling runs.

The TPWD creel survey generates estimates of landings in numbers for private/rental boats and charter vessels fishing off Texas. Landings are reported in numbers by high (May 15-November 20) and low-use time periods (November 21-May 14), area fished (state vs. federal waters), and mode of fishing (private vs. charter). To convert TPWD landings in numbers to landings in pounds, red snapper average lengths by mode, wave, and area fished are converted to weights using a length-weight conversion formula. High- and low-use estimates of uncertainty in TPWD numbers of fish landed are expressed as PSE and were obtained from NOAA Fisheries' Southeast Fisheries Science Center for this analysis.

Methods

2014 Projections: Average Weights and Catch Rates

A tiered projection approach was taken for forecasting recreational red snapper average weight and in-season catch rates in the Gulf of Mexico for 2014. Average weights and in-season catch rates were computed using the same methodology as 2013 projections (see SERO-LAPP-2013-02 Addendum). Estimates of landings per day were computed instead of modeling landings to account for shorter and shorter fishing seasons implemented in recent years. Since 2007, the recreational fishing season has decreased from 194 days to 42 days (2013 season length). Because the most recent red snapper stock assessment treated red snapper as separate Eastern and Western Gulf of Mexico subpopulations, and because the Eastern and Western Gulf states have differing data collection programs, average weights and catch rates were projected separately for the Eastern and Western Gulf of Mexico. Different projections were done for Headboat and the Private/Charter sectors to account for differences in the effort dynamics of these sectors and the availability and completeness of data. This differed from previous projections, which aggregated data across Headboat and Private/Charter sectors.

Generalized linear regression models were implemented using R (R Core Team 2014). The best-fitting models for each of the model scenarios in SERO-LAPP-2013-10 were identified based on significance of parameter terms, AICc (Burnham & Anderson 2002), BIC (Schwarz 1978), and R-square goodness of fit. In this report, additional steps were taken to extend previous projection methodologies, utilizing parametric bootstrapping techniques where the mean and variance per year were used to define a distribution of possible values at each observed point. This extension allowed different variance estimates at each point, directly incorporating variance estimates from the surveys (e.g., MRIP and TPWD PSEs) into the projection framework.

To generate a mean estimate with variance for 2014 Eastern and Western Gulf of Mexico private/charter average weights, 1000 bootstrapped time series were generated around the mean in-season average weights for the Eastern and Western Gulf of Mexico. These

bootstrapped time series incorporated uncertainty using weighted mean East and West PSEs. For the East, state-specific average weight PSE estimates were obtained from the MRIP website (countmyfish.noaa.gov) and weighted by landings in pounds. No PSE for TPWD average weight was available, so the Louisiana MRIP estimate of PSE was used as a proxy for the whole Western Gulf average weight PSE. Generalized linear model regressions with a Gaussian distribution were fit to each of the 1000 bootstrapped time series and forecast to 2014. Residual diagnostics were used to verify goodness-of-fit. For the East, input years for the regression were 2007-2013. For the West, input years for the regression were 2005-2013. To generate a mean estimate with variance for 2014 Eastern and Western Gulf of Mexico private/charter catch rates in numbers of fish, 1000 bootstrapped time series were generated around the mean in-season catch rates in numbers for the Eastern and Western Gulf of Mexico. These bootstrapped time series incorporated uncertainty using weighted mean East MRIP and West MRIP/TPWD PSEs. For the East, state-specific PSE estimates for landings (in numbers) were obtained from the MRIP website (countmyfish.noaa.gov) and weighted by landings in numbers. For the West, MRIP and TPWD survey estimates of landed (numbers of fish) PSE were weighted by landings in numbers. Generalized linear model regressions with a log-linked negative binomial distribution were fit to each of the 1000 bootstrapped time series and forecast to 2014. Residual diagnostics were used to verify goodness of fit. For the East and West, input years for the regression were 2007-2013.

Mean and variance estimates for 2014 East/West Gulf of Mexico private/charter catch per day (in pounds per day) were computed by running summary statistics on the product of the 1000 bootstrapped forecasts for 2014 average weight and the 1000 bootstrapped forecasts for 2014 catch rate in numbers for both the Eastern and Western Gulf of Mexico.

Uncertainty estimates are not generated for headboat survey catches. Due to differences in observed trends, it was still useful to project the changes in average weight and catch rate in numbers separately, then combine them for a forecast of catch rate in pounds.

To generate a mean estimate with variance for 2014 East/West Gulf of Mexico headboat average weights, a generalized linear regression model with a Gaussian distribution was fit to input data for 2007-2013 and forecast to 2014 for both regions. To generate a mean estimate with variance for 2014 East/West Gulf of Mexico headboat catch rate in numbers, a generalized linear regression model with a Gaussian distribution was fit to input data for 2007-2013 and forecast to 2014 for both regions, using spawning stock biomass as a predictor (**Figure 1**). Landings from Headboat Collaborative vessels were excluded from input data before fitting regression models. Spawning stock biomass (SSB) was included to potentially account for changes in stock size (and corresponding availability) as the population rebuilds. To appropriately express the combined uncertainty in the projected average weight and catch rate in numbers to generate a catch rate in pounds per day, 1000 bootstrapped time series were generated around the mean projected 2014 average weight and catch rate in numbers for the East and West Gulf of Mexico. These bootstrapped time series incorporated uncertainty using the standard error in the forecast as output from the regression model.

Mean and variance estimates for 2014 East/West Gulf of Mexico headboat catch per day (in pounds per day) were computed by running summary statistics on the product of the 1000 bootstrapped forecasts for 2014 average weight and the 1000 bootstrapped forecasts for 2014 catch rate in numbers for both the Eastern and Western Gulf of Mexico.

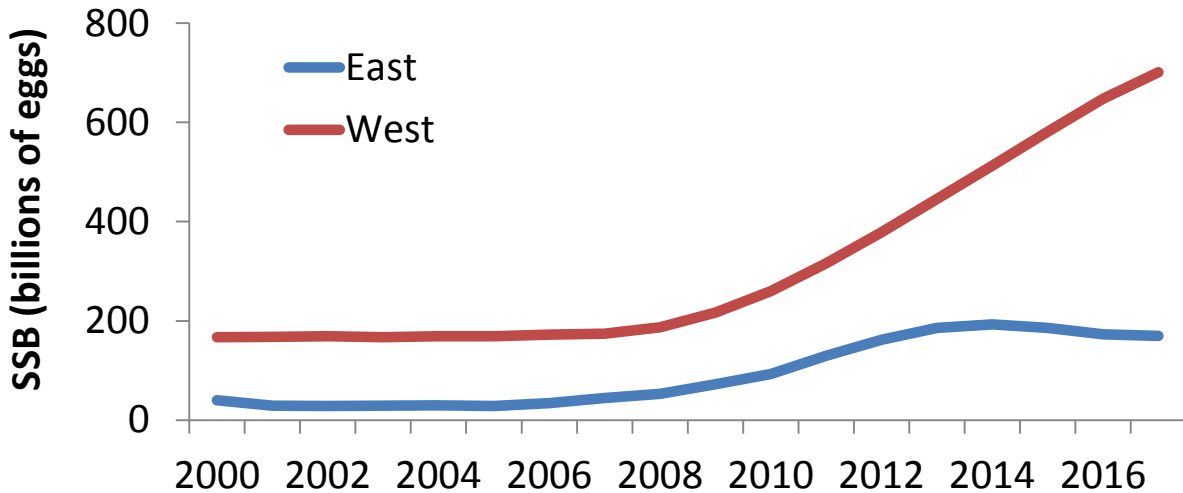


Figure 1. Spawning stock biomass (SSB) estimates, in billions of eggs, from SEDAR-31 (2013) stock assessment model for Eastern and Western Gulf of Mexico red snapper stock, used as covariate predictor variable for projections as a measure of underlying stock productivity.

Separate out-of-season Western Gulf catch rates for charter/private vessels were computed using 2012-2013 Texas out-of-season landings and 2013 Louisiana out-of-season landings. Estimates were generated both prior to and after the federal season. For Texas, landings were summed from January through mid-May 2013 and divided by the number of days that state waters were open prior to the federal season to generate estimates of pre-season catch rates per day (325 lbs/day). Similarly, landings from August-December 2012 were summed and divided by the number of days state waters were open after the federal season to calculate post-federal season state water catch rates per day (145 lbs/day). For Louisiana, landings from mid-March through May 31, 2013 were summed and divided by the number of days that state waters were open to estimate pre-season catch rates (1,839 lbs/day). Louisiana post-season state water catch rates were computed using two different time periods. Catch rates during summer months were calculated by summing July 12-August 11, 2013 landings and dividing by the number of days state waters were open (4,333 lbs/day). Fall and winter catch rates were computed by summing landings from mid-August through September 30, 2013, and then dividing those landing by the number of days state waters were open (1,541 lbs/day). Similar computations were also done for headboats and for landings occurring when both state and federal waters were closed.

Florida state water private landings per day on weekends and holidays were assumed to be equal to the private landings per day when the federal season is open. Private landings on weekdays were assumed to equal the average catch per day from state waters when the

federal season is open. On a weekly basis, average catch per day by Florida private anglers was computed to be 28,965 lbs per day.

Additionally, in 2014 NOAA Fisheries approved the Gulf of Mexico Headboat Collaborative exempted fishing permit (EFP). This EFP allotted 286,465 lbs of the red snapper quota to 17 headboat vessels. The Collaborative allocated the pounds of quota received amongst the vessels in the collaborative. Headboats participating in the program could harvest red snapper beginning January 1. NOAA Fisheries is actively tracking landings (in numbers) in near real time and landings are being converted to pounds based on dockside sampling estimates. Projections accounted for the red snapper to be landed by the Headboat Collaborative. When estimating 2014 catch rates and average weights for headboats, historical landings by Collaborative vessels were removed from catch per day and average weight computations.

2014 Projections: Season Length

Forecasts of catch rates and average weights from best-fitting models were incorporated, along with their variance, into an Excel-based season length projection model that utilized Solver to determine the federal season length under each scenario with the 2014 recreational quota of 5.39 mp ww. This model accounted for out-of-season catch rates and state incompatibility with federal season length as described previously.

To account for management uncertainty in constraining recreational red snapper landings below the quota, the Gulf Council recommended implementing an Annual Catch Target (ACT) through emergency rule, which would serve as a buffer. The recreational season length under various buffers was computed in the Excel-based season length projection model. The probability of overfishing at various buffer levels was determined by identifying the confidence interval for the projected catch (in pounds) per day that corresponded to the federal in-season catch rate that would result in a season of that length under the non-buffered 5.39 mp ww quota.

The base runs for this analysis assume a 2-fish bag limit in federal waters, that each Gulf state will implement seasons as summarized in Table 2, and that historical state water catch rates for Texas and Louisiana are representative of future state water catch rates. Additionally, the analysis assumes that Florida private mode catch rates will be ~60% of Florida private mode catch rates when the federal season is open. Because catch rates in state waters are uncertain, a sensitivity run was performed assuming that Florida private catch rates would be equal to Florida private catch rates during the federal season. An additional sensitivity run was performed using LA Survey landings per day in place of MRIP landings to calculate federal season catch rates.

Results

2014 Projections: In-Season Catch Rates

The bootstrapped distribution of private/charter average weights input into the projection model is shown in **Figure 2**. Generalized linear regression model fits to mean average weights, by region, are shown in **Figure 3**.

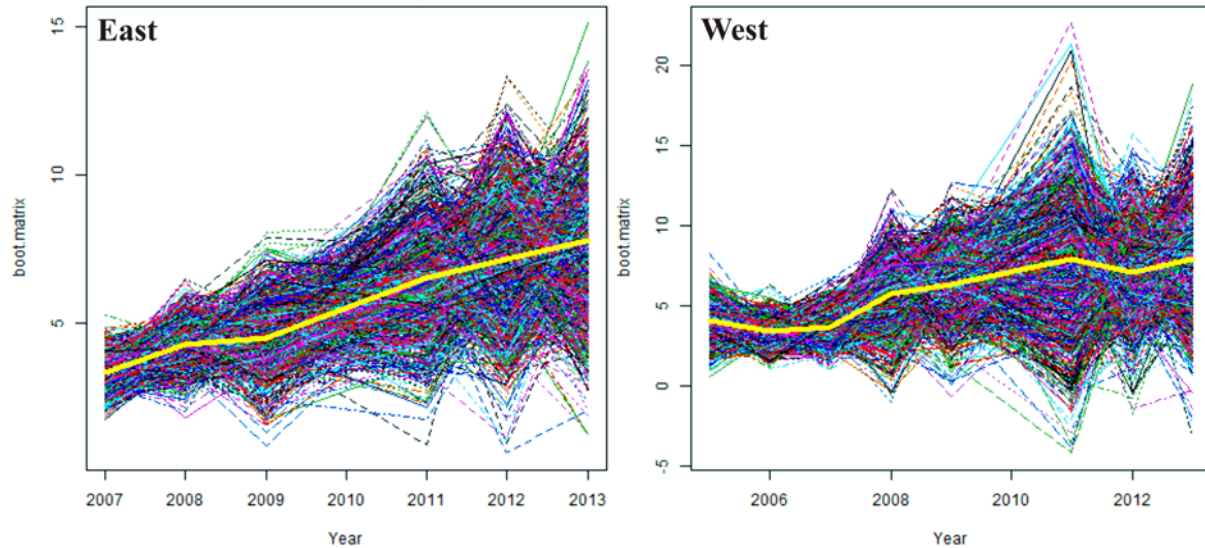


Figure 2. Bootstrapped distribution of average weights for recreational red snapper sampled by MRIP/LA Survey/TPWD in the Eastern and Western Gulf of Mexico, with mean denoted by yellow line and time series generated using PSE denoted by other colors.

In 2013, average weights for private/charter and headboat in the Eastern Gulf were 7.77 and 4.85 lbs ww, respectively. Projected average weights for 2014 for private/charter and headboat in the Eastern Gulf were 8.60 and 5.73 lbs ww, respectively (**Figure 3: Left**). In 2013, average weights for private/charter (including LA Survey 2013 data) and headboat in the Western Gulf were 7.94 and 5.41 lbs ww, respectively. Projected average weights for 2014 for private/charter and headboats in the Western Gulf were 8.82 and 7.75 lbs ww, respectively (**Figure 3: Right**).

The bootstrapped distribution of private/charter catch per day (in numbers) input into the projection model is shown in **Figure 4**. Generalized linear regression model fits to mean catch per day (in numbers), by region, are shown in **Figure 5**.

In 2013, in-season catch per federal day (in numbers) for private/charter and headboats in the Eastern Gulf were 24,725 and 699 fish/day, respectively. Projected 2014 catch (in numbers) per day for Eastern Gulf private/charter and headboats were 22,746 and 976 fish/day, respectively (**Figure 5: Left**). In 2013, catch rates for private/charter (including LA Survey 2013 data) and headboat in the Western Gulf were 1,593 and 677 fish/day, respectively. Projected 2014 catch (in numbers) per day for Western Gulf private/charter and headboats were 2,176 and 724 fish/day, respectively (**Figure 5: Right**).

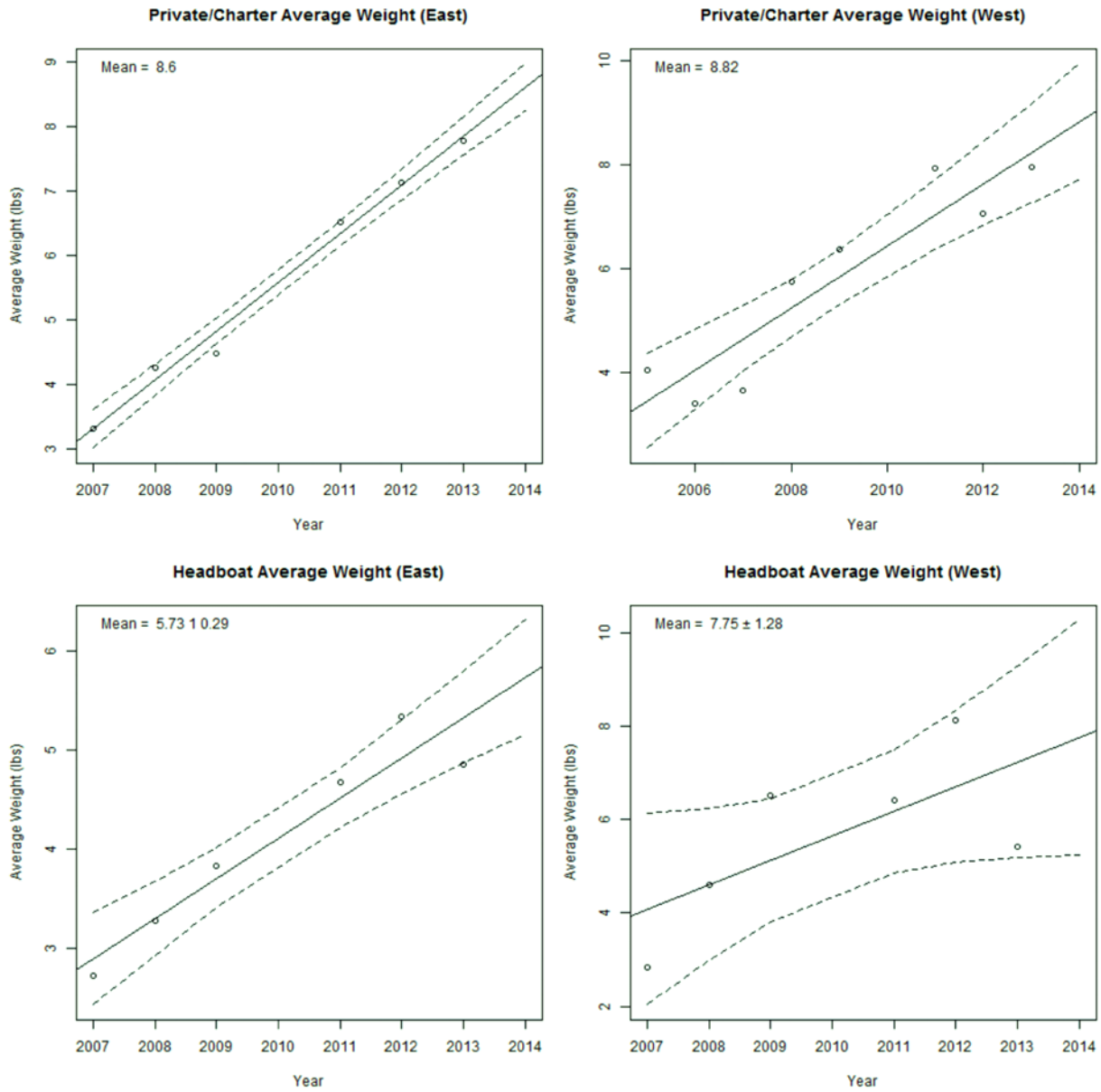


Figure 3. Generalized linear regression fits to mean average weights for recreational red snapper sampled by MRIP/LA Survey/TPWD in the Eastern and Western Gulf of Mexico. Dashed lines denote 95% confidence limits.

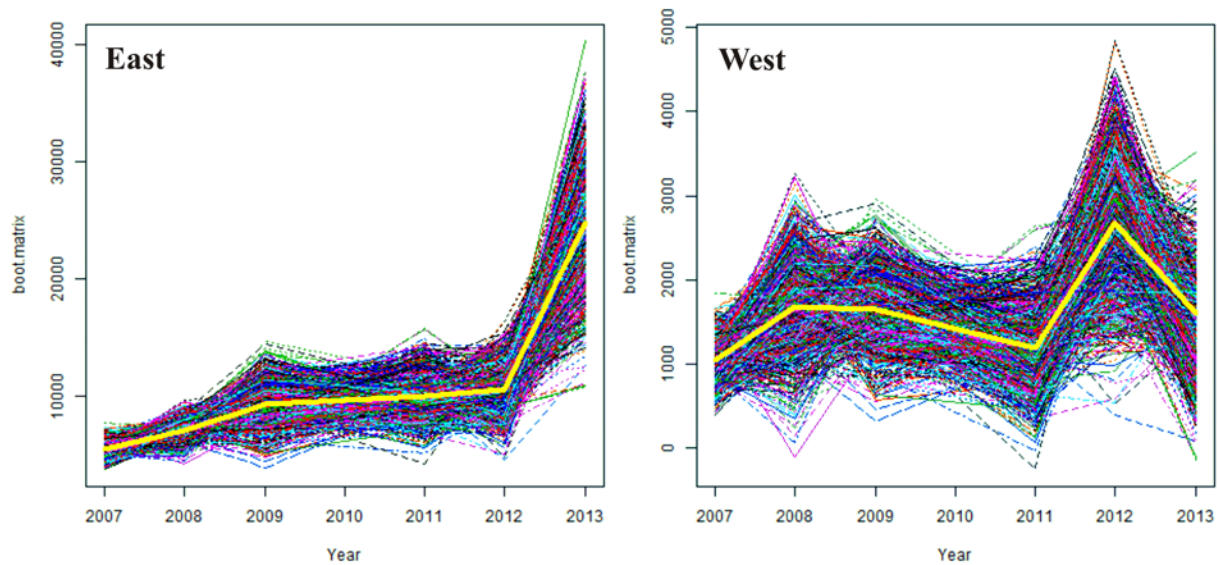


Figure 4. Bootstrapped distribution of catch (in numbers) per day, for recreational red snapper sampled by MRIP/LA Survey/TPWD in the Eastern and Western Gulf of Mexico, with mean denoted by yellow line and time series generated using PSE denoted by other colors.

In general, the Eastern Gulf of Mexico model fits were the most statistically robust (lower AICc, lower BIC, and/or better r^2), and SSB was not useful as a predictor because the rate of change in SSB is slower in the Eastern Gulf and the trend in the stock is swamped by the rapidly increasing interannual trends in average weight and catch rate. Model fits for the Western Gulf of Mexico private/charter catch rate were the least robust due to the low 2011 landings per day estimate followed by the high 2012 landings per day estimate. Several sensitivity runs were performed in SERO-LAPP-2013-10 to evaluate the influence of changes in Western Gulf of Mexico landings per day on season length.

The product of the bootstrapped distributions for average weights and catch (in numbers) per day yielded a distribution of projected catch (in pounds) per day. The distribution of projected 2014 catch (in pounds) per day for the private/charter sector in the Eastern and Western Gulf of Mexico is shown in **Figure 6**. **Table 3** summarizes estimated federal season catches per day based various confidence limits generated from bootstrapped forecasts.

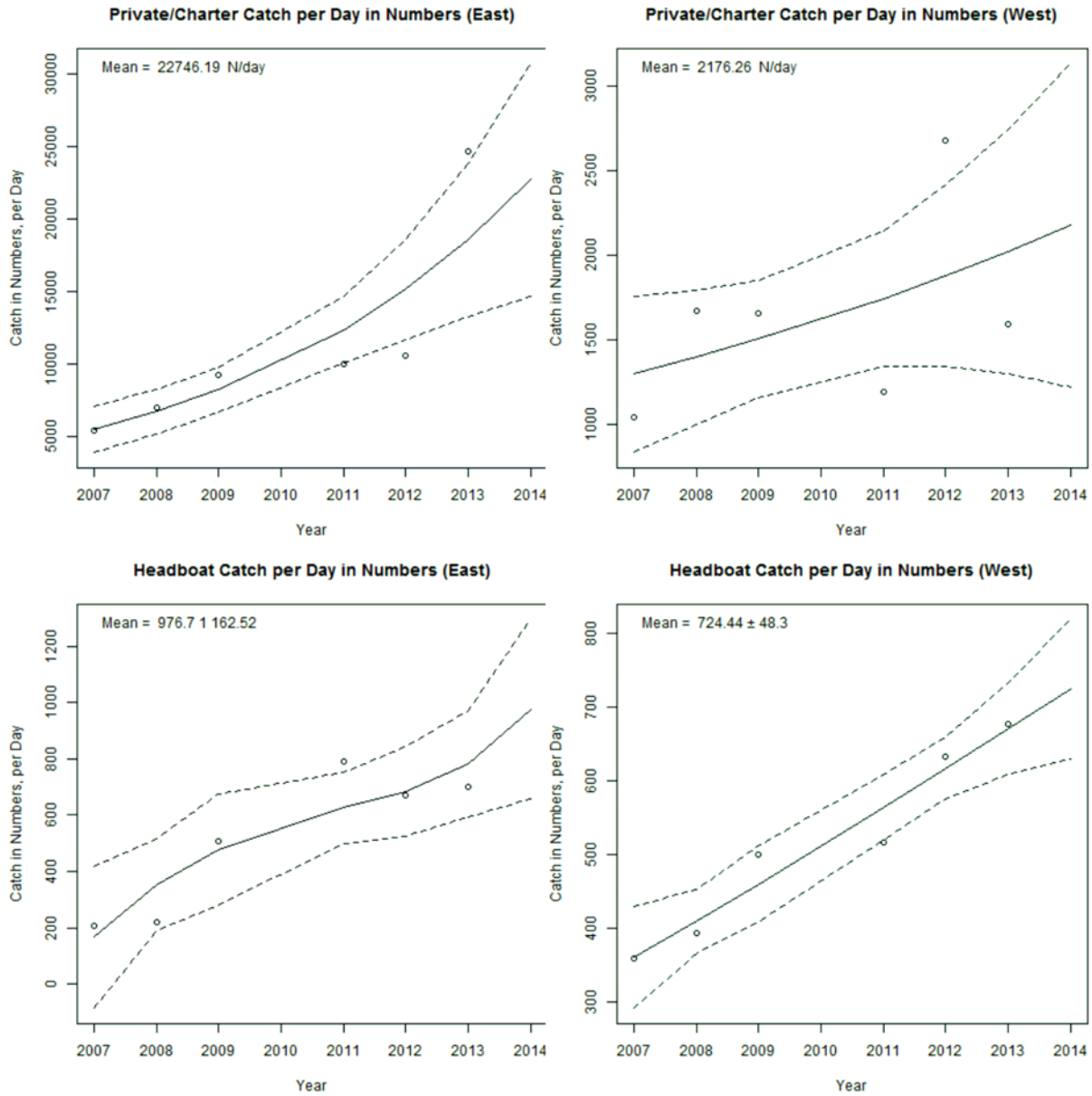


Figure 5. Generalized linear regression fits to mean catch (in numbers) per day for recreational red snapper sampled by MRIP/LA Survey/TPWD in the Eastern and Western Gulf of Mexico. Note that headboat regressions incorporate spawning stock biomass as a predictive covariate. Dashed lines denote 95% confidence limits.

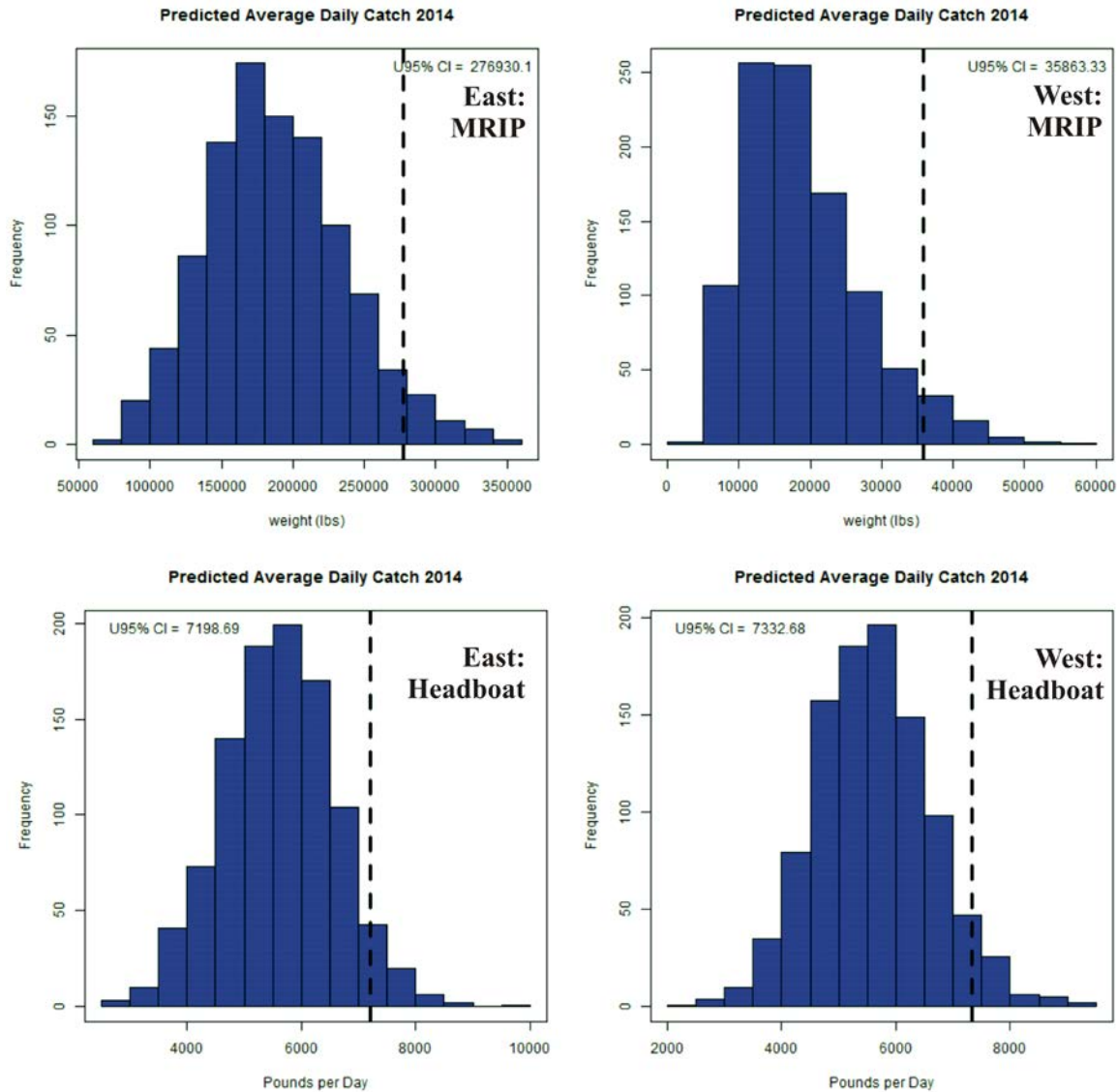


Figure 6. Catch (in pounds) per day from generalized linear regression fits to 1000 bootstrapped distributions of average weight and catch (in numbers) per day for recreational red snapper in the Eastern and Western Gulf of Mexico. Dashed lines denote 95% confidence limits.

Table 3 – Federal season catch rates (lbs/day) associated with various confidence limits generated from bootstrap forecasts. Note: federal season catch rates do not incorporate additional landings from extended state seasons.

Confidence Limit	Federal Catch/Day (lbs ww)
50% (Mean)	219,489
75%	255,770
85%	279,866
95%	327,325

2014 Projections: Season Length

Incorporation of the 2013 MRIP Eastern Gulf of Mexico catch rate as an input variable in the regressions resulted in much higher in-season catch rates than projected in SERO-LAPP-2013-10. Under the base run with no buffer and assuming a 2-fish bag limit and state fishing seasons as summarized in **Table 2**, the federal season would be 15 days, with a 50% chance of exceeding the quota (**Table 4**). Season lengths summarized in **Table 4** assume Florida private catch rates will be approximately 60% of catch rates observed during the federal season. Under a 20% buffer, the ACT would be 4.312 mp ww, and would result in a 9 day season, with a 15% probability of a quota overage. A 30% probability of exceeding the quota would correspond to a 12 day season, or a quota buffer of 10%.

If Florida state water private catch rates are equal to Florida private catch rates during the federal season rather than 60% of federal season catch rates, then the federal season length would be reduced by 6 days from the base run (**Table 5**). Replacing western Gulf projected landings per day with LA survey federal season landings per day in 2013 resulted in no change in the number of days the federal season would be open.

Table 4. Federal season length assuming Florida private catch rates would be approximately 60% of Florida private catch rates during the federal season.

Buffer (%)	Rec ACT (lbs ww)	Federal Season (days)	Prob. of Exceeding Quota
0%	5.39	15	50%
10%	4.851	12	30%
20%	4.312	9	15%
30%	3.773	6	5%
40%	3.234	3	<1%
60%	1.889	0	<1%

Table 5. Federal season length assuming Florida private catch rates would be equal to Florida private catch rates during the federal season.

Buffer (%)	Rec ACT (lbs ww)	Federal Season (days)	Prob. of Exceeding Quota
0%	5.39	9	50%
10%	4.851	6	30%
20%	4.312	3	15%
30%	3.773	0	5%
40%	3.234	0	<1%

Discussion

Past recreational quota overages have occurred for a variety of reasons, including challenges with predicting angler behavior and landing rates, inconsistent state regulations, and rapidly increasing fish sizes. As a result, projection assumptions in more recent years, including this analysis, have been refined to better account for increases in landings per day and changes in average weights. These refinements have led to increasingly conservative and more accurate predictions as described in SERO-LAPP-2013-10.

As with any projection model, the approaches discussed herein are dependent upon assumptions that historical data are accurately estimated and that historical trends are representative of future dynamics. Previous evaluations of Gulf of Mexico recreational red snapper catch rates have indicated that effort compression (i.e., fishing pressure intensifies during open days as the season shortens) is occurring in the fishery (SERO-LAPP-2012-01). These dynamics are implicitly incorporated into the generalized linear regression approaches described by this document. Additionally, the red snapper stock is recovering, leading to changes in abundance and age structure of the exploited stock. This dynamic is explicitly incorporated into our regression approaches as the highly-correlated predictive covariate, SSB. By separating projections by mode of fishing (headboat vs. private/charter) and stock unit (Eastern vs. Western Gulf), inherent differences in rates of fishing between modes and stock recovery between areas are made more explicit, which may continue the trend towards improved forecasting methods revealed by our retrospective analysis.

Estimating the red snapper season for 2014 is additionally complicated due to the substantial changes that took place in 2013 and 2014, with several states adopting much longer fishing seasons and MRIP modifying their dockside sampling methodology. These changes make it difficult to ascertain whether the quota was exceeded in 2013, whether the quota is accurately specified to be consistent with the new MRIP methodology, and what impacts shifting more harvest into state waters in 2013 will have upon catch rates and average weights in 2014.

Setting the season length based on shorter season estimates or incorporating a buffer for management uncertainty in the form of an ACT will reduce the risk of a quota overage (assuming states do not decide to adopt inconsistent regulations beyond those outlined), but increases the likelihood the quota may not be harvested. The mean projected season length is 15 days. A 20% buffer would decrease this season length by 6 days and decrease the probability of overfishing from 50% to 15%.

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