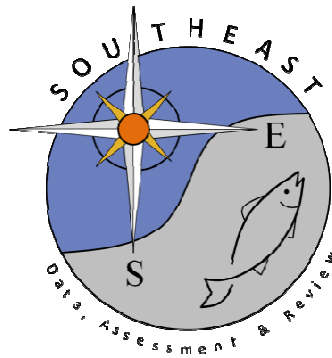


Discards of red grouper (*Epinephelus morio*) for the headboat fishery in the US South Atlantic

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Discards of red grouper (*Epinephelus morio*) for the headboat fishery in the US South Atlantic

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Abstract

The Southeast Region Headboat Survey (SRHS) was modified in 2004 to collect self-reported discards for each reported trip. These self-reported data are currently not validated within the SRHS. The SRHS discard rates were compared to the MRFSS/MRIP At-Sea Observer program discard rates for validation purposes and to determine whether the SRHS discard estimates should be used for a full or partial time series (2004-2015). Discard estimates prior to 2004 are calculated using a proxy method. For red grouper the MRFSS/MRIP CH and MRFSS/MRIP CH:SRHS methods were evaluated as proxy methods for calculating discards from the headboat fishery.

Introduction

The Southeast Region Headboat Survey (SRHS) logbook form was modified in 2004 to collect self-reported discards for each reported trip. From 2004-2012 this was described on the form as the number of fish by species released alive and number released dead. Port agents instructed each captain on criteria for determining the condition of discarded fish. A fish is considered “released alive” if it is able to swim away on its own. If the fish floats off or is obviously dead or unable to swim, it is considered “released dead”. As of Jan 1, 2013 the SRHS began collecting logbook data electronically. Changes to the trip report were also made at this time, one of which removed the condition category for discards i.e., released alive vs. released dead. The new form now collects only the total number of fish released regardless of condition. These self-reported data are currently not validated within the SRHS.

The MRFSS/MRIP At-Sea Observer program was launched in NC and SC in 2004 and in GA and FL in 2005 to collect more detailed information on recreational headboat catch, particularly for discarded fish. Headboat vessels are randomly selected throughout the year in each state, and the east coast of Florida is further stratified into northern and southern sample regions. Biologists board selected vessels with permission from the captain and observe a subset of anglers as they fish on the recreational trip. Data collected include number and species of fish landed and discarded.

The discard rates from the SRHS were compared with the MRFSS/MFIP At-Sea Observer program discards rates in order to assess the validity of these discard estimates. Because discards were not added to the SRHS until 2004, a proxy is used to estimate headboat mode discards for previous years and any years in which At-sea validation does not support the SRHS discard estimates. The MRFSS /MRIP charter mode and the mean MRFSS/MRIP CH:SRHS discard ratio method used in SEDAR 28 (SEDAR 28-Assessment Workshop Report, 2012) were considered as sources for proxy discard estimates.

In SEDAR 19 MRFSS charterboat discard ratios for the period 1981 to 1991 and the values from At-Sea discard data weighted average for 1992 to 2008 were applied to the estimated headboat landings in the respective years. This method attempted to account for regulatory changes prior to 1992 by using the MRFSS charterboat discard ratios, while in turn using the discard data from the At-Sea Observer program for years with a similar regulatory history. However, in the SEDAR 19 assessment discards were only used from the headboat fishery from 2005-2008. The rest of the discards for the time series were generated by the model. For consistency with SEDAR 19 headboat discards were used in the assessment only from 2005-2015. However, discard proxy methods were explored for comparison with the model-generated headboat discard estimates.

Methods

SRHS vs MRFSS/MRIP At-Sea Observer comparison

The purpose of this analysis was to validate the SRHS discard estimates and determine if these data should be used for the entire time-series (2005-2015) or for a partial time-series. Red grouper positive At-Sea Observer trips were compared to SRHS logbook trips to determine the adequacy of coverage by the At-Sea Observer program. The mean discard rate per trip by year and state for matched trips only were compared between the SRHS and At-Sea Observer program. The mean discard rate per trip by year and state were compared between the SRHS and At-Sea Observer program.

Discard proxy

Two sources for proxy discard estimates were considered for years where SRHS discard estimates were not provided (1981-2004). In SEDAR 19 the MRFSS/MRIP CH discard ratio method was used for part of the headboat discard time series. The MRFSS/MRIP CH:SRHS discard ratio method was used to mitigate the differences in magnitude between the MRFSS/MRIP CH discard ratios and the SRHS discard ratios, as is consistent with SEDAR Best Practices. Discard ratios for both sources were compared to the SRHS discard ratios.

Discards were assumed to be negligible prior to 1981. Discard ratios for all both sources were compared to the SRHS discard ratios (2005-2015). Discard rates were applied both by state and as the overall South Atlantic for each proxy method.

Results

SRHS vs MRFSS/MRIP At-Sea Observer comparison

The NC discard rates did not agree between the SRHS and At-Sea survey. Discards from the At-Sea Observer program were limited in SC and nonexistent in GA (Figure 1). This can be attributed to low sample sizes in the MRFSS/MRIP At-Sea Observer program in these states (Table 1 and 2). In FL where sample sizes in the MRFSS/MRIP At-Sea Observer program are larger, the discard rates followed a similar pattern with slight differences in magnitude between the two surveys in all years except 2007. The overall South Atlantic discard rate, which is driven by FL, for both surveys followed the same pattern (Figure 2). When comparing the overall and matched trips, the mean (per trip) discard rates deviated in 2007 and 2010 in the matched trips (Figure 3). In SEDAR 19 the At-Sea Observer discard ratio was found to be closer to the MRFSS/MRIP CH discard ratio, therefore the At-Sea Observer weighted average discards were selected as a proxy for part of the time series. However, possibly due to the MRIP APAIS adjustments to the CH mode landings and discard estimates, the SHRS discard ratios are in closer agreement with the MRFSS/MRIP CH discard ratio (Figure 4).

Discard Proxy

The At-Sea Observer program weighted averages as a proxy were not recommended for use in SEDAR 53 as a result of the SRHS vs MRFSS/MRIP At-Sea Observer comparison.

The red grouper discard ratios from the SRHS were compared to the two proxy sources. The MRFSS/MRIP CH discard ratio and MRFSS/MRIP CH:SRHS discard ratio both agree well with the SRHS from 2005-2012 and 2014-2015 (Figure 5). The MRFSS/MRIP CH:SRHS discard ratio method follows the same pattern as the MRFSS/MRIP CH discard ratio, but with reductions in magnitude (Figure 5). The calculated discards for both proxy methods are presented in Figure 6.

Discussion

SRHS vs MRFSS/MRIP At-Sea Observer comparison

The SRHS and MRFSS/MRIP CH discard ratios in FL exhibit the same pattern and similar magnitude with the exception of 2007 and 2010 matched trips only. This validates the SRHS discard estimates in those years. The SRHS discard ratios are actually closer to the MRFSS/MRIP CH ratios than the At-Sea Observer discard ratios in 2005-2015. Therefore, the SRHS discard ratios were recommended for use for the available time series, beginning in 2005.

Discard Proxy

Both proxy methods follow the same pattern as the SRHS discard estimates with the exception of 2013. The MRFSS/MRIP CH:SRHS discard ratio follows the same pattern as the MRFSS/MRIP CH proxy but with reductions in magnitude. There is little difference between the by state and South Atlantic wide discard ratios for either method. Therefore, the by state ratio is recommended in order to avoid attributing discards to states where discards were negligible. The calculated discards using the MRFSS/MRIP CH:SRHS discard ratio proxy method is recommended for use based on SEDAR Best Practices.

Literature Cited

SEDAR. 2013. SEDAR 28 – Gulf of Mexico Cobia Stock Assessment Report. SEDAR, North Charleston SC. 616 pp. Available online at:
http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=28

Tables

Table 1. Number of red grouper positive trips reported in the SRHS and number of At-Sea Observer trips positive for red grouper by year and state, 2004-2015. No red grouper positive trips were sampled in the At-Sea Observer program in 2004.

| Year | FL | | GA | | NC | | SC | | South Atlantic | |
|------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|
| | At-Sea Observer trips sampled (n) | SRHS reported trips (n) | At-Sea Observer trips sampled (n) | SRHS reported trips (n) | At-Sea Observer trips sampled (n) | SRHS reported trips (n) | At-Sea Observer trips sampled (n) | SRHS reported trips (n) | At-Sea Observer trips sampled (n) | SRHS reported trips (n) |
| 2004 | | 944 | | 1 | | 196 | | 138 | | 1,279 |
| 2005 | 92 | 1,313 | - | 3 | 17 | 173 | 3 | 86 | 112 | 1,575 |
| 2006 | 69 | 1,036 | - | 14 | 13 | 157 | 2 | 182 | 84 | 1,389 |
| 2007 | 41 | 932 | - | 7 | 6 | 121 | - | 204 | 47 | 1,264 |
| 2008 | 24 | 1,356 | - | 3 | 9 | 123 | - | 109 | 33 | 1,591 |
| 2009 | 40 | 2,114 | - | 3 | 1 | 116 | - | 73 | 41 | 2,306 |
| 2010 | 55 | 2,524 | - | 1 | 2 | 101 | - | 63 | 57 | 2,689 |
| 2011 | 30 | 1,618 | - | - | 3 | 93 | - | 48 | 33 | 1,759 |
| 2012 | 35 | 2,177 | - | - | 3 | 74 | - | 23 | 38 | 2,274 |
| 2013 | 55 | 2,643 | - | - | - | 52 | - | 10 | 55 | 2,705 |
| 2014 | 10 | 2,009 | - | - | - | 36 | - | 9 | 10 | 2,054 |
| 2015 | 18 | 1,721 | - | - | - | 26 | - | 5 | 18 | 1,752 |

Table 2. Proportion of red grouper positive At-Sea Observer trips to SRHS reported trips, 2004-2015. No red grouper positive trips were sampled in the At-Sea Observer program in 2004.

| Year | FL | GA | NC | SC | South Atlantic |
|------|------|----|------|------|----------------|
| 2004 | 0.00 | | 0.00 | 0.00 | 0.00 |
| 2005 | 0.07 | | 0.10 | 0.03 | 0.07 |
| 2006 | 0.07 | | 0.08 | 0.01 | 0.06 |
| 2007 | 0.04 | | 0.05 | 0.00 | 0.04 |
| 2008 | 0.02 | | 0.07 | 0.00 | 0.02 |
| 2009 | 0.02 | | 0.01 | 0.00 | 0.02 |
| 2010 | 0.02 | | 0.02 | 0.00 | 0.02 |
| 2011 | 0.02 | | 0.03 | 0.00 | 0.02 |
| 2012 | 0.02 | | 0.04 | 0.00 | 0.02 |
| 2013 | 0.02 | | 0.00 | 0.00 | 0.02 |
| 2014 | 0.00 | | 0.00 | 0.00 | 0.00 |
| 2015 | 0.01 | | 0.00 | 0.00 | 0.01 |

Figures

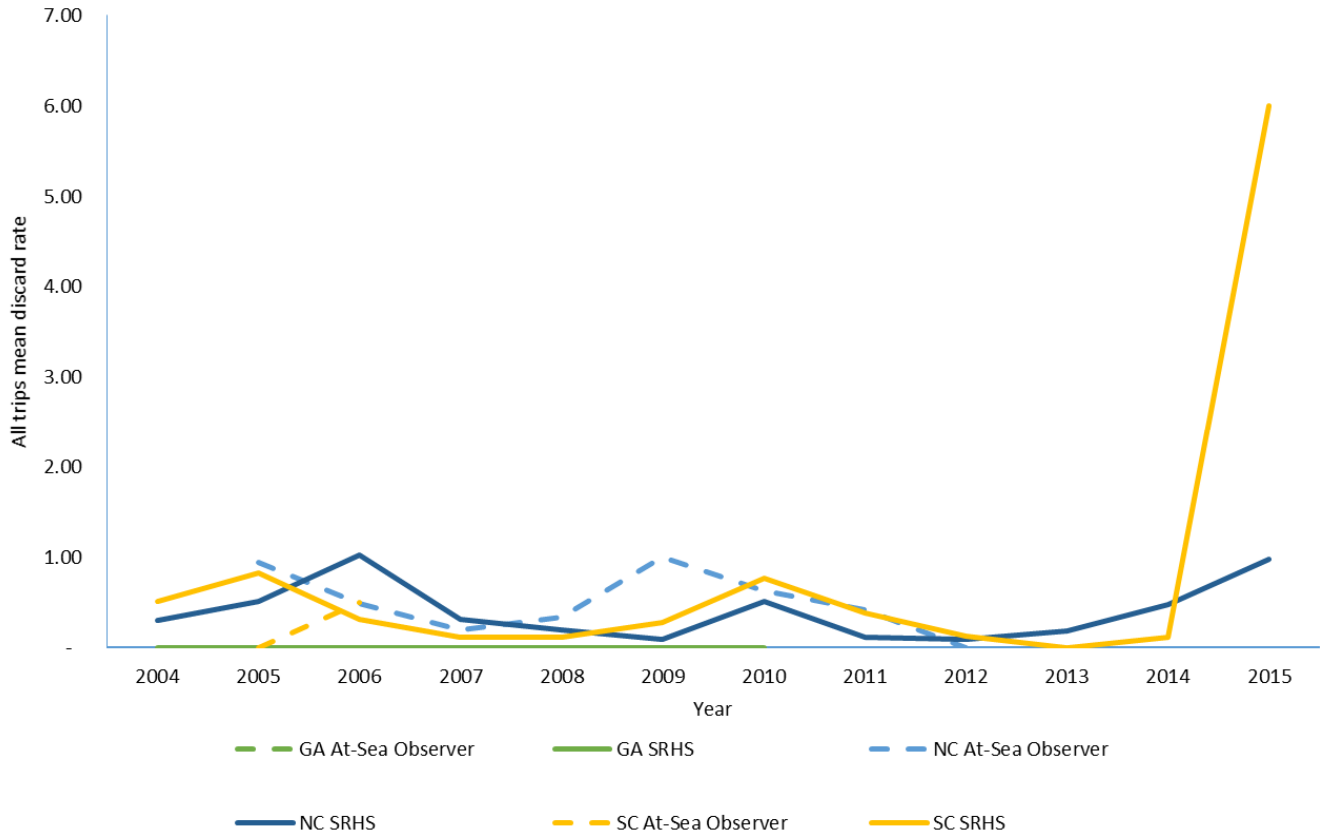


Figure 1. Mean discard rate per trip by year and state for NC, SC and GA in the SRHS and At-sea Observer program, 2004-2015. There were no red grouper positive trips in the At-sea Observer program in 2004.

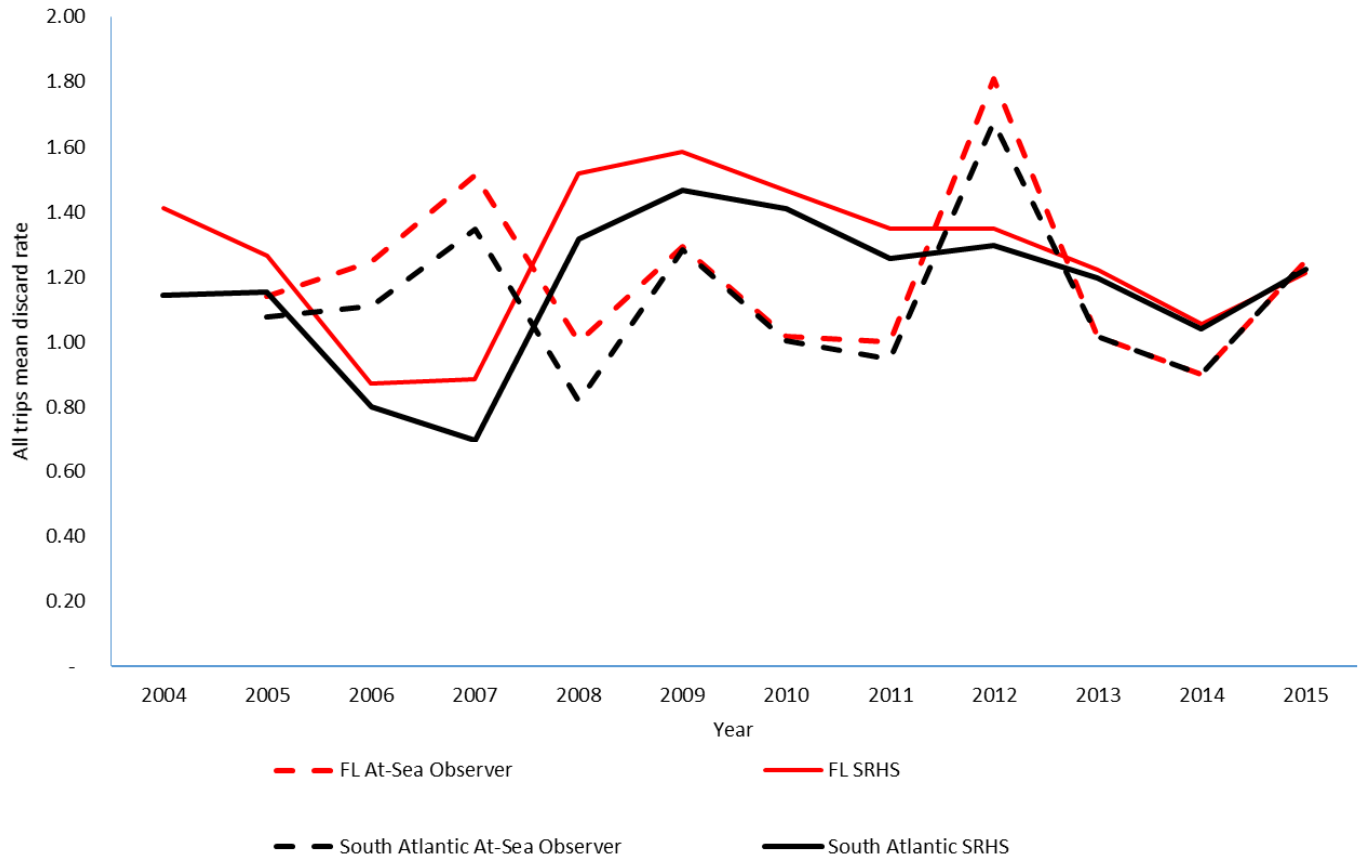


Figure 2. Mean discard rate per trip by year for the SRHS, and At-sea Observer program in FL and the South Atlantic combined from all trips, 2005-2015. There were no red grouper positive trips in the At-sea Observer program in 2004.

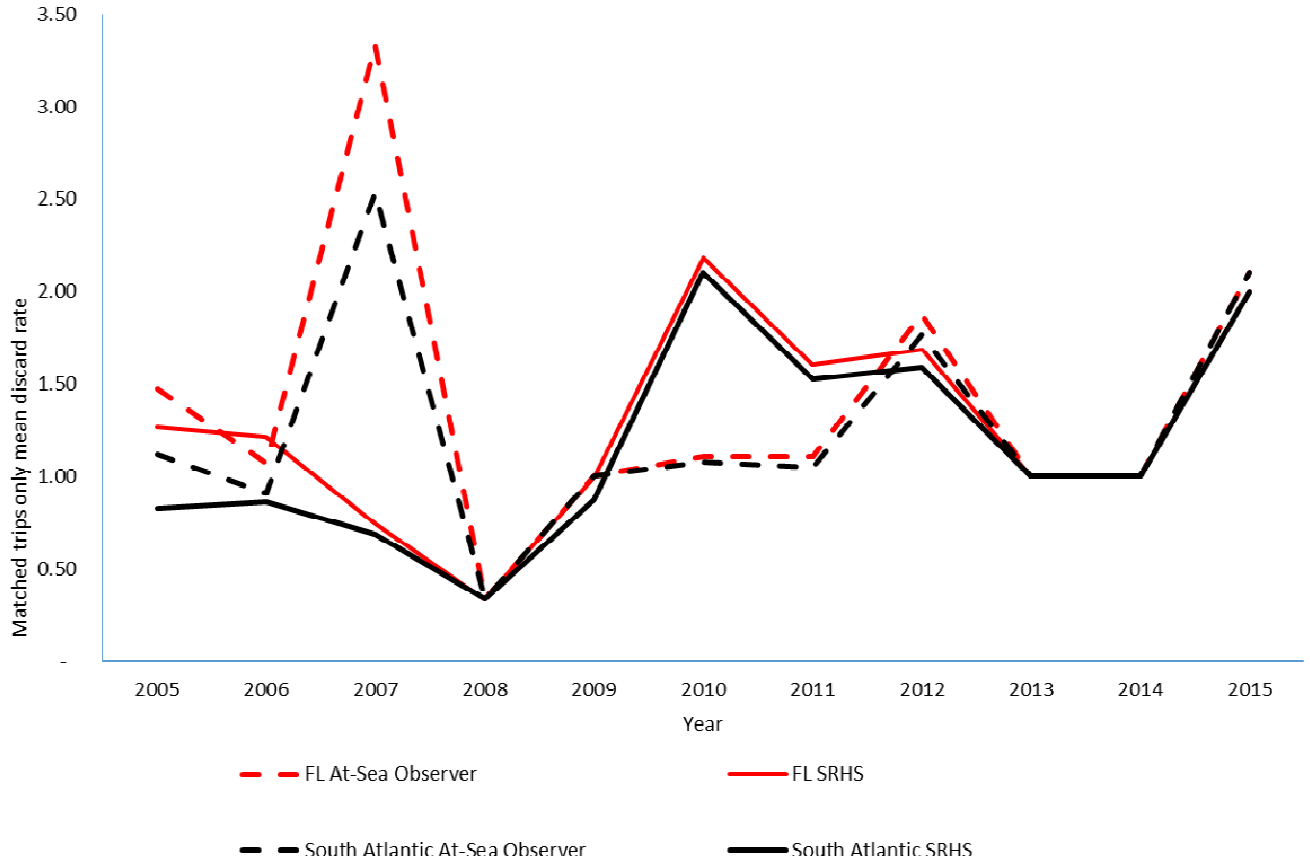


Figure 3. Mean discard rate per trip by year for the SRHS, and At-sea Observer program in FL and the South Atlantic combined from matched trips only, 2005-2015.

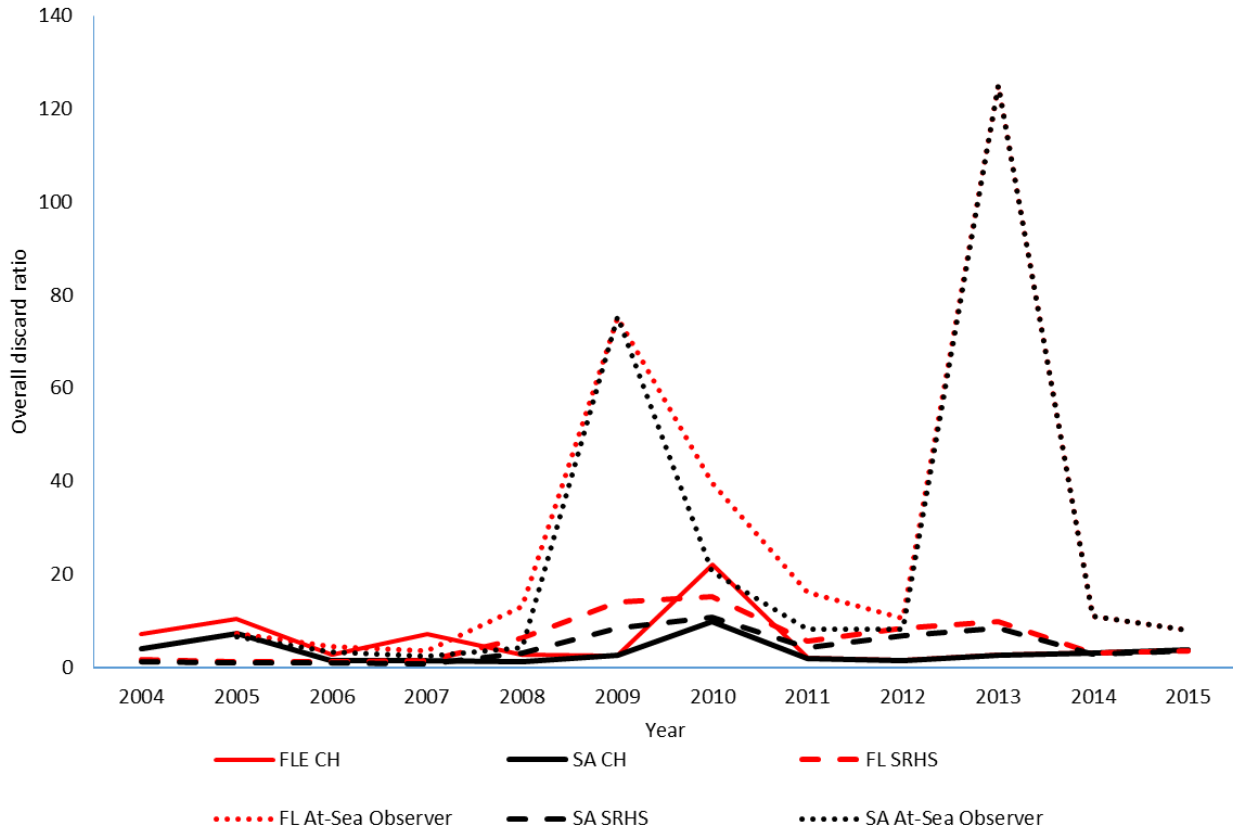


Figure 4a: Overall discard ratio from the SRHS, MRFSS CH, and At-Sea Observer programs in FL and the South Atlantic, 2004-2015. No discards were observed in the At-Sea Observer program in 2004.



Figure 4b: Overall discard rate from the SRHS, MRFSS/MRIP CH, and At-Sea Observer programs in FL, 2004-2015, at a reduced scale. No discards were observed in the At-Sea Observer program in 2004.

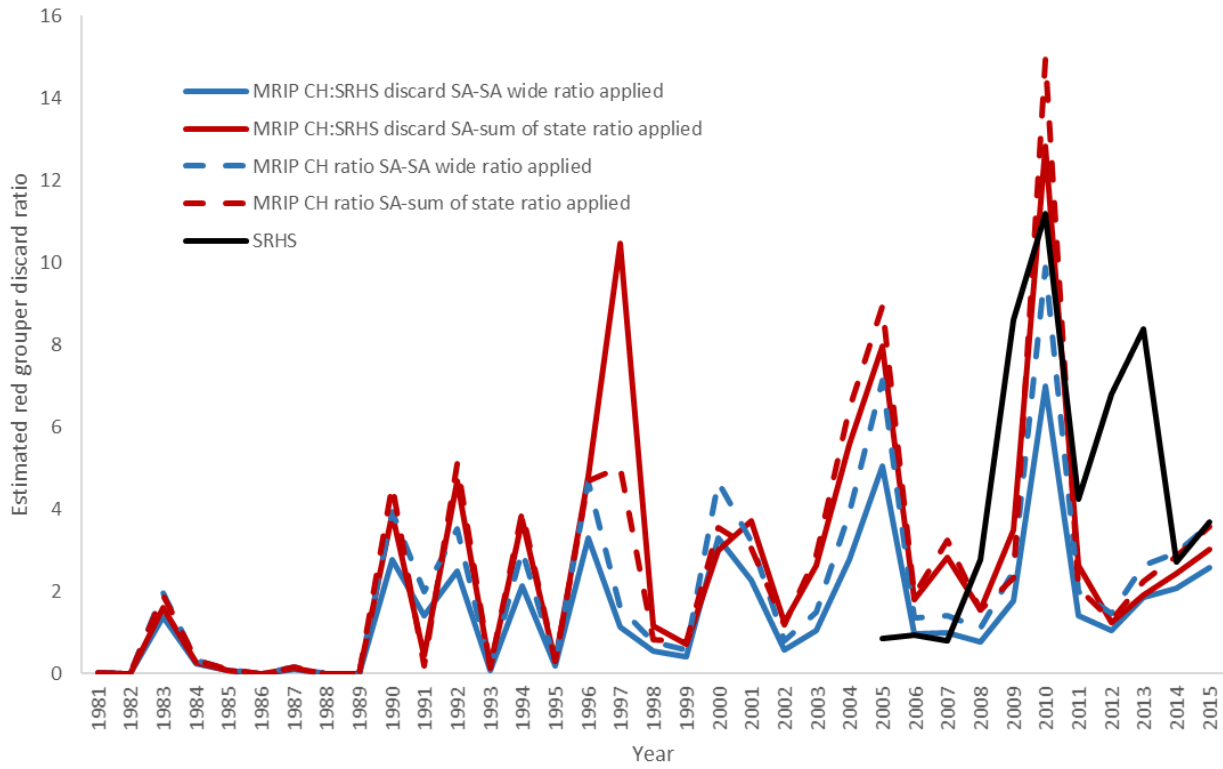


Figure 5. MRFSS/MRIP CH discard ratio (1981-2015), MRFSS/MRIP CH:SRHS discard ratio (1981-2015), and SRHS discard ratios (2004-2015).

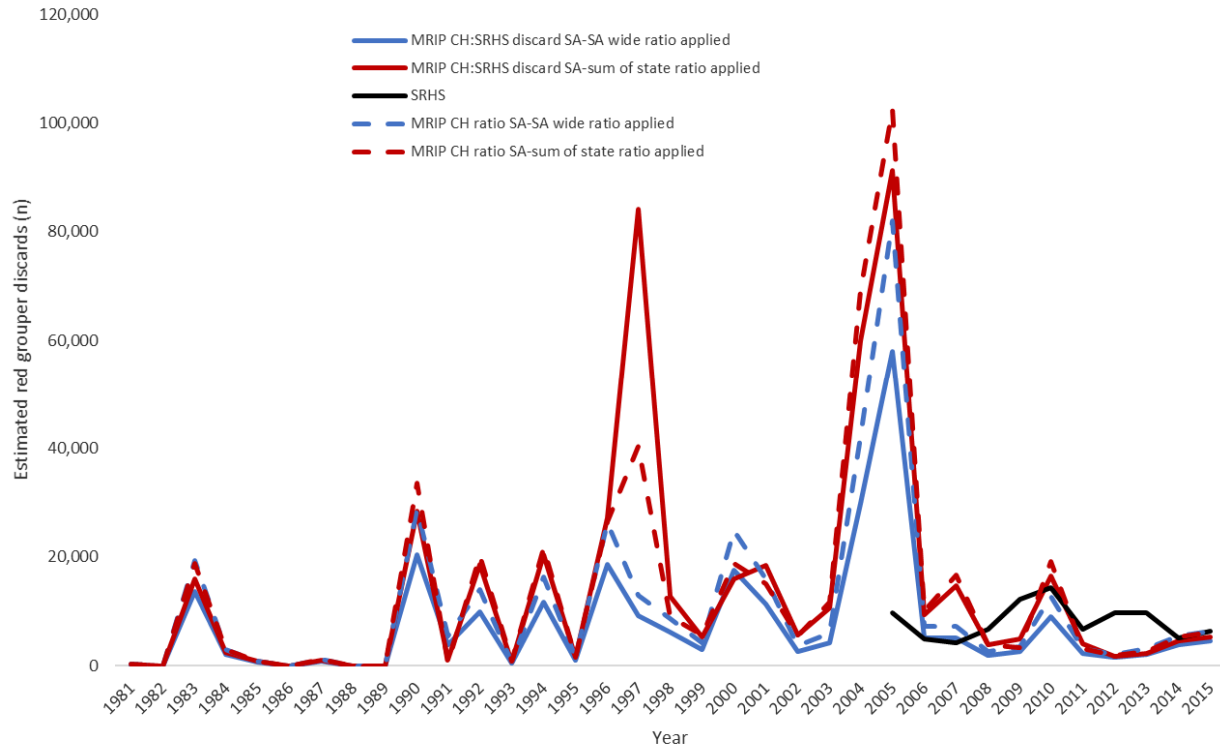


Figure 6. SRHS discards (2005-2015) with calculated discards using the MRFSS/MRIP CH:SRHS proxy method (1981-2015) and MRFSS/MRIP CH proxy method (1981-2015) methods.