Addendum to SEDAR41-DW30: Discards of gray triggerfish (*Balistes capriscus*) for the headboat fisheryin the US South Atlantic

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SEDAR41-AW01

Submitted: 04 December 2015

Please cite this document as:

Fisheries Ecosystem Branch – National Marine Fisheries Service. 2015. Addendum to SEDAR41-DW30: Discards of gray triggerfish (*Balistes capriscus*) for the headboat fishery in the US South Atlantic. SEDAR41-AW01. SEDAR, North Charleston, SC. 13 pp.

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Addendum to SEDAR 41-DW30: Discards of gray triggerfish (*Balistes capriscus*) for the headboat fishery in the US South Atlantic

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August 4-6, 2015

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 (2004-2014). Discard estimates prior to 2004 are calculated using a proxy method. For gray triggerfish the MRFSS/MRIP CH, MRFSS/MRIP PR, MRFSS/MRIP CH:SRHS, and SRHS dockside sample discard ratio 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 was considered "released alive" if it was able to swim away on its own. If the fish floated off or was obviously dead or unable to swim, it was 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, MRFSS/MRIP private boat mode, the mean MRFSS/MRIP CH:SRHS discard ratio method used in SEDAR 28 (SEDAR 28-Assessment Workshop Report, 2012), and the SRHS dockside sample method were all considered as sources for proxy 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 (2004-2014) or for a partial time-series. Gray triggerfish 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

Several sources for proxy discard estimates were considered. The MRFSS/MRIP charter boat and private boat modes (b2/ab1) were considered. In SEDAR 32 the MRFSS/MRIP CH discard ratios were applied to the SRHS landings to estimate discards. This was the recommended method for calculating headboat discards prior to 2004. In SEDAR 28 the mean 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.

The SRHS dockside sample method was developed based on analysis that the reported gray triggerfish landings were well correlated with the numbers sampled in BPs (SEDAR 41-DW46). This method uses information on size limits to determine changes in the proportion of fish under a certain size over time. There were no size limits on gray triggerfish until 1995, when Florida adopted a 12in TL size limit. From the SRHS dockside samples calculate the mean ratio of fish less than 12in TL (1976-1980) and subtract from that the mean ratio of fish less than 12in TL (1981-1994) (if negative assume the proportion of discards is equal to the proportion of fish

<12in TL in the dockside sample); apply that to the SRHS landings (1981-2003) to get the number of fish <12in TL discarded (1984-2003). Calculate the mean ratio of fish 12in TL (1981-1994) and subtract from that the mean ratio of fish less 12in TL (1995-2003) (if negative assume the proportion of discards is equal to the proportion of fish <12in TL in the dockside sample); apply that to the SRHS landings (1995-2003) to estimate the number of fish 12in TL discarded (1995-2003).

In order to estimate discards during 1974-1980, a five year average discard ratio (1981-1985) was applied to the landings (1974-1980). This method was used for all of the discard proxy options.

Discard ratios for all four sources were compared to the SRHS discard ratios (2004-2014).

Results

SRHS vs MRFSS/MRIP At-Sea Observer comparison

The NC, SC and GA discard rates between the SRHS and At-Sea survey agreed in most years (Figure 1) despite low sample sizes in the MRFSS/MRIP At-Sea Observer program in these states (Table 1). Discard rates in these states were very low in both surveys. In FL where sample sizes in the MRFSS/MRIP At-Sea Observer program are larger, the discard rates followed the same pattern between the two surveys from 2010-2014 but with differences in magnitude. The overall South Atlantic discard rate, which is driven by FL, for both surveys followed the same pattern between 2010-2014 (Figure 2). When comparing the overall and matched trips, the mean (per trip) discard rates the rate are much lower in 2005-2010 in the matched trips from the At-Sea Observer program (Figure 3).

Discard Proxy

The RWG compared the gray triggerfish discard ratios from the SRHS to the three proxy sources. The MRFSS/MRIP CH discard ratios follow the same pattern as the SRHS from 2006-2009. However, there are large differences in magnitude between the SRHS and MRFSS/MRIP CH in certain years (Figure 4a). The MRFSS/MRIP PR discard ratio does not agree with the SRHS and is significantly higher than the SRHS in most years (2004-2014). 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 4b). The SRHS dockside sample method cannot be directly compared to the SRHS logbook discards in 2004-2014. The calculated discards using all four methods are presented in Figure 5.

Discussion

SRHS vs MRFSS/MRIP At-Sea Observer comparison

The SRHS and MRFSS/MRIP At-Sea Observer discard ratios in FL exhibit the same pattern from 2008-2014 in both the overall and matched trips only. This validates the SRHS discard estimates in those years. The 2005-2006 discard rates in FL exhibit a similar pattern with differences in magnitude in the overall trips but in the matched only trips the discard rate for the At-Sea Observer program was lower. In SEDAR 32 (SEDAR 32-Data Workshop Report, 2012), it was determined that due to low coverage rates (1-2 percent of trips by state) the At-Sea Observer program discard data did not adequately characterize a sporadic headboat fishery such as gray triggerfish. Therefore the SRHS discard data was recommended for use (2004-2014).

Discard Proxy

The MRFSS/MRIP CH discard ratio agrees with the SRHS in 2006-2009, however it shows the opposite trend in 2010-2014. The MRFSS/MRIP PR discard ratio proxy doesn't agree with the SRHS discard ratio and is significantly higher, and therefore is not recommended for consideration. The MRFSS/MRIP CH:SRHS discard ratio method is closer to the SRHS discard rate in terms of magnitude in all years but 2010-2012. The SRHS dockside method does not capture changes in desirability in the gray triggerfish fishery. Due to the lack of size limits in the fishery in states other than Florida it is not possible to calculate the proportion of discarded fish from the dockside sample in other states. The SRHS dockside method does not work well for species with few/no size limits and with significant changes in desirability over time. Therefore the SRHS dockside method was not recommended for consideration.

The following options were presented for consideration by the RWG.

Option 1: Use the MRFSS/MRIP CH discard ratio proxy method 1981-2003, use a five year average discard ratio (1981-1985) to estimate discards 1974-1980.
Option 2: Use the MRFSS/MRIP CH:SRHS discard ratio proxy method 1981-2003, use a five year average discard ratio (1981-1985) to estimate discards 1974-1980.

Decision: Option 2. The MRIP CH:SRHS discard ratio method follows the same pattern as the SRHS in 2006-2009 and is closer to the SRHS discard rate in terms of magnitude in all years but 2010-2012. The increase in discards during later years is most likely driven by discards from FL after size limit regulation was introduced in 1995.

Literature Cited

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Tables

Table 1. Number of gray triggerfish positive trips reported in the SRHS and number of At-Sea Observer trips positive for gray triggerfish by year and state, 2004-2014. No gray triggerfish positive trips were sampled in the At-Sea Observer program in 2004.

	FL		GA		NC		SC		South Atlantic	
Year	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)	At-Sea Observer trips sampled(n)
2004	1,684		86		508		677		2,955	
2005	1,385	83	88	1	318	24	400	14	2,191	122
2006	1,350	76	55	2	287	15	449	11	2,141	104
2007	1,362	72	60	2	299	24	639	12	2,360	110
2008	2,316	59	48	2	317	20	479	7	3,160	88
2009	3,418	74	126	7	369	15	525		4,438	96
2010	3,739	87	48	3	461	29	659	1	4,907	120
2011	3,588	65	90	3	361	25	558	11	4,597	104
2012	3,973	70	82	7	387	39	410	5	4,852	121
2013	3,649	85	104	12	398	32	418		4,569	129
2014	4,740	77	122	7	404	11	421	1	5,687	96

Table 2. Proportion of gray triggerfish positive At-Sea Observer trips matched to SRHS reported trips, 2005-2014. No gray triggerfish positive trips were sampled in the At-Sea Observer program in 2004.

Year	FL	GA	NC	SC	South Atlantic
2005	0.010	0.011	0.025	0.030	0.016
2006	0.015		0.024	0.016	0.016
2007	0.013		0.037	0.013	0.016
2008	0.011		0.038	0.010	0.014
2009	0.009	0.032	0.016		0.009
2010	0.012		0.043		0.013
2011	0.011	0.022	0.044	0.009	0.014
2012	0.009	0.061	0.075	0.007	0.015
2013	0.013	0.115	0.055		0.018
2014	0.010	0.041	0.027		0.011

Figures

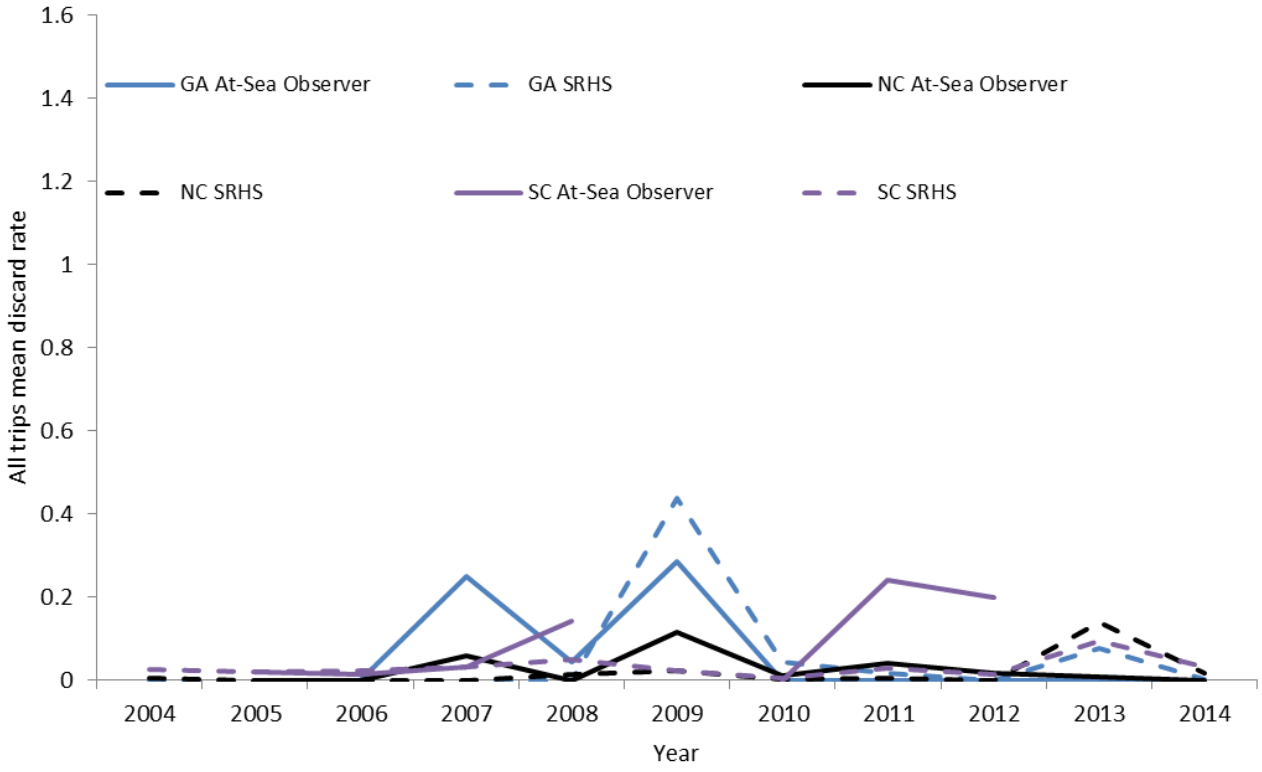

Figure 1. Mean discard rate per trip by year and state for NC, SC and GA in the SRHS and At-sea Observer program, 2004-2014. There were no gray triggerfish positive trips in the At-sea Observer program in 2004.

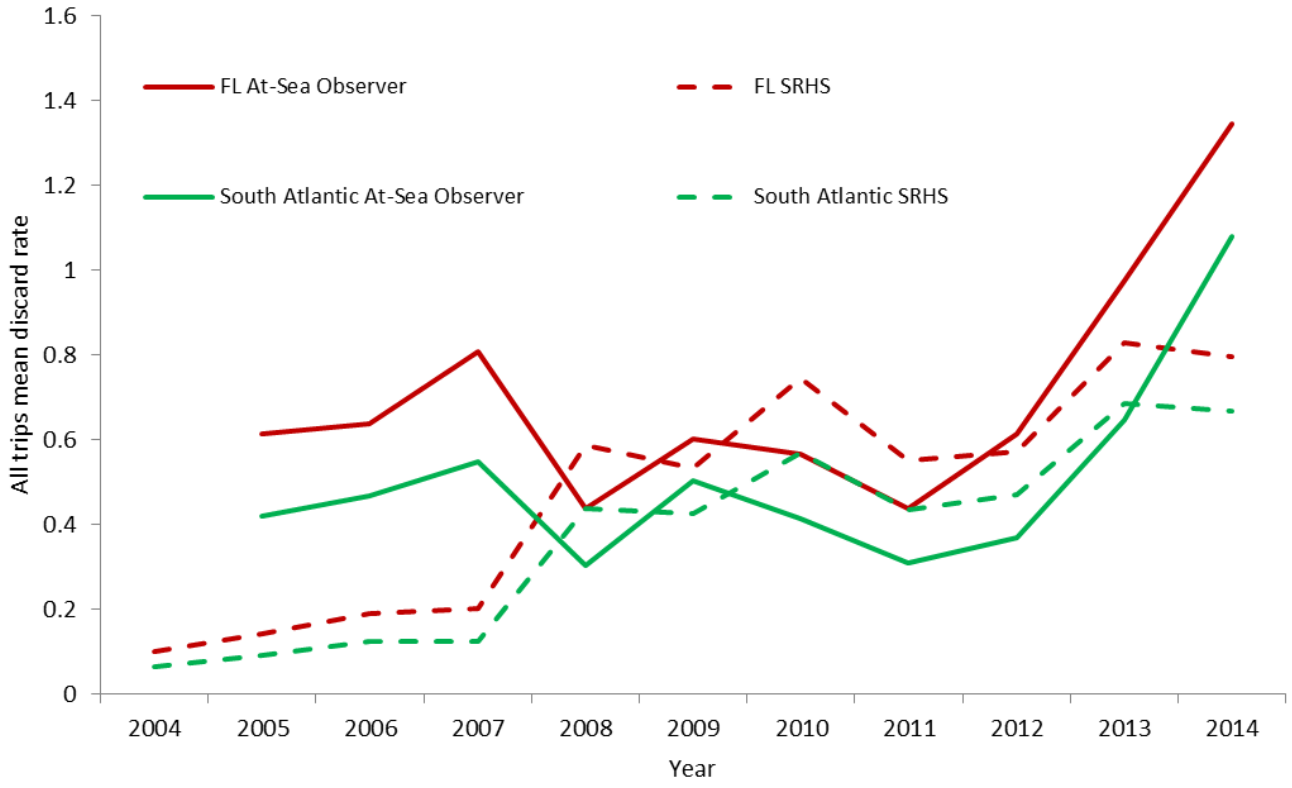

Figure 2. Mean discard rate per trip by year for all gray triggerfish positive trips in the SRHS and At-sea Observer program in FL and the South Atlantic combined, 2004-2014. There were no gray triggerfish positive trips in the At-sea Observer program in 2004.

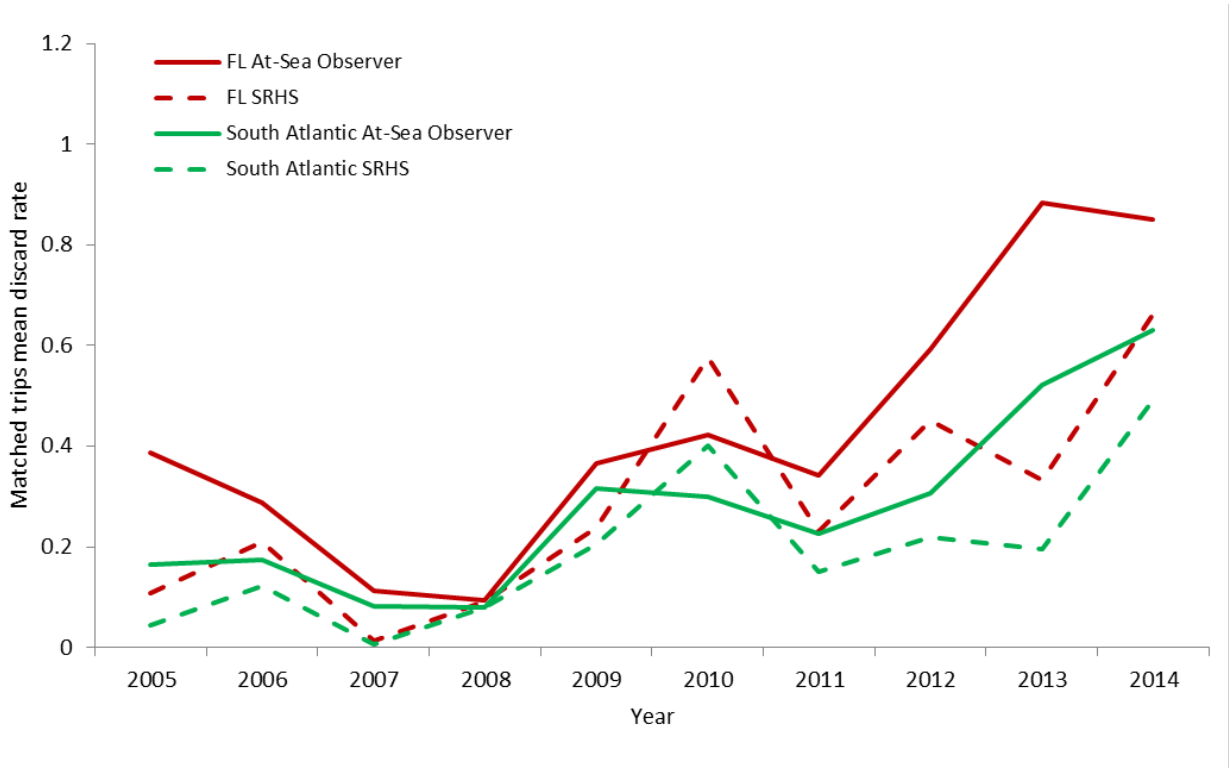

Figure 3. Mean discard rate per trip by year for gray triggerfish positive trips in the SRHS and At-sea Observer program in FL and the South Atlantic combined from matched trips only, 2005-2014.

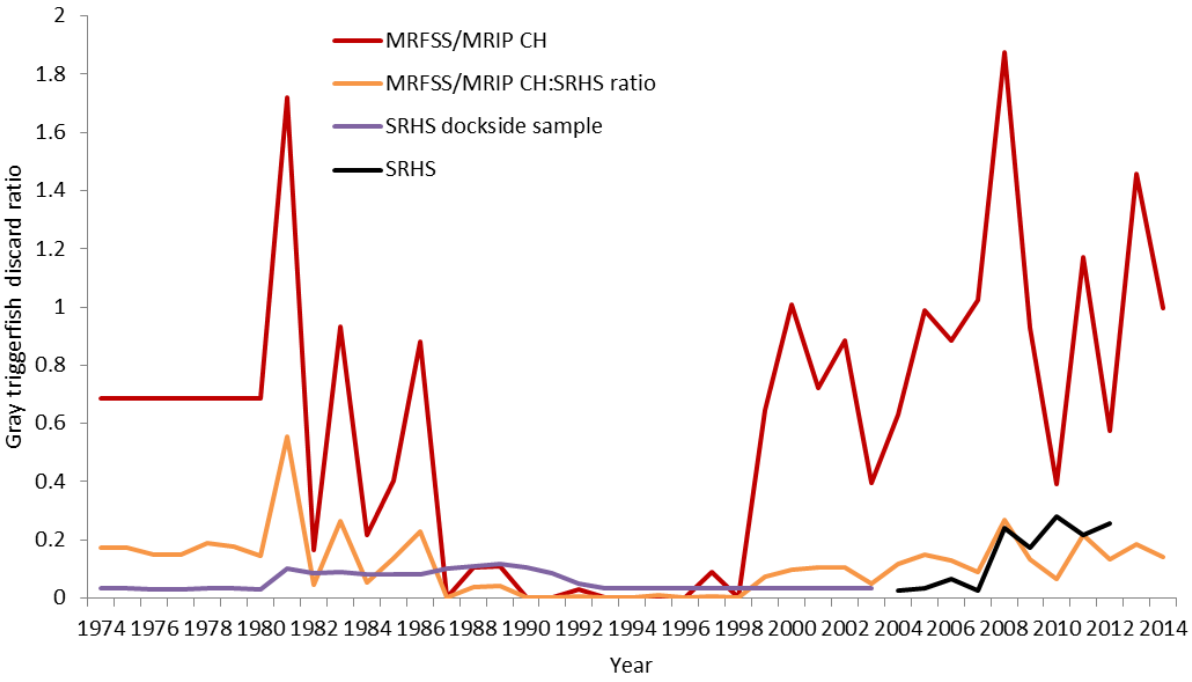

Figure 4a. MRFSS/MRIP CH (1974-2014), MRFSS/MRIP CH:SRHS discard ratio methods (1974-2014), SRHS dockside sample (1974-2003), and SRHS discard ratios (2004-2014).

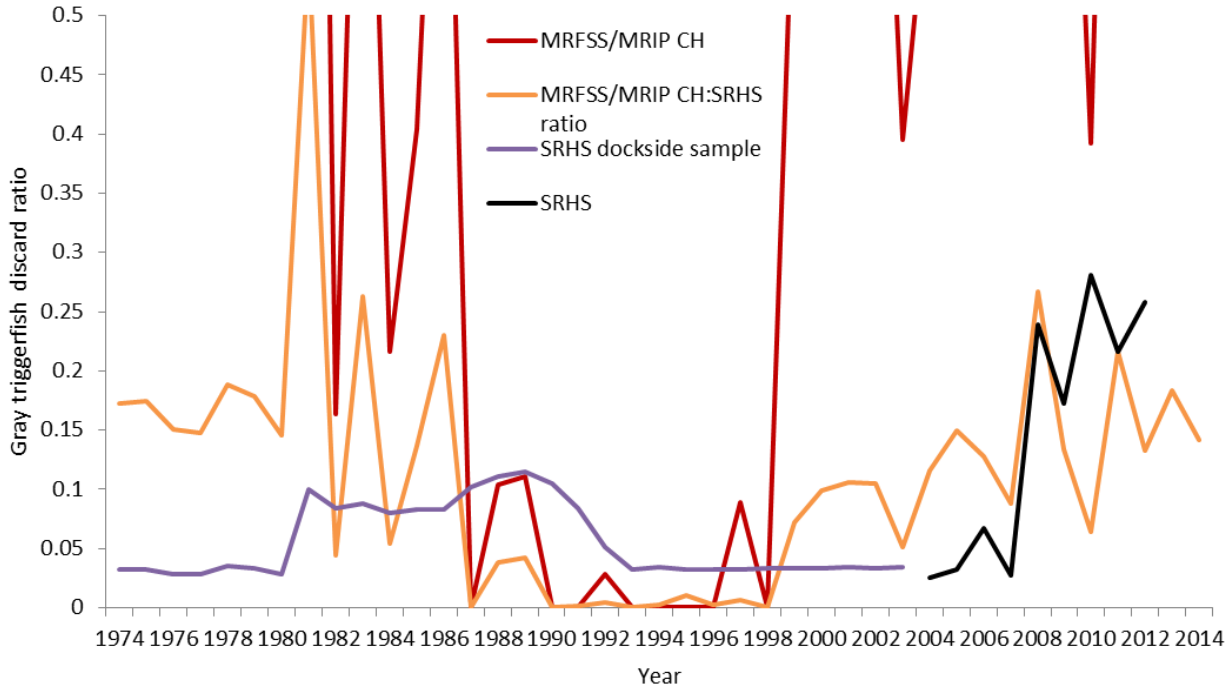

Figure 4b. MRFSS/MRIP CH (1974-2014), MRFSS/MRIP CH:SRHS discard ratio methods (1974-2014), SRHS dockside sample (1974-2003), and SRHS discard ratios (2004-2014).

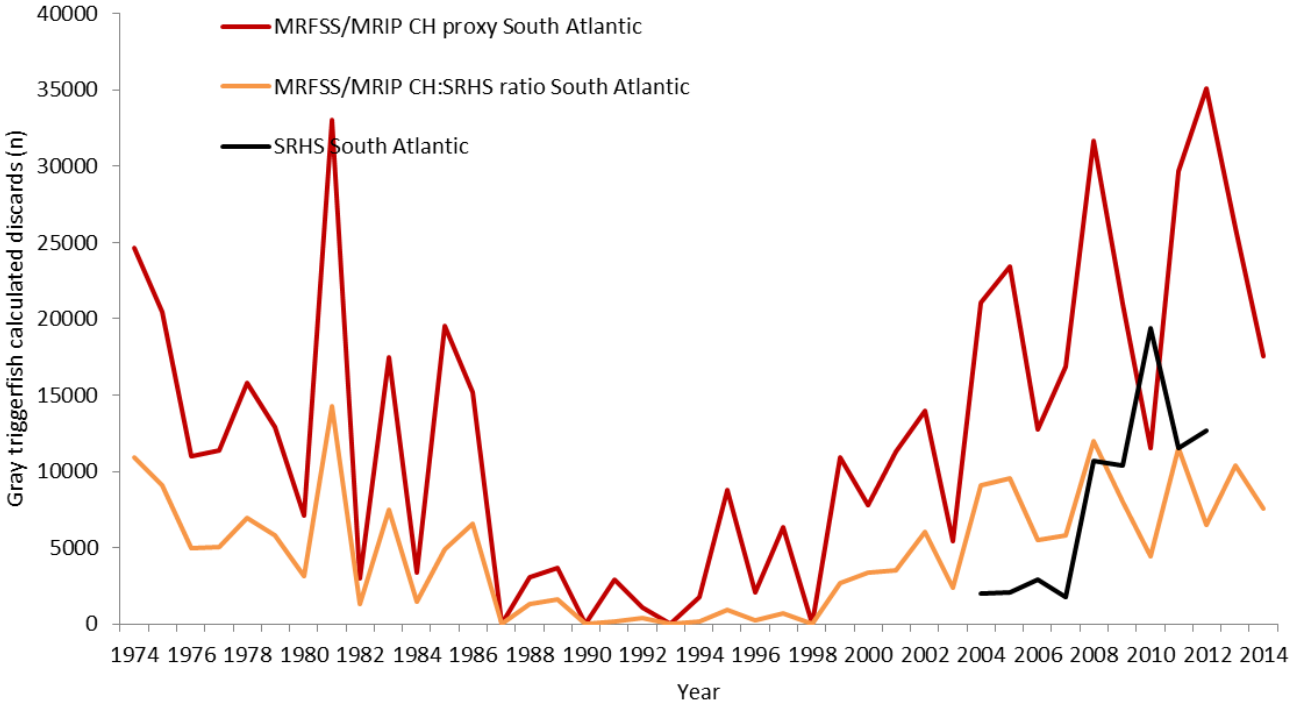

Figure 5. SRHS discards (2004-2014) with calculated discards using the MRFSS/MRIP CH proxy (1974-2014) and MRFSS/MRIP CH:SRHS discard ratio proxy methods (1974-2014).