Discards of vermilion snapper (*Rhomboplites aurorubens*) for the headboat fishery in the US South Atlantic

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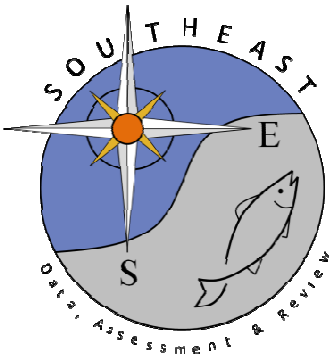
SEDAR55-WP08

Submitted: 20 December 2017



Please cite this document as:

Fisheries Ecosytems Branch, National Marine Fisheries Service, Southeast Fisheries Science Center, Beaufort, NC. 2017. Discards of vermilion snapper (*Rhomboplites aurorubens*) for the headboat fishery in the US South Atlantic. SEDAR55-WP08. SEDAR, North Charleston, SC. 12 pp.

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Discards of vermilion snapper (*Rhomboplites aurorubens*) 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 proportions were compared to the MRIP At-Sea Observer program discard proportions for validation purposes and to determine whether the SRHS discard estimates should be used for a full or partial time series (2004-2013). Discard estimates prior to 2004 are calculated using a proxy method. For vermilion snapper the MRIP CH and MRIP CH:SRHS 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 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 not currently validated within the SRHS.

The MRIP At-Sea Observer program was launched in FL in 2005 to collect more detailed information on recreational headboat catch, particularly for discarded fish. No trips were sampled in FL in 2008. 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 At-Sea Observer program does not operate in the rest of the US Gulf of Mexico.

The discard proportions (b2/ab1b2) from the SRHS were compared with the MRFSS/MFIP At-Sea Observer program discard proportions 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 MRIP charter mode and mean MRIP CH:SRHS discard ratio method used in SEDAR 28 (SEDAR 28-Assessment Workshop Report, 2012) were considered as sources for proxy discard estimates.

Methods

SRHS vs 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 (2004-2016) or for a partial time-series. Vermilion snapper 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 proportion per trip by year for matched trips only was compared between the SRHS and At-Sea Observer program in the state of FL. The mean discard proportion per trip by year was compared between the SRHS and At-Sea Observer program in the state of FL.

Discard proxy

Several sources for proxy discard estimates were considered. The MRIP charter boat mode (b2/ab1) was considered. In SEDAR 17 the MRIP charter boat mode discard proxy was used to estimate headboat discards (SEDAR 17-Assessment Workshop Report, 2018). This was the recommended method for calculating discards from the headboat fishery in all years. In SEDAR 28 the mean MRIP CH:SRHS discard ratio method was used to mitigate the differences in magnitude between the MRIP CH discard ratios and the SRHS discard ratios. This method is currently the SEDAR Best Practice for calculating headboat discards. Discard ratios for both sources were compared to the SRHS discard ratios.

Results

SRHS vs MRIP At-Sea Observer comparison

In the state of Florida the discard proportions between the SRHS and At-Sea survey matched trips follow the same pattern with differences in magnitude in 2005-2007 and again in 2012-2013. In 2008-2011 and 2014-2016 the discard proportions agree more closely (Figure 1). The discard proportions in the two surveys (both matched trips and overall trips) are similar in North Carolina throughout the time series. At-Sea Observer coverage is low in Georgia and South Carolina (no vermilion snapper positive trips were sampled in South Carolina in 2010, 2013-2015). Low sample sizes in the MRIP At-Sea Observer program could explain the differences in magnitude between the SRHS and the At-Sea program (Tables 1 and 2). However, in most years when data is available in South Carolina and Georgia the discard proportions follow the same pattern as the SRHS. When comparing the overall and matched trips, the mean (per trip) discard proportions are nearly identical in the matched trips and the overall trips from the At-Sea Observer program.

Discard Proxy

The RWG compared the vermilion snapper discard proportions from the SRHS to the two proxy sources. The MRIP CH discard proportions follows the same pattern as the SRHS from 2004-2010 and 2013-2015. However, there are differences in magnitude between the SRHS and MRIP CH in certain years (Figure 3). There is a slight lag in the decline of discards in 2011-2012 in the SRHS. The MRIP CH:SRHS discard ratio method follows the same pattern as the MRIP CH discard ratio, but with reductions in magnitude. The calculated discards using all three sources are presented in Figure 4.

Discussion

SRHS vs MRIP At-Sea Observer comparison

The SRHS and MRIP At-Sea Observer discard proportions in Florida and North Carolina exhibit the same pattern from 2005-2016 in the matched trips. This validates the SRHS discard estimates in those years and areas.

The following options were considered.

Option 1: Use the SRHS discard estimates in all areas 2004-2016 and the preferred proxy method 1981-2003.
Option 2: Use the preferred proxy method (to be determined by the RWG) in all areas in all years (2004-2016).

Recommendation: Option 1. The SRHS discard estimates are validated by the At-Sea Observer discard proportion comparison, particularly in Florida and North Carolina. This is also consistent with the SEDAR 17 update.

Discard Proxy

The MRIP CH discard ratio is higher than that of the SRHS in 2004-2009. The MRIP CH:SRHS discard ratio method is closer to the SRHS discard proportion in terms of magnitude. The MRIP CH:SRHS discard ratio method presumes use of the SRHS discard estimates for at least a partial time series. The final calculated discards from all three methods are very similar in 2008-2015.

The following options are for consideration by the RWG.

Option 1: Use the MRIP CH discard ratio proxy method 1981- end year (determined by RWG).
Option 2: Use the MRIP CH:SRHS discard ratio proxy method 1981-end year (determined by RWG).

Recommendation: Use the MRIP CH:SRHS discard ratio proxy method 19816-2003 and the SRHS discards 2004-2016. The SRHS discards are validated by the At-Sea Observer data in 2004-2016. The MRIP CH:SRHS discard ratio proxy method is the current SEDAR Best Practices accepted method, and allows for changes in management and year class effects to be incorporated.

Literature Cited

SEDAR. 2011. SEDAR 17 – South Atlantic Vermilion snapper Stock Assessment Report. SEDAR, North Charleston SC. 450 pp. Available online at: http://sedarweb.org/docs/sar/S17SAR2%20Vermilion%20Snapper%20Final.pdf

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 vermilion snapper positive trips reported in the SRHS and number of At-Sea Observer trips positive for vermilion snapper by year and state, 2004-2016. No vermilion snapper positive trips were sampled in the At-Sea Observer program in 2004.

	FL		GA		NC		SC		SouthAtlantic	
Year	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		1,484		141		374		559		2,558
2005	43	1,075		130	31	260	25	385	99	1,850
2006	45	1,119	2	123	24	278	14	503	85	2,023
2007	58	1,039	1	105	23	254	10	600	92	1,998
2008	65	1,825	2	96	28	285	7	437	102	2,643
2009	62	2,097	5	147	15	323	1	517	83	3,084
2010	43	1,943		78	23	319		506	66	2,846
2011	33	1,813	2	103	19	226	7	470	61	2,612
2012	46	2,093	5	64	33	268	4	354	88	2,779
2013	44	1,808	12	82	25	266		297	81	2,453
2014	54	2,092	8	117	10	294		376	72	2,879
2015	76	2,977	5	103	6	307		339	87	3,726
2016	61	3,411	4	110	13	327	5	414	83	4,262

Table 2. Proportion of vermilion snapper positive At-Sea Observer trips matched to SRHS reported trips by year and state, 2004-2016. No vermilion snapper positive trips were sampled in the At-Sea Observer program in 2004.

Year	FL	GA	NC	SC	South Atlantic
2004	-	-	-	-	-
2005	0.04	-	0.12	0.06	0.05
2006	0.04	0.02	0.09	0.03	0.04
2007	0.06	0.01	0.09	0.02	0.05
2008	0.04	0.02	0.10	0.02	0.04
2009	0.03	0.03	0.05	0.00	0.03
2010	0.02	-	0.07	-	0.02
2011	0.02	0.02	0.08	0.01	0.02
2012	0.02	0.08	0.12	0.01	0.03
2013	0.02	0.15	0.09	-	0.03
2014	0.03	0.07	0.03	-	0.03
2015	0.03	0.05	0.02	-	0.02
2016	0.02	0.04	0.04	0.01	0.02

Figures

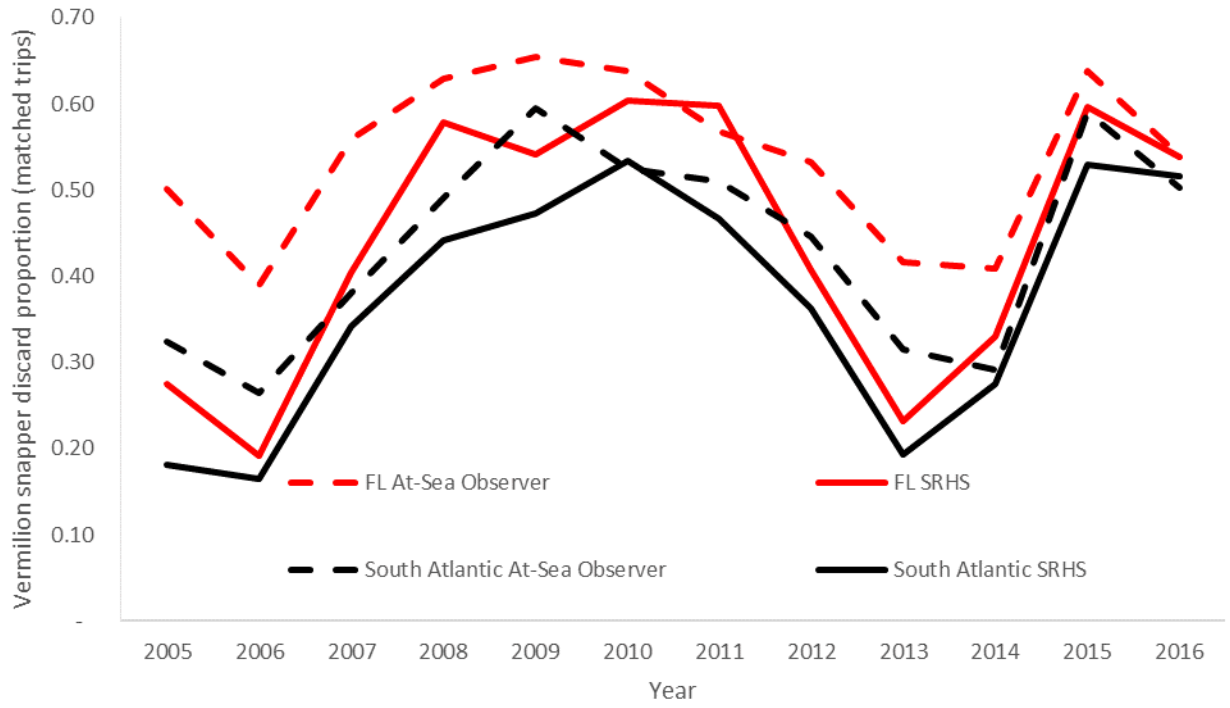

Figure 1a. Mean discard proportion per trip by year in the SRHS and At-sea Observer program in Florida and the overall South Atlantic, 2004-2016. There were no vermilion snapper positive trips sampled in the At-sea Observer program in 2004.

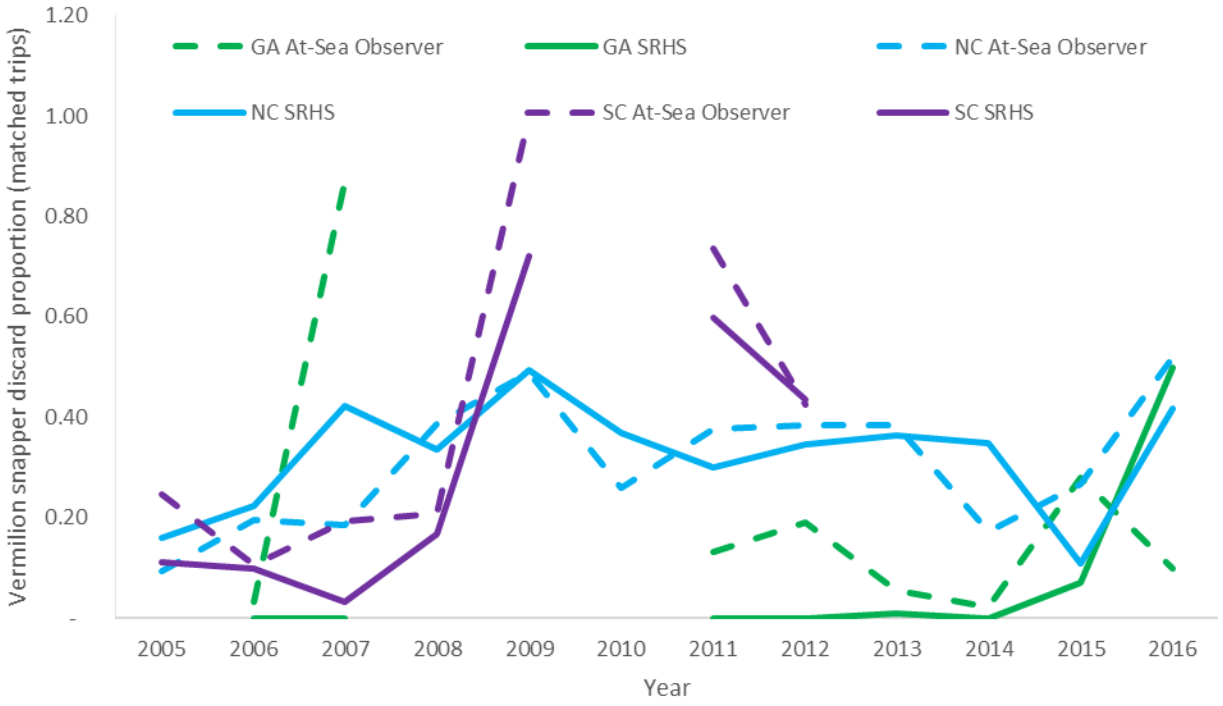

Figure 1b. Mean discard proportion per trip by year in the SRHS and At-sea Observer program in North Carolina, South Carolina, and Georgia, 2004-2016. There were no vermilion snapper positive trips sampled in the At-sea Observer program in 2004.

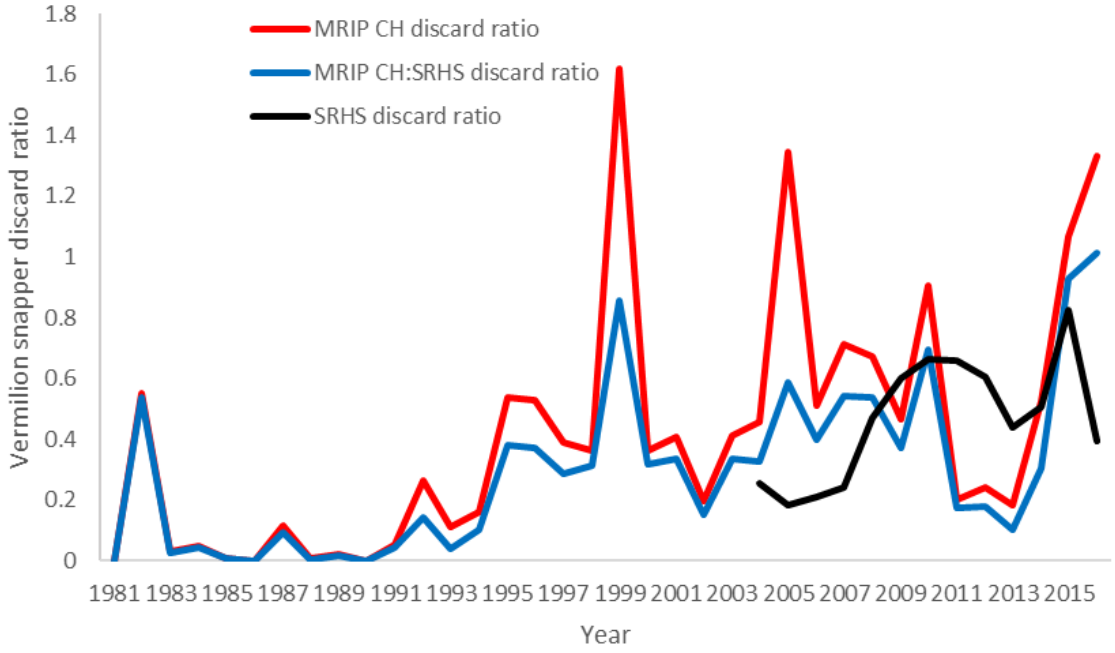

Figure 2. MRIP CH (1981-2016), MRIP CH:SRHS discard ratio methods (1981-2016), and SRHS discard ratios (2004-2016).

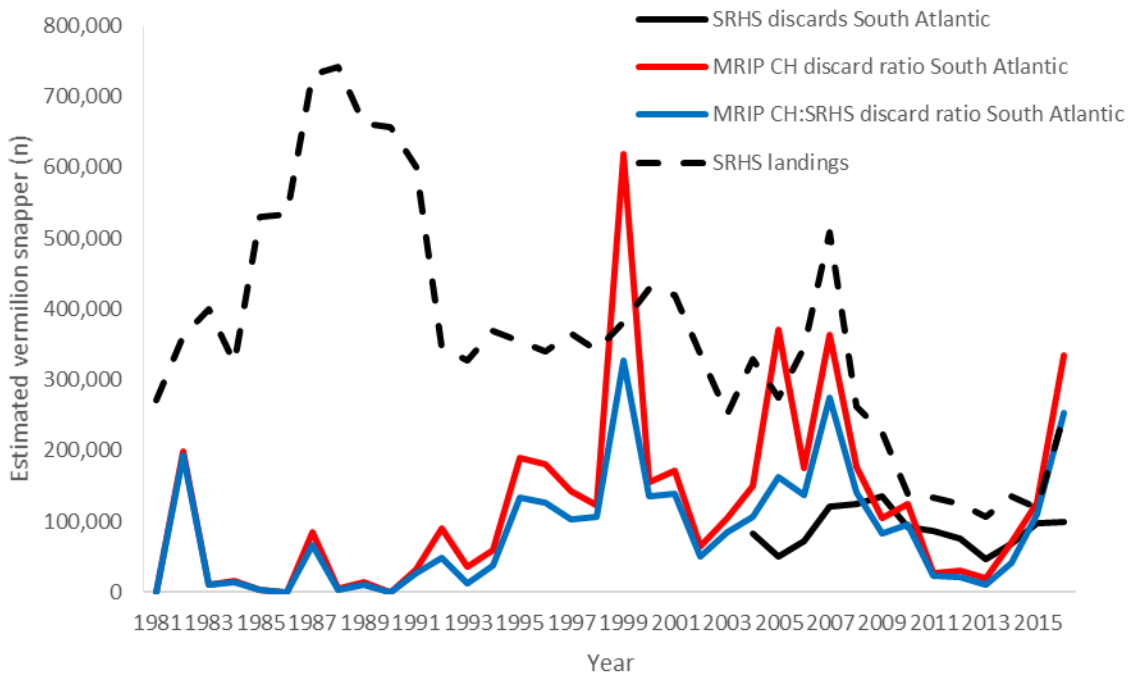

Figure 3. SRHS discards (2004-2016) and landings with calculated discards using the MRIP CH proxy (1981-2016) and MRIP CH:SRHS discard ratio proxy methods (1981-2016).