

MRIP Recreational Estimates for Black Sea Bass in the South Atlantic

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MRIP Recreational Landings

Introduction

The recreational charter, private, and shore landings for black sea bass were obtained from the Marine Recreational Fisheries Statistics Survey (MRFSS) and the Marine Recreational Information Program (MRIP).

MRFSS/MRIP provides a long time series of estimated catch per unit effort, total effort, landings, and discards for six two-month periods (waves) each year. MRFSS/MRIP provides estimates for three recreational fishing modes: shore-based fishing (SH), private and rental boat fishing (PR), and for-hire charter and guide fishing (CH). When the survey first began in Wave 2 (Mar/Apr), 1981, headboats were included in the for-hire mode, but were excluded after 1985 in the South Atlantic and Gulf of Mexico to avoid overlap with the Southeast Region Headboat Survey (SRHS) conducted by the NMFS Beaufort, NC lab. The MRFSS/MRIP survey covers coastal Atlantic states from Maine to Florida.

Adjustments and modifications

- The For-Hire Telephone Survey (FHS) was developed to estimate effort in the for-hire mode. Conversion factors have been estimated to calibrate the traditional MRFSS charter boat estimates with the FHS for 1986-2003 in the South Atlantic (SEDAR25-Data Workshop Report). To calibrate the MRFSS combined charter boat and headboat mode effort estimates in 1981-1985, conversion factors were estimated using 1986-1990 effort estimates from both modes, in equivalent effort units, an angler trip (SEDAR28-DW-12).

- **Table 1.** South Atlantic MRFSS charterboat conversion factors and standard errors (in parentheses).

Table 1a) Apply to 1981-1985 charterboat/headboat mode in the South Atlantic.

	WAVE					
STATE	1	2	3	4	5	6
NC	-	2.151 (0.12)	2.294 (0.12)	1.444 (0.12)	1.763 (0.12)	0.857 (0.12)
SC	-	1.035 (0.04)	1.085 (0.04)	1.437 (0.04)	0.891 (0.04)	0.750 (0.04)
GFE	0.845 (0.02)	0.951 (0.02)	0.985 (0.02)	1.016 (0.02)	0.811 (0.02)	0.696 (0.02)

Table 1b) Apply to 1986- 2002 charterboat mode in FLE
*FHS began in the east coast of Florida in 2003.

	WAVE					
AREA	1	2	3	4	5	6
INSHORE	1.600 (0.65)	2.786 (0.65)	2.201 (0.65)	2.894 (0.65)	1.630 (0.65)	2.386 (0.65)
OCEAN	0.664 (0.10)	0.852 (0.10)	0.828 (0.10)	1.006 (0.10)	0.478 (0.10)	0.549 (0.10)

Table 1c) Apply to 1986- 2003 charterboat mode in GA and SC

	WAVE				
AREA	2	3	4	5	6
INSHORE	1.635 (0.90)	3.100 (0.90)	2.092 (0.90)	0.931 (0.90)	0.757 (0.90)
OCEAN	0.939 (0.36)	1.272 (0.33)	2.161 (0.32)	0.835 (0.33)	0.638 (0.36)

Table 1d) Apply to 1986- 2003 charterboat mode in NC

	WAVE				
AREA	2	3	4	5	6
INSHORE	11.850(3.48)	10.026(2.63)	6.616(2.84)	3.766 (2.84)	9.415 (3.11)
OCEAN	2.188 (0.58)	2.504 (0.58)	1.565 (0.60)	2.102 (0.60)	0.661 (0.60)

- The Marine Recreational Information Program (MRIP) was developed to generate more accurate recreational catch rates by re-designing the MRFSS sampling protocol to address potential biases including port activity and time of day. Starting in 2013, wave 2, the MRIP Access Point Angler Intercept Survey (APAIS) implemented a revised sampling design. As new MRIP APAIS estimates are available for a portion of the recreational time series that the MRFSS covers, conversion factors between the MRFSS estimates and the MRIP APAIS estimates were developed in order to maintain one consistent time series for the recreational catch estimates. Ratio estimators, based on the ratios of the means, were developed for South Atlantic black sea bass to hind-cast catch

and variance estimates by fishing mode. In order to apply the charter boat ratio estimator back in time to 1981, charter boat landings were isolated from the combined charter boat /headboat mode for 1981-1985. The MRFSS to MRIP APAIS calibration process is the same as the original MRFSS to MRIP adjustment that has been used since 2012, which is detailed in SEDAR31-DW25 and SEDAR32-DW02. In SEDAR 56, MRIP APAIS adjustment factors, shown in Table 2 below, were used to maintain a consistent time series of recreational catch and reflect the most current methodologies.

- **Table 2.** South Atlantic black sea bass ratio estimators for adjusting MRFSS numbers and variance estimates (AB1 and B2) to MRIP APAIS numbers and variances for 1981-2003. The variances of the numbers ratio estimators are also shown.

MODE	Numbers Ratio Estimator		Variance Ratio Estimator		Variance of Numbers Ratio Estimator	
	AB1	B2	AB1	B2	AB1	B2
Charter boat	1.045918	1.964585	1.888896	12.66713	0.023225	0.033701607
Private	1.406391	1.196326	9.030675	5.289636	0.013943	0.00250428
Shore	0.68386	1.262351	0.850392	10.53941	0.020234	0.023279117

- The MRFSS and the MRIP surveys use different methodologies to estimate landings in weight. To apply a consistent methodology over the entire recreational time series, the Southeast Fisheries Science Center (SEFSC) implemented a method for calculating average weights for the MRIP (and MRIP adjusted) landings. This method is detailed in SEDAR32-DW-02.
- Following SEDAR 25 recommendations, MRIP black sea bass estimates are provided from Cape Hatteras, NC to East Florida. Monroe County estimates were not included in the South Atlantic stock. MRFSS landings north of Cape Hatteras from 1981 to 2003 can be post-stratified to separate them from the MRFSS North Carolina estimates. Originally, during the first MRIP re-estimation, North Carolina landings (2004+) could be separated at Cape Hatteras using domain estimation. The South of Cape Hatteras domain includes only intercepted trips returning to that region as identified in the intercept survey data. Estimates are then calculated within this domain using standard design-based estimation which incorporates the MRIP design stratification, clustering, and sample weights. However, the new MRIP APAIS calibration does not allow for domain estimation at this time for adjusted estimates from 2004 to 2012. The approach used for this update is to use the annual proportions from the original MRIP domain estimates (south of Cape Hatteras over total NC) and apply those proportions to the new North Carolina MRIP APAIS estimates in order to remove estimates north of Cape Hatteras. This approach was used in SEDAR 42, Gulf of Mexico red grouper and other assessments to remove Monroe County from the West Florida estimate.. Traditional MRIP domain estimation is available for estimates 2013+ and is used in this standard assessment to exclude the area north of Cape Hatteras from the South Atlantic for that time period.

- Missing estimates from MRIP East Florida 1981, wave 1 have been filled in using the proportion of catch in wave 1 to catch in all other waves for 1982-1984 by fishing mode and area.
- Variances are provided by MRFSS/MRIP for their recreational catch estimates. Variances are adjusted to take into account the variance of the conversion factor when an adjustment to the estimate has been made (FHS and MRIP conversions). However, the variance estimates of the charter and headboat modes in 1981-1985 are missing. This is due to the MRIP calibration procedure, which requires the combined charter/headboat mode to be split in order to apply the MRIP adjustment to the charter mode back to 1981. In addition, variance estimates are not available for weight estimates generated through the SEFSC method described above.
- Headboat estimates from MRFSS from 1981 to 1985 have been excluded in order to prevent overlap with the SRHS.
- MRIP adjustments applied in the following order:
 - FHS calibration
 - Separate North Carolina estimates at Cape Hatteras
 - MRIP APAIS adjustment
 - Weight estimation
 - Fill in 1981, wave 1

MRIP Recreational Discards

Discarded live fish are reported by the anglers interviewed by the MRIP/MRFSS. Consequently, neither the identity nor the quantities reported are verified. MRFSS/MRIP estimates of live released fish (B2 fish) were adjusted in the same manner as the landings (i.e., using charter boat calibration factors, MRIP adjustment, substitutions, etc. described in section above).

MRIP Recreational Catch Estimates

- Table 3.** Estimated MRIP catch estimates and coefficients of variations (CV) for black sea bass in the South Atlantic (Cape Hatteras, NC to East Florida). Charterboat estimates use the FHS method or are calibrated to the FHS method. MRIP estimates (or MRFSS estimates adjusted to MRIP APAIS estimates) are used.

YEAR	MRIP Landings			MRIP Discards	
	AB1 (Number)	CV_ab1	AB1 (Pounds)	B2 (Number)	CV_b2
1981	2,212,315	0.12	762,769	1,937,672	0.24
1982	3,184,350	0.48	2,377,209	1,200,122	0.54
1983	2,923,318	0.27	1,196,833	498,335	0.52
1984	3,188,643	0.43	2,501,222	1,263,455	0.34
1985	3,103,172	0.41	1,556,479	1,284,875	0.28
1986	1,411,761	0.46	792,728	1,061,759	0.42
1987	2,074,725	0.29	1,298,519	1,490,302	0.30
1988	3,036,564	0.49	2,444,504	1,299,328	0.33
1989	1,714,874	0.24	1,269,805	1,150,432	0.29
1990	1,026,479	0.48	797,639	608,161	0.36
1991	1,343,920	0.43	1,252,788	1,029,672	0.31
1992	1,173,196	0.24	870,621	1,072,483	0.23
1993	821,819	0.23	609,142	964,140	0.31
1994	886,273	0.28	672,123	1,693,220	0.20
1995	811,984	0.29	725,914	1,254,929	0.28
1996	806,141	0.41	809,268	1,044,594	0.29
1997	756,717	0.33	665,416	1,411,552	0.19
1998	467,269	0.38	434,498	1,011,117	0.19
1999	376,304	0.39	385,368	1,483,950	0.19
2000	487,988	0.38	408,244	2,033,693	0.21
2001	725,489	0.32	710,163	2,247,767	0.17
2002	444,711	0.38	424,445	1,511,444	0.20
2003	545,662	0.31	524,609	1,757,042	0.19
2004	1,571,644	0.26	1,487,077	3,448,135	0.13
2005	938,192	0.19	937,125	2,961,062	0.11
2006	819,435	0.20	805,528	3,155,824	0.12
2007	526,621	0.17	641,334	3,373,451	0.11
2008	428,662	0.21	492,255	3,100,964	0.12
2009	353,727	0.21	409,818	2,480,077	0.12
2010	662,204	0.33	770,552	3,382,418	0.12
2011	480,570	0.23	602,456	3,915,057	0.10
2012	448,072	0.22	592,019	6,106,940	0.12
2013	238,302	0.25	294,447	2,811,175	0.09
2014	337,541	0.12	476,204	4,933,128	0.09
2015	210,909	0.13	292,148	3,301,602	0.08
2016	187,097	0.31	247,875	3,212,569	0.09

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