Update concerning species misidentifications in the commercial landing data of gag groupers and black groupers in the Gulf of Mexico

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Update concerning species misidentifications in the commercial landing data of gag groupers and black groupers in the Gulf of Mexico

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This report is an update of a previous report (SEDAR10-DW-24) that estimated the gag to black grouper ratio in commercial landings from various fishing and landing areas from 1984 to 2004. Before mid-1990, gag groupers had been coded as black groupers in some Gulf regions. Beginning in 1997 and continuing into 1998, attempts were made to correct these coding problems. However, coding problems still exist in that some dealers tend to report or sell gag groupers as black groupers because they think that consumers may have a better perception of black groupers. Thus, commercial landings of gag groupers may be underestimated, and landings of black groupers overestimated, in the historical data base, particularly before 1990. The current report uses TIP samples collected from 1984 to 2012 to estimate the ratio of gag groupers to black groupers in commercial landings and in different fishing areas.

Methods

The ratios of gag groupers to black groupers in TIP samples collected from commercial fishing trips from 1984 to 2012 were calculated to estimate the actual ratios of gag groupers to black groupers in commercial landings. The assumptions for calculating these ratios were that TIP sampling trips were randomly selected from all fishing trips, and that TIP samples were randomly selected from the landings of gag and black groupers.

Because of small sample sizes and large variations in the weights of black groupers, the proportion of gag groupers by weight was obtained by adjusting the proportion of gag groupers by number with a weight adjusting factor. To estimate the weight adjusting factor, mean weights of gag and black groupers were estimated from TIP samples collected from 1984 to 2012.

RESULTS

Estimated proportions of gag grouper in gag/black grouper landings from different fishing and landing areas are shown in Table 1 and 2. Readers may

group these areas into different strata as needed and calculate the corresponding landing proportions in weights or numbers.

The length to weight conversion equations estimated from TIP data were (length in inches, weight in pounds):

Gag groupers

Gutted weight=0.0004265 x (fork length)$^{3.027}$, n=14291, r^2=0.98
Gutted weight=0.0004465 x (total length)$^{2.989}$, n=1254, r^2=0.95

Black groupers

Gutted weight=0.0002847 x (fork length)$^{3.176}$. n=1481, r^2=0.98
Gutted weight=0.0003328 x (total length)$^{3.111}$. n=224, r^2=0.98

The mean gutted weight of TIP black grouper samples (26.61 $\pm$ 19.88 pounds, n=7589) was considerably larger than that for gag groupers (14.15 $\pm$ 8.87 pounds, n= 113556). This is also seen in the length distributions of TIP samples for the two species (Fig 1). The proportions of gag groupers by number were converted into proportions of gag groupers by weight by using the ratio of mean weight.

Reference

Chih, C.P. and S. Turner (2006) Estimation of species misidentification in the commercial landing data of gag groupers and black groupers in the Gulf of Mexico. SEDAR10_DW-24.

Table 1. Sum of TIP samples for gag groupers and black groupers, and the proportion of gag groupers by number and by weight, from 1984 to 2012 in different grid areas in the Gulf of Mexico.

Grid	Number of Gag groupers	Number of black groupers	Total number	Proportion of gag groupers by number	Proportion of gag groupers by weight
1	169	883	1052	0.161	0.092
2	5134	3825	8959	0.573	0.416
3	4824	718	5542	0.870	0.781
4	14625	887	15512	0.943	0.898
5	25849	626	26475	0.976	0.956
6	27055	235	27290	0.991	0.984
7	11774	8	11782	0.999	0.999
8	13658	5	13663	1.000	0.999
9	1490	4	1494	0.997	0.995
10	1523	23	1546	0.985	0.972
11	585	10	595	0.983	0.969
12	45	.	.	.	.
13	229	6	235	0.974	0.953
14	451	7	458	0.985	0.972
15	364	12	376	0.968	0.942
16	263	11	274	0.960	0.927
17	189	4	193	0.979	0.962
18	90	3	93	0.968	0.941
19	14	.	.	.	.
20	14	3	17	0.824	0.713
21	242	4	246	0.984	0.970
22	16	1	17	0.941	0.895

Table 2. Sum of TIP samples for gag groupers and black groupers, and the proportion of gag groupers by number and by weight, from 1984 to 2012 in different counties in the Gulf of Mexico.

State	County name	Number of Gag groupers	Number of black groupers	Total number	Proportion of gag groupers by number	Proportion of gag groupers by weight
AL	Baldwin	140	21	161	0.870	0.780
AL	Mobile	51	12	63	0.810	0.693
FL	Bay	22861	18	22879	0.999	0.999
FL	Charlotte	90	18	108	0.833	0.727
FL	Citrus	2586	85	2671	0.968	0.942
FL	Collier	285	38	323	0.882	0.800
FL	Dixie	108	.	.	.	.
FL	Escambia	1268	6	1274	0.995	0.991
FL	Franklin	6115	11	6126	0.998	0.997
FL	Gulf	1	.	.	.	.
FL	Hillsborough	90	9	99	0.909	0.842
FL	Lee	2505	314	2819	0.889	0.809
FL	Levy	1372	.	.	.	.
FL	Manatee	3337	225	3562	0.937	0.887
FL	Miami-Dade	.	8	.	.	.
FL	Monroe	1618	3038	4656	0.348	0.221
FL	Okaloosa	3116	35	3151	0.989	0.979
FL	Pasco	960	1	961	0.999	0.998
FL	Pinellas	61173	3633	64806	0.944	0.900
FL	Putnam	83	.	.	.	.
FL	Santa Rosa	182	1	183	0.995	0.990
FL	Sarasota	233	52	285	0.818	0.704
FL	St. Lucie	.	2	.	.	.
FL	Taylor	2724	1	2725	1.000	0.999
FL	Volusia	22	27	49	0.449	0.302
FL	Wakulla	1396	5	1401	0.996	0.993
LA	Cameron	18	.	.	.	.
LA	Jefferson	363	7	370	0.981	0.965
LA	Lafourche	1063	25	1088	0.977	0.958
LA	Plaquemines	21	4	25	0.840	0.736
LA	Terrebonne	7	.	.	.	.
LA	Vermilion	41	1	42	0.976	0.956
MS	Harrison	1	.	.	.	.
MS	Jackson	146	4	150	0.973	0.951
TX	Cameron	267	5	272	0.982	0.966
TX	Galveston	43	1	44	0.977	0.958
TX	San Patricio	1	.	.	.	.

Fig 1. Comparisons of size distributions for gag groupers and black groupers collected from the Gulf of Mexico from 1984 to 2012 (total length in inches).