Fisheries-independent data for hogfish (*Lachnolaimus maximus*) from reef-fish visual surveys in the Florida Keys and Dry Tortugas, 1994-2012.

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Introduction

The southern Florida coral reef ecosystem supports lucrative fishing and tourism economies (Ault et al., 2005a). Fishery-dependent (FD) information has been the principal data source supporting stock assessments to address the key management objectives of preventing overfishing and sustaining benefits from tropical ecosystems with high species diversity (Pauly and Morgan, 1987; Gallucci et al., 1996; Sparre and Venema, 1998). However, there are risks in basing assessments entirely upon data from extractive fishing operations (Walters and Martell, 2004; Rotherham et al., 2007). Numerous sources of bias and uncertainty may arise from the process of obtaining catch-effort data from the wide variety of vessels, capture gears, and landing sites typical of tropical reef fisheries. Also problematic is the nonrandom strategy of catching fishes employed by fishers with respect to the spatial distributions of species and habitats. Many of these potential biases and uncertainties can be eliminated through the controlled sampling approach offered by fishery-independent (FI) surveys. These surveys can be designed to provide the same size-structured abundance estimates as FD surveys for conducting modern stock assessments (Ault et al., 1998, 2005b; Smith and Lundy, 2006). In addition, FI surveys can sample pre-exploited life stages of fishery species and thus provide indices of recruitment to the exploited stock.

Fishery-independent diver visual sampling of the reef-fish community in southern Florida began in 1979 in shallow fore-reef habitats (depth<10 m), and was conducted by scientists from NOAA's Southeast Fisheries Science Center (SEFSC). Scientists from the University of Miami's Rosenstiel School of Marine and Atmospheric Science (RSMAS) began collaborating with NOAA scientists on the visual surveys in 1993, and in 1994 the survey was expanded to cover the full range of reef habitats to depths of 33 m along the coral reef tract extending from Miami to Key West. In 1999, the visual survey was further expanded to the Dry Tortugas region. In 2008, scientists from the Florida Fish and Wildlife Conservation Commission and the National Park Service joined the survey effort as full partners along with NOAA-SEFSC and UM-RSMAS.

This paper presents abundance data for hogfish (*Lachnolaimus maximus*) populations in the Florida Keys and Dry Tortugas from diver visual surveys. For the Florida Keys, data are provided for both pre-exploited (fork length <300 mm) and exploited (fork length ≥ 300 mm) life stages of hogfish for annual diver surveys from 1994 to 2012. For the Dry Tortugas region, hogfish data (pre-exploited and exploited) are provided for surveys conducted in 1999, 2000, 2004, 2006, 2008, 2010, and 2012 (surveys in the Dry Tortugas have been conducted biannually since 2004).

Methods

Visual sampling was conducted along the Florida coral reef tract that extends about 400 km southwest from Miami to the Dry Tortugas (Fig. 1A). The reef tract lies within the management boundaries of the Florida Keys National Marine Sanctuary (FKNMS) and two national parks, Biscayne and Dry Tortugas (Fig. 1B). The spatial domain of the survey encompassed the full extent of mapped Holocene live-coral reef habitats (Fig. 1A, red) to 33 m depths. The domain was subdivided into two regions, the Florida Keys (Miami to Key West, 564 km^2) and the Dry Tortugas (338 km^2). Environmental features, including depth and benthic habitat classifications, that correlate with the spatial distribution of reef-fishes were used to partition the survey area into subareas (i.e., strata) of low, moderate, and high variation in abundance. The sampling design also incorporated a network of no-take marine reserves as an additional stratification variable (Fig. 1B, green). This network is comprised of 23 mostly small reserves established in the Florida Keys (FKNMS) in 1997, and several large reserves established in the Dry Tortugas in 2001 (FKNMS) and 2007 (Dry Tortugas National Park)(Ault et al., 2006, 2013).

The field sampling method employed highly trained and experienced divers using SCUBA Nitrox to collect biological data following a standard, non-destructive, in situ monitoring protocol in which a stationary diver records reef-fish data (number and sizes of each species) while centered in a randomly selected circular plot 15 m in diameter (Bohnsack and Bannerot, 1986; Brandt et al., 2009). Principal metrics evaluated were reef fish species density (i.e., the number of individuals per unit sample area of 177 m^2, the area of a diver circular plot) and species length composition. Density and length composition can subsequently be used to produce additional metrics such as abundance-at-length and biomass. Statistical estimation procedures followed Cochran (1977) and Thompson (2002) for a two-stage stratified random sampling design. Computational methods are detailed in Smith et al. (2011). For the visual surveys, the primary sample unit (PSU) was a 200 by 200 m habitat grid cell (the minimum mapping unit for benthic habitat classification), and the second-stage unit (SSU) was a diver circular plot. In most cases, each SSU was sampled by a buddy pair of divers. For analysis, each SSU metric was computed as the arithmetic average of the stationary counts for a buddy team. Biomass computations converted SSU numbers-at-length to total weight using a weight-length conversion for hogfish from Ault et al. 2005b.

Results/Discussion

Visual survey estimates of hogfish mean density and precision (CV, coefficient of variation) for pre-exploited and exploited life stages are given in Table 1 for the Florida Keys (Table 1A) and Dry Tortugas (Table 1B) regions. The CV of mean density is the standard error expressed as a percentage of the mean, and is sometimes referred to as the 'relative error'. Survey precision improved in the late 1990s—early 2000s due to refinements in the benthic habitat maps, statistical design, and efficiency of field sampling (Smith et al. 2011). In the Florida Keys, mean density of exploited phase hogfish increased from the late 1990s to mid-2000s (Fig. 2A, solid diamonds), whereas density in the Dry Tortugas (Fig. 2A, open diamonds) was relatively stable during this period. A decline in density of exploited phase hogfish was observed in both regions following the intense hurricane period of 2004-2005 in south Florida, followed by a rebound from 2006 to 2008. After 2008, exploited phase density has decreased somewhat in the Florida Keys but appears to have increased in the Dry Tortugas. In contrast, density of pre-exploited hogfish has remained relatively stable in both regions since 2000 (Fig. 2B). Exploited phase densities are more or less similar in magnitude in the Florida Keys and Dry Tortugas, whereas pre-exploited densities are substantially higher in the Florida Keys compared to the Dry Tortugas.

Survey estimates of hogfish abundance-at-length using the procedures of Smith et al. (2011) are given in Appendix A for the Florida Keys and Appendix B for the Dry Tortugas. Hogfish relative length frequencies (derived from the values in the appendices) for the 2012 visual surveys in the Florida Keys and Dry Tortugas are shown in Fig. 3. These results illustrate some general differences between the two regions that have been observed in the visual surveys dating back to 1999 (the start of the Tortugas sampling): the Florida Keys has a higher percentage of pre-exploited phase hogfish and a lower percentage of exploited phase hogfish compared to the Dry Tortugas (Ault et al., 2013). Moreover, the average size of hogfish in the exploited life stage is higher in the Dry Tortugas compared to the Florida Keys (Fig. 4). It follows that mean biomass of exploited phase hogfish has generally been higher in the Dry Tortugas compared to the Florida Keys over the survey history (Fig. 5), owing to the larger-sized fish in the Dry Tortugas.

An important feature of the southern Florida reef-fish visual survey is that it employs a non-destructive sampling method. This aspect of the visual survey makes it very advantageous for sampling inside no-take marine reserves, thereby obtaining information on a portion of the hogfish stock that is not sampled by commercial or recreational fishers (Smith et al., 2011). Although no-take marine reserves occupy a small area within the Florida Keys region, they are fairly extensive in the Dry Tortugas (Fig. 1B; Ault et al., 2006, 2013).

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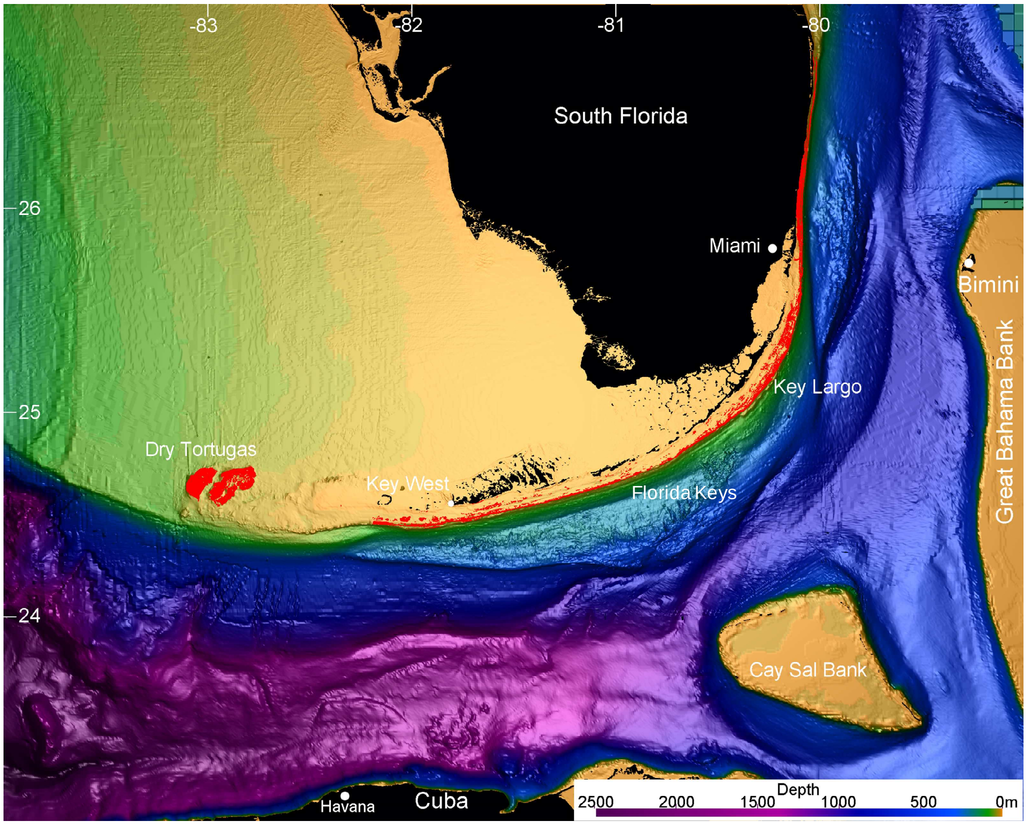
Figure 1. South Florida reef fish visual survey domain. (A) Seafloor morphology of the coral reef ecosystem and the Straits of Florida with mapped coral reef habitats (red) in the Florida Keys and Dry Tortugas; depths are represented by the color scale; land is black. (B) Managed area boundaries for the Florida Keys National Marine Sanctuary (blue), Biscayne, Everglades and Dry Tortugas National Parks (tan), and no-take marine reserves (green).

(A)



(B)

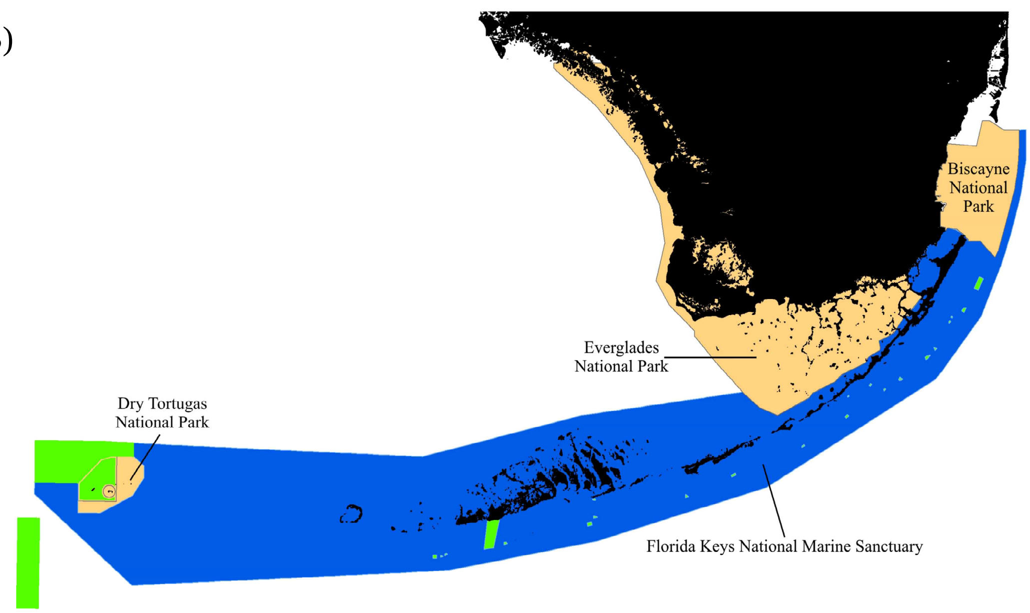


Table 1. Visual survey estimates of hogfish mean density and precision (CV) for pre-exploited and exploited life stages for the (A) Florida Keys and (B) Dry Tortugas regions. Density units are number of fish per 177 m^2 (second-stage unit SSU). Sample sizes: n = primary sample units, nm = second-stage units.

(A) Florida Keys

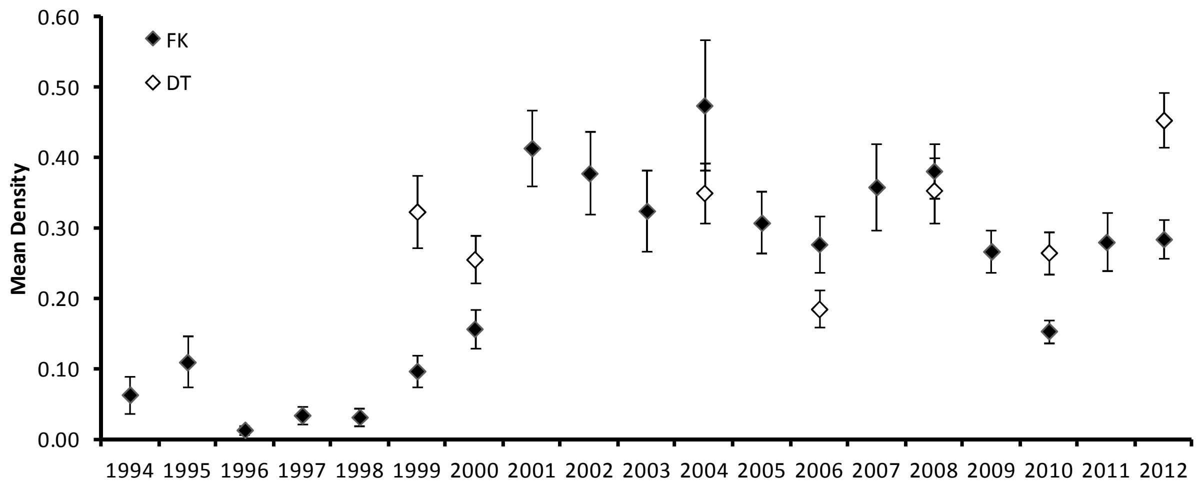
			Pre-exploited Density (L<300 mm)		Exploited Density (L≥300 mm)		All Sizes	
Year	n	nm	Mean	CV (%)	Mean	CV (%)	Mean	CV (%)
1994	24	117	0.2414	39.4	0.0629	41.9	0.3346	26.9
1995	61	278	0.2701	24.5	0.1093	33.2	0.3791	19.5
1996	27	143	0.1560	42.1	0.0132	44.5	0.1739	38.4
1997	66	388	0.3453	22.7	0.0340	35.7	0.3805	21.7
1998	75	428	0.3185	18.9	0.0314	36.3	0.3649	16.0
1999	160	408	0.4897	12.1	0.0965	23.3	0.5951	10.3
2000	228	499	0.8182	10.3	0.1565	17.1	0.9380	9.8
2001	304	701	1.0144	10.1	0.4130	12.8	1.3825	9.2
2002	356	665	0.8068	8.8	0.3774	15.6	1.1839	8.6
2003	237	433	0.8685	12.2	0.3239	17.6	1.1928	12.1
2004	136	259	0.7425	12.6	0.4736	19.6	1.2161	12.2
2005	256	498	0.9299	12.4	0.3070	14.3	1.2370	10.6
2006	328	593	0.7323	8.8	0.2767	14.4	1.0090	8.6
2007	317	614	0.7265	9.9	0.3578	17.3	1.0843	10.5
2008	376	735	1.2754	6.7	0.3806	10.4	1.6560	6.5
2009	516	1005	0.9641	6.2	0.2665	10.9	1.2307	6.3
2010	379	740	0.9527	8.0	0.1534	10.8	1.1060	7.4
2011	402	789	0.8121	8.3	0.2798	14.7	1.0919	7.7
2012	416	803	1.0522	6.8	0.2839	9.4	1.3361	6.3

(B) Dry Tortugas

			Pre-exploited Density (L<300 mm)		Exploited Density (L≥300 mm)		All Sizes	
Year	n	nm	Mean	CV (%)	Mean	CV (%)	Mean	CV (%)
1999	168	298	0.4286	19.6	0.3229	16.0	0.7514	12.9
2000	203	360	0.2661	13.9	0.2552	13.1	0.5267	9.7
2004	310	576	0.1189	19.7	0.3494	11.9	0.4683	10.6
2006	260	497	0.2737	14.2	0.1848	14.0	0.4585	9.2
2008	338	653	0.2177	21.8	0.3530	13.4	0.5707	13.9
2010	364	703	0.1677	13.3	0.2648	11.2	0.4325	9.0
2012	416	813	0.1907	11.4	0.4528	8.7	0.6435	7.7

Figure 2. Visual survey estimates of hogfish mean density (±SE) for (A) exploited and (B) pre-exploited life stages during 1994-2012 in the Florida Keys (solid diamonds) and Dry Tortugas (open diamonds). Density units are number of fish per SSU.

(A) Exploited Life Stage (L ≥ 300 mm)



(B) Pre-exploited Life Stage (L < 300 mm)

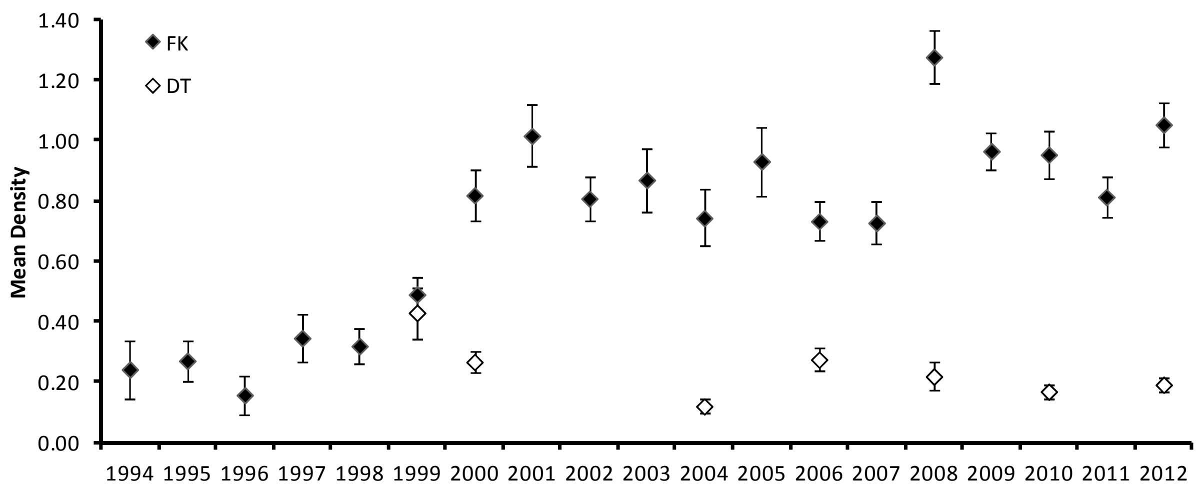


Figure 3. Hogfish length frequency histograms for 2012 visual surveys in the Florida Keys and Dry Tortugas. Shaded bars denote the exploited life stage.

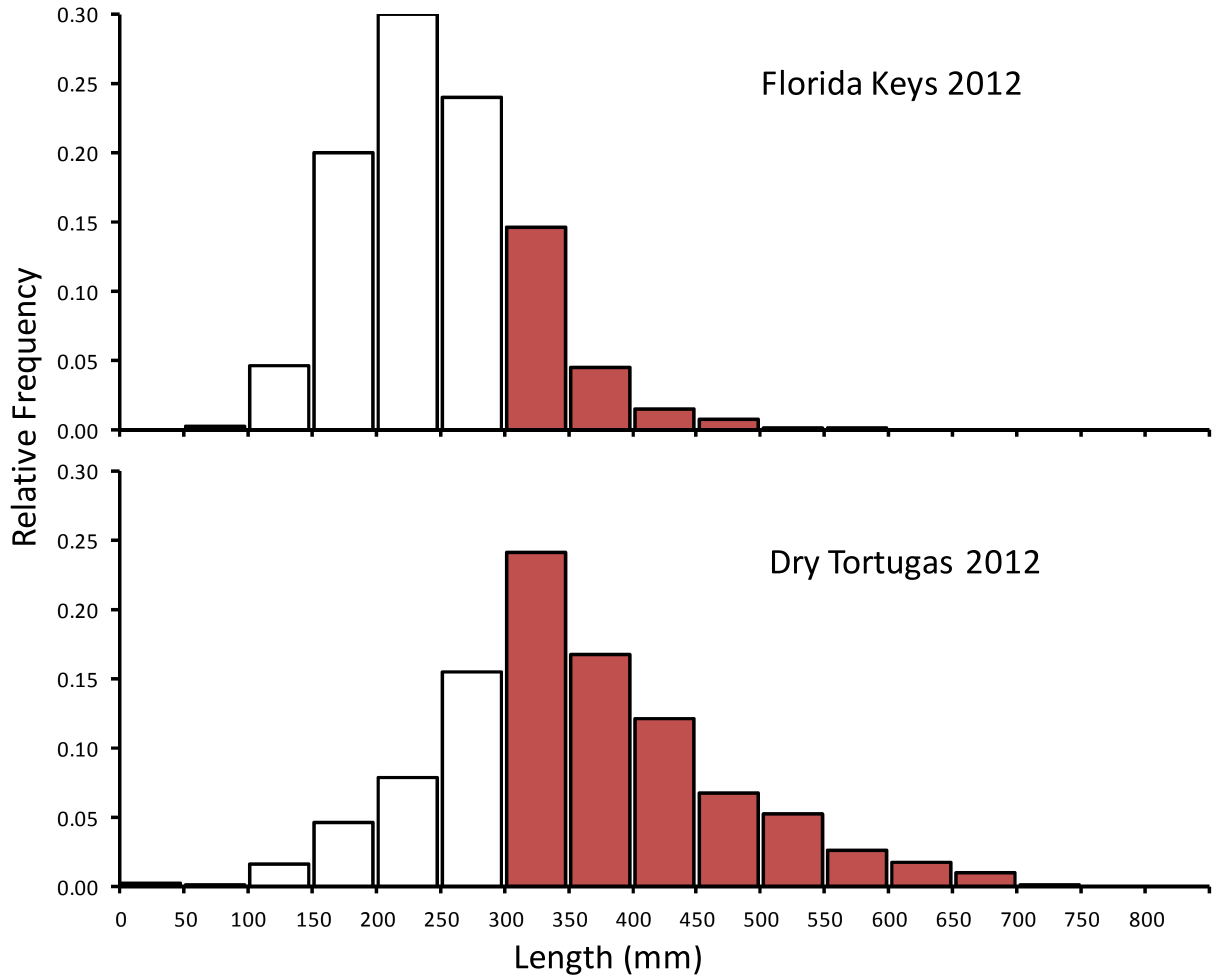


Figure 4. Visual survey estimates of average length (±SE) of exploited phase hogfish during 1994-2012 in the Florida Keys (FK, solid circles) and Dry Tortugas (DT, open circles). The lower dashed line is the minimum legal length of capture (LC).

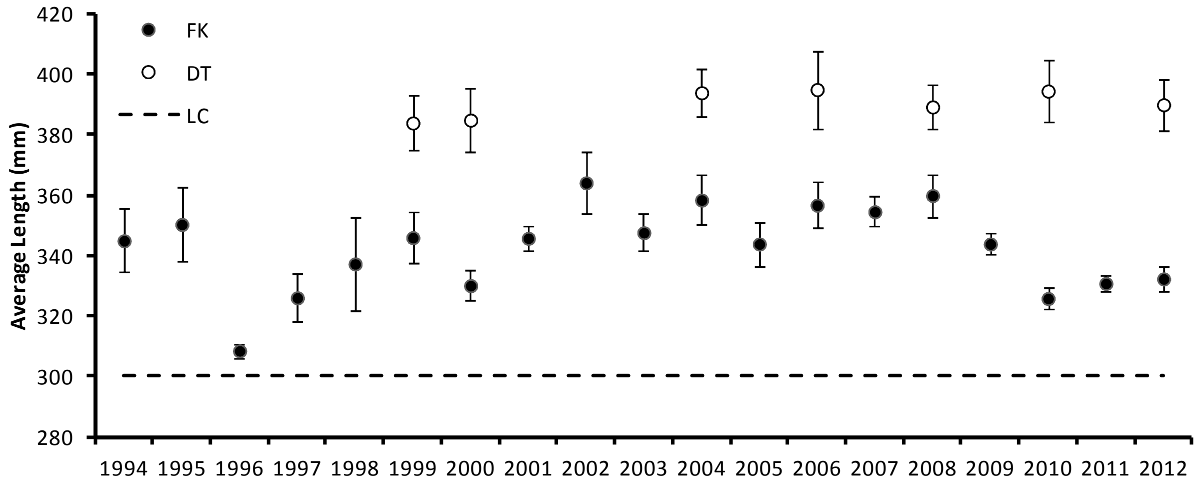
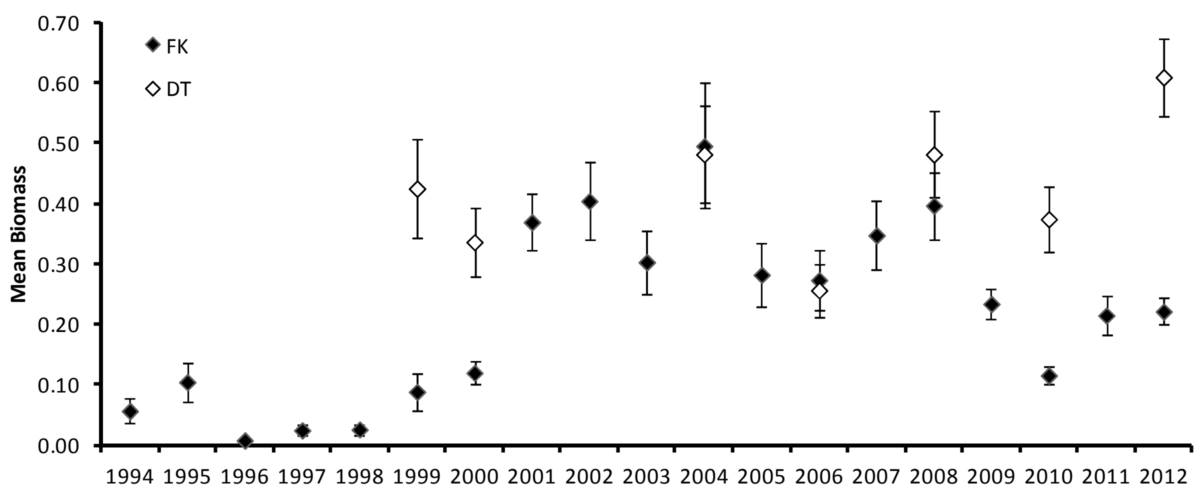


Figure 5. Visual survey estimates of mean biomass (kg per SSU) and associated standard errors for exploited phase hogfish during 1994-2012 in the Florida Keys (FK, solid diamonds) and Dry Tortugas (DT, open diamonds).



Appendix A. Visual survey estimates of hogfish abundance-at-length, Florida Keys, 1994-2012.

Length (cm)	_1994	_1995	_1996	_1997	_1998	_1999	_2000	_2001	_2002	_2003	_2004	_2005	_2006	_2007	_2008	_2009	_2010	_2011	_2012
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	366	848	0	0	0	0	0	0	0
3	0	0	0	0	183	9657	0	0	0	0	0	0	0	4325	0	0	0	1174	0
4	0	0	13300	0	0	0	0	0	0	0	0	0	0	2831	3727	2692	0	0	0
5	0	0	0	0	0	0	14893	0	1972	0	0	0	0	0	7748	0	0	6009	2900
6	0	0	0	10078	0	0	0	6516	0	4302	0	0	0	0	0	2194	0	0	0
7	0	5243	0	0	6741	0	14893	0	3943	7668	0	0	0	2831	534	0	0	0	0
8	0	1646	13300	0	60593	0	5801	14048	0	0	0	16589	4294	2831	10834	8448	4244	11949	292
9	0	0	0	37810	0	5115	0	0	1972	13946	0	364	0	2831	6844	3101	2592	8288	5246
10	18137	16430	13300	0	20230	0	54561	46380	37819	62878	33184	67236	39974	41367	22637	23770	64464	24115	23781
11	0	57061	0	0	0	34659	10505	7579	9732	15585	0	19666	5426	41711	21039	8607	900	14638	13551
12	107060	71286	13300	97021	32255	33248	118566	91926	87181	123252	16494	216193	66645	73020	58253	108622	42496	46918	36552
13	60469	13458	13300	39234	9163	15345	81924	44233	29579	33432	20642	52627	40147	67276	51971	105396	54051	47433	39715
14	0	50255	13300	57229	65570	75537	137890	68957	79662	71542	69998	77932	63791	53718	126068	137881	114739	61361	82159
15	36274	94834	27773	82528	142552	191056	422924	275866	338151	220949	142890	483537	345666	242617	343447	372055	348426	153039	157689
16	54411	5243	586	64047	46069	171828	246314	98560	102432	101344	119973	79693	149800	82048	167541	180392	173673	142851	157179
17	18137	1988	0	23613	81338	96181	123788	190629	127426	139121	85502	156800	138498	151101	187912	179966	153137	157109	152189
18	31761	23631	26600	59074	70658	81449	308342	220861	233734	215269	214437	197100	230359	185761	286815	230044	261112	177474	279960
19	18137	29353	0	60544	10392	117228	18000	148767	46566	128838	54704	88474	73526	68716	141069	92275	54060	85692	104224
20	25086	67345	158453	137079	125333	144077	335554	506355	427450	335430	413493	522464	345824	439977	648151	376299	396689	264696	460856
21	593	30534	586	3715	98776	110708	73067	110156	61659	142185	122936	67139	60632	65879	124043	106862	102289	135403	114314
22	20009	53502	14473	44024	60677	74790	61899	191059	157941	189589	221623	126838	192755	107623	414814	185590	175050	194384	327355
23	0	28050	53786	36538	20640	90506	15024	118975	95428	80300	40825	36866	62897	39369	239436	103663	131035	116253	137732
24	167826	16743	53938	43586	40584	94429	50058	81367	111255	130722	72180	75943	31794	59287	225646	152340	150751	179796	237821
25	108842	120696	14473	137840	71437	87248	295302	489482	419315	444377	417824	504825	398733	326673	452070	351878	380316	348908	369676
26	141928	66507	0	49906	39174	106803	43494	72414	21801	78051	67514	36578	27922	72751	114879	102735	112786	163484	186746
27	18137	685	78779	93436	35301	25894	81448	221064	79740	117023	108461	41079	23277	73781	142943	100233	86435	75200	160070
28	23898	56425	0	18230	13309	9160	31223	69675	83350	66210	78113	77212	49400	123355	174337	107596	164493	143728	256557
29	593	10054	0	13440	1469	14772	5638	63290	18792	37992	33382	1668	4831	11887	73051	27928	44546	53675	46792
30	76976	177573	28946	44390	32642	114848	229864	408360	418066	342049	421340	416172	300317	375979	333243	299604	283345	342544	338202
31	0	15095	0	1657	36684	22358	12240	21022	11720	108975	9783	22136	11721	14411	29915	46340	39904	40893	67479
32	42925	15095	13300	2915	1961	24467	10761	120122	40753	88831	146757	72116	37932	56024	84357	69589	36419	131670	137163
33	891	14144	0	10078	92	19042	11471	74542	48385	42138	54924	12459	7816	6596	60729	23267	1600	16072	42503
34	891	7872	586	12054	899	14772	0	17370	27068	16887	40759	45827	15025	13099	52010	19910	11020	71268	34465
35	37759	42180	586	26199	15674	25463	92506	258470	168516	135066	468221	216732	141859	204294	198071	109981	64882	112177	114700
36	0	17052	586	0	0	13874	13696	43172	62724	67442	2862	6995	14684	6148	34210	46162	7723	32360	15055
37	18137	0	586	0	0	11630	11471	19054	31805	4548	3067	1033	40275	50199	48939	38272	4644	17040	19714
38	0	10396	0	0	693	0	2597	67123	24643	18464	27269	41128	29307	50621	57642	38416	19095	27474	35414
39	0	0	0	0	0	0	0	4729	4641	12850	0	15115	8818	10897	28084	14801	0	829	3193
40	18731	43335	0	5048	7213	23150	35591	110502	169699	106906	179410	73216	95565	184944	95875	86241	18076	28531	36724
41	0	0	0	0	0	0	226	117	18622	7889	0	7819	0	1415	3073	0	0	3230	10150
42	0	0	0	0	0	0	4636	14296	12604	1613	21730	0	23313	9199	33025	14863	400	14984	6012
43	0	0	0	0	0	0	0	0	2486	4819	0	0	29276	13644	16619	9239	400	2738	5587
44	0	0	0	0	0	0	0	4378	0	22578	0	0	4409	4325	37419	3713	0	1174	2900
45	0	0	0	706	13673	24449	3313	70092	52316	13104	38233	17713	34452	55367	40738	7533	9994	3214	26946
46	0	15745	0	0	0	0	0	0	0	0	0	0	16460	1081	2615	0	400	0	292
47	0	0	0	0	0	0	0	4375	0	1076	34346	0	4811	4756	0	0	0	1174	0
48	0	0	0	0	0	0	0	4131	25849	0	15820	0	6669	4325	2058	0	0	6009	2659
49	0	0	0	0	0	0	0	918	2486	0	0	0	3617	0	0	0	0	0	0
50	18137	13458	0	0	285	2414	8413	14066	41520	3227	43738	2226	30681	22874	34487	10751	0	8559	0
51	0	13116	0	0	0	0	0	0	0	374	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	2248	0	0	0	4673	0	2692	0	0	3193
53	0	0	0	0	0	0	0	3790	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	338	0	12708	0	0	0	0
55	0	0	0	0	0	9657	0	918	30391	17488	2672	8691	603	11762	6441	1785	0	2738	442
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	309	0	0	0	2082	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1928	0	0	0
59	0	0	0	0	0	0	0	0	0	7668	0	0	0	0	0	0	0	0	0
60	0	1646	0	0	0	0	0	0	0	11940	14120	20816	0	3435	6881	4606	7087	0	0
61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0	0	0	0	2082	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	716	0	8326	0	0	6441	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	3790	0	374	14120	0	0	319	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3727	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	418	0	0	0	0	0	0	0	0	0

Appendix B. Visual survey estimates of hogfish abundance-at-length, Dry Tortugas, 1999-2012.

species	Length (cm)	_1999	_2000	_2004	_2006	_2008	_2010	_2012
LAC MAXI	1	0	0	0	0	0	2490	0
LAC MAXI	2	0	0	0	617	3339	1781	0
LAC MAXI	3	15710	2039	0	12086	0	0	1513
LAC MAXI	4	0	0	0	8318	434	0	356
LAC MAXI	5	1313	2039	12227	1228	0	353	356
LAC MAXI	6	5237	2039	0	351	0	0	124
LAC MAXI	7	0	0	4388	0	3339	0	356
LAC MAXI	8	0	0	0	0	0	0	587
LAC MAXI	9	0	4017	0	23589	419	0	124
LAC MAXI	10	0	0	6113	33728	434	533	356
LAC MAXI	11	2626	2039	245	23589	3616	0	231
LAC MAXI	12	8098	13828	4644	617	410	1781	4350
LAC MAXI	13	0	6712	3637	0	1727	5439	1124
LAC MAXI	14	32267	21260	0	336	18523	16758	13471
LAC MAXI	15	68964	31793	6797	15915	8853	14850	14452
LAC MAXI	16	45528	23693	10132	30355	17341	2472	7411
LAC MAXI	17	91083	26501	927	3315	11172	5373	3315
LAC MAXI	18	83356	32951	2745	32079	15043	9116	21463
LAC MAXI	19	29510	4718	2686	4747	13827	23938	9125
LAC MAXI	20	106066	63918	27572	70820	39190	33720	32268
LAC MAXI	21	5260	11563	61	7667	11108	1071	6356
LAC MAXI	22	49924	35982	32354	43166	50510	9512	17563
LAC MAXI	23	36313	15135	743	8587	15066	23558	11692
LAC MAXI	24	16346	31895	11629	10490	24889	31067	27964
LAC MAXI	25	102329	58685	61172	75811	56532	69520	56166
LAC MAXI	26	25563	41411	7421	46305	25523	25517	34531
LAC MAXI	27	20913	16861	2414	27854	41539	9712	32269
LAC MAXI	28	50208	50089	18435	40559	36390	33526	38841
LAC MAXI	29	17700	8570	9742	4613	26249	3830	28371
LAC MAXI	30	135236	105413	105373	54375	114492	86935	103910
LAC MAXI	31	16163	11204	2194	4703	15727	6226	32172
LAC MAXI	32	59236	34769	22255	13392	37966	31750	71388
LAC MAXI	33	19832	14409	3265	2923	19869	22995	41148
LAC MAXI	34	12454	19884	4767	15461	22263	25591	48050
LAC MAXI	35	108822	80794	160223	77271	97288	69761	123912
LAC MAXI	36	24600	6109	3907	3198	22742	7777	22297
LAC MAXI	37	6220	4675	12258	5120	11417	12000	14346
LAC MAXI	38	16467	16971	7157	9920	31350	25429	40933
LAC MAXI	39	5237	5657	3388	0	4850	9760	4676
LAC MAXI	40	47000	52238	148167	40248	90094	56618	93329
LAC MAXI	41	574	5657	0	0	711	211	11274
LAC MAXI	42	16574	8060	11045	6236	44565	11056	17622
LAC MAXI	43	7234	4582	21767	336	4271	3985	17699
LAC MAXI	44	842	2634	2194	2643	3517	3145	9374
LAC MAXI	45	34595	54382	70141	58914	55423	27569	68751
LAC MAXI	46	5237	6002	0	2306	7946	4274	1883
LAC MAXI	47	1582	1919	0	0	2609	3332	5600
LAC MAXI	48	11019	1919	128	2643	19319	5419	6152
LAC MAXI	49	0	0	510	0	837	0	386
LAC MAXI	50	40204	20767	43546	20145	9552	36039	52247
LAC MAXI	51	0	0	0	0	1137	353	3883
LAC MAXI	52	17176	2240	2938	4955	419	4324	5793
LAC MAXI	53	0	0	3637	0	0	1003	1637
LAC MAXI	54	0	0	0	0	0	1781	682
LAC MAXI	55	10473	15061	2441	3921	9022	20011	18935
LAC MAXI	56	0	0	0	0	0	571	5476
LAC MAXI	57	0	0	0	0	0	1781	0
LAC MAXI	58	0	5657	682	0	266	323	7733
LAC MAXI	59	0	0	0	0	0	0	0
LAC MAXI	60	9042	6102	25618	19491	16973	14593	14868
LAC MAXI	61	0	0	0	336	0	0	510
LAC MAXI	62	5237	0	510	0	0	217	4063
LAC MAXI	63	0	0	510	0	0	0	0
LAC MAXI	64	0	0	0	0	0	0	2096
LAC MAXI	65	5725	0	2784	0	10173	1930	10423
LAC MAXI	66	0	0	0	0	0	0	386
LAC MAXI	67	574	0	0	0	0	0	0
LAC MAXI	68	0	0	0	0	0	211	214
LAC MAXI	69	0	0	0	0	0	0	0
LAC MAXI	70	0	11314	6113	0	4873	2490	741
LAC MAXI	71	0	0	0	0	0	0	0
LAC MAXI	72	0	0	0	0	0	0	0
LAC MAXI	73	1582	0	0	0	0	0	0
LAC MAXI	74	0	0	0	0	0	0	0
LAC MAXI	75	2298	0	211	617	0	649	0
LAC MAXI	76	0	0	0	0	0	0	0
LAC MAXI	77	0	0	0	0	0	0	0
LAC MAXI	78	0	0	0	0	0	0	0
LAC MAXI	79	0	0	0	0	0	0	0
LAC MAXI	80	0	0	128	0	5162	217	0
LAC MAXI	81	0	0	0	0	0	0	0
LAC MAXI	82	0	0	0	0	0	0	0
LAC MAXI	83	0	0	0	0	0	0	0
LAC MAXI	84	0	0	0	0	0	0	0
LAC MAXI	85	0	0	768	0	0	0	0