

Inventory of Coastal Pelagic Fishes of Dry Tortugas National Park

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INTRODUCTION

While the status and distribution of coral reef fishes, invertebrates and benthic habitats inside the boundary of the Dry Tortugas National Park (DRTO) is improving (Ault et al. 1998, 2002; Chiappone et al. 2001; Miller et al. 2001; Franklin et al. 2003), the distribution of the non-reef, coastal pelagic fish assemblages is virtually unknown. This unknown needs to be addressed since the distribution, abundance, and occurrence of these fish assemblages is an objective identified within the “Study Plan to the Inventory of Vascular Plants and Vertebrates in the S. Florida/Caribbean Network of the National Park Service” conducted by Sasso and Patterson (2000). Current fish sampling techniques utilized at DRTO, i.e. fisheries independent monitoring (FIM - underwater visual census surveys) and fisheries dependent monitoring (FDM - creel census, logbook surveys), do not assess these open-water, fast swimming species that are generally not associated with coral reefs. Therefore, we designed and implemented fish survey methodologies, which are conducive to the life history characteristics of the pelagic species under investigation.

METHODS

Two methods were used to identify non-reef, coastal pelagic fish assemblages. The primary method was a scientist-designed hook and line resource assessment survey with sampling in all four seasons. The second method involved deploying a 21 meter seine net for a distance of 9 meters in the habitats of bare substrate, patchy discontinuous seagrass, and continuous seagrass. The habitat classifications and locations came from NOAA benthic habitat maps generated from high resolution aerial photographic surveys. Information on numbers, sizes, and locations were recorded for every fish collected and the fish were released alive. Photographs were taken of all species except if additional handling time jeopardized the survival of the fish.

RESULTS

A total of seven research cruises were conducted which resulted in sampling 1,171 fish. Forty-three different species of fish were identified (**Table 1**) and photographs were taken of all the fish except 5 species. **Table 2** reveals the site number, fork length, weight, and location of the different species of fish and **Figure 1** plots the location of the sampled sites. **Table 3** reveals the gear used to sample the fish.

Table 1.- Forty-three different species of fish sampled on the seven research cruises within the boundary of the Dry Tortugas National Park. The species are arranged from primitive to advanced species according to Robins et al. (1986).

Common Name	Species
Bonnethead Shark	<i>Sphyrna tiburo</i>
Reef Shark	<i>Carcharhinus perezi</i>
Tiger Shark	<i>Galeocerdo cuvier</i>
Lemon Shark	<i>Negaprion brevirostris</i>
Sharpnose Shark	<i>Rhizoprionodon porosus</i>
Bonfish	<i>Albula vulpes</i>
Key Worm Eel	<i>Ahlia egmontis</i>
Redear Sardine	<i>Harengula humeralis</i>
Herring	<i>Harengula jaguana</i>
Dusky Anchovy	<i>Anchoa lyolepis</i>
Ballyhoo	<i>Hemiramphus brasiliensis</i>
Flyingfish	<i>Cypselurus melanurus</i>
Atlantic Needlefish	<i>Strongylura marina</i>
Timucu	<i>Strongylura timuca</i>
Redfin needlefish	<i>Strongylura notata</i>
Reef Silverside	<i>Hypoatherina harringtonensis</i>
Sharksucker	<i>Echereis naucrates</i>
Whitefin Sharksucker	<i>Echereis neucratoides</i>
Yellow Jack	<i>Caranx bartholomaei</i>
Bar Jack	<i>Caranx ruber</i>
Blue Runner	<i>Caranx crysos</i>
Horse-Eye Jack	<i>Caranx latus</i>
Bigeye scad	<i>Selar crumenophthalmas</i>
Greater Amberjack	<i>Seriola dumerili</i>
Permit	<i>Trachinotus falcatus</i>
Pinfish	<i>Lagodon rhomboides</i>
Yellow chub	<i>Kyphosus incisor</i>
Yellowfin Mojarra	<i>Gerres cinereus</i>
Slender Mojarra	<i>Eucinostomus jonesi</i>
Silver Jenny	<i>Eucinostomus gula</i>
Slippery Dick	<i>Halichoeres bivittatus</i>
Green Razorfish	<i>Hemipteronotus splendens</i>
Barracuda	<i>Sphraena barracuda</i>
Code Goby	<i>Gobiosoma robustum</i>
King Mackerel	<i>Scomberomorus cavalla</i>
Cero	<i>Scomberomorus regalis</i>
Barbfish	<i>Scorpaena brasiliensis</i>
Scrawled Filefish	<i>Aluterus scriptus</i>
Planehead filefish	<i>Stephanolepis hispidus</i>
Pygmy Filefish	<i>Monacanthus setifer</i>
Ocean Trigger	<i>Canthidermis sufflamen</i>
Scrawled Cowfish	<i>Acanthostracion quadricornis</i>
Bandtail Puffer	<i>Sphoeroides spengleri</i>

Table 2.- The site number (corresponds to **Figure 1**), common name, species name, fork length, weight, latitude, and longitude for the forty three different species of fish collected and identified within the boundaries of the Dry Tortugas National Park. Average length was given for species collected in the seine net.

Site#	Date	Common Name	Species	FL (mm)	Wt (kg)	Latitude	Longitude
1	3/8/2006	Greater Amberjack	<i>Seriola dumerili</i>	90	9.53	24 40.105	82 54.758
2	9/19/2006	Ballyhoo	<i>Hemiramphus brasiliensis</i>	20		24 34.316	82 54.315
3	3/28/2006	Ocean Trigger	<i>Canthidermis sufflamen</i>	35	1.36	24 34.625	82 53.690
4	9/19/2006	Blue Runner	<i>Caranx crysos</i>	26	0.23	24 35.468	82 52.512
5	9/19/2006	Cero	<i>Scomberomorus regalis</i>	45	0.68	24 35.471	82 52.510
6	9/19/2006	Barracuda	<i>Sphraena barracuda</i>	104	7.26	24 35.530	82 52.565
7	9/19/2006	Yellow Jack	<i>Caranx bartholomaei</i>	41	1.13	24 35.541	82 52.564
8	3/13/2007	Reef Shark	<i>Carcharhinus perezi</i>	68	3.63	24 36.637	82 56.243
9	3/28/2006	Cero	<i>Scomberomorus regalis</i>	63	1.81	24 37.147	82 56.178
10	7/11/2007	Lemon Shark	<i>Negaprion brevirostris</i>	1600	18.14	24 37.198	82 52.502
11	7/11/2007	Permit	<i>Trachinotus falcatus</i>	695	4.08	24 37.277	82 52.411
12	3/13/2007	Ballyhoo	<i>Hemiramphus brasiliensis</i>	19		24 37.410	82 56.632
13	7/11/2007	Bonefish	<i>Albula vulpes</i>	453	1.36	24 37.412	82 52.104
14	9/18/2006	Reef Silverside	<i>Hypoatherina harringtonensis</i>	6		24 37.470	82 52.311
14	9/18/2006	Bigeye scad	<i>Selar crumenophthalmas</i>	22		24 37.470	82 52.311
14	9/18/2006	Redear Sardine	<i>Harengula humeralis</i>	15		24 37.470	82 52.311
14	9/18/2006	Redear Sardine	<i>Harengula humeralis</i>	14		24 37.470	82 52.311
14	9/18/2006	Redear Sardine	<i>Harengula humeralis</i>	14		24 37.470	82 52.311
14	9/18/2006	Redear Sardine	<i>Harengula humeralis</i>	14		24 37.470	82 52.311
14	9/18/2006	Bigeye scad	<i>Selar crumenophthalmas</i>	21		24 37.470	82 52.311
15	3/13/2007	Redear sardine	<i>Harengula humeralis</i>	12		24 37.472	82 52.310
16	3/12/2007	Bigeye scad	<i>Selar crumenophthalmas</i>	21		24 37.473	82 52.309
16	3/13/2007	Horse-Eye Jack	<i>Caranx latus</i>	18	0.11	24 37.473	82 52.309
17	7/11/2007	Redfin Needlefish	<i>Strongylura notata</i>	350		24 37.493	82 52.189
18	3/28/2006	Blue Runner	<i>Caranx crysos</i>	28	0.23	24 37.523	82 52.237
18	3/28/2006	Herring	<i>Harengula jaguana</i>	12	0.05	24 37.523	82 52.237
18	3/28/2006	Key Worm Eel	<i>Ahlia egmontis</i>	17	0.05	24 37.523	82 52.237
19	3/28/2006	Cero	<i>Scomberomorus regalis</i>	42	0.45	24 37.535	82 55.464
20	7/10/2007	Bandtail Puffer	<i>Sphoeroides spengleri</i>	67.0		24 37.570	82 52.050
20	7/10/2007	Green Razorfish	<i>Hemipteronotus splendens</i>	31.0		24 37.570	82 52.050
20	7/10/2007	Scrawled Cowfish	<i>Acanthostracion quadricornis</i>	145.0		24 37.570	82 52.050
20	7/10/2007	Scrawled Filefish	<i>Aluterus scriptus</i>	79.0		24 37.570	82 52.050
20	7/10/2007	Silver Jenny	<i>Eucinostomus gula</i>	74.2		24 37.570	82 52.050
20	7/10/2007	Slender Mojarra	<i>Eucinostomus jonesi</i>	57.8		24 37.570	82 52.050
21	7/10/2007	Atlantic Needlefish	<i>Strongylura timuca</i>	199.0		24 37.611	82 51.844
21	7/10/2007	Pinfish	<i>Lagodon rhomboides</i>	86.8		24 37.611	82 51.844
21	7/10/2007	Planehead filefish	<i>Stephanolepis hispidus</i>	42.2		24 37.611	82 51.844
21	7/10/2007	Slippery Dick	<i>Halichoeres bivittatus</i>	61.5		24 37.611	82 51.844
22	7/10/2007	Code Goby	<i>Gobiosoma robustum</i>	30.5		24 37.624	82 52.038
22	7/10/2007	Dusky Anchovy	<i>Anchoa lyolepis</i>	68.9		24 37.624	82 52.038
22	7/10/2007	Yellowfin Mojarra	<i>Gerres cinereus</i>	230.0		24 37.624	82 52.038
23	3/28/2006	Cero	<i>Scomberomorus regalis</i>	44	0.68	24 37.650	82 56.220

Site#	Date	Common Name	Species	FL (mm)	Wt (kg)	Latitude	Longitude
24	2/27/2006	Greater Amberjack	<i>Seriola dumerili</i>	66	5.44	24 38.248	82 57.953
24	2/27/2006	Greater Amberjack	<i>Seriola dumerili</i>	42		24 38.248	82 57.953
25	3/28/2006	King Mackerel	<i>Scomberomorus cavalla</i>	122	13.15	24 39.545	82 56.196
26	3/28/2006	Bar Jack	<i>Caranx ruber</i>	38	0.91	24 39.830	82 55.820
27	3/13/2007	Cero	<i>Scomberomorus regalis</i>	56	1.13	24 39.832	82 54.735
28	3/28/2006	Cero	<i>Scomberomorus regalis</i>	67	2.04	24 40.021	82 54.824
29	9/19/2006	Blue Runner	<i>Caranx crysos</i>	12.5		24 40.541	82 55.367
29	9/19/2006	Blue Runner	<i>Caranx crysos</i>	7.5		24 40.541	82 55.367
30	9/19/2006	Pygmy Filefish	<i>Monacanthus setifer</i>	2.5		24 40.596	82 55.370
31	3/27/2006	Reef Shark	<i>Carcharhinus perezi</i>	70	2.95	24 40.700	82 55.103
31	3/27/2006	Whitefin Sharksucker	<i>Echereis neucratoides</i>	12	0.05	24 40.700	82 55.103
31	3/27/2006	Ballyhoo	<i>Hemiramphus brasiliensis</i>	26	0.05	24 40.700	82 55.103
32	2/26/2007	Cero	<i>Scomberomorus regalis</i>	65		24 40.712	82 55.396
32	2/26/2007	Cero	<i>Scomberomorus regalis</i>	54		24 40.712	82 55.396
32	2/26/2007	Cero	<i>Scomberomorus regalis</i>	60		24 40.712	82 55.396
32	2/26/2007	King Mackerel	<i>Scomberomorus cavalla</i>	65		24 40.712	82 55.396
33	2/27/2007	Bonnethead Shark	<i>Sphyrna tiburo</i>	96		24 40.715	82 55.371
33	2/27/2007	Barbfish	<i>Scorpaena brasiliensis</i>	19		24 40.715	82 55.371
34	3/13/2007	Yellow chub	<i>Kyphosus incisor</i>	50	2.04	24 40.838	82 55.072
35	1/5/2007	Sharpnose Shark	<i>Rhizoprionodon porosus</i>	74	2.04	24 40.941	82 54.875
35	1/5/2007	Reef Shark	<i>Carcharhinus perezi</i>	97	4.54	24 40.941	82 54.875
36	2/26/2007	Blue Runner	<i>Caranx crysos</i>	37	0.23	24 41.082	82 55.938
37	9/18/2006	Blue Runner	<i>Caranx crysos</i>	34	0.68	24 41.240	82 46.387
37	9/18/2006	Blue Runner	<i>Caranx crysos</i>	31	0.45	24 41.240	82 46.387
37	9/18/2006	Cero	<i>Scomberomorus regalis</i>	45	0.45	24 41.240	82 46.387
37	9/18/2006	Blue Runner	<i>Caranx crysos</i>	32	0.45	24 41.240	82 46.387
37	9/18/2006	Blue Runner	<i>Caranx crysos</i>	34	0.45	24 41.240	82 46.387
37	9/18/2006	Blue Runner	<i>Caranx crysos</i>	32	0.45	24 41.240	82 46.387
38	3/13/2007	Yellow Jack	<i>Caranx bartholomaei</i>	69	4.99	24 41.863	82 55.066
38	3/13/2007	Sharpnose shark	<i>Rhizoprionodon porosus</i>	79	3.18	24 41.863	82 55.066
38	3/13/2007	King Mackerel	<i>Scomberomorus cavalla</i>	125	18.14	24 41.863	82 55.066
39	3/12/2007	Blue Runner	<i>Caranx crysos</i>	41	0.68	24 41.990	82 46.517
39	3/12/2007	Key Worm Eel	<i>Ahlia egmontis</i>	32		24 41.990	82 46.517
40	2/28/2007	Tiger Shark	<i>Galeocerdo cuvier</i>	270		24 42.031	82 54.700
40	2/28/2007	Sharksucker	<i>Echereis naucrates</i>	23		24 42.031	82 54.700
40	2/28/2007	Sharksucker	<i>Echereis naucrates</i>	27		24 42.031	82 54.700
41	9/19/2006	Cero	<i>Scomberomorus regalis</i>	64	2.04	24 42.525	82 51.448
42	9/19/2006	Cero	<i>Scomberomorus regalis</i>	64.5	2.72	24 42.828	82 54.072
43	2/27/2007	Greater Amberjack	<i>Seriola dumerili</i>	95		24 43.078	82 53.357
44	9/18/2006	Atlantic Needlefish	<i>Strongylura marina</i>	32		24 43.086	82 47.351
44	9/18/2006	Sharksucker	<i>Echereis naucrates</i>	90	3.40	24 43.086	82 47.351
44	9/18/2006	Ballyhoo	<i>Hemiramphus brasiliensis</i>	26		24 43.086	82 47.351
45	9/19/2006	Cero	<i>Scomberomorus regalis</i>	45	0.45	24 43.184	82 53.183
46	9/19/2006	Cero	<i>Scomberomorus regalis</i>	48	0.68	24 43.277	82 52.793
47	9/19/2006	Cero	<i>Scomberomorus regalis</i>	41	0.45	24 43.304	82 49.920
48	9/19/2006	Cero	<i>Scomberomorus regalis</i>	39	0.45	24 43.374	82 50.769
49	9/19/2006	Cero	<i>Scomberomorus regalis</i>	46	0.45	24 43.392	82 51.177
50	9/19/2006	Cero	<i>Scomberomorus regalis</i>	41	0.45	24 43.399	82 48.984

Site#	Date	Common Name	Species	FL (mm)	Wt (kg)	Latitude	Longitude
51	9/19/2006	Yellow Jack	<i>Caranx bartholomaei</i>	50	1.59	24 43.413	82 47.837
51	9/19/2006	Yellow Jack	<i>Caranx bartholomaei</i>	57	2.49	24 43.413	82 47.837
52	9/19/2006	Cero	<i>Scomberomorus regalis</i>	57		24 43.415	82 47.668
53	9/19/2006	Cero	<i>Scomberomorus regalis</i>	58	1.36	24 43.423	82 48.000
54	3/28/2006	Sharpnose shark	<i>Rhizoprionodon porosus</i>	70	2.49	24 61.116	82 93.823
55	3/27/2006	Flyingfish	<i>Cypselurus melanurus</i>	23	0.11	24 39.966	82 55.079

Table 3.- The gear used to sample the different species of fish. Additional information of strength of the line (# test line), hook size, and bait was provided for fish caught with hook-and-line gear. The cast net had a diameter of 426 cm with a 7 mm mesh. The seine net was a 21.3 m center-bag seine with 3 mm mesh. The dip net had a diameter or 61 cm with a 13 mm mesh.

Common Name	Species	Gear	# Test Line	Hook Size	Bait
Greater Amberjack	<i>Seriola dumerili</i>	Hook-and-Line	20	3/0	Ballyhoo
Ballyhoo	<i>Hemiramphus brasiliensis</i>	Cast Net			
Ocean Trigger	<i>Canthidermis sufflamen</i>	Hook-and-Line	15	1/0	Ballyhoo
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	15	1/0	Ballyhoo
Barracuda	<i>Sphraena barracuda</i>	Hook-and-Line	20	4/0	Lure
Yellow Jack	<i>Caranx bartholomaei</i>	Hook-and-Line	15	1/0	Ballyhoo
Reef Shark	<i>Carcharhinus perezi</i>	Hook-and-Line	20	3/0	Ballyhoo
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Lemon Shark	<i>Negaprion brevirostris</i>	Hook-and-Line	20	3/0	Ballyhoo
Permit	<i>Trachinotus falcatus</i>	Hook-and-Line	15	1/0	Crab
Ballyhoo	<i>Hemiramphus brasiliensis</i>	Cast Net			
Bonfish	<i>Albula vulpes</i>	Hook-and-Line	15	1/0	Crab
Reef Silverside	<i>Hypoatherina harringtonensis</i>	Cast Net			
Bigeye scad	<i>Selar crumenophthalmas</i>	Cast Net			
Redear Sardine	<i>Harengula humeralis</i>	Cast Net			
Redear Sardine	<i>Harengula humeralis</i>	Cast Net			
Redear Sardine	<i>Harengula humeralis</i>	Cast Net			
Redear Sardine	<i>Harengula humeralis</i>	Cast Net			
Bigeye scad	<i>Selar crumenophthalmas</i>	Cast Net			
Redear sardine	<i>Harengula humeralis</i>	Cast Net			
Bigeye scad	<i>Selar crumenophthalmas</i>	Cast Net			
Horse-Eye Jack	<i>Caranx latus</i>	Cast Net			
Redfin Needlefish	<i>Strongylura notata</i>	Cast Net			
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Herring	<i>Harengula jaguana</i>	Cast Net			
Key Worm Eel	<i>Ahlia egmontis</i>	Dip Net			
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Bandtail Puffer	<i>Sphoeroides spengleri</i>	Seine Net			
Green Razorfish	<i>Hemipteronotus splendens</i>	Seine Net			
Scrawled Cowfish	<i>Acanthostracion quadricornis</i>	Seine Net			
Scrawled Filefish	<i>Aluterus scriptus</i>	Seine Net			
Silver Jenny	<i>Eucinostomus gula</i>	Seine Net			
Slender Mojarra	<i>Eucinostomus jonesi</i>	Seine Net			

Common Name	Species	Gear	# Test Line	Hook Size	Bait
Atlantic Needlefish	<i>Strongylura timuca</i>	Seine Net			
Pinfish	<i>Lagodon rhomboides</i>	Seine Net			
Planehead filefish	<i>Stephanolepis hispidus</i>	Seine Net			
Slippery Dick	<i>Halichoeres bivittatus</i>	Seine Net			
Code Goby	<i>Gobiosoma robustum</i>	Seine Net			
Dusky Anchovy	<i>Anchoa lyolepis</i>	Seine Net			
Yellowfin Mojarra	<i>Gerres cinereus</i>	Seine Net			
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Greater Amberjack	<i>Seriola dumerili</i>	Hook-and-Line	20	3/0	Ballyhoo
Greater Amberjack	<i>Seriola dumerili</i>	Hook-and-Line	20	3/0	Ballyhoo
King Mackerel	<i>Scomberomorus cavalla</i>	Hook-and-Line	20	3/0	Ballyhoo
Bar Jack	<i>Caranx ruber</i>	Hook-and-Line	15	1/0	Ballyhoo
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	20	4/0	Lure
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Pygmy Filefish	<i>Monacanthus setifer</i>	Hook-and-Line	15	1/0	Ballyhoo
Reef Shark	<i>Carcharhinus perezi</i>	Hook-and-Line	20	3/0	Ballyhoo
Whitefin Sharksucker	<i>Echereis neucratoides</i>	Hook-and-Line	15	1/0	Ballyhoo
Ballyhoo	<i>Hemiramphus brasiliensis</i>	Cast Net			
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	15	1/0	Ballyhoo
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Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	15	1/0	Ballyhoo
King Mackerel	<i>Scomberomorus cavalla</i>	Hook-and-Line	20	4/0	Lure
Bonnethead Shark	<i>Sphyrna tiburo</i>	Hook-and-Line	20	3/0	Ballyhoo
Barbfish	<i>Scorpaena brasiliensis</i>	Hook-and-Line	15	1/0	Ballyhoo
Yellow chub	<i>Kyphosus incisor</i>	Hook-and-Line	15	1/0	Ballyhoo
Sharpnose Shark	<i>Rhizoprionodon porosus</i>	Hook-and-Line	20	3/0	Ballyhoo
Reef Shark	<i>Carcharhinus perezi</i>	Hook-and-Line	20	3/0	Ballyhoo
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	15	1/0	Ballyhoo
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Yellow Jack	<i>Caranx bartholomaei</i>	Hook-and-Line	15	1/0	Ballyhoo
Sharpnose shark	<i>Rhizoprionodon porosus</i>	Hook-and-Line	15	1/0	Ballyhoo
King Mackerel	<i>Scomberomorus cavalla</i>	Hook-and-Line	20	4/0	Lure
Blue Runner	<i>Caranx crysos</i>	Hook-and-Line	15	1/0	Ballyhoo
Key Worm Eel	<i>Ahlia egmontis</i>	Dip Net			
Tiger Shark	<i>Galeocerdo cuvier</i>	Hook-and-Line	20	3/0	Ballyhoo
Sharksucker	<i>Echereis naucrates</i>	Dip Net			
Sharksucker	<i>Echereis naucrates</i>	Dip Net			
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Greater Amberjack	<i>Seriola dumerili</i>	Hook-and-Line	20	4/0	Lure

Common Name	Species	Gear	# Test Line	Hook Size	Bait
Atlantic Needlefish	<i>Strongylura marina</i>	Cast Net			
Sharksucker	<i>Echereis naucrates</i>	Dip Net			
Ballyhoo	<i>Hemiramphus brasiliensis</i>	Cast Net			
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Yellow Jack	<i>Caranx bartholomaei</i>	Hook-and-Line	20	4/0	Lure
Yellow Jack	<i>Caranx bartholomaei</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Cero	<i>Scomberomorus regalis</i>	Hook-and-Line	20	4/0	Lure
Sharpnose shark	<i>Rhizoprionodon porosus</i>	Hook-and-Line	20	4/0	Lure
Flyingfish	<i>Cypselurus melanurus</i>	Cast Net			

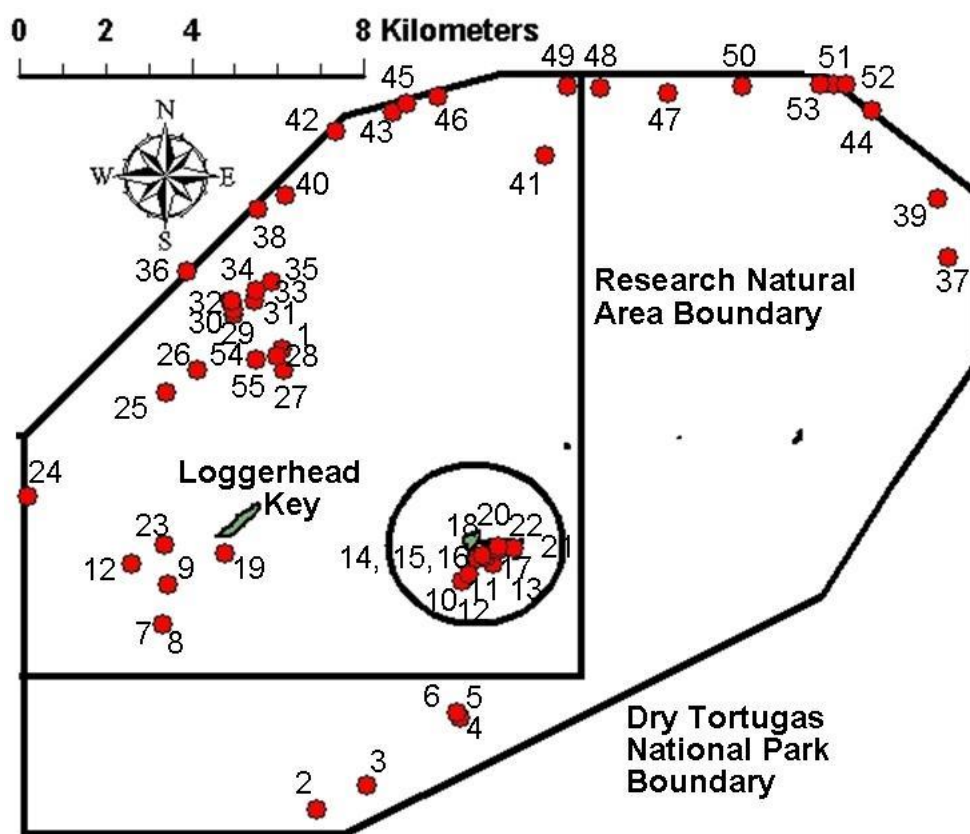


Figure 1.- The plotted locations of the fifty-five sites where non-reef, coastal pelagic fish were sampled inside the Dry Tortugas National Park. The number at each site refers to the site number in **Table 2**.

The next 15 pages consist of pictures of the different species of fish collect with information on the date and location of capture (**Figures 2 – 39**). The fish pictures are arranged from primitive to advanced species according to Robins et al. (1986). No pictures are available for the Ocean triggerfish, *Canthidermis sufflamen*, Slippery Dick (*Halichoeres bivittatus*), Scrawled filefish (*Aluterus scriptus*), Slender Mojarra (*Eucinostomus jonesi*), and Dusky Anchovy (*Anchoa lyolepis*).



Figure 2: Bonnethead Shark, *Sphyrna tiburo*, collected on 2/27/2007 at 24 40.715, 82 55.371.



Figure 3: Reef shark, *Carcharhinus perezii*, collected on 3/27/2006 at 24°40.700, 82°55.103.



Figure 4: Tiger shark, *Galeocerdo cuvier*, collected on 2/28/2007 at 24 42.031, 82 54.700.



Figure 5: Lemon Shark, *Negaprion brevirostris*, collected on 7/10/2007 at 24°37.198, 82°52.502.



Figure 6: Sharpnose shark, *Rhizoprionodon porosus*, collected on 3/28/2006 at 24°61.116, 82°93.823.



Figure 7: Bonefish, *Albula vulpes*, collected on 7/10/2007 at 24 37.412, 82 52.104.



Figure 8: Key worm eel, *Ahlia egmontis*, collected on 3/28/2006 at 24'37.523, 82'52.237.



Figure 9: Redear sardine, *Harengula humeralis*, collected on 9/18/06 at 24 37.470, 82 52.311.



Figure 10: Herring, *Harengula jaguana*, collected on 3/28/2006 at 24'37.523, 82'52.237.



Figure 11: Ballyhoo, *Hemiramphus brasiliensis*, collected on 3/27/2006 at 24°40.700, 82°55.103.



Figure 12: Flyingfish, *Cupselurus melanurus*, on 3/27/2006 at 24°39.966, 82°55.079.



Figure 13: Atlantic needlefish, *Strongylura marina*, collected on 9/18/06 at 24 43.086, 82 47.351.



Figure 14: Timuca, *Strongylura timuca*, collected on 7/10/2007 at 24 37.611, 82 51.844.

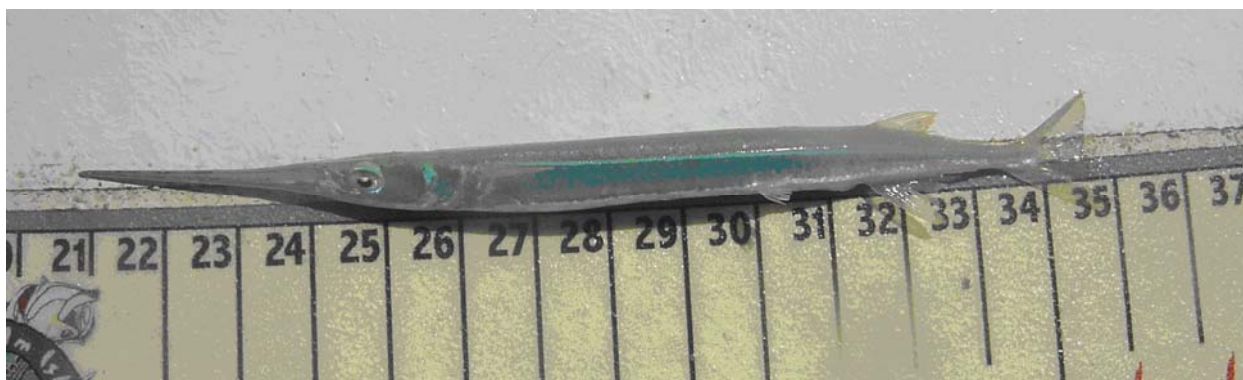


Figure 15: Redfin needlefish, *Strongylura notata*, collected on 7/10/2007 at 24 37.493, 82 52.189.

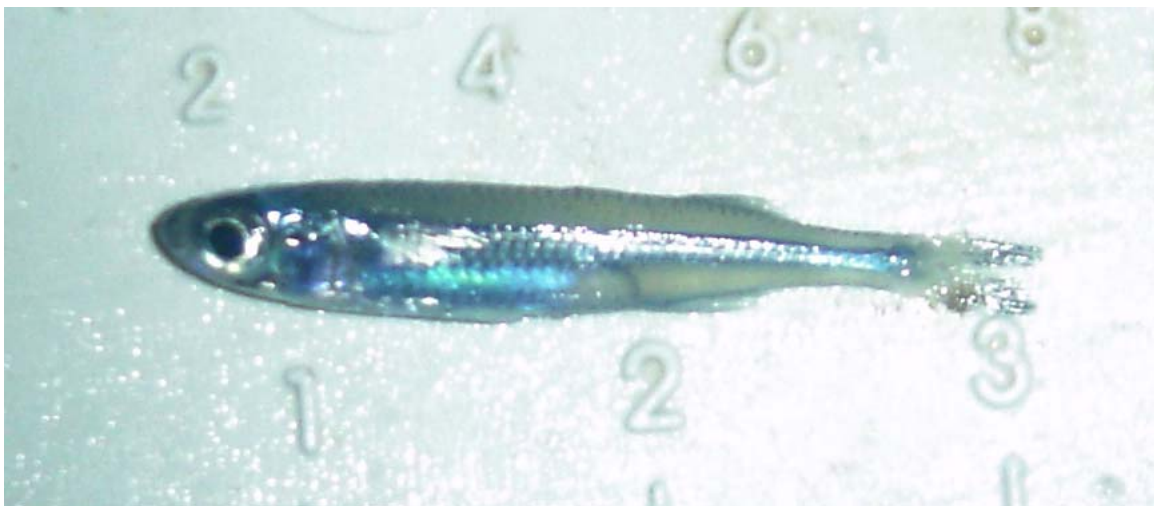


Figure 16: Reef silverside, *Hypoatherina harringtonensis*, collected on 9/18/06 at 24 37.470, 24 37.470.



Figure 17: Sharksucker, *Echereis naucrates*, collected on 9/18/06 at 24 43.086, 82 47.351.



Figure 18: Whitefin Sharksucker, *Echereis neucratooides*, collected on 3/27/2006 at 24°40.700, 82°55.103.



Figure 19: Yellow Jack, *Caranx Bartholomaei*, collected on 9/19/06 at 24 35.541, 82 52.564.



Figure 20: Bar jack, *Caranx ruber*, collected on 3/28/2006 at 24°39.830, 82°55.820.



Figure 21: Blue Runner, *Caranx crysos*, collected on 3/28/2006 at 24°37.523, 82°52.237.



Figure 22: Horse-eye jack, *Caranx latus*, collected on 3/13/2007 at 24 37.473, 82 52.309.



Figure 23: Bigeye scad, *Selar crumenophthalmas*, collected on 9/18/06 at 24 37.470, 82 52.311.



Figure 24: Greater Amerjack, *Seriola dumerili*, collected on 2/27/2006 at 24 38.248, 82 57.953.



Figure 25: Permit, *Trachinotus falcatus*, collected on 7/10/2007 at 24 37.277, 82 52.411.



Figure 26: Pinfish, *Lagodon rhomboides*, collected on 7/10/2007 at 24 37.611, 82 51.844.



Figure 27: Yellow chub, *Kyphosus incisor*, collected on 3/13/2007 at 24 40.838, 82 55.072.



Figure 28: Yellowfin Mojarra, *Gerres cinereus*, collected on 7/10/2007 at 24 37.624, 82 52.038.



Figure 29: Silver Jenny, *Eucinostomus gula*, collected on 7/10/2007 at 24 37.570, 82 52.050.



Figure 30: Green Razorfish, *Hemipteronotus splendens*, collected on 7/10/2007 at 24 37.570, 82 52.050.



Figure 31: Barracuda, *Sphraena barracuda*, collected on 9/19/2006 at 24 35.530, 82 52.565.



Figure 32: Code Goby, *Gobiosoma robustum*, collected on 7/10/2007 at 24 37.624, 82 52.038.



Figure 33: King mackerel, *Scomberomorus cavalla*, collected on 3/28/2006 at 24°39.545, 82°56.196.



Figure 34: Cero mackerel, *Scomberomorus regalis*, on 3/28/2006 at 24°40.021, 82°54.824

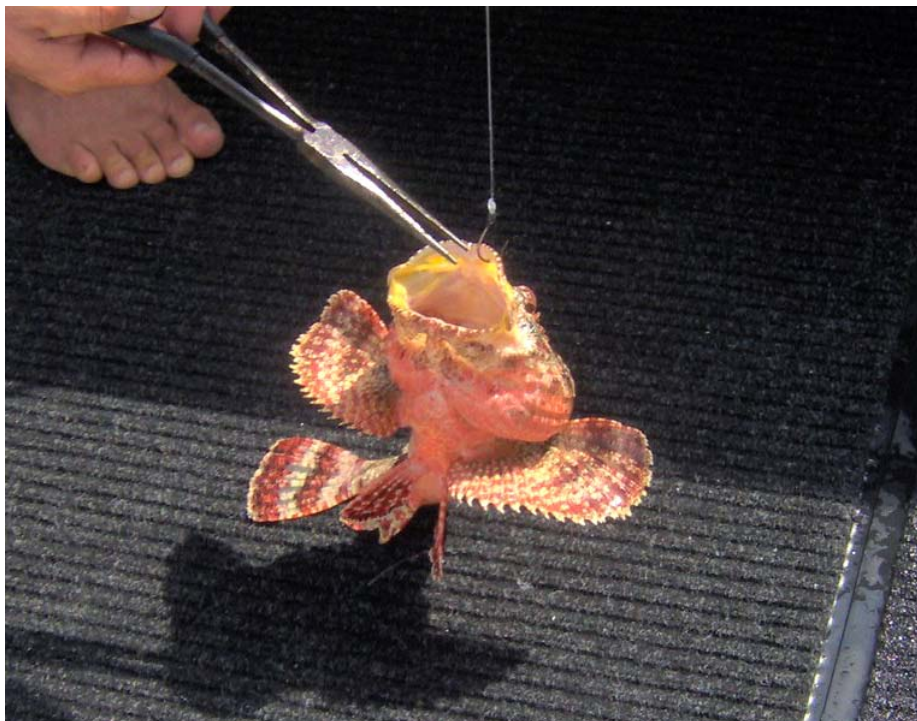


Figure 35: Barbfish, *Scorpaena brasiliensis*, collected on 2/27/2007 at 24 40.715, 82 55.371.



Figure 36: Planehead filefish, *Stephanolepis hispidus*, collected on 7/10/2007 at 24 37.611, 82 51.844.



Figure 37: Pygmy filefish, *Monacanthus setifer*, collected on 9/19/06 at 24 40.596, 82 55.370.



Figure 38: Scrawled Cowfish, *Acanthostracion quadricornis*, collected on 7/10/2007 at 24 37.570, 82



Figure 39: Bandtail puffer, *Sphoeroides spengleri*, collected on 7/10/2007 at 24 37.570, 82 52.050.

Our most recent trip focused on seining with some additional hook-and-line gear deployment. A total of 1,054 fish were collected in the seine net which comprised of twenty-five different species (**Table 4**). Great care was taken to ensure that all fish were released alive despite making field identification more difficult.

Table 4.- The twenty-five different species of fish caught with a seine net within the Dry Tortugas National Park. All measurements were in fork length (mm).

Common Name	Species	n	Min	Max	Mean	SE
Atlantic Needlefish	<i>Strongylura timuca</i>	2	198	200	199.0	1.0
Bandtail Puffer	<i>Sphoeroides spengleri</i>	2	65	69	67.0	2.0
Barbfish	<i>Scorpaena brasiliensis</i>	1	25	25	25.0	-
Barracuda	<i>Sphyraena barracuda</i>	6	35	72	63.0	3.4
Bluestriped Grunt	<i>Haemulon sciurus</i>	16	39	145	60.3	6.1
Code Goby	<i>Gobiosoma robustum</i>	2	33	28	30.5	2.5
Dusky Anchovy	<i>Anchoa lyolepis</i>	720	50	86	68.9	0.4
Foureye Butterflyfish	<i>Chaetodon capistratus</i>	1	28	28	28.0	-
Gray Snapper	<i>Lutjanus griseus</i>	1	110	110	110.0	-
Green Razorfish	<i>Hemipteronotus splendens</i>	1	31	31	31.0	-
Lane Snapper	<i>Lutjanus synagris</i>	2	89	125	107.0	18.0
Mutton Snapper	<i>Lutjanus analis</i>	10	51	190	86.5	12.7
Pinfish	<i>Lagodon rhomboides</i>	4	61	122	86.8	13.3
Planehead Filefish	<i>Stephanolepis hispidus</i>	36	24	71	42.2	1.9
Redear Sardine	<i>Harengula humeralis</i>	19	58	84	71.1	1.7
Reef Silverside	<i>Hypoatherina harringtonensis</i>	124	64	94	79.4	0.6
Schoolmaster Snapper	<i>Lutjanus apodus</i>	3	43	58	51.7	4.5
Scrawled Cowfish	<i>Acanthostracion quadricornis</i>	1	145	145	145.0	-
Scrawled Filefish	<i>Aluterus scriptus</i>	1	79	79	79.0	-
Silver Jenny	<i>Eucinostomus gula</i>	5	71	81	74.2	1.9
Slender Mojarra	<i>Eucinostomus jonesi</i>	69	41	83	57.8	1.3
Slippery Dick	<i>Halichoeres bivittatus</i>	10	39	101	61.5	6.3
Yellow Jack	<i>Caranx bartholmaei</i>	3	75	93	83.3	5.2
Yellowfin Mojarra	<i>Gerres cinereus</i>	1	230	230	230.0	-
Yellowtail Snapper	<i>Ocyurus chrysurus</i>	14	33	68	43.9	2.9

A combination of the seining and some hook-and-line gear deployment on the most recent trip produced 17 new species (**Table 5**) at locations close to Fort Jefferson (**Figure 40**). Thirteen new species were collected in the seine net and four new species were collected with hook-and-line gear.

Table 5.- Seventeen new species were sampled at seven different sites within the Dry Tortugas National Park. Fish collected in the seine net were given “S” in the Gear column and hook-and-line collected fish were given an “H”. Average length was given for species collected in the seine net.

Site	Date	Common Name	Species	FL (mm)	Wt (kg)	Gear
A	7/10/2007	Atlantic Needlefish	<i>Strongylura timuca</i>	199		S
	7/10/2007	Pinfish	<i>Lagodon rhomboides</i>	87		S
	7/10/2007	Planehead Filefish	<i>Stephanolepis hispidus</i>	42		S
	7/10/2007	Slippery Dick	<i>Halichoeres bivittatus</i>	62		S
B	7/10/2007	Bandtail Puffer	<i>Sphoeroides spengleri</i>	67		S
	7/10/2007	Green Razorfish	<i>Hemipteronotus splendens</i>	31		S
	7/10/2007	Scrawled Cowfish	<i>Acanthostracion quadricornis</i>	145		S
	7/10/2007	Scrawled Filefish	<i>Aluterus scriptus</i>	79		S
	7/10/2007	Silver Jenny	<i>Eucinostomus gula</i>	74		S
B	7/10/2007	Slender Mojarra	<i>Eucinostomus jonesi</i>	58		S
C	7/10/2007	Code Goby	<i>Gobiosoma robustum</i>	31		S
	7/10/2007	Dusky Anchovy	<i>Anchoa lyolepis</i>	69		S
	7/10/2007	Yellowfin Mojarra	<i>Gerres cinereus</i>	230		S
D	7/11/2007	Lemon Shark	<i>Negaprion brevirostris</i>	1600	18.1	H
E	7/11/2007	Permit	<i>Trachinotus falcatus</i>	695	4.1	H
F	7/11/2007	Bonfish	<i>Albula vulpes</i>	453	1.4	H
G	7/11/2007	Redfin needlefish	<i>Strongylura notata</i>	350		H

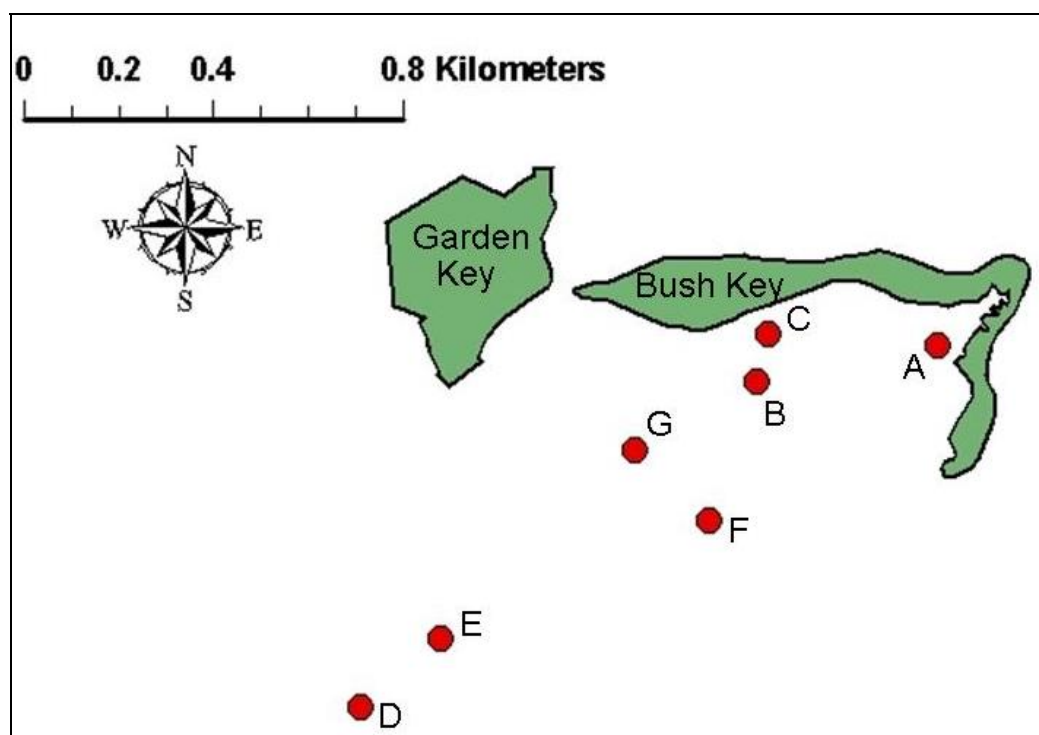


Figure 40.- Plotted location of the seven sites where new species of non-reef, coastal pelagic fish were sampled with a seine net and hook-and-line gear within the Dry Tortugas National Park.

DISCUSSION

The remote location of the DTNP limited the amount of time we could spend inside the park. To maximize our results, we conducted extensive sampling for the entire time (day and night) we were inside the park boundary. We sampled a lot of fish, however, to our surprise, we frequently caught reef fish (i.e. grouper) during pelagic surveys. We also frequently caught the same non-reef, coastal pelagic fish species (Cero Mackerel, *Scomberomorus regalis*) repeatedly. We put great effort into targeting tunas and dolphinfish at different seasons of the year but instead frequently caught mackerels. This result is probably due the fact that the boundary of the park has a maximum depth of 32 meters and tuna and dolphinfish are frequently encountered in depths much greater.

The results from this study provide a baseline of the distribution, abundance, and occurrence of non-reef, coastal pelagic fish assemblages of DRNP. This will help evaluate the effectiveness of the Park's recently authorized Research Natural Area (RNA) marine protection zone.

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