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NOTE

The fishes of Alligator Reef and environs in the Florida Keys: a 2020 update

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Alligator Reef is an outer reef along the Florida Keys, on the edge of the Gulfstream, offshore of the town of Islamorada, near the middle of the island chain and with a rich diversity of marine habitats within a radius of 10 nautical miles. In a pioneering survey of coral-reef fish diversity in the New World, Starck (1968) documented 516 species from Alligator Reef and its environs. A half-century later, Starck, Estapé & Estapé (2017) updated this list with numerous name changes and revisions and added an additional 102 species to the list, bringing the total to 618 species. Since 2017, we have documented 14 additional species for Alligator Reef and environs, bringing the total to 632 species in 122 families (Table 1). This intensively surveyed location continues to contain the greatest diversity of shorefish species from any comparable area in the New World (Starck, Estapé & Estapé 2017).

As of 2017, the senior authors CJE and AME had photographed 314 species in the study area and created a folder of 323 images of 318 fish species (4 by other photographers), archived at <https://doi.org/10.5281/zenodo.848289>. Of the 14 additional species documented here, 13 are photographed and added to the archive, along with photographs of 33 species previously listed but not photographed (Table 2), for a total of 369 images of 364 fish species.

Key words: biogeography, zoogeography, species list, ichthyology, shorefishes, coral reefs, Florida Reef Tract

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The Florida Keys are fortuitously situated at a meeting place of multiple major contributors to marine biodiversity. The Keys extend along the southern tip of the Florida peninsula, just above the northern tropic, with the vast northward-flowing Gulf Stream running just offshore. The inshore waters share shorefish species from the warm temperate Atlantic coast to the north, the Gulf of Mexico, and tropical fauna from the Caribbean Sea. The Gulf Stream brings tropical water conditions to the local offshore reefs, as well as a pelagic oceanic faunal component close to the outer reef margin. The underwater topography immediately outside the reefs drops off sharply into the Florida Straits, also bringing a diverse, deeper, continental-shelf fauna into the survey area.

Of the 14 additional species added to the Alligator Reef species list, most (10) are inshore shallow grassbed or sand species (I), three are primarily reef species (R), and one is an offshore pelagic species (O). In geographic

TABLE 1

Additions to the list of fishes of Alligator Reef and environs
in Starck, Estapé & Estapé (2017) (14 added spp.)

Species	Common Name	details (occurrences, individuals)	habitat/ range
MURAENIDAE	MORAY EELS		
<i>Gymnothorax saxicola</i>	Honeycomb Moray	Lower Matecumbe Bight, bayside, 2 m (1,1)	I, NA
TRIGLIDAE	SEAROBINS		
<i>Prionotus scitulus</i>	Leopard Searobin	Martecumbe bayside & seaside, seagrass & silt, <4 m (2,2)	I, NA
SERRANIDAE	GROUPE/SEABASSES		
<i>Rypticus maculatus</i>	Spotted Soapfish	Galleon ballast pile, <5 m (1,1)	R, NA
CARANGIDAE	JACKS		
<i>Seriola fasciata</i>	Lesser Amberjack	Sargassum mat, drift, <1 m (1,1)	O, A
GERREIDAE	MOJARRAS		
<i>Eucinostomus melanopterus</i>	Spotfin Mojarra	Lower Matecumbe, dead -end canal, 1 m (1, <10)	I, TWA/EA
CHAENOPSIDAE	TUBE BLENNIES		
<i>Acanthemblemaria chaplini</i>	Papillose Blenny	Lower Matecumbe, Hawk Channel patch reefs, 7 m (3, <10)	R, TWA
BLENNIIDAE	COMBTOOTH BLENNIES		
<i>Hypleurochilus pseudoaequipinnis</i>	Atlantic Oyster Blenny	Derelict lobster trap, 3 m (1,1)	I, TWA
GOBIIDAE	GOBIES		
<i>Gobionellus oceanicus</i>	Highfin Goby	Long Key Bight, seagrass & silt, 2 m (multiple, >10)	I, TWA
<i>Microgobius gulosus</i>	Clown Goby	Long Key Bight, seagrass & silt, 2 m (2, <5)	I, NA
BOTHIDAE	LEFTEYE FLOUNDERS		
<i>Bothus robinsi</i>	Twospot Flounder	sand, 3 m (multiple, >5)	I, TWA
MONACANTHIDAE	FILEFISHES		
<i>Aluterus heudelotti</i>	Dotterel Filefish	Lower Matecumbe, Hawk Channel patch reefs, 5 m (1,1)	I, A
<i>Melichthys niger</i>	Black Durgon	Upper Matecumbe, outer reef on wreck, 15 m (1,1)	R, C
TETRAODONTIDAE	PUFFERFISHES		
<i>Sphaeroides nephelus</i>	Southern Puffer	Lower Matecumbe, sand, 5 m (1,1)	I, TWA
<i>Sphaeroides testudineus</i>	Checkered Puffer	Channel 2 fishing pier, hook & line (1,1)	I, TWA

C=circumtropical; EA= East Atlantic, A=East & West Atlantic, NA=North (West) Atlantic (US coast & Gulf of Mexico); TWA= Tropical West Atlantic or Greater Caribbean. Habitats are inshore (I), offshore (O), mainly coral reef (R).

TABLE 2

Additions to photographed list of fishes of Alligator Reef and environs
in Starck, Estapé & Estapé (2017) (46 added spp.)
(* also new addition to the species list)

Species	Common Name	Species	Common Name
* <i>Acanthemblemaria chaplini</i>	Papillose Blenny	<i>Halichoeres caudalis</i>	Painted Wrasse
<i>Achirus lineatus</i>	Lined Sole	<i>Hippocampus zosterae</i>	Dwarf Seahorse
<i>Ahlia egmontis</i>	Key Worm Eel	* <i>Hypleurochilus pseudoaequipinnis</i>	Atlantic Oyster Blenny
<i>Alphestes afer</i>	Mutton Hamlet	<i>Lagodon rhomboides</i>	Pinfish
* <i>Aluterus heudelotii</i>	Dotterel Filefish	<i>Lucania parva</i>	Rainwater Killifish
<i>Astrapogon alutus</i>	Bronze Cardinalfish	* <i>Melichthys niger</i>	Black Durgon
<i>Astrapogon stellatus</i>	Conchfish	<i>Microgobius gulosus</i>	Clown Goby
<i>Barbulifer ceuthoecus</i>	Atlantic Bearded Goby	<i>Mugil curema</i>	White Mullet
* <i>Bothus robinsi</i>	Twospot Flounder	<i>Nicholsina usta</i>	Emerald Parrotfish
<i>Calamus arctifrons</i>	Grass Porgy	<i>Ogilbia cayorum</i>	Key Brotula
<i>Centropyge argi</i>	Cherubfish	<i>Paraclinus marmoratus</i>	Marbled Blenny
<i>Chriodorus atherinoides</i>	Hardhead Halfbeak	<i>Pareques umbrosus</i>	Cubbyu
<i>Cosmocampus elucens</i>	Shortfin Pipefish	* <i>Prionotus scitulus</i>	Leopard Searobin
<i>Ctenogobius stigmaturus</i>	Spottail Goby	* <i>Rypticus maculatus</i>	Whitespotted Soapfish
<i>Diplogrammus pauciradiatus</i>	Spotted Dragonet	<i>Scorpaena brasiliensis</i>	Barbfish
<i>Doratonotus megalepis</i>	Dwarf Wrasse	<i>Scorpaena grandicornis</i>	Plumed Scorpionfish
<i>Enchelycore carychroa</i>	Chestnut Moray	<i>Seriola fasciata</i>	Lesser Amberjack
<i>Eucinostomus harengulus</i>	Tidewater Mojarra	<i>Serranus annularis</i>	Orangeback Bass
* <i>Eucinostomus melanopterus</i>	Flagfin Mojarra	* <i>Sphoeroides nephelus</i>	Southern Puffer
<i>Floridichthys carpio</i>	Goldspotted Killifish	<i>Strongylura marina</i>	Atlantic Needlefish
* <i>Gobionellus oceanicus</i>	Highfin Goby	<i>Syacium papillosum</i>	Dusky Flounder
<i>Gobiosoma robustum</i>	Code Goby	<i>Syngnathus louisianae</i>	Chain Pipefish
* <i>Gymnothorax saxicola</i>	Honeycomb Moray	<i>Synodus foetens</i>	Inshore Lizardfish
<i>Halichoeres caudalis</i>	Painted Wrasse		

distribution, one is a circumtropical offshore reef species (Black Durgon), one a pan-Atlantic pelagic (Lesser Amberjack), 4 are limited to the subtropical continental US east coast and Gulf of Mexico (NA), and 8 are widespread in the Greater Caribbean (subtropical and tropical Western Atlantic TWA), two of which are also found in the eastern Atlantic (Robertson & Van Tassell 2019).

Supplementary material

<https://doi.org/10.5281/zenodo.4243020>

Alligator Reef Fishes species checklist 2020.xlsx Spreadsheet of the checklist of fish species documented in the study area of Alligator Reef & environs, Florida Keys, USA, by Starck, Estapé & Estapé (2017), updated with 14 additional species records.

<https://doi.org/10.5281/zenodo.4243030>

Alligator Reef Fishes species photographs 2020: updated version of Fishes of Alligator Reef & environs, Florida Keys, USA. Starck, Estapé & Estapé (2017) obtained 323 images of 318 fish species, now we add 33 additional photographs of species listed in 2017, plus 13 photographs of new records since 2017, to make a total of 369 images of 364 fish species in the study area (all but 4 taken by Carlos Estapé and Allison Morgan Estapé).

<https://doi.org/10.5281/zenodo.4243090>

Video of first record of the Great White Shark, *Carcharodon carcharias*, on Alligator Reef, Florida Keys, USA, 16 April 2016.

Authors' Note

We (CJE and AME) no longer live in Florida and co-author WAS is residing overseas. Hopefully, with the now-established popularity of recreational fish counting, other devoted enthusiasts will continue to document the fishes in this area. In particular, the ongoing advances in affordable, high-quality, remotely operated vehicles, as well as the increasing popularity of technical diving and mixed-gas rebreathers will open the door to exploring the rich deeper-water fauna beyond the outer reefs in the area.

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