



Global biogeographical data bases on marine fishes: caveat emptor

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ABSTRACT

A review of georeferenced collection-site records for Caribbean shore-fishes served by major online distributors of aggregated biodiversity data found large-scale errors in over a third of the species and genera, in nearly two-thirds of the families. To avoid compromising the value of their services to the global science community online providers must actively address the question of data quality.

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Keywords

Marine fishes, global data bases, erroneous GIS data, faulty biogeographical analyses.

An interlinked group of major online services supplies the global science community with various types of data bases on the biodiversity of terrestrial and marine organisms. Those data bases should be extremely useful for biogeographical analyses, provided that the data are accurate. Unfortunately, major errors are rife among georeferenced collection-site data (GIS data) on marine fishes served by the oldest such service, FishBase (<http://www.fishbase.org>), and by newer systems that serve data from FishBase. These include the Ocean Biogeographical Information System (<http://www.iobis.org>), the Global Biodiversity Information Facility (<http://www.gbif.org>) and the Encyclopedia of Life (<http://www.eol.org>).

When comparing OBIS-generated map displays of GIS data against published descriptions of the geographical ranges of shallow-water shore-fishes from the Greater Caribbean region, I frequently encountered obvious large-scale location errors. These included data-points in the wrong ocean, on the wrong side of the Atlantic, in the wrong hemisphere, in the centre of a deep ocean basin (inappropriate for inshore, demersal fishes) and in the centre of a continent. These observations stimulated a formal assessment of the extent, nature, distribution across major taxonomic groups and provenance of such errors. For this I examined the first species (alphabetic order) with OBIS GIS data in each genus of each family of Greater Caribbean shore-fishes, compared an OBIS map of those data to published descriptions of that species geographical range (Robins *et al.*, 1986; McEachran & Fechtel, 1998, 2002; Carpenter, 2002; Floeter *et al.*, 2008; and individual species pages in FishBase at <http://www.fishbase.org>), and tallied the types of large-scale errors listed above. Furthermore, as FishBase and OBIS do not segregate GIS data on adults and pelagic larvae for any species, I also tallied records of larval data-points far outside the limits of the adult range, i.e. cool temperate and mid-ocean records for inshore demersal tropical species. While pelagic larvae of demersal marine organisms often are carried on ocean currents well beyond

the boundaries of the adult range, data on larvae collected well outside that range are inappropriate for inclusion in analyses of the geographical distributions of adults.

I found that large-scale errors in OBIS GIS data are taxonomically widespread, with 36.8% of the species and genera in 64.7% of the families of sharks, rays and bony fishes having such adult and/or larval data errors (see Appendix S1 in Supporting Information). Most of those errors are from collections of adults (errors in 32.3% of species and genera, 60.8% of families), with obvious large-scale errors due to the admixture of larval data with adult data occurring in only 6.9% of species and genera and 11.8% of families. However, such larval data errors affect some taxa (notably eels) at relatively high rates (see Appendix S1). GIS data provided by FishBase to OBIS are responsible for errors in 96.8% of the species that have erroneous data. Errors in the distributions of adults of most (87.6%) species reflect faulty georeferencing of named sites (e.g. West African coordinates for Puerto Rico; see Appendix S1). Other errors are due to misidentifications, the admixture of data on adults of other species, or the use of outdated (at least 5 years old) taxonomy. These adult and larval data errors originated from 32 primary sources, including both FishBase and OBIS.

For this analysis I tallied only the most obvious large-scale errors, excluded likely errors that I could not fully resolve, and did not include smaller scale, but biogeographically still important errors, such as those within the Greater Caribbean. Hence overall error rates among GIS data on marine fishes served by FishBase and OBIS are higher than the present analysis indicates. This high frequency of errors likely is not unique to Greater Caribbean shore-fishes, as a number of the main primary sources of erroneous data (major museums) that are served by FishBase have worldwide collections of fishes and other marine organisms.

Any biogeographical analysis of fish distributions that uses GIS data on marine fishes provided by FishBase and OBIS 'as is' will be seriously compromised by the high incidence of species

with large-scale geographical errors. A major revision of GIS data for (at least) marine fishes provided by FishBase, OBIS, GBIF and EoL is essential. While the primary sources naturally bear responsibility for data quality, global online providers of aggregated data are also responsible for the content they serve, and cannot side-step the issue by simply including generalized disclaimers about data quality. Those providers need to actively coordinate, organize and effect a revision of GIS data they serve, as revisions by individual users will inevitably lead to confused science (which version did you use?) and a tremendous expenditure of redundant effort. To begin with, it should be relatively easy for providers to segregate all data on pelagic larvae and adults of marine organisms that they serve online. Providers should also include the capacity for users to post readily accessible public comments about the accuracy of individual records and the overall quality of individual data bases. This would stimulate improvements in data quality, and generate 'selection pressures' favouring the usage of better quality data bases, and the revision or elimination of poor-quality data bases. The services provided to the global science community by the interlinked group of online providers of biodiversity data are invaluable and should not be allowed to be discredited by a high incidence of known serious errors in GIS data among marine fishes, and, likely, other marine organisms.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Appendix S1 Errors in Greater Caribbean fish distributions.

Please note: Wiley-Blackwell are not responsible for the content or functionality of any supporting materials supplied by the authors. Any queries (other than missing material) should be directed to the corresponding author for the article.

Table S1. Large-scale geographical errors in geo-referenced data-points downloaded from the Ocean Biogeographic Information System (www.iobis.org) during February, 2008.

TAXON ¹	# Data points	No. Errors	Geographic Range of Species ²	Error type ³	Location of errors ^{2,4}	Sources of errors ⁵
GINGLYMOSTOMATIDAE	-	-	-	Adult	-	-
<i>Ginglymostoma cirratum</i>	264	5	TEP+E&WA	Adult	S France for Nigeria; Offshore Bahamas for Bimini	FB; FB (IGFA)
RHINCODONTIDAE	-	-	-	-	-	-
<i>Rhincodon typus</i>	368	-	CT	-	-	-
ODONTASPIDIDAE	-	-	-	-	-	-
<i>Carcharias taurus</i>	588	-	E&WA+M+IWP	-	-	-
<i>Odontaspis ferox</i>	34	-	CG	-	-	-
ALOPIIDAE	-	-	-	-	-	-
<i>Alopias superciliosus</i>	253	-	CT	-	-	-
CETORHINIDAE	-	-	-	-	-	-
<i>Cetorhinus maximus</i>	1253	-	Antitropical; CG	-	-	-
LAMNIDAE	-	-	-	-	-	-
<i>Carcharodon carcharias</i>	197	-	CG	-	-	-

<i>Isurus oxyrinchus</i>	2,121	-	CG	-	-	-
<i>Lamna nasus</i>	251	-	Antitropical; CG	-	-	-
SCYLIORHINIDAE	-	-	-	-	-	-
<i>Scyliorhinus haeckelii</i>	6	-	TWA	-	-	-
TRIAKIDAE	-	-	-	Adult	-	-
<i>Mustelus canis</i>	493	2	WA	Adult	Cape Verde, Mauritania	FB (MNHN)
CARCHARHINIDAE	-	-	-	Adult	-	-
<i>Carcharhinus acronotus</i>	19	3	WA	Adult	TEP; TEP for Tobago; TEP for Colombia	FB (UBC; ROM; MNHN)
<i>Galeocerdo cuvier</i>	934	-	CT	-	-	-
<i>Isogomphodon oxyrinchus</i>	83	-	SWA	-	-	-
<i>Negaprion brevirostris</i>	26	-	TEP+E&WA	-	-	-
<i>Prionace glauca</i>	2742	-	CG	-	-	-
<i>Rhizoprionodon lalandii</i>	9	-	SWA	-	-	-
SPHYRNIDAE	-	-	-	Adult	-	-
<i>Sphyrna lewini</i>	1,106	4	CG	Adult	S France for Nigeria	FB
HEXANCHIDAE	-	-	-	-	-	-
<i>Heptranchias perlo</i>	957	-	CG except EP	-	-	-
<i>Hexanchus griseus</i>	626	-	Antitropical; CG	-	-	-
ECHINORHINIDAE	-	-	-	-	-	-

Echinorhinus brucus	37	-	CG except EP	-	-	-
SQUALIDAE	-	-	-	Adult	-	-
Cirrhigaleus asper	22	1	NWA+SWIO+Hawaii	Adult	W Africa for IO	IndOBIS
Squalus acanthias	28,267	-	Antitropical; A&P	-	-	-
CENTROPHORIDAE	-	-	-	-	-	-
Centrophorus granulosus	794	-	CG except EP	-	-	-
DALATIIDAE	-	-	-	-	-	-
Dalatias licha	2,710	-	CG except EP	-	-	-
ETMOPTERIDAE	-	-	-	Adult	-	-
Etmopterus gracilispinis	1	-	Antitropical; N&SA + SWIO	-	-	-
Isistius brasiliensis	342	4	CT	Adult	S France for Nigeria	FB
SQUATINIDAE	-	-	-	Adult	-	-
Squatina dumeril	214	1	GC	Adult	Uruguay	FB (MNHN)
TORPEDINIDAE	-	-	-	-	-	-
Torpedo andersoni	4	-	GC	-	-	-
NARCINIDAE	-	-	-	Adult	-	-
Diplobatis colombiensis	5	-	GC	-	-	-
Narcine bancroftii	105	22	GC	Adult	Includes SWA data for <i>N. brasiliensis</i> , separated from <i>N. bancroftii</i> in 2001	FB; FB (IIPB;USNM)

					(6); TEP; CA for Surinam	
PRISTIDAE	-	-	-	Adult	-	-
Pristis pectinata	764	12	CT	Adult	S France for Nigeria	FB
RHINOBATIDAE	-	-	-	-	-	-
Rhinobatos horkelii	6	-	SWA	-	-	-
RAJIDAE	-	-	-	-	-	-
Dipturus olsenii	15	-	GoM	-	-	-
Fenestraja sinusmexicanus	57	-	GC	-	-	-
Leucoraja garmani	349	-	GC	-	-	-
Raja ackleyi	2	-	GoM	-	-	-
UROTRYGONIDAE	-	-	-	Adult	-	-
Urobatis jamaicensis	22	1	GC	Adult	TEP	FB (MNHN)
Urotrygon microphthalmum	20	1	TWA	Adult	W Africa for French Guiana	FB (CAS)
DASYATIDAE	-	-	-	-	-	-
Dasyatis americana	33	-	E&WA	-	-	-
Himantura schmardae	4	-	TWA	-	-	-
Pteroplatytrygon violacea	173	-	CG	-	-	-
GYMNURIDAE	-	-	-	Adult	-	-
Gymnura altavela	708	3	E&WA+M+IWP	Adult	India	ISH

MYLIOBATIDAE	-	-	-	Adult	-	-
Aetobatus narinari	479	7	CT	Adult	S France for Nigeria	FB
Myliobatis freminvillii	64	-	TWA	-	-	-
RHINOPTERIDAE	-	-	-	-	-	-
Rhinoptera bonasus	156	-	E&WA	-	-	-
MOBULIDAE	-	-	-	-	-	-
Manta birostris	130	-	CT	-	-	-
Mobula hypostoma	5	-	WA	-	-	-
ELOPIDAE	-	-	-	Adult	-	-
Elops saurus	169	9	WA	Adult	EPB for Colombia; EA; WIO; India; Red Sea; Taiwan; Australia	FB (ROM; USNM; IGFA; MNHN); IndOBIS; ASIZ; Australian Museum
MEGALOPIDAE	-	-	-	-	-	-
Megalops atlanticus	237	-	E&WA	-	-	-
ALBULIDAE	-	-	-	-	-	-
Albula nemoptera	18	-	TWA	-	-	-
ANGUILLIDAE	-	-	-	Adult + larvae	-	-
Anguilla rostrata	543	~50	NWA	Adult + larvae	Argentina; Offshore EA	FB (ROM); BMNH
MORINGUIDAE	-	-	-	Adult + larvae	-	-
Moringua edwardsi	99	6	WA	Adult + larvae	EPB & TEP for	FB (ROM; BMNH)

					Barbados; Offshore CA	
<i>Neoconger mucronatus</i>	54	-	TWA	-	-	-
CHLOPSIDAE	-	-	-	Adult + larvae	-	-
<i>Catesbya pseudomuraena</i>	1	1	Bahamas	Larvae	Offshore Bermuda	FB (USNM)
<i>Chilorhinus suensonii</i>	73	-	TWA	-	-	-
<i>Chlopsis bicolor</i>	119	10	E&WA+M	Larvae	Offshore CA	FB (BMNH)
<i>Kaupichthys hyoprroides</i>	234	4	GC+IWP	Adult + larvae	Offshore CA; Africa for Panama	FB (BMNH; CAS)
<i>Robinsia catherinae</i>	13	12	GC+WIO	Larvae	Offshore Bermuda	FB (NMNH)
MURAENIDAE	-	-	-	Adult + larvae	-	-
<i>Anarchias similis</i>	119	7	TE&WA	Larvae	Offshore NWA	ARC, FB (BMNH)
<i>Channomuraena vittata</i>	8	-	CT except TEP	-	-	-
<i>Echidna catenata</i>	32	4	W&CA	Adult	EP for Barbados & Tobago; includes data on <i>E. fuscomaculata</i> from WIO + WP	FB (ROM; CAS)
<i>Enchelycore anatina</i>	1	-	TW,C&EA	-	-	-
<i>Gymnothorax conspersus</i>	51	-	TWA	-	-	-
<i>Monopenchelys acuta</i>	3	-	TW&CA+ICP	-	-	-
<i>Muraena retifera</i>	16	-	TWA	-	-	-
<i>Uropterygius macularius</i>	10	-	GC	-	-	-

SYNAPHOBRANCHIDAE	-	-	-	Larvae	-	-
Dysomma anguillare	32	1	TWA+WP+WIO	Larvae	Offshore Bermuda	FB (BMNH)
OPHICHTHIDAE	-	-	-	Adult + larvae	-	-
Ahlia egmontis	37	9	NWA	Larvae	Offshore Nova Scotia	ARC
Aplatophis chauliodus	3	-	TWA	-	-	-
Aprognathodon platyventris	1	-	GC	-	-	-
Apterichtus ansp	7	4	TWA	Larvae	Offshore Nova Scotia	ARC
Bascanichthys bascanium	4	-	GC	-	-	-
Callechelys bilinearis	5	1	WA	Adult	TEP for Barbados	FB (ROM); BMNH
Caralophia loxochila	5	-	TWA	-	-	-
Echiophis intertinctus	23	-	TWA	-	-	-
Ethadophis akkistikos	3	-	TWA	-	-	-
Gordiichthys leiby	4	1	NGC	Larvae	Offshore Nova Scotia	ARC
Ichthyapus ophioneus	10	-	TWA	-	-	-
Letharchus velifer	3	-	NGC	-	-	-
Myrichthys breviceps	10	1	TWA	Larvae	Offshore SWIO	SAM
Myrophis anterodorsalis	2	-	TWA	-	-	-
Ophichthus cruentifer	25	4	WA	Larvae	Offshore Newfoundland & EA	FB (BMNH)
Pseudomyrophis frio	1	-	TWA	-	-	-

Quassiremus ascensionis	1	-	TW&CA	-	-	-
MURAENESOCIDAE	-	-	-	Adult	-	-
Cynoponticus savanna	11	1	TWA	Adult	New York	FB (MNHN)
CONGRIDAE	-	-	-	Larvae	-	-
Ariosoma anale	7	1	TWA	Larvae	Offshore Newfoundland	ARC
Bathycongrus bullisi	19	-	TWA	-	-	-
Conger esculentus	6	6	TWA	-	-	-
Gnathophis bathytopos	6	-	NWA	-	-	-
Heteroconger longissimus	234	-	GC&TEA	-	-	-
Paraconger caudilimbatus	25	1	GC	Larvae	Offshore Newfoundland	ARC
Pseudoplichthys splendens	64	3	E&WA	Larvae	Offshore Newfoundland & CA	ARC & FB (BMNH)
Rhynchoconger flavus	56	6	TWA	Larvae	Offshore Bermuda & Newfoundland	ARC & FB (USNM)
Uroconger syringinus	57	19	E&WA	Larvae	Offshore Bermuda & Newfoundland	ARC & FB (USNM, BMNH)
NETTASTOMATIDAE	-	-	-	Adult	-	-
Hoplunnis diomediana	25	1	NWA	Adult	EA	FB
Nettastoma melanurum	309	2	E&WA+M	larvae	Offshore Newfoundland	ARC
Saurenhelys cognita	3	-	GC	-	-	-
PRISTIGASTERIDAE	-	-	-	Adult	-	-

Chirocentrodon bleekermanus	20	1	TWA	Adult	IO	FB (BMNH)
Odontognathus compressus	1	-	TWA	-	-	-
Pellona harroweri	20	1	TWA	Adult	EA for Brazil	FB (CAS)
ENGRAULIDAE	-	-	-	Adult	-	-
Anchoa cayorum	16	2	Caribbean	Adult	EPB for Barbados & St Vincent	FB (ROM)
Anchovia clupeioides	82	1	TWA	Adult	TEP	FB (USNM)
Anchoviella brevirostris	15	1	SWA	Adult	Includes data for <i>A. brasiliensis</i> from GoM	FB (GCRL)
Cetengraulis edentulus	18	-	TWA	-	-	-
Engraulis eurystole	144	1	WA	Adult	IO for Trinidad	FB (ROM)
Lycengraulis grossidens	110	-	TWA	-	-	-
CLUPEIDAE	-	-	-	Adult	-	-
Alosa aestivalis	1,513	-	NWA	-	-	-
Brevoortia gunteri	11	-	GC	-	-	-
Dorosoma cepedianum	542	2	NWA	Adult	M, Russia for New York	FB (MNHN, MNHN)
Etrumeus teres	320	-	CG	-	-	-
Harengula clupeiola	39	7	NWA	Adult	EPB for Barbados; Europe, EA, WIO	FB (ROM; MNHN)
Jenkinsia lamprotaenia	35	1	GC	Adult	TEP for Barbados	FB (ROM)
Lile piquitinga	1	-	TWA	-	-	-

Opisthonema oglinum	264	3	WA	Adult	EPB for Barbados; Galapagos; WIO for Trinidad	FB (ROM; AMNH; ROM)
Sardinella aurita	680	2	E&WA+M	Adult	India; Taiwan	IndOBIS; FB (NTUM)
ARIIDAE	-	-	-	-	-	-
Ariopsis felis	39	-	NWA	-	-	-
Bagre bagre	103	-	TWA	-	-	-
Cathorops mapale	1	-	GC	-	-	-
Notarius grandicassis	115	-	SWA	-	-	-
Sciades couma	135	-	SWA	-	-	-
ARGENTINIDAE	-	-	-	-	-	-
Argentina striata	220	-	WA	-	-	-
Glossanodon pygmaeus	49	-	WA	-	-	-
SYNODONTIDAE	-	-	-	Adult	-	-
Saurida brasiliensis	951	12	E&WA	Adult	S France for Nigeria	FB
Synodus foetens	363	2	WA	Adult	TEP; CA for Florida	FB (MNHN; ROM)
Trachinocephalus myops	1,924	17	CT except TEP	Adult	EPB for Venezuela, Bonaire, Tobago, Grenada ; mid-Sahara desert; S France for Nigeria; N Canada	FB (ROM; MNHN); FB; ARC
CHLOROPHTHALMIDAE	-	-	-	-	-	-

<i>Chlorophthalmus agassizi</i>	1,568	-	CG	-	-	-
LAMPRIDIDAE	-	-	-	-	-	-
<i>Lampris guttatus</i>	184	-	CG	-	-	-
POLYMIXIIDAE	-	-	-	-	-	-
<i>Polymixia lowei</i>	416	-	WA	-	-	-
BREGMACEROTIDAE	-	-	-	-	-	-
<i>Bregmaceros atlanticus</i>	569	-	CT	-	-	-
MORIDAE	-	-	-	Adult	-	-
<i>Laemonema barbatulum</i>	111	1	WA	Adult	EA for USA	FB (CAS)
MERLUCCIIDAE	-	-	-	Adult	-	-
<i>Merluccius albidus</i>	1792	9	WA	Adult	TEP; EA for Florida; M	FB (USNM; USNM; USNM)
GADIDAE	-	-	-	Adult	-	-
<i>Enchelyopus cimbrius</i>	8,289	-	NE&NWA	-	-	-
<i>Phycis chesteri</i>	4,214	2	NWA	Adult	Lake Michigan (USA); EA	NMFS; DFO-NG
<i>Urophycis cirrata</i>	181	1	WA	Adult	CA for Brazil	FB (MNHN)
CARAPIDAE	-	-	-	Larvae	-	-
<i>Carapus bermudensis</i>	74	9	WA	Larvae	Offshore Nova Scotia & CA	FB (ISH)
<i>Echiodon dawsoni</i>	100	77	WA	Larvae	Offshore Nova Scotia & EA	ARC, FB (ISH) & ZMUC

OPHIDIIDAE	-	-	-	Adult + larvae	-	-
Brotula barbata	810	13	E&WA	Adult + larvae	Offshore Nova Scotia; S France for Nigeria	ARC; FB
Lepophidium aporrhox	8	-	TWA	-	-	-
Neobythites gilli	88	-	GoM	-	-	-
Ophidion grayi	62	-	GC	-	-	-
Otophidium omostigma	41	-	GC	-	-	-
Parophidion schmidti	14	1	TWA	Adult	EPB for Tobago	FB (ROM)
Petrotyx sanguineus	6	-	GC	-	-	-
BYTHITIDAE	-	-	-	Larvae	-	-
Calamopteryx goslinei	4	1	GC	Larvae	Offshore EA	FB (BMNH)
Gunterichthys longipenis	4	-	GoM	-	-	-
Ogilbia cayorum	6	-	GoM	-	-	-
Stygnobrotula latebricola	7	-	GC	-	-	-
BATRACHOIDIDAE	-	-	-	Adult	-	-
Amphichthys cryptocentrus	9	-	SWA	-	-	-
Batrachoides gilberti	1	-	Caribbean	-	-	-
Opsanus beta	20	-	GoM	-	-	-
Porichthys plectrodon	174	-	WA	-	-	-
Sanopus greenfieldorum	1	-	Caribbean	-	-	-

Thalassophryne maculosa	37	1	GC	Adult	CA for Caribbean	FB (USNM)
LOPHIIDAE	-	-	-	Adult + larvae	-	-
Lophiodes reticulatus	36	-	TWA	-	-	-
Lophius americanus	11,775	9	NWA	Adult + larvae	Lakes Michigan & Erie; offshore Labrador & Hudson's Bay for New Brunswick & S Carolina; TEA	NMFS; DFO-NG; CMN & ARC
ANTENNARIIDAE	-	-	-	Adult	-	-
Antennarius bermudensis	4	-	GC	-	-	-
Histrio histrio	848	5	CT except TEP	Adult	Includes data for <i>A. inops</i> from TEP; S France for Nigeria	FB (CAS); FB
OGCOCEPHALIDAE	-	-	-	Adult	-	-
Dibranchus atlanticus	999	8	E&WA	Adult	Includes data for <i>D. hystrix</i> from TEP & Vietnam; S France for Nigeria; mid -Africa, Tibet, Vietnam	FB (CAS; MNHN; ASIZP)
Halieutichthys aculeatus	316	~150	TWA	Adult	EPB for Barbados; NE Pacific; offshore Nova Scotia; CA for Florida; longitudinal string of points in mid-W Africa for various parts of USA	FB (ROM; CAS; ZMUC; USNM; CAS)
Malthopsis gnoma	17	1	WA	Adult	W Africa on land	FB (CAS)
Ogocephalus corniger	52	7	GC	Adult	NW Africa on land for east USA; mid-Sahara	FB (CAS)

					desert for Florida	
Zalieutes mcgintyi	63	6	TWA	Adult	Longitudinal string of points through W Africa for Caribbean	FB (CAS)
MUGILIDAE	-	-	-	Adult	-	-
Agonostomus monticola	62	5	TEP+TWA	Adult	EPB for Barbados & USA; EA	FB (ROM, MNHN; MNHN)
<i>Joturus pichardi</i>	3	-	GC	-	-	-
<i>Mugil cephalus</i>	954	-	CT	-	-	-
ATHERINOPSIDAE	-	-	-	Adult	-	-
<i>Atherinella blackburni</i>	3	-	TWA	-	-	-
<i>Melanorhinus microps</i>	2	-	GC	-	-	-
<i>Membras martinica</i>	18	2	NWA	-	-	-
Menidia beryllina	116	3	NWA	Adult	NE Pacific; W Africa for Kuwait	SAIAB; IndOBIS
ATHERINIDAE	-	-	-	Adult	-	-
Atherinomorus stipes	86	3	GC	Adult	EPB for lesser Antilles	FB (ROM)
Hypoatherina harringtonensis	25	4	GC	Adult	EPB for Barbados; W Africa on land for Panama & Bermuda	FB (ROM; CAS)
EXOCOETIDAE	-	-	-	Adult	-	-
Cheilopogon cyanopterus	95	3	CT except TEP	Adult	Includes data for <i>Cypselurus bahiensis</i> from TEP	FB (AMNH, UBC)

<i>Cypselurus comatus</i>	15	-	TWA	-	-	-
Exocoetus obtusirostris	35,223	40	E&WA	Adult	EP to WP+EIO; longitudinal string of points through W Africa	FB (ROM, USNM; ZMUC)
Hirundichthys affinis	163	31	E&WA	Adult	EPB for Lesser Antilles; WP+ EIO; longitudinal string of points through W Africa	FB (ROM; ZMUC; ZMUC)
<i>Parexocoetus hillianus</i>	1	-	E&WA	-	-	-
<i>Prognichthys glaphyrae</i>	1	-	E&WA	-	-	-
HEMIRAMPHIDAE	-	-	-	Adult	-	-
<i>Chriodorus atherinoides</i>	5	-	N GC	-	-	-
<i>Euleptorhamphus velox</i>	54	-	E&WA	-	-	-
Hemiramphus balao	117	8	TE&WA	Adult	Central south America for Martinique	FB (ROM)
<i>Hyporhamphus meeki</i>	10	-	NWA	-	-	-
Oxyporhamphus micropterus similis	74	1	E&WA	Adult	Mid-Sahara desert	FB (ZMUC)
BELONIDAE	-	-	-	Adult	-	-
<i>Ablennes hians</i>	191	-	CT	-	-	-
<i>Platybelone argalus argalus</i>	1	-	TWA	-	-	-
Strongylura marina	70	1	WA	Adult	EA	FB (AMNH)
Tylosurus acus acus	61	1	TWA	Adult	EPB for Venezuela	FB (ROM)

ANOMALOPIDAE	-	-	-	-	-	-
<i>Kryptophanaron alfredi</i>	2	-	GC	-	-	-
TRACHICHTHYIDAE	-	-	-	Adult	-	-
<i>Gephyroberyx darwinii</i>	740	12	A&IWP	Adult	S France for Nigeria	FB (NMNH)
BERYCIDAE	-	-	-	Adult	-	-
<i>Beryx splendens</i>	2,168	4	CG except M	Adult	S France for Nigeria	FB
HOLOCENTRIDAE	-	-	-	Adult	-	-
<i>Corniger spinosus</i>	8	-	TWA	-	-	-
<i>Holocentrus adscensionis</i>	313	7	E&WA	Adult	EPB for Tobago; S France for Nigeria; offshore CA	FB (ROM); FB; FB (ZMUC)
<i>Myripristis jacobus</i>	88	1	E&WA	Adult	EPB for St Vincent	FB (ROM)
<i>Neoniphon marianus</i>	22	-	-	-	-	-
<i>Ostichthys trachypoma</i>	21	-	TWA	Adult	Mid-W africa for Puerto Rico	FB (CAS)
<i>Plectrypops retrospinis</i>	32	-	GC	-	-	-
<i>Sargocentron vexillarium</i>	75	4	GC	Adult	EPB for Barbados & Tobago	FB (ROM)
PARAZENIDAE	-	-	-	-	-	-
<i>Cyttopsis rosea</i>	146	-	A&IWP	-	-	-
GRAMMICOLEPIDIDAE	-	-	-	-	-	-
<i>Xenolepidichthys dalgleishi</i>	301	-	A&IWP	-	-	-

ZEIDAE	-	-	-	Adult	-	-
Zenopsis conchifera	1193	12	A&WIO	Adult	S France for Nigeria	FB
SYNGNATHIDAE	-	-	-	Adult	-	-
Acentronura dendritica	21	1	TWA	Adult	India for USA	FB (KU)
Anarchopterus criniger	1	-	GC	-	-	-
Bryx dunckeri	5	-	TWA	-	-	-
Cosmocampus albirostris	14	-	GC	-	-	-
Hippocampus erectus	142	4	WA	Adult	NE&SE Pacific; includes data for <i>H. punctulatus</i> from W Africa; mid-Sahara for Mexico	FB (UBC&ISH; ZMUC; CAS)
Micrognathus crinitus	29	1	TWA	Adult	Central W Africa for St Lucia	FB (CAS)
Minyichthys inusitatus	1	-	Caribbean	-	-	-
Penetopteryx nanus	1	-	GC	-	-	-
Syngnathus caribbaeus	8	-	Caribbean	-	-	-
AULOSTOMIDAE	-	-	-	Adult	-	-
Aulostomus maculatus	50	5	TWA	Adult	SCA; EA; WIO for Tobago	FB (MNHN; MNHN; ROM)
FISTULARIIDAE	-	-	-	Adult	-	-
Fistularia petimba	2,462	11	CT except TEP	Adult	TEP	FB (UBC, MNHN)
CENTRISCIDAE	-	-	-	-	-	-

Macroramphosus scolopax	385	-	CG	-	-	-
DACTYLOPTERIDAE	-	-	-	-	-	-
Dactylopterus volitans	449	-	E&WA+M	-	-	-
SCORPAENIDAE	-	-	-	Adult	-	-
Neomerinthe beanorum	43	-	GC	-	-	-
Phenacoscorpius nebris	5	-	GC	-	-	-
Pontinus castor	7	-	GC	-	-	-
Scorpaena agassizii	86	-	TWA	-	-	-
Scorpaenodes caribbaeus	51	2	WA	Adult	EPB for Barbados; EA for Colombia	FB (ROM; CAS)
TRIGLIDAE	-	-	-	Adult	-	-
Bellator brachychir	36	-	WA	-	-	-
Prionotus alatus	59	2	NWA	Adult	EA for USA	FB (CAS)
PERISTEDIIDAE	-	-	-	-	-	-
Peristedion gracile	27	-	NWA	-	-	-
CENTROPOMIDAE	-	-	-	-	-	-
Centropomus ensiferus	22	-	TWA	-	-	-
MORONIDAE	-	-	-	Adult	-	-
Morone saxatilis	145	8	NWA	Adult	NEP data are from introductions; central Canada for EP; NA;	FB; FB (CAS, IGFA; MNHN; NMHN)

					offshore Bahamas for USA	
ACROPOMATIDAE	-	-	-	Adult	-	-
Synagrops bellus	1,066	9	E&WA	Adult	S France for Nigeria	FB-MNHN
POLYPRIONIDAE	-	-	-	-	-	-
<i>Polyprion americanus</i>	1,173	-	NE&NWA+M+IWP	-	-	-
SYMPHYSANODONTIDAE	-	-	-	Adult	-	-
Symphysanodon berryi	25	2	TE&WA+IO	Adult	Central Africa for Puerto Rico	FB-CAS
SERRANIDAE	-	-	-	Adult	-	-
Alphestes afer	31	5	E&WA	Adult	TEP; EPB for Grenada & Barbados	FB (USNM, AMNH; ROM)
<i>Anthias nicholsi</i>	10	-	WA	-	-	-
Bathyanthias cubensis	31	1	TWA	Adult	EA for Puerto Rico	FB (CAS)
<i>Bullisichthys caribbaeus</i>	4	-	GC	-	-	-
<i>Centropristis ocyurus</i>	186	-	NWA	-	-	-
Cephalopholis cruentata	1,130	1	TWA	Adult	EPB for Barbados	FB (ROM)
<i>Dermatolepis inermis</i>	7	-	TWA	-	-	-
<i>Diplectrum bivittatum</i>	145	-	TWA	-	-	-
Epinephelus adscensionis	97	4	TE,C&WA	Adult	TEP; EPB for Tobago & Barbados	FB (AMNH; ROM)
<i>Gonioplectrus hispanus</i>	4	-	TWA	-	-	-

Hemanthias aureorubens	28	-	TWA	-	-	-
Hypoplectrus aberrans	10	1	GC	Adult	EA for Panama	FB (CAS)
Liopropoma carmabi	2	-	GC	-	-	-
Mycteroperca acutirostris	4	-	TWA	-	-	-
Paralabrax dewegeri	8	-	TWA	-	-	-
Paranthias furcifer	48	20	TWA	Adult	TEP; EPB for Barbados; EA for Caribbean; Burma; Indonesia	FB (AMNH & UBC; ROM; CAS; MNHN; MNHN)
Plectranthias garrupellus	9	-	GC	-	-	-
Pronotogrammus martinicensis	25	-	TWA	-	-	-
Pseudogramma gregoryi	29	-	GC	-	-	-
Rypticus bistrispinus	4	-	TWA	-	-	-
Schultzea beta	2	-	GC	-	-	-
Serraniculus pumilio	82	-	TWA	-	-	-
Serranus annularis	7	-	TWA	-	-	-
GRAMMATIDAE	-	-	-	-	-	-
Gramma loreto	18	-	GC	-	-	-
Lipogramma anabantoides	3	-	GC	-	-	-
OPISTOGNATHIDAE	-	-	-	-	-	-
Lonchopisthus higmani	15	-	TWA	-	-	-

<i>Opistognathus aurifrons</i>	4	-	GC	-	-	-
PRIACANTHIDAE	-	-	-	Adult +larvae	-	-
<i>Cookeolus japonicus</i>	49	-	CG	-	-	-
<i>Heteropriacanthus cruentatus</i>	292	-	CT	-	-	-
Priacanthus arenatus	1,238	19	TE&WA	Adult +larvae	S France for Nigeria; WIO; NE Canada for larvae	FB; SAMC; ARC
Pristigenys alta	80	11	TWA	Larvae	NE Canada for larvae	FB (USNM, ROM), CMN
APOGONIDAE	-	-	-	Adult	-	-
<i>Apogon affinis</i>	44	-	E&WA	-	-	-
<i>Astrapogon alutus</i>	8	-	GC	-	-	-
Phaeoptyx conklini	44	1	GC	Adult	EPB for St Lucia	FB (ROM)
MALACANTHIDAE	-	-	-	Adult	-	-
<i>Caulolatilus chrysops</i>	40	-	TWA	-	-	-
<i>Lopholatilus chamaeleonticeps</i>	24	-	WA	-	-	-
Malacanthus plumieri	27	2	TWA	Adult	NEP for St Lucia; Mid-W Africa for Caribbean	FB (USNM; CAS)
POMATOMIDAE	-	-	-	Adult	-	-
Pomatomus saltatrix	28,102	3	E&WA&IWP	Adult	Mid-Sahara for Tunisia coast; mid Greenland for Canada; Hawaii	INSTM; FB (ROM; MNHN)
CORYPHAENIDAE	-	-	-	-	-	-

<i>Coryphaena equiselis</i>	162	-	CT	-	-	-
RACHYCENTRIDAE	-	-	-	Adult	-	-
Rachycentron canadum	1,747	12	TE&WA+IWP	Adult	S France for Nigeria	FB
ECHENEIDAE	-	-	-	Adult	-	-
Echeneis naucrates	1,513	1	CT	Adult	Mid-Sahara for Puerto Rico	FB (CAS)
<i>Phtheichthys lineatus</i>	27	-	CT	-	-	-
<i>Remora australis</i>	12	-	CT	-	-	-
<i>Remorina albescens</i>	20	-	CT	-	-	-
CARANGIDAE	-	-	-	Adult	-	-
Alectis ciliaris	698	9	CT	Adult	S France for Nigeria	FB
Carangoides bartholomaei	41	1	TWA	Adult	WIO for Trinidad	FB (ROM)
<i>Caranx crysos</i>	500	-	E&WA	-	-	-
Chloroscombrus chrysurus	1,146	8	E&WA	Adult	S France for Nigeria; WIO for Trinidad; India	FB; FB (ROM; MNHN)
<i>Decapterus macarellus</i>	150	-	CT	-	-	-
Elagatis bipinnulata	534	4	CT	Adult	S France for Nigeria	FB
Gnathanodon speciosus	394	4	IP	Adult	EA for E Africa	IndOBIS
<i>Hemicaranx amblyrhynchus</i>	32	-	TWA	-	-	-
<i>Naucrates ductor</i>	631	-	CT	-	-	-
<i>Oligoplites palometa</i>	18	-	TWA	-	-	-

<i>Pseudocaranx dentex</i>	2,244	-	Antitropical; TE&WA+ICP	-	-	-
Selar crumenophthalmus	1,236	4	CT	Adult	S France for Nigeria	FB
<i>Selene brownii</i>	22	-	GC	-	-	-
<i>Seriola dumerili</i>	998	-	E&WA+ICP	-	-	-
<i>Trachinotus carolinus</i>	34	-	TWA	-	-	-
<i>Trachurus lathami</i>	358	-	WA	-	-	-
Uraspis secunda	690	12	E&A+P	Adult	S France for Nigeria	FB
BRAMIDAE	-	-	-	-	-	-
<i>Brama brama</i>	2,351	-	E&WA+IO+SP	-	-	-
<i>Pterycombus brama</i>	60	-	E&WA	-	-	-
<i>Taractes rubescens</i>	11	-	A&P	-	-	-
<i>Taractichthys longipinnis</i>	29	-	E&WA	-	-	-
EMMELICHTHYIDAE	-	-	-	Adult	-	-
Erythrocles monodi	695	12	E&WA	Adult	S France for Nigeria	FB
LUTJANIDAE	-	-	-	Adult + larvae	-	-
<i>Apsilus dentatus</i>	7	-	GC	-	-	-
<i>Etelis oculatus</i>	28	-	TWA	-	-	-
<i>Lutjanus analis</i>	217	-	WA	-	-	-
Ocyurus chrysurus	1,741	1	WA	Adult	EA for Panama	FB (CAS)

Pristipomoides aquilonaris	136	1	WA	Larvae	Off Nova Scotia	ARC
Rhomboplites aurorubens	100	2	TWA	Adult	EPB for Barbados; EA for USA	FB (ROM; ROM)
LOBOTIDAE	-	-	-	Adult	-	-
Lobotes surinamensis	238	1	E&WA + IWP	Adult	TEP	FB (UBC)
GERREIDAE	-	-	-	Adult	-	-
Diapterus auratus	20	1	TWA	Adult	TEP	FB (MNHN)
Eucinostomus argenteus	150	2	TWA	Adult	WIO for Venezuela; Canada for Belize	FB (USNM; GCRL)
Eugerres plumieri	17	1	TWA	Adult	TEP	FB (MNHN)
Gerres cinereus	92	-	TEP+TWA	-	-	-
HAEMULIDAE	-	-	-	Adult	-	-
Anisotremus moricandi	9	-	TWA	-	-	-
Conodon nobilis	38	2	TWA	Adult	TEP; WIO for Trinidad	FB (UBC; ROM)
Genyatremus luteus	100	-	TWA	-	-	-
Haemulon album	29	-	TWA	-	-	-
Orthopristis chrysoptera	58	-	NWA	-	-	-
Pomadasys corvinaeformis	14	-	TWA	Adult	-	-
INERMIIDAE	-	-	-	Adult	-	-
Emmelichthys atlanticus	16	-	TWA	-	-	-
Inermia vittata	9	1	GC	Adult	EPB for Barbados	FB (ROM)

SPARIDAE	-	-	-	Adult	-	-
<i>Archosargus probatocephalus</i>	34	-	WA	-	-	-
<i>Calamus arctifrons</i>	3	-	GoM	-	-	-
<i>Diplodus bermudensis</i>	1	-	Bermuda	-	-	-
Lagodon rhomboides	229	2	NWA	Adult	Central Canada for E Canada; EA for IO	FB (ROM); IndOBIS
<i>Pagrus pagrus</i>	1,031	-	E&WA+M	-	-	-
<i>Stenotomus caprinus</i>	138	-	GoM	-	-	-
POLYNEMIDAE	-	-	-	-	-	-
<i>Polydactylus octonemus</i>	11	-	GoM	-	-	-
SCIAENIDAE	-	-	-	Adult	-	-
<i>Bairdiella chrysoura</i>	118	-	NWA	-	-	-
Ctenosciaena gracilicirrus	29	1	TWA	Adult	EA for Trinidad	FB (CAS)
<i>Cynoscion acoupa</i>	95	-	TWA	-	-	-
Equetus lanceolatus	63	2	TWA	Adult	IO for Colombia, India for Surinam	FB (KU,KU)
<i>Isopisthus parvipinnis</i>	99	-	TWA	-	-	-
Larimus breviceps	32	1	TWA	Adult	IO for Trinidad	FB (ROM)
Leiostomus xanthurus	313	1	NWA	Adult	California	FB (MNHN)
<i>Lonchurus lanceolatus</i>	6	-	SWA	-	-	-
<i>Macrodon ancylodon</i>	116	-	SWA	-	-	-

<i>Menticirrhus americanus</i>	72	-	WA	-	-	-
<i>Micropogonias furnieri</i>	62	-	TWA	-	-	-
<i>Nebris microps</i>	94	-	TWA	-	-	-
Odontoscion dentex	24	1	TWA	Adult	Central USA for Belize	FB (GCRL)
<i>Ophioscion punctatissimus</i>	3	-	TWA	-	-	-
<i>Paralonchurus brasiliensis</i>	31	-	TWA	-	-	-
Pareques acuminatus	25	1	WA	Adult	Peru	FB (UBC)
<i>Pogonias cromis</i>	89	-	WA	-	-	-
<i>Protosciaena trewavasae</i>	10	-	TWA	-	-	-
Sciaenops ocellatus	300	1	NWA	Adult	North Texas for south Texas coast	CMN
<i>Stellifer chaoi</i>	4	-	GC	-	-	-
<i>Umbrina broussonnetii</i>	10	-	Caribbean	-	-	-
MULLIDAE	-	-	-	Adult + larvae	-	-
Mulloidichthys martinicus	37	5	E,W&SCA	Adult	EPB for St Vincent; mid-Sahara for Jamaica	FB (ROM; CAS)
Mullus auratus	81	1	GC	Larvae	Offshore NWA	FB (USNM)
<i>Pseudupeneus maculatus</i>	94	-	TWA	-	-	-
<i>Upeneus parvus</i>	57	-	TWA	-	-	-
PEMPHERIDAE	-	-	-	-	-	-
<i>Pempheris poeyi</i>	7	-	GC	-	-	-

KYPHOSIDAE	-	-	-	-	-	-
Kyphosus incisor	12	-	E&WA	-	-	-
CHAETODONTIDAE	-	-	-	Adult	-	-
Chaetodon capistratus	1,896	1	TWA	Adult	EPB for St Vincent	FB (ROM)
Prognathodes aculeatus	5	-	TWA	-	-	-
POMACANTHIDAE	-	-	-	Adult	-	-
Centropyge argi	5	-	TWA	-	-	-
Holacanthus bermudensis	47	-	GC	-	-	-
Pomacanthus arcuatus	471	2	TWA	Adult	TEP; includes data for <i>Chaetodon aureus</i> from Hong Kong	FB (UBC; CAS)
CIRRHITIDAE	-	-	-	Adult	-	-
Amblycirrhitus pinos	11	1	TWA	Adult	EIO	FB (MNHN)
POMACENTRIDAE	-	-	-	Adult	-	-
Abudefduf saxatilis	484	~100	E&WA	Adult	Includes IP data from <i>A. vaigiensis</i> , separated from <i>A. saxatilis</i> in 1991(7)	FB (BPBM, CAS, UBC, RUSI, USNM, ROM, MNHN), IndOBIS, NODC, SAIAB, UWFC.
Chromis cyanea	18	-	GC	-	-	-
Microspathodon chrysurus	2,779	2	TWA	Adult	EPB for St Vincent; EA	FB (ROM; MNHN)
Stegastes adustus	109	5	GC	Adult	EPB for Barbados & St Vincent	FB (ROM)
LABRIDAE	-	-	-	Adult	-	-

Bodianus pulchellus	7	-	TWA	-	-	-
Clepticus parrae	19	-	GC	-	-	-
Decodon puellaris	43	-	GC	-	-	-
Doratonotus megalepis	24	-	E&WA	-	-	-
Halichoeres bathyphilus	8	-	TWA	-	-	-
Lachnolaimus maximus	321	-	GC	-	-	-
Thalassoma bifasciatum	128	6	GC	Adult	EPB for Barbados & St Vincent	FB (ROM)
Xyrichtys martinicensis	7	-	GC	-	-	-
SCARIDAE	-	-	-	Adult	-	-
Cryptotomus roseus	20	-	TWA	-	-	-
Nicholsina usta usta	31	-	TWA	-	-	-
Scarus coelestinus	77	4	GC	Adult	Includes data on <i>S. trispinosus</i> from Brazil, separated from <i>S. coelestinus</i> in 2001(8)	FB (MNHN, BMNH, GCRL)
Sparisoma atomarium	298	-	GC	-	-	-
URANOSCOPIDAE	-	-	-	-	-	-
Astroscopus y-graecum	22	-	TWA	-	-	-
Kathetostoma albigutta	100	-	GC	-	-	-
Xenocephalus egregius	1	-	GC	-	-	-

TRIPTERYGIIDAE	-	-	-	-	-	-
<i>Enneanectes altivelis</i>	30	-	GC	-	-	-
DACTYLOSCOPIIDAE	-	-	-	Adult	-	-
<i>Dactylagnus peratikos</i>	2	-	GC	-	-	-
<i>Dactyloscopus crossotus</i>	2	-	GC	-	-	-
<i>Gillellus greyae</i>	9	-	TWA	-	-	-
<i>Platygillellus rubrocinctus</i>	31	2	GC	Adult	EPB for Grenada; SIO for Bahamas	FB (ROM; SAMC)
BLENNIIDAE	-	-	-	Adult + larvae	-	-
<i>Chasmodes bosquianus</i>	14	-	NWA	-	-	-
<i>Entomacrodus nigricans</i>	60	-	GC	Adult	EPB for Barbados & St Vincent	FB (ROM)
<i>Hyleurochilus bermudensis</i>	1	-	GC	-	-	-
<i>Hypsoblennius henz</i>	2	-	NWA	-	-	-
<i>Lupinoblennius nicholsi</i>	2	-	GoM	-	-	-
<i>Ophioblennius atlanticus</i>	164	~65	E,C&WA	Adult	TEP; EPB for Barbados	FB (UBC; ROM)
<i>Parablennius marmoreus</i>	77	7	NWA	larvae	Offshore Nova Scotia	BIO, ARC
<i>Scartella cristata</i>	85	29	E&WA+M	Adult	EPB for Barbados & Grenada; includes data for <i>S. marginata</i> from SWIO; Taiwan	FB (ROM; SAMC; NTUM)
LABRISOMIDAE	-	-	-	Adult	-	-

<i>Labrisomus albigenys</i>	4	-	GC	-	-	-
Malacoctenus aurolineatus	15	2	GC	Adult	EPB for Barbados	FB (ROM)
<i>Nemaclinus atelestos</i>	2	-	GC	-	-	-
<i>Paraclinus barbatus</i>	1	-	GC	-	-	-
<i>Starksia atlantica</i>	8	-	Caribbean	-	-	-
CHAENOPSIDAE	-	-	-	Adult	-	-
<i>Acanthemblemaria aspera</i>	16	-	GC	-	-	-
<i>Chaenopsis limbaughii</i>	3	-	GC	-	-	-
<i>Coralliozetus cardonae</i>	3	-	Caribbean	-	-	-
<i>Ekemblemaria nigra</i>	10	-	Caribbean	-	-	-
<i>Emblemaria atlantica</i>	8	-	NWA	-	-	-
<i>Emblemariopsis bottomei</i>	5	-	GC	-	-	-
<i>Lucayablennius zingaro</i>	8	-	Caribbean	-	-	-
Stathmonotus gymnodermis	8	1	Caribbean	Adult	EPB for Barbados	FB (ROM)
GOBIESOCIDAE	-	-	-	Adult	-	-
<i>Acyrtops amplicirrus</i>	2	-	Caribbean	-	-	-
Acyrtus artius	15	1	Caribbean	Adult	EPB for Barbados	FB (ROM)
Arcos macrophthalmus	12	2	GC	Adult	EPB for Barbados	FB (ROM)
<i>Derilissus altifrons</i>	2	-	Caribbean	-	-	-

<i>Gobiesox barbatulus</i>	1	-	TWA	-	-	-
<i>Tomicodon clarkei</i>	1	-	Caribbean	-	-	-
CALLIONYMIDAE	-	-	-	Larvae	-	-
<i>Diplogrammus pauciradiatus</i>	14	1	GC	Larvae	Offshore Nova Scotia	ARC
<i>Foetorepus agassizii</i>	45	-	WA	-	-	-
<i>Paradiplogrammus bairdi</i>	25	7	GC	Larvae	Offshore Nova Scotia	ARC
ELEOTRIDAE	-	-	-	Adult	-	-
<i>Dormitator maculatus</i>	82	12	TWA	Adult	TEP	FB (UBC, MNHN, USNM)
<i>Eleotris amblyopsis</i>	6	-	GC	-	-	-
<i>Erotelis smaragdus</i>	23	4	TWA	Adult	TEP	FB (USNM)
<i>Gobiomorus dormitor</i>	59	8	E&WA	Adult	TEP; Malaysia; China	FB (MNHN; USNM; CAS)
<i>Guavina guavina</i>	6	3	TWA	Adult	TEP; EA	FB (USNM; MNHN)
<i>Leptophilypnus fluviatilis</i>	6	-	Caribbean	-	-	-
GOBIIDAE	-	-	-	Adult +larvae	-	-
<i>Akko dionaea</i>	4	-	TWA	-	-	-
<i>Barbulifer antennatus</i>	7	2	GC	Adult	EPB for Barbados	FB (ROM)
<i>Bathygobius curacao</i>	39	2	GC	Adult	EPB for Barbados	FB (ROM)
<i>Bollmannia boqueronensis</i>	24	-	GC	-	-	-
<i>Chriolepis vespa</i>	2	-	GoM	-	-	-

<i>Coryphopterus alloides</i>	2	-	GC	-	-	-
<i>Ctenogobius boleosoma</i>	82	-	TWA	-	-	-
<i>Elacatinus atronasus</i>	1	-	Bahamas	-	-	-
<i>Evermannichthys metzelaari</i>	23	-	GC	-	-	-
<i>Evorthodus lyricus</i>	41	-	TWA	-	-	-
<i>Ginsburgellus novemlineatus</i>	12	7	GC	Adult	EPB for Barbados	FB (ROM)
<i>Gnatholepis thompsoni</i>	114	-	E&WA	-	-	-
<i>Gobioides broussonnetii</i>	9	-	TWA	-	-	-
<i>Gobionellus oceanicus</i>	72	2	TWA	Adult +larvae	EA; Offshore Nova Scotia	FB (ISH); ARC
<i>Gobiosoma bosc</i>	50	-	NWA	-	-	-
<i>Gobulus myersi</i>	4	-	GC	-	-	-
<i>Lophogobius cyprinoides</i>	29	-	GC	-	-	-
<i>Lythrypnus crocodilus</i>	18	-	Caribbean	-	-	-
<i>Microgobius carri</i>	10	-	GC	-	-	-
<i>Nes longus</i>	14	-	GC	-	-	-
<i>Oxyurichthys stigmalophius</i>	2	-	TWA	-	-	-
<i>Palatogobius paradoxus</i>	3	-	GC	-	-	-
<i>Priolepis dawsoni</i>	10	-	SWA	-	-	-
<i>Psilotris alepis</i>	1	-	GC	-	-	-

<i>Pycnomma roosevelti</i>	2	-	Caribbean	-	-	-
Risor ruber	33	1	TWA	Adult	Hawaii for Dominica	FB (ROM)
<i>Robinsichthys arrowsmithensis</i>	2	-	Caribbean	-	-	-
<i>Varicus bucca</i>	3	-	GC	-	-	-
MICRODESMIDAE	-	-	-	Adult	-	-
<i>Cerdale floridana</i>	14	-	GC	Adult	EPB for Barbados	FB (ROM)
<i>Microdesmus bahianus</i>	7	-	TWA	-	-	-
PTERELEOTRIDAE	-	-	-	-	-	-
<i>Ptereleotris helenae</i>	11	-	TWA	-	-	-
EPHIPPIDAE	-	-	-	-	-	-
<i>Chaetodipterus faber</i>	223	-	TWA	-	-	-
LUVARIDAE	-	-	-	-	-	-
<i>Luvarus imperialis</i>	20	-	CG	-	-	-
ACANTHURIDAE	-	-	-	Adult	-	-
<i>Acanthurus bahianus</i>	3,763	7	TW&CA	Adult	EPB for Barbados, St Vincent & Grenada; EA for Caribbean; IO for Trinidad	FB (ROM; USNM); SAIAB
SPHYRAENIDAE	-	-	-	-	-	-
<i>Sphyaena barracuda</i>	604	-	CT	-	-	-
GEMPYLIDAE	-	-	-	Adult	-	-

Gempylus serpens	586	8	CT	Adult	S France for Nigeria	FB
Lepidocybium flavobrunneum	681	-	CT	-	-	-
Nealotus tripes	685	8	CT	Adult	S France for Nigeria	FB
Promethichthys prometheus	373	4	CT	Adult	S France for Nigeria	FB
Ruvettus pretiosus	1519	12	CT	Adult	S France for Nigeria	FB
TRICHIURIDAE	-	-	-	-	-	-
Trichiurus lepturus	2,856	-	CG	-	-	-
SCOMBRIDAE	-	-	-	Adult	-	-
Acanthocybium solandri	833	-	CT	-	-	-
Auxis thazard thazard	2	-	E&WA+ICP	-	-	-
Euthynnus alletteratus	372	3	E&WA+M	Adult	TEP; Hawaii; WIO	FB (AMNH; MNHN; MNHN)
Katsuwonus pelamis	5,656	-	CG	-	-	-
Sarda sarda	346	-	E&WA+M	-	-	-
Scomber colias	10	5	E&WA+M	Adult	TEP; Australia	FB (UBC,CAS); SAMA
Scomberomorus brasiliensis	13	-	TWA	-	-	-
Thunnus alalunga	73,764	-	CG	-	-	-
XIPHIIDAE	-	-	-	-	-	-
Xiphias gladius	1,683	-	CG	-	-	-
ISTIOPHORIDAE	-	-	-	-	-	-

<i>Istiophorus platypterus</i>	628	-	CT	-	-	-
<i>Makaira nigricans</i>	578	-	CT	-	-	-
CENTROLOPHIDAE	-	-	-	-	-	-
<i>Hyperoglyphe bythites</i>	3	-	WA	-	-	-
<i>Schedophilus ovalis</i>	55	-	CG	-	-	-
NOMEIDAE	-	-	-	-	-	-
<i>Cubiceps pauciradiatus</i>	191	-	CG	-	-	-
<i>Nomeus gronovii</i>	63	-	CG	-	-	-
<i>Psenes arafurensis</i>	36	-	CT	-	-	-
ARIOMMATIDAE	-	-	-	Adult	-	-
<i>Ariomma bondi</i>	1,055	12	E&WA	Adult	S France for Nigeria	FB
STROMATEIDAE	-	-	-	-	-	-
<i>Peprilus burti</i>	157	-	GoM	-	-	-
CAPROIDAE	-	-	-	Adult	-	-
<i>Antigonia capros</i>	1,121	12	TE&WA+IWP	Larvae	S France for Nigeria	FB
SCOPHTHALMIDAE	-	-	-	Larvae	-	-
<i>Scopthalmus aquosus</i>	6,897	4	NWA	Larvae	Offshore Labrador; Lake Erie; offshore Florida; offshore Bahamas	DFO-NFLD; NMFS; FB (MNHN; USNM)
PARALICHTHYIDAE	-	-	-	Adult	-	-

<i>Ancylosetta cycloidea</i>	18	-	TWA	-	-	-
<i>Citharichthys abbotti</i>	10	-	GoM	-	-	-
Cyclosetta chittendeni	74	2	GC	Adult	TEP; EA for Trinidad	FB (USNM; CAS)
Etropus crossotus	211	1	TEP&WA	Adult	Hawaii	FB (MNHN)
<i>Gastropsetta frontalis</i>	23	-	GC	-	-	-
Hippoglossina oblonga	5,307	3	NWA	Adult	Lakes Michigan & Erie for E Canada	NMFS
<i>Paralichthys albigutta</i>	24	-	GC	-	-	-
<i>Syacium gunteri</i>	276	-	GC	-	-	-
BOTHIDAE	-	-	-	Adult	-	-
Bothus lunatus	254	6	TE,SC&WA	Adult	EPB for Barbados; offshore E USA for Netherlands Antilles; S France for Nigeria	FB (ROM; MNHN);FB
Engyophrys senta	77	1	TWA	Larvae	Offshore Nova Scotia	-
<i>Monolene atrimana</i>	14	-	TWA	-	-	-
<i>Trichopsetta caribbaea</i>	49	-	TWA	-	-	-
ACHIRIDAE	-	-	-	Adult	-	-
Achirus declivis	15	1	TWA	Adult	CA for Antilles	-
<i>Gymnachirus melas</i>	58	-	NWA	-	-	-
<i>Trinectes inscriptus</i>	18	-	TWA	-	-	-

CYNOGLOSSIDAE	-	-	-	-	-	-
<i>Symphurus arawak</i>	6	-	GC	-	-	-
BALISTIDAE	-	-	-	Adult	-	-
<i>Balistes capriscus</i>	1,078	1078	E&WA+M	-	-	-
<i>Canthidermis maculata</i>	107	-	CT	-	-	-
<i>Melichthys niger</i>	899	-	CT	-	-	-
<i>Xanthichthys ringens</i>	29	6	TWA	Adult	Hawaii; TEP; W Africa for IO; SWIO	FB (CAS& BPBM; UBC & MNHN); IndOBIS; FB (MNHN)
MONACANTHIDAE	-	-	-	Adult	-	-
<i>Aluterus heudelotii</i>	712	12	E&WA	Adult	S France for Nigeria	FB
<i>Cantherhines macrocerus</i>	46	-	TWA	-	-	-
<i>Monacanthus ciliatus</i>	146	1	E&WA	Adult	NE Pacific	FB (UBC)
<i>Stephanolepis hispida</i>	1,122	19	E&WA	Adult	EPB for Barbados; S France for Nigeria; SWIO	FB (ROM); FB; SAMC
OSTRACIIDAE	-	-	-	Adult	-	-
<i>Acanthostracion polygonius</i>	25	1	TWA	Adult	Hawaii for Caribbean	FB (ROM)
<i>Lactophrys bicaudalis</i>	7	-	TWA	-	-	-
TETRAODONTIDAE	-	-	-	Adult	-	-
<i>Canthigaster figueiredoi</i>	1	-	SWA	-	-	-

Colomesus psittacus	104	-	SWA	-	-	-
Lagocephalus laevigatus	988	12	E&WA	Adult	S France for Nigeria	FB
Sphoeroides dorsalis	149	-	-	-	-	-
DIODONTIDAE	-	-	-	-	-	-
Chilomycterus antillarum	17	-	TWA	-	-	-
Diodon eydouxi	25	-	CT	-	-	-
MOLIDAE	-	-	-	-	-	-
Masturus lanceolatus	24	-	CG	-	-	-
Mola mola	3,348	-	CG	-	-	-
Ranzania laevis	34	-	CT	-	-	-

Notes:

- 1. Taxon:** Only includes taxa for which OBIS GIS-data were available for at least one species. **Bold names** = taxa with GIS data errors.
- 2. Geographic range:** Adult geographic range as obtained from the literature – see text of paper. **A** (both sides of Atlantic ocean); **CA** (central Atlantic); **CG** (circumglobal, tropical & temperate); **CT** (circumtropical); **E&WA** (tropical + temperate east & west Atlantic); **EP** (tropical and temperate eastern Pacific); **EPB** (Eastern Pacific Barrier – deep ocean between TEP and central Pacific islands); **GC** (Greater Caribbean = Caribbean + Gulf of Mexico, Bahamas, south-eastern Florida and Bermuda); **GoM** (Gulf of Mexico); **M** (Mediterranean); **ICP** (Indo-central Pacific); **IO** (Indian Ocean); **IP** (Indo-Pacific); **IWP** (Indo-west Pacific); **NA** (north Atlantic); **NEP** (northeast Pacific); **NW Africa** (northwest Africa); **NWA** (tropical to temperate northwest Atlantic); **P** (Pacific); **SCA** (south-central Atlantic – Ascension Is); **SEP** (southeast Pacific); **SP** (south Pacific); **S France** (on-land, southern France); **SWA** (southwest Atlantic-Brazil); **SWIO** (southwest Indian Ocean); **TEA** (tropical east Atlantic); **TE&WA** (tropical east & west Atlantic); **TEP** (tropical eastern Pacific); **TWA** (tropical north + south west Atlantic); **TW Africa** (tropical west Africa); **WA** (tropical & temperate west Atlantic); **W Africa** (west Africa); **WIO** (western Indian Ocean).
- 3. Adult :** data points on adults in the wrong ocean, the wrong side of the Atlantic, the wrong hemisphere, mid-ocean, and mid-continent. **Larvae:** data includes data points for larvae of tropical demersal species collected far beyond the adult range in cool temperate and mid-ocean sites.
- 4. Location of errors:** a for b, e.g. S France for Nigeria = for a site named Nigeria the GIS coordinates are for the south of France.
- 5. Sources of errors:** name of primary source for each of the errors listed in “location of errors”. Cases with FB (name of primary source), e.g. FB (ROM) indicates that material from the primary source(s) was served to OBIS by FishBase; name codes for sources are from OBIS.
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