RED LIST OF MARINE BONY FISHES OF THE EASTERN CENTRAL ATLANTIC

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EASTERN CENTRAL ATLANTIC

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Table of contents

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Executive Summary

Aim

The Red List of Marine Bony Fishes of the Eastern Central Atlantic (ECA) is a review of the conservation status of all native marine bony fishes in ECA according to the global Categories and Criteria of the IUCN Red List of Threatened Species. It identifies those species that are threatened with extinction at the global level and occur within the ECA region. This comprehensive assessment, which is the first of its kind in the ECA, aims to provide improved knowledge of species presence and extinction risk status for the purposes of guiding conservation actions and improved policies for these species both globally and regionally.

Scope

All currently described marine bony fishes native to the Eastern Central Atlantic (a total of 1,288 species), have been assessed in this Red List. The geographic scope encompasses all marine areas extending from Mauritania to Angola, including the offshore islands of Cape Verde, Saint Helena and Ascension, and Bioko, São Tomé and Príncipe and Annobón in the Gulf of Guinea. Of the 1,288 species assessed, approximately 18% (231 species) are considered endemic to the Eastern Central Atlantic region.

Status assessment

All species were assessed using the IUCN Red List Categories and Criteria, which is the most widely accepted system for measuring extinction risk. Species data were compiled based on data and knowledge from a network of leading regional and international experts on marine fishes. Species assessments were primarily completed and reviewed at three large workshops held in Dakar, Senegal; Accra, Ghana; and Libreville, Gabon; as well as through email correspondence with relevant experts. More than 65 experts participated in the assessment workshops in the region, and more than 250 experts overall contributed data, expertise, and time to the review process for these fishes. All species global assessments and final results were made available on the IUCN Red List of Threatened Species in November 2015.

Results

Approximately 3% (37 species) of the 1,288 marine bony fishes present in the Eastern Central Atlantic are classified in threatened categories (i.e. Critically Endangered, Endangered or Vulnerable). A further 1.1 % (14 species) are considered Near Threatened. However, for 13% (164 species) there were insufficient data available to evaluate risk of extinction and thus these species were classified as Data Deficient. When more data become available, some of these species may qualify for a threatened category. The major threats to marine bony fish species in the ECA are overfishing, habitat degradation, pollution, climate change, and invasive and problematic species.

Current population trends for the vast majority of species in the ECA are largely unknown, especially as many of the marine fishes present are deep-sea species that are only known from a few specimens or have unresolved taxonomic questions. The majority of species with known population declines are species that are directly targeted by fisheries, or have been indirectly affected as by-catch.

In the ECA, the diversity of marine bony fishes is highest around the Cape Verde Islands and off the coast of Senegal, with a maximum of 757 species of marine fish per 100 km^2. The diversity of fishes in oceanic waters is substantially lower than that of coastal waters, except for the area surrounding St. Helena and Ascension. The top 10% of endemic species diversity (116-128 species per 100 km^2) occurs from Sierra Leone to Gabon, including Bioko (Equatorial Guinea) in the Gulf of Guinea.

Recommendations

Although a number of local, national and regional conservation measures and management bodies exist, this comprehensive Red List assessment of all marine fishes in the ECA has reinforced several recommendations to improve marine resource management and conservation.

- In many countries, limited surveillance and enforcement capacity leads to illegal fishing and overfishing, which imperils national and regional management efforts. Perhaps the greatest need in the region is to strengthen governance, including increased capacity, training and resources, in order to improve management and reduce illegal and unregulated fishing activities.

- Research capacity to conduct stock assessments or assess population trends in much of the region is limited. There is a great need to increase capacity, training and resources for local and national fisheries management agencies to better quantify the impacts of local, national and regional fishery efforts on targeted and non-targeted species.

- Of particular importance is the need to train more key scientists and middle level practitioners on taxonomic identification techniques, and to disaggregate fisheries data reported by family or genus. In many cases, fishes being recorded in landings, fish markets, academic surveys and other instances are incorrectly identified, compounding the difficulties of understanding species distributions and population trends.

- Although a number of marine and coastal protected areas have been established in the region to limit overharvesting of coastal resources and ensure their sustainable utilization, many are in need of increased capacity, funding, infrastructure and governance for effective enforcement and conservation.

- Many nations are still lacking in adequate marine or coastal protected areas. In addition to the creation of more marine and coastal protected areas, there is a need to identify, and include within protected areas, critical habitats and spawning sites.

- As in many regions around the world with a large number of governments, ethnic groups and languages, and management goals, there is a need for improved transboundary collaboration on shared fish stocks, regional data management and the creation of marine protected area networks.

- With increased capacity, training and resources, there is a need to improve collection of fisheries-dependent data of commercial fisheries, in particular data on catch composition, by-catch, landings, discards, and catch per unit effort, and to establish monitoring schemes for the vast number of small scale artisanal fisheries.

- Increased resources need to be directed to increase fisheries-independent data collection and monitoring throughout the region, and to ensure that data are made available to all countries and regional scientific bodies and Regional Fisheries Management Organizations (e.g., ICCAT, FAO, etc.).

- With the completion of this first comprehensive Red List of marine fishes in the ECA, an essential next step is to identify marine Key Biodiversity Areas (KBAs) to more effectively prioritize local conservation action towards the mitigation, regulation, or cessation of threats impacting marine species.

1.Background

1.1 The Eastern Central Atlantic

The Eastern Central Atlantic (ECA), also known as the Eastern Tropical Atlantic, can be biogeographically defined as the marine zone from Mauritania to Angola, including the offshore islands of Ascension, Cape Verde and Saint Helena, and Bioko, São Tomé and Príncipe and Annobón in the Gulf of Guinea (Spalding et al. 2007; Figure 1). The West African coast can be divided into 3 coastal segments: the semi-arid coast from Morocco to Senegal, which is characterized by the cool Canary Current; the humid tropical coast from Cape Verde to the Congo River, which is dominated by the Guinea Current; and the sub-humid coast south to Angola, which is influenced by the cooler Benguela Current and coastal upwelling (Schwartz 2006). Although variable across the region, the continental shelf is generally narrow, extending 15-90 km offshore, and breaking at depths of approximately 100-120 m. It is the smallest tropical shelf area of the 4 tropical regions of the world (Briggs 1974).

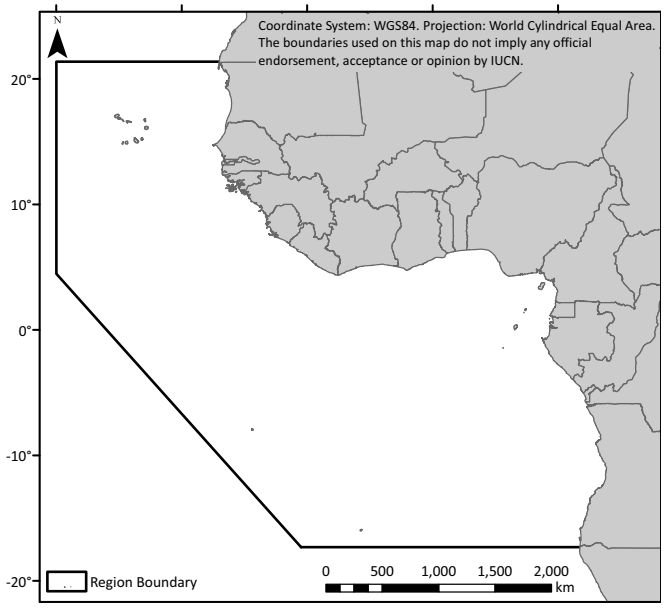


Figure 1: Limits of the Eastern Central Atlanitc as defined for this project (following Spalding et al. 2007).

The dominant coastal features in the ECA are the Gulf of Guinea and the influence of the Guinea Current. There are no coral reefs in this region, although some limited coral communities exist in the southern Gulf of Guinea, mixed with rocky reef (Spalding et al. 2001). Mangroves, coastal lagoons and large estuarine areas from the drainage of major rivers, including the Niger, Volta, Gambia and Congo, all serve as important reservoirs for biological diversity (Ajao et al. 2009). Mangrove forests and swamps are the most biologically significant coastal ecosystems in the Gulf of Guinea region and collectively represent 15% of the world's mangrove area (Schwartz 2006). The mangrove regions of the ECA provide critical breeding grounds for many fish and shrimp species, and essential habitats for a variety of other coastal species, including mammals, reptiles and birds. Seven species of mangrove are native to the ECA, though most of the mangrove forests are dominated primarily by stands of *Rhizophora racemosa* (Polidoro et al. 2010).

The most important mangrove stands are the Niger Delta communities in Nigeria and Yawri Bay in Sierra Leone (FAO 2007). Mangrove stands of the Niger Delta are considered to be the largest in Africa, and the third largest in the world (Ukwe et al. 2001).

Mangrove stand in Libreville, Gabon. © B. Polidoro.

About 40% of the region's human populations live in coastal areas and are dependent on the lagoons, estuaries, creeks and inshore waters for their sustenance and socio-economic well-being (GCLME 2008). Although poorly developed, rivers and lagoons are important waterways for the transportation of goods and people. Presently, local fish and shellfish constitute a major source of animal protein in coastal communities. Despite the rich endowment in natural resources and recent improvements in economic growth, the majority of the population lives in conditions of widespread poverty due to huge imbalances in the production and distribution of goods and services and socio-political issues, among other concerns (GCLME 2008).

The status of marine fishes, especially coastal and pelagic fishes, is of great concern in the ECA due to overharvesting of marine resources (unsustainable gathering, fishing and hunting); conversion of mangrove swamps (rice, shrimp, fish culture and salt production); oil exploration, drilling and production; coastal erosion and habitat degradation; urban and tourism development; pollution; sedimentation and siltation; changes to the hydrological cycle; potential impending changes due to sea-level rise; and inadequate policy responses, legislation and enforcement. Destructive fishing practices include intensive inshore and offshore trawling with associated consequences of unwanted bycatch, the use of explosives and chemicals in inshore areas, and the use of small-sized beach and purse seine nets in offshore regions (GCLME 2008) and in juvenile nursery habitats.

Species diversity and fish size for many important commercial species have markedly declined over the past few decades, and several reviews report that many artisanal and commercial fish stocks are now considered to be overexploited (Ajayi 1994, FAO 2000, Mensah and Quaatey 2002, Srinivasan et al. 2012). With the human population in this region expected to double in the next 20-25 years, this first assessment of all marine bony fishes in the ECA aims to provide comprehensive information about species inhabiting this region that will transform the current capacity to identify and enact marine conservation priorities.

Local fishing vessels in Accra, Ghana. © B. Polidoro

1.2 Diversity and Endemism

The 1,288 marine fishes present in this complete assessment of all known bony fishes found in the ECA collectively represent a wide diversity of deep-water, pelagic and near-shore species in 32 orders and more than 200 families (Table 1). This list is currently the most up-to-date, complete taxonomic list of all marine bony fishes in the ECA biogeographic region.

Until now, the most authoritative sources for complete lists of all marine fishes included the *Check-list of the Fishes of the Eastern Tropical Atlantic* (Quéro et al. 1990) and *A Revision of Irvine's Marine Fishes of Tropical West Africa* (Edwards et al. 2001), both of which were, in part, based on the currently out-of-date version of the Food and Agriculture Organization of the United Nation (FAO) *Living Marine Resources of the Eastern Central Atlantic* (Fischer et al. 1981).

The complete list of marine bony fishes presented here is based on the soon to be published and significantly updated version of the FAO *Living Marine Resources of the Eastern Central Atlantic* (Carpenter and De Angelis 2014, Carpenter and De Angelis in press). However, there are some differences in the definitions of the region that impact the species included in this report. The FAO Fishing Areas 34 and 47 are defined by latitude, and include the eastern Atlantic Ocean from the Strait of Gibraltar to the eastern coast of South Africa. The FAO *Living Marine Resources of the Eastern Central Atlantic* defined the ECA as the eastern portion of FAO fishing area 34 and the northern part of fishing area 47. We took a more restrictive, biogeographic definition for this project (Spalding et al. 2007; Figure 2).

Many species present in the ECA have geographic ranges that extend across the Atlantic to the Caribbean Sea (e.g., Joyeux et al. 2001, Floeter et al. 2008), spill northward into Moroccan waters and into the Mediterranean Sea, or extend southward into waters of northern Namibia. A large proportion of the deepwater species included in the assessment have ranges that are thought to be circumglobal, based on currently known taxonomy and relatively few records. For these reasons, endemism in the ECA is relatively low, with less than 20% of all marine bony fishes considered endemic to this biogeographic region.

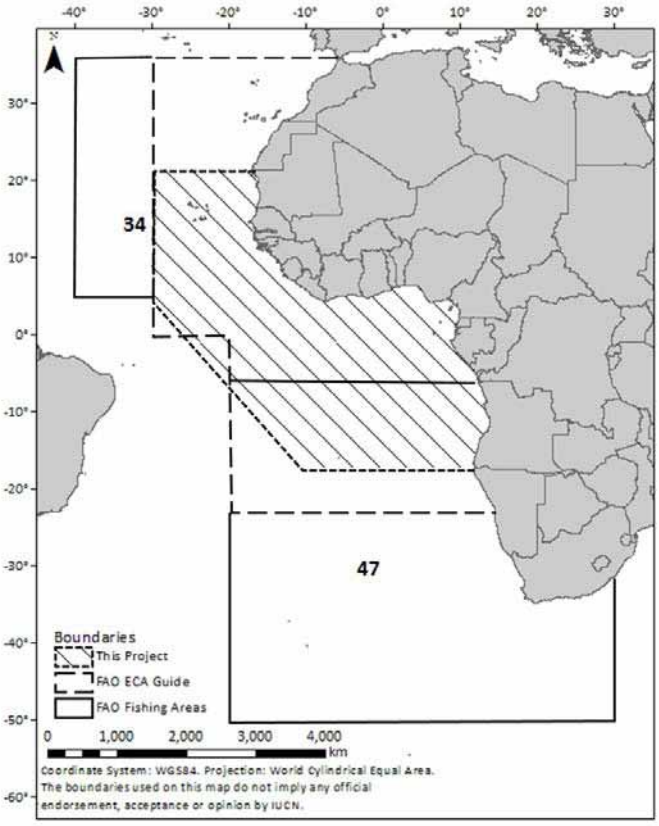


Figure 2: Boundaries of the various political and biogeographic definitions of the Eastern Central Atlantic. The two FAO fishing areas included within the definitions of the ECA are 34 - Eastern Central Atlantic and 47 - Southeast Atlantic.

1.3 Importance of Marine Fishes

Marine resources form the foundation for food security and coastal livelihoods for the nearly 400 million people that inhabit western and central African countries with a marine coastline. The ECA supports some of the most productive fisheries in the world, and industrialized, artisanal and subsistence fisheries are critical to food security, household income and national economies. Unfortunately, marine resources are under immense pressures from various threats, including: overfishing, destructive fishing practices, pollution, coastal and urban development and habitat modification. These threats are compounded by

Table 1: Richness of marine bony fish species present in the Eastern Central Atlantic, including the number of nominal species and families in each order, as well as the number and percentage of endemic species in each order.

Order	Number of families	Number of species	Number of endemic species	Percentage of endemic species
Albuliformes	1	1	0	0.0%
Anguilliformes	13	100	29	29.0%
Ateleopodiformes	1	2	0	0.0%
Atheriniformes	1	3	1	33.3%
Aulopiformes	13	64	4	6.3%
Batrachoidiformes	1	4	1	25.0%
Beloniformes	4	28	1	3.6%
Beryciformes	5	14	1	7.1%
Cetomimiformes	3	10	0	0.0%
Clupeiformes	3	9	4	44.4%
Elopiformes	2	3	2	66.7%
Gadiformes	7	56	7	12.5%
Gobiesociformes	1	8	2	25.0%
Gonorynchiformes	1	1	0	0.0%
Lampriformes	6	9	0	0.0%
Lophiiformes	14	66	5	7.6%
Mugiliformes	1	10	5	50.0%
Myctophiformes	2	82	0	0.0%
Notacanthiformes	2	11	0	0.0%
Ophidiiformes	5	36	5	13.9%
Osmeriformes	7	68	0	0.0%
Perciformes	69	404	118	29.2%
Pleuronectiformes	6	51	19	37.3%
Polymixiiformes	1	1	0	0.0%
Saccopharyngiformes	4	7	2	28.6%
Scorpaeniformes	9	45	12	26.7%
Siluriformes	1	3	3	100.0%
Stephanoberyciformes	2	18	1	5.6%
Stomiiformes	4	130	5	3.8%
Syngnathiformes	4	11	3	27.3%
Tetraodontiformes	6	25	1	4.0%
Zeiformes	5	8	0	0.0%

the challenge of managing shared stocks across a culturally, politically and geographically diverse landscape.

In 2011, nearly 500,000 metric tonnes of seafood was exported from the 21 countries in the region, and these resources were valued at approximately US$972 million (FAO 2016). Although the largest fishery production reported in 2005 occurred in Nigeria, followed by Senegal, Ghana and Mauritania (Neiland 2006), more recently Mauritania and Angola have surpassed Nigeria (FAO 2016). Throughout the region, the artisanal sector dominates fishing employment and the fishing industry in West Africa with 70% of the total fishery production estimated to come from small-scale artisanal fisheries (GCLME 2008, De Graaf and Garibaldi 2014). However, it is estimated that high levels of illegal and unreported fishing are providing little benefit to national economies, and fisheries are underperforming and overexploited due to poor governance and unregulated, open-access policies. For example, it is estimated that illegal catches represent more than 40% of the reported legal catch (Pauly and Zeller 2016) in many countries. In some countries, few local fishing companies are in operation, whereas a large number of local agents are engaged in joint ventures with foreign fleets, which results in few fish actually landed locally.

In the ECA, industrial fishing is conducted in the offshore waters of maritime countries. It often relies on non-African trawlers and fleets and has limited direct economic and employment benefit to West African countries. Typically, artisanal fishermen use traditional wooden boats, sometimes motorized, with a variety of gear types, including nets, lines and seines. Aquaculture is rudimentary in most of the region, although it has recently received higher levels of governmental and private support (Davies et al. 2014). Inland fisheries exist in many countries and frequently provide subsistence incomes.

Local fishing vessels in Accra, Ghana. © B. Polidoro

Pagellus bellottii (Red Pandora) from a fish market in Accra, Ghana. © F.K.E. Nunoo

Throughout the region, women are responsible for artisanal processing and assuring transport of fish to urban areas and inland. Traditional processing methods include smoking, drying, and salting and curing. Industrial processing—including canning, filleting and peeling—exists in some countries. In many countries, inaccessibility of cold storage facilities inhibits the growth of a value-added industry.

At a regional scale, fishery management in the ECA is overseen by the FAO Fishery Commission for the Eastern Central Atlantic (CECAF). Composed of members from each of the nations in the region, this regional fishery body is responsible for all living marine resources within the area (which is defined by the FAO as extending from approximately the Straits of Gibraltar and northern Morocco to northern Angola). The CECAF committee produces reports on the status of exploited fish stocks in the region, including small pelagic and demersal fishes. The CECAF commission includes three sub-regional fisheries commissions, the Sub-Regional Fisheries Commission (SRFC) that covers Mauritania to Sierra Leone, including Cape Verde; the Fishery Committee of the West Central Gulf of Guinea (FCWC), which extends from Liberia to Nigeria; and the Regional Fisheries Committee for the Gulf of Guinea (COREP), which covers the area from Cameroon to northern Angola, including the island nation of São Tomé and Príncipe. The International Commission for the Conservation of Atlantic Tunas (ICCAT), a regional fisheries organization, manages all species of Atlantic tunas and their relatives (https://www.iccat.int/en/); most, but not all, of the countries in the ECA as defined herein are contracting parties to ICCAT.

Other sources of regional marine biodiversity data include species catch data from fisheries-independent scientific surveys. The Danish Atlantide expedition (1945-1946) to tropical West Africa took 170 samples along the West African coast from the Canary Islands south to Angola (Bruun 1950). Another vital dataset is the Guinean Trawling Survey (1963-1964); during two phases, each with two French trawlers, eight transects off the West African coast were conducted at depths ranging from about 15-20 m to 400-600 m (Williams 1968). The species collected were identified, including potential commercial fishes, and some samples were preserved for future analyses. More recently, surveys have been conducted by the *RV Dr. Fridtjof Nansen*, in collaboration with the FAO and funded by the Norwegian Agency for Development Cooperation (NORAD). Since the early 1990s, the Nansen Programme has expanded on its original scope of undertaking national and regional marine biodiversity surveys to also include capacity building in fisheries research and management (institutional strengthening in partner countries), and organization of post-survey meetings to provide fisheries administrations with results of surveys. Other sources of marine species information in the region include national fisheries stock assessments and catch data, and independent academic surveys.

Key marine conservation and fisheries management programs in the region include the Programme Régional de Conservation de la Zone Côtière et Marine en Afrique de l'Ouest or PRCM, a joint initiative between IUCN, WWF, Wetlands International and the Fondation Internationale du Banc d'Arguin (FIBA, recently merged with MAVA Fondation pour la Nature), in partnership with the Sub-Regional Fisheries Commission (SRFC). The PRCM covers seven countries: Mauritania,

Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone and Cape Verde. The goal of the PRCM is to coordinate the efforts of institutions and individuals to strengthen the conservation of the coastline in the coastal countries in the sub-region.

1.4 Assessment of Species Extinction Risk

The conservation status of plants, animals and fungi is one of the most widely used indicators for assessing the condition of ecosystems and their biodiversity. The IUCN Red List Categories and Criteria (IUCN 2001) are the most widely accepted system for classifying extinction risk at the species level (e.g., Butchart et al. 2005, de Grammont and Cuarón 2006, Rodrigues et al. 2006, Hoffmann et al. 2008). The IUCN Red List process consolidates the most current and highest quality data available, and ensures peer-reviewed scientific consensus on the probability of extinction for each species (Regan et al. 2005). All species data and results of Red List assessments for the ECA were published on the IUCN Red List of Threatened Species in November 2015.

The IUCN Red List Categories (Figure 3) are based on a set of quantitative criteria linked to population trends, size and structure, and species' geographic ranges. The IUCN Red List Categories are nine different levels of extinction risk: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD) and Not Evaluated (NE). A species qualifies for one of the three threatened categories (CR, EN, or VU) by meeting or exceeding the threshold for that category in one of the five different available criteria (A-E: Table 1). These different criteria are based on extinction risk theory (Mace et al. 2008) and

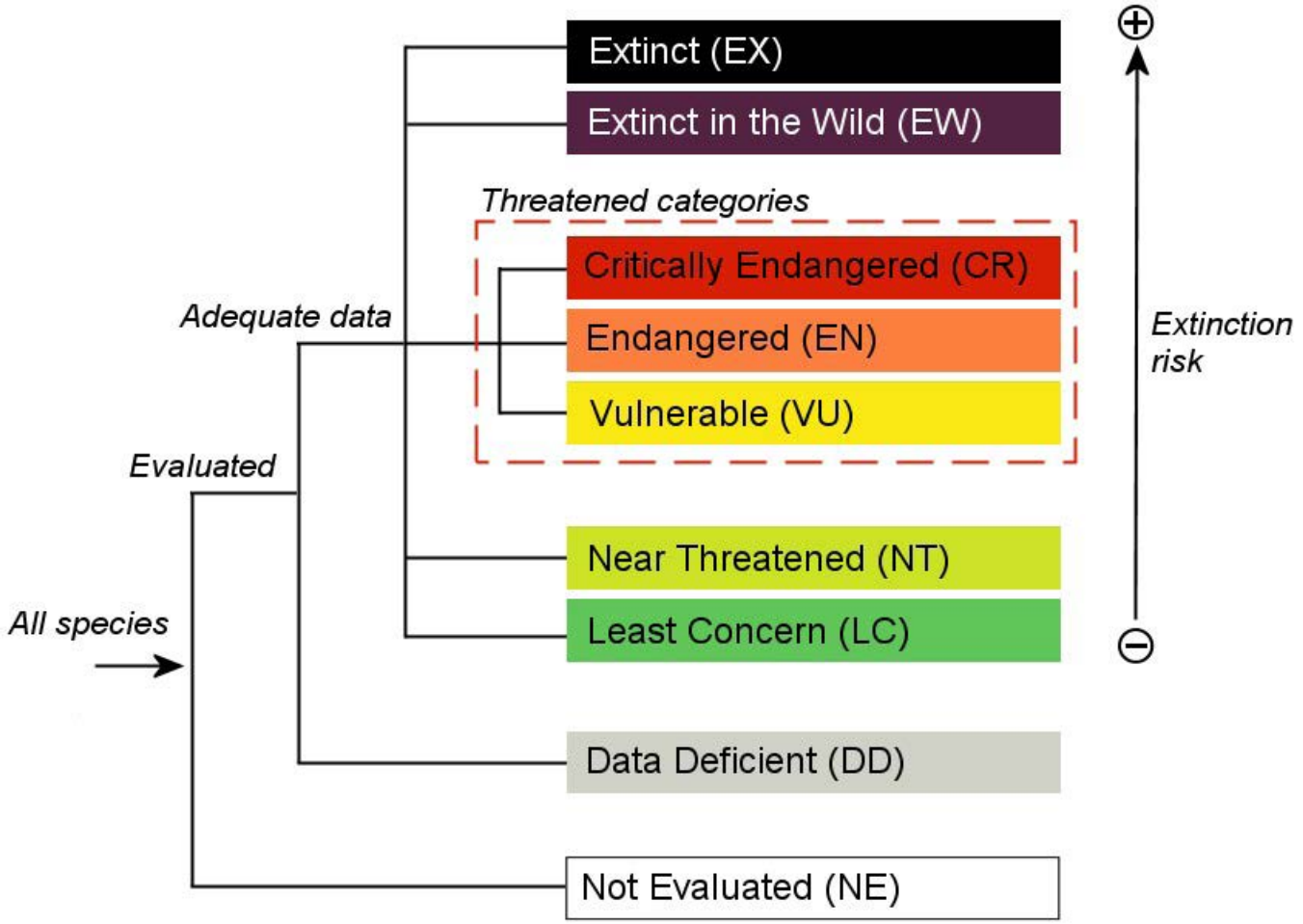


Figure 3: The nine IUCN Red List categories used to classify species based on symptoms of extinction risk (IUCN 2011).

form the real strength of the IUCN Red List as they provide a standardized methodology that is applied consistently to any species from any taxonomic group (e.g., Stuart et al. 2004 , Butchart et al. 2004, Dulvy et al. 2005).

Table 2: Summary of the IUCN criteria for listing a species in a threatened category (Vulnerable, Endangered, or Critically Endangered).

Criterion	Description
A	The population has declined, is declining, or will decline over the past three generations.
B	The range is small AND two of the three sub-criteria related to (i) fragmentation, small number of threat-based locations, (ii) continuing declines in range or mature individuals, and (iii) extreme fluctuations.
C	The number of mature individuals is small and the population has experienced, is experiencing, or will experience a continuing decline.
D	The number of mature individuals is very small or the range is very small.
E	A quantitative population analysis indicates that the probability of extinction in the wild is high.

For the ECA Red List Assessment, the marine bony fishes in the ECA were assessed for extinction risk based on their entire global population and range, using the IUCN Red List Global Categories and Criteria. By contrast, many regional or national assessments assess only the status of the species in that region, using the IUCN Red List Regional Guidelines (IUCN 2012a), which include two additional categories: Regionally Extinct (RE) and Not Applicable (NA). Regional assessments also account for species population connectivity outside the region of interest to consider the impact of immigration on the regional population. As the extinction risk of a species can be assessed at global, regional or national levels, one species can have different Red List Categories in the global Red List than in the regional Red List. For example, a species that is common worldwide and classed as Least Concern (LC) in the global Red List could face a high level of threat in a particular region and therefore be listed as Endangered (EN) in the regional Red List. Logically, an endemic species should have the same category at regional and global levels, as it is not present in any other part of the world.

The majority of marine fishes in the ECA that qualified for a threatened category were assessed under Criterion A, which measures the rate of decline over the longer time frame of three generation lengths or ten years. Generation length, defined as the average age of the current cohort of reproducing individuals, can be calculated in several different ways, depending on the data available (IUCN Guidelines 2014). For these analyses, fishes with stock assessments and age class data, including estimates of numbers of individuals and mortality rates in each age class, were used to determine generation length. For fishes without age class data, the average age of reproducing adults was calculated as the median age between age of first reproduction and historical maximum longevity. In some cases, calculation of generation length using both methods for the same species can yield different values, resulting in an overestimation or underestimation of generation length depending on the method chosen.

Mola mola (Ocean Sunfish) assessed as Vulnerable. © A. Hines

In these cases, decline was calculated over the range of generation lengths values, with the final Red List Category classification based on supporting data and information within the range of population decline under Criterion A.

Some marine fishes with relatively small range sizes qualified for a threatened category under Criterion B, which measures extinction risk based on a small geographic range size (extent of occurrence < 20,000 km^2 or area of occupancy < 2,000 km^2 to meet the lowest threshold for Vulnerable), combined with a small number of locations, and/or continued decline and habitat fragmentation. The majority of marine fishes assessed under Criterion B, for example, were island endemics with an area of occupancy estimated to be less than 2,000 km^2 due to very specific habitat requirements. Although not used to assess marine fishes in this study, Criterion C is applied to species with small population sizes estimated to be less than 10,000 mature individuals, Criterion D is applied to species with less than 1,000 mature individuals or those with an area of occupancy of less than 20 km^2, and Criterion E is applied to species with extensive population information that allows for population declines to be appropriately modelled over time. A category of Near Threatened was assigned to species that come close to, but do not fully meet, all of the thresholds or conditions required for a threatened category under Criterion A, B, C, D or E.

1.5 Objectives of the Assessment

The main objective of the ECA assessment was to assess the global population and conservation status of all marine bony fishes present in the ECA biogeographic region using the IUCN Red List Categories and Criteria. A number of other important objectives and goals were fulfilled, including:

1) development of a network of regional experts to enable species assessments to be continually updated as new information is discovered and to provide expert opinion on policy and management recommendations in the region;

2) support of regional marine and coastal planning initiatives and policy development in the ECA for the conservation and sustainable management of marine fishes by providing comprehensive reports to inform the current status of species and regions;

3) provisioning of a comprehensive marine fishes species database stored within the IUCN Species Survival Commission's (SSC) data management system, the Species Information Service (SIS), which contains information on distribution, population, habitat preference, major threats, conservation measures and key literature for each marine fish species assessed as a baseline dataset and in a format suitable for use by scientists, stakeholders and decision makers;

4) publication of this information on the IUCN Red List of Threatened Species, in a regional report, and in a peer-reviewed publication, to make the data and analyses widely available throughout the region;

and 5) provision of increased capacity, facilitation and improved species data to complete the much needed revision of the FAO *Living Marine Resources of the Eastern Central Atlantic*.

The main outputs presented in this report are: a comprehensive species list of all native marine bony fishes present in the ECA biogeographic region (not including the vagrant, introduced or diadromous species); an IUCN Red List categorization of each species; a summary of the main threats affecting the threatened fishes; and recommendations for regional conservation of marine fishes and their habitats.

The IUCN Global Species Programme's Marine Biodiversity Unit will facilitate wide dissemination of this document to concerned decision-makers, scientists and non-governmental organizations in order to mobilize marine fish conservation action at the local, national and regional levels.

2.Assessment Methodology

2.1 Geographic Scope

This ECA assessment includes all valid bony marine fishes with a current, known global distribution that overlaps the marine zone from Mauritania to Angola, including the offshore islands of Ascension, Cape Verde and Saint Helena, and Bioko, São Tomé and Príncipe and Annobón in the Gulf of Guinea. The updated version of the FAO *Living Marine Resources of the Eastern Central Atlantic* (Carpenter and De Angelis 2014, Carpenter and De Angelis in press) includes significantly more species than this assessment for several reasons. Firstly, the FAO *Living Marine Resources of the Eastern Central Atlantic* includes most of the FAO Fishing Area 34 and the northern part of Fishing Area 47 (see Figure 2) in the ECA, which is a political rather than biogeographic region. The guide therefore includes species that can be found in Morocco, many of which are primarily known from more temperate zones to the north (including the Mediterranean Sea), and those found in northern Namibia, many of which are primarily found in the southern temperate region around South Africa. Secondly, many deeper-water or poorly-known species reported in the FAO *Living Marine Resources of the Eastern Central Atlantic* are assumed to be circumglobal, but may not yet have published records in the biogeographic ECA region. For the latter group, if a species was reported in the FAO publication, but no reported occurences could be found as to allow a reasonable distribution map to be drawn that included the ECA biogeographic region, then that species was not included in this assessment.

2.2 Taxonomic Scope

The list of 1,288 marine fishes compiled for this assessment (see Appendix I) is currently the most updated, complete taxonomic list of marine teleost fishes in the ECA biogeographic region, excluding vagrant, introduced or diadromous species. The taxonomy primarily follows Nelson (2006); however, the Argeniformes are here included within the Osmeriformes. In addition, recent molecular analyses suggest that the Girellinae should be elevated to a family within the Perciformes (Knudsen and Clements 2013), but it is here considered a subfamily of the Kyphosidae. The species-level taxonomy follows the Catalog of Fishes (Eschmeyer et al. 2016).

All described, valid bony marine fishes with a drawn distribution map that overlapped the biogeographic delineation of the ECA were included in this assessment. As a group, the 1,288 marine bony fishes in this region represent a wide diversity of deepwater, pelagic, dermersal and near-shore species from 32 orders and more than 200 families. A number of deep water species, such as many of the species of Stomiiformes and Myctophiformes, were known only from a few individuals from trawl surveys or by-catch in the region, but were still included in the assessment.

The commercially important Orange Roughy (*Hoplostethus atlanticus*) was not included in the assessment, as its distribution is primarily anti-tropical, and no reliable catch records exist for this species in the ECA as defined herein. Additionally, species that were newly described or had reported range extensions into the ECA after the workshop assessment process was completed, such as *Malacoctenus carrowi* (Labrisomidae, newly described from Cape Verde, Wirtz 2014) and *Liopropoma emanueli* (Serranidae, newly described from Cape Verde and Senegal, Wirtz and Schliewen 2012) were not included. Finally, this initiatve assessed the global status of currently valid species, so no subspecies assessements were included.

Particpants at the first West African regional IUCN Red List assessment workshop in Dakar, Senegal, July 2012. © B. Polidoro and M. Comeros-Raynal

Particpants at the second West African regional IUCN Red List assessment workshop in Accra, Ghana, May 2013. © B. Polidoro and M. Comeros-Raynal

Particpants at the third West African regional IUCN Red List assessment workshop in Libreville, Gabon, July 2014. © B. Polidoro and M. Comeros-Raynal

2.3 Regional IUCN Red List Assessment Workshops

Of the 1,288 marine bony fishes assessed in the ECA, approximately 250 species were globally assessed during prior IUCN Red List initiatives. These include tunas and billfishes (Collette et al. 2011), surgeonfishes (Comeros-Raynal et al. 2012), groupers (Sadovy et al. 2013) bonefishes (Adams et al. 2014), blennioids (Polidoro et al. 2014), porgies (Comeros-Raynal et al. in review), puffers (Stump et al. in prep), wrasses and eels, among others.The remaining ~1,000 species were assessed during three workshops held in West Africa over the course of three years (January 2012-December 2014) with generous funding from the MAVA Foundation.

IUCN Red List assessment workshops in the ECA involved more than 65 leading scientific experts, including fisheries biologists, ecologists, taxonomists, government officials, and conservation practitioners from 14 countries, including Australia, Benin, Cape Verde, Denmark, France, Gambia, Gabon, Guinea, Ghana, Mauritania, Nigeria, Senegal, South Africa and the United States (see Appendix II for a list of participants at each of the three regional assessment workshops). Approximately 350 marine fishes were assessed during the first workshop in Dakar, Senegal (9-13 July 2012) with logistical support from IUCN MACO, IUCN Senegal Mission, and the Centre de Recherches Océanographiques Dakar (CRODT). Approximately 350 marine fishes were assessed during the second workshop in Accra, Ghana (5-9 May 2013) with logistical support from IUCN MACO, IUCN PACO, IUCN Ghana Office, the Department of Marine & Fisheries Science of the University of Ghana, and the Marine Fisheries Research Division of Ghana's Fisheries Commission. Approximately 300 marine fishes were assessed during the third workshop in Libreville, Gabon (7-11 July 2014) with logistical support from IUCN MACO, Agence Nationale du Parcs Nationaux (ANPN), Gabon Bleu and the Direction Génerale de la Pêches et de l'Agriculture (DGPA).

2.4 IUCN Red List Assessment Protocol

2.4.1 Pre-workshop data collection

The IUCN Red List assessments are data driven, and involve initial data collection and compilation of information and range maps for draft assessments, to be used at Red List workshops. During this process, all species data are entered into the IUCN Species Information System (SIS), and draft digital range maps are created for each species. Data collected include information on each species' taxonomy, distribution, population status and trends, habitat, ecology, use and trade, major threats and current conservation measures. Data collection is often conducted with the assistance of the participating West African fish experts. The draft species accounts and maps are made available to the experts for review prior to the workshops.

2.4.2 Expert review and evaluation

Three 5-day IUCN Red List Workshops were conducted in the region between 2012 and 2014. Each workshop hosted leading experts on the relevant West African marine fishes. The workshops were facilitated by IUCN MBU staff in collaboration with representatives from a number of local organizations and regional IUCN programme staff. The first day of each Red List assessment workshop was reserved for the provision of an overview of the project; initial training on the IUCN Red List assessment process and the application of the IUCN Categories and Criteria; and to consolidate a network of marine scientists with IUCN Red List experience for future collaboration and marine conservation activities.

2.4.3 Post-workshop editing, consistency check and external review

Following each workshop, additional scientific consultations continued by e-mail to finalize editing for each species' assessment and digital distribution map. Each species assessment also went through a peer-review evaluation process by outside reviewers, and an internal consistency check for application of the Red List Criteria before they were considered final and ready to be published on the Red List of Threatened Species.

2.4.4 Submission of the data to the IUCN Red List of Threatened Species

The final peer-reviewed species assessments were submitted to IUCN Red List Unit in Cambridge, UK in August 2015 and published on the IUCN Red List of Threatened Species (IUCN 2015) in November 2015.

2.5 Methodology for Spatial Analyses

Digital generalized distribution maps were generated for each species in ArcGIS 10.1, following accepted IUCN Red List spatial protocols (IUCN 2012b). The maps for coastal species, defined as those species found to depths of less than 200 m, were generated using a basemap that followed either the 200 m bathyline or 100 km from shore, while the maps for pelagic and deep sea species were digitized by hand, following known and inferred occurrences. Regardless of the ecological preferences, the maps for species known from very few localities (typically less than 10) were created by adding a 50 km buffer to each known point of occurrence.

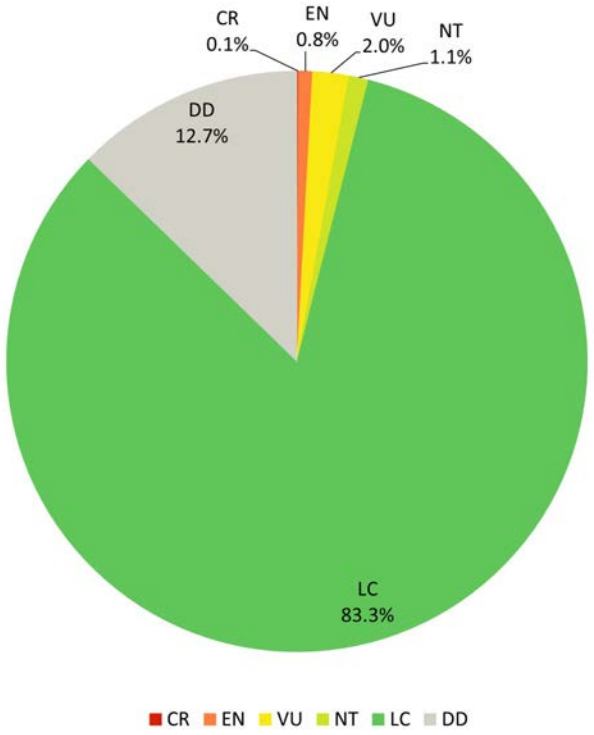
For all richness analyses, the species' distributions were restricted to the ECA region as defined for this project (Figure 2). Individual species' polygons were converted to 10 km by 10 km raster grids by assigning a value of "1" to cells that overlapped with the species polygon and a value of "0" to all other cells. The number of species in each cell was then calculated by adding the raster grids together. This was completed for all species as well as for specific subsets of species, including the endemic species, threatened species and Data Deficient species.

3. Results

3.1 Threat Status

Overall, 37 of the 1,288 ECA marine bony fish species assessed against the IUCN Red List Categories and Criteria were listed as threatened (Table 3, Figure 4): 1 Critically Endangered, 10 Endangered and 26 Vulnerable; the species assessed as globally threatened are listed in Table 4. Approximately 50%, 22 species, were listed based on population declines (Criterion A), while 35% (13 species) and 5% (2 species) were listed based on small geographic ranges (Criterion B and D2, respectively). Another 14 were listed as Near Threatened; these species were close to meeting, but did not quite meet, the thresholds for inclusion in a threatened category. To date, no species in the ECA are known to be Extinct or Extinct in the Wild.

Figure 4: Proportion of Eastern Central Atlantic marine bony fish species assessed in the IUCN Red List Categories: CR - Critically Endangered; EN - Endangered; VU - Vulnerable; NT - Near Threatened; LC - Least Concern; DD - Data Deficient.



The vast majority of marine bony fish species, 83.3%, were listed as Least Concern. This category encompasses species that are: widespread and abundant; currently stable; or declining at a rate unlikely to lead to extinction in the near future. For example, Damselfish (*Chromis chromis*) is widely distributed in the eastern Atlantic Ocean, and can be common in parts of its range.

Chromis chromis (Linneaus, 1758) assessed as Least Concern. © Albert Kok.

Table 3: Summary of the number of Eastern Central Atlantic species listed in each of the IUCN Red List global categories for all species and endemic species only. No species were assessed as Extinct (EX) or Extinct in the Wild (EW).

Red List Category	Number of species	Proportion of species	Number of endemic species	Proportion of endemic species
Critically Endangered (CR)	1	0.1%	0	0.0%
Endangered (EN)	10	0.8%	5	2.2%
Vulnerable (VU)	26	2.0%	10	4.3%
Near Threatened (NT)	14	1.1%	2	0.9%
Least Concern (LC)	1073	83.3%	145	62.8%
Data Deficient (DD)	164	12.7%	69	29.9%
TOTAL	1288		231	

Table 4: Eastern Central Atlantic marine bony fish species assessed as threatened (Critically Endangered - CR, Endangered - EN, or Vulnerable - VU) based on the IUCN Red List methodology. *Recent molecular analyses suggest that the Girellinae should be elevated to a family (Knudsen and Clements 2013), but it is here considered a subfamily of the Kyphosidae.

Order	Family	Species	RL Category
Perciformes	Epinephelidae	*Epinephelus itajara*	CR
Gadiformes	Merlucciidae	*Merluccius senegalensis*	EN
Perciformes	Cirrhitidae	*Amblycirrhitus earnshawi*	EN
Perciformes	Epinephelidae	*Epinephelus marginatus*	EN
Perciformes	Epinephelidae	*Mycteroperca fusca*	EN
Perciformes	Gobiidae	*Bathygobius burtoni*	EN
Perciformes	Gobiidae	*Priolepis ascensionis*	EN
Perciformes	Sciaenidae	*Pseudotolithus senegalensis*	EN
Perciformes	Scombridae	*Thunnus thynnus*	EN
Scorpaeniformes	Scorpaenidae	*Scorpaena ascensionis*	EN
Scorpaeniformes	Scorpaenidae	*Scorpaena mellissii*	EN
Clupeiformes	Clupeidae	*Sardinella maderensis*	VU
Elopiformes	Megalopidae	*Megalops atlanticus*	VU
Gobiesociformes	Gobiesocidae	*Apletodon barbatus*	VU
Perciformes	Blenniidae	*Scartella nuchifilis*	VU
Perciformes	Blenniidae	*Scartella springeri*	VU
Perciformes	Carangidae	*Trachurus trachurus*	VU
Perciformes	Gobiidae	*Corcyrogobius lubbocki*	VU
Perciformes	Gobiidae	*Didogobius amicuscaridis*	VU
Perciformes	Gobiidae	*Gobius tetrophthalmus*	VU
Perciformes	Gobiidae	*Gorogobius stevcici*	VU
Perciformes	Istiophoridae	*Kajikia albida*	VU
Perciformes	Istiophoridae	*Makaira nigricans*	VU
Perciformes	Kyphosidae*	*Girella zonata*	VU
Perciformes	Labridae	*Bodianus scrofa*	VU
Perciformes	Mullidae	*Pseudupeneus prayensis*	VU
Perciformes	Polynemidae	*Pentanemus quinquarius*	VU
Perciformes	Pomatomidae	*Pomatomus saltatrix*	VU
Perciformes	Sciaenidae	*Atractoscion aequidens*	VU
Perciformes	Sciaenidae	*Pseudotolithus senegallus*	VU
Perciformes	Scombridae	*Thunnus obesus*	VU
Perciformes	Sparidae	*Dentex dentex*	VU
Perciformes	Sparidae	*Rhabdosargus globiceps*	VU
Syngnathiformes	Syngnathidae	*Hippocampus algiricus*	VU
Tetraodontiformes	Balistidae	*Balistes capriscus*	VU
Tetraodontiformes	Balistidae	*Balistes punctatus*	VU
Tetraodontiformes	Molidae	*Mola mola*	VU

Lepidopus caudatus (Euphrasen, 1788) assessed as Data Deficient in an Italian fish market. © G. Dall'Orto

Approximately 13%, 164 species, were listed as Data Deficient. Species were assessed as Data Deficient for two main reasons. Some species, such as Young Whalefish (*Danacetichthys galathenus*), are known from very few museum specimens, which creates uncertainty as to the true distribution and population size of the species. Other species, such as Silver Scabbardfish (*Lepidopus caudatus*), were assessed as Data Deficient because there were indications of population declines caused by overfishing, but the data were insufficient to calculate population declines over three generation lengths.

The best estimate of the percentage of threatened marine bony fishes in the ECA is the mid-point, 3.3%, which assumes that the Data Deficient species are equally as threatened as the species for which sufficient data were available to assess. Accounting for the uncertainty surrounding the Data Deficient species results in estimates of the percentage threatened ranging from 2.9%, if none of the Data Deficient species are threatened, to 15.6%, if all the Data Deficient species are threatened (Table 5).

Table 5: Range of percentage of threatened marine bony fishes in the Eastern Central Atlantic, using the estimators recommended in IUCN (2011).

Estimator	Percentage Threatened
Lower bound (CR+EN+VU)/(assessed-EX)	2.90%
Mid-point (CR+EN+VU)/(assessed-EX-DD)	3.30%
Upper bound (CR+EN+VU+DD)/(assessed-EX)	15.60%

Of the 1,288 species that occur in the ECA, the best available data suggest that 231 (~18%) are endemic. A larger percentage of endemic species were assessed as threatened (6.5-36.4%, with a midpoint of 9.2%) than the pandemic species (2.1-11.1%, with a midpoint of 2.3%). The threatened endemic species were primarily restricted-range species, such as White Hawkfish (*Amblycirrhitus earnshawi*), known only from Ascension Island; 13 of the 15 threatened endemics were listed based on small geographic ranges (Criterion B), and only two were listed based on population declines.

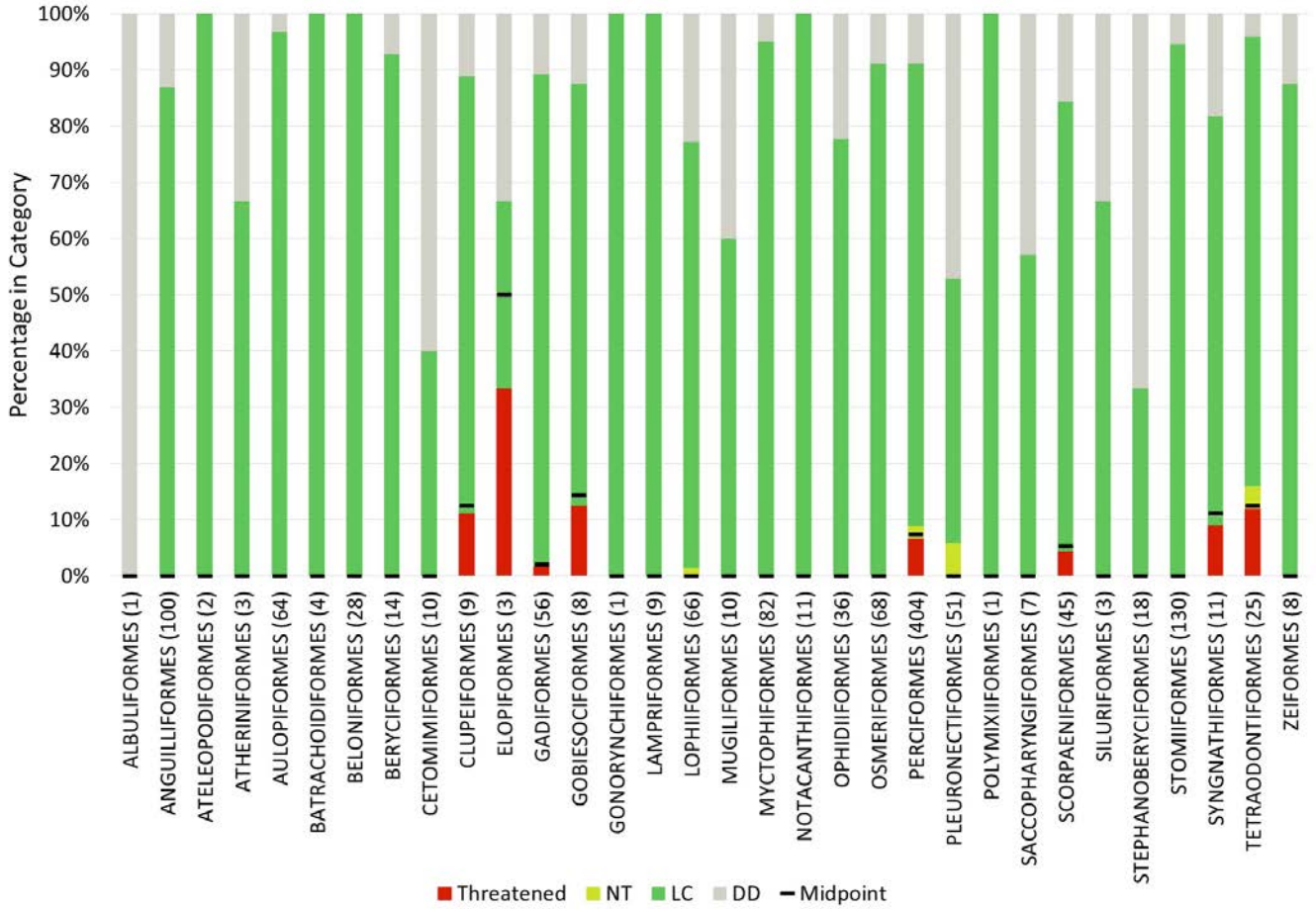


Figure 5: Percentage of species in each order assessed as threatened (CR, EN or VU), Near Threatened (NT), Least Concern (LC) and Data Deficient, with the number of species in each order in parentheses. The midpoint represents the best estimate for the percentage threatened, and was calculated as: threatened species/(all species - DD species).

3.2 Status by Taxonomic Group

The marine bony fishes of the ECA represent 32 orders and over 200 families, with a maximum species richness of 404 (in the order Perciformes) and 92 (in the family Stomiidae). Three orders are currently represented by only one species in the ECA, including the shallow-water bonefishes (order Albuliformes), as well as the milkfishes (order Gonorynchiformes) and the deep-water beardfish (order Polymixiiformes).

The majority of the orders contained species assessed as either LC or DD, while all of the threatened bony fish species occurred in 8 of the orders (Figure 5). The midpoint estimate for the percentage of threatened species in each order ranged from 2 to 50%. The largest number of threatened species occurs in the Perciformes, representing approximately 7% of this diverse order.

Euthynnus alletteratus (Little Tunny) assessed as Least Concern. © F.K.E. Nunoo

Sardines in the Eastern Central Atlantic

The family Clupeidae consists of many important commercial species. Sardines, sometimes called pilchards, depending on size, are typically caught in both artisanal and commercial fisheries within the ECA with the use of purse or beach seines, and gill nets. Sardines also provide a staple food source, typically being marketed fresh, frozen, smoked, canned or dried (Whitehead 1985) and are often used as bait in fisheries.

Seven common species of sardine are found in the ECA: *Ethmalosa fimbriata*, *Pellonula leonensis*, *P. vorax*, *Sardina pilchardus*, *Sardinella aurita*, *Sardinella maderensis* and *Sardinella rouxi*. *Ethmalosa fimbriata*, *Sardina pilchardus* and S*ardinella maderensis* are the three most important clupeid commercial species in the region. Their schooling nature and relative proximity to shore during certain periods allow for easy harvesting.

Pellonula leonensis and *Ethmalosa fimbriata* occur in fresh and estuarine waters within their ranges. *Pellonula leonensis* is known from the Congo system (Gourène and Teugels 1991), where its preferred habitats make it common in artisanal fisheries. A small population of *E. fimbriata* occurs in large concentrations in lagoons and estuaries, and is also known from Lake Nokoué, Benin.

ECA sardine populations are wide ranging and, depending on the species, can be found from Iceland south to the Democratic Republic of Congo. However, the exact geographic extent of these species is not clear because reported landings of sardines are often contain multiple species and therefore under-reported for a particular species.

Overfishing has caused many previous stock collapses (Worm et. al 2009), and the recent collapses of Pacific sardine (*Sardinops sagax*) stocks emphasize the importance of monitoring population size and structure (Zwolinski and Demer 2012). This project has highlighted the need for additional population assessments in the region. *Ethmalosa fimbriata, Sardinella maderensis* and *Sardina pilchardus* are all considered overfished within the ECA. Landings reported to the FAO have gradually increased for sardine species over the last 60 years (FAO 2011). However, the effect of the increased effort on stocks is difficult to estimate due to the mixed landings. Clupeids are dependent on high levels of recruitment to maintain current stock levels and climate variability increases recruitment uncertainty (Failler 2014). Since these species are commonly found in mixed catches, it is difficult to estimate true population size, or overall effect of exploitation on individual species. These mixed landings have created a knowledge gap regarding the population of *Sardinella rouxi*. This species is currently thought to be the least abundant sardine species in the region, but more research is necessary to better define its current population status.

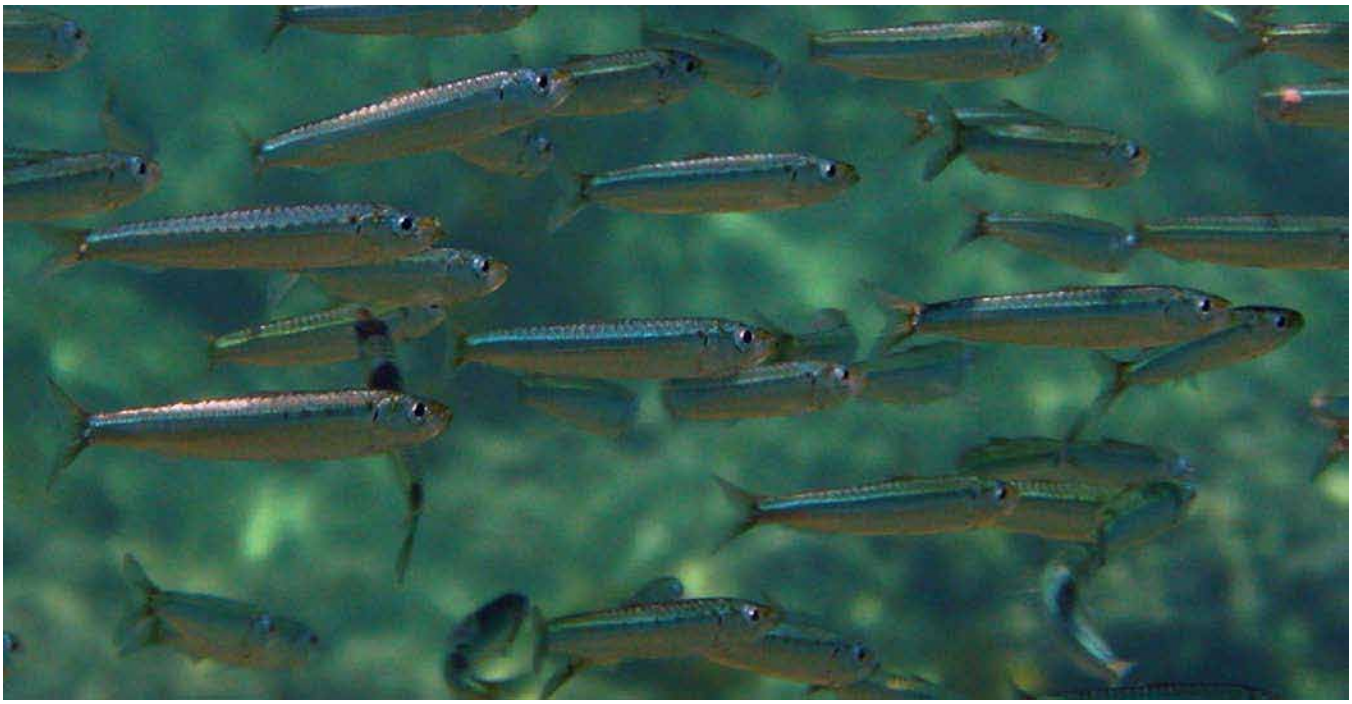
Mixed sardine landings. © D. Ventura

The population status of these clupeids is further complicated by the overlapping Mediterranean and European ranges of many similar commercial species, in addition to the ECA sardine populations. Fishing pressure from European and Mediterranean fleets along with inconsistent reporting of mixed landings between the two regions have complicated

efforts to clearly define the current population status and larger effects of fishing pressures.

Several conservation measures have been put into place in an attempt to conserve populations, following the management advice provided by the permanent FAO Working Group on the Assessment of Small Pelagic Fish off Northwest Africa (FAO 2013). These measures include catch limits, freezing investments in canning factories and fishing, and recommendations of a reduction in fishing effort. This latter item was suggested because fishing efforts in the region have steadily increased and juveniles of *Sardinella maderensis* are currently being harvested, while observed adult size is decreasing (FAO 2013). These data, combined with an estimated minimum 30% decline in population over the last 10 years, have resulted in *Sardinella maderensis* being listed as Vulnerable. Moving forward, it will be necessary to monitor these populations individually. The data gaps created by mixed landings of sardine species have made it difficult to fully understand the effects of increased fishing pressure on each of these species. Although *Ethmalosa fimbriata, Sardina pilchardus* and *Sardinella maderensis* face the greatest commercial pressure, *Sardinella rouxi* was listed as Data Deficient partially due to lack of separate catch statistics.

School of sardines. © A. Duci



Status of Croakers (Sciaenidae) in the Eastern Central Atlantic

Throughout much of the ECA, sciaenids are highly sought during seasonal occurrences inshore or in estuaries. Many species are found in schools or spawning aggregations, making them easy targets for both artisanal and commercial fisheries. Geographic ranges for these species extend from off the coast of Norway in the north to off the coast of Namibia in the south. Many species also occur in the Mediterranean Sea.

Croakers or drums get their name from the characteristic "croaking" sound they produce. The sound, which is produced by specialized muscles vibrating against the swim bladder, is used as a means of communication either for mates, warnings or understanding surroundings in turbid water (Ramcharitar et al 2006). Depending on the species, males and females are both capable of producing sounds, though some species are only able to do so on a seasonal basis.

Many West African countries are considered traditional fishing countries, and fish provide a large portion of the dietary intake of protein. In addition to being a staple food item for local populations, many countries also depend on these fishes as an important economic resource. The largest West African combined commercial and artisanal fishing fleets occur in Nigeria, Senegal, Cameroon, and Ghana. Stocks in these areas are easily overfished because near-shore trawlers and traditional artisanal fisheries are occurring in similar geographic areas. The recent increase in recreational fishing in the region has further exacerbated the problem of overfishing on these stocks (Belhabib et al. 2014).

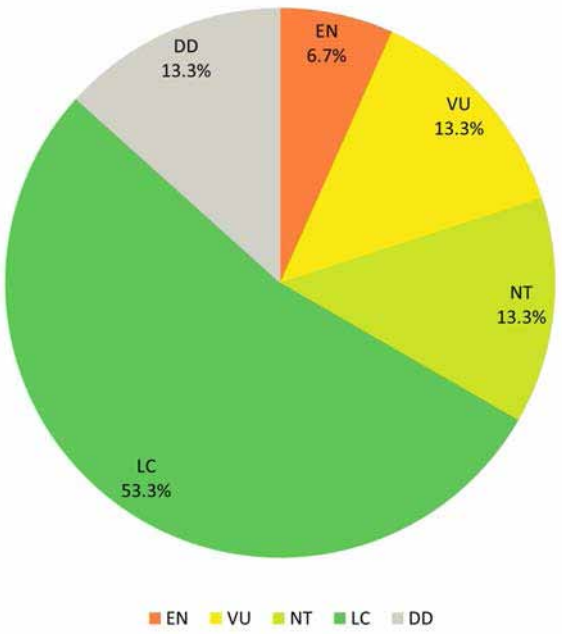
Reported landings for numerous species have shown a steady increase over the last several decades (FAO 2006), though the stocks of several species including *Atractoscion aequidens*, *Pseudotolithus mbizi,* and *Pseudotolithus senegalensis* are in decline

Sciaena umbra Linnaeus 1758 assessed as Near Threatened. © A. Abadie

(Hutton et al. 2001, Gaffer 1994). Increases in landings can most likely be attributed to changes in gear. Many fishermen have switched from gill nets to trawling. This, in conjunction with increased issuance of permits, has resulted in increased fishing effort in the region. *RV Nansen* sciaenid surveys conducted from 2000-2006 show an overall estimated reduction in biomass from 1,046 tonnes to 664 tonnes, representing a 37% decline in stocks. The increase in landings and decrease in population size has also led to an observed decrease in mean body size. This decline in body size is most likely due to the use of smaller mesh sizes in many fisheries, which results subsequently in an increase in catches of juveniles.

These declines have resulted in one species, *Pseudotolithus senegalensis*, to be listed as Endangered, two species, *Atractoscion aequidens* and *Pseudotolithus senegallus*, to be listed as Vulnerable, and two species, *Pentheroscion mbizi* and *Sciaena umbra*, to be listed as Near Threatened. Each of these species has experienced significant declines in population size in the last few decades, which can be directly attributed to the increased fishing pressure and overfishing currently seen in the ECA region.

Figure 6: IUCN Red List status of the 15 sciaenid species in the Eastern Central Atlantic.



The overall decline in sciaenid stocks highlights the importance of further conservation actions focused on this group. Currently, there are few conservation measures in place for sciaenids (*Argyrosomus regius*, *Atractoscion aequidens*, *Miracorvina angolensis*, *Pentheroscion mbizi*, *Pseudotolithus elongatus*, *Pseudotolithus epipercus*, *Pseudotolithus moorii*, *Pseudotolithus senegalensis*, *Pseudotolithus senegallus*, *Pseudotolithus typus*, *Pteroscion peli*, *Sciaena umbra*, *Umbrina canariensis*, *Umbrina ronchus* and *Umbrina steindachneri*) in the ECA. Several species' ranges may overlap with marine protected areas (MPAs). However, it is unknown if these are effective in stabilizing or increasing local sciaenid populations because regulations in the region are lax regarding demersal and pelagic fisheries. Catch and size limits for *A. aequidens* have been enforced in South Africa for both recreational and commercial fisheries. Recent South African surveys have shown that to address declining stocks, a 70% reduction in commercial effort, in addition to recreational regulations, will be needed in order to allow stocks to recover.

As is common with many species, more research is necessary to better understand the life history of sciaenid species. The effect of increased fishing pressure, especially on juveniles, is not fully understood. While improvements in gear types continue and fishing regulations are slow to catch up, these species, and others like them, are more likely to face declines in stock size. It is important to emphasize that this group of fishes is especially important to near-shore, artisanal fishers, who will be most negatively affected by stock declines. With improved research and regulations, such as those seen in South Africa, it may be possible to see long term improvements in sciaenid stocks in the ECA.

Mudskippers and Mangroves in the Eastern Central Atlantic

In the ECA, only a single species of mudskipper (Family Gobiidae, subfamily Oxudercinae) is present: *Periophthalmus barbarus*. Although heavily exploited in parts of its range, and also subject to habitat threat and pollution, this species is listed as Least Concern as it is widespread and considered to be relatively common. It can be found in fresh, marine and brackish waters in exposed intertidal mudflats of mangrove swamps, coastal lagoons and estuaries from Senegal to Angola, including Sáo Tomé and Príncipe Islands (Stiassny et al. 2007).

In the Niger Delta region, *P. barbarus* is harvested in subsistence fisheries and targeted for the commercial aquarium trade. Although little data are available on the volume and value of ornamental fish traded in Nigeria, *P. barbarus* was exported at approximately US$1 per fish in 2006-2007 (Ukaonu et al. 2011). In the Imo River Estuary, in southeast Nigeria, the stock of *P. barbarus* is now considered to be over-exploited, with 79% of the available stock being fished annually (Udoh et al. 2013). In general, mudskipper fisheries, along with other tropical artisanal fisheries in the region, are considered to be poorly-managed (Udoh et al. 2013).

Local fishermen utilizing mangrove habitats in Libreville, Gabon. © B. Polidoro

Mangrove habitat across Africa has on average declined by about 14% since 1980 (FAO 2007), with the highest losses occurring in western central Africa, where more than 60% of mangrove habitat has been lost along the coasts of the Congo, Cote d'Ivoire, and Liberia. In West Africa, a 35% decline in overall mangrove coverage was observed by remote sensing between 1986 and 2010 (Carney et al. 2014). In western central Africa, mangrove areas are very important for fisheries and as a source of timber and fuelwood (Feka 2015, Feka and Ajonina 2011).

Widespread mangrove losses have also occurred due to conversion to urban or agricultural lands. Oil and gas extraction in the Bight of Biafra, which extends from the Niger River Delta to Gabon, has severely degraded mangrove areas, drinking water and fish stocks. Oil exploration and extraction activities in this area, including dredging of channels, digging new canals, clearance for platforms, pipelines and seismic surveys have severally changed water flows, salinities and siltation rates (Spalding et al. 2010). Direct pollution incidents from oil spills are a regular occurrence, with more than 2000 incidents recorded from 1997-2001 (Nwilo and Badejo 2006). In the Niger Delta region, total hydrocarbons measured in sediment, surface water and mudskippers exceeded the national permissible limit for inland waters and seafood (Clinton et al. 2009).

3.3 Spatial Distribution of Species

3.3.1 Species richness

In the ECA, the maximum species riches is 757 species per 100 km^2. Diversity of marine bony fishes is highest around the Cape Verde Islands and off the coast of Senegal (Figure 7). The remaining coast of West Africa, including the offshore islands in the Gulf of Guinea (Bioko, São Tomé and Príncipe and Annobón), is also home to a large diversity of bony fishes. As expected, the diversity of fishes in oceanic waters is substantially lower than that of coastal waters, except for the area surrounding the islands of St. Helena and Ascension.

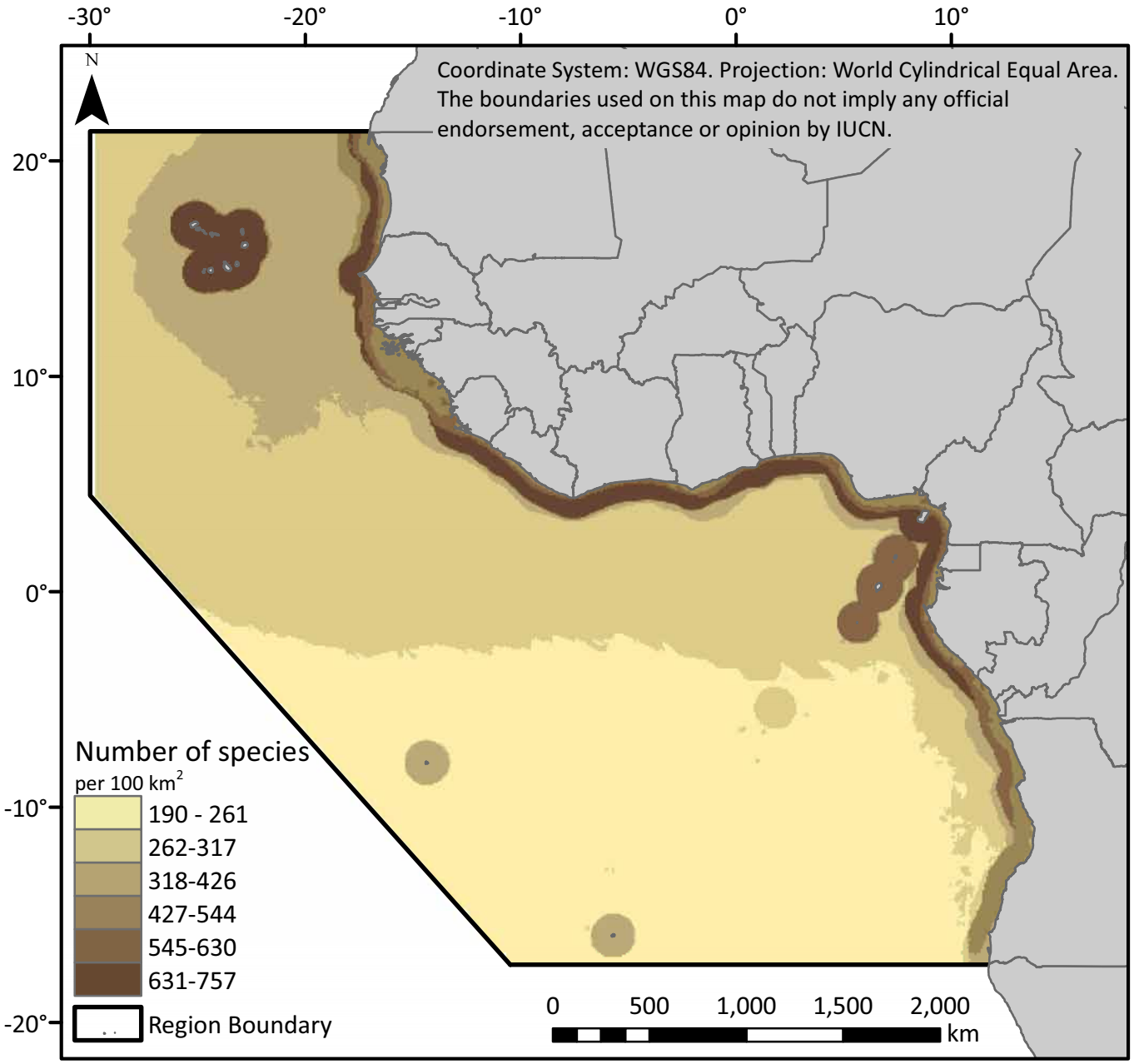


Figure 7: Distribution of the 1,288 marine bony fish species in the Eastern Central Atlantic.

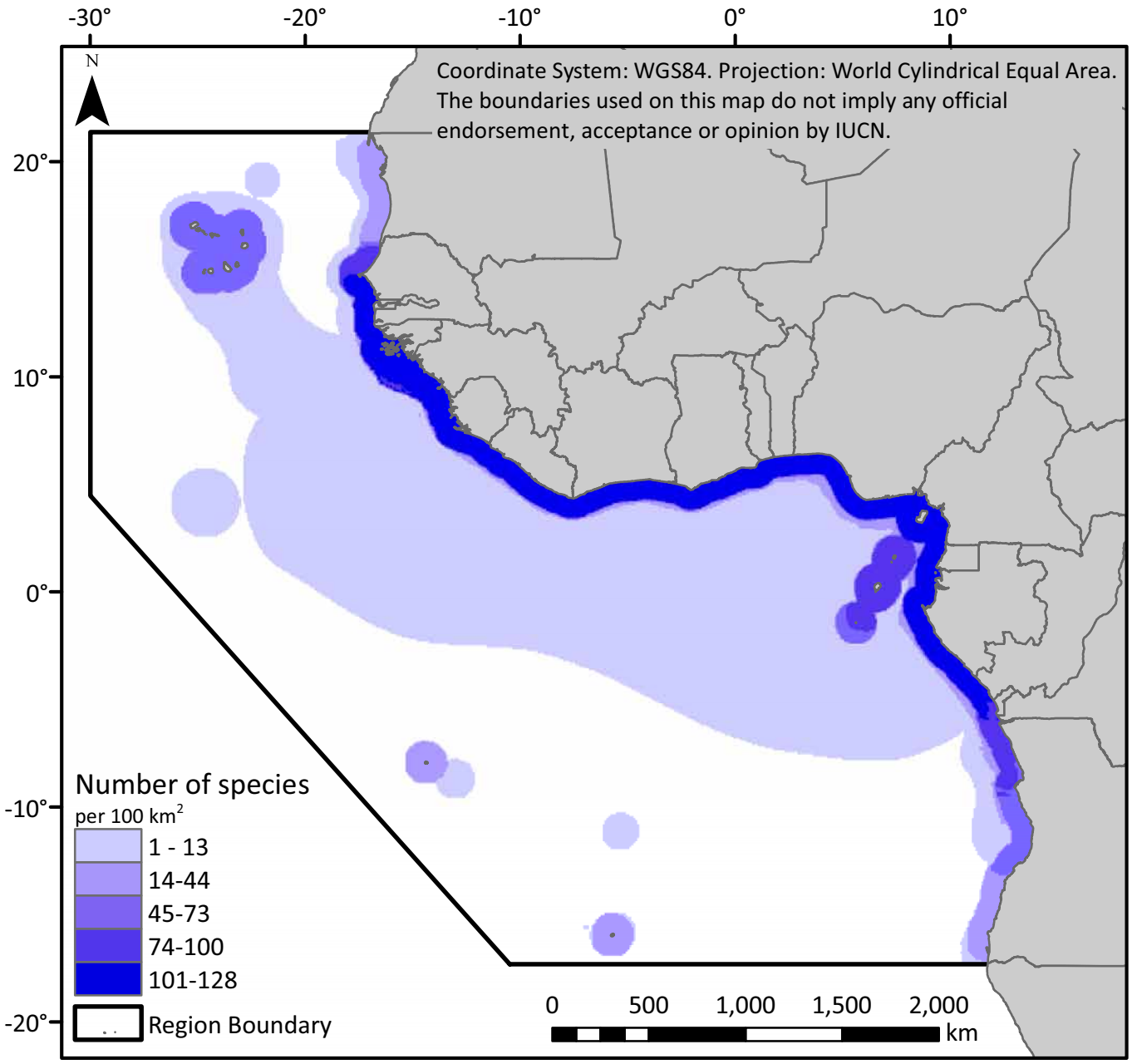


Figure 8: Distribution of the 231 endemic marine bony fish species in the Eastern Central Atlantic.

3.3.2 Endemic species richness

In general, the highest density of endemic species occurs along the African coast from Senegal to Angola (Figure 8). The top 10% of endemic species diversity (116-128 species per 100 km^2) occurs from Sierra Leone to Gabon, including Bioko (Equatorial Guinea) in the Gulf of Guinea. The offshore islands of Cape Verde and São Tomé and Príncipe are also home to substantial numbers of endemic species.

Very few endemic species are found offshore, except when associated with the oceanic islands of St. Helena and Ascenscion.

3.3.3 Distribution of threatened species

The distribution of threatened species primarily follows that of the overall species richness, with the highest numbers of threatened species (16-18 species per 100 km^2) occurring around the islands of Cape Verde, Bioko (Equatorial Guinea) and Sao Tome, as well as along the coasts of Senegal and eastern Gabon (Figure 9). The remaining coast of West Africa and offshore islands have fewer threatened species (8-15 species per 100 km^2). Low numbers of threatened species occur in the offshore waters, less than 4 species per 100 km^2.

The relatively low variability in richness of threatened species along the coast appears to be driven by the overexploited species that are distributed along much of West Africa. For example, *Epinephelus itajara*, the Atlantic Goliath Grouper, is found from Senegal to Gabon in the east Atlantic, and was assessed as Critically Endangered due to estimated declines of >80% over the past three generation

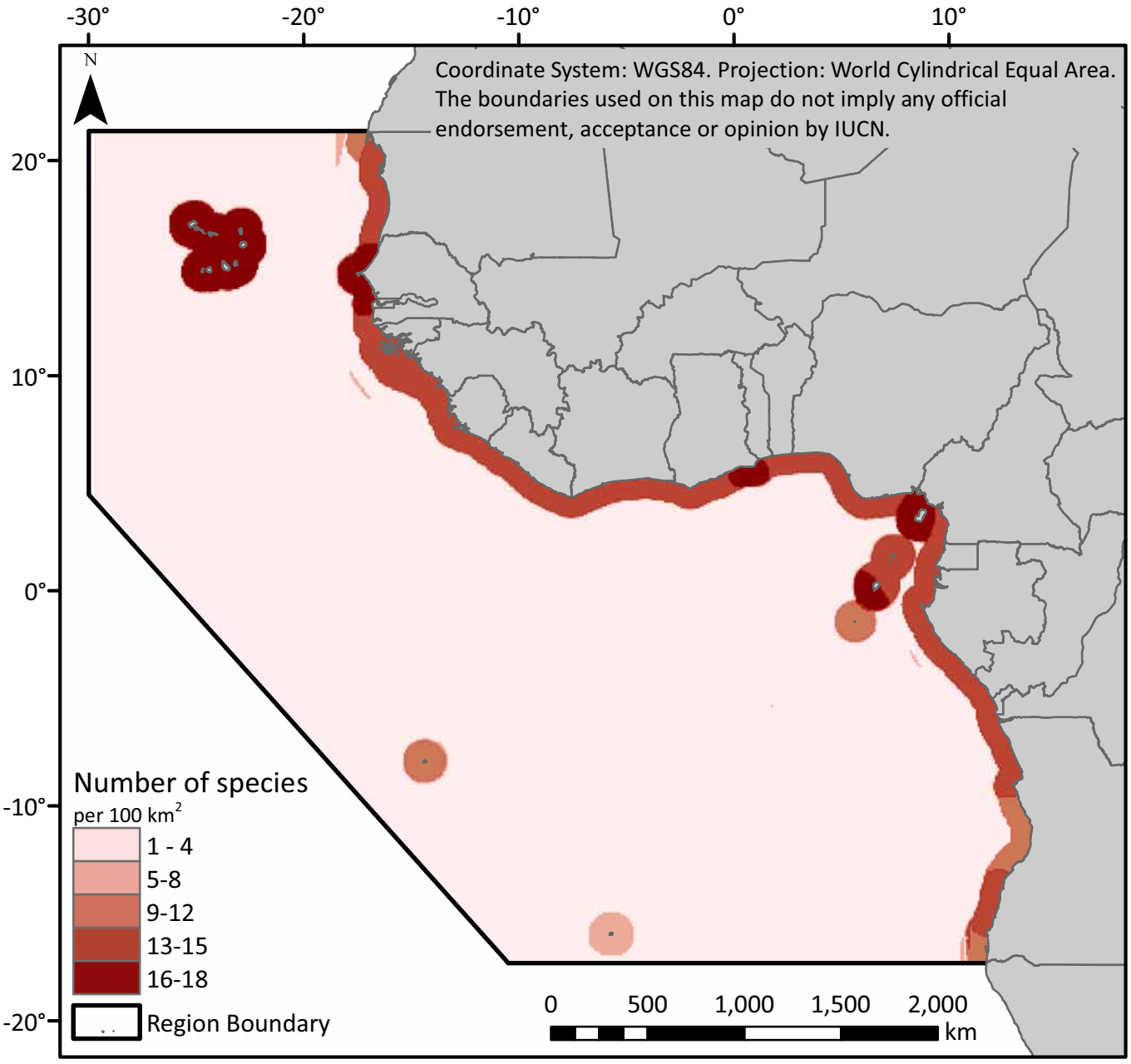


Figure 9: Distribution of the 37 threatened marine bony fish species in the Eastern Central Atlantic (i.e., those assessed as Critically Endangered, Endangered, or Vulnerable)..

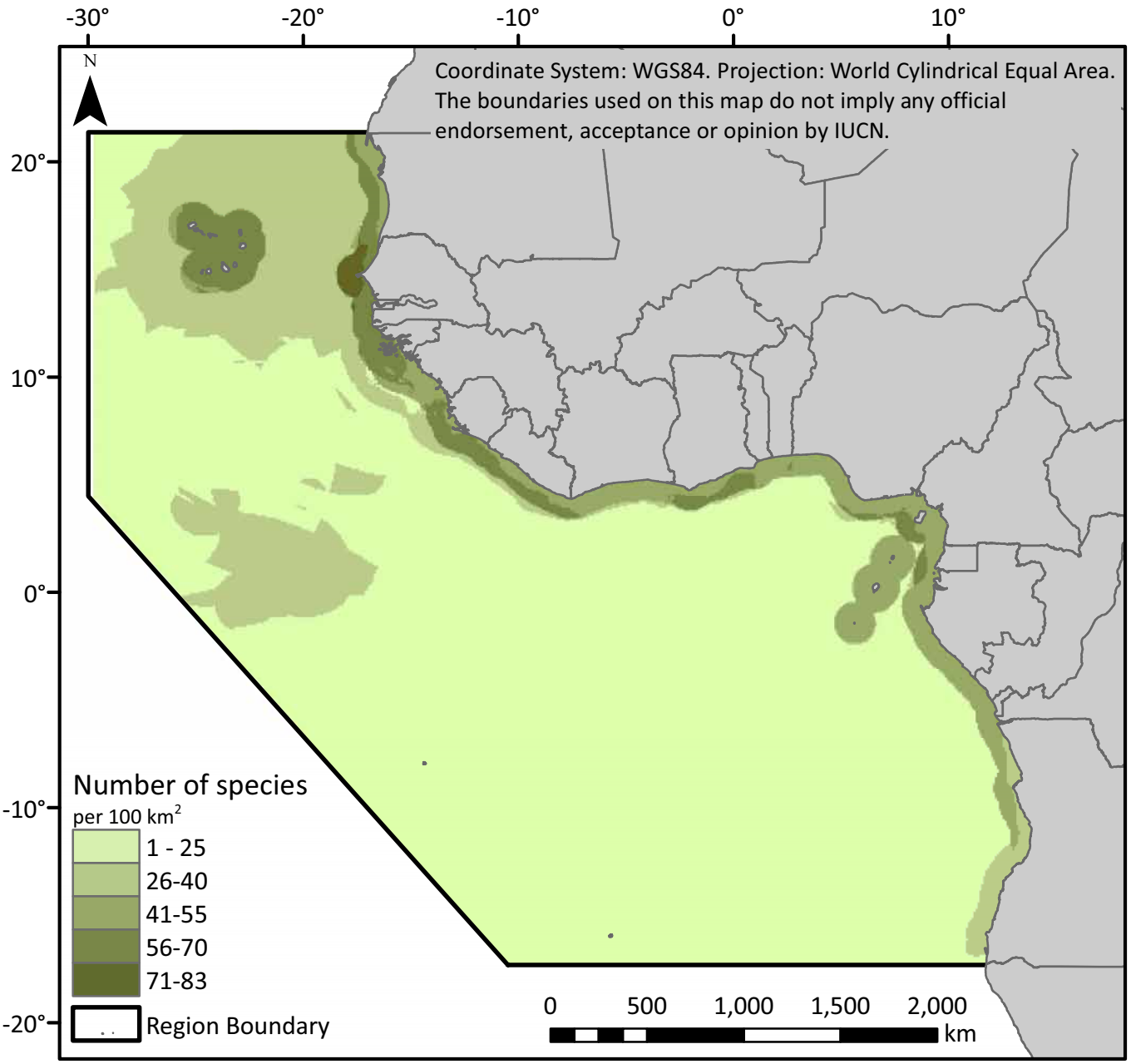


Figure 10: Distribution of the 164 marine bony fish species in the Eastern Central Atlantic assessed as Data Deficient.

lengths (Craig 2011). However, the richness around the offshore islands is more a function of restricted range endemics, such as *Priolepis ascensionis*, an endangered goby known only from St. Helena and Ascension islands (Carpenter et al. 2015).

3.3.4 Distribution of Data Deficient species

The concentration of species assessed as Data Deficient is highest off Dakar, Senegal, representing the top 10% of species richness, 75-83 species per 100 km^2 (Figure 10). Another large region of high richness of Data Deficient species is at the Cape Verde Islands, with up to 64 species per 100 km^2. The offshore zone along parts of West Africa, especially from Mauritania to Liberia and Ghana, also stand out as having a relatively high richness of species assessed as Data Deficient.

3.4 Major Threats to Marine Fishes in the ECA

Major threats were reviewed for the 51 species assessed as threatened (Critically Endangered, Endangered or Vulnerable) and Near Threatened. The major threats to marine bony fish species in the ECA were overfishing , habitat degradation, pollution, climate change and invasive and problematic species (Figure 11). Almost 40% (19 species) of species assessed as threatened or Near Threatened are negatively affected by more than one major threat.

3.4.1 Overfishing

The biggest threat facing marine fishes, globally, is overfishing (Roberts and Hawkins 1999, Dulvy et al. 2009, Harnick et al. 2012), and prolonged overfishing renders recovery improbable for the majority of the world's depleted stocks (Neubauer et al. 2013). Overfishing is also a major threat in the ECA as well, with 39 of the 51 threatened and Near Threatened species negatively affected by overfishing, including both direct and indirect effects.

Many West African nations rely heavily on fish and fishing as a source of food, income and employment to varying degrees. Traditionally, fishers manually propelled dugout canoes with simple fishing gears such as hook and line, gill nets and beach seines. Over the past 50 years, these labor-intensive methods were replaced by larger, fuel-propelled vessels and more sophisticated gears, increasing the efficiency and expanding fishing ranges of the fishers (see Atta-Mills et al. 2004 for a history of West African fisheries). A number of African countries have commercial vessels that fish all year round with huge trawls and purse seine gears that are non-selective resulting in capture of juveniles, breeding fishes, as well as remarkable amounts of discards. However, some West African countries have lacked the monetary means to acquire and operate commercial-capacity fishing vessels, and have often sold licenses to European Union (EU) and other non-African countries so that these countries can harvest fish in the EEZs of the licensing countries. These licenses are often purchased at prices well below the monetary value of the marine resources exploited by licensed fishing vessels, which, in turn, exacerbates and

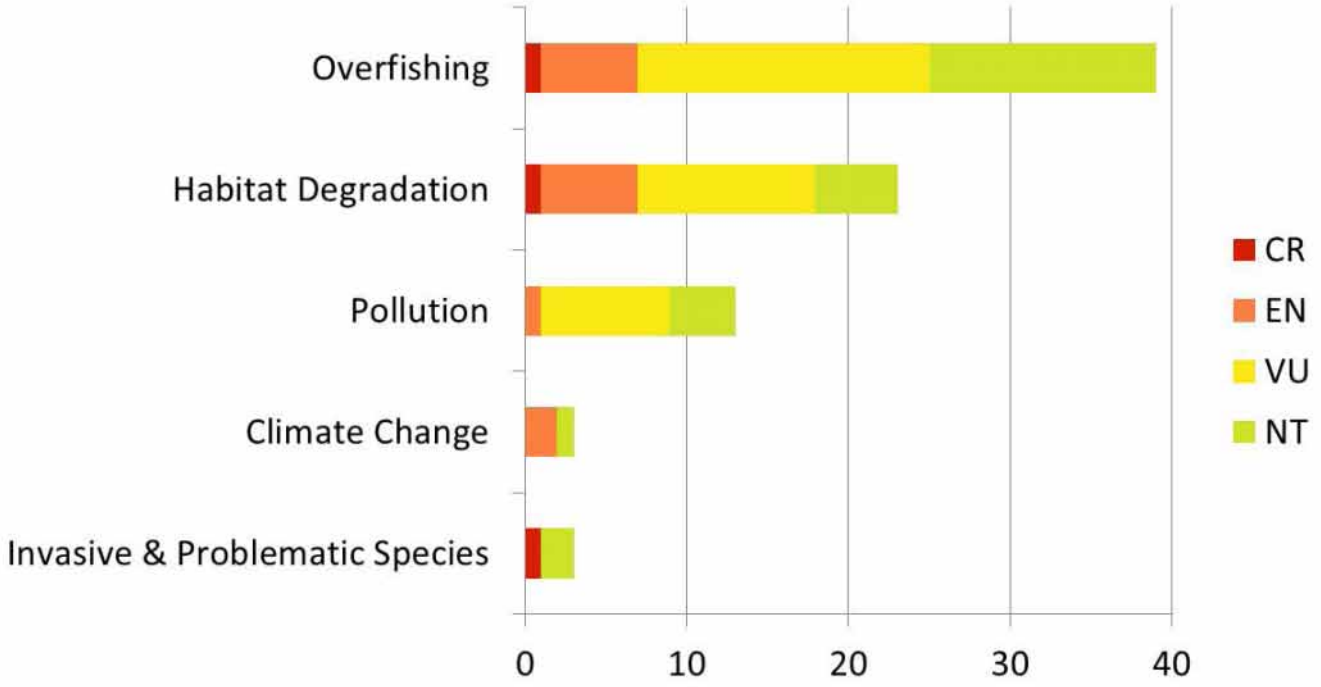


Figure 11: Major threats to marine bony fishes assessed globally as threatened (Critically Endangered – CR, Endangered – EN, or Vulnerable – VU) and Near Threatened (NT) in the Eastern Central Atlantic (n=51), listed in order of the number of species impacted.

Local fishing market in Dakar, Senegal. © B. Polidoro

perpetuates the financial instability of the region and destabilizes the economic and nutritional sovereignty of West Africa countries.

With these increases in capacity in both the artisanal and commercial sector, as well as illegal, unreported and unregulated (IUU) fishing, effort has risen sharply, concomitant with declining fish catches in many West African nations. Species diversity and fish size for many important species have also markedly declined over the past few decades, and many stocks are characterized as overexploited (Ajayi 1994, Mensah and Quaatey 2002).

3.4.2 Habitat degradation

Habitat degradation is another major threat facing marine species globally. In the ECA, almost half (23 species) of the threatened and Near Threatened species were negatively affected by habitat degradation. Some species are affected by the destruction of juvenile habitats, such as mangroves and seagrasses. For example, juveniles of the Critically Endangered *Epinephelus itajara* may rely on mangrove areas (Sadovy and Eklund 1999), which have declined by 35% or more in some locations along the West African coast (Carney et al. 2014).

Fishing vessels in Accra, Ghana © F.K.E. Nunoo

3.4.3 Pollution

Local declines in water quality resulting from land and sea based pollution are another major concern in the ECA (Ukwe et al. 2006). Industries and populations of large coastal cities are often limited in waste-water treatment capabilities, causing widespread eutrophication, dead zones and contamination of sediments and organisms (Ukwe et al. 2006). Pollution from oil and gas exploration and extraction, including tar balls, can be a major issue in oil producing countries such as Nigeria (Ukwe and Ibe 2010). Another issue of increasing concern is marine debris, including plastic waste from anthropogenic sources, which has been found in all marine habitats (Wang et al. 2016). However, the direct and indirect impacts, such as smothering sessile species and hindering essential life processes (e.g., feeding, respiration and reproduction) of mobile species, on marine bony fishes are often hard to quantify at the population level. Pollution was indicated as a major threat for only 13 of the 51 threatened and Near Threatened species.

3.4.4 Climate change

Although global climate change has and will continue to affect marine fishes and fisheries, the long-term changes to the extinction risk of marine fishes are uncertain. Northward distributional shifts and relative changes in abundance are expected in response to increasing seawater temperatures (Perry et al. 2005, Pinsky et al. 2013, Rutterford et al. 2015). When physical barriers prevent individuals from migrating to preferred temperature regimes, marine species may be driven towards extinction (e.g., in the Mediterranean Sea: Ben Rais Lasram et al. 2010). The open nature of the ECA marine zone may limit effects of climate change on the ichthyofauna, at least in the near future, as physical barriers to the expected poleward migration are lacking. However, other intrinsic and extrinsic factors, such as the pelagic larval duration, population density and swimming ability, will likely also impact which species can successful migrate poleward in response to climate change (e.g., Feary et al. 2014). Further, the long term effects of climate change and ocean acidification on the ecology of marine systems, including changes in predation rates (e.g., Ferrari et al. 2015), have not been well studied to date. The long-term implications of these changes for the extinction risk of marine bony fishes is poorly understood. Thus, climate change is only indicated as a major threat for three of the 51 threatened and Near Threatened species: *Pagellus bogaraveo* and *Merluccius senegalensis* are thought to be negatively impacted by changes to atmospheric oscillations (Meiners et al. 2010, Báez et al. 2014) and *Pseudotolithus senegalensis* by increased sea

Marine debris washed onshore at a fishing beach in Dakar, Senegal. © B. Polidoro

surface temperatures and reduced upwelling (Nunoo and Nascimento 2015).

3.4.5 Invasive and problematic species

The negative effects of invasive and problematic species are currently limited in the ECA, with this category of threats being indicated for only three species. Two species listed as Near Threatened globally are impacted by invasive species. Although the primary threat to *Balistes vetula*, the Queen Triggerfish, is overfishing, it has also been found in the diet of the invasive lionfish (*Pterois volitans*) in the western Atlantic (Bejarano et al. 2015). While the impact to *B. vetula* is currently thought to be limited, the introduction of *P. volitans* and *P. miles* to the Caribbean has caused dramatic adverse impacts on fisheries and conservation efforts (Schofield 2009, Bejarano et al. 2015). Fortunately, to date, lionfishes have yet to spread into the eastern Atlantic. Replacement of native mangroves by an exotic palm (*Nypa fruticans*) in Nigeria may be affecting the juveniles of *Galeoides decadactylus*, which rely on the three-dimensional structure provided by native mangroves (Moses 2000). Unlike most mangroves, the trunk of *N. fruticans* grows underground, limiting the available structural refuge for juveniles.

Nypa fruticans stand © B. Dupont

Harmful algal blooms (HABs) have been implicated in fish kills of *Epinephelus itajara* (e.g., in the Gulf of Mexico: Smith 1976). HABs can produce large fish kills and short term recruitment declines, but the long-term impacts on populations are currently unknown. In the ECA, harmful algal species have been documented in the upwelling systems in both the Benguela and Canary current regions; of the 29 common algal species responsible for HABs, 20 occur in high-biomass blooms in the Benguela Current region and 11 in the Canary Current region (Trainer et al. 2010). Further, algal species known to cause marine mortalities, including *Heterosigma akashiwo*, *Karlodinium micrum* and *Karenia cristata*, occur in high-desnity blooms in the Benguela Current region (Trainer et al. 2010).

3.5 Population Trends

In the ECA, the current population trend for the vast majority of species is unknown (Figure 12). Many of these are poorly known deep-sea species with ongoing taxonomic problems. For example, it was recently determined that different life history stages of the flabby whalefishes, family Cetomimidae, had been described as belonging to three different deep-sea families (Johnson et al. 2009); the six species in the family Cetomimidae found in the region were assessed as Data Deficient with unknown current population trends. However, this large proportion of species in the ECA with unknown population status reflects the relatively poor state of knowledge, in general, regarding the living marine resources of the region.

Currently, the populations of 36 species are decreasing, including 27 of the 51 species listed as threatened or Near Threatened. The majority of these are exploited species. For example, populations of the four heavily exploited *Thunnus* species present

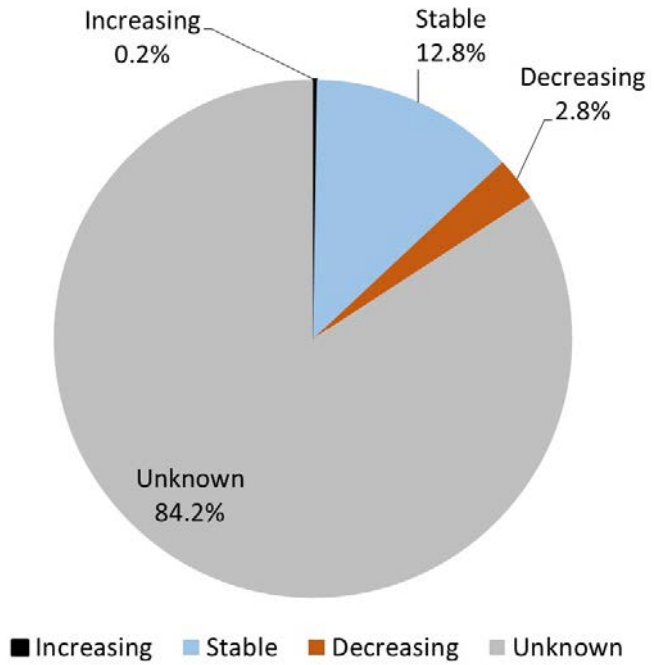


Figure 12: Current population trend of the 1,288 marine bony fish species of the Eastern Central Atlantic.

in the ECA (*T. alalunga*, *T. albacares*, *T. obesus* and *T. thunnus*) are decreasing and the majority of the stocks are overfished (ISSF 2015).

3.6 Gaps in Knowledge

Overall, aspects of the taxonomy, ecology, life history and population dynamics of the marine fish fauna of the ECA are poorly known, despite the long history of marine resource exploitation in the region. Taxonomy of the marine bony fishes remains a major challenge. Taxonomic training and identification are sorely lacking by regional scientists, resulting in limited species-specific data for nearly all species in the region. This lack of taxonomic resolution hampers effective conservation of the marine resources, as landings data are often grouped at the genus or even family level. In addition, it results in an underestimate of the true biodiversity in the region. For example, the commercially and recreationally important *Caranx hippos* complex was recently found to include two species in the eastern Atlantic: *C. hippos* and *C. fischeri* (Smith-Vaniz and Carpenter 2007).

Additionally, there is a lack of support for the development and maintenance of scientific collections of specimens. Very few, if any, institutional natural history collections exist in West African countries. The collection of specimens assembled by Dr. J. Cadenat of l'Institut Francais d'Afrique Noire in Goree, Senegal, has been neglected for decades and many of the specimens have since been damaged, destroyed or lost. Rigorous natural history collections provide essential information for a variety of research and conservation needs, including IUCN Red List assessments (Rocha et al. 2014). Given the potential of this collection to serve vital research and training needs of the regional scientific community, immediate priority should be given to the curation and improvement of this collection before this valuable research resource is lost.

Collection of specimens assembled by Dr. J. Cadenat of l'Institut Francais d'Afrique Noire in Goree, Senegal. © B. Polidoro.

4. Conservation Measures

4.1 Conservation of Marine Fish

Countries in West Africa increasingly rely on marine resources for economic, social and nutritional stability. Recently, there have been significant efforts, independently as well as cooperatively in regional agreements, to more actively pursue an agenda for the reclamation of the marine resources within West African EEZs, as well as to formulate and execute sustainable fishing practices and management of the fisheries in the ECA. However, most legislation and regulation in the region relates to elasmobranchs rather than bony fishes.

Hippocampus hippocampus (Short-snouted Seahorse) assessed as Data Deficient. © L. Rooman-Guylian

4.1.1 International conservation measures

Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)

CITES is an international trade treaty signed in 1963 at a meeting of members of the International Union for Conservation of Nature (IUCN) aimed at ensuring that the international trade of wild biota is not conducted in a fashion that threatens the survival of the species in the wild. Species considered at risk are listed in one of three appendices.

Appendix I lists species threatened with extinction; wild-caught species listed in this appendix are banned from international trade. Appendix II lists species that have not yet been formally declared endangered, but are threatened to the degree that necessitates control of trade in wild individuals in order to ensure the sustained survival of the species in question. Appendix III is reserved for species in which one member country requests other member countries to assist in the control of trade of a species, mostly of which may be locally threatened but not necessarily globally threatened (CITES 1973). Only two marine bony fishes in the region (*Hippocampus algiricus* and *H. hippocampus*) are listed in CITES Appedix II, though two sharks (*Cetorhinus maximus* and *Rhincodon typus*) are also listed (Table 6).

Table 6: Marine fishes occurring the Eastern Central Atlantic that are listed in CITES Appendix II.

Species	Common Name	Red List Status
Hippocampus algiricus	West African seahorse	VU
Hippocampus hippocampus	Short snouted seahorse	DD
Cetorhinus maximus	Basking shark	VU
Rhincodon typus	Whale shark	VU

United Nations Convention on the Law of the Sea (UNCLOS)

Since 1994, UNCLOS has provided a framework for establishing environmental and managerial responsibilities of nations regarding the equitable use and conservation of marine natural resources. The convention sets standards for responsible management of fisheries in both international waters and those within the Exclusive Economic Zones (EEZs) of independent nation states. UNCLOS balances the rights of nations to exploit marine environments and biota of the oceans and seas with the responsibilities to preserve them by resolving continental shelf jurisdiction disputes, regulating deep seabed mining operations and identifying key scientific research initiatives (Kimball 2003). The UN recently completed The First Global Integrated Marine Assessment, providing a global framework for the assessment of the status of the marine environment, with the intention of periodic status reevaluations (http://www.worldoceanassessment.org/).

International Commission for the Conservation of Atlantic Tunas (ICCAT)

ICCAT is an inter-governmental organization designed to protect and conserve approximately 30 species of tuna and tuna-like species in the Atlantic Ocean and adjacent water bodies, of which 16 occur in the ECA (Table 7). Its primary concern is to monitor the status of tunas by compiling fisheries statistics from its members, coordinating research on the conservation status of the species and the development of scientifically sound management advice on the exploitation of tunas, derived from conducting stock assessments and other relevant studies.

Thunnus thynnus (Atlantic Bluefin Tuna) assessed as Endangered. © OCEANA/K. Ellenbogen.

Table 7: Tunas and relatives managed by the International Commission for the Conservation of Atlantic Tunas (ICCAT) present in the Eastern Central Atlantic, with common names and Red List status.

Family	Species	Common Name	RL Status
Scombridae	*Acanthocybium solandri*	Wahoo	LC
Scombridae	*Auxis rochei*	Bullet Tuna	LC
Scombridae	*Auxis thazard*	Frigate Tuna	LC
Scombridae	*Euthynnus alletteratus*	Little Tunny	LC
Scombridae	*Katsuwonus pelamis*	Skipjack Tuna	LC
Scombridae	*Orcynopsis unicolor*	Plain Bonito	LC
Scombridae	*Sarda sarda*	Atlantic Bonito	LC
Scombridae	*Scomber colias*	Atlantic Chub Mackerel	LC
Scombridae	*Scomberomorus tritor*	West African Spanish Mackerel	LC
Scombridae	*Thunnus alalunga*	Albacore	NT
Scombridae	*Thunnus albacares*	Yellowfin Tuna	NT
Scombridae	*Thunnus obesus*	Bigeye Tuna	VU
Scombridae	*Thunnus thynnus*	Atlantic Bluefin Tuna	EN
Istiophoridae	*Istiophorus platypterus*	Sailfish	LC
Istiophoridae	*Makaira nigricans*	Blue Marlin	VU
Xiphiidae	*Xiphias gladius*	Swordfish	LC

Local fishing vessels at the Elmina Fish Market in Accra, Ghana. © C. Linardich

In addition, ICCAT is also deeply involved in reducing bycatch in tuna fisheries, particularly of sharks. The diversity of non-teleost bycatch species caught and reported is vast: 12 skates and rays, 57 sharks, 37 seabirds, 5 sea turtles and 26 marine mammals. Low rates of bycatch can have disproportionate impacts on these species, as they typically have slow replacement rates.

Fishery Committee for the Eastern Central Atlantic (CECAF)

CECAF, the FAO regional fishery body responsible for Fishing Area 34, promotes a more sustainable utilization of marine resources by managing and developing fisheries within its jurisdiction, as well as directing research efforts that will promote the conservation of living marine organisms. The CECAF is responsible for providing advice for controlling surveillance measures, an important responsibility in combating IUU fishing practices that are prevalent in the region. The CECAF also attempts to encourage and facilitate the communication and exchange of information regarding fishing restrictions, rules and regulations between the sovereign nations of West Africa. Specifically, it guides the member countries in the selection of appropriate fishing gear and vessels for specific species and populations of fishes, as well as in selecting seasonal closures of fishing for certain species, including the provision of regulations for adopting and implementing regulatory measures as is necessary.

4.1.2 Local and regional conservation measures

Convention for Co-Operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention 1981)

This convention addresses the protection and management of the marine environment, coastal zones and inland waters of western Africa, from Mauritania to Namibia, and protects these areas from the deleterious effect of pollution to marine resources occurring within the geographic confines of the participating countries. This convention aims

to reduce anthropogenic impacts to marine resources and activities, focusing on pollution and overfishing.

New Partnership for Africa's Development (NEPAD)

In 2001, a group of African country leaders established the NEPAD to address concerns about mutual accountability and coherence to policy decisions regarding the economic development of the continent. In 2005 at the Fish for All summit in Abuja, Nigeria, the NEPAD introduced the "NEPAD Action Plan for the Development of African Fisheries and Aquaculture" (NEPAD 2005a). This plan seeks to promote the reduction of poverty and increase food security and environmental sustainability of Africa's marine resources (as declared by the Abuja Declaration at the Fish for All Summit: NEPAD 2005b) by identifying, defining and supporting policies that will strengthen Africa's potential to implement responsible and functioning amendments in the governance and execution of fisheries reforms and international trade practices. One of the main ways the NEPAD deploys these implementations is by engaging with and including local fishing communities and private sector, non-governmental organization agencies (NGOs) in the policy inception and implementation phases of restructuring the fisheries and trade policies of localities, states and regions. The NEPAD also recognizes the need for long-term consideration and regulation regarding the licensure of foreign fishing vessels and fleets, as African fish stocks are finite and are undergoing rapid depletion due to over-fishing and IUU practices. The NEPAD has successfully begun to change the way the licenses to foreign vessels are sold and distributed by including the prohibition of fishing at certain times of the year, by limiting overall catch and by instituting mandatory compliance with surveillance and enforcement programs (NEPAD 2005a).

Partnership for African Fisheries (PAF)

Born of the NEPAD, the Partnership for African Fisheries (PAF) working groups (composed of African citizens from fishing communities, industry analysts, technology experts and educational and governmental institutions) utilize a "think-tank" approach to encourage the transparent exchange of ideas and solutions for economic and environmentally-sound growth of African fisheries and international trade policies. Partnered with the World Bank's Global Program on Fisheries (PROFISH), the PAF is actively fostering the "Currents of Change" program in order to define comprehensive reform policies regarding African fisheries that reduces licensing of foreign fishing vessels in African EEZs and increases access to grants and loans for African countries to exploit ECA marine resources responsibly and sustainably.

Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic (COMHAFAT-ATLAFCO)

ATLAFCO, better known by its French acronym COMHAFAT, is an inter-governmental organization founded in 1989. The coastal countries from Morocco to Namibia, excluding Western Sahara, form the 22 Member States. The principal purpose of this organization is to improve the conservation and sustainable development of fisheries in the region by encouraging cooperation between Member States. In particular, focus is on training, research and regulations to promote responsible fishing.

Sub-regional Fisheries Commission (SRFC)

The SRFC is an inter-governmental organization created in 1985, consisting of the countries: Cape Verde, Gambia, Guinea, Guinea Bissau, Mauritania, Senegal and Sierra Leone. The main objective of the SRFC is to facilitate and reinforce communication and cooperation between the member States regarding the exploitation and conservation of marine resources in the sub-region, to adopt scientifically sound and enforceable management practices of these resources, to increase the prevalence and effectiveness of tracing, controls and surveillance of IUU fishing vessels in the sub-region and to direct the development of fisheries research at the sub-regional

West African fishers. © C. Bene

level. The SRFC strives to incorporate stakeholder involvement by strengthening and homogenizing fisheries policies and legislation at the sub-region level. The SRFC also provides leadership in program development and policy construction in the areas of access to fishing zones and traditional fishing grounds and the management of marine resource utilization in the sub-regional area. The SRFC strives to promote and require coherence to sectoral fisheries policies aimed at sustainable development and management of fisheries, as well as policies concerning trade, economic development and environmental protection. The SRFC also ensures that sub-regional adherence to international policies and conventions concerning safety at sea and resource utilization is kept to the best degree possible.

Fishery Committee of the West Central Gulf of Guinea (FCWC)

The Fishery Committee for the West Central Gulf of Guinea (FCWC) is comprised of the member states of Benin, Cote D'Ivoire, Ghana, Liberia, Nigeria and Togo. As in other sub-regional committees, the FCWC provides a forum for member states for discussion on all fishery initiatives, including the harmonization of legislation and regulations; cooperation in monitoring, control, surveillance and enforcement; and development of research capabilities and data standards. The FCWC is especially committed to the development of small-scale fishers capacity and management frameworks that ensure sustainable harvest of all living marine resources.

Regional Fisheries Commission of the Gulf of Guinea (COREP)

COREP is another inter-governmental organization established in 1984 aimed at improving coorperative management of marine (Gulf of Guinea) and inland waters of parties. In 2008 COREP was designed as a specialized agency of the Economic Community of Central African States (ECCAS). There are five Member States (Cameroon, Congo, Democratic Republic of the Congo, Gabon and São Tomé and Príncipe) and two Observer States (Angola and Equatorial Guinea). The overall objective is to assist Member States to protect and develop, sustainable, fisheries resources and to promote the development of aquaculture, with a view to maximize the use of the potentialities of aquatic environments and ensure the welfare of the greatest number of people.

4.2 Marine Protected Areas (MPAs) in West Africa

4.2.1 Regional MPAs

As of 2007, the Regional Network of MPAs in West Africa (RAMPAO) consists of 23 MPAs in six countries, including ten national parks and four reserves. RAMPAO serves to conserve representative samples of critical habitat while protecting threatened and endangered species by working in conjunction with fisheries and resource managers in the region to responsibly and coherently utilize the abundant resources of the region, while simultaneously preserving the vast and exquisite biodiversity in the ECA (Wells et al. 2008).

The Western Africa Regional Seas Programme (WARSP) has 22 participating States, of which the SRFC countries were selected in 2002 for the development of a regional strategy to put together a system of connected marine protected areas (MPAs) in the region (Wells et al. 2008). With the support of the IUCN, the Fondation Internationale du Banc d'Arguin (FIBA), the World Wildlife Fund (WWF) and Wetlands International, a system of interconnected, ecologically representative MPAs were designed in accordance with the WWF West Africa Ecoregion's (WAMER) mission of building "an effective network of MPAs in West Africa with participatory management, led by strong institutions contributing to the sustainable development of the region by enhancing natural and cultural diversity." The three main ecosystems targeted for protection were upwelling areas off Senegal and Mauritania, rocky island coastlines of Cape Verde and estuarine-mangrove areas in Guinea and Guinea-Bissau.

Elmira fish market, Accra, Ghana. © C. Linardich

With the help of 53 governmental and nongovernmental organizations and agencies, including the IUCN, WWF, FIBA, UNESCO and SRFC/CSRP, a five-year, Regional Conservation Programme for the Coastal and Marine Zone of West Africa (PRCM) strategy for the implementation of the MPA network was designed and initiated. The EU funded a project called Coherence of Conservation and Development Policies on Coastal and Marine Protected Areas (CONSDEV), which worked closely with SRFC countries to integrate local, State and regional polices with international policies to better improve the integration and connectivity of the MPAs, incorporated a means by which stakeholders could apply for the right to responsibly use resources within some of the protected areas and encouraging ecotourism that minimized damage to the MPAs.

4.2.2 National MPAs

In addition to the regional strategies for instituting MPAs in West Africa, nationally established MPAs, devised and implemented by individual countries in the ECA, are critical to the local conservation of vital marine resources. They augment existing fisheries regulations through the establishment of no-take zones and the enforcement of seasonal fishing closures activities, and they shelter vital marine habitats, such as nurseries, migration routes, spawning areas and coral reefs, amongst others. National MPAs help bolster cultural and social values in the communities around them, as the protection of natural marine resources is crucial to the livelihoods of many of the inhabitants of West Africa (PRCM 2005).

Mauritania:

The Cap Blanc Satellite Reserve was initially conceived to protect the endangered monk seals that are found there, but it is also home to a diverse collection of marine flora and cetaceans. Post-breeding migration and nesting of sea birds, especially *Sterna* spp. and *Chlidonias* spp. occurs in the reserve, and there is a high density of *Mugil* spp. and *Morone* spp. Cap Blanc Satellite Reserve has a terrestrial and marine component; the marine extent of this reserve is 4.2 km along the coast, situated between Porta Ilia in the west and Cap Blanc beach in the east.

The Banc d'Arguin National Park is 1.17 million ha, of which roughly 6,245 km^2 is marine. It includes 450 km^2 of intertidal mudflats consisting of *Zostera noltii* and *Cymodocea nodosa* seagrass beds and an abundance of marine fauna, including over 140 temperate and tropical fish species, crustaceans, molluscs, *Tursiops truncatus*, *Sousa teuszii* and *Orcinus orca*, several species of sea turtles. It is also home to one of the world's largest concentration of wintering waders, approximately 2.5 million birds. The key objectives of the Banc d'Arguin National Park are: to protect critical habitats, such as fish nurseries and spawning grounds; to preserve biological and cultural heritage and diversity; and to protect major scientific and archeological sites.

In order to protect and restore the lower Mauritanian delta ecosystems, Mauritania set up the Diawling National Park and the Chat T'Boul Reserve. This park and reserve hosts a variety of freshwater and estuarine fish species and protects vast areas of marine nursery areas and estuaries.

Senegal:

Langue de Barbarie National Park is a 2,000 ha area, located 25 km south of the town of Saint-Louis and stretching to the mouth of the Senegal River. It is composed of a barrier spit and a marine zone with fixed sand dunes on the seaward side. The Park functions mainly as a nesting site for populations of colonial birds, but it is also a nesting site for sea turtles. In a few areas of the park, there are small stands of *Avicennia* mangroves.

The Magdalen Islands National Park is found in the uninhabited islands a few km west of Dakar, with a surface area of 15 ha. It has rocky volcanic islets and steep cliffs along the shores of the islands and boasts a diverse collection of marine life. Demersal species, such as groupers (*Epinephelus* spp.), and pelagic species of barracuda proliferate the waters, and nesting birds, such as the very rare *Phaeton aethereus*, as well as *Corvus albus*, *Milvus migrans* and *Euplectes* spp. are found on the islands.

Poponguine Nature Reserve is mostly a terrestrial reserve, but it also contains a strip of marine habitat approximately one nautical mile wide. Where the terrestrial and marine areas converge, a rocky, shallow-water area provides breeding habitat for numerous marine species. Migratory marine birds also frequent the reserve between November and February.

The Saloum Delta National Park (59,934 ha) and Biosphere Reserve (222,062 ha) were initiated to protect the delta systems, restore ecosystems and preserve biological diversity. The area consists of a coastal and marine fringe, which includes sand bars and several small islands. Near the continent are tannes and mangrove stands. Between the Park and Reserve, 114 fish species from 52 families reside there, in addition to crustaceans and molluscs. Sea turtles are also present, as well as manatees, dolphins and the African clawless otter. The dominant vegetation type is mangroves.

The Gambia:

The Nuimi National Park, centered on the north bank of the River Gambia, extends from Barra Point at the mouth of the river north to the boarder and east to the upper limit of the saline intrusion. The park contains the island of Jinack and the Niji Bolon.

Fishes caught in a beach seine at Labadi Beach, Ghana. © C. Linardich

The island contains extensive coastal dune areas, saltwater marshes and mangrove stands. The West African manatee (*Trichechus senegalensis*) is found there, as well as the Atlantic humpbacked dolphin, green turtles, and nearly 300 species of birds.

The Bijol Islands (the only offshore islands of Gambia) and Tanji River Bird Reserve have a total area of 612 ha. They are situated along the Atlantic coast and encompass the Tanji River and its estuary, including mangrove stands. Natural marine features include shallow, rocky reef areas and a lagoon system that changes dynamically during rain storms. The cape and lagoons provide vital feeding and roosting grounds for gulls, terns and waders. Additionally, the Bijol Islands provide the only known breeding site in the country for *Sterna caspia*, *Sterna maxima* and gulls at the present time. Monk seals, Atlantic humpbacked dolphins and sea turtles frequent the islands and reserves. There is a wide variety of habitat types in the protected area for marine, estuarine and freshwater species.

The Tanbi Wetland Complex is 6,000 ha and is located on the southern bank of the River Gambia. It includes wetlands, estuaries and fringe mangrove stands. The entire southern portion of the River Gambia estuary is encompassed by this protected area and serves as a fish breeding ground for a number of species. Mangrove forests dominate the landscape.

Located on the north bank of the River Gambia, the Boa Bolon Wetland Reserve covers approximately 22,000 ha and extends from the River Gambia north to the Senegalese boarder and along the Boa Bolon tributary. The African manatee and the African clawless otter reside there, as well as tilapia and mullets. The high mangroves, permanent saltmarshes

and bare tannes provide suitable habitat for a plethora of marine wildlife.

Guinea-Bissau:

The Rio Cacheu Mangrove Park is an 88,615 ha protected area, of which 68% is covered with mangrove trees. The vast mangrove area is an ideal habitat for large numbers of migratory birds during the winter months, and it provides excellent breeding and nursery grounds for numerous marine animals.

The Bolama Bijagos Archipelago Biosphere Reserve provides protection to 88 islands and islets that have a combined surface area of over 1 million ha. The seaward side is comprised of vast extenses of sandy-muddy intertidal flats and channels which are fringed by mangrove forests. The archipelago is home to a wide variety of mammals, reptiles, birds and fish and is the largest nesting site on the Atlantic coast for Green sea turtles (over 7,000 nests annually). Also, the Reserve hosts nearly 800,000 wintering Palearctic waders and other colonial birds.

Orango National Park is located on the southern portion of the Bijagos archipelago, covering over 150,000 ha, including 5 large islands and 3 small ones, and having a maximum depth of 30 m throughout the entire marine area. The Park hosts and extensive mangrove forest exceeding 16,000 ha. It is responsible for a multitude of primary ocean resource production and provided critical breeding areas for numerous fish and shellfish species. Five sea turtle species occur in the park., and it also has a rich fish and invertebrate fauna. The African clawless otter, African manatee, the Atlantic humpbacked dolphin and the Bottlenose dolphin are all found there.

João Vieira-Poilão Islands Marine National Park is a 49,500 ha protected area that mainly consists of 4 main islands and 3 small islands. There are mangrove forests in the intertidal zone, and the island beaches are ideal for nesting sea turtles, such as the green turtle, Atlantic hawksbill turtle and the Olive Ridley turtle. The fish fauna in the Park is also abundant and diverse, and it is the breeding ground for a large fish-eating bird community.

Nigeria:

Established in 1991 by the Federal Government of Nigeria, the Cross River National Park is a 1,000 km^2 protected area. It consists primarily of terrestrial rain forests, but the southern portion of the park also protects mangrove swamps and coastal fringes (Ezebilo and Mattsson 2010).

Gabon:

In late 2014, Gabonese President Ali Bongo Ondimba announced that Gabon is in the process of designating 46,000 km^2 as a marine protected area. This constitutes nearly 25% of Gabon's EEZ within which no commercial fishing will be allowed. This new MPA will protect threatened species such as hammerhead sharks, tiger sharks, manta rays, whale sharks, humpback dolphin, humpback whales and four species of marine turtles.

4.3 IUCN Red List versus Priority for Conservation Action

The results of this IUCN Red List initiative in the ECA should inform future conservation actions in the region, but should not be used in place of a regional conservation prioritization process. IUCN Red List assessments consider only one of a number of important variables for setting conservation priorities: relative extinction risk. How these other variables, including economic, social, political, and cultural factors, are used to supplement the information provided by IUCN Red List assessments to define conservation priorities is for the local and regional management authorities to determine.

5. Recommendations

5.1 Recommendations for Management and Policy

Fishery and marine resource management in West Africa is complicated due to the number of governments, languages and ministries involved. The jurisdictional landscape differs by country, and coordinating management goals and policies is challenging. In many countries, limited surveillance and enforcement capacity leads to illegal fishing and overfishing, which imperils regional management efforts. National management capacities are also constrained by their inability to limit entry of national and international fleets into fisheries and to control the type of fishing gear used. Overall, great needs exist for strengthening governance and increasing capacity, for training and resources for improved management and for the reduction of illegal and unregulated fishing activities.

5.2 Recommendations for Marine Protected Areas and Conservation Action

A number of marine and coastal protected areas have been established in the region to limit harvesting of coastal resources and ensure their sustainable utilization. Many of these sites were established to conserve biodiversity by providing refuge for marine fauna and flora and undisturbed sites for research, monitoring, education and tourism. Many of these protected areas lack capacity, funding, infrastructure and governance for effective enforcement and conservation. A number of Ramsar and World Heritage sites have also been designated or proposed for protection of these resources. However, many regions are still lacking in marine or coastal projected areas. For example, 71 priority biodiversity areas have been identified in the region, many of which have not been formally designated

Ophioblennius atlanticus (Redlip Blenny) assessed as Least Concern. © Q. Muñoz

(Armah 2006). As is increasingly occurring in other regions, the creation of spawning reserves and other spatial tools to protect species with aggregating spawners from highly concentrated overfishing is recommended.

Equally as important as strengthening local and national efforts to improve marine protected area designation and management, is the need for improved transboundary collaboration on shared fish stocks, regional data management and the creation of marine protected area networks.

5.3 Recommendations for Research and Training

Research capacity in much of the region is so limited as to be unable to conduct stock assessments or report on trends. There is a great research need to better quantify the impacts of local, national and regional fishery efforts on targeted and non-targeted species, including the identification of important spawning aggregations and spawning grounds by enhanced outreach with fishers (e.g., Lindeman et al. 2000, Heyman and Kjerfve 2008). Industrial challenges in West Africa that could benefit from research to implement affordable, culturally-appropriate and sustainable solutions include: the lack of access to credit and financing, weak cold storage infrastructure, poor transportation infrastructure, inefficient and outdated equipment, lack of knowledge about export standards and weak industrial organization. Additionally, taxonomic expertise as well as museums and other educational or scientific depositories of marine biodiversity are very few or non-existent in most countries.

Drying fishes at the Elmina fish market in Accra, Ghana. © C. Lindardich

Of particular importance is the need to train more key scientists and middle level practitioners on taxonomic identification techniques. Although availability of the updated FAO Living Marine Resources of the Eastern Central Atlantic will greatly aid in providing an updated taxonomic indentification guide, fishery biologists and practitioners in the region need additional training to be able to use identification keys correctly and understand taxonomic limitations. In many cases, fishes being recorded in landings, fish markets, academic surveys and other instances are incorrectly identified, compounding the difficulties of understanding species distributions and population trends. Similarly, the vast majority of fishery landings are reported by family or genus, which does not easily allow for adequately quantifying the impacts of threats on individual species.

5.4 The future: IUCN Red List Assessments and Key Biodiversity Areas

Our initiative in the ECA is part of a broader program, the Global Marine Species Assessment (http://sci.odu.edu/gmsa/), to increase the representation of marine species on the IUCN Red List of Threatened Species. The program's primary goal is to assess 20,000 marine species against the IUCN Red List Categories and Criteria with the objective of substantially improving global marine biodiversity conservation. To date, over 11,000 marine species assessments are publicly available at www.iucnredlist.org, including the nearly 1,300 marine bony fishes present in West Africa.

An essential next step in the ECA is the identification of Key Biodiversity Areas (KBAs). KBAs produce a science-based method of effectively prioritizing spatial conservation action towards the mitigation, regulation, or cessation of threats impacting marine species (Edgar et al. 2008b). Building upon the concepts formalized by BirdLife International to identify site-scale conservation targets as Important Bird Areas (IBAs), KBAs can be designated as targets needing conservation action to protect biodiversity with a larger taxonomic scope (Eken et al. 2004). The process relies on the ability to quantify the irreplaceability and vulnerability of each species. The IUCN Red List assessments completed during this project would provide essential information for both essential components: the accumulated data on species distributions will inform the irreplaceability and the IUCN Red List category will identify species that are globally threatened (Eken et al. 2004). Despite widespread recognition of increasing threats in the marine realm, very few marine KBA analyses have been conducted to date, specifically in the Philippines (Ambal et al. 2012), Melanesia (Bass et al. 2011) and the Eastern Tropical Pacific (Edgar et al. 2008a); although these KBA analyses represent a wide geographic coverage, there have been limited taxonomic and region-wide coverage in these analyses (Foster et al. 2012). Through the assessment of the diverse bony fishes in the region, data on all marine vertebrates, as well as habitat-forming plants (mangroves and seagrasses), reef-forming corals and important invertebrates (e.g., cephalopods and lobsters) are now available to inform the identification of regional KBAs and enhance marine spatial planning.

Traditional West African cuisine provided during the Red List assessment workshop in Libreville, Gabon. © B. Polidoro

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Appendix 1. Red List status of Eastern Central Atlantic marine fishes

Table A1.1 Red List status of marine fishes (listed alphabetically by Order, Family, and Species). Cat = Red List category and Crit = Red List criteria. Note that Crit is only applicable to species listed as threatened (i.e., Critically Endangered, Endangered, or Vulnerable).

Order	Family	Species	Cat	Crit	Endemic
Albuliformes	Albulidae	*Pterothrissus belloci*	DD		No
Anguilliformes	Chlopsidae	*Chlopsis bicolor*	LC		No
Anguilliformes	Chlopsidae	*Chlopsis olokun*	LC		Yes
Anguilliformes	Colocongridae	*Coloconger cadenati*	LC		Yes
Anguilliformes	Congridae	*Ariosoma anale*	LC		No
Anguilliformes	Congridae	*Ariosoma balearicum*	LC		No
Anguilliformes	Congridae	*Ariosoma mellissii*	DD		Yes
Anguilliformes	Congridae	*Bathycongrus bertini*	LC		Yes
Anguilliformes	Congridae	*Bathyuroconger vicinus*	LC		No
Anguilliformes	Congridae	*Conger conger*	LC		No
Anguilliformes	Congridae	*Heteroconger longissimus*	LC		No
Anguilliformes	Congridae	*Japonoconger africanus*	LC		Yes
Anguilliformes	Congridae	*Paraconger notialis*	LC		Yes
Anguilliformes	Congridae	*Promyllantor atlanticus*	DD		Yes
Anguilliformes	Congridae	*Pseudophichthys splendens*	LC		No
Anguilliformes	Congridae	*Uroconger drachi*	DD		Yes
Anguilliformes	Congridae	*Uroconger syringinus*	LC		No
Anguilliformes	Congridae	*Xenomystax congroides*	LC		No
Anguilliformes	Derichthyidae	*Derichthys serpentinus*	LC		No
Anguilliformes	Derichthyidae	*Nessorhamphus danae*	LC		No
Anguilliformes	Derichthyidae	*Nessorhamphus ingolfianus*	LC		No
Anguilliformes	Heterenchelyidae	*Panturichthys isognathus*	LC		Yes
Anguilliformes	Heterenchelyidae	*Panturichthys longus*	LC		Yes
Anguilliformes	Heterenchelyidae	*Panturichthys mauritanicus*	LC		No
Anguilliformes	Muraenesocidae	*Cynoponticus ferox*	LC		No
Anguilliformes	Muraenidae	*Anarchias longicauda*	LC		No
Anguilliformes	Muraenidae	*Channomuraena vittata*	LC		No
Anguilliformes	Muraenidae	*Echidna catenata*	LC		No
Anguilliformes	Muraenidae	*Echidna peli*	LC		Yes
Anguilliformes	Muraenidae	*Enchelycore anatina*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Anguilliformes	Muraenidae	*Enchelycore carychroa*	LC		No
Anguilliformes	Muraenidae	*Enchelycore nigricans*	LC		No
Anguilliformes	Muraenidae	*Gymnothorax afer*	LC		No
Anguilliformes	Muraenidae	*Gymnothorax bacalladoi*	DD		No
Anguilliformes	Muraenidae	*Gymnothorax maderensis*	LC		No
Anguilliformes	Muraenidae	*Gymnothorax mareei*	LC		Yes
Anguilliformes	Muraenidae	*Gymnothorax miliaris*	LC		No
Anguilliformes	Muraenidae	*Gymnothorax moringa*	LC		No
Anguilliformes	Muraenidae	*Gymnothorax polygonius*	LC		No
Anguilliformes	Muraenidae	*Gymnothorax unicolor*	LC		No
Anguilliformes	Muraenidae	*Gymnothorax vicinus*	LC		No
Anguilliformes	Muraenidae	*Monopenchelys acuta*	LC		No
Anguilliformes	Muraenidae	*Muraena augusti*	LC		No
Anguilliformes	Muraenidae	*Muraena helena*	LC		No
Anguilliformes	Muraenidae	*Muraena melanotis*	LC		No
Anguilliformes	Muraenidae	*Muraena pavonina*	LC		No
Anguilliformes	Muraenidae	*Muraena robusta*	LC		No
Anguilliformes	Muraenidae	*Uropterygius macularius*	LC		No
Anguilliformes	Muraenidae	*Uropterygius wheeleri*	LC		Yes
Anguilliformes	Myrocongridae	*Myroconger compressus*	DD		Yes
Anguilliformes	Nemichthyidae	*Avocettina infans*	LC		No
Anguilliformes	Nemichthyidae	*Nemichthys curvirostris*	LC		No
Anguilliformes	Nemichthyidae	*Nemichthys scolopaceus*	LC		No
Anguilliformes	Nettastomatidae	*Hoplunnis punctata*	LC		No
Anguilliformes	Nettastomatidae	*Nettastoma melanurum*	LC		No
Anguilliformes	Nettastomatidae	*Venefica proboscidea*	LC		No
Anguilliformes	Ophichthidae	*Apterichtus anguiformis*	LC		No
Anguilliformes	Ophichthidae	*Apterichtus caecus*	LC		No
Anguilliformes	Ophichthidae	*Apterichtus gracilis*	DD		Yes
Anguilliformes	Ophichthidae	*Apterichtus kendalli*	LC		No
Anguilliformes	Ophichthidae	*Apterichtus monodi*	LC		Yes
Anguilliformes	Ophichthidae	*Bascanichthys ceciliae*	LC		Yes
Anguilliformes	Ophichthidae	*Bascanichthys paulensis*	LC		No
Anguilliformes	Ophichthidae	*Brachysomophis atlanticus*	LC		Yes
Anguilliformes	Ophichthidae	*Callechelys bilinearis*	LC		No
Anguilliformes	Ophichthidae	*Callechelys guineensis*	LC		No
Anguilliformes	Ophichthidae	*Callechelys leucoptera*	LC		Yes
Anguilliformes	Ophichthidae	*Dalophis boulengeri*	LC		Yes
Anguilliformes	Ophichthidae	*Dalophis cephalopeltis*	LC		Yes
Anguilliformes	Ophichthidae	*Dalophis multidentatus*	DD		Yes
Anguilliformes	Ophichthidae	*Dalophis obtusirostris*	DD		Yes
Anguilliformes	Ophichthidae	*Echelus myrus*	LC		No
Anguilliformes	Ophichthidae	*Echelus pachyrhynchus*	LC		No
Anguilliformes	Ophichthidae	*Echiophis punctifer*	LC		No
Anguilliformes	Ophichthidae	*Hemerorhinus opici*	DD		Yes

Order	Family	Species	Cat	Crit	Endemic
Anguilliformes	Ophichthidae	*Herpetoichthys regius*	DD		No
Anguilliformes	Ophichthidae	*Ichthyapus insularis*	DD		Yes
Anguilliformes	Ophichthidae	*Ichthyapus ophioneus*	LC		No
Anguilliformes	Ophichthidae	*Myrichthys pardalis*	LC		No
Anguilliformes	Ophichthidae	*Myrophis plumbeus*	LC		No
Anguilliformes	Ophichthidae	*Mystriophis crosnieri*	LC		No
Anguilliformes	Ophichthidae	*Mystriophis rostellatus*	LC		No
Anguilliformes	Ophichthidae	*Ophichthus leonensis*	DD		Yes
Anguilliformes	Ophichthidae	*Ophichthus ophis*	LC		No
Anguilliformes	Ophichthidae	*Ophichthus pullus*	LC		Yes
Anguilliformes	Ophichthidae	*Ophisurus serpens*	LC		No
Anguilliformes	Ophichthidae	*Phaenomonas longissima*	LC		No
Anguilliformes	Ophichthidae	*Pisodonophis semicinctus*	LC		No
Anguilliformes	Ophichthidae	*Pseudomyrophis atlanticus*	LC		Yes
Anguilliformes	Ophichthidae	*Pseudomyrophis nimius*	LC		No
Anguilliformes	Ophichthidae	*Quassiremus ascensionis*	LC		No
Anguilliformes	Ophichthidae	*Xyrias guineensis*	DD		Yes
Anguilliformes	Serrivomeridae	*Serrivomer beanii*	LC		No
Anguilliformes	Serrivomeridae	*Serrivomer lanceolatoides*	LC		No
Anguilliformes	Serrivomeridae	*Stemonidium hypomelas*	LC		No
Anguilliformes	Synaphobranchidae	*Dysomma brevirostre*	LC		No
Anguilliformes	Synaphobranchidae	*Haptenchelys texis*	LC		No
Anguilliformes	Synaphobranchidae	*Ilyophis brunneus*	LC		No
Anguilliformes	Synaphobranchidae	*Simenchelys parasitica*	LC		No
Anguilliformes	Synaphobranchidae	*Synaphobranchus affinis*	LC		No
Anguilliformes	Synaphobranchidae	*Synaphobranchus kaupii*	LC		No
Ateleopodiformes	Ateleopodidae	*Guentherus altivela*	LC		No
Ateleopodiformes	Ateleopodidae	*Ijimaia loppei*	LC		No
Atheriniformes	Atherinidae	*Atherina boyeri*	LC		No
Atheriniformes	Atherinidae	*Atherina lopeziana*	DD		Yes
Atheriniformes	Atherinidae	*Atherina presbyter*	LC		No
Aulopiformes	Alepisauridae	*Alepisaurus brevirostris*	LC		No
Aulopiformes	Alepisauridae	*Alepisaurus ferox*	LC		No
Aulopiformes	Anotopteridae	*Anotopterus pharao*	LC		No
Aulopiformes	Aulopidae	*Aulopus cadenati*	LC		Yes
Aulopiformes	Aulopidae	*Aulopus filamentosus*	LC		No
Aulopiformes	Bathysauridae	*Bathysaurus ferox*	LC		No
Aulopiformes	Bathysauridae	*Bathysaurus mollis*	LC		No
Aulopiformes	Chlorophthalmidae	*Chlorophthalmus agassizi*	LC		No
Aulopiformes	Chlorophthalmidae	*Parasudis fraserbrunneri*	LC		No
Aulopiformes	Evermannellidae	*Coccorella atlantica*	LC		No
Aulopiformes	Evermannellidae	*Evermannella balbo*	LC		No
Aulopiformes	Evermannellidae	*Evermannella melanoderma*	LC		No
Aulopiformes	Evermannellidae	*Odontostomops normalops*	LC		No
Aulopiformes	Giganturidae	*Gigantura chuni*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Aulopiformes	Giganturidae	*Gigantura indica*	LC		No
Aulopiformes	Ipnopidae	*Bathymicrops regis*	LC		No
Aulopiformes	Ipnopidae	*Bathypterois atricolor*	LC		Yes
Aulopiformes	Ipnopidae	*Bathypterois dubius*	LC		No
Aulopiformes	Ipnopidae	*Bathypterois grallator*	LC		No
Aulopiformes	Ipnopidae	*Bathypterois longipes*	LC		No
Aulopiformes	Ipnopidae	*Bathypterois phenax*	LC		No
Aulopiformes	Ipnopidae	*Bathypterois quadrifilis*	LC		No
Aulopiformes	Ipnopidae	*Bathypterois viridensis*	LC		No
Aulopiformes	Ipnopidae	*Bathytyphlops marionae*	LC		No
Aulopiformes	Ipnopidae	*Bathytyphlops sewelli*	LC		No
Aulopiformes	Ipnopidae	*Ipnops agassizii*	LC		No
Aulopiformes	Notosudidae	*Ahliesaurus berryi*	LC		No
Aulopiformes	Notosudidae	*Luciosudis normani*	LC		No
Aulopiformes	Notosudidae	*Scopelosaurus argenteus*	LC		No
Aulopiformes	Notosudidae	*Scopelosaurus lepidus*	LC		No
Aulopiformes	Notosudidae	*Scopelosaurus meadi*	LC		No
Aulopiformes	Notosudidae	*Scopelosaurus smithii*	LC		No
Aulopiformes	Omosudidae	*Omosudis lowii*	LC		No
Aulopiformes	Paralepididae	*Arctozenus risso*	LC		No
Aulopiformes	Paralepididae	*Dolichosudis fuliginosa*	LC		No
Aulopiformes	Paralepididae	*Lestidiops affinis*	LC		No
Aulopiformes	Paralepididae	*Lestidiops cadenati*	LC		Yes
Aulopiformes	Paralepididae	*Lestidiops distans*	LC		Yes
Aulopiformes	Paralepididae	*Lestidiops jayakari*	LC		No
Aulopiformes	Paralepididae	*Lestidiops similis*	LC		No
Aulopiformes	Paralepididae	*Lestidiops sphyrenoides*	LC		No
Aulopiformes	Paralepididae	*Lestidium atlanticum*	LC		No
Aulopiformes	Paralepididae	*Lestrolepis intermedia*	LC		No
Aulopiformes	Paralepididae	*Macroparalepis affinis*	LC		No
Aulopiformes	Paralepididae	*Macroparalepis brevis*	LC		No
Aulopiformes	Paralepididae	*Magnisudis atlantica*	LC		No
Aulopiformes	Paralepididae	*Paralepis elongata*	LC		No
Aulopiformes	Paralepididae	*Stemonosudis gracilis*	LC		No
Aulopiformes	Paralepididae	*Stemonosudis intermedia*	LC		No
Aulopiformes	Paralepididae	*Stemonosudis siliquiventer*	LC		No
Aulopiformes	Paralepididae	*Sudis atrox*	LC		No
Aulopiformes	Paralepididae	*Sudis hyalina*	DD		No
Aulopiformes	Paralepididae	*Uncisudis longirostra*	DD		No
Aulopiformes	Paralepididae	*Uncisudis quadrimaculata*	LC		No
Aulopiformes	Scopelarchidae	*Benthalbella infans*	LC		No
Aulopiformes	Scopelarchidae	*Rosenblattichthys hubbsi*	LC		No
Aulopiformes	Scopelarchidae	*Scopelarchoides danae*	LC		No
Aulopiformes	Scopelarchidae	*Scopelarchus analis*	LC		No
Aulopiformes	Scopelarchidae	*Scopelarchus guentheri*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Aulopiformes	Scopelarchidae	*Scopelarchus michaelsarsi*	LC		No
Aulopiformes	Synodontidae	*Saurida brasiliensis*	LC		No
Aulopiformes	Synodontidae	*Synodus saurus*	LC		No
Aulopiformes	Synodontidae	*Synodus synodus*	LC		No
Aulopiformes	Synodontidae	*Trachinocephalus myops*	LC		No
Batrachoidiformes	Batrachoididae	*Batrachoides liberiensis*	LC		Yes
Batrachoidiformes	Batrachoididae	*Halobatrachus didactylus*	LC		No
Batrachoidiformes	Batrachoididae	*Perulibatrachus elminensis*	LC		No
Batrachoidiformes	Batrachoididae	*Perulibatrachus rossignoli*	LC		No
Beloniformes	Belonidae	*Ablennes hians*	LC		No
Beloniformes	Belonidae	*Belone belone*	LC		No
Beloniformes	Belonidae	*Platybelone argalus*	LC		No
Beloniformes	Belonidae	*Strongylura senegalensis*	LC		Yes
Beloniformes	Belonidae	*Tylosurus acus*	LC		No
Beloniformes	Belonidae	*Tylosurus crocodilus*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon cyanopterus*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon exsiliens*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon furcatus*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon heterurus*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon melanurus*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon milleri*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon nigricans*	LC		No
Beloniformes	Exocoetidae	*Cheilopogon pinnatibarbatus*	LC		No
Beloniformes	Exocoetidae	*Exocoetus obtusirostris*	LC		No
Beloniformes	Exocoetidae	*Exocoetus volitans*	LC		No
Beloniformes	Exocoetidae	*Fodiator acutus*	LC		No
Beloniformes	Exocoetidae	*Hirundichthys affinis*	LC		No
Beloniformes	Exocoetidae	*Hirundichthys speculiger*	LC		No
Beloniformes	Exocoetidae	*Parexocoetus hillianus*	LC		No
Beloniformes	Exocoetidae	*Prognichthys gibbifrons*	LC		No
Beloniformes	Exocoetidae	*Prognichthys glaphyrae*	LC		No
Beloniformes	Hemiramphidae	*Euleptorhamphus velox*	LC		No
Beloniformes	Hemiramphidae	*Hemiramphus balao*	LC		No
Beloniformes	Hemiramphidae	*Hemiramphus brasiliensis*	LC		No
Beloniformes	Hemiramphidae	*Hyporhamphus picarti*	LC		No
Beloniformes	Hemiramphidae	*Oxyporhamphus similis*	LC		No
Beloniformes	Scomberesocidae	*Scomberesox simulans*	LC		No
Beryciformes	Anoplogastridae	*Anoplogaster cornuta*	LC		No
Beryciformes	Berycidae	*Beryx decadactylus*	LC		No
Beryciformes	Berycidae	*Beryx splendens*	LC		No
Beryciformes	Diretmidae	*Diretmichthys parini*	LC		No
Beryciformes	Diretmidae	*Diretmoides pauciradiatus*	LC		No
Beryciformes	Diretmidae	*Diretmus argenteus*	LC		No
Beryciformes	Holocentridae	*Corniger spinosus*	LC		No
Beryciformes	Holocentridae	*Holocentrus adscensionis*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Beryciformes	Holocentridae	*Myripristis jacobus*	LC		No
Beryciformes	Holocentridae	*Sargocentron hastatum*	LC		No
Beryciformes	Trachichthyidae	*Gephyroberyx darwinii*	LC		No
Beryciformes	Trachichthyidae	*Hoplostethus cadenati*	LC		No
Beryciformes	Trachichthyidae	*Hoplostethus mediterraneus*	LC		No
Beryciformes	Trachichthyidae	*Hoplostethus vniro*	DD		Yes
Cetomimiformes	Barbourisiidae	*Barbourisia rufa*	LC		No
Cetomimiformes	Cetomimidae	*Cetomimus compunctus*	DD		No
Cetomimiformes	Cetomimidae	*Cetomimus gillii*	DD		No
Cetomimiformes	Cetomimidae	*Cetostoma regani*	DD		No
Cetomimiformes	Cetomimidae	*Danacetichthys galathenus*	DD		No
Cetomimiformes	Cetomimidae	*Ditropichthys storeri*	DD		No
Cetomimiformes	Cetomimidae	*Gyrinomimus myersi*	DD		No
Cetomimiformes	Cetomimidae	*Rhamphocetichthys savagei*	LC		No
Cetomimiformes	Rondeletiidae	*Rondeletia bicolor*	LC		No
Cetomimiformes	Rondeletiidae	*Rondeletia loricata*	LC		No
Clupeiformes	Clupeidae	*Ethmalosa fimbriata*	LC		No
Clupeiformes	Clupeidae	*Pellonula leonensis*	LC		Yes
Clupeiformes	Clupeidae	*Pellonula vorax*	LC		Yes
Clupeiformes	Clupeidae	*Sardina pilchardus*	LC		No
Clupeiformes	Clupeidae	*Sardinella aurita*	LC		No
Clupeiformes	Clupeidae	*Sardinella maderensis*	VU	A2d	No
Clupeiformes	Clupeidae	*Sardinella rouxi*	DD		Yes
Clupeiformes	Engraulidae	*Engraulis encrasicolus*	LC		No
Clupeiformes	Pristigasteridae	*Ilisha africana*	LC		Yes
Elopiformes	Elopidae	*Elops lacerta*	LC		Yes
Elopiformes	Elopidae	*Elops senegalensis*	DD		Yes
Elopiformes	Megalopidae	*Megalops atlanticus*	VU	A2bd	No
Gadiformes	Bregmacerotidae	*Bregmaceros atlanticus*	LC		No
Gadiformes	Bregmacerotidae	*Bregmaceros nectabanus*	LC		No
Gadiformes	Lotidae	*Enchelyopus cimbrius*	LC		No
Gadiformes	Macrouridae	*Bathygadus favosus*	LC		No
Gadiformes	Macrouridae	*Bathygadus macrops*	LC		No
Gadiformes	Macrouridae	*Bathygadus melanobranchus*	LC		No
Gadiformes	Macrouridae	*Cetonurus globiceps*	LC		No
Gadiformes	Macrouridae	*Coelorinchus caelorhincus*	LC		No
Gadiformes	Macrouridae	*Coelorinchus geronimo*	LC		Yes
Gadiformes	Macrouridae	*Coelorinchus labiatus*	LC		No
Gadiformes	Macrouridae	*Coelorinchus polli*	LC		No
Gadiformes	Macrouridae	*Coryphaenoides armatus*	LC		No
Gadiformes	Macrouridae	*Coryphaenoides guentheri*	LC		No
Gadiformes	Macrouridae	*Coryphaenoides leptolepis*	LC		No
Gadiformes	Macrouridae	*Coryphaenoides marshalli*	LC		Yes
Gadiformes	Macrouridae	*Coryphaenoides mediterraneus*	LC		No
Gadiformes	Macrouridae	*Coryphaenoides paramarshalli*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Gadiformes	Macrouridae	*Coryphaenoides rudis*	LC		No
Gadiformes	Macrouridae	*Coryphaenoides zaniophorus*	LC		No
Gadiformes	Macrouridae	*Gadomus arcuatus*	LC		No
Gadiformes	Macrouridae	*Gadomus longifilis*	LC		No
Gadiformes	Macrouridae	*Hymenocephalus italicus*	LC		No
Gadiformes	Macrouridae	*Hymenogadus gracilis*	DD		No
Gadiformes	Macrouridae	*Macrouroides inflaticeps*	LC		No
Gadiformes	Macrouridae	*Malacocephalus laevis*	LC		No
Gadiformes	Macrouridae	*Malacocephalus occidentalis*	LC		No
Gadiformes	Macrouridae	*Mesobius berryi*	LC		No
Gadiformes	Macrouridae	*Nezumia aequalis*	LC		No
Gadiformes	Macrouridae	*Nezumia africana*	LC		No
Gadiformes	Macrouridae	*Nezumia duodecim*	LC		No
Gadiformes	Macrouridae	*Nezumia micronychodon*	LC		No
Gadiformes	Macrouridae	*Nezumia milleri*	LC		Yes
Gadiformes	Macrouridae	*Nezumia sclerorhynchus*	LC		No
Gadiformes	Macrouridae	*Odontomacrurus murrayi*	LC		No
Gadiformes	Macrouridae	*Sphagemacrurus hirundo*	LC		No
Gadiformes	Macrouridae	*Squalogadus modificatus*	LC		No
Gadiformes	Macrouridae	*Trachyrincus scabrus*	LC		No
Gadiformes	Melanonidae	*Melanonus zugmayeri*	LC		No
Gadiformes	Merlucciidae	*Merluccius capensis*	LC		No
Gadiformes	Merlucciidae	*Merluccius merluccius*	LC		No
Gadiformes	Merlucciidae	*Merluccius polli*	LC		No
Gadiformes	Merlucciidae	*Merluccius senegalensis*	EN	A2bd	No
Gadiformes	Moridae	*Antimora rostrata*	LC		No
Gadiformes	Moridae	*Gadella imberbis*	LC		No
Gadiformes	Moridae	*Laemonema laureysi*	LC		No
Gadiformes	Moridae	*Laemonema robustum*	DD		No
Gadiformes	Moridae	*Laemonema yarrellii*	LC		No
Gadiformes	Moridae	*Mora moro*	LC		No
Gadiformes	Moridae	*Physiculus cyanostrophus*	LC		Yes
Gadiformes	Moridae	*Physiculus dalwigki*	LC		No
Gadiformes	Moridae	*Physiculus helenaensis*	DD		Yes
Gadiformes	Moridae	*Physiculus huloti*	LC		Yes
Gadiformes	Moridae	*Physiculus karrerae*	DD		No
Gadiformes	Moridae	*Physiculus maslowskii*	DD		No
Gadiformes	Moridae	*Physiculus microbarbata*	DD		Yes
Gadiformes	Phycidae	*Phycis phycis*	LC		No
Gobiesociformes	Gobiesocidae	*Apletodon barbatus*	VU	B2ab(iii)	Yes
Gobiesociformes	Gobiesocidae	*Apletodon pellegrini*	LC		No
Gobiesociformes	Gobiesocidae	*Apletodon wirtzi*	LC		Yes
Gobiesociformes	Gobiesocidae	*Diplecogaster bimaculata*	LC		No
Gobiesociformes	Gobiesocidae	*Diplecogaster ctenocrypta*	LC		No
Gobiesociformes	Gobiesocidae	*Lecanogaster chrysea*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Gobiesociformes	Gobiesocidae	*Lepadogaster purpurea*	LC		No
Gobiesociformes	Gobiesocidae	*Opeatogenys cadenati*	DD		No
Gonorynchiformes	Gonorynchidae	*Gonorynchus gonorynchus*	LC		No
Lampriformes	Lampridae	*Lampris guttatus*	LC		No
Lampriformes	Lophotidae	*Eumecichthys fiski*	LC		No
Lampriformes	Radiicephalidae	*Radiicephalus elongatus*	LC		No
Lampriformes	Regalecidae	*Regalecus glesne*	LC		No
Lampriformes	Regalecidae	*Regalecus russelii*	LC		No
Lampriformes	Stylephoridae	*Stylephorus chordatus*	LC		No
Lampriformes	Trachipteridae	*Desmodema polystictum*	LC		No
Lampriformes	Trachipteridae	*Trachipterus trachypterus*	LC		No
Lampriformes	Trachipteridae	*Zu cristatus*	LC		No
Lophiiformes	Antennariidae	*Antennarius pardalis*	LC		No
Lophiiformes	Antennariidae	*Antennarius striatus*	LC		No
Lophiiformes	Antennariidae	*Antennatus nummifer*	LC		No
Lophiiformes	Antennariidae	*Fowlerichthys senegalensis*	LC		No
Lophiiformes	Antennariidae	*Histrio histrio*	LC		No
Lophiiformes	Caulophrynidae	*Caulophryne jordani*	LC		No
Lophiiformes	Caulophrynidae	*Caulophryne pelagica*	DD		No
Lophiiformes	Caulophrynidae	*Caulophryne polynema*	LC		No
Lophiiformes	Centrophrynidae	*Centrophryne spinulosa*	LC		No
Lophiiformes	Ceratiidae	*Ceratias holboelli*	LC		No
Lophiiformes	Ceratiidae	*Ceratias uranoscopus*	LC		No
Lophiiformes	Ceratiidae	*Cryptopsaras couesii*	LC		No
Lophiiformes	Chaunacidae	*Chaunax pictus*	LC		No
Lophiiformes	Chaunacidae	*Chaunax suttkusi*	LC		No
Lophiiformes	Diceratiidae	*Bufoceratias wedli*	LC		No
Lophiiformes	Diceratiidae	*Diceratias pileatus*	LC		No
Lophiiformes	Gigantactinidae	*Gigantactis elsmani*	LC		No
Lophiiformes	Gigantactinidae	*Gigantactis gibbsi*	LC		No
Lophiiformes	Gigantactinidae	*Gigantactis golovani*	LC		No
Lophiiformes	Gigantactinidae	*Gigantactis gracilicauda*	DD		No
Lophiiformes	Gigantactinidae	*Gigantactis longicirra*	LC		No
Lophiiformes	Gigantactinidae	*Gigantactis vanhoeffeni*	DD		No
Lophiiformes	Gigantactinidae	*Gigantactis watermani*	DD		No
Lophiiformes	Gigantactinidae	*Rhynchactis macrothrix*	DD		No
Lophiiformes	Himantolophidae	*Himantolophus albinares*	DD		No
Lophiiformes	Himantolophidae	*Himantolophus brevirostris*	DD		No
Lophiiformes	Himantolophidae	*Himantolophus cornifer*	LC		No
Lophiiformes	Himantolophidae	*Himantolophus crinitus*	LC		Yes
Lophiiformes	Himantolophidae	*Himantolophus groenlandicus*	LC		No
Lophiiformes	Himantolophidae	*Himantolophus macroceras*	DD		No
Lophiiformes	Himantolophidae	*Himantolophus macroceratoides*	DD		No
Lophiiformes	Himantolophidae	*Himantolophus multifurcatus*	DD		Yes
Lophiiformes	Himantolophidae	*Himantolophus paucifilosus*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Lophiiformes	Himantolophidae	*Himantolophus rostratus*	DD		No
Lophiiformes	Linophrynidae	*Haplophryne mollis*	LC		No
Lophiiformes	Linophrynidae	*Linophryne arborifera*	LC		No
Lophiiformes	Linophrynidae	*Linophryne pennibarbata*	LC		No
Lophiiformes	Linophrynidae	*Photocorynus spiniceps*	LC		No
Lophiiformes	Lophiidae	*Lophiodes kempi*	DD		Yes
Lophiiformes	Lophiidae	*Lophius budegassa*	DD		No
Lophiiformes	Lophiidae	*Lophius piscatorius*	LC		No
Lophiiformes	Lophiidae	*Lophius vomerinus*	NT		No
Lophiiformes	Melanocetidae	*Melanocetus johnsonii*	LC		No
Lophiiformes	Melanocetidae	*Melanocetus murrayi*	LC		No
Lophiiformes	Neoceratiidae	*Neoceratias spinifer*	LC		No
Lophiiformes	Ogcocephalidae	*Dibranchus atlanticus*	LC		No
Lophiiformes	Ogcocephalidae	*Dibranchus tremendus*	LC		No
Lophiiformes	Oneirodidae	*Chaenophryne draco*	LC		No
Lophiiformes	Oneirodidae	*Chaenophryne longiceps*	LC		No
Lophiiformes	Oneirodidae	*Chaenophryne ramifera*	LC		No
Lophiiformes	Oneirodidae	*Dolopichthys allector*	LC		No
Lophiiformes	Oneirodidae	*Dolopichthys danae*	LC		No
Lophiiformes	Oneirodidae	*Dolopichthys dinema*	LC		Yes
Lophiiformes	Oneirodidae	*Dolopichthys jubatus*	DD		No
Lophiiformes	Oneirodidae	*Dolopichthys longicornis*	LC		No
Lophiiformes	Oneirodidae	*Dolopichthys pullatus*	DD		No
Lophiiformes	Oneirodidae	*Lophodolos acanthognathus*	LC		No
Lophiiformes	Oneirodidae	*Lophodolos indicus*	LC		No
Lophiiformes	Oneirodidae	*Microlophichthys microlophus*	LC		No
Lophiiformes	Oneirodidae	*Oneirodes carlsbergi*	LC		No
Lophiiformes	Oneirodidae	*Oneirodes eschrichtii*	LC		No
Lophiiformes	Oneirodidae	*Oneirodes macrosteus*	LC		No
Lophiiformes	Oneirodidae	*Oneirodes theodoritissieri*	LC		Yes
Lophiiformes	Oneirodidae	*Pentherichthys atratus*	LC		No
Lophiiformes	Oneirodidae	*Spiniphryne gladisfenae*	LC		No
Lophiiformes	Thaumatichthyidae	*Lasiognathus saccostoma*	LC		No
Mugiliformes	Mugilidae	*Chelon bispinosus*	LC		Yes
Mugiliformes	Mugilidae	*Chelon labrosus*	LC		No
Mugiliformes	Mugilidae	*Liza bandialensis*	DD		Yes
Mugiliformes	Mugilidae	*Liza dumerili*	DD		No
Mugiliformes	Mugilidae	*Liza falcipinnis*	DD		Yes
Mugiliformes	Mugilidae	*Liza grandisquamis*	DD		Yes
Mugiliformes	Mugilidae	*Mugil bananensis*	LC		Yes
Mugiliformes	Mugilidae	*Mugil capurrii*	LC		No
Mugiliformes	Mugilidae	*Mugil cephalus*	LC		No
Mugiliformes	Mugilidae	*Mugil curema*	LC		No
Myctophiformes	Myctophidae	*Benthosema glaciale*	LC		No
Myctophiformes	Myctophidae	*Benthosema suborbitale*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Myctophiformes	Myctophidae	*Bolinichthys distofax*	LC		No
Myctophiformes	Myctophidae	*Bolinichthys indicus*	LC		No
Myctophiformes	Myctophidae	*Bolinichthys photothorax*	LC		No
Myctophiformes	Myctophidae	*Bolinichthys supralateralis*	LC		No
Myctophiformes	Myctophidae	*Centrobranchus nigroocellatus*	LC		No
Myctophiformes	Myctophidae	*Ceratoscopelus maderensis*	LC		No
Myctophiformes	Myctophidae	*Ceratoscopelus warmingii*	LC		No
Myctophiformes	Myctophidae	*Diaphus anderseni*	LC		No
Myctophiformes	Myctophidae	*Diaphus bertelseni*	LC		No
Myctophiformes	Myctophidae	*Diaphus brachycephalus*	LC		No
Myctophiformes	Myctophidae	*Diaphus dumerilii*	DD		No
Myctophiformes	Myctophidae	*Diaphus effulgens*	LC		No
Myctophiformes	Myctophidae	*Diaphus fragilis*	LC		No
Myctophiformes	Myctophidae	*Diaphus garmani*	LC		No
Myctophiformes	Myctophidae	*Diaphus holti*	LC		No
Myctophiformes	Myctophidae	*Diaphus lucidus*	LC		No
Myctophiformes	Myctophidae	*Diaphus luetkeni*	LC		No
Myctophiformes	Myctophidae	*Diaphus metopoclampus*	LC		No
Myctophiformes	Myctophidae	*Diaphus mollis*	LC		No
Myctophiformes	Myctophidae	*Diaphus perspicillatus*	LC		No
Myctophiformes	Myctophidae	*Diaphus problematicus*	LC		No
Myctophiformes	Myctophidae	*Diaphus rafinesquii*	LC		No
Myctophiformes	Myctophidae	*Diaphus splendidus*	LC		No
Myctophiformes	Myctophidae	*Diaphus subtilis*	DD		No
Myctophiformes	Myctophidae	*Diaphus taaningi*	DD		No
Myctophiformes	Myctophidae	*Diaphus termophilus*	LC		No
Myctophiformes	Myctophidae	*Diaphus vanhoeffeni*	LC		No
Myctophiformes	Myctophidae	*Diogenichthys atlanticus*	LC		No
Myctophiformes	Myctophidae	*Electrona risso*	LC		No
Myctophiformes	Myctophidae	*Gonichthys cocco*	LC		No
Myctophiformes	Myctophidae	*Hygophum benoiti*	LC		No
Myctophiformes	Myctophidae	*Hygophum hygomii*	LC		No
Myctophiformes	Myctophidae	*Hygophum macrochir*	LC		No
Myctophiformes	Myctophidae	*Hygophum reinhardtii*	LC		No
Myctophiformes	Myctophidae	*Hygophum taaningi*	LC		No
Myctophiformes	Myctophidae	*Lampadena anomala*	DD		No
Myctophiformes	Myctophidae	*Lampadena chavesi*	LC		No
Myctophiformes	Myctophidae	*Lampadena luminosa*	LC		No
Myctophiformes	Myctophidae	*Lampadena pontifex*	LC		No
Myctophiformes	Myctophidae	*Lampadena speculigera*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus alatus*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus australis*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus crocodilus*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus festivus*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus intricarius*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Myctophiformes	Myctophidae	*Lampanyctus macdonaldi*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus nobilis*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus photonotus*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus pusillus*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus tenuiformis*	LC		No
Myctophiformes	Myctophidae	*Lampanyctus vadulus*	LC		No
Myctophiformes	Myctophidae	*Lepidophanes gaussi*	LC		No
Myctophiformes	Myctophidae	*Lepidophanes guentheri*	LC		No
Myctophiformes	Myctophidae	*Lobianchia dofleini*	LC		No
Myctophiformes	Myctophidae	*Lobianchia gemellarii*	LC		No
Myctophiformes	Myctophidae	*Loweina rara*	LC		No
Myctophiformes	Myctophidae	*Myctophum affine*	LC		No
Myctophiformes	Myctophidae	*Myctophum asperum*	LC		No
Myctophiformes	Myctophidae	*Myctophum nitidulum*	LC		No
Myctophiformes	Myctophidae	*Myctophum obtusirostre*	LC		No
Myctophiformes	Myctophidae	*Myctophum phengodes*	LC		No
Myctophiformes	Myctophidae	*Myctophum punctatum*	LC		No
Myctophiformes	Myctophidae	*Myctophum selenops*	LC		No
Myctophiformes	Myctophidae	*Nannobrachium atrum*	LC		No
Myctophiformes	Myctophidae	*Nannobrachium cuprarium*	LC		No
Myctophiformes	Myctophidae	*Nannobrachium isaacsi*	LC		No
Myctophiformes	Myctophidae	*Nannobrachium lineatum*	LC		No
Myctophiformes	Myctophidae	*Notolychnus valdiviae*	LC		No
Myctophiformes	Myctophidae	*Notoscopelus bolini*	LC		No
Myctophiformes	Myctophidae	*Notoscopelus caudispinosus*	LC		No
Myctophiformes	Myctophidae	*Notoscopelus resplendens*	LC		No
Myctophiformes	Myctophidae	*Scopelopsis multipunctatus*	LC		No
Myctophiformes	Myctophidae	*Symbolophorus kreffti*	LC		No
Myctophiformes	Myctophidae	*Symbolophorus rufinus*	LC		No
Myctophiformes	Myctophidae	*Symbolophorus veranyi*	LC		No
Myctophiformes	Myctophidae	*Taaningichthys bathyphilus*	LC		No
Myctophiformes	Myctophidae	*Taaningichthys minimus*	LC		No
Myctophiformes	Myctophidae	*Taaningichthys paurolychnus*	LC		No
Myctophiformes	Neoscopelidae	*Neoscopelus macrolepidotus*	LC		No
Myctophiformes	Neoscopelidae	*Scopelengys tristis*	LC		No
Notacanthiformes	Halosauridae	*Aldrovandia gracilis*	LC		No
Notacanthiformes	Halosauridae	*Aldrovandia oleosa*	LC		No
Notacanthiformes	Halosauridae	*Aldrovandia phalacra*	LC		No
Notacanthiformes	Halosauridae	*Aldrovandia rostrata*	LC		No
Notacanthiformes	Halosauridae	*Halosauropsis macrochir*	LC		No
Notacanthiformes	Halosauridae	*Halosaurus attenuatus*	LC		No
Notacanthiformes	Halosauridae	*Halosaurus guentheri*	LC		No
Notacanthiformes	Halosauridae	*Halosaurus johnsonianus*	LC		No
Notacanthiformes	Halosauridae	*Halosaurus ovenii*	LC		No
Notacanthiformes	Notacanthidae	*Notacanthus chemnitzii*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Notacanthiformes	Notacanthidae	*Polyacanthonotus challengeri*	LC		No
Ophidiiformes	Aphyonidae	*Aphyonus rassi*	DD		No
Ophidiiformes	Aphyonidae	*Nybelinella erikssoni*	DD		No
Ophidiiformes	Aphyonidae	*Sciadonus jonassoni*	DD		No
Ophidiiformes	Bythitidae	*Cataetyx bruuni*	LC		Yes
Ophidiiformes	Bythitidae	*Cataetyx laticeps*	LC		No
Ophidiiformes	Bythitidae	*Grammonus longhursti*	LC		Yes
Ophidiiformes	Carapidae	*Carapus acus*	LC		No
Ophidiiformes	Carapidae	*Echiodon dentatus*	LC		No
Ophidiiformes	Carapidae	*Snyderidia canina*	LC		No
Ophidiiformes	Ophidiidae	*Abyssobrotula galatheae*	LC		No
Ophidiiformes	Ophidiidae	*Acanthonus armatus*	LC		No
Ophidiiformes	Ophidiidae	*Apagesoma delosommatus*	LC		No
Ophidiiformes	Ophidiidae	*Barathrites iris*	LC		No
Ophidiiformes	Ophidiidae	*Bassozetus compressus*	LC		No
Ophidiiformes	Ophidiidae	*Bassozetus levistomatus*	LC		No
Ophidiiformes	Ophidiidae	*Bassozetus normalis*	LC		No
Ophidiiformes	Ophidiidae	*Bassozetus oncerocephalus*	DD		Yes
Ophidiiformes	Ophidiidae	*Bassozetus taenia*	LC		No
Ophidiiformes	Ophidiidae	*Bathyonus laticeps*	DD		No
Ophidiiformes	Ophidiidae	*Brotula barbata*	LC		No
Ophidiiformes	Ophidiidae	*Dicrolene introniger*	LC		No
Ophidiiformes	Ophidiidae	*Holcomycteronus squamosus*	LC		No
Ophidiiformes	Ophidiidae	*Lamprogrammus brunswigi*	LC		No
Ophidiiformes	Ophidiidae	*Lamprogrammus exutus*	LC		No
Ophidiiformes	Ophidiidae	*Lamprogrammus niger*	LC		No
Ophidiiformes	Ophidiidae	*Luciobrotula corethromycter*	LC		No
Ophidiiformes	Ophidiidae	*Luciobrotula nolfi*	LC		No
Ophidiiformes	Ophidiidae	*Monomitopus metriostoma*	LC		No
Ophidiiformes	Ophidiidae	*Penopus microphthalmus*	LC		No
Ophidiiformes	Ophidiidae	*Porogadus abyssalis*	DD		No
Ophidiiformes	Ophidiidae	*Porogadus miles*	LC		No
Ophidiiformes	Ophidiidae	*Porogadus nudus*	DD		Yes
Ophidiiformes	Ophidiidae	*Porogadus subarmatus*	DD		Yes
Ophidiiformes	Ophidiidae	*Selachophidium guentheri*	LC		No
Ophidiiformes	Ophidiidae	*Spectrunculus grandis*	LC		No
Ophidiiformes	Parabrotulidae	*Parabrotula plagiophthalma*	LC		No
Osmeriformes	Alepocephalidae	*Alepocephalus agassizii*	LC		No
Osmeriformes	Alepocephalidae	*Alepocephalus australis*	LC		No
Osmeriformes	Alepocephalidae	*Alepocephalus bairdii*	DD		No
Osmeriformes	Alepocephalidae	*Alepocephalus rostratus*	LC		No
Osmeriformes	Alepocephalidae	*Asquamiceps caeruleus*	LC		No
Osmeriformes	Alepocephalidae	*Asquamiceps hjorti*	LC		No
Osmeriformes	Alepocephalidae	*Bajacalifornia arcylepis*	DD		No
Osmeriformes	Alepocephalidae	*Bajacalifornia calcarata*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Osmeriformes	Alepocephalidae	*Bajacalifornia megalops*	LC		No
Osmeriformes	Alepocephalidae	*Bathylaco nigricans*	LC		No
Osmeriformes	Alepocephalidae	*Bathytroctes macrolepis*	LC		No
Osmeriformes	Alepocephalidae	*Bathytroctes michaelsarsi*	LC		No
Osmeriformes	Alepocephalidae	*Bathytroctes microlepis*	LC		No
Osmeriformes	Alepocephalidae	*Bathytroctes squamosus*	LC		No
Osmeriformes	Alepocephalidae	*Conocara macropterum*	LC		No
Osmeriformes	Alepocephalidae	*Conocara salmoneum*	LC		No
Osmeriformes	Alepocephalidae	*Einara edentula*	LC		No
Osmeriformes	Alepocephalidae	*Einara macrolepis*	LC		No
Osmeriformes	Alepocephalidae	*Herwigia kreffti*	LC		No
Osmeriformes	Alepocephalidae	*Leptoderma macrops*	LC		No
Osmeriformes	Alepocephalidae	*Narcetes erimelas*	LC		No
Osmeriformes	Alepocephalidae	*Narcetes stomias*	LC		No
Osmeriformes	Alepocephalidae	*Photostylus pycnopterus*	LC		No
Osmeriformes	Alepocephalidae	*Rinoctes nasutus*	LC		No
Osmeriformes	Alepocephalidae	*Rouleina attrita*	LC		No
Osmeriformes	Alepocephalidae	*Rouleina maderensis*	LC		No
Osmeriformes	Alepocephalidae	*Talismania antillarum*	LC		No
Osmeriformes	Alepocephalidae	*Talismania homoptera*	LC		No
Osmeriformes	Alepocephalidae	*Talismania longifilis*	LC		No
Osmeriformes	Alepocephalidae	*Talismania mekistonema*	LC		No
Osmeriformes	Alepocephalidae	*Xenodermichthys copei*	LC		No
Osmeriformes	Argentinidae	*Glossanodon leioglossus*	LC		No
Osmeriformes	Argentinidae	*Glossanodon polli*	LC		No
Osmeriformes	Bathylagidae	*Bathylagichthys greyae*	LC		No
Osmeriformes	Bathylagidae	*Bathylagoides argyrogaster*	LC		No
Osmeriformes	Bathylagidae	*Dolicholagus longirostris*	LC		No
Osmeriformes	Bathylagidae	*Melanolagus bericoides*	LC		No
Osmeriformes	Leptochilichthyidae	*Leptochilichthys agassizii*	LC		No
Osmeriformes	Microstomatidae	*Microstoma microstoma*	LC		No
Osmeriformes	Microstomatidae	*Nansenia atlantica*	LC		No
Osmeriformes	Microstomatidae	*Nansenia megalopa*	DD		No
Osmeriformes	Microstomatidae	*Nansenia pelagica*	DD		No
Osmeriformes	Microstomatidae	*Xenophthalmichthys danae*	LC		No
Osmeriformes	Opisthoproctidae	*Bathylychnops brachyrhynchus*	DD		No
Osmeriformes	Opisthoproctidae	*Dolichopteroides binocularis*	LC		No
Osmeriformes	Opisthoproctidae	*Dolichopteryx longipes*	LC		No
Osmeriformes	Opisthoproctidae	*Opisthoproctus grimaldii*	LC		No
Osmeriformes	Opisthoproctidae	*Opisthoproctus soleatus*	LC		No
Osmeriformes	Opisthoproctidae	*Rhynchohyalus natalensis*	LC		No
Osmeriformes	Opisthoproctidae	*Winteria telescopa*	LC		No
Osmeriformes	Platytroctidae	*Barbantus curvifrons*	LC		No
Osmeriformes	Platytroctidae	*Barbantus elongatus*	DD		No
Osmeriformes	Platytroctidae	*Holtbyrnia anomala*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Osmeriformes	Platytroctidae	*Holtbyrnia cyanocephala*	LC		No
Osmeriformes	Platytroctidae	*Holtbyrnia innesi*	LC		No
Osmeriformes	Platytroctidae	*Holtbyrnia macrops*	LC		No
Osmeriformes	Platytroctidae	*Maulisia argipalla*	LC		No
Osmeriformes	Platytroctidae	*Maulisia mauli*	LC		No
Osmeriformes	Platytroctidae	*Maulisia microlepis*	LC		No
Osmeriformes	Platytroctidae	*Mentodus facilis*	LC		No
Osmeriformes	Platytroctidae	*Mentodus longirostris*	LC		No
Osmeriformes	Platytroctidae	*Mentodus mesalirus*	LC		No
Osmeriformes	Platytroctidae	*Mentodus perforatus*	LC		No
Osmeriformes	Platytroctidae	*Mentodus rostratus*	LC		No
Osmeriformes	Platytroctidae	*Normichthys operosus*	LC		No
Osmeriformes	Platytroctidae	*Platytroctes apus*	LC		No
Osmeriformes	Platytroctidae	*Sagamichthys schnakenbecki*	LC		No
Osmeriformes	Platytroctidae	*Searsia koefoedi*	LC		No
Perciformes	Acanthuridae	*Acanthurus bahianus*	LC		No
Perciformes	Acanthuridae	*Acanthurus chirurgus*	LC		No
Perciformes	Acanthuridae	*Acanthurus coeruleus*	LC		No
Perciformes	Acanthuridae	*Acanthurus monroviae*	LC		No
Perciformes	Acanthuridae	*Prionurus biafraensis*	LC		Yes
Perciformes	Acropomatidae	*Synagrops japonicus*	LC		No
Perciformes	Acropomatidae	*Synagrops microlepis*	LC		No
Perciformes	Ammodytidae	*Gymnammodytes capensis*	LC		No
Perciformes	Ammodytidae	*Gymnammodytes cicerelus*	LC		No
Perciformes	Apogonidae	*Apogon axillaris*	LC		No
Perciformes	Apogonidae	*Apogon imberbis*	LC		No
Perciformes	Apogonidae	*Apogon pseudomaculatus*	LC		No
Perciformes	Apogonidae	*Paroncheilus affinis*	LC		No
Perciformes	Apogonidae	*Phaeoptyx pigmentaria*	LC		No
Perciformes	Ariommatidae	*Ariomma bondi*	LC		No
Perciformes	Ariommatidae	*Ariomma melanum*	LC		No
Perciformes	Blenniidae	*Bathyblennius antholops*	DD		Yes
Perciformes	Blenniidae	*Blennius normani*	LC		Yes
Perciformes	Blenniidae	*Entomacrodus cadenati*	LC		Yes
Perciformes	Blenniidae	*Entomacrodus textilis*	LC		Yes
Perciformes	Blenniidae	*Hypleurochilus aequipinnis*	LC		Yes
Perciformes	Blenniidae	*Hypleurochilus bananensis*	LC		No
Perciformes	Blenniidae	*Hypleurochilus langi*	LC		Yes
Perciformes	Blenniidae	*Lipophrys pholis*	LC		No
Perciformes	Blenniidae	*Microlipophrys bauchotae*	DD		Yes
Perciformes	Blenniidae	*Microlipophrys caboverdensis*	LC		Yes
Perciformes	Blenniidae	*Microlipophrys velifer*	LC		Yes
Perciformes	Blenniidae	*Ophioblennius atlanticus*	LC		Yes
Perciformes	Blenniidae	*Parablennius dialloi*	LC		Yes
Perciformes	Blenniidae	*Parablennius goreensis*	LC		Yes

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Blenniidae	*Parablennius incognitus*	LC		No
Perciformes	Blenniidae	*Parablennius parvicornis*	LC		No
Perciformes	Blenniidae	*Parablennius pilicornis*	LC		No
Perciformes	Blenniidae	*Parablennius salensis*	LC		Yes
Perciformes	Blenniidae	*Parablennius sierraensis*	LC		Yes
Perciformes	Blenniidae	*Parablennius tentacularis*	LC		No
Perciformes	Blenniidae	*Parablennius verryckeni*	DD		Yes
Perciformes	Blenniidae	*Scartella caboverdiana*	LC		Yes
Perciformes	Blenniidae	*Scartella cristata*	LC		No
Perciformes	Blenniidae	*Scartella nuchifilis*	VU	D2	Yes
Perciformes	Blenniidae	*Scartella springeri*	VU	D2	Yes
Perciformes	Blenniidae	*Spaniblennius clandestinus*	DD		Yes
Perciformes	Blenniidae	*Spaniblennius riodourensis*	DD		No
Perciformes	Bramidae	*Brama brama*	LC		No
Perciformes	Bramidae	*Brama dussumieri*	LC		No
Perciformes	Bramidae	*Pterycombus brama*	LC		No
Perciformes	Bramidae	*Taractes rubescens*	LC		No
Perciformes	Bramidae	*Taractichthys longipinnis*	LC		No
Perciformes	Callanthiidae	*Callanthias ruber*	LC		No
Perciformes	Callionymidae	*Callionymus bairdi*	LC		No
Perciformes	Callionymidae	*Callionymus lyra*	LC		No
Perciformes	Callionymidae	*Callionymus maculatus*	LC		No
Perciformes	Callionymidae	*Draculo shango*	LC		Yes
Perciformes	Callionymidae	*Synchiropus phaeton*	LC		No
Perciformes	Caproidae	*Antigonia capros*	LC		No
Perciformes	Caproidae	*Capros aper*	LC		No
Perciformes	Carangidae	*Alectis alexandrina*	LC		No
Perciformes	Carangidae	*Alectis ciliaris*	LC		No
Perciformes	Carangidae	*Campogramma glaycos*	LC		No
Perciformes	Carangidae	*Caranx bartholomaei*	LC		No
Perciformes	Carangidae	*Caranx crysos*	LC		No
Perciformes	Carangidae	*Caranx fischeri*	LC		No
Perciformes	Carangidae	*Caranx hippos*	LC		No
Perciformes	Carangidae	*Caranx latus*	LC		No
Perciformes	Carangidae	*Caranx lugubris*	LC		No
Perciformes	Carangidae	*Caranx rhonchus*	LC		No
Perciformes	Carangidae	*Caranx ruber*	LC		No
Perciformes	Carangidae	*Caranx senegallus*	LC		No
Perciformes	Carangidae	*Chloroscombrus chrysurus*	LC		No
Perciformes	Carangidae	*Decapterus macarellus*	LC		No
Perciformes	Carangidae	*Decapterus muroadsi*	LC		No
Perciformes	Carangidae	*Decapterus punctatus*	LC		No
Perciformes	Carangidae	*Decapterus tabl*	LC		No
Perciformes	Carangidae	*Elagatis bipinnulata*	LC		No
Perciformes	Carangidae	*Hemicaranx bicolor*	LC		Yes

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Carangidae	*Lichia amia*	LC		No
Perciformes	Carangidae	*Naucrates ductor*	LC		No
Perciformes	Carangidae	*Pseudocaranx dentex*	LC		No
Perciformes	Carangidae	*Selar crumenophthalmus*	LC		No
Perciformes	Carangidae	*Selene dorsalis*	LC		No
Perciformes	Carangidae	*Seriola carpenteri*	LC		No
Perciformes	Carangidae	*Seriola dumerili*	LC		No
Perciformes	Carangidae	*Seriola fasciata*	LC		No
Perciformes	Carangidae	*Seriola lalandi*	LC		No
Perciformes	Carangidae	*Seriola rivoliana*	LC		No
Perciformes	Carangidae	*Trachinotus goreensis*	LC		Yes
Perciformes	Carangidae	*Trachinotus maxillosus*	LC		No
Perciformes	Carangidae	*Trachinotus ovatus*	LC		No
Perciformes	Carangidae	*Trachinotus teraia*	LC		No
Perciformes	Carangidae	*Trachurus mediterraneus*	LC		No
Perciformes	Carangidae	*Trachurus picturatus*	LC		No
Perciformes	Carangidae	*Trachurus trachurus*	VU	A2bd	No
Perciformes	Carangidae	*Trachurus trecae*	LC		No
Perciformes	Carangidae	*Uraspis helvola*	LC		No
Perciformes	Carangidae	*Uraspis secunda*	LC		No
Perciformes	Caristiidae	*Paracaristius aquilus*	LC		No
Perciformes	Caristiidae	*Paracaristius nemorosus*	LC		Yes
Perciformes	Caristiidae	*Paracaristius nudarcus*	DD		Yes
Perciformes	Caristiidae	*Platyberyx andriashevi*	DD		No
Perciformes	Caristiidae	*Platyberyx opalescens*	LC		No
Perciformes	Centracanthidae	*Centracanthus cirrus*	LC		No
Perciformes	Centracanthidae	*Spicara alta*	LC		Yes
Perciformes	Centracanthidae	*Spicara melanurus*	LC		No
Perciformes	Centrolophidae	*Centrolophus niger*	LC		No
Perciformes	Centrolophidae	*Schedophilus pemarco*	LC		No
Perciformes	Centrolophidae	*Schedophilus velaini*	LC		No
Perciformes	Cepolidae	*Cepola macrophthalma*	LC		No
Perciformes	Cepolidae	*Cepola pauciradiata*	DD		Yes
Perciformes	Chaetodontidae	*Chaetodon hoefleri*	LC		No
Perciformes	Chaetodontidae	*Chaetodon robustus*	LC		Yes
Perciformes	Chaetodontidae	*Chaetodon sanctaehelenae*	LC		Yes
Perciformes	Chaetodontidae	*Prognathodes dichrous*	LC		Yes
Perciformes	Chaetodontidae	*Prognathodes marcellae*	LC		Yes
Perciformes	Chiasmodontidae	*Chiasmodon braueri*	LC		No
Perciformes	Chiasmodontidae	*Chiasmodon niger*	LC		No
Perciformes	Chiasmodontidae	*Dysalotus alcocki*	LC		No
Perciformes	Chiasmodontidae	*Dysalotus oligoscolus*	LC		No
Perciformes	Chiasmodontidae	*Kali indica*	LC		No
Perciformes	Chiasmodontidae	*Kali kerberti*	LC		No
Perciformes	Chiasmodontidae	*Kali macrodon*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Chiasmodontidae	*Kali macrura*	LC		No
Perciformes	Chiasmodontidae	*Kali parri*	LC		No
Perciformes	Chiasmodontidae	*Pseudoscopelus altipinnis*	LC		No
Perciformes	Chiasmodontidae	*Pseudoscopelus scriptus*	LC		No
Perciformes	Chiasmodontidae	*Pseudoscopelus scutatus*	LC		No
Perciformes	Cirrhitidae	*Amblycirrhitus earnshawi*	EN	B2ab(iii)	Yes
Perciformes	Cirrhitidae	*Amblycirrhitus pinos*	LC		No
Perciformes	Cirrhitidae	*Cirrhitus atlanticus*	LC		Yes
Perciformes	Coryphaenidae	*Coryphaena equiselis*	LC		No
Perciformes	Coryphaenidae	*Coryphaena hippurus*	LC		No
Perciformes	Dinopercidae	*Centrarchops chapini*	LC		Yes
Perciformes	Drepaneidae	*Drepane africana*	LC		Yes
Perciformes	Echeneidae	*Echeneis naucrates*	LC		No
Perciformes	Echeneidae	*Phtheirichthys lineatus*	LC		No
Perciformes	Echeneidae	*Remora albescens*	LC		No
Perciformes	Echeneidae	*Remora australis*	LC		No
Perciformes	Echeneidae	*Remora brachyptera*	LC		No
Perciformes	Echeneidae	*Remora osteochir*	LC		No
Perciformes	Echeneidae	*Remora remora*	LC		No
Perciformes	Eleotridae	*Eleotris vittata*	LC		No
Perciformes	Emmelichthyidae	*Emmelichthys ruber*	LC		No
Perciformes	Emmelichthyidae	*Erythrocles monodi*	LC		No
Perciformes	Ephippidae	*Chaetodipterus lippei*	LC		No
Perciformes	Ephippidae	*Ephippus goreensis*	LC		Yes
Perciformes	Epigonidae	*Epigonus affinis*	LC		Yes
Perciformes	Epigonidae	*Epigonus constanciae*	LC		No
Perciformes	Epigonidae	*Epigonus denticulatus*	LC		No
Perciformes	Epigonidae	*Epigonus pandionis*	LC		No
Perciformes	Epigonidae	*Epigonus telescopus*	LC		No
Perciformes	Epinephelidae	*Alphestes afer*	LC		No
Perciformes	Epinephelidae	*Cephalopholis nigri*	LC		No
Perciformes	Epinephelidae	*Cephalopholis taeniops*	DD		No
Perciformes	Epinephelidae	*Epinephelus adscensionis*	LC		No
Perciformes	Epinephelidae	*Epinephelus aeneus*	NT		No
Perciformes	Epinephelidae	*Epinephelus caninus*	DD		No
Perciformes	Epinephelidae	*Epinephelus costae*	DD		No
Perciformes	Epinephelidae	*Epinephelus goreensis*	DD		Yes
Perciformes	Epinephelidae	*Epinephelus itajara*	CR	A2d	No
Perciformes	Epinephelidae	*Epinephelus marginatus*	EN	A2d	No
Perciformes	Epinephelidae	*Hyporthodus haifensis*	DD		No
Perciformes	Epinephelidae	*Mycteroperca fusca*	EN	B1ab(v)	No
Perciformes	Epinephelidae	*Mycteroperca rubra*	LC		No
Perciformes	Epinephelidae	*Paranthias furcifer*	LC		No
Perciformes	Gempylidae	*Diplospinus multistriatus*	LC		No
Perciformes	Gempylidae	*Gempylus serpens*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Gempylidae	*Lepidocybium flavobrunneum*	LC		No
Perciformes	Gempylidae	*Nealotus tripes*	LC		No
Perciformes	Gempylidae	*Nesiarchus nasutus*	LC		No
Perciformes	Gempylidae	*Promethichthys prometheus*	LC		No
Perciformes	Gempylidae	*Ruvettus pretiosus*	LC		No
Perciformes	Gerreidae	*Eucinostomus melanopterus*	LC		No
Perciformes	Gerreidae	*Gerres nigri*	LC		Yes
Perciformes	Gobiidae	*Bathygobius burtoni*	EN	B2ab(iii)	Yes
Perciformes	Gobiidae	*Bathygobius casamancus*	LC		Yes
Perciformes	Gobiidae	*Bathygobius soporator*	LC		No
Perciformes	Gobiidae	*Corcyrogobius lubbocki*	VU	B2ab(iii)	Yes
Perciformes	Gobiidae	*Ctenogobius lepturus*	LC		Yes
Perciformes	Gobiidae	*Didogobius amicuscaridis*	VU	B2ab(iii)	Yes
Perciformes	Gobiidae	*Didogobius kochi*	LC		No
Perciformes	Gobiidae	*Didogobius wirtzi*	LC		Yes
Perciformes	Gobiidae	*Gnatholepis thompsoni*	LC		No
Perciformes	Gobiidae	*Gobioides africanus*	LC		Yes
Perciformes	Gobiidae	*Gobioides sagitta*	LC		Yes
Perciformes	Gobiidae	*Gobionellus occidentalis*	LC		Yes
Perciformes	Gobiidae	*Gobius ateriformis*	LC		Yes
Perciformes	Gobiidae	*Gobius cruentatus*	LC		No
Perciformes	Gobiidae	*Gobius niger*	LC		No
Perciformes	Gobiidae	*Gobius paganellus*	LC		No
Perciformes	Gobiidae	*Gobius rubropunctatus*	LC		Yes
Perciformes	Gobiidae	*Gobius senegambiensis*	LC		No
Perciformes	Gobiidae	*Gobius tetrophthalmus*	VU	B2ab(iii)	Yes
Perciformes	Gobiidae	*Gorogobius nigricinctus*	LC		Yes
Perciformes	Gobiidae	*Gorogobius stevcici*	VU	B2ab(iii)	Yes
Perciformes	Gobiidae	*Lesueurigobius friesii*	LC		No
Perciformes	Gobiidae	*Lesueurigobius koumansi*	LC		Yes
Perciformes	Gobiidae	*Lesueurigobius sanzi*	LC		No
Perciformes	Gobiidae	*Mauligobius nigri*	LC		Yes
Perciformes	Gobiidae	*Nematogobius brachynemus*	LC		Yes
Perciformes	Gobiidae	*Pomatoschistus microps*	LC		No
Perciformes	Gobiidae	*Priolepis ascensionis*	EN	B2ab(iii)	Yes
Perciformes	Gobiidae	*Thorogobius angolensis*	LC		Yes
Perciformes	Gobiidae	*Thorogobius rofeni*	LC		No
Perciformes	Gobiidae	*Vanneaugobius canariensis*	LC		No
Perciformes	Gobiidae	*Wheelerigobius maltzani*	LC		Yes
Perciformes	Gobiidae	*Wheelerigobius wirtzi*	LC		Yes
Perciformes	Haemulidae	*Brachydeuterus auritus*	NT		No
Perciformes	Haemulidae	*Parakuhlia macrophthalmus*	DD		Yes
Perciformes	Haemulidae	*Parapristipoma humile*	LC		No
Perciformes	Haemulidae	*Parapristipoma octolineatum*	LC		No
Perciformes	Haemulidae	*Plectorhinchus macrolepis*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Haemulidae	*Plectorhinchus mediterraneus*	DD		No
Perciformes	Haemulidae	*Pomadasys incisus*	LC		No
Perciformes	Haemulidae	*Pomadasys jubelini*	LC		Yes
Perciformes	Haemulidae	*Pomadasys perotaei*	LC		Yes
Perciformes	Haemulidae	*Pomadasys rogerii*	LC		Yes
Perciformes	Howellidae	*Howella atlantica*	LC		No
Perciformes	Istiophoridae	*Istiophorus platypterus*	LC		No
Perciformes	Istiophoridae	*Kajikia albida*	VU	A2bd	No
Perciformes	Istiophoridae	*Makaira nigricans*	VU	A2bd	No
Perciformes	Istiophoridae	*Tetrapturus georgii*	DD		No
Perciformes	Istiophoridae	*Tetrapturus pfluegeri*	LC		No
Perciformes	Kyphosidae	*Girella zonata*	VU	B2ab(iii)	Yes
Perciformes	Kyphosidae	*Kyphosus sectatrix*	LC		No
Perciformes	Kyphosidae	*Kyphosus vaigiensis*	LC		No
Perciformes	Labridae	*Acantholabrus palloni*	LC		No
Perciformes	Labridae	*Bodianus insularis*	LC		No
Perciformes	Labridae	*Bodianus scrofa*	VU	B2ab(iv,v)	No
Perciformes	Labridae	*Bodianus speciosus*	DD		No
Perciformes	Labridae	*Coris atlantica*	LC		No
Perciformes	Labridae	*Doratonotus megalepis*	LC		No
Perciformes	Labridae	*Labrus mixtus*	LC		No
Perciformes	Labridae	*Lappanella guineensis*	DD		Yes
Perciformes	Labridae	*Nicholsina collettei*	LC		Yes
Perciformes	Labridae	*Scarus hoefleri*	LC		Yes
Perciformes	Labridae	*Sparisoma cretense*	LC		No
Perciformes	Labridae	*Symphodus bailloni*	LC		No
Perciformes	Labridae	*Thalassoma pavo*	LC		No
Perciformes	Labridae	*Xyrichtys novacula*	LC		No
Perciformes	Labrisomidae	*Malacoctenus africanus*	DD		Yes
Perciformes	Lethrinidae	*Lethrinus atlanticus*	LC		Yes
Perciformes	Lobotidae	*Lobotes surinamensis*	LC		No
Perciformes	Lutjanidae	*Apsilus fuscus*	LC		No
Perciformes	Lutjanidae	*Lutjanus agennes*	DD		Yes
Perciformes	Lutjanidae	*Lutjanus dentatus*	DD		Yes
Perciformes	Lutjanidae	*Lutjanus endecacanthus*	DD		Yes
Perciformes	Lutjanidae	*Lutjanus fulgens*	LC		Yes
Perciformes	Lutjanidae	*Lutjanus goreensis*	DD		Yes
Perciformes	Luvaridae	*Luvarus imperialis*	LC		No
Perciformes	Malacanthidae	*Branchiostegus semifasciatus*	LC		No
Perciformes	Malacanthidae	*Malacanthus plumieri*	LC		No
Perciformes	Microdesmidae	*Microdesmus aethiopicus*	LC		Yes
Perciformes	Microdesmidae	*Microdesmus africanus*	DD		Yes
Perciformes	Moronidae	*Dicentrarchus labrax*	LC		No
Perciformes	Moronidae	*Dicentrarchus punctatus*	LC		No
Perciformes	Mullidae	*Mulloidichthys martinicus*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Mullidae	*Mullus barbatus*	LC		No
Perciformes	Mullidae	*Mullus surmuletus*	LC		No
Perciformes	Mullidae	*Pseudupeneus prayensis*	VU	A2ad	No
Perciformes	Nomeidae	*Cubiceps caeruleus*	LC		No
Perciformes	Nomeidae	*Cubiceps capensis*	LC		No
Perciformes	Nomeidae	*Cubiceps gracilis*	LC		No
Perciformes	Nomeidae	*Cubiceps pauciradiatus*	LC		No
Perciformes	Nomeidae	*Nomeus gronovii*	LC		No
Perciformes	Nomeidae	*Psenes arafurensis*	LC		No
Perciformes	Nomeidae	*Psenes cyanophrys*	LC		No
Perciformes	Nomeidae	*Psenes pellucidus*	LC		No
Perciformes	Percophidae	*Bembrops cadenati*	LC		Yes
Perciformes	Percophidae	*Bembrops greyi*	LC		Yes
Perciformes	Percophidae	*Bembrops heterurus*	LC		No
Perciformes	Pinguipedidae	*Parapercis atlantica*	DD		Yes
Perciformes	Polynemidae	*Galeoides decadactylus*	NT		No
Perciformes	Polynemidae	*Pentanemus quinquarius*	VU	A2bd	Yes
Perciformes	Polynemidae	*Polydactylus quadrifilis*	LC		Yes
Perciformes	Polyprionidae	*Polyprion americanus*	DD		No
Perciformes	Pomacanthidae	*Centropyge resplendens*	LC		Yes
Perciformes	Pomacanthidae	*Holacanthus africanus*	LC		Yes
Perciformes	Pomacanthidae	*Pomacanthus paru*	LC		No
Perciformes	Pomacentridae	*Abudefduf hoefleri*	DD		Yes
Perciformes	Pomacentridae	*Abudefduf luridus*	LC		No
Perciformes	Pomacentridae	*Abudefduf saxatilis*	LC		No
Perciformes	Pomacentridae	*Abudefduf taurus*	LC		No
Perciformes	Pomacentridae	*Chromis cadenati*	LC		Yes
Perciformes	Pomacentridae	*Chromis chromis*	LC		No
Perciformes	Pomacentridae	*Chromis limbata*	LC		No
Perciformes	Pomacentridae	*Chromis lubbocki*	LC		Yes
Perciformes	Pomacentridae	*Chromis multilineata*	LC		No
Perciformes	Pomacentridae	*Chromis sanctaehelenae*	LC		Yes
Perciformes	Pomacentridae	*Chrysiptera unimaculata*	LC		No
Perciformes	Pomacentridae	*Microspathodon frontatus*	LC		Yes
Perciformes	Pomacentridae	*Stegastes imbricatus*	LC		Yes
Perciformes	Pomacentridae	*Stegastes lubbocki*	LC		Yes
Perciformes	Pomacentridae	*Stegastes sanctaehelenae*	LC		Yes
Perciformes	Pomatomidae	*Pomatomus saltatrix*	VU	A2bd	No
Perciformes	Priacanthidae	*Heteropriacanthus cruentatus*	LC		No
Perciformes	Priacanthidae	*Priacanthus arenatus*	LC		No
Perciformes	Rachycentridae	*Rachycentron canadum*	LC		No
Perciformes	Sciaenidae	*Argyrosomus regius*	LC		No
Perciformes	Sciaenidae	*Atractoscion aequidens*	VU	A2bd	No
Perciformes	Sciaenidae	*Miracorvina angolensis*	LC		Yes
Perciformes	Sciaenidae	*Pentheroscion mbizi*	NT		No

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Sciaenidae	*Pseudotolithus elongatus*	LC		No
Perciformes	Sciaenidae	*Pseudotolithus epipercus*	LC		Yes
Perciformes	Sciaenidae	*Pseudotolithus moorii*	LC		Yes
Perciformes	Sciaenidae	*Pseudotolithus senegalensis*	EN	A2bd	No
Perciformes	Sciaenidae	*Pseudotolithus senegallus*	VU	A2bd	No
Perciformes	Sciaenidae	*Pseudotolithus typus*	LC		Yes
Perciformes	Sciaenidae	*Pteroscion peli*	LC		Yes
Perciformes	Sciaenidae	*Sciaena umbra*	NT		No
Perciformes	Sciaenidae	*Umbrina canariensis*	LC		No
Perciformes	Sciaenidae	*Umbrina ronchus*	DD		No
Perciformes	Sciaenidae	*Umbrina steindachneri*	DD		Yes
Perciformes	Scombridae	*Acanthocybium solandri*	LC		No
Perciformes	Scombridae	*Auxis rochei*	LC		No
Perciformes	Scombridae	*Auxis thazard*	LC		No
Perciformes	Scombridae	*Euthynnus alletteratus*	LC		No
Perciformes	Scombridae	*Katsuwonus pelamis*	LC		No
Perciformes	Scombridae	*Orcynopsis unicolor*	LC		No
Perciformes	Scombridae	*Sarda sarda*	LC		No
Perciformes	Scombridae	*Scomber colias*	LC		No
Perciformes	Scombridae	*Scomberomorus tritor*	LC		No
Perciformes	Scombridae	*Thunnus alalunga*	NT		No
Perciformes	Scombridae	*Thunnus albacares*	NT		No
Perciformes	Scombridae	*Thunnus obesus*	VU	A2bd	No
Perciformes	Scombridae	*Thunnus thynnus*	EN	A2bd	No
Perciformes	Scombrolabracidae	*Scombrolabrax heterolepis*	LC		No
Perciformes	Serranidae	*Anthias anthias*	LC		No
Perciformes	Serranidae	*Anthias cyprinoides*	DD		Yes
Perciformes	Serranidae	*Anthias helenensis*	DD		Yes
Perciformes	Serranidae	*Holanthias caudalis*	DD		Yes
Perciformes	Serranidae	*Holanthias fronticinctus*	DD		Yes
Perciformes	Serranidae	*Meganthias carpenteri*	DD		Yes
Perciformes	Serranidae	*Pseudogramma gregoryi*	LC		No
Perciformes	Serranidae	*Pseudogramma guineensis*	LC		Yes
Perciformes	Serranidae	*Rypticus saponaceus*	LC		No
Perciformes	Serranidae	*Rypticus subbifrenatus*	LC		No
Perciformes	Serranidae	*Serranus accraensis*	LC		Yes
Perciformes	Serranidae	*Serranus africanus*	LC		Yes
Perciformes	Serranidae	*Serranus cabrilla*	LC		No
Perciformes	Serranidae	*Serranus hepatus*	LC		No
Perciformes	Serranidae	*Serranus heterurus*	LC		Yes
Perciformes	Serranidae	*Serranus sanctaehelenae*	LC		No
Perciformes	Serranidae	*Serranus scriba*	LC		No
Perciformes	Sparidae	*Boops boops*	LC		No
Perciformes	Sparidae	*Dentex angolensis*	NT		No
Perciformes	Sparidae	*Dentex barnardi*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Sparidae	*Dentex canariensis*	LC		No
Perciformes	Sparidae	*Dentex congoensis*	LC		Yes
Perciformes	Sparidae	*Dentex dentex*	VU	A2bd	No
Perciformes	Sparidae	*Dentex gibbosus*	LC		No
Perciformes	Sparidae	*Dentex macrophthalmus*	LC		No
Perciformes	Sparidae	*Dentex maroccanus*	LC		No
Perciformes	Sparidae	*Diplodus bellottii*	LC		No
Perciformes	Sparidae	*Diplodus cervinus*	LC		No
Perciformes	Sparidae	*Diplodus fasciatus*	LC		Yes
Perciformes	Sparidae	*Diplodus prayensis*	LC		Yes
Perciformes	Sparidae	*Diplodus puntazzo*	LC		No
Perciformes	Sparidae	*Diplodus sargus*	LC		No
Perciformes	Sparidae	*Diplodus vulgaris*	LC		No
Perciformes	Sparidae	*Lithognathus mormyrus*	LC		No
Perciformes	Sparidae	*Oblada melanura*	LC		No
Perciformes	Sparidae	*Pachymetopon blochii*	LC		No
Perciformes	Sparidae	*Pagellus acarne*	LC		No
Perciformes	Sparidae	*Pagellus bellottii*	LC		No
Perciformes	Sparidae	*Pagellus bogaraveo*	NT		No
Perciformes	Sparidae	*Pagellus erythrinus*	LC		No
Perciformes	Sparidae	*Pagrus auriga*	LC		No
Perciformes	Sparidae	*Pagrus caeruleostictus*	LC		No
Perciformes	Sparidae	*Rhabdosargus globiceps*	VU	A2bd	No
Perciformes	Sparidae	*Sarpa salpa*	LC		No
Perciformes	Sparidae	*Sparus aurata*	LC		No
Perciformes	Sparidae	*Spondyliosoma cantharus*	LC		No
Perciformes	Sparidae	*Virididentex acromegalus*	LC		Yes
Perciformes	Sphyraenidae	*Sphyraena afra*	LC		No
Perciformes	Sphyraenidae	*Sphyraena barracuda*	LC		No
Perciformes	Sphyraenidae	*Sphyraena guachancho*	LC		No
Perciformes	Sphyraenidae	*Sphyraena sphyraena*	LC		No
Perciformes	Sphyraenidae	*Sphyraena viridensis*	LC		No
Perciformes	Stromateidae	*Stromateus fiatola*	LC		No
Perciformes	Symphysanodontidae	*Symphysanodon berryi*	LC		No
Perciformes	Tetragonuridae	*Tetragonurus atlanticus*	LC		No
Perciformes	Tetragonuridae	*Tetragonurus cuvieri*	LC		No
Perciformes	Trachinidae	*Trachinus araneus*	LC		No
Perciformes	Trachinidae	*Trachinus armatus*	LC		No
Perciformes	Trachinidae	*Trachinus collignoni*	DD		Yes
Perciformes	Trachinidae	*Trachinus draco*	LC		No
Perciformes	Trachinidae	*Trachinus lineolatus*	LC		No
Perciformes	Trachinidae	*Trachinus pellegrini*	LC		No
Perciformes	Trachinidae	*Trachinus radiatus*	LC		No
Perciformes	Trichiuridae	*Aphanopus intermedius*	LC		No
Perciformes	Trichiuridae	*Benthodesmus tenuis*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Perciformes	Trichiuridae	*Lepidopus caudatus*	DD		No
Perciformes	Trichiuridae	*Lepidopus dubius*	LC		Yes
Perciformes	Trichiuridae	*Trichiurus lepturus*	LC		No
Perciformes	Tripterygiidae	*Helcogramma ascensionis*	LC		Yes
Perciformes	Tripterygiidae	*Tripterygion delaisi*	LC		No
Perciformes	Uranoscopidae	*Uranoscopus albesca*	LC		Yes
Perciformes	Uranoscopidae	*Uranoscopus cadenati*	LC		Yes
Perciformes	Uranoscopidae	*Uranoscopus polli*	LC		Yes
Perciformes	Uranoscopidae	*Uranoscopus scaber*	LC		No
Perciformes	Xiphiidae	*Xiphias gladius*	LC		No
Perciformes	Zoarcidae	*Melanostigma atlanticum*	LC		No
Perciformes	Zoarcidae	*Pachycara bulbiceps*	LC		No
Perciformes	Zoarcidae	*Pachycara crassiceps*	LC		No
Perciformes	Zoarcidae	*Pachycara crossacanthum*	LC		Yes
Pleuronectiformes	Bothidae	*Arnoglossus capensis*	LC		No
Pleuronectiformes	Bothidae	*Arnoglossus imperialis*	LC		No
Pleuronectiformes	Bothidae	*Arnoglossus laterna*	LC		No
Pleuronectiformes	Bothidae	*Arnoglossus thori*	DD		No
Pleuronectiformes	Bothidae	*Bothus guibei*	DD		Yes
Pleuronectiformes	Bothidae	*Bothus lunatus*	LC		No
Pleuronectiformes	Bothidae	*Bothus mellissi*	LC		Yes
Pleuronectiformes	Bothidae	*Bothus podas*	LC		No
Pleuronectiformes	Bothidae	*Chascanopsetta lugubris*	LC		No
Pleuronectiformes	Bothidae	*Monolene helenensis*	DD		Yes
Pleuronectiformes	Bothidae	*Monolene mertensi*	LC		Yes
Pleuronectiformes	Bothidae	*Monolene microstoma*	LC		No
Pleuronectiformes	Citharidae	*Citharus linguatula*	LC		No
Pleuronectiformes	Cynoglossidae	*Cynoglossus browni*	DD		Yes
Pleuronectiformes	Cynoglossidae	*Cynoglossus cadenati*	DD		Yes
Pleuronectiformes	Cynoglossidae	*Cynoglossus canariensis*	NT		No
Pleuronectiformes	Cynoglossidae	*Cynoglossus monodi*	NT		Yes
Pleuronectiformes	Cynoglossidae	*Cynoglossus senegalensis*	NT		Yes
Pleuronectiformes	Cynoglossidae	*Symphurus insularis*	LC		No
Pleuronectiformes	Cynoglossidae	*Symphurus ligulatus*	LC		No
Pleuronectiformes	Cynoglossidae	*Symphurus lubbocki*	DD		Yes
Pleuronectiformes	Cynoglossidae	*Symphurus nigrescens*	LC		No
Pleuronectiformes	Cynoglossidae	*Symphurus normani*	LC		Yes
Pleuronectiformes	Cynoglossidae	*Symphurus reticulatus*	DD		Yes
Pleuronectiformes	Cynoglossidae	*Symphurus vanmelleae*	LC		Yes
Pleuronectiformes	Paralichthyidae	*Citharichthys stampflii*	LC		Yes
Pleuronectiformes	Paralichthyidae	*Syacium guineensis*	LC		No
Pleuronectiformes	Psettodidae	*Psettodes belcheri*	DD		No
Pleuronectiformes	Psettodidae	*Psettodes bennettii*	DD		No
Pleuronectiformes	Soleidae	*Bathysolea lactea*	DD		Yes
Pleuronectiformes	Soleidae	*Bathysolea polli*	LC		Yes

Order	Family	Species	Cat	Crit	Endemic
Pleuronectiformes	Soleidae	*Bathysolea profundicola*	LC		No
Pleuronectiformes	Soleidae	*Dagetichthys lusitanica*	DD		No
Pleuronectiformes	Soleidae	*Dicologlossa cuneata*	LC		No
Pleuronectiformes	Soleidae	*Dicologlossa hexophthalma*	LC		No
Pleuronectiformes	Soleidae	*Heteromycteris proboscideus*	DD		No
Pleuronectiformes	Soleidae	*Microchirus azevia*	DD		No
Pleuronectiformes	Soleidae	*Microchirus boscanion*	DD		No
Pleuronectiformes	Soleidae	*Microchirus frechkopi*	DD		Yes
Pleuronectiformes	Soleidae	*Microchirus ocellatus*	DD		No
Pleuronectiformes	Soleidae	*Microchirus theophila*	DD		No
Pleuronectiformes	Soleidae	*Microchirus variegatus*	LC		No
Pleuronectiformes	Soleidae	*Microchirus wittei*	LC		No
Pleuronectiformes	Soleidae	*Monochirus atlanticus*	DD		No
Pleuronectiformes	Soleidae	*Pegusa cadenati*	DD		Yes
Pleuronectiformes	Soleidae	*Pegusa lascaris*	LC		No
Pleuronectiformes	Soleidae	*Solea senegalensis*	DD		No
Pleuronectiformes	Soleidae	*Solea solea*	DD		No
Pleuronectiformes	Soleidae	*Solea triophthalma*	DD		Yes
Pleuronectiformes	Soleidae	*Synapturichthys kleinii*	DD		No
Pleuronectiformes	Soleidae	*Vanstraelenia chirophthalma*	DD		Yes
Polymixiiformes	Polymixiidae	*Polymixia nobilis*	LC		No
Saccopharyngiformes	Cyematidae	*Cyema atrum*	LC		No
Saccopharyngiformes	Eurypharyngidae	*Eurypharynx pelecanoides*	LC		No
Saccopharyngiformes	Monognathidae	*Monognathus jesperseni*	DD		Yes
Saccopharyngiformes	Monognathidae	*Monognathus nigeli*	DD		No
Saccopharyngiformes	Monognathidae	*Monognathus taningi*	DD		Yes
Saccopharyngiformes	Saccopharyngidae	*Saccopharynx ampullaceus*	LC		No
Saccopharyngiformes	Saccopharyngidae	*Saccopharynx ramosus*	LC		No
Scorpaeniformes	Dactylopteridae	*Dactylopterus volitans*	LC		No
Scorpaeniformes	Liparidae	*Careproctus albescens*	LC		No
Scorpaeniformes	Liparidae	*Paraliparis copei*	DD		No
Scorpaeniformes	Peristediidae	*Peristedion cataphractum*	LC		No
Scorpaeniformes	Platycephalidae	*Solitas gruveli*	LC		Yes
Scorpaeniformes	Psychrolutidae	*Cottunculus thomsonii*	LC		No
Scorpaeniformes	Psychrolutidae	*Ebinania costaecanariae*	LC		No
Scorpaeniformes	Psychrolutidae	*Psychrolutes inermis*	LC		No
Scorpaeniformes	Scorpaenidae	*Idiastion kyphos*	LC		No
Scorpaeniformes	Scorpaenidae	*Neomerinthe folgori*	DD		No
Scorpaeniformes	Scorpaenidae	*Pontinus accraensis*	LC		Yes
Scorpaeniformes	Scorpaenidae	*Pontinus kuhlii*	DD		No
Scorpaeniformes	Scorpaenidae	*Pontinus leda*	LC		No
Scorpaeniformes	Scorpaenidae	*Pontinus nigropunctatus*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena angolensis*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena annobonae*	DD		Yes
Scorpaeniformes	Scorpaenidae	*Scorpaena ascensionis*	EN	B2ab(iii)	Yes

Order	Family	Species	Cat	Crit	Endemic
Scorpaeniformes	Scorpaenidae	*Scorpaena elongata*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena laevis*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena loppei*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena maderensis*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena mellissii*	EN	B2ab(iii)	Yes
Scorpaeniformes	Scorpaenidae	*Scorpaena normani*	LC		Yes
Scorpaeniformes	Scorpaenidae	*Scorpaena notata*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena plumieri*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena scrofa*	LC		No
Scorpaeniformes	Scorpaenidae	*Scorpaena stephanica*	LC		Yes
Scorpaeniformes	Scorpaenidae	*Scorpaenodes africanus*	DD		Yes
Scorpaeniformes	Scorpaenidae	*Scorpaenodes elongatus*	DD		Yes
Scorpaeniformes	Scorpaenidae	*Scorpaenodes insularis*	LC		No
Scorpaeniformes	Sebastidae	*Helicolenus dactylopterus*	LC		No
Scorpaeniformes	Sebastidae	*Trachyscorpia cristulata*	LC		No
Scorpaeniformes	Setarchidae	*Ectreposebastes imus*	LC		No
Scorpaeniformes	Setarchidae	*Setarches guentheri*	LC		No
Scorpaeniformes	Triglidae	*Chelidonichthys cuculus*	LC		No
Scorpaeniformes	Triglidae	*Chelidonichthys gabonensis*	LC		Yes
Scorpaeniformes	Triglidae	*Chelidonichthys lastoviza*	LC		No
Scorpaeniformes	Triglidae	*Chelidonichthys lucerna*	LC		No
Scorpaeniformes	Triglidae	*Chelidonichthys obscurus*	LC		No
Scorpaeniformes	Triglidae	*Lepidotrigla cadmani*	LC		No
Scorpaeniformes	Triglidae	*Lepidotrigla carolae*	LC		Yes
Scorpaeniformes	Triglidae	*Lepidotrigla dieuzeidei*	LC		No
Scorpaeniformes	Triglidae	*Trigla lyra*	LC		No
Scorpaeniformes	Triglidae	*Trigla macrodactylus*	DD		Yes
Scorpaeniformes	Triglidae	*Trigloporus lastoviza*	LC		No
Siluriformes	Ariidae	*Carlarius heudelotii*	LC		Yes
Siluriformes	Ariidae	*Carlarius latiscutatus*	DD		Yes
Siluriformes	Ariidae	*Carlarius parkii*	LC		Yes
Stephanoberyciformes	Melamphaidae	*Melamphaes ebelingi*	DD		No
Stephanoberyciformes	Melamphaidae	*Melamphaes eulepis*	LC		No
Stephanoberyciformes	Melamphaidae	*Melamphaes hubbsi*	DD		No
Stephanoberyciformes	Melamphaidae	*Melamphaes leprus*	LC		Yes
Stephanoberyciformes	Melamphaidae	*Melamphaes longivelis*	DD		No
Stephanoberyciformes	Melamphaidae	*Melamphaes polylepis*	DD		No
Stephanoberyciformes	Melamphaidae	*Melamphaes pumilus*	DD		No
Stephanoberyciformes	Melamphaidae	*Melamphaes simus*	LC		No
Stephanoberyciformes	Melamphaidae	*Melamphaes suborbitalis*	DD		No
Stephanoberyciformes	Melamphaidae	*Melamphaes typhlops*	DD		No
Stephanoberyciformes	Melamphaidae	*Poromitra capito*	DD		No
Stephanoberyciformes	Melamphaidae	*Poromitra crassiceps*	LC		No
Stephanoberyciformes	Melamphaidae	*Poromitra megalops*	DD		No
Stephanoberyciformes	Melamphaidae	*Scopeloberyx opisthopterus*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Stephanoberyciformes	Melamphaidae	*Scopeloberyx robustus*	DD		No
Stephanoberyciformes	Melamphaidae	*Scopelogadus beanii*	DD		No
Stephanoberyciformes	Melamphaidae	*Scopelogadus mizolepis*	LC		No
Stephanoberyciformes	Stephanoberycidae	*Abyssoberyx levisquamosus*	DD		No
Stomiiformes	Gonostomatidae	*Bonapartia pedaliota*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone acclinidens*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone alba*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone braueri*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone livida*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone microdon*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone obscura*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone pallida*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone parapallida*	LC		No
Stomiiformes	Gonostomatidae	*Cyclothone pseudopallida*	LC		No
Stomiiformes	Gonostomatidae	*Diplophos taenia*	LC		No
Stomiiformes	Gonostomatidae	*Gonostoma atlanticum*	LC		No
Stomiiformes	Gonostomatidae	*Gonostoma denudatum*	LC		No
Stomiiformes	Gonostomatidae	*Gonostoma elongatum*	LC		No
Stomiiformes	Gonostomatidae	*Manducus maderensis*	DD		No
Stomiiformes	Gonostomatidae	*Sigmops bathyphilus*	LC		No
Stomiiformes	Gonostomatidae	*Triplophos hemingi*	LC		No
Stomiiformes	Phosichthyidae	*Ichthyococcus ovatus*	LC		No
Stomiiformes	Phosichthyidae	*Ichthyococcus polli*	LC		No
Stomiiformes	Phosichthyidae	*Phosichthys argenteus*	LC		No
Stomiiformes	Phosichthyidae	*Pollichthys mauli*	LC		No
Stomiiformes	Phosichthyidae	*Polymetme thaeocoryla*	LC		No
Stomiiformes	Phosichthyidae	*Vinciguerria attenuata*	LC		No
Stomiiformes	Phosichthyidae	*Vinciguerria nimbaria*	LC		No
Stomiiformes	Phosichthyidae	*Vinciguerria poweriae*	LC		No
Stomiiformes	Phosichthyidae	*Yarrella blackfordi*	LC		No
Stomiiformes	Sternoptychidae	*Argyropelecus aculeatus*	LC		No
Stomiiformes	Sternoptychidae	*Argyropelecus affinis*	LC		No
Stomiiformes	Sternoptychidae	*Argyropelecus gigas*	LC		No
Stomiiformes	Sternoptychidae	*Argyropelecus hemigymnus*	LC		No
Stomiiformes	Sternoptychidae	*Argyropelecus sladeni*	LC		No
Stomiiformes	Sternoptychidae	*Maurolicus walvisensis*	LC		No
Stomiiformes	Sternoptychidae	*Maurolicus weitzmani*	LC		No
Stomiiformes	Sternoptychidae	*Polyipnus polli*	LC		No
Stomiiformes	Sternoptychidae	*Sternoptyx diaphana*	LC		No
Stomiiformes	Sternoptychidae	*Sternoptyx pseudobscura*	LC		No
Stomiiformes	Sternoptychidae	*Sternoptyx pseudodiaphana*	LC		No
Stomiiformes	Sternoptychidae	*Valenciennellus tripunctulatus*	LC		No
Stomiiformes	Stomiidae	*Aristostomias lunifer*	LC		No
Stomiiformes	Stomiidae	*Aristostomias polydactylus*	LC		No
Stomiiformes	Stomiidae	*Aristostomias tittmanni*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Stomiiformes	Stomiidae	*Aristostomias xenostoma*	LC		No
Stomiiformes	Stomiidae	*Astronesthes atlanticus*	LC		No
Stomiiformes	Stomiidae	*Astronesthes caulophorus*	LC		No
Stomiiformes	Stomiidae	*Astronesthes decoratus*	LC		No
Stomiiformes	Stomiidae	*Astronesthes gemmifer*	DD		No
Stomiiformes	Stomiidae	*Astronesthes haplophos*	LC		No
Stomiiformes	Stomiidae	*Astronesthes indicus*	LC		No
Stomiiformes	Stomiidae	*Astronesthes karsteni*	LC		Yes
Stomiiformes	Stomiidae	*Astronesthes leucopogon*	LC		No
Stomiiformes	Stomiidae	*Astronesthes macropogon*	LC		No
Stomiiformes	Stomiidae	*Astronesthes micropogon*	LC		No
Stomiiformes	Stomiidae	*Astronesthes niger*	LC		No
Stomiiformes	Stomiidae	*Astronesthes richardsoni*	LC		No
Stomiiformes	Stomiidae	*Bathophilus brevis*	LC		No
Stomiiformes	Stomiidae	*Bathophilus digitatus*	LC		No
Stomiiformes	Stomiidae	*Bathophilus longipinnis*	LC		No
Stomiiformes	Stomiidae	*Bathophilus metallicus*	LC		No
Stomiiformes	Stomiidae	*Bathophilus nigerrimus*	LC		No
Stomiiformes	Stomiidae	*Bathophilus pawneei*	LC		No
Stomiiformes	Stomiidae	*Bathophilus schizochirus*	LC		No
Stomiiformes	Stomiidae	*Bathophilus vaillanti*	LC		No
Stomiiformes	Stomiidae	*Borostomias antarcticus*	LC		No
Stomiiformes	Stomiidae	*Borostomias elucens*	LC		No
Stomiiformes	Stomiidae	*Borostomias mononema*	LC		No
Stomiiformes	Stomiidae	*Chauliodus danae*	LC		No
Stomiiformes	Stomiidae	*Chauliodus minimus*	LC		No
Stomiiformes	Stomiidae	*Chauliodus schmidti*	LC		No
Stomiiformes	Stomiidae	*Chauliodus sloani*	LC		No
Stomiiformes	Stomiidae	*Echiostoma barbatum*	LC		No
Stomiiformes	Stomiidae	*Eustomias acinosus*	DD		No
Stomiiformes	Stomiidae	*Eustomias aequatorialis*	LC		No
Stomiiformes	Stomiidae	*Eustomias arborifer*	LC		No
Stomiiformes	Stomiidae	*Eustomias bigelowi*	LC		No
Stomiiformes	Stomiidae	*Eustomias enbarbatus*	LC		No
Stomiiformes	Stomiidae	*Eustomias fissibarbis*	LC		No
Stomiiformes	Stomiidae	*Eustomias furcifer*	LC		No
Stomiiformes	Stomiidae	*Eustomias insularum*	DD		Yes
Stomiiformes	Stomiidae	*Eustomias intermedius*	LC		No
Stomiiformes	Stomiidae	*Eustomias kreffti*	LC		No
Stomiiformes	Stomiidae	*Eustomias lanceolatus*	LC		No
Stomiiformes	Stomiidae	*Eustomias longibarba*	LC		No
Stomiiformes	Stomiidae	*Eustomias macrurus*	LC		No
Stomiiformes	Stomiidae	*Eustomias melanonema*	LC		No
Stomiiformes	Stomiidae	*Eustomias melanostigma*	LC		No
Stomiiformes	Stomiidae	*Eustomias monoclonoides*	DD		Yes

Order	Family	Species	Cat	Crit	Endemic
Stomiiformes	Stomiidae	*Eustomias obscurus*	LC		No
Stomiiformes	Stomiidae	*Eustomias patulus*	DD		No
Stomiiformes	Stomiidae	*Eustomias satterleei*	LC		No
Stomiiformes	Stomiidae	*Eustomias simplex*	LC		No
Stomiiformes	Stomiidae	*Eustomias spherulifer*	LC		No
Stomiiformes	Stomiidae	*Eustomias tenisoni*	DD		No
Stomiiformes	Stomiidae	*Eustomias triramis*	LC		No
Stomiiformes	Stomiidae	*Flagellostomias boureei*	LC		No
Stomiiformes	Stomiidae	*Grammatostomias dentatus*	LC		No
Stomiiformes	Stomiidae	*Heterophotus ophistoma*	LC		No
Stomiiformes	Stomiidae	*Idiacanthus fasciola*	LC		No
Stomiiformes	Stomiidae	*Leptostomias gladiator*	LC		No
Stomiiformes	Stomiidae	*Leptostomias gracilis*	LC		No
Stomiiformes	Stomiidae	*Leptostomias longibarba*	LC		No
Stomiiformes	Stomiidae	*Malacosteus niger*	LC		No
Stomiiformes	Stomiidae	*Melanostomias bartonbeani*	LC		No
Stomiiformes	Stomiidae	*Melanostomias biseriatus*	LC		No
Stomiiformes	Stomiidae	*Melanostomias melanops*	LC		No
Stomiiformes	Stomiidae	*Melanostomias paucilaternatus*	LC		No
Stomiiformes	Stomiidae	*Melanostomias spilorhynchus*	LC		No
Stomiiformes	Stomiidae	*Melanostomias tentaculatus*	LC		No
Stomiiformes	Stomiidae	*Melanostomias valdiviae*	LC		No
Stomiiformes	Stomiidae	*Neonesthes capensis*	LC		No
Stomiiformes	Stomiidae	*Neonesthes microcephalus*	LC		No
Stomiiformes	Stomiidae	*Odontostomias masticopogon*	LC		Yes
Stomiiformes	Stomiidae	*Odontostomias micropogon*	LC		No
Stomiiformes	Stomiidae	*Pachystomias microdon*	LC		No
Stomiiformes	Stomiidae	*Photonectes braueri*	LC		No
Stomiiformes	Stomiidae	*Photonectes caerulescens*	LC		No
Stomiiformes	Stomiidae	*Photonectes margarita*	LC		No
Stomiiformes	Stomiidae	*Photonectes mirabilis*	LC		No
Stomiiformes	Stomiidae	*Photonectes parvimanus*	LC		No
Stomiiformes	Stomiidae	*Photonectes phyllopogon*	LC		No
Stomiiformes	Stomiidae	*Photostomias atrox*	LC		No
Stomiiformes	Stomiidae	*Photostomias goodyeari*	LC		No
Stomiiformes	Stomiidae	*Photostomias guernei*	LC		No
Stomiiformes	Stomiidae	*Rhadinesthes decimus*	LC		No
Stomiiformes	Stomiidae	*Stomias affinis*	LC		No
Stomiiformes	Stomiidae	*Stomias boa*	LC		No
Stomiiformes	Stomiidae	*Stomias brevibarbatus*	LC		No
Stomiiformes	Stomiidae	*Stomias lampropeltis*	LC		Yes
Stomiiformes	Stomiidae	*Stomias longibarbatus*	LC		No
Stomiiformes	Stomiidae	*Thysanactis dentex*	LC		No
Stomiiformes	Stomiidae	*Trigonolampa miriceps*	LC		No
Syngnathiformes	Aulostomidae	*Aulostomus strigosus*	LC		No

Order	Family	Species	Cat	Crit	Endemic
Syngnathiformes	Centriscidae	*Macroramphosus scolopax*	LC		No
Syngnathiformes	Fistulariidae	*Fistularia petimba*	LC		No
Syngnathiformes	Fistulariidae	*Fistularia tabacaria*	LC		No
Syngnathiformes	Syngnathidae	*Cosmocampus retropinnis*	DD		No
Syngnathiformes	Syngnathidae	*Enneacampus ansorgii*	LC		No
Syngnathiformes	Syngnathidae	*Enneacampus kaupi*	LC		Yes
Syngnathiformes	Syngnathidae	*Hippocampus algiricus*	VU	A2cd+4cd	Yes
Syngnathiformes	Syngnathidae	*Hippocampus hippocampus*	DD		No
Syngnathiformes	Syngnathidae	*Microphis brachyurus*	LC		Yes
Syngnathiformes	Syngnathidae	*Syngnathus acus*	LC		No
Tetraodontiformes	Balistidae	*Balistes capriscus*	VU	A2bd	No
Tetraodontiformes	Balistidae	*Balistes punctatus*	VU	A2bd	No
Tetraodontiformes	Balistidae	*Balistes vetula*	NT		No
Tetraodontiformes	Balistidae	*Canthidermis maculata*	LC		No
Tetraodontiformes	Balistidae	*Melichthys niger*	LC		No
Tetraodontiformes	Diodontidae	*Chilomycterus reticulatus*	LC		No
Tetraodontiformes	Diodontidae	*Chilomycterus spinosus*	LC		No
Tetraodontiformes	Diodontidae	*Diodon eydouxii*	LC		No
Tetraodontiformes	Diodontidae	*Diodon holocanthus*	LC		No
Tetraodontiformes	Diodontidae	*Diodon hystrix*	LC		No
Tetraodontiformes	Molidae	*Masturus lanceolatus*	LC		No
Tetraodontiformes	Molidae	*Mola mola*	VU	A4bd	No
Tetraodontiformes	Molidae	*Ranzania laevis*	LC		No
Tetraodontiformes	Monacanthidae	*Aluterus monoceros*	LC		No
Tetraodontiformes	Monacanthidae	*Aluterus schoepfii*	LC		No
Tetraodontiformes	Monacanthidae	*Aluterus scriptus*	LC		No
Tetraodontiformes	Monacanthidae	*Cantherhines pullus*	LC		No
Tetraodontiformes	Monacanthidae	*Stephanolepis hispidus*	LC		No
Tetraodontiformes	Ostraciidae	*Acanthostracion guineensis*	LC		Yes
Tetraodontiformes	Ostraciidae	*Acanthostracion notacanthus*	DD		No
Tetraodontiformes	Tetraodontidae	*Ephippion guttifer*	LC		No
Tetraodontiformes	Tetraodontidae	*Lagocephalus laevigatus*	LC		No
Tetraodontiformes	Tetraodontidae	*Lagocephalus lagocephalus*	LC		No
Tetraodontiformes	Tetraodontidae	*Sphoeroides marmoratus*	LC		No
Tetraodontiformes	Tetraodontidae	*Sphoeroides pachygaster*	LC		No
Zeiformes	Grammicolepididae	*Grammicolepis brachiusculus*	LC		No
Zeiformes	Grammicolepididae	*Xenolepidichthys dalgleishi*	LC		No
Zeiformes	Oreosomatidae	*Allocyttus guineensis*	LC		No
Zeiformes	Oreosomatidae	*Allocyttus verrucosus*	LC		No
Zeiformes	Parazenidae	*Cyttopsis rosea*	LC		No
Zeiformes	Zeidae	*Zenopsis conchifer*	LC		No
Zeiformes	Zeidae	*Zeus faber*	DD		No
Zeiformes	Zenionidae	*Zenion hololepis*	LC		No

Appendix 2: Workshop Participants

Table A2.1 Participants at the first IUCN Red List workshop in Dakar, Senegal, 9-14 July 2012, with institutional affiliations and country of residence, organized alphabetically by family name.

Participant Name	Institution	Country
Titus Ayo Adeofe	Department of Fisheries	Nigeria
Paul Bannerman	Department of Fisheries	Ghana
Khairdine Mahamed Abdallahi Camara	Mauritanian Institute of Oceanographic Research and Fisheries (IMROP)	Mauritania
Youssouf Hawa Camara	Direction Générale du Centre National des Sciences Halieutiques de Bossoura	Guinea
Pablo Chavance	IUCN Mauritania Programme Office	Mauritania
Kadiatou Cissoko	Direction Générale du CNSHB	Guinea
Bruce B. Collette	National Marine Fisheries Service Systematics Laboratory	USA
Madeleine Diouf	IUCN Programme Marin et Cotier (MACO)	Senegal
Roger Djiman	Department of Fisheries	Benin
Mathieu Ducrocq	Gabon National Parks (ANPN)	Gabon
Massal Fall	Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT)	Senegal
Ofer Gon	South African Museum	South Africa
Heather Harwell	IUCN Marine Biodiversity Unit and Christopher Newport University	USA
Andrew Hines	IUCN Marine Biodiversity Unit and National Oceanographic and Atmospheric Administration	USA
P. Alexander Hulley	Iziko-South African Museum	South Africa
Tomio Iwamoto	California Academy of Science	USA
Ebou Mass Mbye	Department of Fisheries	Gambia
Thomas Munroe	National Marine Fisheries Service	USA
Francis K. E. Nunoo	Department of Marine & Fisheries Science, University of Ghana	Ghana
Beth Polidoro	IUCN Marine Biodiversity Unit and Arizona State University	USA
Stuart Poss	California Academy of Science	USA
Andrew Rodrigues	IUCN Headquarters	Switzerland
Barry Russell	Museum & Art Gallery of the Northern Territory	Australia
Alphonse Sagna	Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT)	Senegal
Aboubacar Sidibe	Independent Consultant	Senegal
Emilie Stump	IUCN Marine Biodiversity Unit and University of British Columbia	Canada
Mor Sylla	Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT)	Senegal
Luis Tito De Morais	Institut de Recherche pour le Développement (IRD)	France
Philippe Tous	Sub-Regional Fisheries Commission (CSRP)	Senegal
Michael Vakily	Sub-Regional Fisheries Commission (CSRP)	Senegal

Table A2.2 Participants at the second IUCN Red List workshop in Accra, Ghana, 4-9 May 2013, with institutional affiliations and country of residence, organized alphabetically by family name.

Participant Name	Institution	Country
Rachel Arnold	Northwest Indian College	USA
Jack Buchanan	IUCN Marine Biodiveristy Unit and Old Dominion University	USA
Khairdine Mahamed		
Abdallahi Camara	Mauritanian Institute of Oceanographic Research and Fisheries (IMROP)	Mauritania
Kent Carpenter	IUCN Marine Biodiveristy Unit and Old Dominion University	USA
Mia T. Comeros-Raynal	IUCN Marine Biodiveristy Unit and American Samoa Environmental Protection Agency	USA
Roger Djiman	Centre de Recherches Halieutiques et Océanologiques du Bénin	Benin
Antony S. Harold	Grice Marine Lab, College of Charleston	USA
Tomio Iwamoto	California Academy of Sciences	USA
Christi Linardich	IUCN Marine Biodiveristy Unit and Old Dominion University	USA
Ken Lindeman	Florida Institute of Technology	USA
Vanda Monteiro	Instituto Nacional de Desenvolvimento das Pescas - Cabo Verde	Cape Verde
Francis K. E. Nunoo	Department of Marine & Fisheries Science, University of Ghana	Ghana
Beth Polidoro	IUCN Marine Biodiversity Unit and Arizona State University	USA
Richmond Quartey	Marine Fisheries Research Division	Ghana
Alphonse Sagna	Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT)	Senegal
Aboubacar Sidibe	Independent Consultant	Senegal
William Smith-Vaniz	Florida Museum of Natural History, University of Florida	USA
Emilie Stump	IUCN Marine Biodiversity Unit and University of British Columbia	Canada
Mor Sylla	Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT)	Senegal
Luis Tito De Morais	Institut de Recherche pour le Développement (IRD)	France
Akanbi Williams	Nigerian Institute for Oceanography and Marine Research	Nigeria

Table A2.3 Participants at the third IUCN Red List workshop in Libreville, Gabon 7-11 July 2014, with institutional affiliations and country of residence, organized alphabetically by family name.

Participant Name	Institution	Country
Jean Noel Bibang Po Ngueba	Direction General de la Peches et d l'Agriculture (DGPA) and Centre National de la Recherche Scientifique et Technique (CENAREST)	Gabon
Kent Carpenter	IUCN Marine Biodiveristy Unit and Old Dominion University	USA
Mia T. Comeros-Raynal	IUCN Marine Biodiveristy Unit and American Samoa Environmental Protection Agency	USA
Godefroy de Bruyne	Wildlife Conservation Society (WCS)	France
Mathieu Ducrocq	Gabon National Parks (ANPN)	Gabon
Antony S. Harold	Grice Marine Lab, College of Charleston	USA
Steen Knudsen	Natural History Museum of Denmark, University of Copenhagen	Denmark
Jean de Diem Lewembe	Direction General de la Peches et d l'Agriculture (DGPA)	Gabon
Jean Edgard Mikolo	Direction General de la Peches et d l'Agriculture (DGPA)	Gabon
Jean Bernard Mougoussi	Direction General de la Peches et d l'Agriculture (DGPA)	Gabon
Jean Herve Mve Beh	Centre National de la Recherche Scientifique et Technique (CENAREST)	Gabon
Alain Nkoghe Nze	Agence Nationale du Parcs Nationaux (ANPN)	Gabon
Beth Polidoro	IUCN Marine Biodiversity Unit and Arizona State University	USA
William Smith-Vaniz	Florida Museum of Natural History, University of Florida	USA
Emilie Stump	IUCN Marine Biodiversity Unit and University of British Columbia	Canada
Luis Tito De Morais	Institut de Recherche pour le Développement (IRD)	France