Global Marine Species Assessment (GMSA)

GMSA is an international collaborative project of the International Union for Conservation of Nature (IUCN) (under the Biodiversity Assessment Unit, Species Programme/Species Survival Commission) and Conservation International (under the Center for Applied Biodiversity Science) aimed at substantially increasing the number of marine species assessed under the IUCN Red List Categories and Criteria, and to provide the information necessary in facilitating species conservation plans, global marine Hotspot analysis and the identification of marine Key Biodiversity Areas (KBAs). At the international level, GMSA is coordinated by Dr. Kent Carpenter, Professor of the Biological Sciences, based in the Old Dominion University, Norfolk, Virginia.

GMSA was established in 2005 and mandated to conduct RLA of 20,000 marine species globally by 2010. About 15 international RLA workshops have been completed, in collaboration with other species specialists and academic and research institutions. GMSA's commitment to the Philippines through FPCI's GMSA-CT is to provide technical supervision of GMSA-CT in research and analysis, and to build and strengthen capacities for the IUCN Red Listing process at the local/national (e.g., BFAR/NFRDI, DENR-PAWB) and regional (e.g., SSME or CTI) levels. Through GMSA, at least 5 international and/or regional workshops have been conducted in the Philippines, such as, the Indo-Pacific sharks RLA, also in collaboration with the IUCN Shark Specialists Group (e.g., July 2007), RLAs of the habitat-forming species such as corals (July 2007), seagrasses in collaboration with SeagrassNet (March 2008), mangroves (March 2008), and various fish groups such as wrasses and blennies (March 2009). GMSA-CT project was established in FPCI in October 2007 as the Philippine node of GMSA. More Red List training and assessment workshops are planned for 2010-2020.

First Philippine Conservation Incorporated (FPCI) and GMSA in the Philippines:

The Global Marine Species Assessment for the Coral Triangle (GMSA-CT) was launched in October 2007. It is a project by First Philippine Conservation Incorporated through its Project Center of Center, with technical and management support from Old Dominion University and CI-Philippines. Its primary goal is to support the objectives of GMSA, through preliminary secondary data collection, collation, and analysis of data pertinent to the Red listing process in the Coral Triangle area (initially within Philippines, Malaysia and Indonesia, now encompassing the six countries of the Coral Triangle Initiative to include Timor Leste, Papua New Guinea and Solomon Islands). FPCI's GMSA-CT team has been involved in the collection, review and analysis of over 700 scientific literature, publications, reports, and other references from various sources on various marine fish species. For the first year, GMSA-CT has exceeded species targets of 400 marine species entries into the SIS-DEM for GMSA. The GMSA-CT team has also been involved in the conduct of global RL training and/or assesment workshops, particularly on seagrasses and mangroves, held in March 2008, and on blennies and wrasses in March 2009.

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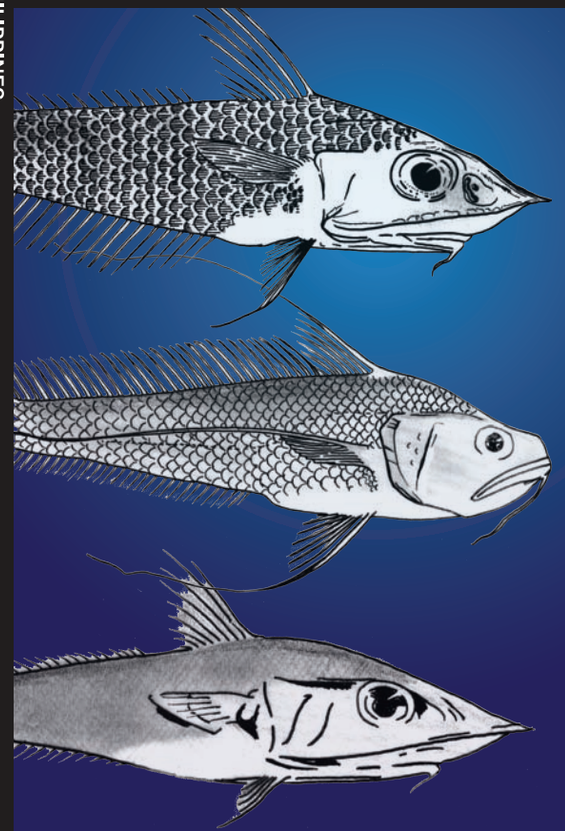
RED LIST STATUS OF MARINE ENDEMIC TELEOSTS (BONY FISHES) OF THE PHILIPPINES

RED LIST

STATUS OF MARINE ENDEMIC TELEOSTS (BONY FISHES) OF THE PHILIPPINES



Global Marine Species Assessment for the Coral Triangle

First Philippine Conservation Incorporated

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Adaptation to Climate Change & Conservation of the Biodiversity in the Philippines

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Red List Status of Marine Endemic Teleosts (Bony Fishes) of the Philippines

Global Marine Species Assessment for the Coral Triangle

First Philippine Conservation Incorporated

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LIST OF ACRONYMS

AFP	Armed Forces of the Philippines
AIMS	Australian Institute of Marine Sciences
BAU	Biodiversity Assessment Unit
BFAR	Bureau of Fisheries and Aquatic Resources
CABS	Center for Applied Biodiversity Science
CBD	Convention on Biological Diversity
CI	Conservation International
CITES	Convention on the International Trade of Endangered Species
CR	Critically Endangered
CRM	Coastal Resource Management
CTI	Coral Triangle Initiative
DA	Department of Agriculture
DAO	DENR Administrative Order
DD	Data Deficient
DENR	Department of Environment and Natural Resources
EMB	Environmental Management Bureau
EN	Endangered
FPCI	First Philippine Conservation Incorporated
GIS	Geographic Information System
GMSA	Global Marine Species Assessment
GMSA-CT	Global Marine Species Assessment for the Coral Triangle
GTZ	German Technical Cooperation (Deutsche Gesellschaft fur Technische Zusammenarbeit)
IAS	Invasive Alien Species
KBA	Key Biodiversity Area
LC	Least Concern
LGU	Local Government Unit
MFDP	Municipal Fishery Development Plan
MPA	Marine Protected Area
NBI	National Bureau of Investigation
NE	Not Evaluated
NFARMC	National Fishery and Aquatic Resources Council
NFRDI	National Fisheries Research and Development Institute
NGO	Non-Government Organization
NIPAS	National Integrated Protected Areas System
NRLC	National Red List Committee
NSAP	National Stock Assessment Project
NT	Near Threatened
IUCN	International Union for the Conservation of Nature
ODU	Old Dominion University
PCG	Philippine Coast Guard
PD	Presidential Decree
PLRC	Philippine Red List Committee
PN	Philippine Navy
PNP	Philippine National Police
PAWB	Protected Areas and Wildlife Bureau
RA	Republic Act
RLA	Red List Assessment
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SIS-DEM	Species Information Service – Data Entry Module
SSC	Species Survival Commission
SSME	Sulu-Sulawesi Marine Ecoregion
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Program
USNM	United States National Museum (now National Museum of Natural History)
VU	Vulnerable
WCMC	World Conservation Monitoring Centre
WF	WorldFish Center
WWF	World Wide Fund for Nature

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Chapter 1

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: STATUS OF INFORMATION

1

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: STATUS OF INFORMATION

The Philippine marine endemic teleosts (*i.e.*, bony fishes) are one of the first groups of fishes in the Philippines being considered for Red List assessments by the Global Marine Species Assessment for the Coral Triangle (GMSA-CT) project. This is in response to the IUCN/CI's Global Marine Species Assessment's objective of providing the global review of the threat of extinction for every marine vertebrate, plant, and selected invertebrate species. For nearly 50 years, the IUCN Species Survival Commission (SSC) has been assessing the conservation status of species, subspecies, and populations on a global scale to highlight those threatened with extinction, and, therefore, promote their conservation. The process involves a range of partners compiling and/or analyzing all existing data on marine species under consideration, and determining the risk of extinction according to the IUCN Red List Categories and Criteria disseminated through the IUCN Red List of Threatened Species.

The Philippines is the world's second largest archipelago composed of 7,107 islands and islets, with territorial waters covering about 1,968,700 sq. km. In the terrestrial realm, the Philippines is known as the center of biodiversity with a high incidence of endemicity for both plants and animals alike: 76.5% for seed plants; 61.1% for native mammals; 34.6% for birds; 68.1% for reptiles, and 74.7% for amphibians (Merrill 1923-26; Madulid 1991 and 1993; Dickerson 1928; Brown & Alcala 1978, 1980; Cox 1988; Brown *et al.* 2001; Heaney 1986, 1993; Stattersfield *et al.*, 1998; Fernando *et al.* 2003; Heaney *et al.* 2004). Heaney *et al.* (2004) attributed this high species diversity and very high level of endemicity to a combination of factors which include the geological history, patchwork of isolated islands, the tropical location of the country, and the formerly extensive rainforest areas of the country. These numbers in the terrestrial environment are reportedly increasing with coverage of more survey grounds, discovery of newer species and continuing description of Philippine flora and fauna.

In the marine realm, the Philippine Archipelago is also touted as the world's center of the center of marine shore fish biodiversity with a high degree of endemism particularly around the central Philippines (Carpenter & Springer 2005). In the 1997 Philippine Biodiversity Assessment and Action Plan, the fish group comprised the second largest marine group with estimated number of about 1,831 species (or 37%) out of the 4,951 marine species

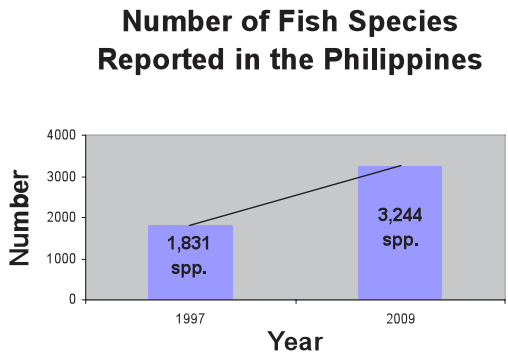


Figure 1.1. Number of fish species reported in the Philippines in 1997 and 2009. (Sources: DENR 1997; Froese and Pauly 2009).

were reported and recorded at that time (DENR 1997). About 16 species (or 0.9%) of these fishes were reported as endemics. Increased information on Philippines fishes has brought the 1997 number up to the more current record of about 3,244 fish species, the great majority of which (*i.e.*, 81%) is found in the marine environment (Froese & Pauly 2009; see Figures 1.1-1.2). Close to 4% (or 122 species) of these Philippine fishes is reported as endemics, about 25% (31 species) is recorded as marine (see Figure 1.3).

Endemicity. Endemicity is the state of being unique to a place due possibly to certain ecological reasons. An endemic species is thus one that has a relatively small extent of occurrence in certain locations (*i.e.*, restricted range species) in terms of a discrete geographical unit, such as an island, habitat type, or nation. Philippine endemics are, thus, of national significance being only found within Philippine territory, and as such, within the management confines of the Philippine government. Endemicity of a species is information-dependent. It is established based on published information available on the species in terms of occurrence and/or museum records (*i.e.*, collection

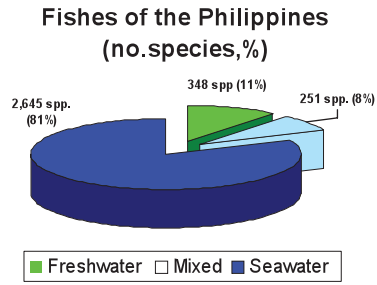


Figure 1.1. Number and percentage of fish species reported in the Philippines based on habitat types: marine, freshwater, or mixed environment. (Source: Froese and Pauly 2009).

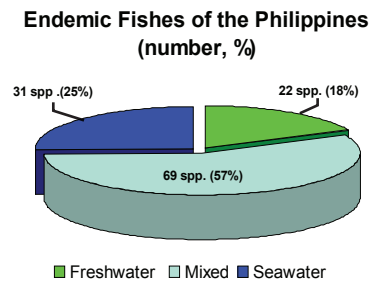


Figure 1.2. Number and percentage of endemic fish species reported in the Philippines based on habitat types: marine, freshwater, or mixed environment. (Source: Froese and Pauly 2009).

records show locations only within the Philippine territory), or photographic evidences as validated by the expert on the species.

Process for compiling endemic list for assessment. The preliminary list of species for Red List assessment in this book revolved around the 31 species initially considered as Philippine marine endemic teleosts[1] (see Appendix A). The list of endemics was initially generated from FishBase and validated through review of literature and consultation with experts on the species under consideration. Original papers describing the species were reviewed and collection sites mapped, when possible. Data collected was entered into the IUCN Species Information System-Database Entry Module (SIS-DEM) and the species assessed against the IUCN Red List Categories and Criteria.

In the course of the information review and synthesis, some species were taken off while new ones were added into the SIS-DEM (see Appendix A). A total of six species were taken off the list, as follows: 1) *Arius manillensis*, a sea catfish largely found in embayments in the Philippines but has also been recorded in Hong Kong; 2) *Plicofollis magatensis,*[2] possibly a freshwater endemic, recorded in Magat River, Bayombong; 3) *Atherinomorus regina*, the Culion silverside which was also recorded recently in Indonesia; 4) *Coelorinchus commutabilis*, which is reported in a number of areas in the Philippines but recorded also in Malaysia and Indonesia; 5) *Encrasicholina oligobranchus*, which used to be known only in the Manila Bay area but is now also reported in Indonesia; and 6) *Exyrias ferrarisi*, used to be known only from Bolinao, Pangasinan but has been recorded also in Indonesia and Vanuatu. These six species were later replaced with four others found to be endemic in the course of this research: 1) the *Equulites laterofenestra,*[3] a newly described leiognathid known only from the Samar Sea; 2) the tentacle scorpionfish *Sepastapistis taeniophyrs*, collected over 100 years ago, previously thought of as juveniles of another species, but now considered as a valid and separate species; 3) *Cirripectes viriosus*, found only in Batan Islands; and 4) *Plagiotremus iosodon,* found only in Jolo Island. Information on the latter two surfaced at the March 2009 blenny assessment workshop in Dumaguete.

In sum, a total of 29 Philippine marine bony fishes are evaluated. These species belong to 11 families under seven orders, as follows: Order Atheriniformes, one species in one family (Atherinidae, or the silversides); Order Perciformes, 10 species in five families (*i.e.*, Blennidae or the combtooth blennies, six species; Leiognathidae or slipmouths and ponyfishes, one species; Sillaginidae or the smelt-whitings, one species; Pomacanthidae or the angelfishes, one species; and Pseudochromidae or the dottybacks, one species); Order Clupeiformes,

1 Note: endemic cartilaginous fishes (sharks and rays) are not included in this list

2 Genus renamed from *Arius*.

3 Genus renamed from *Photoplagius*.

one species in one family (Family Engraulidae or the anchovies); Order Gadiformes, 14 species in one family (Family Marcrouridae, the rattails); Order Myctiphiformes, one species in one family (Family Neoscopelidae, the blackchins).Order Ophidiiformes, one species in one family (Family Bythitidae, the viviparous brotulas); Order Pleuronectiformes, one species in one family (Family Soleidae, soles or flatfishes). The list and number of Philippine marine endemic teleosts may change depending on information that becomes available on the species through time.

At least 20 species were proposed to be added to the original checklist for review and assessment after the March 2009 Blenniidae workshop. Preliminary scanning of information available for this second group of marine teleosts suggests only 15 are potentially endemic to the Philippines, as based on occurrence records (also Appendix A). Additional time and effort, however, is necessary to research more information about the species and validate this information with the species specialist. As such, the second group is not included here but will be considered for Red Listing in a later publication.

Threats and Issues. As with other marine organisms, marine endemic fishes are being affected by a wide array of naturally occurring and human-induced environmental conditions, both at local and global scales. Natural occurrences include such phenomena as typhoons, El Niño pulses, geological events, which could affect, among other things, ocean circulation, adverse meteorological events, tsunamis, which, individually or collectively change coastal landscapes and marine benthic ecosystems. Human induced environmental conditions may be more sustained and insidious, causing direct and indirect impacts to species and their habitats. Direct impacts may include physical removal of the individuals, stock or population such as resulting from fisheries operations, both target and/or incidental to other more commercially viable species. On more general terms, fisheries operations have been identified as the most important anthropogenic effect on marine biodiversity at the genetic, species, and habitat levels, negatively affecting marine organisms indirectly and directly (NRC 1995, Boehlert 1996). Overfishing is a major threat to biodiversity as it depletes resources that can lead to losses in genetic integrity, extirpation of local populations, and even extinction of species (Boehlert 1996). Some of these endemics may be taken in fisheries but there is not much information on their catches, contributing to difficulty in assessing impacts of fisheries operations on their population. However, catch trends of most fishes, particularly those in nearshore fisheries, have declined in recent years with exploitation values getting higher than the sustainable rates, strongly showing signs of overfishing. Near-shore endemics that potentially factor in fisheries, even as by-catch, are thus considered to be at higher risk of extinction than those species found in deeper and off-shore waters.

Indirect impacts, on the other hand, may include alteration, degradation and/or destruction of wild and natural habitats critical to the various life stages of the species (*e.g.*, nursery or feeding grounds). These include a number of often insidious activities such as increased coastal development (*e.g.*, dredging, clearing), sedimentation resulting from poor land-use and watershed management, sewage discharges, chemical pollution (*e.g.*, heavy metals, organochlorines), thermal pollution (*e.g.*, power-plant discharge), marine debris and garbage, nutrient loading and eutrophication from agrochemicals, and the use of destructive fishing practices (*e.g.*, blast fishing, cyanide fishing, trawling). There is little information available for evaluating potential or actual effects of habitat change thus impacts have been largely speculative. Change in the extent, amount and/or level of impact to a critical habitat, however, will be significant particularly to species with small population sizes in the wild and/or have restricted populations and localities, such as endemics. These habitat changes will consequently result in changes in species abundance and distribution and, perhaps, ultimately, cause extirpation and extinction of a species.

At the global scale, climate change exacerbates these local disturbances. The influence of global climate change on the habitat structure of all biological processes, species and ecosystems (*e.g.*, altered timing of breeding activities, shifts in distribution of species, shifts in species composition and community structures across a number of ecosystems, as well as contributing to species extinctions within important and highly sensitive ecosystems) has been documented by a number of authors (*e.g.*, Pratchett *et al.* 2008, Benton & Twitchett 2003, Sepkoski 1998). Impacts are most pronounced on coral reef ecosystems where climate-induced coral bleaching caused massive devastation to coral-reef habitats, particularly on reef-building scleractinian corals which are fundamental to the functioning of coral-reef ecosystems, contributing to primary production, nutrient recycling, and reef growth.

In a recent assessment by Carpenter *et al.* (2008), a third of the reef-building corals are facing elevated risks of extinction from climate change. Rapid build-up of carbon dioxide and other greenhouse gases in the atmosphere is leading to increases in both sea surface temperatures and acidification. Consequently, this increases the likelihood of mass coral bleaching and mortality (Hoegh-Guldbern *et al.* 2007) and decreases the ability of corals to build skeletons resulting in reduced concentrations of ocean carbonate ions in the oceans (Cooper *et al.* 2007). Local anthropogenic impacts reduce the resilience of corals to withstand global threats, resulting in global deterioration of reef structure and ability of these ecosystems to sustain their characteristic complex interaction (Hodgson 1999; Wilkinson 2004; Knowlton 2001; Gardner *et al.* 2003; Hughes *et al.* 2003; Pandoli *et al.* 2003; Bruno and Selig 2007; Hoegh-Guldbern *et al.* 2007). Impending coral loss alters the structure and dynamics of coral-reef habitats, reduces

productivity and ecosystem stability, and negatively impacts highly diverse species assemblages associated with coral reefs. More than 25% of known fish species is associated with coral reefs and are strongly influenced by the cascading trophic and ecological changes caused or exacerbated by climate-induced coral bleaching. A number of the marine endemic fishes on the list are shallow water fishes that may be affected by the global climate change phenomenon; a few of these are reef-associated, and, are thus, possibly threatened.

IUCN Red Listing. The extinction risks of marine endemic bony fishes have been assessed using the 2001 IUCN Red List Categories and Criteria, Version 3.1. These criteria have been widely used and rely primarily on population size reduction and geographic range information to classify, in an objective framework, the extinction risk of a broad range of species (methods are available at www.iucnredlist.org). Categories range from Least Concern, with very little probability of extinction, to high risk, Critically Endangered (Figure 1.4).

The threatened categories (**Critically Endangered**, **CR**; **Endangered**, **EN**; and **Vulnerable**, **VU**); are intended to serve as a means of setting priority measures for biodiversity conservation. Taxa that cannot be evaluated

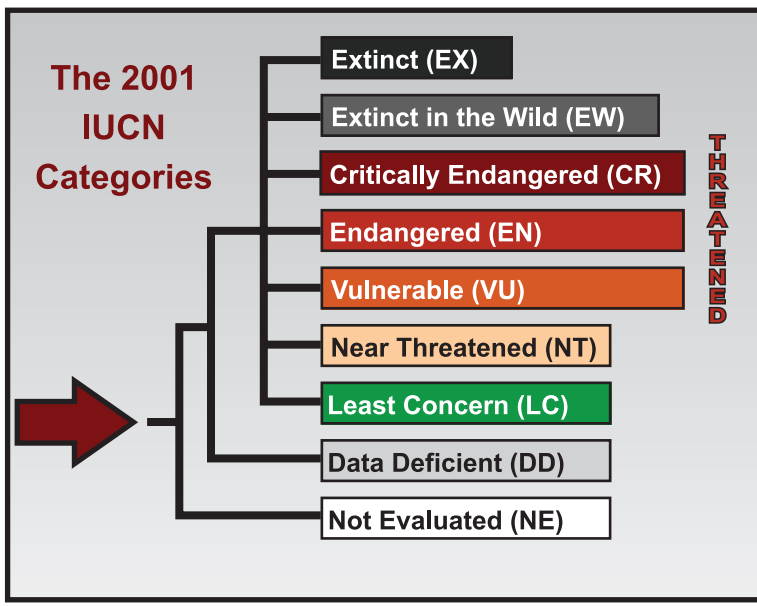


Figure 1.4. The IUCN Red List Categories. The threatened categories (*i.e.*, Critically Endangered, Endangered, and Vulnerable) are intended to serve as a means of setting priority measures for biodiversity conservation. (Source: www.iucnredlist.org).

because of insufficient information are listed as **Data Deficient** (**DD**). Those that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme are listed as **Near Threatened** (**NT**). Taxa that have been evaluated and which have a low risk of extinction are classified as **Least Concern** (**LC**). Those that have not been assessed due to lack of information are classified as **Not Assessed** (**NA**). Summary on the IUCN Red List Criteria and Categories is shown in Appendix B.

The method has been used for more than four decades by the IUCN Species Programme working with the IUCN Species Survival Commission (SSC) which has been assessing the conservation status of species, subspecies, varieties, and even selected subpopulations on a global scale in order to highlight taxa threatened with extinction, and therefore promote their conservation. Taxa assessed for the IUCN Red List are the bearers of genetic diversity and the building blocks of ecosystems. Information on their conservation status and distribution provides the foundation for making informed decisions about conserving biodiversity from local to global levels.

The IUCN Species Programme maintains the information behind the IUCN Red List in a centralized database as part of the Species Information Service (SIS). An extract of that information is publicly available via a searchable database at the IUCN Red List website (www.iucnredlist.org). The Red List Assessments of the Marine Endemic Teleosts of the Philippines are preliminary, pending acceptance from IUCN. The IUCN Red List of Threatened Species is the official and final list.

M.N.R. Alava and K.E. Carpenter

Chapter 2

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: SPECIES ACCOUNTS

2

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: SPECIES ACCOUNTS

Twenty-nine species of Philippine marine endemic bony fishes are presented here, arranged by alphabetical listing of the seven orders, then families within each order, then, genera and lastly, species. For each species there are references to junior synonyms (some of which may still be in current use or entrenched) and to common names in English and the local language or vernacular (*e.g.*, Tagalog, Cebuano, Davaoenyo, *etc.*) and provided with the upper level taxonomy (*i.e.*, Kingdom, phylum, class, order and family). For each species there is information on general distribution information, with locality point data mapped using Arcview GIS 3.1, notes on population, habitat and ecology, threats and conservation measures. The information given for each species is arranged in the following paragraphs:

Red List Status: The IUCN Red listing of the species is shown both at top of page, together with an illustration of the species, when available. Usually the illustrations are re-drawn from the original description papers of the species, the references of which are also cited. Details of the Red Listing are shown towards the end of the species information, and include the rationale or justification for the listing.

Taxonomy: The reference to the Scientific Name is given to the current valid name applied to the species, with author and date provided below it. Species with taxonomic concerns, *e.g.*, doubtful status, are excluded from the assessment.

Synonyms: All names that have been applied to the species are given, as well as some different name combinations (if significant) with author and date. The complete synonymies (*i.e.* all references in the literature) are not cited in full as they were found to be not useful in this presentation.

Common Names: For many species, only English names have are for use, when available. The local names, when available, are also provided in this paragraph and presented as a vernacular, with no details on which language or dialect. In a number of cases, a local name does not necessarily apply to the species alone but possibly to several other species and even to whole families (*e.g.*, *asuhos* for sillaginids).

Distribution: The general geographic range of the species is given in the text and on the map. Distributions are plotted on the maps based on the locality points shown in the museum catalogue of type and non-type specimens. Attempt

is made to identify the general body of water where the localities are. No attempt was made to precisely follow depth contours, although it is recognized that the benthic species in particular occur along relatively restricted isobaths. General bathymetry of the Philippine waters is shown in the maps (*e.g.*, Verde Island Passage, Sulu Sea, Bohol Sea). The upper and lower limits of the depth ranges is provided, expressed in meters.

Population: The maximum known size and where possible, the common adult size are given, as standard length (SL) or total length (TL), in cm, as reported by the taxonomic authority or taken from museum collection information. More often, there is no information available on the populations of marine endemic fishes as many are known only from the type specimens, most of which were collected between 30-100 years ago. Type localities are thus considered arbitrarily here as separate populations and, accordingly cited. Explanations for unexpected name changes of the species and/or doubtful status of species and localities are also provided here (*e.g.*, the genus *Equulites* has been changed from *Photoplagios*).

Habitat and Biology: There is not much information on the habitat and biology of the marine endemic fishes. For very many of the species almost nothing is known of feeding habits, spawning seasons and migrations. The habitats are often based on the depth ranges where the species is reported and substrate type provided based on museum data (*e.g.*, some of the collection stations of the Albatross expedition have description of the substrate type and thus are reported here). References to the species habits are provided when available (*e.g.*, reef-associated, benthopelagic), or, inferred from close relatives and surrogate species, when not available.

Threats: Possible threats as applicable to the species and its habitats are mentioned here. Threats and issues are based on those earlier discussed under "Threats and Issues."

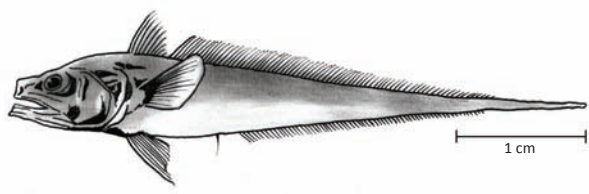
Conservation Measures: Past and present conservation measures of the species are mentioned here. As in the case of the Philippine marine endemic bony fishes, there is not much known. General recommendations are for species protection and habitat management, especially for threatened species and habitats.

Citation: It is recommended that the Red List Status of each species be cited according to the following format:

> Williams, J.T., W.F. Smith-Vaniz and P.A. Hastings. 2009. *Cirripectes viriosus,* p.16-17. In: Alava, M.N.R., K.E. Carpenter, M.J.S. Palomar, R.F.N. Quicho and B. Polidoro. (Editors). 2009. Red List Status of Marine Endemic Teleosts (Bony Fishes) of the Philippines. Global Marine Species Assessment for the Coral Triangle - First Philippine Conservation Incorporated. 108 pp.

Bibliography: Reference is made to all papers and sources on the species used in the review and assessment of the species.

DD



(Redrawn from Smith & Radcliffe, 1912)

Bathygadus sulcatus

Taxonomic Authority: Smith & Radcliffe, 1912
Synonym: *Reganas sulcata* Smith & Radcliffe, 1912

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known in the Philippines only from Sulu Sea, off Cagayan Island.

Depth (m):
Upper limit: 717
Lower limit: 970

Population

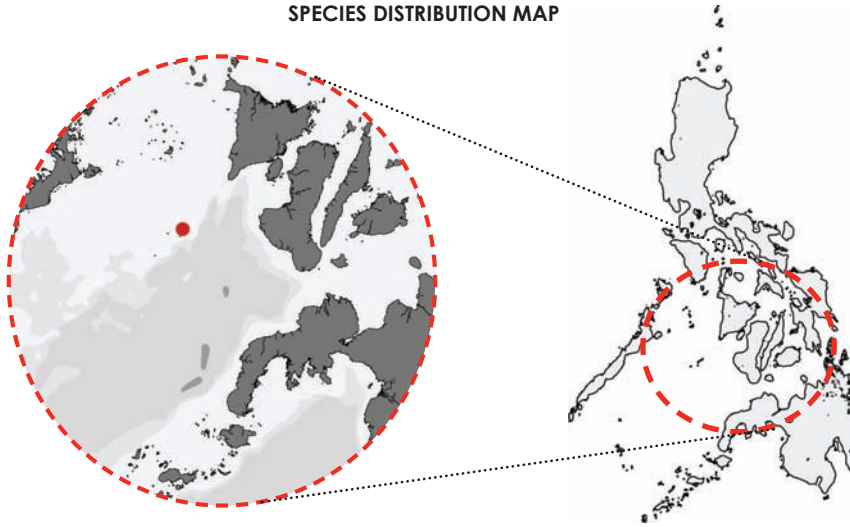
Maximum size from collected specimens is 4.4 cm (TL) (Radcliffe 1912). It is known only from the 1908 collections off Cagayan Island, Sulu Sea. Nominal record for the species is also found in Point Pinos Lighthouse, Monterey Bay, California in 1987 (Anonymous 1999) but no additional information on the species is available and needs further verification.

Habitat and Ecology

This species is bathydemersal/bentho-pelagic (Herre 1953; Cohen *et al.* 1990). The substrate of the type locality is described as gray mud and coral sand (Radcliffe 1912).

Threats

There are no major threats known to this species except possibly from fisheries. Many species under this family are taken by commercial bottom trawlers as bycatch and used either fresh or processed, for fishmeal and fish paste (Cohen *et al.* 1990).



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Bathygadus sulcatus* is a rare deep water species (*i.e.*, 717–970 m) only known from the type specimens collected off Cagayan Island (Sulu Sea) in 1908. Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is, therefore, listed as Data Deficient (DD). There are some nominal records on the species in Monterey Bay, California apparently collected in 1987 (Anonymous 1999) which need to be verified. Additional information on its population, habitat, ecology, and threats, if any, will improve understanding of its current status. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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Herre, A.W.C.T. 1953. Check list of Philippine fishes. Res. Rep. U.S. Fish Wild. Serv. (20): 977 p.

Marshall, N.B. 1973. Family Macrouridae, pp. 496–665. In: Cohen, D.M. (Ed). Fishes of the Western North Atlantic. Mem. Sears Found. Mar. Res. no. 1, pt. 6.

Okamura, O. 1970. Fauna Japonica. Macrourina (Pisces). Academic Press, Tokyo. 216 pp. 64 pls.

Radcliffe, L. 1912. Descriptions of a new family, two genera, and tweny-nine species of Anacanthine fishes from the Philippine Islands and contiguous waters. Scientific Results of the Philippine Cruise of the Fisheries Steamer Albatross, 1907–1910. No.21. Proceedings U.S. National Museum. Vol. 43 No. 1924: 105–140.

DD

Chaetodontoplus caeruleopunctatus

Taxonomic Authority: Yasuda & Tominaga, 1976
Common name: Blue-spotted angelfish (English)

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: POMACANTHIDAE

Distribution

This species is known only from Cebu, central Visayas.

Depth (m):
Upper limit:
Lower limit:

Population

Maximum size from collected specimens is 14.0 cm (TL) (Allen 1985). Available information on the species is only from the type specimen collected by an aquarium fisherman in Cebu in 1972 (Anonymous 1999; Yasuda & Tominaga 1976).

Habitat and Ecology

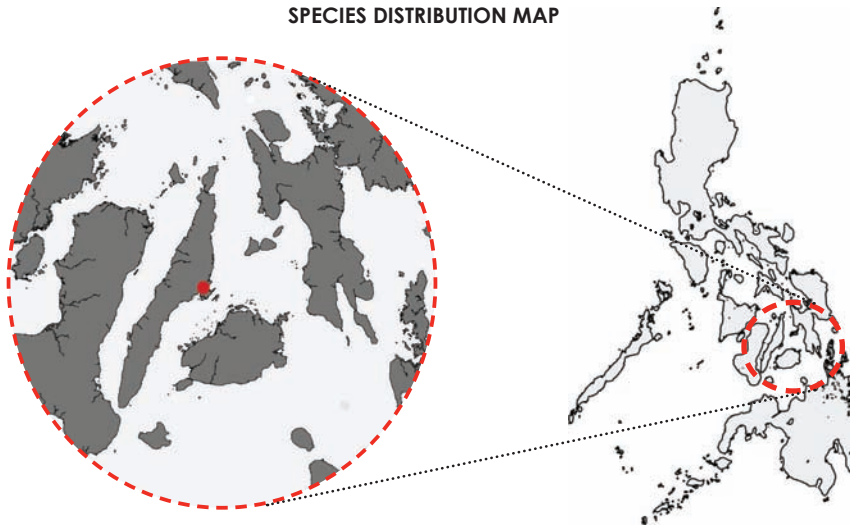
This species is reef-associated (Lieske & Myers 1994) and feeds on sponges and tunicates.

Threats

Possible threats to this species may come from habitat destruction associated with cyanide and/or blast fishing. It is exported, although rarely, through the aquarium trade (Pyle 2001).

Conservation Measures

There are no specific conservation measures in place for this species, although they may be found in MPAs. More information is also needed on the population, habitat and ecology. Catches need to be monitored in fisheries or aquarium trade when taken.



IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The blue-spotted angelfish, *Chaetodontoplus caerulupunctatus*, is evidently a rare species known only from one specimen caught off Cebu Island in 1972. There is no other record of the species despite increased fisheries activities (*e.g.*, the aquarium trade) in its locality in recent years. The species, therefore, is listed as Data Deficient (DD). The type locality should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation, if taken in fisheries and the aquarium trade.

Assessors: M.N.R. Alava and M.J.S. Palomar

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Hodgson, G. 1999. A global assessment of human effects on coral reefs. Mar. Pollut. Bull. 38, p. 345.

Lieske, E. and R. Myers. 1994. Collins Pocket Guide. Coral reef fishes. Indo-Pacific and Caribbean including the Red Sea. Harper Collins Publishers, 400 p.

Pyle, R. 2001. Pomacanthidae: Angelfishes, p. 3266–3286. In: K.E. Carpenter and V.H. Niem. (Eds.) FAO Species Identification Guide for Fishery Purposes. The Living Marine Resources of the Western Central Pacific. v. 5. Bony fishes part 3 (Menidae to Pomacentridae). Rome, FAO.

Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.A. Lachner, R.N. Lea, and W.B. Scott. 1991. World fishes important to North Americans. Exclusive of species from the continental waters of the United States and Canada. Am. Fish. Soc. Spec. Publ. (21): 243 p.

Yasuda, F. and Y. Tominaga. 1976. A new pomacanthid fish, *Chaetodontoplus caeruleopunctatus*, from the Philippines. Japanese Journal of Ichthyology. v. 23 (No. 3): 130–132.

LC

Cirripectes viriosus

Taxonomic Authority: Williams, 1988

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: BLENNIIDAE

Distribution

This species is known only from the Batanes province, off Batan Island (Balugan Bay).

Depth (m):
Upper limit: 0
Lower limit: 10

Population

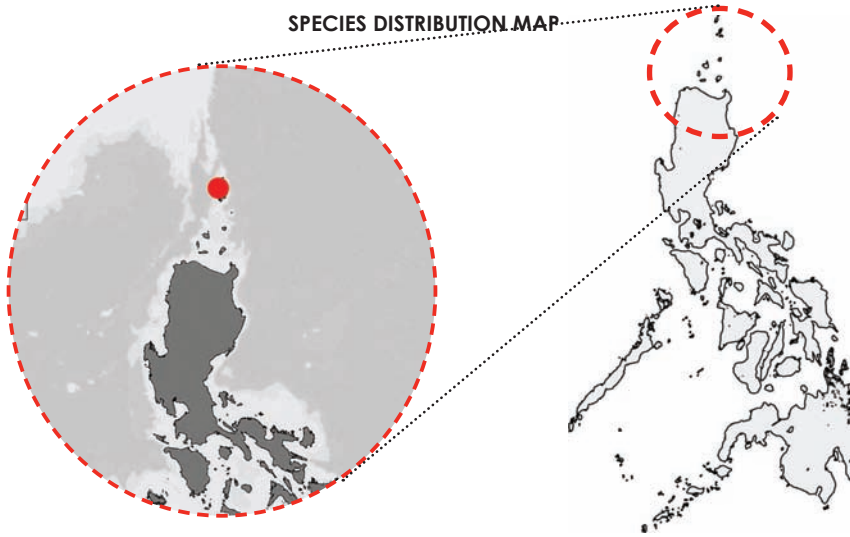
Maximum size from collected specimens is 11.5 cm (SL) (Williams 1988). This species is known only from three type specimens found in the Batan islands of the Philippines.

Habitat and Ecology

This species is known only from three type specimens collected in the surge zone among large boulders at Batan Island, Philippines. Species of the genus *Cirripectes* are small agile herbivores, commonly observed in shallow surge-zone habitats (Carlson 1980).

Threats

There are no major threats known to this species.



Conservation Measures

There are no specific conservation measures in place for this species. The Batanes group of islands in the Philippines is a designated Protected Landscape/Seascape under Philippine National Integrated Protected Areas System Act of 1992 (Wood 2007).

IUCN Red Listing

Red List Category & Criteria: **Least Concern** (version 3.1)

Rationale for the Red List Assessment

This rare blenniid species, *Cirripectes viriosus,* is known only from a few specimens in a remote location off Batanes Island, northern Philippines with very little human impact. Its area of occurrence is a designated MPA. It is, therefore, listed as Least Concern (LC).

Assessors: J.T. Williams, W.F. Smith-Vaniz and P.A. Hastings

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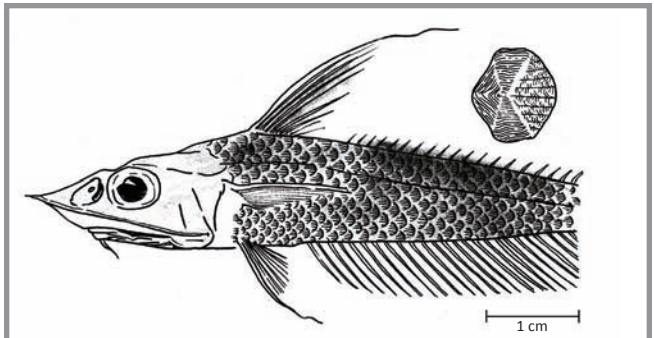
DD



(Redrawn from Gilbert & Hubbs, 1920)

Coelorinchus dorsalis

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonyms: *Caelorinchus dorsalis* Gilbert & Hubbs, 1920
Coelorynchus dorsalis Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from northern Luzon (in Font Island and Hermanos Island).

Depth (m):
Upper limit: 388
Lower limit: 421

Population

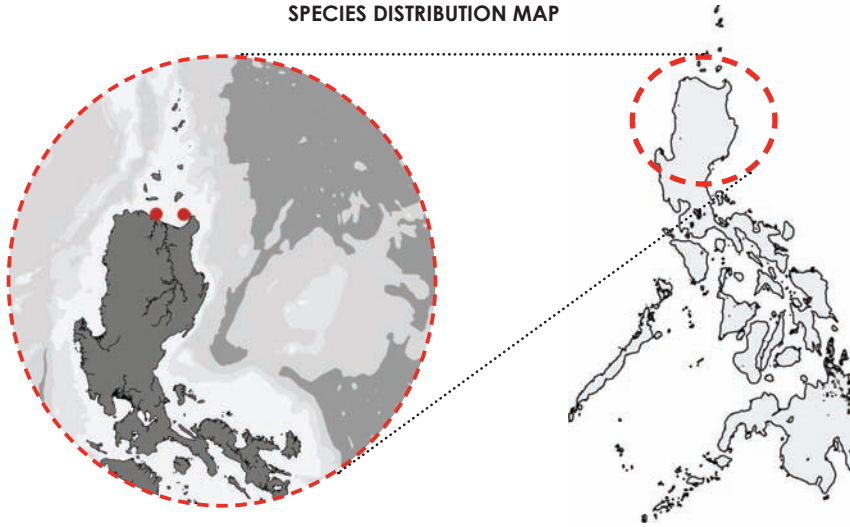
Maximum size from collected specimens is 20 cm (TL) (Gilbert & Hubbs 1920). Known information on the species is only from the 1908 collections (Anonymous 2001). According to Gilbert and Hubbs (1920), it is the only *Coelorinchus* species known from off northern Luzon that was not collected off southern Luzon during the Albatross expedition (where *C. velifer* and *C. macrolepis* were reportedly dredged in abundance).

Habitat and Ecology

This species is benthopelagic (Cohen *et al.* 1990).

Threats

There are no major threats known to this species except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste.



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coelorinchus dorsalis* is evidently a rare deep water species (*i.e.*, 388–421 m), known only from the type specimens collected off Font Island and Hermanos Island in 1908. Threats to this species are unknown, except that it is taken as bycatch in other fisheries. There is no other information available on the species and, thus, is listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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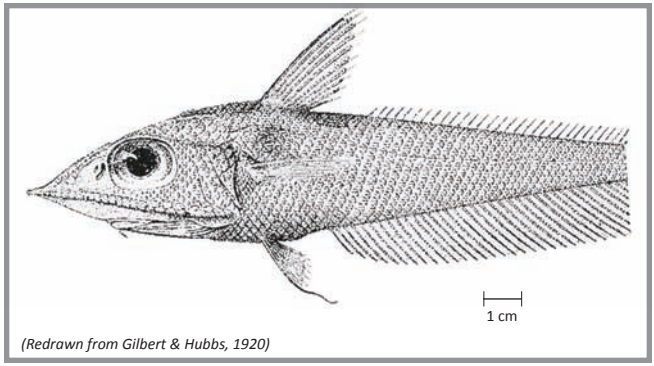
Herre, A.W.C.T. 1953. Check list of Philippine fishes. Res. Rep. U.S. Fish Wild. Serv. (20): 977 p.

Huang, Z. 2001. Marine species and their distribution in China's seas, pp. 404–463. Vertebrata. Smithsonian Institution, Florida, USA. 598 p.

Iwamoto, T. 2000. Gadiformes: Bregmacerotidae (codlets), Macrouridae (grenadiers), Moridae (deepsea cods), p. 594–595. In: J.E. Randall and K.K.P. Lim. (Eds). 2000. A checklist of the fishes of the South China Sea. Raffles Bull. Zool. (8): 569–667.

DD



(Redrawn from Gilbert & Hubbs, 1920)

Coelorinchus macrolepis

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonyms: *Caelorinchus macrolepis* Gilbert & Hubbs, 1920
Coelorynchus macrolepis Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from the Verde Island Passage (*i.e.*, Sombrero Island, Cape Santiago Light, and Malavatuan Island near China Sea).

Depth (m):
Upper limit: 432
Lower limit: 432

Population

Maximum size from collected specimens is 14.3 cm (TL) (Gilbert & Hubbs 1920). Available information on the species is only from type specimens collected in 1908–1909 (Anonymous 2001; Eschmeyer & Frickle 2008).

Habitat and Ecology

This species is benthopelagic (Cohen *et al.* 1990).

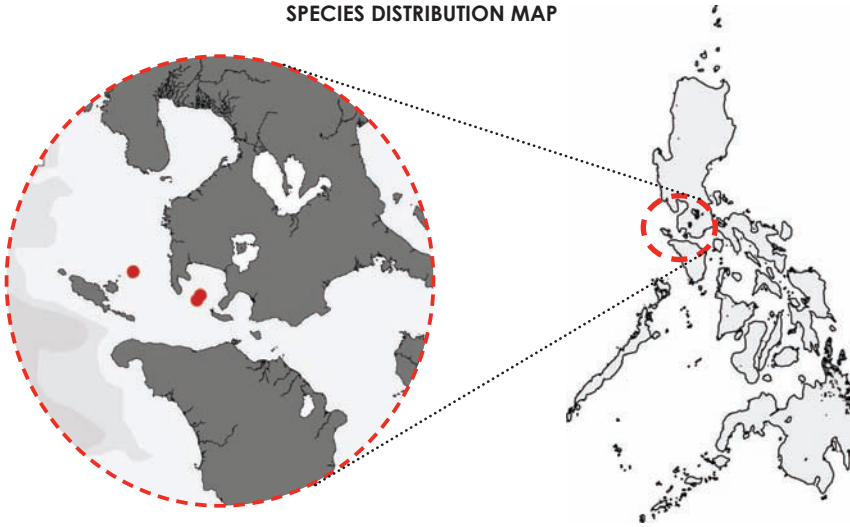
Threats

Threats are possibly from fisheries as most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et. al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste. Also a possible threat is habitat degradation caused by pollution from domestic, industrial and shipping sources.

Conservation Measures

There are no specific conservation measures in place for this species.

SPECIES DISTRIBUTION MAP



IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coelorinchus macrolepis* is a deep water species (*i.e.*, 432 m) known only from type specimens collected in 1908–1909, in a contiguous area within the Verde Island Passage. This area, however, is increasingly subjected to numerous stresses including commercial fishing activities, pollution and shipping. It is possible that the species is threatened, but for lack of available data on its population and the level of threats it is in, is listed here as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J. Palomar and M.N.R. Alava

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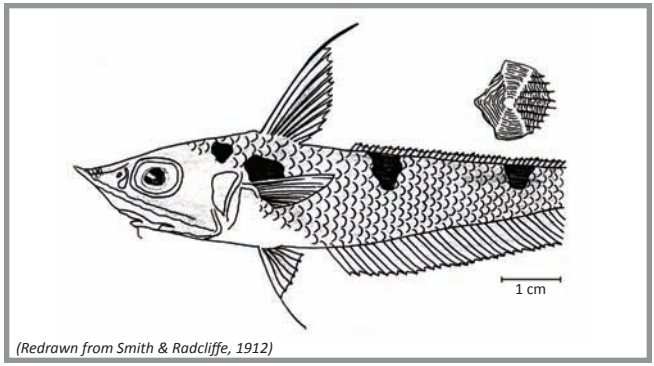
Herre, A.W.C.T. 1953. Check list of Philippine fishes. Res. Rep. U.S. Fish Wild. Serv. (20): 977 p.

Huang, Z. 2001. Marine species and their distribution in China's seas, p. 404–463. Vertebrata. Smithsonian Institution. Florida, USA. 598 pp.

Iwamoto, T. 2000. Gadiformes: Bregmacerotidae (codlets), Macrouridae (grenadiers), Moridae (deep sea cods), p. 594–595. In: J.E. Randall and K.K.P. Lim. (Eds). 2000. A checklist of the fishes of the South China Sea. Raffles Bull. Zool. (8): 569–667.

DD



(Redrawn from Smith & Radcliffe, 1912)

Coelorinchus notatus

Taxonomic Authority: Smith & Radcliffe, 1912

Synonyms: *Caelorinchus notatus* Smith & Radcliffe, 1912
Coelorhynchus notatus Smith & Radcliffe, 1912

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from the Alice Channel, Sulu Archipelago.

Depth (m):

Upper limit: 421
Lower limit: 421

Population

Maximum size from collected specimens is 27 cm (TL) (Radcliffe 1921), known only from the type specimen collected in 1908. It is apparently a rare species, being the only representative of the species in the collection (Gilbert & Hubbs 1920).

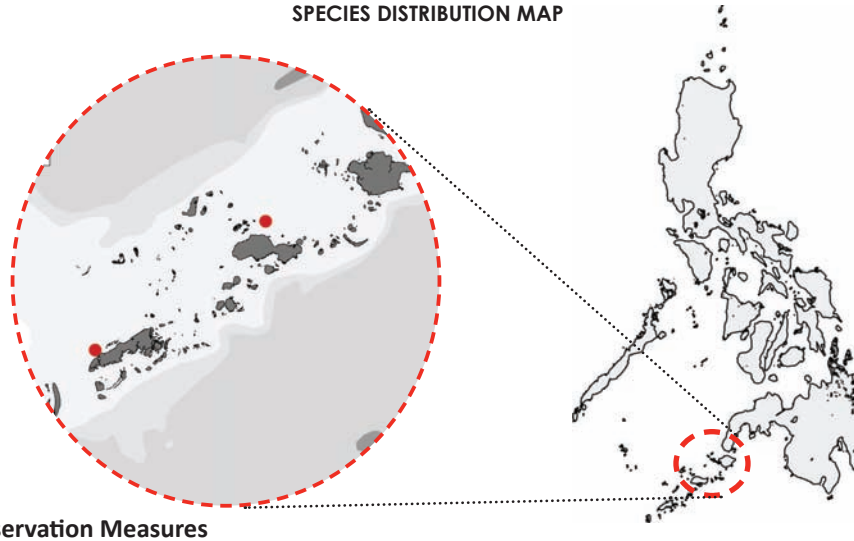
Habitat and Ecology

This species is benthopelagic (Cohen *et al.* 1990). The substrate of the type locality is described as coarse sand and broken shells (Radcliffe 1912).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste. Type specimen was collected using a beam trawl (Radcliffe 1912).

SPECIES DISTRIBUTION MAP



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coelorinchus notatus* is a rare species known only from the type specimen collected in 1908, in the deeper waters (*i.e.*, 421 m) of the Alice Channel connecting the Sulu Sea with the Sulawesi Sea. Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is, therefore, listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.N.R. Alava and M.J.S. Palomar

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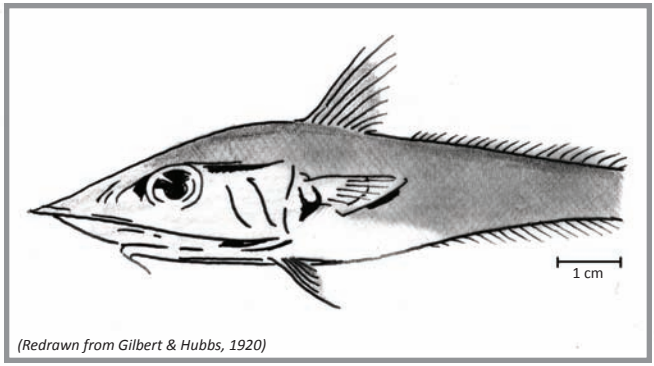
LC



(Redrawn from Gilbert & Hubbs, 1920)

Coelorinchus quincunciatus

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonyms: *Caelorinchus quincunciatus* Gilbert & Hubbs, 1920
Coelorhynchus quincunciatus Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known from the Verde Island Passage (off Malabrigo Light, east coast Mindoro; Escarceo Light near South China Sea; east of Barrio Masaging, north of Culibra Island, and southeast/east of Talaga in Batangas), Samar-Masbate (off Panalangan Point, Talajit Island and Tubig Point), Cebu Strait, and Marinduque (north of Silangan Point).

Depth (m):
Upper limit: 198
Lower limit: 296

Population

Maximum size from collected specimens is 24 cm (TL) (Iwamoto 1994 in Eschmeyer & Fricke 2008). The species is known from at least ten sites. Earliest records were from four sites in 1908–1909: in the east coast of Mindoro, Verde Island Passage (southern Luzon), Masbate, Cebu Strait and Samar-Masbate. By 1966, the species had been recollected in at least five new localities in the Verde Island Passage and one in Marinduque (Anonymous 2001).

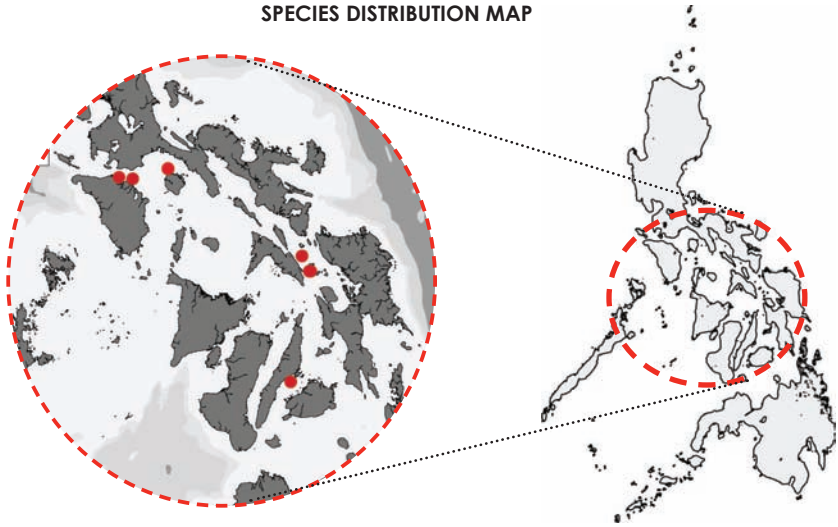
Habitat and Ecology

This species is benthopelagic (Herre 1953; Cohen *et al.* 1990).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste.

SPECIES DISTRIBUTION MAP



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Least Concern** (version 3.1)

Rationale for the Red List Assessment

The marcrourid *Coelorinchus quincunciatus* is a deep water species (*i.e.*, 198–296 m) with no known major threats, except that it is taken as bycatch in other fisheries. Although localized in the Philippines, it has a fairly wide distribution within the Philippines, *i.e.*, discovered in east coast of Mindoro, southern Luzon, Masbate, Cebu Strait and Samar-Masbate in 1908–1909, and recollected again after more than 50 years in the Verde Island Passage and Marinduque. It is, thus, listed as a species of Least Concern (LC). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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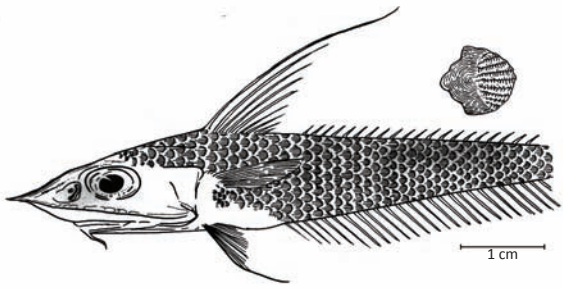
Iwamoto, T. 2000. Gadiformes: Bregmacerotidae (codlets), Macrouridae (grenadiers), Moridae (deepsea cods). p. 594-595. In: J.E. Randall and K.K.P. Lim. (Eds). 2000. A checklist of the fishes of the South China Sea. Raffles Bull. Zool. (8): 569-667.

DD



(Redrawn from Gilbert & Hubbs, 1920)

Coelorinchus sexradiatus

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonyms: *Caelorinchus sexradiatus* Gilbert & Hubbs, 1920
Coelorhynchus sexradiatus Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from Jolo and Tawi-tawi, southwestern Mindanao (off Jolo Light and Dammi Island).

Depth (m):
Upper limit: 243
Lower limit: 582

Population

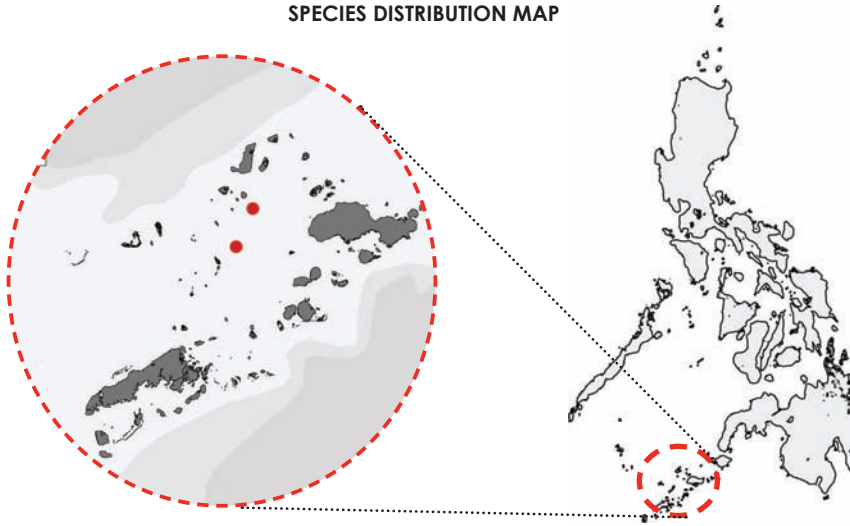
Maximum size from collected specimens is 20.5 cm (TL) (Gilbert & Hubbs 1920). Available information on the species is only from type specimens collected in 1908 (Anonymous 2001; Bogutskaya 2007).

Habitat and Ecology

This species is benthopelagic (Cohen *et. al.* 1990).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste.



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coelorinchus sexradiatus* is evidently a rare species known only from type specimens collected in 1908, from the deep waters (*i.e.*, 445–582 m) of Jolo and Tawi-tawi, southwestern Mindanao. It is also a deep water species. Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is, therefore, listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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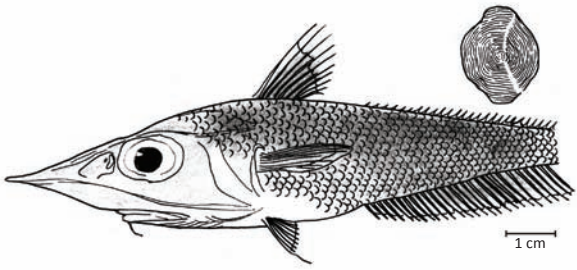
Gilbert, C. H. and C. L. Hubbs. 1920. Contributions to the biology of the Philippine Archipelago and adjacent regions. The macrouroid fishes of the Philippine Islands and the East Indies. Bulletin of the United States National Museum No. 100. v. 1 (pt 7): 369-588.

Herre, A.W.C.T. 1953. Check list of Philippine fishes. Res. Rep. U.S. Fish Wild. Serv. (20): 977 p.

LC



(Redrawn from Gilbert & Hubbs, 1920)

Coelorinchus thompsoni

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonym: *Caelorinchus thompsoni* Gilbert & Hubbs, 1920
Coelorhynchus thompsoni Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from San Bernardino Strait to San Miguel Bay (Legaspi Light), Verde Island Passage (off Sombrero Island, northwest of Maricaban Island; Balayan Bay: south of Cape Santiago, southeast of Pagapas Bay, south of Calaca town, and southeast of San Pedrino Point; and Batangas Bay: east Talaga Cove, north of Gamao Point, north of Culibra Island), Marinduque, and northern Mindanao (Tagolo Light).

Depth (m):

Upper limit: 133
Lower limit: 441

Population

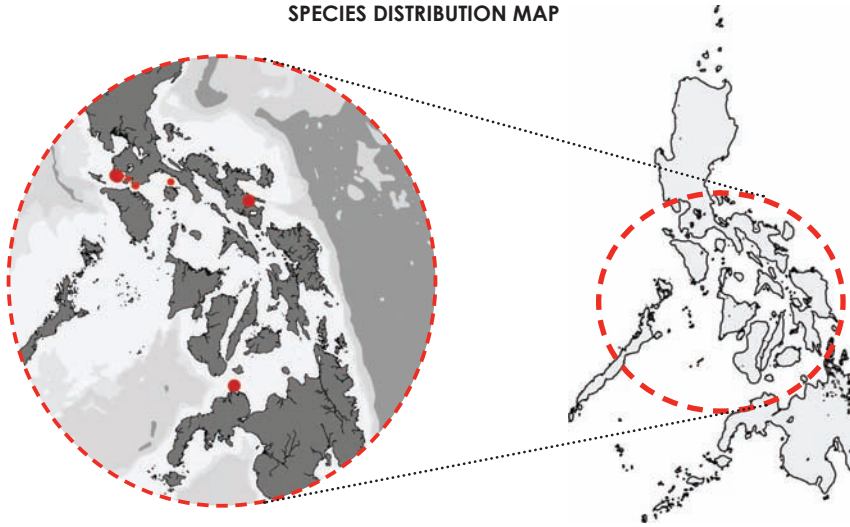
Maximum size from collected specimens is 19 cm (TL) (Gilbert & Hubbs 1920). The species is known from at least 11 localities. Earliest records were from four sites in 1908–1909: in San Bernardino Strait, Verde Island Passage, and northern Mindanao. The species was recollected in 1966 off in seven other new sites within the Verde Island Passage and also in Marinduque (Anonymous 2001; Eschmeyer and Frickle 2008).

Habitat and Ecology

This species is bathydemersal (Herre 1953) or benthopelagic (Cohen *et al.* 1990).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste.



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Least Concern** (version 3.1)

Rationale for the Red List Assessment

The marcrourid *Coelorinchus thompsoni* is a deep water species (*i.e.*, 133–441 m) with no known major threats, except that it is taken as bycatch in other fisheries. Although localized in the Philippines, it has a fairly wide distribution within the Philippines, *i.e.*, discovered in San Bernardino Strait, Verde Island Passage, in 1908–1909, and recollected after more than 50 years again in the Verde Island Passage and also in Marinduque. It is, thus, listed as Least Concern (LC). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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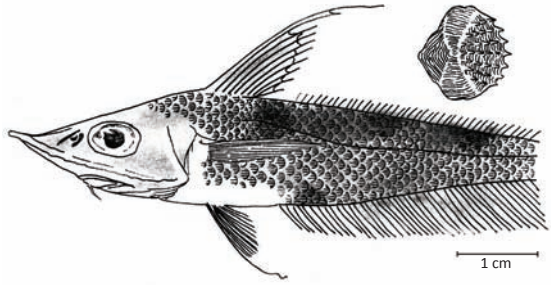
DD



(Redrawn from Gilbert & Hubbs, 1920)

Coelorinchus triocellatus

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonym: *Caelorinchus triocellatus* Gilbert & Hubbs, 1920
Coelorhynchus triocellatus Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from Tawi-tawi, southwestern Mindanao.

Depth (m):
Upper limit: 315
Lower limit: 576

Population

Maximum size from collected specimens is 19 cm (TL) (Gilbert & Hubbs 1920), known only from the 1908 specimens collected off Tawi-tawi, Mindanao.

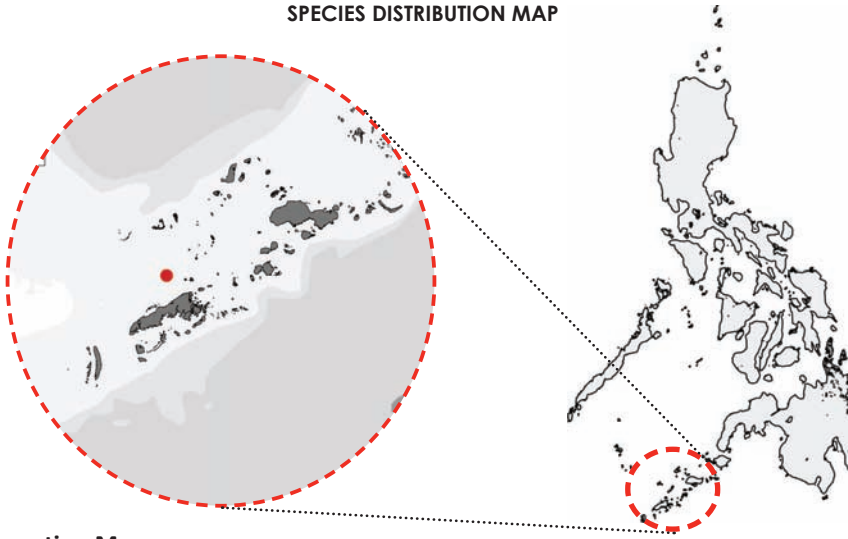
Habitat and Ecology

This species is benthopelagic (Cohen *et al.* 1990).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste.

SPECIES DISTRIBUTION MAP



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coelorinchus triocellatus* is a rare species known only from the type specimens collected in 1908 in the deep waters (*i.e.*, 576 m) off Tawi-tawi Island, southwestern Mindanao. Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is listed here as Data Deficient (DD). The type locality should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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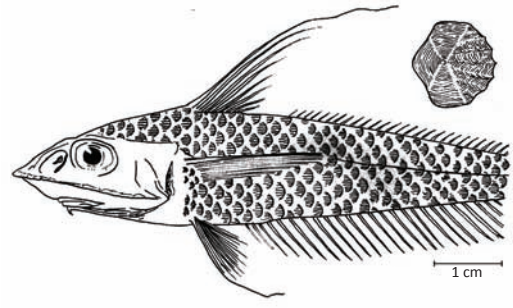
DD



(Redrawn from Gilbert & Hubbs, 1920)

Coelorinchus velifer

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonym: *Caelorinchus velifer* Gilbert & Hubbs, 1920
Coelorhynchus velifer Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from the Verde Island Passage (Escarcero Light and Matocot Point in Batangas Bay) and the Bohol Sea, northern Mindanao (in Tagolo Light and vicinity).

Depth (m):
Upper limit: 173
Lower limit: 329

Population

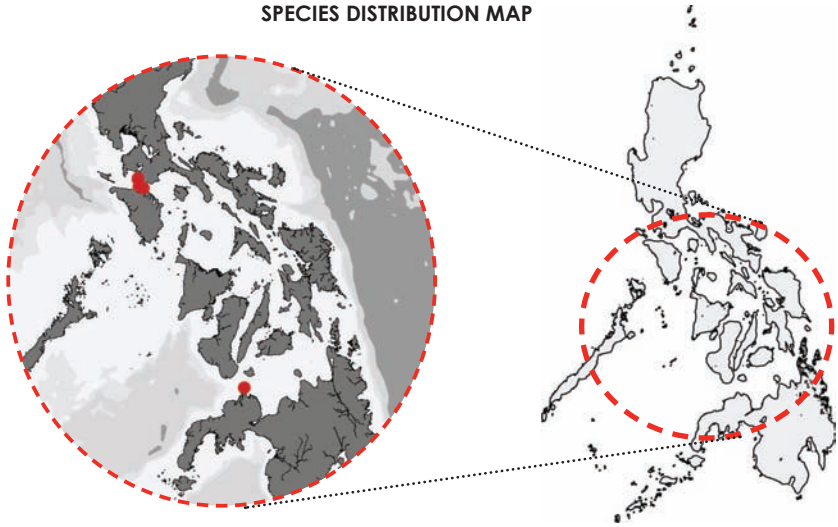
Maximum size from collected specimens is 25.1 cm (TL) (Gilbert & Hubbs 1920). It is known only from specimens collected in 1908–1909 from three sites. It is apparently more abundant in the southern Luzon area than in northern Mindanao. The young of this species is believed to inhabit shallower waters (*e.g.*, 247-329 m) while adults in deeper waters (*e.g.*, 362–446 m), with vertical range overlap (*e.g.*, 314-329 m).

Habitat and Ecology

This species is bathydemersal (Herre 1953). Substrate of the type locality is composed of broken shells, sandy, and fine black sand (Anonymous 2001; Eschmeyer & Frickle 2008).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste.



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coelorinchus velifer* is known only from type specimens collected in 1908–1909 in the deeper waters (*i.e.*, 247–446 m) of Verde Island Passage (southern Luzon: Batangas Bay) and western Bohol Sea (northern Mindanao: Tagolo Light). Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is, therefore, listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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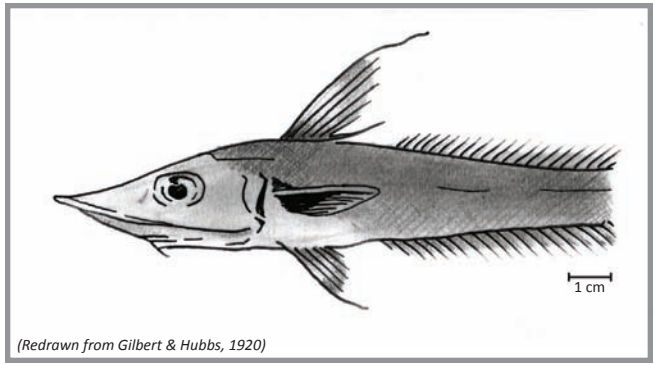
DD



(Redrawn from Gilbert & Hubbs, 1920)

Caelorinchus weberi

Taxonomic Authority: Gilbert & Hubbs, 1920

Synonym: *Caelorinchus weberi* Gilbert & Hubbs, 1920
Coelorhynchus weberi Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from Hermanos Island, off northern Luzon.

Depth (m):
Upper limit: 224
Lower limit:

Population

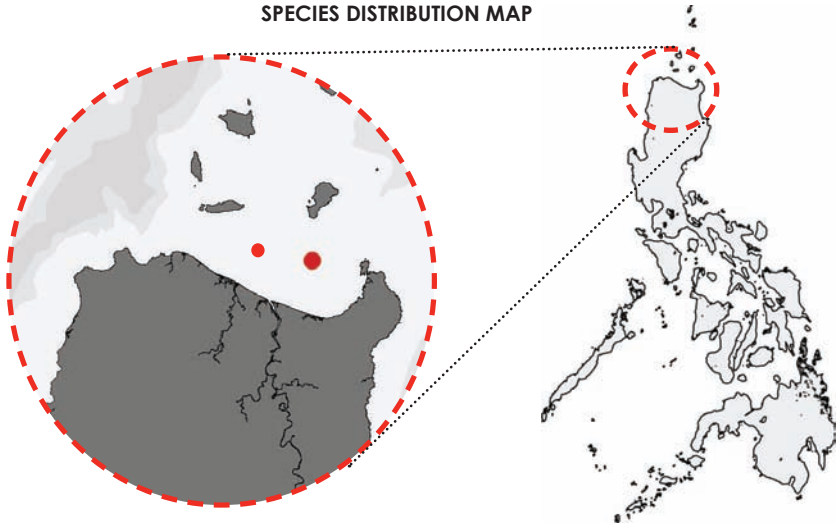
Maximum size from collected specimens is 31.5 cm (TL) (Gilbert & Hubbs 1920). It is known only from a specimen collected off Hermanos Island, northern Luzon in 1908.

Habitat and Ecology

This species is benthopelagic (Cohen *et al.* 1990).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of this genus are found in relatively shallow waters of the continental slope (*e.g.*, in depths between 150–800 m) making them susceptible to capture by commercial trawls (Cohen *et al.* 1990). Several species are taken as bycatch of trawls and utilized for fish meal or fish paste.



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coelorinchus weberi* is a rare species known only from the type species collected in 1908 from the deep waters (*i.e.*, 410 m) of Hermanos Island, northern Luzon. Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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LC

(Redrawn from Jordan & Richardson, 1908)

Congrogadus hierichthys

Taxonomic Authority: Jordan & Richardson, 1908
Synonym: *Congrogadoides hierichthys* (Jordan & Richardson, 1908)

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: PSEUDOCHROMIDAE

Distribution

This species is known from the Sulu Sea (off Cuyo Island in Palawan, Sibutu and Jolo islands in northwestern Mindanao) and southern Tañon Strait (off Dumaguete, central Visayas).

Depth (m):
Upper limit:
Lower limit:

Population

Maximum size from collected specimen is 16.0 cm (SL) (Winterbottom 1986). Earliest records of the species are from the type specimens collected in 1908 off Cuyo Island (Palawan) Jordan & Richardson (1908). It was collected in new sites in 1931 and 1937 off Dumaguete and Jolo-Sibutu Island group, recollected in 1977–1978 off Cuyo Island and in new localities off Cocoro Island (Herre 1933, 1934, 1953; Anonymous 2001). Apparently the species is widespread around the Sulu Sea rim.

Habitat and Ecology

This species is probably demersal. Other members of this family are reported to remain near crevices or among rubble and feed on small invertebrates and fishes (Nelson 1994).

Threats

Threats are possibly from habitat degradation or destruction caused by coastal development and pollution.

Conservation Measures

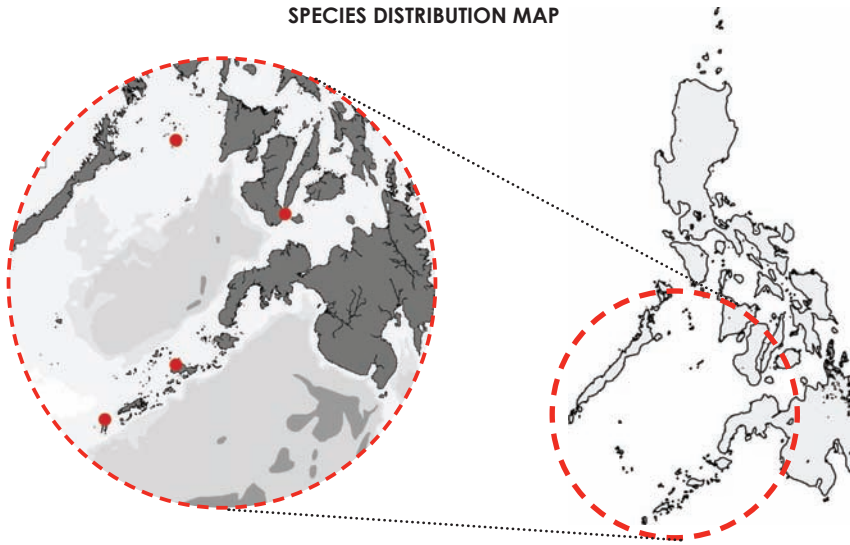
There are no specific conservation measures in place for this species. MPAs may be located in the areas where the species is found.

IUCN Red Listing

Red List Category & Criteria: **Least Concern** (version 3.1)

Rationale for the Red List Assessment

The pseudochromid *Congrogadus hierichthys* is a very shallow-water species (*i.e.*, 1.2 m) possibly subjected to threats from coastal development



and pollution. However, it has a fairly wide distribution around the Sulu Sea rim. The species may also be protected if found in MPAs. It is, thus, listed as a species of Least Concern (LC). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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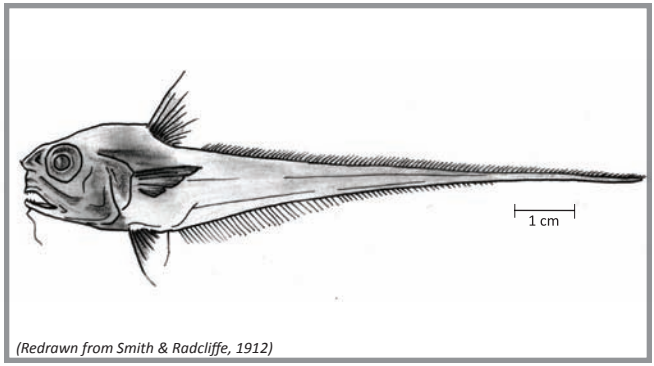
DD



(Redrawn from Smith & Radcliffe, 1912)

Coryphaenoides camurus

Taxonomic Authority: Smith & Radcliffe, 1912
Synonym: *Macrourus camurus* Smith & Radcliffe, 1912

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from western Sulu Sea (off eastern Palawan Island).

Depth (m):
Upper limit: 2022
Lower limit: 2022

Population

Maximum size from collected specimens is 10.2 cm (TL) (Radcliffe 1912; Gilbert & Hubbs 1912). The species is known only from the type collected off eastern Palawan Island in 1909.

Habitat and Ecology

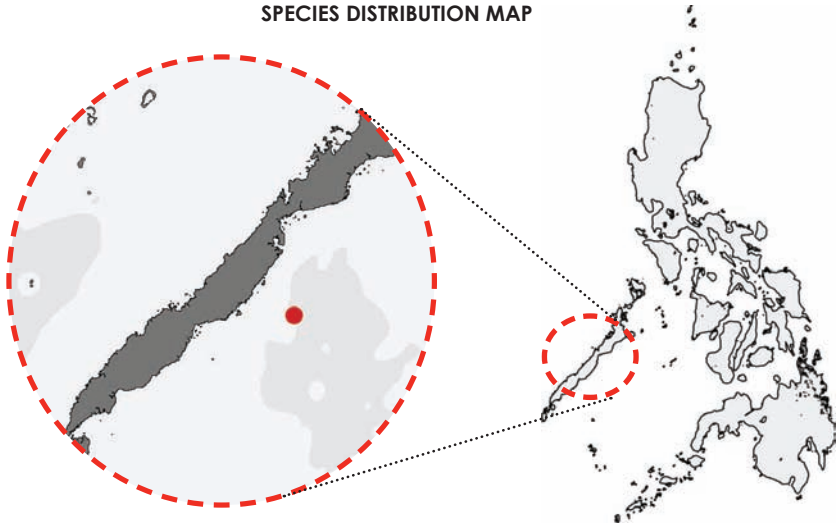
This species is bathypelagic. The substrate of the type locality is described as composed of gray mud (Radcliffe 1912).

Threats

There are no major threats known to this species, except possibly from fisheries. Many species under this family are taken by commercial bottom trawlers as bycatch and used either fresh or processed, for fishmeal and fish paste (Cohen *et al.* 1990).

Conservation Measures

There are no specific conservation measures in place for this species.



IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coryphaenoides camurus* is a very rare species known only from type specimens collected in 1909 in deeper water (*i.e.*, 2022 m) off eastern Palawan (Sulu Sea). Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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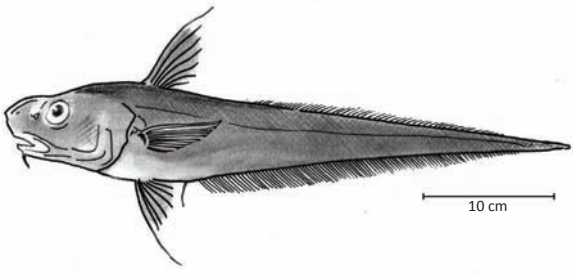
DD



(Redrawn from Smith & Radcliffe, 1912)

Coryphaenoides dubius

Taxonomic Authority: Smith & Radcliffe, 1912
Synonym: *Macrourus dubius* Smith & Radcliffe, 1912

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only in Iligan Bay, off Camp Overton Light.

Depth (m):
Upper limit: 750
Lower limit: 750

Population

Maximum size from collected specimen is 42.5 cm (TL) (Radcliffe 1912; Gilbert & Hubbs 1912). The species is known only from a type collected in Iligan Bay in 1909.

Habitat and Ecology

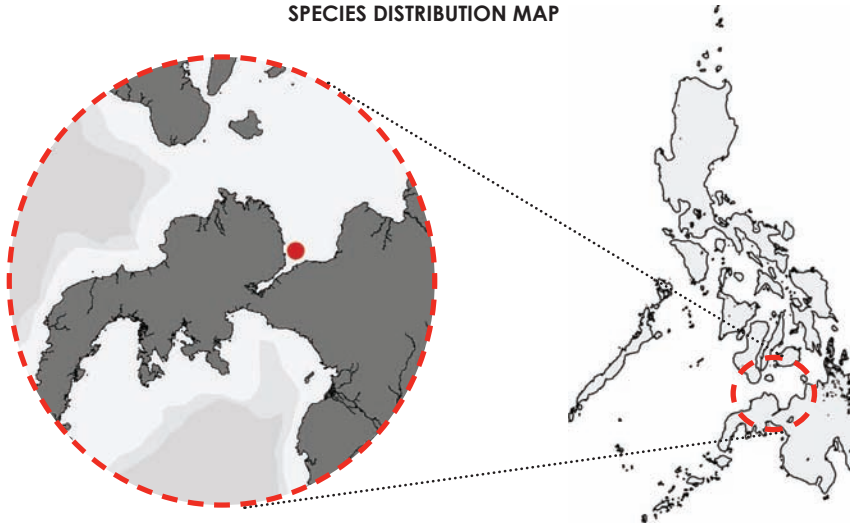
This species is bathypelagic. The substrate of the type locality is described as gray mud and fine sand (Radcliffe 1912).

Threats

There are no major threats known to this species, except possibly from fisheries. Many species under this family are taken by commercial bottom trawlers as bycatch and used either fresh or processed, for fishmeal and fish paste (Cohen *et al.* 1990).

Conservation Measures

There are no specific conservation measures in place for this species.



IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Coryphaenoides dubius* is a very rare species known only from a type specimen collected in 1909 in the deeper water (*i.e.*, 750 m) of Iligan Bay, Mindanao. Threats to this species are unknown except that it is taken as bycatch in other fisheries. It is listed as Data Deficient (DD). The type locality should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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LC

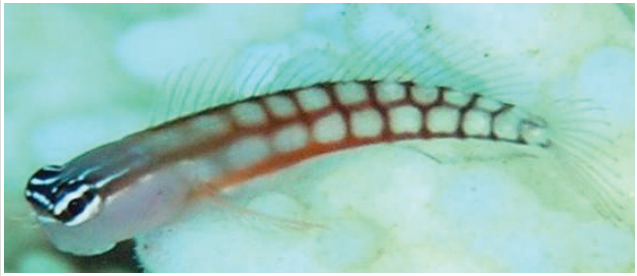


Photo by Brian Stockwell

Ecsenius dilemma

Taxonomic Authority: Springer, 1988
Common name: Philippine blenny

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: BLENNIIDAE

Distribution

This species is known only in the Verde Island Passage (off Caban Island and Sombrero Island in Batangas), and the southern part of Tañon Strait (off Pescador Island, Liloan Point, and Sumilon between southern Cebu and Negros Oriental). This species is also known in the Spratly Islands, South China Sea, based on a colored photograph (Springer & Allen 2004).

Depth (m):

Upper limit: 1
Lower limit: 34

Population

Maximum size from the collection is 3.1 cm (SL) (Springer 1988); 4.6 cm (TL) reported from photos (Randall 1997). This species was discovered in 1979 in at least two localities in southern Tañon Strait. It is uncommon (Stockwell, B. pers comm.) but apparently wide-spread and abundant.

Habitat and Ecology

This species is found on coral reefs at depths between 1–34 m. (Allen pers comm.; Springer 1988; Ferraris 1980 in Anonymous 2001). *Ecsenius* juveniles and adults are almost entirely restricted to subtidal habitats with living coral. Little information is available on the reproductive habits and the early life history of species of this genus (Springer 1988).

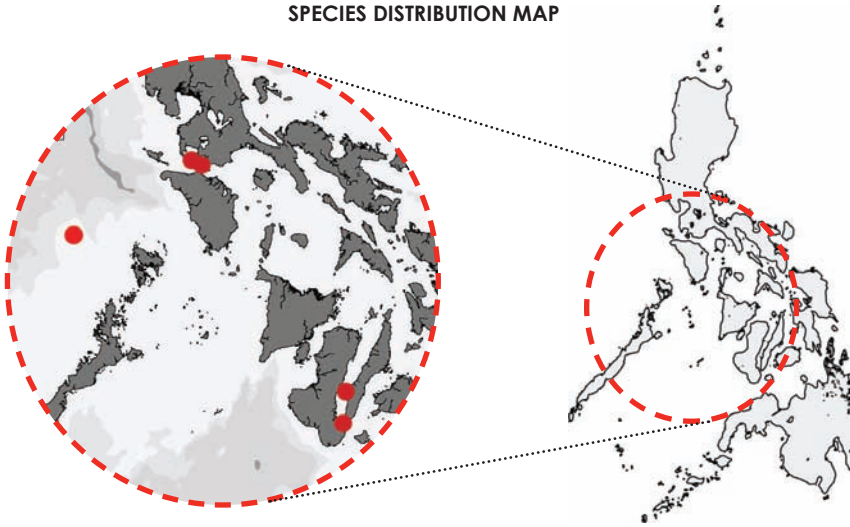
Threats

There are no major threats known to this species, although most species of *Ecsenius* are likely to be collected for the aquarium trade.

Conservation Measures

There are no specific conservation measures in place for this species. Its distribution overlaps several MPAs within its range.

SPECIES DISTRIBUTION MAP



IUCN Red Listing

Red List Category & Criteria: **Least Concern** (version 3.1)

Rationale for the Red List Assessment

The blenniid species, *Ecsenius dilemma,* is uncommon but has a fairly wide distribution in the Philippines and Spratly islands and although it is likely to be collected for the aquarium trade, there is not likely to be much pressure throughout its entire distribution (not much aquarium activity in the Spratly islands yet, Stockwell, B. pers comm). This species is considered Least Concern (LC). However, if aquarium activity picks up in the Spratly islands, species listing needs to be reconsidered.

Assessors: J.T. Williams, W.F. Smith-Vaniz, P.A. Hastings, and B. Stockwell

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VU

Ecsenius kurti

Taxonomic Authority: Springer, 1988

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: BLENNIIDAE

Distribution

This species is known only from northern Sulu Sea (off Bararin Island, western side of Cuyo Island, and Tagauayan Island).

Depth (m):
Upper limit: 0
Lower limit: 34

Population

Maximum size from collected specimens is 3.5 cm (SL) (Springer 1988). Discovered only in 1978, the species was only described in 1988. Although it is known only in two adjacent localities in Cuyo Islands (Anonymous 2001), it is locally common and abundant (Williams, J. pers comm.).

Habitat and Ecology

Most species of *Ecsenius* are found on coastal fringing reefs and lagoons to 10 m.; solitary or in small groups on coral outcroppings. For most species of *Ecsenius*, juveniles and adults are almost entirely restricted to subtidal habitats with living coral. Little information is available on the reproductive habits and the early life history of species of this genus (Springer 1988).

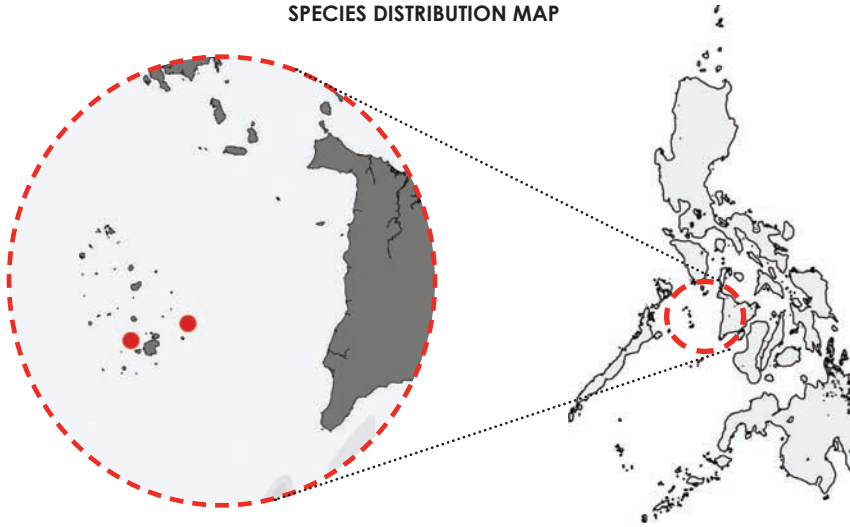
Threats

This species is likely to be collected for the aquarium trade.

Conservation Measures

There are no specific conservation measures in place for this species.

SPECIES DISTRIBUTION MAP



IUCN Red Listing

Red List Category & Criteria: **Vulnerable D2** (version 3.1)

Rationale for the Red List Assessment

This rare blenniid species, *Ecsenius kurti,* is found in very shallow-water reef habitats (*i.e.*, 0-34 m) and is known only from specimens collected off two adjacent localities in the Sulu Sea (*i.e.*, Bararin and Tagauayan islands). It is likely to be targeted for the aquarium trade. Based on its restricted distribution and potential threat from aquarium collection, it is listed as Vulnerable (VU) under D2. It is recommended that surveys and monitoring be done on the status of the populations of this species.

Assessors: J.T. Williams, W.F. Smith-Vaniz and P.A. Hastings

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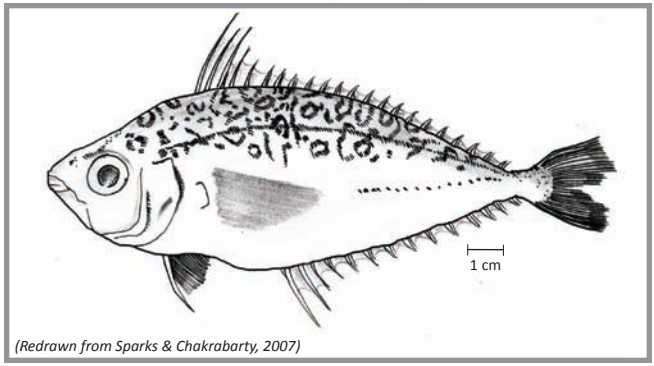
DD



(Redrawn from Sparks & Chakrabarty, 2007)

Equulites laterofenestra

Taxonomic Authority: Sparks & Chakrabarty, 2007
Synonym: *Photoplagios laterofenestra* Sparks & Chakrabarty, 2007

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: LEIOGNATHIDAE

Distribution

This species is known only from the Samar Sea, north of Carigara Bay, Leyte.

Depth (m):
Upper limit: 0
Lower limit: 86

Population

Maximum size from collected specimens is 12.8 cm (SL) (Sparks & Chakrabarty 2007), known only from the single lot of specimens collected from Carigara Bay, Leyte. Members of the family are common in shallow coastal waters and tidal creeks where they feed on benthic invertebrates (Nelson 1994).

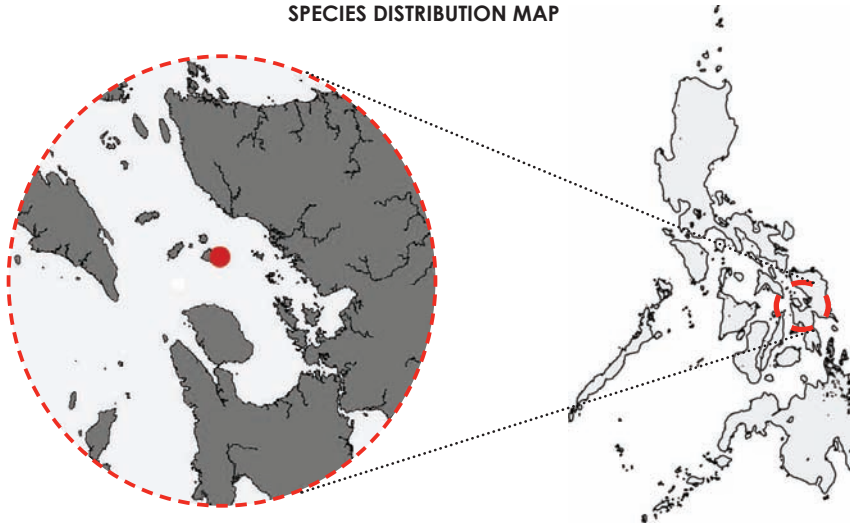
Habitat and Ecology

This species is pelagic-neritic (Sparks & Chakrabarty 2007).

Threats

There are no major threats known to this species, except possibly from fisheries. Most members of the family are easily caught by trawls or beach seines. It is an important artisanal food fish (Nelson 1994). Locally, members of the family are subjected to artisanal and/or commercial fisheries, marketed fresh or dried, for human consumption. Most members show signs of being overfished.

SPECIES DISTRIBUTION MAP



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The leiognathid, *Equulites laterofenestra*, is a new species of ponyfish found in the Samar Sea, described only in 2007. Except for the original description of this species, there is no data on its population, habitat and ecology. Other members of the family are already taken in the local fisheries and are marketed fresh or dried. It is possible that the species may be taken in these fisheries also but not recorded or may be confused with other similar looking species. It is, thus, listed as Data Deficient (DD). The type locality should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: L.R. Casten and M.N.R. Alava

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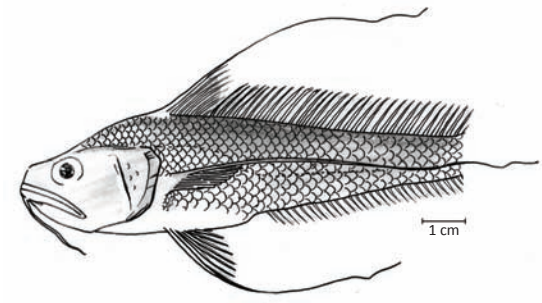
DD



(Redrawn from Gilbert & Hubbs, 1920)

Gadomus magnifilis

Taxonomic Authority: Gilbert & Hubbs, 1920

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known only from Sogod Bay (off Limasawa Island, southern Leyte), Sulu Sea (off Cagayan Island, and Jolo Island) and off northern Mindanao.

Depth (m):

Upper limit: 929
Lower limit: 1281

Population

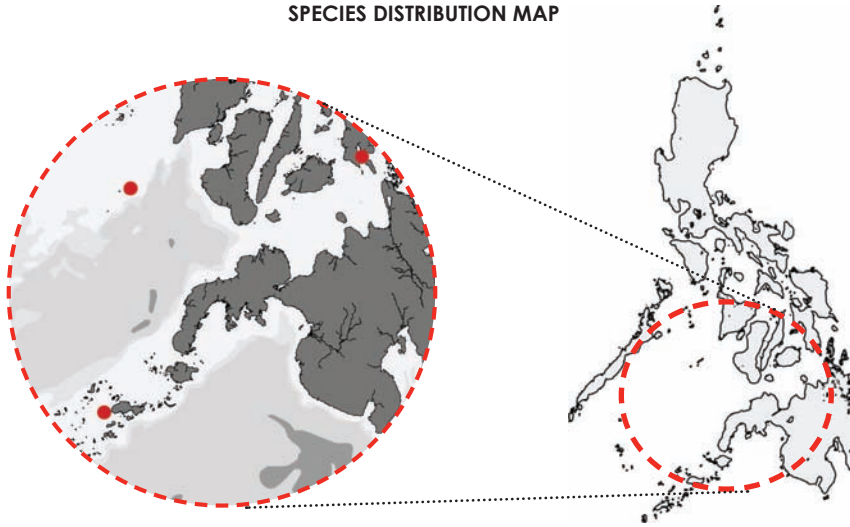
Maximum size reported is at 10.3 cm (SL) and 33.7 (TL) (Gilbert & Hubbs 1920). Only known from type specimens collected in 1908-1909 (Anonymous 2001; Gilbert & Hubbs 1920).

Habitat and Ecology

This species is recorded as bathydemersal (Herre 1953) or benthopelagic (Cohen *et al.* 1990).

Threats

There are no major threats known to this species, except possibly from fisheries. Many species under this family are taken by commercial bottom trawlers as bycatch and used either fresh or processed, for fishmeal and fish paste (Cohen *et al.* 1990).



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The macrourid *Gadomus magnifilis* is a deep water species (*i.e.*, 929–1281 m) known only from type specimens collected in 1908–1909 in three localities in the Sogod Bay, Sulu Sea and northern Mindanao) and the western Bohol Sea (northern Mindanao). Threats to this species are unknown, except that it is taken as bycatch in other fisheries. It is listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.N.R. Alava and M.J.S. Palomar

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DD

Hypoatherina crenolepis

Taxonomic Authority: Schultz, 1953

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: ATHERINIFORMES
Family: ATHERINIDAE

Distribution

This species is known only from Mindoro Strait (off Tara Island, northern Palawan) and southern Sulu Sea (off Papatog islands in Tawi-tawi).

Depth (m):
Upper limit:
Lower limit:

Population

Maximum size from collected specimens is 5.7 cm (TL) (Ivantsoff & Crowley 1999). Only records of the species are from the type specimens collected in 1908 off Tara and Papatog islands in Tawi-tawi, southwestern Mindanao (Schultz 1953).

Habitat and Ecology

Crenulated silversides are pelagic-neritic, inhabiting close inshore waters around islands (Ivantsoff & Crowley 1999). They may be taken as forage fish by larger commercial species (Froese & Pauly 2008).

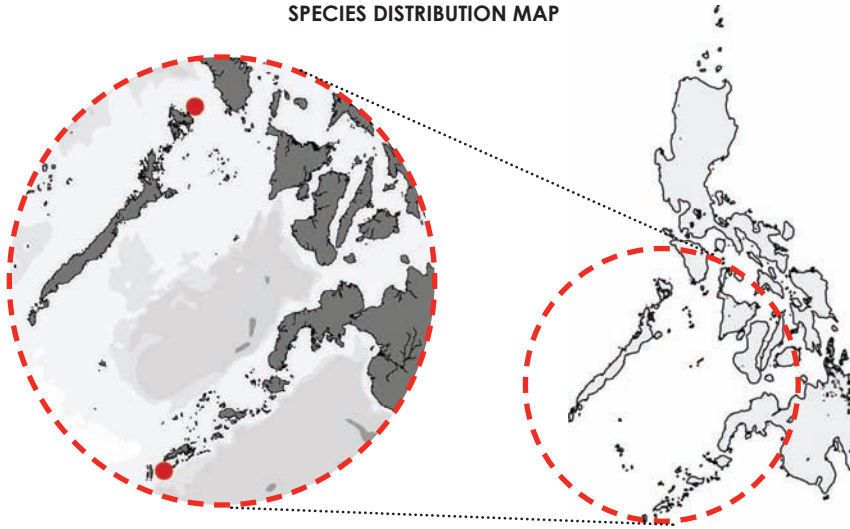
Threats

Major threats to this species may come from habitat degradation or destruction. They have no known commercial value but may also be used as dried pet food or as bait (Froese & Pauly 2008).

Conservation Measures

There are no specific conservation measures in place for this species.

SPECIES DISTRIBUTION MAP



IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The crenulated silverside, *Hypoatherina crenolepis*, is a rare species known only in two localities off Tara and Papatog islands, southwestern Mindanao. Threats to this species are unknown, except probably from habitat destruction affecting most atherinids. However, there is not enough data on the population as the only known records are from the 1908 collection. It is, thus, listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: L.R. Casten and M.N.R. Alava

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LC

Istiblennius colei

Taxonomic Authority: Herre, 1934

Synonym: *Salarias colei* Herre 1934
Salarias martini Herre, 1942

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: BLENNIIDAE

Distribution

This species is known from the Sulu Sea (*i.e.*, Culion Island, and Buluang Bay and Busuanga Island in the Calamianes Island Group) and the Guimaras and Panay islands (*i.e.*, off Estancia). It is considered to have the most restricted range of all the species of *Istiblennius* and *Blenniella*.

Depth (m):
Upper limit: 0
Lower limit: 2

Population

Maximum size from collected specimen is 11.8 cm (SL) (Springer & Williams 1994). This species was previously known only from the type series of its two nominal synonyms, collected more than 50 years ago. Although Springer & Williams (1994) speculated that this species might be extinct, it was subsequently collected from Guimaras and Calamianes group of islands (Williams, J. pers comm). [Nominal record for the species occur in Koh Samit, Thailand in 1900 (Anonymous 2001b) but no additional information on the species is available and needs further verification.]

Habitat and Ecology

This species is common in rocky shore habitats around Calamianes islands (J. Williams, pers. comm.).

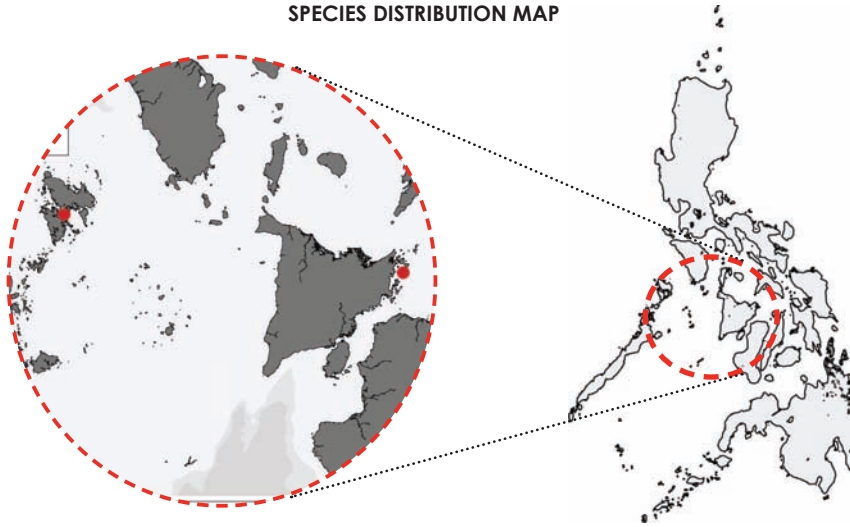
Threats

There are no major threats known to this species. Species of *Istiblennius* and *Blenniella* are of minor commercial importance because of their small size (Springer 2001).

Conservation Measures

There are no specific conservation measures in place for this species. Its distribution overlaps MPAs within its range.

SPECIES DISTRIBUTION MAP



IUCN Red Listing

Red List Category & Criteria: **Least Concern** (version 3.1)

Rationale for the Red List Assessment

Although *Istiblennius colei* is known only from two locations in the Philippines there are no known current threats to its population. This is an intertidal species that is likely to thrive in disturbed habitat that involves increased hard substrates such as rip rap. Because it is in a surf zone, it is not likely to be collected for aquarium trade or subsistence fisheries. It is listed as Least Concern (LC). However, directed monitoring is highly recommended for this species.

Assessors: J.T. Williams, W.F. Smith-Vaniz and P.A. Hastings

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VU

Paradiancistrus cuyoensis

Taxonomic Authority: Schwarzhans, Møller & Nielsen, 2005
Common name: Cuyo coralbrotula (English)

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: OPHIDIIFORMES
Family: BYTHITIDAE

Distribution

This species is known only from the Sulu Sea (off Cocoro Island in the Cuyo Island Group, Palawan) and Bohol Sea (off Pamilacan Island, southern Bohol).

Depth (m):

Upper limit: 0
Lower limit: 33

Population

Maximum size ranges are 3.6 cm and 5.7 cm (SL) (Schwarzhans *et al.* 2005). The Cuyo coralbrotula is a relatively new species discovered only in 1978 from two localities. It is one of two newly described species under a newly described genus *Paradiancistrus* of the family Bythitidae.

Habitat and Ecology

This species is reef-associated.

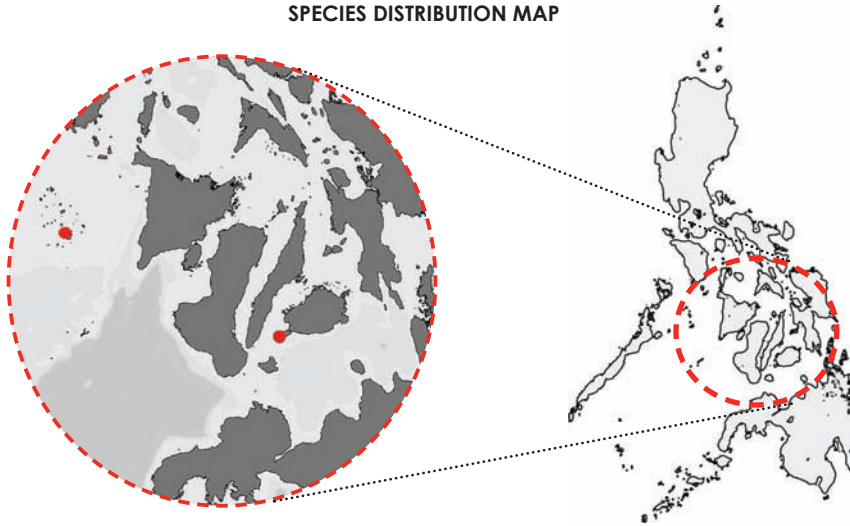
Threats

Threats are from habitat destruction or degradation. Coral reef habitats are already vulnerable to threats from climate change and other various anthropogenic disturbances (Carpenter *et al.* 2008; Wilkinson 2004; Hodgson 1999). Coral loss and degradation may alter the structure and dynamics of coral-reef habitats, negatively impacting highly diverse assemblages of species that associate with coral reefs (Pratchett *et al.* 2008).

Conservation Measures

There are no specific conservation measures in place for this species. MPAs may be located in the coral reef areas where the species is found.

SPECIES DISTRIBUTION MAP



IUCN Red Listing

Red List Category & Criteria: **Vulnerable D2** (version 3.1)

Rationale for the Red List Assessment

The Cuyo coralbrotula, *Paradiancistrus cuyoensis*, is a relatively new species which is a reef-associate and known only from two type localities, *i.e.*, Cuyo and Bohol islands. Its shallow-water reef habitat is vulnerable to various threats from climate change and various anthropogenic disturbances (Carpenter *et al.* 2008; Wilkinson 2004; Hodgson 1999). Until more information is available on the species, it is listed as Vulnerable (VU) under D2. It is recommended that surveys and monitoring be done on the status of the populations of this species. Conservation actions for the species should include habitat management and/or protection.

Assessors: M.N.R. Alava and L.R. Casten

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DD

Plagiotremus iosodon

Taxonomic Authority: Smith-Vaniz 1976

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: BLENNIIDAE

Distribution

This species is known only from one locality in southern Sulu Sea (Jolo Island: Tutu Bay).

Depth (m):
Upper limit: 3
Lower limit: 9

Population

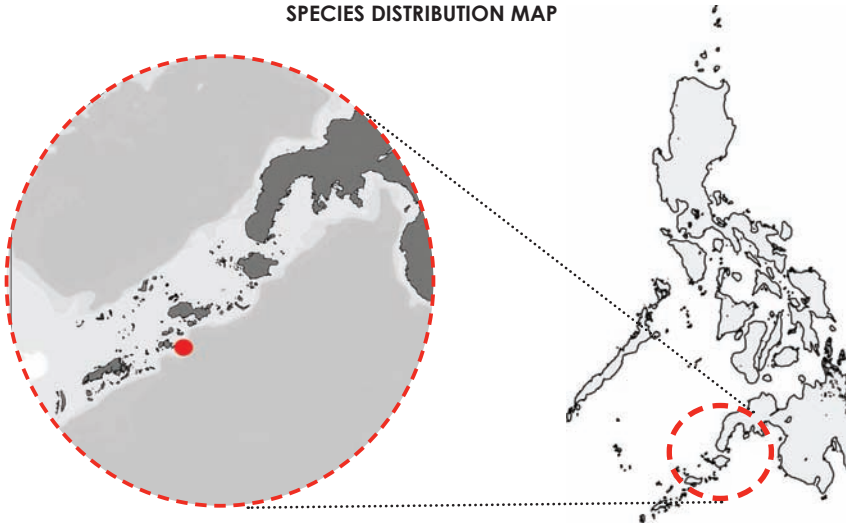
Maximum size from the collection is 4 cm (SL) (Smith-Vaniz 1976). This species is known only from two specimens found in 1909.

Habitat and Ecology

This species is found at a depth range of 3–9 m (Smith-Vaniz 1976). It is reef-associated, and often hovers above the reef waiting for unwary prey. It attacks other fishes to remove scales and skin tissue (stomach contents typically contain only mucous and a few fish scales).

Threats

There are no major threats known to this species. That it is only known from one locality is almost certainly due to a collection artifact. It may be more widely distributed beyond the known locality.



Conservation Measures

There are no specific conservation measures in place for this species. Its distribution overlaps several MPAs within its range.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

Although *Plagiotremus iosodon* is known from only one locality, this is almost certainly due to a collecting artifact and may be more widely distributed beyond the known locality. Survey and monitoring is needed to determine the status of the populations of this species. It is listed as Data Deficient (DD).

Assessors: J.T. Williams, W.F. Smith-Vaniz and P.A. Hastings

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DD

Sebastapistes taeniophrys

Taxonomic Authority: Fowler 1943

Synonym: *Scorpaena taeniophrys* Fowler 1943
Common name: Tentacle scorpionfish

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: SCORPAENIFORMES
Family: SCORPAENIDAE

Distribution

This species is known from two specimens collected in 1909 off Cammahala Bay, Luzon.

Depth (m):
Upper limit:
Lower limit:

Population

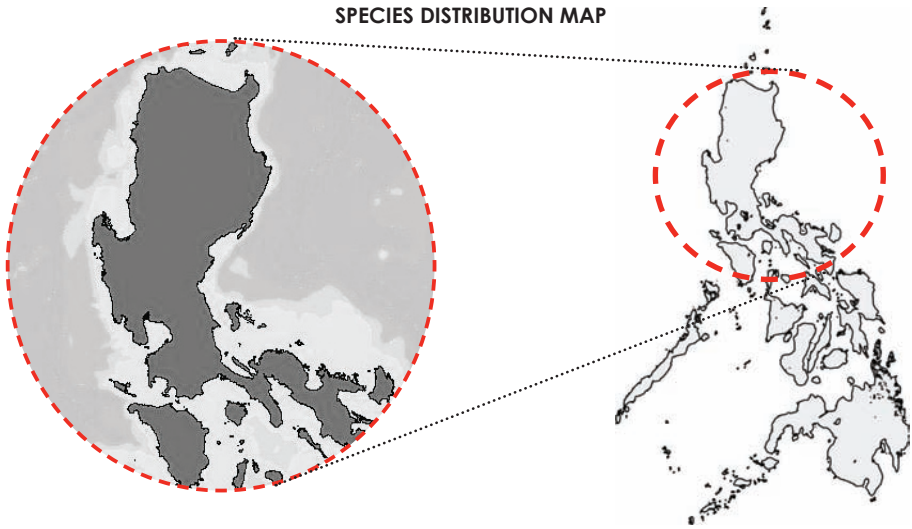
Maximum size from collected specimens is 1.93 cm (SL) (Fowler 1943), making it the smallest member of this genus (Poss 1999). It is known only from two specimens collected in 1909 off Cammahala Bay, Luzon Island during the Albatross Philippine Expedition (Fowler 1943; Herre 1951; Motomura 2009). Originally thought of as juvenile specimens (Herre 1951), it is now considered as a valid species (Motomura 2009).

Habitat and Ecology

The species is demersal. Specimens were collected by a beach seine (Fowler 1943) indicating that the species inhabits shallow sandy bottoms. However, all other species of *Sebastapistes* are known to live in rocky or coral reefs (Motomura 2009).

Threats

Threats are possibly from degradation of its shallow-water habitat due to coastal development.



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The tentacle scorpionfish, *Sebastapistes taeniophrys*, is apparently a rare species known only from the type specimen collected off Cammahala Bay, Luzon Island in 1909. Threats to this species are unknown except those possibly from degradatation of its shallow-water habitat due to coastal development. However, there is not enough information on its population, habitat and ecology, and, thus, is listed as Data Deficient (DD). The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection.

Assessors: M.N.R. Alava and E.C. Capuli

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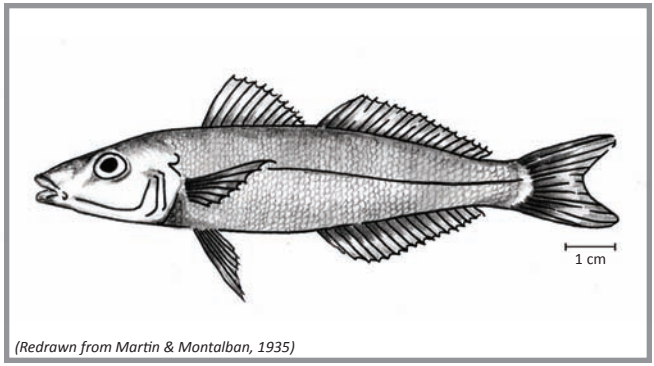
DD



(Redrawn from Martin & Montalban, 1935)

Sillago argentifasciata

Taxonomic Authority: Martin & Montalban, 1935

Common name: English: Silver-banded sillago

Vernacular: *Asohos, asuhos, hosohos, alisoos, asoos, oso-os, usu-us, susay*

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PERCIFORMES
Family: SILLAGINIDAE

Distribution

This species is known only from the Balabac Strait (off Lumbucan Island, southern Palawan).

Depth (m):
Upper limit: 20?
Lower limit: 50?

Population

Maximum size from collected specimens is 11.6 cm (TL) (Herre 1953). The species is only known from the type specimens collected in 1927 from Lumbucan Island. The specimens, however, were destroyed during the World War II. *Sillago argentifasciata* is similar to, and may prove to be a senior synonym of the Bay sillago, *S. ingenuua* (Mackay 1985), a more wide-spread species with a maximum size of 20.0 cm (SL) and a depth range of 20-50 m occurring from India to Western Australia (Mackay 1992).

Habitat and Ecology

No information on the habitat and ecology of this species is known. If comparable to *S. ingenuaa*, the silver-banded sillago, this species is also possibly demersal, occurring in inshore coastal waters (Hoese *et al.* 2006). Silliganids feed mainly on benthic or epibenthic organisms (Mackay 1992).

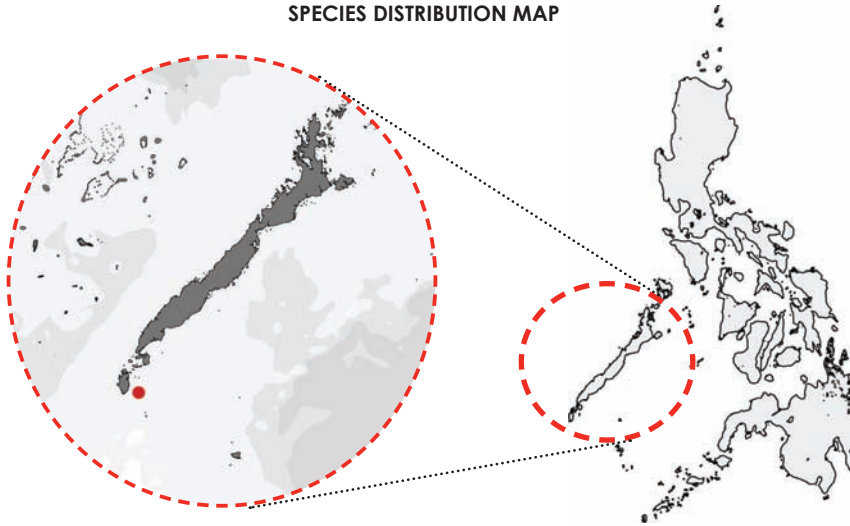
Threats

There are no major threats known to this species, except possibly from fisheries. Similar species are subjected to artisanal and/or commercial fisheries, marketed fresh or processed (*i.e.*, dried or fermented). The other members of this family are esteemed table fish and some are important in estuarine aquaculture (Mackay 1992). It is worth noting that the type locality has also been subjected to blast fishing in the past years and may have affected the species and its habitat.

Conservation Measures

There are no specific conservation measures in place for this species.

SPECIES DISTRIBUTION MAP



IUCN Red Listing

Red List Category & Criteria: **Data Deficient** (version 3.1)

Rationale for the Red List Assessment

The silver-banded sillago, *Sillago argentifasciata*, is evidently a rare species known only from the type specimen collected off Lumbucan Island, Balabac in 1927. Threats to this species are unknown, except possibly from fisheries and blast fishing. Other similar looking *Sillago* species are already taken in the local fisheries and are marketed fresh or processed. It is possible that the species are also taken in these fisheries but not recorded. The species may be Near Threatened (NT), being found only in one locality which is subjected to blasting in recent years. However, there is not enough information on its population, habitat and ecology. It is, thus, listed as Data Deficient (DD). The type locality should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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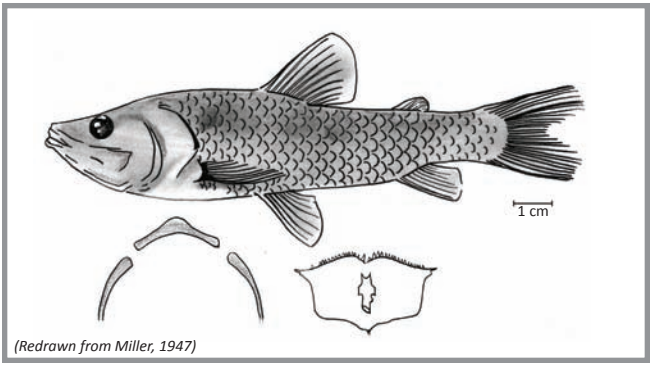
LC



(Redrawn from Miller, 1947)

Solivomer arenidens

Taxonomic Authority: Miller, 1947

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: MYCTOPHIFORMES
Family: NEOSCOPELIDAE

Distribution

This species is known from Sogod Bay (off Limasawa Island, southern Leyte), Bohol Sea (off San Ricardo, Panaon Island; Diwata Point between Leyte and Mindanao; off Camp Overton Light, northern Mindanao; and off Balicasag Island, between Bohol and Siquijor), and western Sulu Sea (off eastern Palawan).

Depth (m):
Upper limit: 1241
Lower limit: 2022

Population

Maximum size from collected specimens is 28.2 cm (SL) (Miller 1997). It is only known from type specimens collected between 1908–1909, generally within the Bohol Sea and vicinity and also in the western Sulu Sea (Anonymous 2001a). Nominal record of the species is found for northern Mindanao (site not specified) collected in 1951 (Anonymous 2001b).

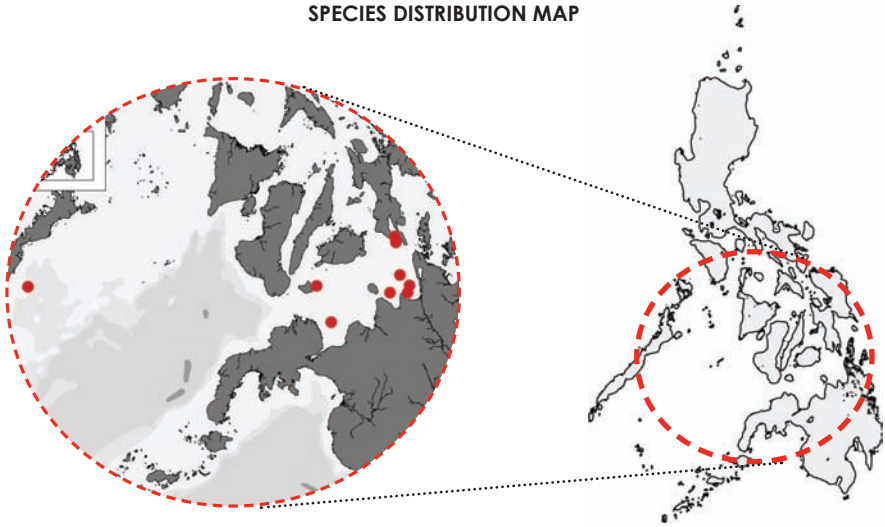
Habitat and Ecology

This species is benthopelagic (Eschmeyer 1998).

Threats

There are no major threats known to this species. Type specimen was collected using a beam trawl (Miller 1947).

SPECIES DISTRIBUTION MAP



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Assessment (using 2001 IUCN system): **Least Concern** (LC)

Rationale for the Red List Assessment

The myctophid *Solivomer arenidens* is a very deep water species (*i.e.*, 1241–2022 m) which is relatively wide-spread within the Bohol Sea and also found in the Sulu Sea. It has no known major threats, and, therefore, is listed as a species of Least Concern (LC). The species has not been reported for over 50–100 years. The type localities should be revisited to validate and improve information on the population, habitat and ecology of the species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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VU

Stolephorus ronquilloi

Taxonomic Authority: Wongratana, 1983

Synonym: *Stolephorus oligobranchus* Wongratana 1983
Common name: English: Ronquillo's anchovy
Vernacular: *Dllis, bolinao, bulinaw, tuakang, tornos burma, muleng-leng, munamom, ligbao na lapad*

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: CLUPEIFORMES
Family: ENGRAULIDAE

Distribution

This species is known only from specimens collected in Binmaley, Manat River and off Manila Bay, Cavite.

Depth (m):
Upper limit: 0
Lower limit: 50

Population

Maximum size from collected specimens is 5.3 cm (SL) (Whitehead *et al.* 1988). The species was first collected in Manat River in 1949, then in Manila Bay in 1966. Nominal records on this species also occur in Mindanao but need validation. Other members of this family are schooling (Whitehead *et al.* 1988) but this species, apparently, is not common in the collection and, therefore, may not be abundant.

Habitat and Ecology

Presence in a river system suggests the species lives in both coastal marine and brackish environments.

Threats

Threats are from coastal development, water pollution, and possibly from fisheries. Most members of the family are caught in artisanal fisheries in the country and utilized as fresh, frozen, fermented, or dried.

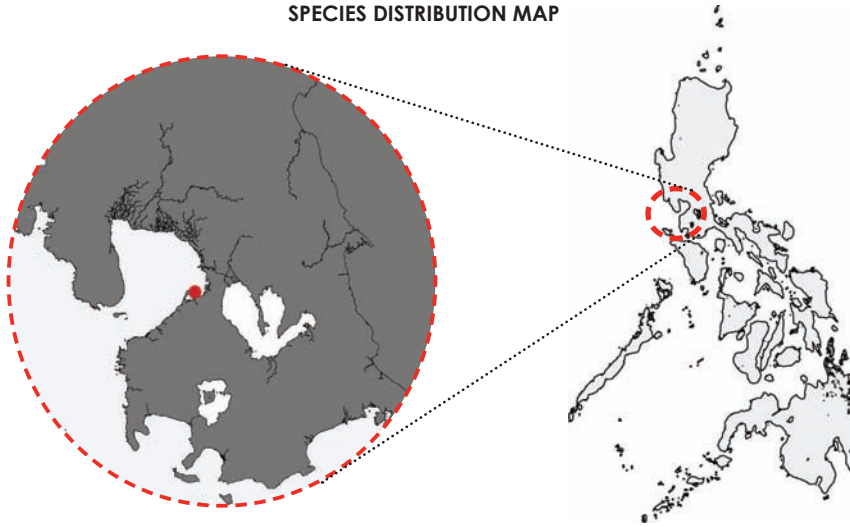
Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Vulnerable D2** (version 3.1)

SPECIES DISTRIBUTION MAP



Rationale for the Red List Assessment

The Ronquillo's anchovy (*Stolephorus ronquilloi)* is presumably not abundant, and found only in two localities subjected to threats common in riverine and near-shore environments such as coastal development and water pollution. Its habitat is highly threatened with domestic, industrial and agricultural pollution. Heavy ship traffic, oil slicks and sewerage contribute greatly to poor water quality and will greatly affect the species. The species may also factor in local fisheries and, thus, is considered as Vulnerable (VU) under D2. It is recommended that surveys and monitoring be done on the status of the populations of this species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: L.R. Casten and M.N.R. Alava

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LC

Trachonurus robinsi

Taxonomic Authority: Iwamoto, 1997

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: GADIFORMES
Family: MACROURIDAE

Distribution

This species is known from various localities in the Sibuyan Sea (off Origon Point, east Mindoro), Camotes Sea (off Dupon Bay, Ponson Island, Leyte), Bohol Sea (off Diwata Point, between Leyte and Mindanao; off Camp Overton Light, northern Mindanao; and off Balicasag Island, between Bohol and Siquijor), and Sulu Sea (off Cagayan Island).

Depth (m):
Upper limit: 514
Lower limit: 1344

Population

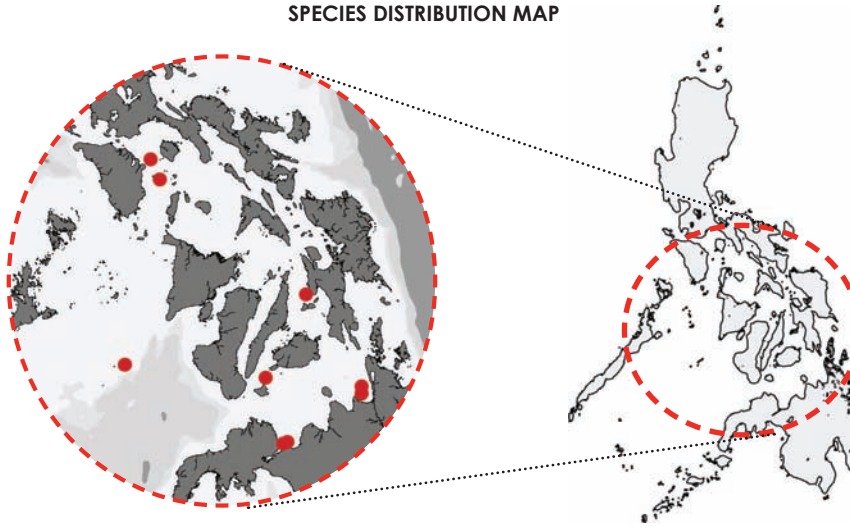
Maximum size from collected specimens is 25 cm (TL). It is known only from type specimens collected in 1908–1909 from various localities characterized as semi-enclosed basins such as the Sibuyan, Camotes, Bohol and Sulu seas (Iwamoto 1997).

Habitat and Ecology

This species is bathydemersal (Iwamoto 1997).

Threats

There are no major threats known to this species.



Conservation Measures

There are no specific conservation measures in place for this species.

IUCN Red Listing

Red List Category & Criteria: **Least Concern** (version 3.1)

Rationale for the Red List Assessment

The whiptail species, *Trachonurus robinsi*, has a fairly wide distribution and is a deep water species (*i.e.*, 514–1344 m). It has no known major threats and, therefore, listed as a species of Least Concern (LC). The type locality should be revisited to validate and improve information on the population, habitat and ecology of the species.Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar and M.N.R. Alava

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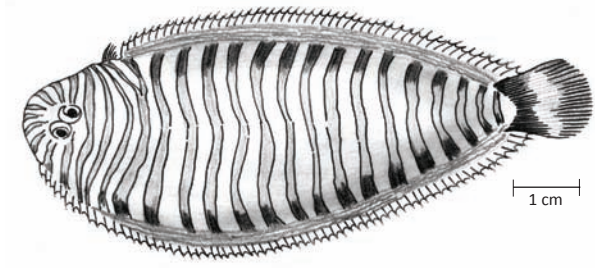
VU



(Redrawn from Seigel & Adamson, 1985)

Zebrias lucapensis

Taxonomic Authority: Seigel & Adamson, 1985

Upper Level Taxonomy

Kingdom: ANIMALIA
Phylum: CHORDATA
Class: ACTINOPTERYGII
Order: PLEURONECTIFORMES
Family: SOLEIDAE

Distribution

This species is known only from the Hundred Islands, Lingayen Gulf, northeastearn Luzon.

Depth (m):
Upper limit:
Lower limit:

Population

Maximum size from collected specimens is 8.4 cm (TL) (Seigel & Adamson 1985). The flatfish *Zebrias lucapensis* is known only from the type specimen collected in 1978 in one locality off the Hundred islands, Lingayen Gulf. It was described only in 1985 and is the only record of the genus *Zebrias* in the country.

Habitat and Ecology

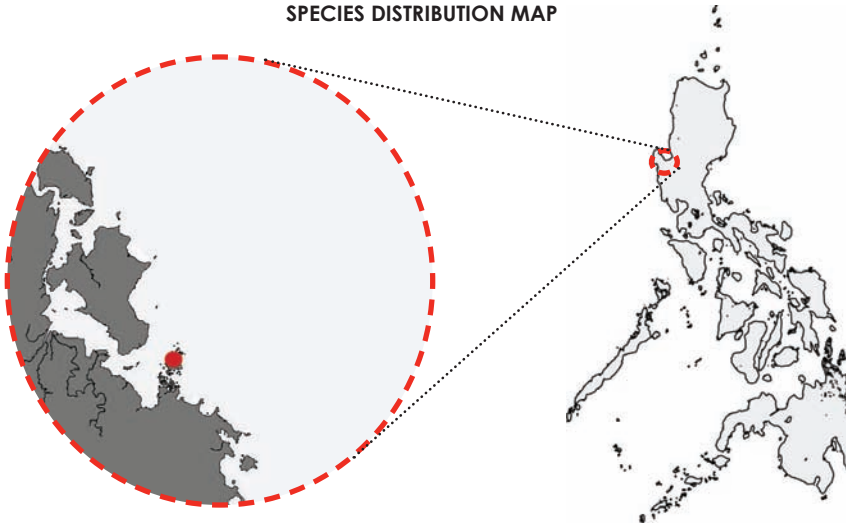
The species is demersal, possibly in shallow waters.

Threats

The species faces threats from fisheries and habitat destruction, possibly from blast fishing. Specimen from Lingayen was caught by trawl (Seigel & Adamson 1985).

Conservation Measures

There are no specific conservation measures in place for this species.



IUCN Red Listing

Red List Category & Criteria: **Vulnerable D2** (version 3.1)

Rationale for the Red List Assessment

The flatfish *Zebrias lucapensis* is a shallow water species known only from the Hundred Islands, Lingayen Gulf. It is listed as Vulnerable (VU) under D2 based on limited number of localities (<5), with possible threats due to fisheries, habitat destruction, blast fishing and trawling common to its only known locality. It is recommended that surveys and monitoring be done on the status of the populations of this species. Conservation actions for the species should include habitat management and/or protection, and catch monitoring and regulation.

Assessors: M.J.S. Palomar, M.N.R. Alava and B. Polidoro

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Chapter 3

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: THREATENED VERSUS NON-THREATENED GROUPS

3

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: THREATENED VERSUS NON-THREATENED

A total of 29 Philippine marine endemic bony fishes (teleosts) are assessed using the IUCN Red List Criteria and Categories (version 3.1). Only 14% is Threatened (*i.e.*, Vulnerable: 4 species), 28% is non-threatened *(i.e.*, Least Concern: 8 species), and 58% is Data Deficient (DD) highlighting the lack of sufficient data to make a threat assessment of the species under consideration (see Table 3.1; Figure 3.1).

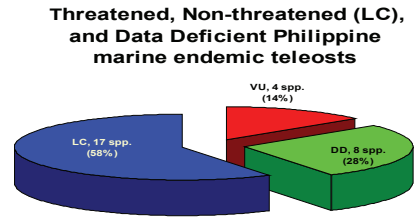

Figure 3.1. Philippine marine endemic teleosts: percent threatened (VU), non-threatened (LC), and data deficient (DD)

Species with Threatened status are: the blenniid *Ecsenius kurti*; the Cuyo coralbrotula *Paradiancistrus cuyoensis*; the Ronquillo's anchovy *Stolephorus ronquilloi*; and the sole or flatfish *Zebrias lucapensis*. All four species fall under the Vulnerable threat category, under criterion D2, having very small and restricted areas of occupancy, between one to three locations, most of which are type localities of specimens collected from at least 30 to over 100 years ago (*e.g.*, Herre collection, Albatross collection). There is no available population trends for most of the species, thus, assessment were based on the number of known localities where the species is known, their abundance in the collection records, possible threats to the population from fisheries (either as targeted catch or by-catch) or to their habitat types. Most of these species are of no or low interest to fisheries but a major threat is coming from habitat degradation and/or destruction. These species are generally found in shallow-water nearshore habitats (such as coral reefs, rocky shores, embayment systems) which are already subjected to a number of anthropogenic disturbances which may be exacerbated by impacts from global climate change.

Marine endemic fishes that do not fall within threatened categories (*i.e.*, Least Concern) are those that are more wide-spread. Although unique to the Philippines, they are found in more than five localities within the Philippines, with no known immediate threats to either their populations and/or habitats.

Table 3.1. Threatened and non-threatened listing of Philippine marine endemic bony fishes, with notes on habit/habitat and depth occurrences.

Species	Red List Status	Habitat/Habit	Depth Range (in meters)	
			Upper Limit	Lower Limit
Ecsenius kurti	VU	Shallow: reefs	0	34
Paradiancistrus cuyoensis	VU	Shallow: reefs	0	33
Stolephorus ronquilloi	VU	Shallow: embayments	0	50
Zebrias lucapensis	VU	Shallow: demersal	?	?
Cirripectes viriosus	LC	Shallow: reefs	0	10
Coelorinchus quincunciatus	LC	Deep: benthopelagic	198	296
Coelorinchus thompsoni	LC	Deep: bathydemersal/ benthopelagic	133	441
Congrogadus hierichthys	LC	Shallow: demersal	1.2	1.2
Ecsenius dilemma	LC	Shallow: reefs	1	34
Istiblennius colei	LC	Shallow: rocky shores	0	2
Solivomer arenidens	LC	Deep: benthopelagic	1241	2022
Trachonurus robinsi	LC	Deep: bathydemersal	514	1344
Bathygadus sulcatus	DD	Deep: bathydemersal/ benthopelagic	717	970
Chaetodontoplus caeruleopunctatus	DD	Shallow: reefs	?	?
Coelorinchus dorsalis	DD	Deep: benthopelagic	388	421
Coelorinchus macrolepis	DD	Deep: benthopelagic	432	432
Coelorinchus notatus	DD	Deep: benthopelagic	421	421
Coelorinchus sexradiatus	DD	Deep: benthopelagic	243	582
Coelorinchus triocellatus	DD	Deep: benthopelagic	315	576
Coelorinchus velifer	DD	Deep: bathydemersal/ benthopelagic	173	329
Coelorinchus weberi	DD	Deep: benthopelagic	224	
Coryphaenoides camurus	DD	Deep: bathypelagic	2022	2022
Coryphaenoides dubius	DD	Deep: bathypelagic	750	750
Equulites laterofenestra	DD	Shallow: pelagic neritic	0	86
Gadomus magnifilis	DD	Deep: bathypelagic	929	1281
Hypoatherina crenolepis	DD	Shallow: pelagic neritic	?	?
Plagiotremus iosodon	DD	Shallow: reefs	3	9
Sebastapistes taeniophrys	DD	Shallow: sandy bottom	?	?
Sillago argentifasciata	DD	Shallow: demersal	20?	50?

There are eight species in this category: *Cirripectes viriosus*, *Coelorinchus quincunciatus*, *C. thompsonii*, *Congrogadus hierichthys*, *Ecsenius dilemma*, *Istiblennius colei*, *Solivomer arenidens*, and *Trachonurus robinsi*. At least half in this group are deep-water species also, and thus, with very minimal threats known.

The pseudochromid *Congrogadus hierichthys* and the blenniid *Ecsenius dilemma*, on the other hand, are apparently demersal, shallow-water species, found in water depths of 1.2 m and 7–31 m, respectively. These two species may be subjected to other threats affecting their population

(*e.g.*, bycatch to fisheries) and their shallow-water habitats (*e.g.*, coastal development, pollution, climate change impacts to coral reef ecosystem). They are, however, more dispersed and widespread than their other shallow-water counterparts. Some of these species have also been recollected in a number of new sites from between 30–50 years after their discoveries (*e.g.*, *Coelorinchus quincunciatus*, *C. thompsoni*, *C. velifer*, and *Congradus hierichthys*, *Solivomer arenidens*), suggesting their persistence in more sites within the country. There is still, however, a need to revisit the type localities to validate and improve information on the species.

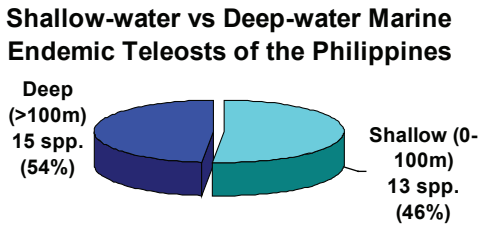

Figure 3.2. Relative abundance of shallow-water versus deeper-water marine endemic teleosts of the Philippines, expressed in number of species and percent.

More than half (58%) of the assessed species are Data Deficient (DD). A considerable period of time has elapsed since the last record of these species. Except for two species (*i.e.*, *Equulities laterofenestra* and *Sillago argentifasciata*), information on all of these species dates back to about 100 years and may be known only from the Albatross collection off various islands in the Philippines. Most are also deep-water species (*i.e.*, bathydemersal or benthopelagic) and were found in depths ranging from 116 to 2022 meters. There is probably no known major threats to their populations (except possibly from bycatch fisheries for some species) nor to their deep-water habitats. Most species in this list have been considered rare by collectors, being less numerous in the collection and found only between one to three

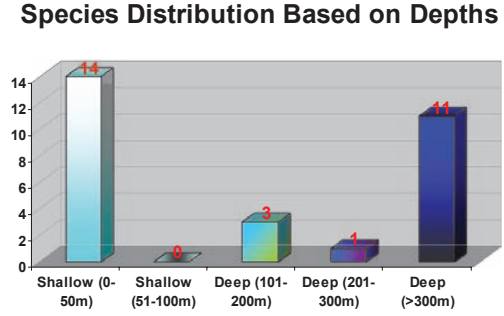

Figure 3.3. Relative abundance of shallow-water versus deeper-water marine endemic teleosts of the Philippines, according to an increasing depth gradient.

localities. At least seven of these species (50%) were reported only in one site *(i.e.*, the macrourids *Coelorincus dorsalis*, *C. triocellatus*, *C. weberi*, *Coryphaenoides camurus*, *C. dubius*, the leiognathid *Equulities laterofenestra*, and the silver-banded sillago, *Sillago argentifasciata*). Except for the latter two species, these single locality species are known only from the collection in their type localities over 100 years ago and urgently need to be recollected so new information on the species, its population, habitat and ecology may be known.

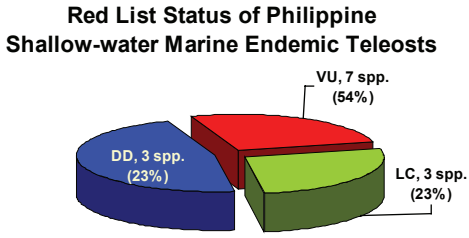

Figure 3.4. Relative abundance of shallow-water marine endemic teleosts of the Philippines, expressed in number of species and percent.

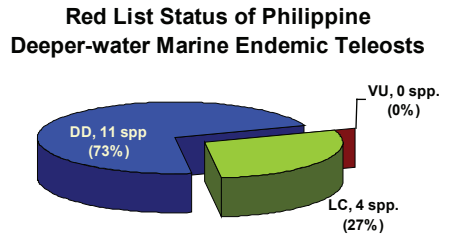

Figure 3.5. Relative abundance of deeper-water marine endemic teleosts of the Philippines, expressed in number of species and percent.

The latter two species, the leiognathid, *E. laterofenestra,* and the silver-banded sillago, *S. argentifasciata*, are relatively newer species, being described only in 1935 and 2007, respectively. Along with the crenulated silverside, *Hypoatherina crenolepis*, these species are found in relatively shallower waters than the macrourids, which are subjected to various fishing operations. They are likely to be Near Threatened (NT) but pending more current information on their populations, are only listed here as DD.

One macrourid, *i.e.*, *Bathygadus sulcatus*, is also listed as DD, being reported in only one site (off Cagayan Island, Sulu Sea) in the Philippines. There is, however, a record of the species being collected off Monterey Bay, California, which needs to be confirmed. As with the other species with this listing, new information is needed to improve its status.

Depths and Species Distribution. To sum, among the Philippine marine endemic teleosts, shallower-water species have higher risks of extinction than those species that are found in deeper-offshore habitats. As shown in Figures 3.2 and 3.3, there are slightly less shallow-water marine endemic teleosts (*i.e.*, 46%) than deeper-water ones.

Among the shallower-water species, more than 50% is threatened as opposed to virtually none for deeper water species (see Figures 3.4 and 3.5) This is largely attributed to higher degree of stresses to which the habitats of the shallower species are subjected, primarily from various anthropogenic sources (*e.g.*, coastal development, destructive fishing, and pollution), which are exacerbated by climate change impacts. However, a high percentage of the species in the deeper waters is listed as Data Deficient (73%), which is not a threat status but an urgent call for more research on these species so as to gauge the current status of their populations and of their habitats.

Species that have more restricted distribution and considered rare (*i.e.*, reported only in less than five localities and are not abundant in the collection) also face higher risks than those which are more dispersed and common, despite being endemics to the Philippines. The paucity of data on each of the species highlights the need to consider management options under the precautionary principle. In the Philippines, conservation measures should include protection of both the species and their habitats. It is recommended that type localities be revisited to collect newer information on the species and reassess their status against current threats at the local level. As marine endemics, their value to the Philippines as natural and national heritage, and to the scientific community as indicators of ecosystem health, cannot be overemphasized.

M.N.R. Alava, K.E. Carpenter, M.J.S. Palomar, and L.R. Casten

Chapter 4

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: POLICY AND MANAGEMENT RESPONSE

4

MARINE ENDEMIC TELEOSTS OF THE PHILIPPINES: POLICY AND MANAGEMENT RESPONSE

The 29 marine endemic bony fishes assessed in this book provide a fitting context to some policy and management actions that must be taken immediately if we were to arrest the further deterioration of the Philippines' marine biodiversity.

Both the national and the local governments as well as other stakeholders in the Philippines are in good position to respond to the challenges posed by these data if only for the reasons that, first, the legal framework is generally adequate, and, second, coastal resource management is well-established in the country not only in the realm of law but, more importantly, in practice.

Significant among the national laws in this regard are the Philippine Fisheries Code of 1998 (Republic Act 8550) which provides for measures to conserve the country's fisheries resources and their habitats, the Local Government Code of 1991 (RA 7160) which empowers and mandates city and municipal governments to manage their respective municipal waters, and the Wildlife Resources Conservation and Protection Act (RA 9147) which institutes strategies for the conservation and protection of wild flora and fauna found in the Philippines. Of some significance also are the National Integrated Protected Areas System (NIPAS) Act of 1992 (RA 7586), and the Marine Pollution Decree of 1976 (Presidential Decree 979).

Meanwhile, coastal resource management (CRM) has been practiced in the country for decades now with already innumerable projects initiated by various NGOs, the national government, local government units, and, lately, the private sector. CRM in the Philippines is basically characterized by multi-stakeholdership where various interest groups at the local level come together to manage their coastal resources, and by establishing locally-managed marine protected areas (MPA). Practitioners and scholars maintain that MPA establishment and management remains the primary strategy in coastal resource conservation (Aliño *et al.* 2004; see also Sobel & Dahlgren 2004). Indeed, the more limited coverage and definite boundaries of MPAs allow for more defined management objectives, purposive actions and cost-effective conservation work.

With this policy environment and our extensive experience in CRM, there is unquestionable capacity for Filipinos to respond to the urgent call for conserving our endemic bony fishes studied in this book. To do this, we need to search, research and protect.

Search

Most of the species described here were last recorded many years ago; in fact, around a dozen of them were not reported in the past century, and about nine of them were last seen between 20 and 100 years ago. The question, therefore, is whether these species remain in our waters. Indeed, there is need to rediscover these species if they were to be conserved and if we were to appropriately manage our marine habitats.

Certainly, the process of rediscovery will involve financial and human resources, but may not have to be extremely costly for government. The search can be a joint effort between government, researchers, NGOs, the private sector and local community members. It is hoped that this publication can help trigger this concerted effort. What will help is an awareness-raising campaign at least on the species studied here, and the institutionalization of a reporting system that will allow continuous gathering, consolidation and dissemination of information.

Rediscovering these species will validate and enrich data. With more species being discovered in Philippine waters, it is reasonable to expect that more endemic species and habitats will be identified that should lead to better understanding of our marine wealth.

Research

Understanding these species should provide resource managers valuable insights on how management should be undertaken. The importance of research is recognized by the Philippine Fisheries Code through the creation of the National Fisheries Research and Development Institute (NFRDI). Its research outputs are envisaged to push the development, management, conservation and protection of the country's fisheries and aquatic resources (Sec. 82, RA 8550). For its part, the Wildlife Resources Conservation and Protection Act mandates the establishment of national wildlife research centers for terrestrial and aquatic species to lead in the conduct of scientific researches on the proper strategies for the conservation and protection of wildlife. In this regard, the participation of experts from academic/research institutions and wildlife industry is highly encouraged (Sec. 31, RA 9147; see also Sec. 31.1, Joint DENR–DA–PCSD Administrative Order No. 2004–01). Three basic researches are in order, *i.e.*, biological, Red listing, and socio-economic.

Biological research. Biological research should at least look into the life cycle of these species, their habitats, food, predators, symbiotic relations with other life forms, and their sensitivities. Not only will this lead to understanding these species, it will also provide appreciation of the nature, nuances and importance of their habitats as well as ecological and socio-economic issues that threaten their continued existence. Of special interest here will be their vulnerability to climate change which is now an overarching concern in biodiversity conservation. That there is very little knowledge of these species emphasizes the need for NFRDI and other research institutions to include these species in their research agenda. Lastly, these researches can be of much help if, as a result of their findings, they can make recommendations that can be translated into management actions.

Red listing. Red listing, meanwhile, will allow for better protection. Lovejoy (2005) asserts that endangered species and endemics with very restricted range should be among those prioritized for conservation. The Philippine Fisheries Code mandates the Department of Agriculture to take conservation and rehabilitation measures for rare, threatened, and endangered species, as it may determine (Sec. 11, RA 8550) and penalizes the fishing or taking of rare, threatened or endangered species as listed in the Convention on the International Trade of Endangered Species (CITES) and as may be determined by the Department of Agriculture (Sec. 97, RA 8550). There is, thus, need for government to determine the Red List status of these species in particular, and of all the marine species in the Philippines in general. The CITES may not be of complete help as it is only concerned with endangered species that are being traded internationally. The reliance, therefore, is on the second clause, *i.e.*, the determination by the Department of Agriculture. In this regard, this book proposes the use of IUCN's Red List Criteria and Categories.

Relative to this, the Implementing Rules and Regulations of the Wildlife Resources Conservation and Protection Act (Joint DENR–DA–PCSD AO No. 2004–01) provides for the creation by the DENR and the DA of a Philippine Red List Committee (PRLC) that will develop the criteria for the determination of threatened species and their classification as critically endangered, endangered, vulnerable or other accepted categories based on the best scientific and commercial data available and with due regard to internationally accepted criteria. (Rule 22.2, Joint DENR–DA–PCSD AO No. 2004–01)

Red listing of species under the jurisdiction of the DENR (See Sec. 4, RA 9147; see also Sec. 4, Joint DENR–DA–PCSD AO No. 2004–01) has begun. The DENR has in fact issued administrative orders containing Red Lists of terrestrial plants and animals. The Bureau of Fisheries and Aquatic Resources of the Department of Agriculture (DA–BFAR) has had initial efforts

but is still in the process of adopting its guidelines to enable it to create a technical working group that will do red listing of the species under its management. Fortunately, it is just a matter of time for DA–BFAR to finalize its implementing rules and regulations on this matter and begin working on its Red List the soonest. Among the objectives of this book is to provide inputs to the Red List of marine species in the Philippines.

Red listing is a highly specialized job and, thus, needs the participation of experts who specialize in target taxonomic groups. Hence, it is also important for DA–BFAR to come up with a National Red List Committee (NLRC) that will do the assessment. Similarly, there is need to train more marine scientists to do Red List assessments so as to cover as many taxonomic groups as possible.

Socio-economic research. Experience has shown that the success of coastal resource conservation depends largely on the support of people who relate with the coastal and marine resources. In fact, in the long run, it is the local stakeholders who will take care of their resources on their own. It is, thus, imperative to understand how community members relate with the resource that we seek to protect, and with one another, *i.e.*, the stakeholder dynamics that will attend the protection and management process. Considering the socio-economic realities on the ground will ensure that not only are the plans appropriate but will also be owned by the stakeholders (Bunce *et al.* 2000).

Protect

All search and research initiatives must boil down to protection actions. Among the protection efforts that we submit should be given importance are discussed below.

MPA establishment. Marine Protected Areas come in different names and forms, and for that matter, are established for different purposes (Salm *et al.* 2000) such as, to enhance tourism, to protect fishery resources, or to allow regeneration of corals. For purposes of this discussion, it is hoped that MPAs be established to protect these endemic bony fishes in the entirety of their life cycles.

The Fisheries Code provides for the establishment of fish refuge and sanctuaries where fishing or other forms of activities which may damage the ecosystem of the area is prohibited and human access may be restricted. (Sec. 4(36), RA 8550). BFAR may establish fish refuge and sanctuaries covering 25-40% of bays, foreshore lands, continental shelf or any fishing ground for mangrove cultivation to strengthen the habitat and the spawning grounds of fish. Similarly, local governments may establish fishery refuge and sanctuaries covering at least 15% of the total coastal areas in the municipality or city (Sec. 81, RA 8550).

In addition, the Department of Agriculture may designate areas outside the municipal water as fishery reservation for propagation, educational, research and scientific purposes. Municipalities or cities may also recommend to the DA that portion of the municipal waters be declared as fishery reserves (Sec. 80, RA 8550). Fishery reserves are designated areas where activities are regulated and set aside for educational and research purposes (Sec. 4(37), RA 8550).

For its part, the Wildlife Resources Conservation and Protection Act mandates the establishment of critical habitats where threatened species are found. Such designation shall be made on the basis of the best scientific data taking into consideration species endemicity and/or richness, presence of human-made pressures/threats to the survival of wildlife living in the area, among others. The DENR, in coordination with the local government units and other concerned groups, shall protect these habitats from any form of exploitation or destruction which may be detrimental to the survival of the threatened species dependent therein (Sec. 25, RA 9147).

The NIPAS Act, meanwhile, pursues the systematized management of, among others, biologically significant terrestrial and aquatic sites for the enjoyment of present and future generations. With zoning as NIPAS' main management strategy (Sec. 9, RA 7586), the law's Implementing Rules and Regulations (DENR Administrative Order No. 25, s. 1992 [hereinafter referred to as DAO 1992–25]) identifies certain zones that should be useful for the management of endemic fishes, namely: (1) strict protection zone, which is closed to all human activities except research and ceremonial use by indigenous peoples (Sec. 10(a), DAO 1992–25 Sec. 10(a), DAO 1992–25); (2) restoration zone, which aims to restore natural habitat with its associated biodiversity (Sec. 10(c), DAO 1992-25); and, (3) habitat management zone, which refers to areas with significant habitat and species values which necessitate management practices required by rare, threatened or endangered species (Sec. 10(d), DAO 1992–25). This law is relevant where the endemic bony fish species are located in a NIPAS or future NIPAS site. The NIPAS is under the administration and management of the DENR (Sec. 10, RA 7586) through the Protected Areas and Wildlife Bureau (PAWB) (Sec. 32, DAO 1992–25).

Planning. Plans are important for at least three reasons: (1) they provide a shared vision and objectives for stakeholders; (2) they lay down specific activities that should be undertaken by identified parties at a pre-determined time; and, (3) they identify investments where funds and similar resources should be placed. Small wonder that planning is at the core of coastal resource conservation.

As a matter of good practice, every MPA is covered by a MPA management plan which can already be implemented by its managers and, ideally, be integrated into the local CRM Plan or the Municipal Fisheries Development Plan.

Among the functions of the National Fisheries and Aquatic Resources Management Council (NFARMC), as created by the Fisheries Code, is to assist in the formulation of national policies for the protection, sustainable development and management of fishery and aquatic resources (Sec. 72(a), RA 8550). This fisheries development planning process happens down the line. Municipal and City Fisheries and Aquatic Resources Management Councils (M/CFARMC) are charged to, among others, assist in the preparation of the Municipal Fishery Development Plan (in some areas, stakeholders prefer to prepare a Coastal Resource Management Plan, which is more comprehensive in scope than a MFDP) and submit such plan to the Municipal Development Council (Sec. 74(a), RA 8550).

Submission of the MFDP to the Municipal Development Council should be considered a critical step so that it becomes part of the comprehensive multi-sectoral development plan prescribed by the Local Government Code (Sec. 106, RA 7160). Along with the development plan, the Municipal Development Council is also tasked to formulate the medium-term and annual public investment programs of the local government (Sec. 109, RA 7160).

Meanwhile, the NIPAS Act mandates that each component of the NIPAS shall be planned and administered to further protect and enhance the permanent preservation of its natural conditions (Sec. 9, RA 7586).

As in the case of the MPA management plans, local CRM plans and MFDP, the protected area management plans should also be reflected in the development plans and investment programs of concerned LGUs. The concern with many MPA management and local CRM plans is that they are not necessarily fed into development plans and investment programs so that they normally end up not completely implemented, if at all.

The plans should contain provisions for the management, conservation and protection of endemic marine species whether they are endangered or not. The importance of these species is not merely determined by their endangered status but by the fact that they are endemic, thus, must play a crucial role in the balance of the specific and limited environment they inhabit. As a matter of policy, an endangered status should raise the level of protection of endemic species.

A useful guide to planning MPAs is the IUCN book “Marine and Coastal Protected Areas: A Guide for Planners and Managers” by Rodney *et al.* (2000).

Law Enforcement. Philippine environment and natural resources laws are replete with provisions on law enforcement. It is, thus, a matter of using these provisions, by bringing all responsible parties into the picture and putting resources together.

The law enforcement officers of DA the Philippine Navy (PN), Philippine Coast Guard (PCG), Philippine National Police (PNP), PNP-Marine Command, law enforcement officers of the LGUs and other government enforcement agencies, are authorized to enforce the Fisheries Code and other fishery laws, rules and regulations. Other competent government officials and employees, *punong barangays* and officers and members of fisherfolk associations who have undergone training on law enforcement may be designated in writing by the DA as deputy fish wardens to also do law enforcement (Sec. 124, RA 8550).

Wildlife enforcement officers from NGOs, citizens groups, community organizations and other volunteers who have undergone the necessary training may be deputized by DENR to enforce the Wildlife Resources Conservation and Protection Act. In addition, the Philippine National Police (PNP), the Armed Forces of the Philippines (AFP), the National Bureau of Investigation (NBI) and other law enforcement agencies shall designate wildlife enforcement officers (Sec. 30, RA 9147).

In the case of NIPAS areas, all officials, technical personnel and forest guards employed in the Integrated Protected Area Service or all persons deputized by the DENR, upon recommendation to the Management Board, shall do law enforcement. Moreover, regular law enforcers and police officers are expected to help in law enforcement in the course of the performance of their duties (Sec. 18, RA 7586) in apprehending any person in the act of violating said laws and regulations in protected areas.

The National Pollution Commission (now the Environmental Management Bureau [EMB] of the DENR) has been tasked to do regulatory functions on marine pollution (Sec. 5, PD 979), while law enforcement is lodged with the Philippine Coast Guard. This law finds importance as a good number of the species studied are threatened with pollution, especially those found in the waters of Cebu, Manila Bay and Verde Island Passage.

Emerging Concerns: The need for policy

The world has changed so much that we now face at least two concerns: global climate change and invasive alien species.

Climate change. Various authors (*e.g.* Pratchett *et al.* 2008) have documented the influence of global climate change on the habitat structure of all biological processes, species and ecosystems. Such effects include altered timing of breeding activities, shifts in distribution of species, shifts in species composition and community structures across a number of ecosystems, as well as contributing to species extinctions within important and highly sensitive ecosystems. Carpenter *et al.* (2008) report that climate change

and human activities have pushed the extinction risk of reef-building corals, especially in the Coral Triangle Region, to a higher level. As there is high likelihood that climate change will adversely affect the abundance and survival of biodiversity, it is important to work for resiliency which, according to Marshall and Schuttenberg (2006), is determined by the ecosystem condition, biological diversity, connectivity between areas and local environmental conditions. The good news about these factors is that human beings can help secure these conditions, but only if we knew what we have (search), we understand what we have (research), and we protect what we have.

Part of the planning process should be a risk vulnerability assessment to inform resource managers and other stakeholders of the sensitivity of species and habitats as well as the perils that face or are likely to face the communities in a climate change situation or, for that matter, extreme weather conditions and other destructive environmental events. The plans should, therefore, include adaptation to such situations, which may necessitate larger areas of coverage and longer periods of effectivity. Lovejoy and Hannah (2005) offer a useful guide to planning and management in consideration of climate change.

There is at this point no national legal instrument that directly points the Philippines' strategy towards adapting to or mitigating climate change. It is indeed about time we formulate these policies.

Invasive alien species. IAS are non-native micro- and macroorganisms that have been introduced, whether accidentally or deliberately, in aquatic ecosystems which bring about adverse ecological and economic impacts. Such introductions can cause displacement and extinction of indigenous species with heavy economic losses (Guerrero 2006). Introduction of IAS is primarily blamed on aquarium trade and aquaculture (Casal *et al.* 2006). In addition, ships from other countries take in and release seawater at different ports for balance. Ballast water can transport organisms from one area to another (Azanza & Baula 2006). The issue of IAS should be construed in relation to climate change as the latter bolsters the invasive power of alien species. Weeds particularly disperse rapidly in niches vacated by species whose ranges have retracted due to climate change (Lovejoy 2005).

Save for research or scientific purposes which the Department of Agriculture may allow, the Fisheries Code proscribes the introduction of foreign finfish, mollusk, crustacean or aquatic plants in Philippine waters without a sound ecological, biological and environmental justification (Secs. 10 and 102, RA 8550). The Wildlife Resources Conservation and Protection Act, meanwhile, prohibits the introduction of exotic species into the country, unless a clearance is first obtained from the DENR (Sec. 13, RA 9147). Additionally, all activities dealing on genetic engineering and pathogenic organisms in the

Philippines, as well as activities requiring the importation, introduction, field release and breeding of organisms that are potentially harmful to humans and the environment shall be reviewed in accordance with the biosafety guidelines ensuring public welfare and the protection and conservation of wildlife and their habitats (Sec. 16, RA 9147).

The above cited provisions cover only deliberate introduction of alien species and not those that are incidentally released by ships through ballast water. An examination of provisions on aquatic pollution may be of some use.

The Fisheries Code prohibits aquatic pollution (Sec. 102, RA 8550) which it defines as the introduction, whether direct or indirect, of substances to the aquatic environment which result or is likely to result in such deleterious effects as to harm living and non-living aquatic resources, pose potential and/or real hazard to human health, hindrance to aquatic activities such as fishing and navigation, including dumping/disposal of waste and other marine litters, discharge of petroleum or residual products of petroleum or carbonaceous materials/substances, and other, radioactive, noxious or harmful liquid, gaseous or solid substances, from any water, land or air transport or other human-made structure (Sec. 4[4], RA 8550). The Marine Pollution Decree, for its part, seeks to prevent and control the pollution of seas by the dumping, discharging or depositing of wastes into the sea and other matters which create hazards to human health, harm living resources and marine life, damage amenities, or interfere with the legitimate uses of the sea within the Philippines (Secs. 2 and 6, PD 979).

The above provisions are important if only for their reference to "substances" which may refer to ballast water in the case of the Fisheries Code, and to "other matter" in the case of the Marine Pollution Decree. However, as in climate change, there is no specific provision of law that directly deals with invasive alien species.

It is, however, important to note that the Philippines is signatory to a good number of international legal instruments concerning climate change and invasive alien species. Among these are the Kyoto Protocol, Cartagena Protocol on Biosafety, International Plant Protection Convention, Ramsar Convention, Convention on International Trade in Endangered Species (CITES), Convention on Biological Diversity (CBD), Convention on Migratory Species of Wild Animals, United Nations Convention on the Law of the Sea (UNCLOS), and International Convention for the Control and Management of Ships' Ballast Water and Sediments. These instruments should be useful in preventing IAS and in furthering our legal and policy framework on IAS.

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APPENDICES

Appendix A

CHECKLIST OF PHILIPPINE MARINE ENDEMIC TELEOSTS

TAXA	REMARKS
EVALUATED	
Order Atheriniformes	
Family Atherinidae	
1. *Hypoatherina crenolepis* (Schultz, 1953)	Philippine endemic. Known only from Mindoro Strait and Sulu Sea.
Order Perciformes	
Family Blennidae	
2. *Cirripectes viriosus* Williams, 1988	New addition to list. Philippine endemic. Known only from the Batanes province, off Batan Island (Balugan Bay).
3. *Ecsenius dilemma* Springer, 1988	Philippine endemic. Known only from the Verde Island Passage and southern Tañon Strait.
4. *Ecsenius kurti* Springer, 1988	Philippine endemic. Known only from northern Sulu Sea.
5. *Istiblennius colei* (Herre, 1934)	Philippine endemic. Initially known only from the Calamianes Island Group and western Visayan Sea. Also reported in Thailand (needs to be validated).
6. *Plagiotremus iosodon* Smith-Vaniz, 1976	New addition to list. Philippine endemic. New addition to list. Known only from one locality in Tutu Bay, Jolo Island.
7. *Sebastapistes taeniophrys* (Fowler 1943)	New addition to list. Philippines endemic. New addition to list. Known only from two specimens collected in 1909 off Cammahala Bay, Luzon Island
Family Leiognathidae	
8. *Equulites laterofenestra* (Sparks & Chakrabarty, 2007)	Philippine endemic. Newly described species. Genus also renamed from *Photoplagius*. Known only from the Samar Sea.
Family Sillaginidae	
9. *Sillago argentifasciata* Martin & Montalban, 1935	Philippine endemic. Known only from the Balabac Strait.
Family Pomacanthidae	
10. *Chaetodontoplus caeruleopunctatus* Yasuda & Tominaga, 1976	Philippine endemic. Known only from Cebu Strait.
Family Pseudochromidae	
11. *Congrogadus hierichthys* Jordan & Richardson, 1908	Philippine endemic. Known only from southern Sulu Sea and southern Tanon Strait.

TAXA	REMARKS
Order Clupeiformes	
Family Engraulidae	
12. *Stolephorus ronquilloi* Wongratana, 1983	Endemic. Known only from Manat River and Manila Bay.
Order Gadiformes	
Family Macrouridae	
13. *Bathygadus sulcatus* (Smith & Radcliffe, 1912)	Philippine endemic. Initially known in the Philippines only from Cagayan Island [Cagayancillo], Sulu Sea. Reportedly collected also in California, USA (needs to be validated).
14. *Coelorinchus dorsalis* Gilbert & Hubbs, 1920	Philippine endemic. Known only from northern Luzon.
15. *Coelorinchus macrolepis* Gilbert & Hubbs, 1920	Philippine endemic. Known only from Verde Island Passage and eastern China Sea.
16. *Coelorinchus notatus* Smith & Radcliffe, 1912	Philippine endemic. Known only from the Alice Channel, Sulu Archipelago.
17. *Coelorinchus quincunciatus* Gilbert & Hubbs, 1920	Philippine endemic. Known only from Verde Island Passage, Samar-Masbate, Marinduque, and Cebu Strait.
18. *Coelorinchus sexradiatus* Gilbert & Hubbs, 1920	Philippine endemic. Known only from southern Sulu Sea.
19. *Coelorinchus thompsoni* Gilbert & Hubbs, 1920	Philippine endemic. Known only from San Bernardino Strait to San Miguel Bay, Verde Island Passage, Marinduque, and northern Mindanao
20. *Coelorinchus triocellatus* Gilbert & Hubbs, 1920	Philippine endemic. Known only from southern Sulu Sea.
21. *Coelorinchus velifer* Gilbert & Hubbs, 1920	Philippine endemic. Known only from the Verde Island Passage and Bohol Sea.
22. *Coelorinchus weberi* Gilbert & Hubbs, 1920	Philippine endemic. Known only from northern Luzon.
23.*Coryphaenoides camurus* (Smith & Radcliffe, 1912)	Philippine endemic. Known only from western Sulu Sea.
24. *Coryphaenoides dubius* (Smith & Radcliffe, 1912)	Philippine endemic. Known only from Iligan Bay.
25. *Gadomus magnifilis* Gilbert & Hubbs, 1920	Philippine endemic. Known only from Bohol Sea, Sogod Bay, and Sulu Sea.
26. *Trachonurus robinsi* Iwamoto, 1997	Philippine endemic. Known only from Sibuyan Sea, Camotes Sea, Bohol Sea, and Sulu Sea.
Order Myctophiformes	
Family Neoscopelidae	
27. *Solivomer arenidens* Miller, 1947	Philippine endemic. Known only from Sogod Bay, Bohol Sea, western Sulu Sea.
Order Ophidiiformes	
Family Bythitidae	
28. *Paradiancistrus cuyoensis* Schwarzhans, Møller & Nielsen, 2005	New addition to list. Philippine endemic. Known only from the Sulu and Bohol seas.
Order Pleuronectiformes	
Family Soleidae	
29. *Zebrias lucapensis* Seigel & Adamson, 1985	Philippine endemic. Known only from Lingayen Gulf.

TAXA	REMARKS
NOT EVALUATED (From Original List)	
Family Ariidae	
30. *Arius manillensis* Valenciennes, 1840	Not a Philippines endemic. A sea catfish largely found in embayments in the Philippines but has also been recorded in Hong Kong.
31. *Plicofollis magatensis* (Herre, 1926)	Possibly a Philippine endemic but identified as a freshwater species, found in river systems. Genus renamed from *Arius*.
Family Atherinidae	
32. *Atherinomorus regina* (Seale, 1910)	Not a Philippine endemic. Specimens from Culion and Busuanga islands and other parts of the Philippines. Recently recorded also in Indonesia.
Family Engraulidae	
33. *Encrasicholina oligobranchus (Wongratana, 1983)*	Not a Philippine endemic Used to be known only in the Manila Bay area but is now also reported in Indonesia.
Family Gobiidae	
34. *Exyrias ferrarisi* Murdy, 1985	Not a Philippine endemic. Used to be known only from Bolinao, Pangasinan but has been recorded also in Indonesia and Vanuatu.
Family Macrouridae	
35. *Coelorinchus commutabilis* Smith & Radcliffe, 1912	Not a Philippine endemic. Reported in a number of areas in the Philippines and also in Malaysia and Indonesia
NOT EVALUATED (New Addition to List)	
Family Apogonidae	
36. *Apogon uninotatus* (Smith & Radcliffe, 1912)	Possibly not a Philippine endemic. Record from the Persian Gulf needs verification.
Family Balistidae	
37. *Abalistes filamentosus* Matsuura & Yoshino, 2004	Not a Philippine endemic. Found in the Indo-West Pacific: Ryukyu Islands to the Northwest Shelf of Australia, and the Timor Sea.
Family Bythitidae	
38. *Ungusurculus philippinensis* Schwarzhans & Møller, 2007	Possibly a Philippine endemic. Needs verification
39. *Ungusurculus williamsi* Schwarzhans & Møller, 2007	Possibly a Philippine endemic. Needs verification
Family Congridae	
40. *Gorgasia naeocepaea* (Böhlke, 1951)	Philippine endemic. Two records: Patalon, Mindanao
Family Gobiesocidae	
41. *Lepadichthys springeri* Briggs, 2001	Possibly a Philippine endemic. Needs verification

TAXA	REMARKS
Family Gobiidae	
42. *Eviota irrasa* Karnella & Lachner, 1981	Not a Philippine endemic: Cuyo islands, Palawan. Recently recorded from Tonga.
Family Labridae	
43. *Pseudojuloides mesostigma* Randall & Randall, 1981	Not a Philippine endemic. Found in the Philippines, Indonesia, and Papua New Guinea. Recently recorded also from Tonga
Family Ophichthidae	
44. *Muraenichthys philippinensis* Schultz & Woods, 1949	Not a Philippine endemic. 3 records: Philippines; 1 record: Palau
45. *Muraenichthys thompsoni* Jordan & Richardson, 1908	Not a Philippine endemic: 3 records: Philippines. Other records: Australia, Fiji, Madagascar, US, and Vietnam
Family Opistognathidae	
46. *Opistognathus hyalinus*	No information available
Family Pomacentridae	
47. *Altrichthys azurelineatus* (Fowler & Bean, 1928)	Philippine Endemic: 6 records (West of Puson: Pinas Island, 1 record; Pinas and Busanga Island. 2 records. Tara Island, Mindoro= 2 records. Balabac = 1 record)
48. *Altrichthys curatus* Allen, 1999	Philippine endemic: 3 records, all in Cuyo Islands
Family Plesiopidae	
49. *Beliops batanensis* Smith-Vaniz & Johnson, 1990	Possibly a Philippine endemic: 1 record: Batan Island, northern Philippines. Possibly occurs also in Taiwan. Needs validation.
Family Pseudochromidae	
50. *Labracinus atrofasciatus* (Herre, 1933)	Philippine Endemic: only 1 record off Culion.
51. *Manonichthys winterbottomi* Gill, 2004	Possibly a Philippine endemic. Only 1 record reported, in Tañon Strait, off Cebu, near Bais
52. *Pseudochromis colei* Herre, 1933	Endemic. Only recorded in Culion
53. *Pseudochromis eichleri*	Limited information available. GILL, A.C. & G.R. ALLEN. In press. *Pseudochromis eichleri*, new species of pseudochromine dottyback from the Philippine Islands (Perciformes: Pseudochromidae). Zeylanica.
Family Ptereleotridae	
54. *Aioliops brachypterus* Rennis & Hoese, 1987	Possibly a Philippine endemic. Western Central Pacific native. Pacific Ocean
Family Serranidae	
55. *Pseudogramma erythreum* Randall & Baldwin, 1997	Philippine endemic. Only two records: Maricaban Island
Family Tripterygiidae	
56. *Helcogramma albimacula* Williams & Howe, 2003	Possibly a Philippine endemic: Apo Island: 3 records. (Note: 1 record labeled as off Tonga Point. Needs validation.)

Appendix B

SUMMARY ON THE IUCN RED LIST CATEGORIES AND CRITERIA

Summary of the five criteria (A-E) used to evaluate if a species belongs in a threatened category (Critically Endangered, Endangered or Vulnerable)

Use any of the Criteria A-E	Critically Endangered	Endangered	Vulnerable
A. Population reduction (declines measured over the longer of 10 years or 3 generations)			
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%
A1. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased, based on and specifying any of the following: (a) direct observation (b) an index of abundance appropriate to the taxon (c) a decline in area of occupancy (AOO), extent of occurrence (EOC) and/or habitat quality (d) actual or potential levels of exploitation (e) effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.			
A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible, based on (a) to (e) under A1.			
A3. Population reduction projected or suspected to be met in the future (up to a maximum of 100 years) based on (b) to (e) under A1.			
A4. An observed, estimated, inferred, projected, or suspected population reduction (up to a maximum of 100 years) where the time period must include both the past and the future, and where the causes of reduction may not have ceased OR may not be understood or may not be reversible, based on (a) to (e) under A1.			
B. Geographic range in the form of either B1 (extent of occurence) AND/OR B2 (area of occupancy)			
B1. Extent of occurrence	< 100 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy	< 10 km²	< 500 km²	< 2,000 km²
AND at least 2 of the following:			
(a) Severely fragmented, OR # of locations	= 1	≤ 5	≤ 10
(b) Continuing decline in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			
C. Small population size and decline			
Number of mature individuals	< 250	< 2,500	< 10,000
AND either **C1** or **C2**:			
C1. An estimated continuing decline of at least: (up to a maximum of 100 years in future)	25% in 3 years or 1 generation	20% in 5 years or 2 generations	10% in 10 years or 3 generations
C2. A continuing decline AND (a) and/or (b)			
(a) (i) # of mature individuals in each subpopulation: or	< 50	< 250	< 1,000
(a) (ii) % individuals in one subpopulation at least	90%	95%	100%
(b) extreme fluctutations in the number of mature individuals			
D. Very small or restricted population			
Either: (1) Number of mature individuals	≤ 50	≤ 250	≤ 1,000
AND/OR: (2) Restricted area of occupancy	na	na	AOO < 20 km² or # locations ≤ 5
E. Quantitative analysis			
Indicating the probability of extinction in the wild to be	≥ 50% in 10 years or 3 generations (100 years max)	≥ 20% in 10 years or 5 generations (100 years max)	≥ 10% in 100 years