

Red List Assessment of

Gulf of Mexico

Endemic Marine Fishes

*Harte Research Institute, Texas A&M University
Corpus Christi, August 8–11, 2011*



Participants at the IUCN Red List Workshop for Gulf of Mexico Endemic Marine Fishes.

Workshop Summary

Twelve scientific experts (Table 1) met at the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University in Corpus Christi to assess the status of Gulf of Mexico marine endemic fishes, under the Categories and Criteria of the IUCN Red List of Threatened Species.

A comprehensive list of marine endemic fishes was produced, and data on each species' taxonomy, distribution, population status, habitat, ecology, exposure to major threats, and conservation measures were collated and reviewed. This information was then used to apply the Criteria and assign each species an IUCN Red List Category.

Preliminary results indicate that there are 67 species of marine fish that can be considered endemic to the Gulf of Mexico (Table 2), representing approximately 5% endemism in the region. Of these, 10 species (15%) were classified in threatened categories. Two species were listed as Near Threatened, 35 as Least Concern, and 20 as Data Deficient. These preliminary results are still under peer review.

The primary threats to species in the Gulf were habitat loss and habitat degradation, mainly due to coastal development and decreased water quality from urban/agricultural pollution, oil spills, sedimentation, eutrophication, and hypoxia. The majority of species in threatened categories were shallow water endemics that were found in sensitive near-shore habitats, particularly oyster reefs, mangroves, lagoons and estuaries.

Many of the deeper water species, including some sharks, rays, and eels, were listed as Data Deficient because the impact of suspected threats from deep water trawling and deep water oil spills could not be quantified.



Joyce & Frank Burek



A terminal phase male Mardi Gras wrasse. Photo: Joyce & Frank Burek

Threatened Species Highlights

Three species of killifish are listed as Vulnerable (*Fundulus jenkinsi*, *Fundulus grandissimus*, *Fundulus persimilis*). All of these species have restricted ranges in shallow salt marshes, coastal lagoons, and/or estuarine areas. They are all threatened by habitat loss from coastal development and pollution.

Two gobies, *Tigrigobius redimiculus* and *Elacatinus jarocho*, are listed as Endangered. Both of these species are only known from the patch reefs in the proximity of Vera Cruz, Mexico and have an estimated extent of occurrence of less than 500 km². These reefs are in a deteriorated condition due to overfishing and pollution.

The Blenny *Chasmodes longimaxilla* is listed as Vulnerable. It has a very restricted known range, and has an area of occupancy estimated to be less than 2,000 km². It has not been recently collected in several parts of its supposed distribution. It is thought to inhabit shallow seagrass and oyster reefs, a habitat that is fragmented and may be impacted by the recent Deepwater Horizon oil spill.

The Gold Brotula (*Gunterichthys longipenis*) is listed as Vulnerable. It has not been collected since 1976, and inhabits soft bottoms along the shoreline and shallow brackish waters, an area that is heavily impacted by coastal development, pollution, dredging, and other anthropogenic activities. Given that it is only present in appropriate habitat along the shoreline to depths of 10 m, it has an estimated are of occupancy of less than 2,000 km². More research is needed to determine the population of status of this species, as it may qualify for a higher threat category.

The Mardi Gras Wrasse, *Halicboeres burekae*, is listed as Endangered as only known from three locations in the western Gulf of Mexico. Although it can be locally common, known areas of suitable habitat are relatively small, few in number, and scattered. It has an area of occupancy estimated to be less than 500 km², and is threatened by the loss of coral reef habitat from sedimentation and pollution within its restricted range.

Conservation of marine resources in the Gulf of Mexico is essential for maintaining human livelihoods and supporting national economies...

Recommendations for the Presidential Task Force Strategy for Restoration

Workshop participant Becki Allee, from the NOAA Gulf Coast Services Center, asked for recommendations for sentinel (indicator) species and for priority research needs for the purposes of including non-managed species in the Science docket, as well as to help develop the Strategy docket. Both dockets will form a large component NOAA's recommendations for the Restoration of the Gulf under the Presidential Task Force (meeting to be held in October).

Sentinel Species and Research Priorities Recommended

Although it is unclear at the moment, restoring coastal Louisiana may turn out to be the focus of the final Strategy. In which case, both oyster reefs and marsh habitats are recommended as priority geographic areas, along with restricted range endemics in this region. Although not all are endemic to the Gulf, sentinel species in this region could include *Cynoscion nebulosus* (Spotted Sea Trout), Blennioids, *Gobiosoma bosc* (Naked Goby), and *Fundulus spp.* (Killifishes), especially *Fundulus grandis*, the endemic Gulf Killifish.

As oyster reefs were recommended as priority geographic areas for protection, the endemic *Chasmodes longimaxilla* (Combtooth or Stretchjaw Blenny) was recommended as a sentinel species. Other non-endemic oyster reef species were also suggested, including *Opsanus beta* (Gulf Toadfish), *Gobiesox spp.* (Clingfishes), and *Gobiosoma bosc* (Naked Goby) as they may provide information on the condition of the reef, although they are also found in other environments.

In terms of research needs, additional surveys in the deeper part of the Gulf are needed, especially in light of Oil Exploration occurring in increasingly deeper areas along the coast. More research is particularly needed in the meso-pelagic zone, and to address geographic gaps in collections within the Gulf. Finally, collection should include specimens that can be used for genetic studies, and more information is also needed on biology and ecology, including diet and life history, for many species.

A Final Workshop To Complete Comprehensive Red List Assessments for All Marine Fishes in the Gulf of Mexico

With the completion of the Gulf of Mexico Marine Endemic Fish workshop, the IUCN Marine Biodiversity Unit has now completed global Red List assessments for more than 1000 of the approximately 1500 marine fish in the Gulf of Mexico. Assessment of the remaining ~ 400 species could be accomplished in one final Red List Workshop.

Conservation of marine resources in the Gulf of Mexico is essential for maintaining human livelihoods and supporting national economies. Completion of the Red List Assessments for all marine fishes present the Gulf of Mexico will provide the first comprehensive review of the region's conservation priorities for all marine fish species. Results will enable increased effort to conserve and recover individual taxa and to identify geographic areas with high concentrations of threatened species. A comprehensive species Red List database containing species distribution, population, habitat, ecology, impact of major threats, and conservation measures will lay the foundation for the development of more effective site and species-specific conservation priorities in the Gulf. Of the species groups assessed to date, there are now 63 marine species listed in threatened IUCN Red List Categories (Table 3).

Table 1 Names, email and affiliation of Workshop participants.

<i>Participant</i>	<i>Email</i>	<i>Organization</i>
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Table 2 Final list of 67 Gulf of Mexico marine endemic fishes and Red List Category.

<i>Class</i>	<i>Order</i>	<i>Family</i>	<i>Species Name</i>	<i>Red List Category</i>
ACTINOPTERYGII	ANGUILLIFORMES	OPHICHTHIDAE	<i>Gordiichthys ergodes</i>	DD
ACTINOPTERYGII	ANGUILLIFORMES	OPHICHTHIDAE	<i>Ophichthus omorgmus</i>	DD
ACTINOPTERYGII	ANGUILLIFORMES	OPHICHTHIDAE	<i>Ophichthus rex</i>	LC
ACTINOPTERYGII	ATHERINIFORMES	ATHERINIDAE	<i>Menidia clarkhubbsi</i>	DD
ACTINOPTERYGII	ATHERINIFORMES	ATHERINIDAE	<i>Menidia colei</i>	VU
ACTINOPTERYGII	ATHERINIFORMES	ATHERINIDAE	<i>Menidia conchorum</i>	DD
ACTINOPTERYGII	AULOPIFORMES	PARALEPIDIDAE	<i>Stemonosudis bullisi</i>	DD
ACTINOPTERYGII	BATRACHOIDIFORMES	BATRACHOIDIDAE	<i>Sanopus reticulatus</i>	VU
ACTINOPTERYGII	CLUPEIFORMES	CLUPEIDAE	<i>Alosa alabamae</i>	NT
ACTINOPTERYGII	CLUPEIFORMES	CLUPEIDAE	<i>Alosa chrysochloris</i>	LC
ACTINOPTERYGII	CLUPEIFORMES	CLUPEIDAE	<i>Brevoortia gunteri</i>	LC
ACTINOPTERYGII	CLUPEIFORMES	CLUPEIDAE	<i>Brevoortia patronus</i>	LC
ACTINOPTERYGII	CLUPEIFORMES	PRISTIGASTERIDAE	<i>Neoopisthopterus cubanus</i>	DD
ACTINOPTERYGII	CYPRINODONTIFORMES	CYPRINODONTIDAE	<i>Garmanella pulchra</i>	LC
ACTINOPTERYGII	CYPRINODONTIFORMES	CYPRINODONTIDAE	<i>Jordanella floridae</i>	LC
ACTINOPTERYGII	CYPRINODONTIFORMES	FUNDULIDAE	<i>Adinia xenica</i>	LC
ACTINOPTERYGII	CYPRINODONTIFORMES	FUNDULIDAE	<i>Fundulus grandis</i>	LC
ACTINOPTERYGII	CYPRINODONTIFORMES	FUNDULIDAE	<i>Fundulus grandissimus</i>	VU
ACTINOPTERYGII	CYPRINODONTIFORMES	FUNDULIDAE	<i>Fundulus jenkinsi</i>	VU
ACTINOPTERYGII	CYPRINODONTIFORMES	FUNDULIDAE	<i>Fundulus persimilis</i>	VU
ACTINOPTERYGII	CYPRINODONTIFORMES	FUNDULIDAE	<i>Fundulus pulvereus</i>	LC
ACTINOPTERYGII	CYPRINODONTIFORMES	POECILIIDAE	<i>Gambusia yucatana</i>	LC
ACTINOPTERYGII	LEPISOSTEIFORMES	LEPISOSTEIDAE	<i>Atractosteus spatula</i>	DD
ACTINOPTERYGII	LEPISOSTEIFORMES	LEPISOSTEIDAE	<i>Lepisosteus oculatus</i>	LC
ACTINOPTERYGII	LOPHIIFORMES	OGCOEPHALIDAE	<i>Halieutichthys intermedius</i>	LC
ACTINOPTERYGII	LOPHIIFORMES	OGCOEPHALIDAE	<i>Ogcocephalus declivirostris</i>	LC
ACTINOPTERYGII	LOPHIIFORMES	OGCOEPHALIDAE	<i>Ogcocephalus pantostictus</i>	LC
ACTINOPTERYGII	LOPHIIFORMES	ONEIRODIDAE	<i>Oneirodes bradburyae</i>	DD
ACTINOPTERYGII	OPHIDIIFORMES	BYTHITIDAE	<i>Gunterichthys longipenis</i>	VU
ACTINOPTERYGII	OPHIDIIFORMES	BYTHITIDAE	<i>Saccogaster rhampidognatha</i>	DD
ACTINOPTERYGII	PERCIFORMES	BLENNIIDAE	<i>Cbsmodes longimaxilla</i>	VU
ACTINOPTERYGII	PERCIFORMES	BLENNIIDAE	<i>Hypleurochilus caudovittatus</i>	LC
ACTINOPTERYGII	PERCIFORMES	BLENNIIDAE	<i>Hypleurochilus multifilis</i>	LC
ACTINOPTERYGII	PERCIFORMES	BLENNIIDAE	<i>Lupinoblennius nicholsi</i>	LC
ACTINOPTERYGII	PERCIFORMES	CENTROLOPHIDAE	<i>Hyperoglyphe bythites</i>	LC
ACTINOPTERYGII	PERCIFORMES	GOBIIDAE	<i>Cbriolepis benthonis</i>	DD
ACTINOPTERYGII	PERCIFORMES	GOBIIDAE	<i>Coryphopterus punctipetporus</i>	LC

Table 2 Continued Final list of 67 Gulf of Mexico marine endemic fishes and Red List Category.

<i>Class</i>	<i>Order</i>	<i>Family</i>	<i>Species Name</i>	<i>Red List Category</i>
ACTINOPTERYGII	PERCIFORMES	GOBIIDAE	<i>Ctenogobius claytonii</i>	NT
ACTINOPTERYGII	PERCIFORMES	GOBIIDAE	<i>Elacatinus jarocho</i>	EN
ACTINOPTERYGII	PERCIFORMES	GOBIIDAE	<i>Gobiosoma longipala</i>	LC
ACTINOPTERYGII	PERCIFORMES	GOBIIDAE	<i>Tigrigobius redimiculus</i>	EN
ACTINOPTERYGII	PERCIFORMES	LABRIDAE	<i>Halichoeres burekae</i>	EN
ACTINOPTERYGII	PERCIFORMES	MICRODESMIDAE	<i>Microdesmus lanceolatus</i>	LC
ACTINOPTERYGII	PERCIFORMES	SCLAENIDAE	<i>Cynoscion arenarius</i>	LC
ACTINOPTERYGII	PERCIFORMES	SPARIDAE	<i>Calamus arctifrons</i>	LC
ACTINOPTERYGII	PERCIFORMES	SPARIDAE	<i>Calamus campechanus</i>	DD
ACTINOPTERYGII	PERCIFORMES	ZOARCIDAE	<i>Lycenchelys bullisi</i>	LC
ACTINOPTERYGII	PLEURONECTIFORMES	ACHIRIDAE	<i>Gymnachirus texae</i>	LC
ACTINOPTERYGII	PLEURONECTIFORMES	BOTHIDAE	<i>Trichopsetta ventralis</i>	LC
ACTINOPTERYGII	PLEURONECTIFORMES	PARALICHTHYIDAE	<i>Citharichthys abbotti</i>	DD
ACTINOPTERYGII	SCORPAENIFORMES	TRIGLIDAE	<i>Prionotus longispinosus</i>	LC
ACTINOPTERYGII	SCORPAENIFORMES	TRIGLIDAE	<i>Prionotus martis</i>	LC
ACTINOPTERYGII	SCORPAENIFORMES	TRIGLIDAE	<i>Prionotus paralatus</i>	LC
ACTINOPTERYGII	STOMIIFORMES	STOMIIDAE	<i>Eustomias leptobolus</i>	DD
ACTINOPTERYGII	SYNGNATHIFORMES	SYNGNATHIDAE	<i>Syngnathus affinis</i>	DD
ACTINOPTERYGII	TETRAODONTIFORMES	TETRAODONTIDAE	<i>Sphoeroides parvus</i>	LC
CHONDRICHTHYES	CARCHARHINIFORMES	SCYLIORHINIDAE	<i>Parmaturus campechiensis</i>	DD
CHONDRICHTHYES	CARCHARHINIFORMES	TRIAKIDAE	<i>Mustelus sinuamexicanus</i>	DD
CHONDRICHTHYES	RAJIFORMES	ANACANTHOBATIDAE	<i>Anacanthobatis folirostris</i>	DD
CHONDRICHTHYES	RAJIFORMES	RAJIDAE	<i>Dipturus olseni</i>	LC
CHONDRICHTHYES	RAJIFORMES	RAJIDAE	<i>Dipturus oregoni</i>	LC
CHONDRICHTHYES	RAJIFORMES	RAJIDAE	<i>Leucoraja lentiginosa</i>	LC
CHONDRICHTHYES	RAJIFORMES	RAJIDAE	<i>Raja texana</i>	LC
CHONDRICHTHYES	SQUATINIFORMES	SQUATINIDAE	<i>Squatina heteroptera</i>	DD
CHONDRICHTHYES	SQUATINIFORMES	SQUATINIDAE	<i>Squatina mexicana</i>	DD
MYXINI	MYXINIFORMES	MYXINIDAE	<i>Eptatretus minor</i>	DD
MYXINI	MYXINIFORMES	MYXINIDAE	<i>Paramyxine springeri</i>	LC



Table 3 Threatened Species of the Gulf of Mexico

Red List Category	Species Name	Common Name	Protection Status	Red List Category	Species Name	Common Name	Protection Status
Critically Endangered	<i>Lepidochelys kempii</i>	Kemp's ridley turtle	ESA-E	Vulnerable	<i>Alopias superciliosus</i>	Bigeye thresher shark	
	<i>Eretmochelys imbricata</i>	Hawksbill turtle	ESA-E		<i>Alopias vulpinus</i>	Common thresher shark	
	<i>Dermochelys coriacea</i>	Leatherback turtle	ESA-E		<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	
	<i>Epinephelus drummondhayi</i>	Speckled hind			<i>Carcharhinus obscurus</i>	Dusky shark	
	<i>Epinephelus itajara</i>	Atlantic goliath grouper			<i>Carcharhinus plumbeus</i>	Sandbar shark	
	<i>Epinephelus nigritus</i>	Warsaw grouper			<i>Carcharhinus signatus</i>	Night shark	
	<i>Pristis pectinata</i>	Smalltooth sawfish	ESA-E		<i>Centrophorus granulosus</i>	Gulper shark	
	<i>Pristis perotteti</i>	Large tooth sawfish			<i>Cetorhinus maximus</i>	Basking shark	
	<i>Narcine bancroftii</i>	Lesser electric ray			<i>Carcharodon carcharias</i>	Great white shark	
	<i>Acropora cervicornis</i>	Staghorn coral	ESA-T		<i>Isurus oxyrinchus</i>	Shortfin mako	
	<i>Acropora palmate</i>	Elk horn coral	ESA-T		<i>Isurus paucus</i>	Longfin mako	
					<i>Carcharias taurus</i>	Sand tiger shark	
	Endangered	<i>Balaenoptera borealis</i>	Servant whale		ESA-E, MMPA	<i>Odontaspis ferox</i>	
<i>Balaenoptera musculus</i>		Blue whale	ESA-E, MMPA	<i>Rhincodon typus</i>	Whale shark		
<i>Balaenoptera physalus</i>		Finback whale	ESA-E, MMPA	<i>Sphyrna zygaena</i>	Smooth hammerhead		
<i>Pterodroma caribbaea</i>		Jamaica petrel	ESA-E, MMPA	<i>Squalus acanthias</i>	Spiny dogfish		
<i>Pterodroma basitata</i>		Black-capped petrel	MBTA	<i>Gymnura altavela</i>	Butterfly ray		
<i>Caretta caretta</i>		Loggerhead turtle	ESA-T	<i>Agaricia lamarcki</i>	Lamarck's sheet coral		
<i>Cblonia mydas</i>		Green turtle	ESA-E, ESA-T (by range)	<i>Montastraea frankii</i>	Montastraea coral		
<i>Elacatinus jarocho*</i>		Jaracho goby		<i>Dendrogyra cylindrus</i>	Pillar coral		
<i>Tigrigobius redimiculus*</i>		Neon goby		<i>Dibocoenia stokesii</i>	Elliptical star coral		
<i>Haitiboeres burekæ*</i>		Mardi Gras wrasse		<i>Mycetophyllia ferox</i>	Rough cactus coral		
<i>Thunnus thynnus</i>		Atlantic Bluefin		<i>Oculina varicose</i>	Large ivory coral		
<i>Sphyrna lewini</i>		Scalloped hammerhead shark		<i>Halophila baillonii</i>	Clover seagrass		
<i>Sphyrna mokarran</i>		Great hammerhead shark					
<i>Montastraea annularis</i>	Boulder star coral						
<i>Montastraea faveolata</i>	Mountainous star coral						
Vulnerable	<i>Trichechus manatus</i>	Manatee	ESA-E, MMPA				
	<i>Physeter macrocephalus</i>	Sperm whale	ESA-E, MMPA				
	<i>Epinephelus fasciolumbatus</i>	Yellowwedge grouper					
	<i>Epinephelus niveatus</i>	Snowy grouper					
	<i>Mycteroperca interstitialis</i>	Yellowmouth grouper					
	<i>Lachnolaimus maximus</i>	Hogfish					
	<i>Menidia colet*</i>	Golden silverside					
	<i>Fundulus grandisissimus*</i>	Giant killifish					
	<i>Fundulus jenkinsi*</i>	Saltmarsh topminnow	US NMFS - SOC				
	<i>Fundulus persimilis*</i>	Yucatan killifish					
	<i>Gunterichthys longipennis*</i>	Gold brotula					
	<i>Casmodes longimaxilla*</i>	Longjaw blenny					
	<i>Sanopus reticulatus*</i>	Reticulate Toadfish					



ESA-E, endangered under the Endangered Species Act (ESA); ESA-T, threatened under the ESA; MBTA, listed on the Migratory Bird Treaty Act; MMPA, listed on the Marine Mammal Protection Act; US NMFS - SOC, listed as a species of concern by the National Marine Fisheries Service.

* preliminary results, Red List assessment is currently under review