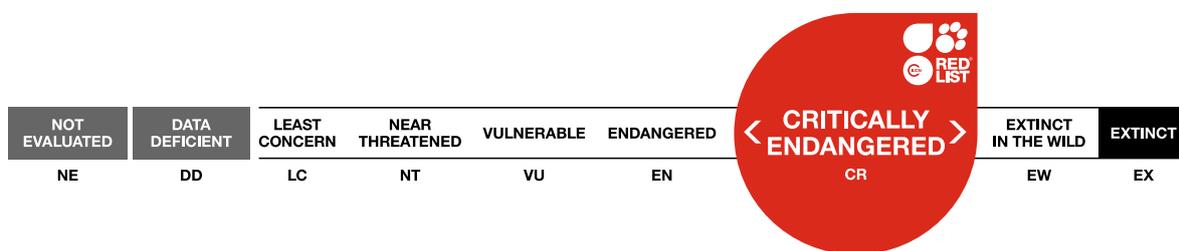


## *Rhinobatos annandalei*, Bengal Guitarfish

Assessment by: Dulvy, N.K., Akhilesh, K.V., Bineesh, K.K., Derrick, D., Ebert, D.A., Fernando, D., Haque, A.B., Jabado, R.W., Khan, M. & Maung, A.



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## Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Chondrichthyes	Rhinopristiformes	Rhinobatidae

**Scientific Name:** *Rhinobatos annandalei* Norman, 1926

### Common Name(s):

- English: Bengal Guitarfish, Annandale's Guitarfish
- Arabic: سوس لة كمس

### Taxonomic Source(s):

Eschmeyer, W.N., Fricke, R. and Van der Laan, R. (eds). 2016. Catalog of Fishes: genera, species, references. Updated 29 September 2016. Available at: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. (Accessed: 29 September 2016).

## Assessment Information

**Red List Category & Criteria:** Critically Endangered A2d [ver 3.1](#)

**Year Published:** 2021

**Date Assessed:** May 13, 2020

### Justification:

The Bengal Guitarfish (*Rhinobatos annandalei*) is a small (to 95 cm total length) guitarfish that occurs in the northern Indian Ocean from the United Arab Emirates (UAE) to Bangladesh, including Sri Lanka. The western boundary of this species distribution is uncertain due to confusion with the Spotted Guitarfish (*R. punctifer*). It is demersal on the inner continental shelf at depths of 5–73 m. The species is mainly a bycatch of a range of industrial and artisanal gears including demersal trawls, longlines, and gillnets. The meat is consumed locally and traded internationally, and the skins are exported from Bangladesh to Myanmar to be made into accessories (e.g. handbags). There is a high level of fisheries resource use and increasing fishing pressure across the range of this species. Severe population reduction is inferred from actual levels of exploitation, as well as several historical accounts and contemporary datasets from the UAE, Iran, Pakistan, and India. Landings data of guitarfishes and rays from the UAE, Iran, Pakistan, India, and Bangladesh indicate landings declines of 69–93% consistent with population reductions of 80% over the past three generation lengths (27 years). These levels of declines are not species-specific but are informative for understanding the broader levels of guitarfish decline in the region. It is suspected that the Bengal Guitarfish has undergone a population reduction of >80% over the past three generation lengths (27 years) due to actual levels of exploitation, and it is assessed as Critically Endangered A2d.

### Previously Published Red List Assessments

2009 – Data Deficient (DD)

<https://dx.doi.org/10.2305/IUCN.UK.2009-2.RLTS.T161478A5432942.en>

## Geographic Range

### Range Description:

The Bengal Guitarfish occurs in the northern Indian Ocean from the United Arab Emirates and Iran to Bangladesh, including Sri Lanka (Hoq *et al.* 2011, Last *et al.* 2016, A.B. Haque unpubl. data 2020). The western boundary of this species distribution is uncertain due to confusion with the Spotted Guitarfish (*Rhynchobatos punctifer*) (A. Moore pers. comm. 8/10/2020).

### Country Occurrence:

**Native, Extant (resident):** Bangladesh; India; Iran, Islamic Republic of; Oman; Pakistan; Sri Lanka; United Arab Emirates

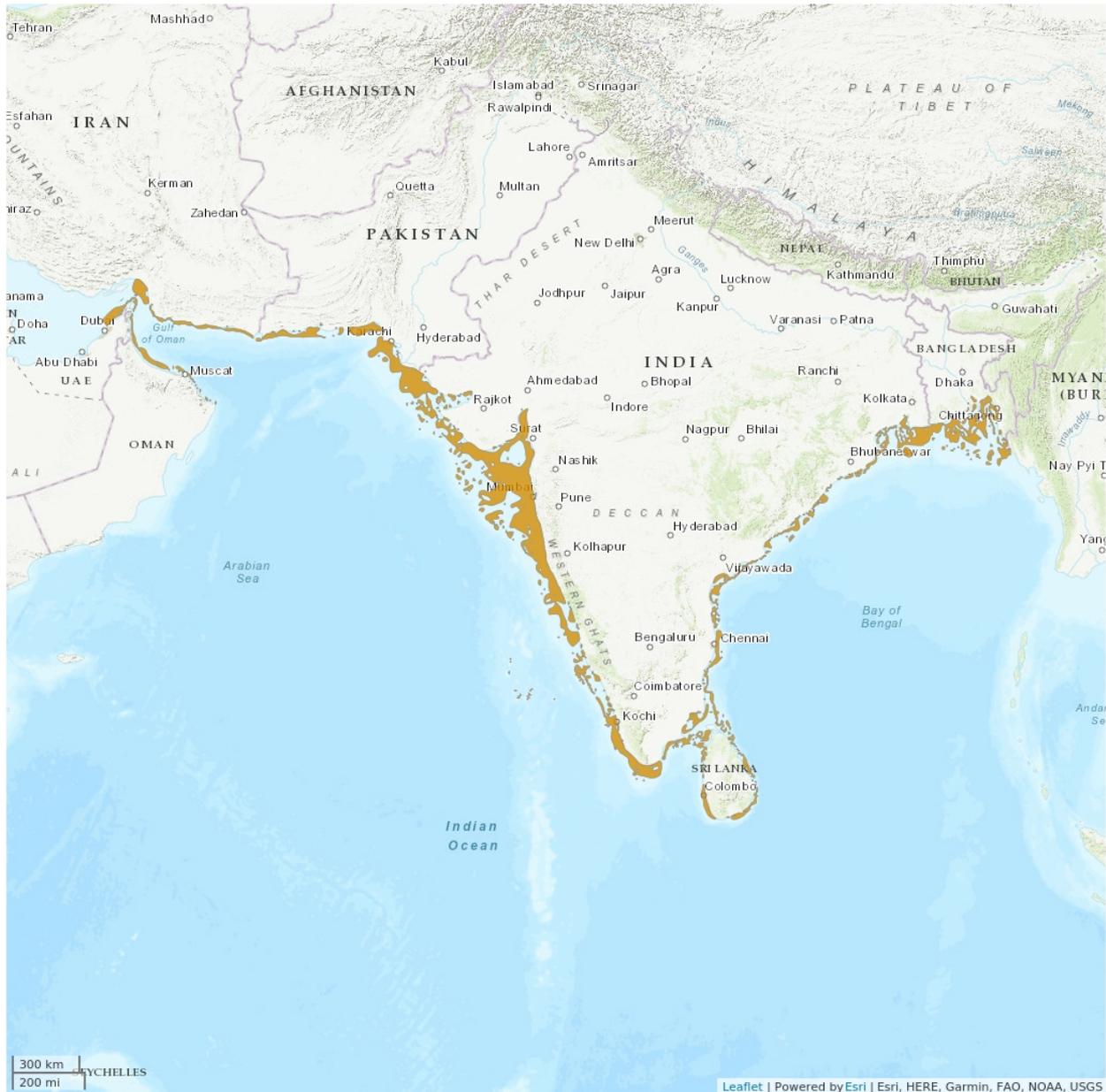
**Native, Presence Uncertain:** Saudi Arabia

### FAO Marine Fishing Areas:

**Native:** Indian Ocean - eastern

**Native:** Indian Ocean - western

# Distribution Map

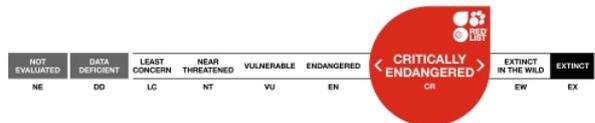


## Legend

■ EXTANT (RESIDENT)

Compiled by:

IUCN SSC Shark Specialist Group 2020



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

## Population

Where Rhinopristiformes (sawfishes, wedgefishes, giant guitarfishes, and guitarfishes) have been targeted or exploited as incidental catch, severe declines, population depletions, and localized disappearances have occurred (e.g. Dulvy *et al.* 2016, Moore 2017, Jabado 2018, Kyne *et al.* 2020). However, there are no species-specific time-series data available for guitarfish species that can be used to estimate population reduction. This is due to a lack of species-specific reporting as well as taxonomic and identification issues, which are acute for the Bengal Guitarfish (Jabado 2018).

Despite the lack of species-specific data, there are a number of relevant historical accounts and contemporary datasets for landings and catch rates, and although landings data are not a direct measure of abundance, these can be used to infer population reduction where landings have decreased while fishing effort has remained stable or increased. In nearly all cases presented below, there is no reason to suspect that overall effort has decreased. In fact, as the human coastal population continues to grow and as fishing technology and market access improves, fishing effort and power is continuing to increase globally, with some of the highest increases in the Asian region (Anticamara *et al.* 2011, Watson *et al.* 2013). To infer population reduction for Bengal Guitarfish, five contemporary datasets on landings and catch rates are supplemented with a historical narrative from Bangladesh.

First, the Bengal Guitarfish is one of the most commonly landed guitarfish (9.5% of rhinopristoids) in the United Arab Emirates (UAE) and Oman (Jabado 2018). Without understanding patterns in fishing effort it can be difficult to infer declines from landings data. Nevertheless, assuming constant or increasing fishing effort, landings surveys reveal significant declines of wedgefishes and guitarfishes in the UAE. For example, there has been a rapid decline – despite ongoing fishing effort – of the related Halavi Guitarfish (*Glaucostegus halavi*); 10–20 individuals were regularly observed during 2010–2012, while landings of 1–2 individuals were more common five years later, consistent with a 90% decline in less than one generation length (Jabado 2018).

Second, landings data for the 'giant guitarfish' category are available from Iran for 1997–2016 (FAO 2018). This grouping likely includes all rhinids, rhinobatids, and glaucostegids occurring locally, and these trends are also likely to be representative for the Bengal Guitarfish. Landings declined by 66% over this period, which is the equivalent of a 69% population reduction over the last three generation lengths (27 years) of the Bengal Guitarfish.

Third, landings data for “guitarfish (Rhinopristiformes)” category, including Bengal Guitarfish, are available from Pakistan for 1993–2011 covering the country’s two coastal provinces (Gore *et al.* 2019, Kyne *et al.* 2020). There was a 72% decrease from peak landings in 1999 to a low in 2011 in Sindh province and an 81% decrease from landings in 1994 to a low in 2011 in Balochistan province (Gore *et al.* 2019). These decreases are the equivalent of 87–93% population reduction over the last three generation lengths (27 years) of the Bengal Guitarfish.

Fourth, this species was historically abundant along both southeast and west coasts of India. There have been steep declines in elasmobranchs reported from India (Kizhakudan *et al.* 2015) which could be applicable to this species. The catch from historically known areas in the east coast has reduced, yet this species is still the one of most commonly caught guitarfish, along with the Stripenose Guitarfish (*Acroteriobatus variegatus*), in the southern coasts of India (K.V. Akhilesh unpubl. data 2020). This

species still occurs along the east coast with greatest numbers in West Bengal and an average of 5–70 individuals ranging in size from 22 to 72 cm total length (TL) caught in trawl catches (K.K. Bineesh unpubl. 2020). In the west coast, this species constituted 2% of the total biomass of all batoids landed in Maharashtra. The estimated landings of Bengal Guitarfish as bycatch of shrimp trawlers, gillnetters and bag or dol netters varied between 0.1–3.1 t from 2012 to 2016 (Purushottama *et al.* 2020). The size range in the fishery is 30–95 cm TL, with a mean size of 56 cm TL (Purushottama *et al.* 2020). Catch data for myliobatid rays (this includes a variety of demersal rays but does not include guitarfishes) is available from Maharashtra, on the west coast of India. There, the annual average catch of rays landed by trawlers at New Ferry Wharf, Mumbai, between 1990–2004 was 502 t. During this period trawler hours doubled, and consequently, the catch rate declined by 60% from 0.65 kg/hr in 1990 to 0.24 kg/hr in 2004 (Raje and Zacharia 2009). Although this information is not species-specific, and the actual proportion of the Bengal Guitarfish in the catch is unknown, it provides a good indication of batoid declines in India. This level of decline equates to a population reduction of 85% over the three generation lengths (27 years) of the Bengal Guitarfish.

Fifth, while there are no species-specific data available on this species, elasmobranchs have been heavily exploited in Tamil Nadu and Kerala, southern India (Raje *et al.* 2002). Significant declines in wedgefish and guitarfish landings have been documented in Tamil Nadu through monitoring at Chennai (Mohanraj *et al.* 2009). Wedgefish and guitarfish landings decreased by 86% over the five years of monitoring (2002–2006). Trawlers in Tamil Nadu fish widely throughout southern India (Karnad *et al.* 2014) and data can be considered representative of the broader area. The entire Indian range of the species is subject to intense and increasing fishing pressure, with little refuge.

Sixth, this species is not very commonly landed, but it is observed throughout the year in Bangladesh. Questionnaire surveys of local fishers revealed a steep decline in wedgefishes and guitarfishes in the past ten years, particularly the Whitespotted Wedgefish (*Rhynchobatos* spp.) which has not been seen in the past decade (A.B. Haque unpubl. data 2020). The Bengal Guitarfish is now regarded as being extremely uncommon (A.B. Haque unpubl. data 2020).

Fishing pressure is high across the range of this species, and while some of these datasets encompass other Rhinopristiformes or may only consider myliobatid rays, they can be considered representative of population reduction throughout the Indian Ocean. Overall, it is suspected that the Bengal Guitarfish has undergone declines in catch of >90%, 69%, 87–93% and 85% in the UAE, Iran, Pakistan and India, respectively, which is consistent with a >80% population reduction over the last three generation lengths (27 years) and it is assessed as Critically Endangered A2d.

**Current Population Trend:** Decreasing

## **Habitat and Ecology (see Appendix for additional information)**

The Bengal Guitarfish is demersal on the inner continental shelf at depths of 5–73 m (Weigmann 2016). It reaches a maximum size of at least 95 cm total length (TL), males mature at 63 cm TL and females mature at 65 cm TL (Last *et al.* 2016, Purushottam *et al.* 2020). Reproduction is presumably lecithotrophic viviparous and size-at-birth is 20 cm TL (Last *et al.* 2016) but relatively little is known of the biology of the species, and it is confused with other species in the Indian Ocean. There is no information on this species' age-at-maturity and maximum age and hence, generation length was inferred based on data for the Common Guitarfish (*Rhinobatos rhinobatos*). The Common Guitarfish has

an age-at-maturity of four years and a maximum age of 24 years and, thus, a generation length of 14 years (Başusta *et al.* 2008). The Bengal Guitarfish has a smaller maximum size (95 cm TL) than the Common Guitarfish (150 cm TL), therefore generation length was scaled to be 9 years.

**Systems:** Marine

## Use and Trade

Guitarfishes are heavily utilized across their range for their meat which is of good quality and is consumed fresh locally, although it also enters the international trade in dried and salted form (e.g. Moore 2017, Jabado 2018). In Bangladesh, the meat is mostly consumed in tribal areas, but it also exported to Myanmar (A.B. Haque unpubl. data 2020). Guitarfish fins are utilised, however, due to their smaller size their value is lower than the value of fins from Giant Guitarfishes or Wedgefishes and fins from smaller individuals are generally discarded. The skin may be traded internationally as a luxury leather product to be made into accessories (e.g. handbags) (Haque *et al.* 2018).

## Threats (see Appendix for additional information)

Globally, guitarfishes are subject to intense fishing pressure on their coastal and shelf habitats that is unregulated across the majority of their distributions. Guitarfishes are captured in industrial, artisanal, and subsistence fisheries with multiple fishing gears, including gillnet, trawl, hook and line, trap, and seine net and are generally retained for their meat, with only the fins of the largest individuals generally retained (Moore 2017, Jabado 2018). There is a high level of fisheries resource use and increasing fishing pressure across the range of the Bengal Guitarfish, and demersal coastal fisheries resources have been severely depleted in significant areas of the Indo-West Pacific, including India and Southeast Asia (Stobutzki *et al.* 2006, Mohamed and Veena 2016).

Sharks and rays, including guitarfishes, may be targeted and now heavily exploited across the region by net and trawl fisheries and increasing fishing effort has put significant pressure on all guitarfish species in the Indo-West Pacific. The Bengal Guitarfish is landed throughout its range (e.g. Jabado 2018) and several countries within the distribution of this species rank among the top 20 shark fishing nations globally, specifically India, Pakistan, and Iran (Oakes and Sant 2019).

In general, fishing effort and the number of fishers has increased in recent decades across the range of this species, with demand for shark and ray product increasing over the same period due to the shark fin trade (Chen 1996, Jabado *et al.* 2017). Most countries have significant fishing fleets operating in coastal waters. In Pakistan, there has been a rapid rise in demersal-set gillnetters with around 7,700 vessels using this gear in Balochistan and Sindh provinces to target demersal fishes including guitarfishes and wedgefishes. There are also 2,500 trawlers targeting demersal fishes and shrimp that take about 5–8% of the annual catch of guitarfishes and wedgefishes (Moazzam and Osmany 2020). There was a rapid rise in the catch of guitarfishes and wedgefishes from around 500 t in 2003–2010 to 6,689 t in 2011 peaking at 7,570t in 2014 dropping to 1,664 t in 2016 due to a restriction in catch and landings of *Rhinopristiformes* in 2016 (Moazzam and Osmany 2020). In the Indian state of Gujarat, the number of trawlers increased from about 6,600 in the early 2000s to 11,582 in 2010 (Zynudheen *et al.* 2004, CMFRI 2010, Jabado *et al.* 2017). All Indian states have high numbers of trawlers (e.g. Maharashtra, 5,613 trawlers; Kerala, 3,678 trawlers, Tamil Nadu, 5,767 trawlers; total trawlers in India: 35,228 as reported in 2010) and a high number of gillnetters (total of 20,257 as reported in 2010). Sri Lanka had 24,600 gillnet

vessels operating in 2004.

There is a large amount of illegal, unreported, and unregulated fishing (IUU) in the Indo-Pacific region with reported catch estimated to represent only 0.9–19.4% of the true catch (Tull 2014). In some areas, including near marine protected areas (MPAs), IUU catch of sharks was estimated to equal 77% of the reported catch, indicating much higher levels of depletion (Varkey *et al.* 2010).

The shallow, inshore, soft-bottom habitat preferred by this species is threatened by habitat loss and environmental degradation (Stobutzki *et al.* 2006, White and Sommerville 2010, Jabado *et al.* 2017, Moore 2017). In the Arabian Sea and adjacent waters, dredging and coastal land reclamation has increased in recent years and has resulted in almost total loss of mangroves in some areas, such as Bahrain (Sheppard *et al.* 2010, Jabado *et al.* 2017), while Southeast Asia has seen an estimated 30% reduction in mangrove area since 1980 (FAO 2007, Polidoro *et al.* 2010).

## Conservation Actions (see Appendix for additional information)

There are limited species-specific conservation or management measures in place for guitarfishes. Some localized protections, trawl bans, finning bans, as well as general fisheries management and marine protected areas likely benefit this species, although in some areas, effective enforcement is an ongoing issue. Kuwait bans the catches of all rays. Balochistan province in Pakistan protects all guitarfishes and wedgefishes and therefore this species is specifically protected in that province, while in Sindh province there are protections for juvenile guitarfishes and wedgefishes (less than 30 cm total length), including this species (Moazzam and Osmany 2020). The United Arab Emirates (UAE), Qatar, and Oman have banned trawling in their waters (since 1980, 1993 and 2011, respectively), and other countries have seasonal trawl closures that may benefit the species. Finning (i.e., removing fins and discarding the body at sea) has been banned in several range states including the UAE, Oman, Iran, India, and Sri Lanka.

To conserve the population and to permit recovery, a suite of measures will be required which may include species protection, spatial management, bycatch mitigation, and harvest and trade management measures (including international trade measures). Effective enforcement of measures will require ongoing training and capacity-building (including in the area of species identification). Catch monitoring is needed to help understand population trends and inform management.

## Credits

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**Authority/Authorities:** IUCN SSC Shark Specialist Group (sharks and rays)

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## Appendix

### Habitats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Habitat	Season	Suitability	Major Importance?
9. Marine Neritic -> 9.4. Marine Neritic - Subtidal Sandy	Resident	Suitable	Yes
9. Marine Neritic -> 9.5. Marine Neritic - Subtidal Sandy-Mud	Resident	Suitable	Yes
9. Marine Neritic -> 9.6. Marine Neritic - Subtidal Muddy	Resident	Suitable	Yes

### Use and Trade

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

End Use	Local	National	International
Wearing apparel, accessories	No	Yes	Yes
Food - human	Yes	Yes	Yes

### Threats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Threat	Timing	Scope	Severity	Impact Score
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale) [harvest]	Ongoing	Whole (>90%)	Rapid declines	High impact: 8
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale) [harvest]	Ongoing	Whole (>90%)	Rapid declines	High impact: 8
	Stresses:	2. Species Stresses -> 2.1. Species mortality		

### Conservation Actions in Place

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: No

<b>Conservation Action in Place</b>
Area based regional management plan: No
Occurs in at least one protected area: Unknown
Invasive species control or prevention: Not Applicable
In-place species management
Harvest management plan: No
Successfully reintroduced or introduced benignly: No
Subject to ex-situ conservation: No
In-place education
Subject to recent education and awareness programmes: No
Included in international legislation: No
Subject to any international management / trade controls: No

## Conservation Actions Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

<b>Conservation Action Needed</b>
1. Land/water protection -> 1.1. Site/area protection
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
3. Species management -> 3.1. Species management -> 3.1.2. Trade management
3. Species management -> 3.2. Species recovery
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level

## Research Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

<b>Research Needed</b>
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.4. Harvest, use & livelihoods
1. Research -> 1.5. Threats
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
3. Monitoring -> 3.1. Population trends

<b>Research Needed</b>
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3. Monitoring -> 3.2. Harvest level trends
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## Additional Data Fields

<b>Distribution</b>
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Lower depth limit (m): 73
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Upper depth limit (m): 5
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<b>Habitats and Ecology</b>
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Generation Length (years): 9
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## The IUCN Red List Partnership



The IUCN Red List of Threatened Species™ is produced and managed by the [IUCN Global Species Programme](#), the [IUCN Species Survival Commission \(SSC\)](#) and [The IUCN Red List Partnership](#).

The IUCN Red List Partners are: [ABQ BioPark](#); [Arizona State University](#); [BirdLife International](#); [Botanic Gardens Conservation International](#); [Conservation International](#); [Missouri Botanical Garden](#); [NatureServe](#); [Re:wild](#); [Royal Botanic Gardens, Kew](#); [Sapienza University of Rome](#); [Texas A&M University](#); and [Zoological Society of London](#).