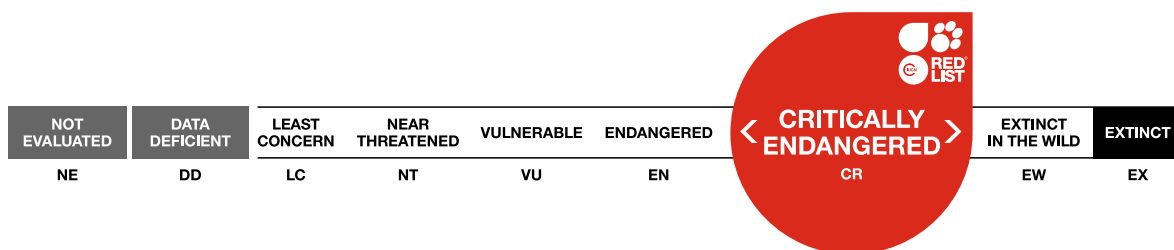


## *Pristis pectinata*, Smalltooth Sawfish

Errata version

Assessment by: Carlson, J. *et al.*



View on [www.iucnredlist.org](http://www.iucnredlist.org)

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## Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Chondrichthyes	Rhinopristiformes	Pristidae

**Scientific Name:** *Pristis pectinata* Latham, 1794

### Synonym(s):

- *Pristis acutirostris*
- *Pristis annandalei*
- *Pristis granulosa*
- *Pristis mississippiensis*
- *Pristis serra*

### Regional Assessments:

- Mediterranean
- Europe
- Central Africa

### Common Name(s):

- English: Smalltooth Sawfish, Wide Sawfish
- French: Poisson-scie
- Spanish; Castilian: Pejepeine, Sayyafah

### Taxonomic Source(s):

Fricke, R., Eschmeyer, W.N. and Van der Laan, R. (eds). 2022. Eschmeyer's Catalog of Fishes: genera, species, references. Updated 07 February 2022. Available at: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. (Accessed: 07 February 2022).

## Assessment Information

**Red List Category & Criteria:** Critically Endangered A2cd [ver 3.1](#)

**Year Published:** 2022

**Date Assessed:** March 9, 2022

### Justification:

The Smalltooth Sawfish (*Pristis pectinata*) is a large (to 500 cm stretched total length) euryhaline shark-like ray with a widespread circumtropical distribution in the Atlantic Ocean with some population structure between the western and eastern Atlantic. The species occurs at depths of 0–122 m with juveniles occupying estuarine habitats and adults occurring in both estuarine and coastal waters. It is taken as bycatch (and was historically targeted) in commercial and small-scale fisheries, and often retained for its meat and fins. Historically, its fins were considered among the most highly valued in the shark fin trade, and this high value drove demand and increased exploitation of the species over the past decades. Habitat loss and the morphology of the rostrum, which makes them susceptible to capture in fishing gear, have also driven declines independently of trade. International trade of all

sawfish species was prohibited in 2007 and 2013 with their listing on Appendix I of the Convention on International Trade of Endangered Species of Wild Flora and Fauna (CITES), however, illegal trade continues (especially for their rostra, but in some areas also for their meat and fins). The species is also listed on Appendix 1 of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), which prohibits the taking of the species. Both the western and eastern Atlantic populations have undergone severe historic and ongoing steep population reductions due to overexploitation and habitat loss and degradation, with significant range contractions across their distribution. In the western Atlantic, the species is now extant in only four of its range states, with its 'presence uncertain' in 12 range states due to limited survey effort and few sightings, and it is 'possibly extinct' in three of its former range states. In the eastern Atlantic, of its former 18 range states, it is now extant in only five, has an uncertain presence in two, and is 'possibly extinct' in 11 states. Despite protection in some of its range states, threats are ongoing, and population decline is continuing. Due to limited abundance data, information on abundance trends was largely inferred from reports of capture records and local ecological knowledge, and this revealed populations have undergone high levels of decline over the past three generation lengths (59 years) in areas where it was historically extant, and is now either 'possibly extinct' or 'presence uncertain'. Only in the west Atlantic extant range states of the United States, some areas in Mexico, and the Bahamas are populations stable or increasing. Overall, it is inferred that the Smalltooth Sawfish has undergone a >80% population reduction over the last three generation lengths (59 years) due to overexploitation, habitat degradation, and reductions in extent of occurrence, and it is assessed as Critically Endangered (CR A2cd).

### **Previously Published Red List Assessments**

[2013 – Critically Endangered \(CR\)](#)

2006 – Critically Endangered (CR)

2000 – Endangered (EN)

1996 – Endangered (EN)

## **Geographic Range**

### **Range Description:**

The Smalltooth Sawfish occurs entirely in the Atlantic Ocean. In the western Atlantic, Smalltooth Sawfish historically were widely distributed from about North Carolina on the Atlantic coast of the United States through the Gulf of Mexico, the Caribbean and Central America to southern Brazil (Yan *et al.* 2021). Smalltooth Sawfish ranged as far south as Uruguay and Argentina, but these were likely vagrants (Cuevas *et al.* 2019). The species has undergone local and regional extinctions from large areas of its former range. Potentially viable populations of Smalltooth Sawfish now only exist in the southeast United States (Brame *et al.* 2019), Mexico (Bonfil *et al.* 2018), Bahamas (Guttridge *et al.* 2015), and Cuba (Figueredo Martín *et al.* 2013).

There are a few unconfirmed records of sawfishes in Belize and Honduras (R. Graham unpubl. data 2021), but they are scarce and identification remains an issue (M. Chevis unpubl. data 2022). Along the Caribbean coast of Guatemala, the Smalltooth Sawfish is 'possibly extinct' with the last known records from over 30 years ago (C. Avalos pers. comm. 22 January 2022). Smalltooth Sawfish are considered 'presence uncertain' throughout the remainder of central and northern South America due to limited

survey effort and a few records between the past 15–30 years. The species is 'possibly extinct' in Jamaica and in Brazil (P. Charvet unpubl. data 2022), where the last confirmed records were from the 1970s and 1980s (Faria and Charvet 2008).

In the Mediterranean Sea, Smalltooth Sawfish historically have been reported occurring with 11 catch records from prior to 1777 to prior to 1956 from mainly the western Mediterranean (France, Italy, and Croatia) and from Israel (Ferretti *et al.* 2016). These records included seven juveniles, which implies the species was historically resident. However, it is unknown how juveniles could survive the cold winter sea surface temperature of the northern Mediterranean Sea (Ferretti *et al.* 2016). The scarcity of records, long exploitation history of the Mediterranean Sea, questions on juvenile survival together with large knowledge gaps on the ecology, biology, and baseline distribution ranges of the species globally have led to continued debate on whether this species occurred as part of the Mediterranean ichthyofauna, as a vagrant species, or as a seasonal migrant from areas off West Africa. In the scenario of Mediterranean sawfish populations, extinction analyses suggested that Smalltooth Sawfish went extinct in the Mediterranean Sea between 1966 and 1970 (Ferretti *et al.* 2016).

Historically, Smalltooth Sawfish occurred from Mauritania to Angola and were abundant in coastal estuaries (Burgess *et al.* 2009, Faria *et al.* 2013). The current distribution of Smalltooth Sawfish in the eastern Atlantic remains uncertain due to the lack of surveys and reporting in most countries; additionally, species identification issues that have not improved over the last decade. The lack of confirmed observations in the past few years suggests that sawfishes are now extremely rare or 'possibly extinct' throughout most of the eastern Atlantic. Interviews conducted in Senegal in 2004 (Robillard and S ret 2006), Liberia and The Gambia in 2014 (Leeney 2015, Leeney and Downing 2016, respectively), Guinea-Bissau (Leeney and Poncelet 2015), and Mauritania (R.W. Jabado unpubl. data 2021) indicated catches are scarce and have not occurred in many years. The species is likely still extant in five range states where the last known records were in Senegal, in 2013, in The Gambia in 2010, in Guinea Bissau in 2012, in Sierra Leone in 2006, and in Liberia in 2014. In two range states, its presence is uncertain, with the last known records in Guinea Conarky in 1999 and in Mauritania in the early 2000s (M. Diop pers. comm. 10 November 2021). Most of these records did not allow species identification, Leeney and Poncelet (2015); however, where there is confirmation from photographs or rostra, it is mostly Largetooth Sawfish (*P. pristis*) rather than Smalltooth Sawfish, which could suggest that it is Largetooth Sawfish rather than Smalltooth Sawfish that is persisting across the region (R. Jabado pers. comm. 28 March 2022). There have been no confirmed records of sawfishes in this or other areas of west Africa since 2019 (R. Leeney pers. comm. 24 February 2022). The species is 'possibly extinct' in 11 out of 18 range states from this region.

#### **Country Occurrence:**

**Native, Extant (resident):** Bahamas; Cuba; Gambia; Guinea-Bissau; Liberia; Mexico; Senegal; Sierra Leone; United States

**Native, Possibly Extinct:** Angola; Benin; Brazil; Cameroon; Congo; Congo, The Democratic Republic of the; C te d'Ivoire; Equatorial Guinea; Gabon; Ghana; Guatemala; Jamaica; Nigeria; Togo

**Native, Presence Uncertain:** Belize; Colombia; Costa Rica; Dominican Republic; French Guiana; Guinea; Guyana; Haiti; Honduras; Mauritania; Nicaragua; Panama; Suriname; Venezuela, Bolivarian Republic of

**Possibly Extinct & Origin Uncertain:** Croatia; France; Israel; Italy

**FAO Marine Fishing Areas:**

**Native:** Atlantic - western central

**Native:** Atlantic - northwest

**Native:** Atlantic - eastern central

**Native:** Atlantic - southwest

**Native:** Atlantic - southeast

# Distribution Map

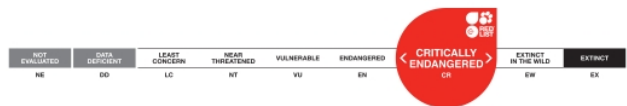


## Legend

- EXTANT (RESIDENT)
- POSSIBLY EXTINCT
- PRESENCE UNCERTAIN

Compiled by:

IUCN SSC Shark Specialist Group 2022



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

## Population

Genetic data suggest one global population; however, morphological differences in the number of rostral teeth between the western and eastern Atlantic suggests some population structure (Faria *et al.* 2013). With the exception of the United States and the Bahamas, there is limited species-specific catch data or information on trends in abundance. Thus, the population status is mostly inferred from reports of capture and local ecological knowledge (LEK), which are not always species-specific. Although catch or 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 the western Atlantic, data are available on population structure and size using genetic techniques. Smalltooth Sawfish have male-mediated gene flow across United States (U.S.) waters, while females are regionally philopatric and rarely change parturition sites (Feldheim *et al.* 2017, Smith 2021, Smith *et al.* 2021). Smalltooth Sawfish have high levels of genetic diversity in U.S. waters, with low incidence of inbreeding (Chapman *et al.* 2011, Smith 2021). Genetic analysis of historic Smalltooth Sawfish saws also suggests genetic diversity did not decline during the 20th century (Smith 2021). Estimates of the U.S. effective genetic population size based on samples collected between 2002–2008 ranged from 250 to 350 individuals (95% confidence limits 142–955) (Chapman *et al.* 2011). An updated analysis for samples collected from 2012 to 2015 indicated the effective genetic population size was 650 adult females (95% confidence limits 367–2,358) (Smith 2021).

Preliminary population trend data are available from a meta-analysis of all current Smalltooth Sawfish abundance data from the U.S. (Carlson *et al.* in prep.). The trend data from each source were analysed over three generation lengths using a Bayesian state-space framework (Sherley *et al.* 2020, Winker *et al.* 2020). This analysis yields an annual rate of change, a median change over three generation lengths, and the probability of the most likely IUCN Red List category percent change over three generation lengths (see the Supplementary Information). The relative abundance series was used to represent data including scientific surveys, observer data in commercial fisheries, and recreational intercept data of anglers fishing in core sawfish habitat (Carlson *et al.* in prep.). When all indices are considered together, the annual rate of change is an increase of 9.2%, consistent with an estimated increase over three generation lengths (59 years), with the highest probability of no reduction over three generation lengths.

Elsewhere in the western Atlantic, in Mexico, Bonfil *et al.* (2018) reported a significant decadal decline in Smalltooth Sawfish sightings and records from the 1970s to the 2010s, and their analysis suggests a range contraction of the species. There was a sighting of a Smalltooth Sawfish in Quintana Roo in 2018 (M. del Pilar Blanco unpubl. data 2021) as well as a live juvenile female that was caught on January 20, 2016, in Barra de Cazon, Veracruz and is now in the Veracruz Aquarium (Bonfil *et al.* 2017). Recent eDNA studies demonstrate the presence of Smalltooth Sawfish in three coastal lagoons and one coastal area around the Yucatan Peninsula (Bonfil *et al.* 2021), in addition to two unconfirmed reports by fishers of sawfishes (likely Smalltooth Sawfish) in the Mexican Caribbean in 2016 and 2018 (R. Bonfil unpubl. data 2022). Thus, the remaining population in Mexico is small but considered stable. In the Bahamas, Smalltooth Sawfish are regularly reported by recreational bonefish (Albulidae) guides off west Andros. Identical survey methods employed to examine large Smalltooth Sawfish relative abundance in the U.S. have also been used in the Bahamas. Analyses of these data suggest the Bahamas population is much smaller than, perhaps <10% of the size of, the U.S. population (Grubbs

2019).

There are no data on population size for the eastern Atlantic, and the only information on trends in the population can be inferred from anecdotal capture records. These imply population abundance has declined continuously over the past few decades, and the species is now considered 'possibly extinct' in 11 of the 18 range states areas where it was once considered common. That is, historically, multiple lines of evidence indicate that Smalltooth Sawfish and sawfishes in general were common in many areas along the West African coast up until the 1970s or 1980s (R. Leeney unpubl. data 2022) but today records are sparse. The Casamance River in Senegal was a nursery for Smalltooth Sawfish, and the species used Gambian waters as adults. Sawfish were very common in Guinean-Bissau waters where they had cultural significance as well as in Ghana. Sawfish rostra have been recorded from Gabon (R. Leeney unpubl. data 2022). According to fishers, sawfish were common in West Africa in the 1990s. Although most catches tended to consist of one or two specimens, there are reports of up to 10 individuals in a single catch. The catches were common (weekly) in some areas, but in other areas were just a few catches a year (M. Diop pers. comm. 20 November 2021). In Mauritania, in general, sawfish seemed particularly abundant around Tidra, but on the rest of the northwest African coast, sawfish were mainly present in the region between Casamance in Senegal and Kamsar in Guinea-Conakry (M. Diop pers. comm. 20 November 2021). It is suspected that the Smalltooth Sawfish population has undergone a >80% reduction over the past three generation lengths (59 years), and given much of this remaining area has artisanal gillnet fisheries with little or no regulation, it is likely the population will continue to decline.

Overall, except for the United States, some areas in Mexico, the Bahamas and Cuba where the species is still extant, steep declines in the populations are inferred across the range of the Smalltooth Sawfish. The areas where populations are still extant represent only a small proportion of the global range. Thus, it is inferred that the Smalltooth Sawfish population has undergone a >80% reduction over the past three generation lengths (59 years) due to actual levels of intense and mostly unregulated exploitation, habitat degradation (see the 'Threats' section), and a decline in its extent of occurrence and area of occupancy.

**Current Population Trend:** Decreasing

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

The Smalltooth Sawfish is a euryhaline species that occurs from inshore to a depth of 122 m but rarely deeper than 100 m (Carlson *et al.* 2014, Graham *et al.* 2021). Juveniles occupy estuarine habitats, and adults occur in shallow estuarine and coastal marine waters. It reaches a likely maximum size of approximately 500 cm stretched total length (STL) with both males and females mature at 340–370 cm STL (Brame *et al.* 2019). Using the relationship between rostral size and stretched total length, Smith (2021) estimated a maximum size of 510 cm STL. Reproduction is aplacental viviparous, with litter sizes of 7–14, a biennial reproductive cycle, and a size-at-birth of 64–81 cm STL (Feldheim *et al.* 2017, Brame *et al.* 2019). Female age-at-maturity is 7–11 years (Brame *et al.* 2019). Smalltooth Sawfish grow rapidly, especially as juveniles, with von Bertalanffy growth coefficients from 0.14–0.22 yr<sup>-1</sup> (Simpfendorfer *et al.* 2008, Scharer *et al.* 2012). Using data from Scharer *et al.* (2012), Carlson and Simpfendorfer (2015) extrapolated a maximum age in the wild of approximately 30 years, and thus, generation length is 19.5 years.

## Use and Trade

Despite species-level protections in many countries across the range of the Smalltooth Sawfish, the species is still used for the fins, whole rostra, rostral teeth, meat, liver, and skin (McDavitt 2005). Sawfish fins are among the most valuable in the shark fin trade and although international trade of sawfishes and their products is prohibited since 2007 and 2013 when they were listed on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I, illegal international trade likely exists due to the high value of their products. Sawfish (*Pristis* spp.) fins have recently been reported from Hong Kong, albeit as a small proportion of fins sampled (Cardeñosa *et al.* 2020). In many parts of its range, the meat is generally consumed locally by coastal communities and does not usually enter the international trade, such as in the Bahamas (T. Guttridge pers. comm. 21 January 2022) and West Africa (R. Leeney unpubl. data 2022). In some West African countries, sawfish meat was the basis of a dish served as part of traditional ceremonies on the Bijago Archipelago, Guinea-Bissau (Leeney and Poncelet 2015). Sawfish rostra are used in traditional medicines, ceremonial weapons and as curios (McDavitt 2005). In West African countries, rostra were often kept by fishers and incorporated into local practices such as headdresses for ceremonial dances in Guinea-Bissau (Leeney and Poncelet 2015) or hung on the walls of a fisher's house as a decoration. The Smalltooth Sawfish is displayed in public aquaria.

The use of sawfish rostral teeth for cockfighting spurs has been historically reported from Perú and other South American countries (Cogorno Ventura 2001), but recent reports highlight that this practice still occurs in Ecuador, Perú, Brazil, Bolivia, Panamá, and Costa Rica (Valerio-Vargas and Espinoza 2019, López-Angarita *et al.* 2021, P. Charvet unpubl data 2021, M. Espinoza unpubl. data 2022). The rostral teeth are mostly obtained from Brazil, Ecuador, Panamá, Costa Rica, and various Caribbean countries (CITES 2007, M. Espinoza unpubl. data 2022).

## Threats (see Appendix for additional information)

The Smalltooth Sawfish is subject to intense fishing pressure, current and historic, that is poorly managed or unregulated across much of its range. The species is taken as bycatch in commercial and small-scale fisheries (including artisanal, cultural, and subsistence) with a variety of fishing gears including gillnet, trawl, and line, where it is often retained for at least its fins and meat (Dulvy *et al.* 2016, Yan *et al.* 2021). The toothed rostra of sawfish make them highly susceptible to entanglement, particularly in gillnets and trawls. Fishing effort has increased over the past decades across the species' range, with the fin and meat trade driving increasing demand and exploitation of many elasmobranchs (Okes and Sant 2019). The difficulty of removing them from gear and returning them live combined with their exceedingly high first point of sale and final point of sale value means that there is a high likelihood of retention even though they are captured infrequently (Yan *et al.* 2021).

The freshwater and inshore estuarine, mangrove, and coastal habitats used by the species are threatened by habitat loss and degradation (CITES 2007). Removal of Red Mangroves (*Rhizophora mangle*) and destruction of shallow waters habitats, features upon which juvenile Smalltooth Sawfish rely, are immediate habitat threats. Agricultural and urban development, aquaculture, commercial activities, dredge-and-fill operations, boating, erosion, and diversions of freshwater runoff as a result of continued coastal and catchment development has caused substantial loss or modification of their

inshore habitats (Brame *et al.* 2019).

## **Conservation Actions (see Appendix for additional information)**

Through proposals made in 2007 and 2013, all five sawfish species are now listed on Appendix I of the Convention on International Trade of Endangered Species (CITES), which essentially bans commercial international trade in sawfish and their parts. In 2014, all sawfishes were added to Appendix I and II of the Convention on Migratory Species (CMS), which obligates Parties to act nationally and cooperate regionally to 'strictly protect' the species. All sawfishes were added to Annex 1 of the CMS Memorandum of Understanding (MoU), which aims to facilitate regional conservation of the species.

Smalltooth Sawfish were listed as Endangered under the US Endangered Species Act in 2003 which makes it illegal to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct with Smalltooth Sawfish. Smalltooth Sawfish were added to Annex II of the Protocol for Specially Protected Areas and Wildlife (SPA Protocol) of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (the Cartagena Convention) in 2017 and 2019, respectively. These listings obligate Parties to strictly protect sawfishes, including through bans on take and trade.

In 2012, the General Fisheries Commission for the Mediterranean (GFCM) banned retention and mandated careful release for Smalltooth Sawfish listed on the Barcelona Convention Annex II of the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean. Implementation by GFCM Parties, however, has been very slow.

Despite these binding international treaty mandates, sawfishes remain inadequately protected in a great number of countries, where basic regulations are still lacking and/or poorly enforced. A 2018 analysis identified the Caribbean and Amazon Delta among priority regions for concerted, international sawfish conservation policy action (Fordham *et al.* 2018). Yan *et al.* (2021) underscored the urgent need for domestic sawfish protections, particularly by nations where sawfish presence is uncertain, low or declining, yet extinction probability is low. Countries where sawfishes are still regularly found that fail to apply species-specific prohibitions on killing, retention, sale, and trade (i.e., the Bahamas) are also considered priorities for conservation action.

Other potential sawfish range states that still lack national protections include Honduras and Perú (Harrison and Dulvy 2014, Fordham *et al.* 2018, Lawson and Fordham 2018). The United States, where sawfish are still present and relatively well protected, is considered a “lifeboat” country, but relaxation of key safeguards would immediately threaten these populations. Other countries with domestic sawfish protections include Costa Rica and Senegal (Harrison and Dulvy 2014, Fordham *et al.* 2018).

In addition to species-specific legal protections, sawfish recovery requires minimization of bycatch (and associated mortality) as well as conservation of important coastal habitats (Harrison and Dulvy 2014, Fordham *et al.* 2018). Effective enforcement of such safeguards requires ongoing educational initiatives, training (including in the area of species identification), and other capacity-building efforts. In these areas, there is room for improvement in every sawfish range state. Better monitoring of sawfish catches, including in artisanal fisheries, and expanded research programs are also needed to help understand population trends and inform management. The multi-lateral environmental agreements that have already listed sawfishes as species warranting strict protections can provide valuable platforms for

facilitating sawfish recovery at regional and global scales, but targeted initiatives to do so have not yet been developed. This inaction demonstrates that ongoing public, political, and financial support is also integral to preventing further sawfish extinction.

## Credits

- Assessor(s):** Carlson, J., Blanco-Parra, MP, Bonfil, R., Charles, R., Charvet, P., Chevis, M., Dulvy, N.K., Espinoza, M., Faria, V., Ferretti, F., Fordham, S., Giovos, I., Graham, J., Grubbs, D., Pacoureau, N. & Phillips, N.M.
- Reviewer(s):** Wiley, T., Young, C., Simpfendorfer, C. & Rigby, C.L.
- Contributor(s):** Graham, R., Jabado, R.W., Leeney, R.H., Morata, A.Z.A., Serena, F., Soldo, A. & Smith, K.
- Facilitator(s) and Compiler(s):** Rigby, C.L.
- Authority/Authorities:** IUCN SSC Shark Specialist Group (sharks and rays)

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## External Resources

For [Supplementary Material](#), and for [Images and External Links to Additional Information](#), please see the Red List website.

## Appendix

### Habitats

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

Habitat	Season	Suitability	Major Importance?
9. Marine Neritic -> 9.10. Marine Neritic - Estuaries	Resident	Suitable	Yes
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
9. Marine Neritic -> 9.9. Marine Neritic - Seagrass (Submerged)	Resident	Suitable	Yes
12. Marine Intertidal -> 12.4. Marine Intertidal - Mud Flats and Salt Flats	Resident	Suitable	Yes
12. Marine Intertidal -> 12.7. Marine Intertidal - Mangrove Submerged Roots	Resident	Suitable	Yes

### Use and Trade

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

End Use	Local	National	International
1. Food - human	Yes	Yes	Yes
3. Medicine - human & veterinary	No	Yes	Yes
10. Wearing apparel, accessories	No	Yes	Yes
12. Handicrafts, jewellery, etc.	No	Yes	Yes
13. Pets/display animals, horticulture	No	Yes	Yes
15. Sport hunting/specimen collecting	No	Yes	Yes

### Threats

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

Threat	Timing	Scope	Severity
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	Minority (<50%)	Rapid declines
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation	
1. Residential & commercial development -> 1.2. Commercial & industrial areas	Ongoing	Minority (<50%)	Rapid declines
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation	

5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.1. Intentional use: (subsistence/small scale) [harvest]	Ongoing	Majority (50-90%)	Rapid declines
	Stresses:	2. Species Stresses -> 2.1. Species mortality	
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.2. Intentional use: (large scale) [harvest]	Past, unlikely to return	Majority (50-90%)	Rapid declines
	Stresses:	2. Species Stresses -> 2.1. Species mortality	
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale) [harvest]	Ongoing	Majority (50-90%)	Rapid declines
	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	Majority (50-90%)	Rapid declines
	Stresses:	2. Species Stresses -> 2.1. Species mortality	
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.3. Abstraction of surface water (agricultural use)	Ongoing	Minority (<50%)	Rapid declines
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation	
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.10. Large dams	Ongoing	Minority (<50%)	Rapid declines
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation	
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Future	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation	
11. Climate change & severe weather -> 11.3. Temperature extremes	Future	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation	

## Conservation Actions in Place

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

<b>Conservation Action in Place</b>
In-place research and monitoring
Action Recovery Plan: Yes
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: Yes, over part of range
Area based regional management plan: No
Occurs in at least one protected area: Yes

<b>Conservation Action in Place</b>
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: Yes
Included in international legislation: Yes
Subject to any international management / trade controls: Yes

## Conservation Actions Needed

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

<b>Conservation Action Needed</b>	<b>Notes</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	-
4. Education & awareness -> 4.2. Training	-
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>	<b>Notes</b>
1. Research -> 1.2. Population size, distribution & trends	-
1. Research -> 1.3. Life history & ecology	-
1. Research -> 1.4. Harvest, use & livelihoods	-
2. Conservation Planning -> 2.1. Species Action/Recovery Plan	-
3. Monitoring -> 3.1. Population trends	-
3. Monitoring -> 3.2. Harvest level trends	-

<b>Research Needed</b>	<b>Notes</b>
3. Monitoring -> 3.3. Trade trends	-
3. Monitoring -> 3.4. Habitat trends	-

## **Additional Data Fields**

<b>Distribution</b>
Continuing decline in area of occupancy (AOO): Yes
Continuing decline in extent of occurrence (EOO): Yes
Lower depth limit (m): 122
Upper depth limit (m): 0
<b>Habitats and Ecology</b>
Generation Length (years): 19.5

## Errata

**Errata reason:** This errata version of the 2022 assessment was created to correct the assessor name "Bonfil-Sanders, R." to "Bonfil, R."

## 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](#).

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