

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Nineteenth meeting of the Conference of the Parties
Panama City (Panama), 14 - 25 November 2022

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

The proposal is to list the family Rhinobatidae (guitarfishes) in Appendix II.

The family Rhinobatidae contains 37 species of guitarfishes (listed in Annex 1 of this proposal); 35 of the 37 species are in decline, 23 of the 37 are classified by the IUCN Red List of Threatened Species as Endangered; and 10 of them are Critically Endangered.

The proposal is to list the following six Critically Endangered species in Appendix II in accordance with Article II, paragraph 2(a) of the Convention. All six species meet the biological criteria in Res. Conf. 9.24 (Rev. CoP17), Annex 1, paragraph C.

1. *Acroteriobatus variegatus*
2. *Pseudobatos horkelii*
3. *Rhinobatos albomaculatus*
4. *Rhinobatos irvinei*
5. *Rhinobatos rhinobatos*
6. *Rhinobatos schlegelii*

Due to the difficulty in identifying parts and derivatives of guitarfishes in trade, this proposal is to list all the rest of the species that are in family Rhinobatidae in Appendix II, in accordance with Article II, paragraph 2(b) of the Convention (the so-called "look-alike provision").

This proposal also includes a new standard reference for family Rhinobatidae and for the species in this family (see Section 11, Additional Remarks, below).

B. Proponent

Party names: Israel, Kenya, Panama and Senegal*

C. Supporting statement1. Taxonomy

- 1.1 Class: Elasmobranchii
- 1.2 Order: Rhinopristiformes
- 1.3 Family: Rhinobatidae

* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

1.4 Genus and species, including author and year.

Last et al. (2016a) reviewed the taxonomy of the Order Rhinopristiformes and determined that there are 5 families in this order: Pristidae¹, Rhinidae, Rhinobatidae, Glaucostegidae and Trygonorrhinidae. Since then, new species have been described. Eschmeyer's Catalog of Fishes (Fricke et al. 2022) currently recognizes 37 valid species in the family Rhinobatidae, divided into 3 genera: 10 species in *Acroteriobatus*, 9 species in *Pseudobatos*, and 18 species in *Rhinobatos*. The 37 valid species are listed in Annex 1, below.

1.5 Scientific synonyms. See Annex 1, below.

1.6 Common names. In English, the family Rhinobatidae is called guitarfishes. In French, they are *poisson guitare*, and in Spanish *peces guitarra*. The common names of the 37 species are in Annex 1, below.

1.7 Code numbers: Not relevant

2. Overview

Elasmobranchs, i.e., sharks, rays and chimaeras (the cartilaginous fishes) have been subject to tremendous declines over the past few decades (Pacoureau 2021). Shark-like rays², specifically those of the order Rhinopristiformes, are among the most threatened species of fishes globally (Dulvy et al. 2014; Kyne et al. 2020; Ebert et al. 2021). This is due to life history characteristics such as slow growth, late age at maturity, and low fecundity, combined with their being mostly being restricted to nearshore coastal habitat at relatively shallow depths, which makes them very vulnerable to overfishing and to habitat degradation.

Most of the species of shark-like rays have already been listed in the CITES Appendices. All the species of sawfishes (family Pristidae) are in Appendix I, as they are one of the most Critically Endangered groups, with all species having been extirpated from much of their ranges (Dulvy et al. 2014; Yan et al. 2021). All the wedgefishes (Rhinidae) and the giant guitarfishes (Glaucostegidae) have also been listed in Appendix II; a recent assessment shows that 15 of 16 species in the family Glaucostegidae are Endangered or Critically Endangered on the IUCN Red List of Threatened Species (Kyne et al. 2020).

The guitarfishes (family Rhinobatidae) have mostly been overlooked for protection even though most species are endangered (Dulvy et al. 2021) and they share the same life history and habitat characteristics, and are subject to intense fishing pressure and habitat degradation, as the other shark-like rays (Moore 2017; Jabado 2018; Jabado et al. 2018). There is apparently a significant amount of international trade in fins and skins (legal and illegal) of many of the species in this proposal, but it is very poorly documented. An Appendix II listing of all the species will not stop legal trade in these species, but it will enable collection of better trade data and should help ensure that legal international trade is not detrimental to the survival of these species and populations.

For all six of the species listed in Section A, above, the major cause of decline is international trade and domestic exploitation, both legal and illegal (see details on Threats, in Section 5, below). Further compounding conservation and fisheries management efforts has been a lack of taxonomic clarity and species-specific identification. Due to the similarity of their parts and derivatives (especially the fins), this proposal is to list all species of the family Rhinobatidae in Appendix II in accordance with Article II, paragraph 2 (b) of the Convention (the so-called "look-alike provision").

The "look-alike provision"

Paragraph 2 of Article II of the CITES Convention on 'Fundamental Principles' explains which species should be included in Appendix II.

¹ In the current CITES Appendices, the family Pristidae is not included in the Order Rhinopristiformes. In accordance with the recommendation of the Animal Committee's nomenclature specialist, we do not recommend to move the family Pristidae to the Order Rhinopristiformes in the Appendices at this time.

² The term "shark-like rays" is used in this proposal to refer collectively to the guitarfishes (family Rhinobatidae); wedgefishes (family Rhinidae); giant-guitarfishes (family Glaucostegidae); banjo-rays (family Trygonorrhinidae); and sawfishes (family Pristidae). Others use the term "rhino rays" in much the same way.

Sub-paragraph (a) clearly explains that this includes "all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival".

Sub-paragraph (b) adds the notion that "other species" shall be listed in Appendix II when it will allow the "effective control" of trade in those species threatened with or potentially threatened with extinction.

It is important to note that no biological criteria are attached to sub-paragraph (b) and as such, the requirement that a species be "threatened with extinction" does not apply here. The criteria for inclusion of species under sub-paragraph (b), are listed in Annex 2b to Resolution Conf. 9.24 (Rev CoP17), as follows:

"Species may be included in Appendix II in accordance with Article II, paragraph 2 (b), if **either one** of the following criteria is met:

- A. The specimens of the species in the form in which they are traded resemble specimens of a species included in Appendix II under the provisions of Article II, paragraph 2 (a), or in Appendix I, so that enforcement officers who encounter specimens of CITES-listed species are unlikely to be able to distinguish between them; or
- B. There are compelling reasons other than those given in criterion A above to ensure that effective control of trade in currently listed species is achieved."

These criteria have led to the nick-naming of Article II, sub-paragraph (b) of the Convention as "the look-alike provision", and this has been used regularly for listing quite a number of species, including many at the higher taxonomic levels. For example, at CoP 17, the entire genus of thresher sharks (*Alopias*) was included in Appendix II even though only one species *A. superciliosus* met the biological criteria. Other thresher shark species, *A. vulpinus* and *A. pelagicus*, which did not meet the biological criteria were included in Appendix II as "look-alikes" because their fins cannot be readily distinguished from other thresher shark fins in trade.³

3. Species characteristics

3.1 Distribution – See the table in Annex 1 of this proposal.

Approximately 110 countries (i.e., over half the countries of the world), are range States for Rhinobatidae. Species of *Acroteriobatus* are mostly confined to the western Indian Ocean although some reach to the southeastern Atlantic. Species of *Pseudobatos* are restricted to the ampho-American region (i.e., on both sides of the American continent), while species of *Rhinobatos* are in a wider area, occurring mostly in the Indo-western Pacific and eastern Atlantic (Weigmann et al. 2021).

3.2 Habitat

All species of the family Rhinobatidae are marine and demersal (bottom-dwellers). Most species occur only in relatively shallow water from the shoreline to a depth of about 100 m. They inhabit mainly nearshore and inshore areas, including estuaries, enclosed bays, the surf zone, and near coral reefs, mainly on soft substrates and benthic habitats covered in mud, sand or small rocks. Only a few species, such as *A. ocellatus*, and *R. schlegelii* have been found at depths of over 200 m.

3.3 Biological characteristics

There is little biological information available about most of the species, as only a few have been studied in detail. For example, *R. rhinobatos* 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). All species that have been studied have been found to have very low fecundity of about 2-16 young per year, late sexual maturity, and long generation lengths, for example 18.5 years in *P. horkelii* (Lessa et al. 1986).

All species that have been studied have viviparous reproduction (live birth), with the embryos nourished by their own egg yolk while in the uterus, so it is likely that all the species do. Some species that have

³ Listing proposal 43 from CITES CoP 17 (2016):
<https://cites.org/sites/default/files/eng/cop/17/prop/060216/E-CoP17-Prop-43.pdf>

been studied also have aplacental histotrophic matrotrophy (i.e. the embryos receive additional nourishment from the mother by indirect absorption of uterine fluid enriched with mucus, fat or protein).

A breeding migration pattern is described for some species, in which pregnant females come into very shallow coastal waters in early summer to give birth, followed by the adult males a bit later. Parturition (birth) occurs in summer, mating takes place in late summer into autumn, and the adults then migrate to deeper waters over the winter. This pattern has been well documented for *P. horkelii* in Brazil (Vooren et al. 2005). Similarly, in Israeli waters in the eastern Mediterranean, gravid female *R. rhinobatos* can be found predictably migrating into coastal shallow waters from mid-August to November for giving birth (Chaikin et al. 2020).

Movement from deeper waters to shallow areas is also well documented for *R. productus* and *R. glaucostigma*, two guitarfish species found in the Gulf of California that are caught in bottom gillnets from March to June, when gravid females migrate to shallower waters (Blanco-Parra et al. 2009). This seasonal migration into shallow waters makes guitarfishes particularly vulnerable to gillnets when artisanal fisheries can target and capture large numbers of pregnant females.

3.4 Morphological characteristics

Rhinobatidae are medium-sized (adults attain 1.7 m maximum total length) shark-like benthic rays. They are called guitarfishes because of their resemblance to the musical instrument when viewed from above; with the anterior part of the body (the disc) being flattened, into a wedge- or shovel-shaped snout, while the trunk is longer yet depressed. They have a ventral mouth. The nostrils are short with nasal flaps that are often very broad. The three genera can be separated from each other externally by the morphology of their nasal flaps. The skin is usually covered with fine denticles (sometimes partly naked); small thorns and thornlets are variably developed in rows along the dorsal midline of the body, in small patches near the eyes, and on the shoulders and snout. The pelvic fins are positioned laterally and posteriorly to the disc. There are two dorsal fins, well separated, the first positioned slightly behind the rear tips of the pelvic fins. Dorsal coloration is plain (usually greyish or brownish) or with strong pattern of lines, bars, spots and/or blotches; the ventral surface is usually white, with black blotches often present on the snout (based on Last et al. 2016a). They do not have venomous dorsal spines.

3.5 Role of the species in its ecosystem

Like all the demersal rays, guitarfish feed on benthic invertebrates. They are apparently preyed upon by sharks and other large piscivorous animals, such as cetaceans, especially when young.

4. Status and trends

For trends in IUCN Red List Status, see the table in Annex 1 of this proposal. The following is based largely on recent IUCN Red List of Threatened Species assessments (www.iucnredlist.org).

Acroteriobatus variegatus occurs in the Arabian Seas region and in southern India and Sri Lanka. This species is taken as bycatch in trawl fisheries, especially those operating off southwestern India. Fishing pressure is generally very intense, with many vessels in operation, and increasing (Kyne et al. 2017).

Pseudobatos horkelii occurs in the southwest Atlantic from Rio de Janeiro, Brazil, to northern Argentina. This species is subjected to intense and largely unregulated fishing pressure by commercial and artisanal demersal trawl, gillnet, longline, and beach seine fisheries, which are intensive across its range. This species is caught in artisanal Brazilian fisheries and is still landed and traded despite legislation to protect it. Fishers in Brazil sometimes land this species illegally and remove part of its snout to disguise it as *Zapteryx brevirostris*, which is legal to land. The species is targeted by recreational fisheries in southern Brazil during summer, with an average 10-20 gravid females/fisher/day. In Uruguay, it is captured frequently in gillnets and longlines, and is sometimes targeted (Jaureguizar et al. 2015). In Argentina, recreational fisheries are popular along most of the coast with large tournaments that include this species, with thousands of fishers, and poor or null regulations (Venerus & Cedrola 2017).

Rhinobatos albomaculatus occurs in the eastern central Atlantic and southeast Atlantic from Mauritania to Angola. There are targeted shark and ray fisheries across many countries in the west Africa region and there is quite likely increasing fishing pressure on this species (Leurs et al. 2021). This has led to population reductions of many species of sharks and rays including the local extinction of sawfishes (family Pristidae). Sharks and rays are still targeted in a number of countries by artisanal fishers using

gillnets. In general, fishing effort and the number of fishers has intensified in recent decades across most of this species' range. Between 1950–2010, the total artisanal fishing effort increased by 10-fold with an estimated 252,000 unregulated artisanal and 3,300 industrial vessels operating in this region by 2010 (mostly distant water fleets from Europe and east Asia that take sharks and rays as bycatch) (Belhabib et al. 2018). This region also has some of the highest levels of illegal, unreported, and unregulated (IUU) fishing in the world. In addition, the shallow, soft-substrate habitats preferred by rays and guitarfishes are threatened by severe habitat loss and degradation in this region (Moore 2017).

Rhinobatos irvinei occurs in the eastern central Atlantic and southeast Atlantic from Morocco to Angola. The situation with regards to this species is the same as that of *R. albomaculatus*, above.

Rhinobatos rhinobatos occurs in the Mediterranean Sea and in the eastern Atlantic Ocean from the southern Bay of Biscay to Angola. In the Mediterranean Sea, the species is sometimes landed in fisheries as bycatch, and it is still fished in Tunisia and Egypt. However, it has largely disappeared from its former range in the northern and western regions of the Mediterranean. In the west Africa region there are artisanal targeted shark fishing across much of the region (Moore et al. 2019), and this has expanded into targeted shark and ray fisheries across many west African countries causing fishing pressure on this species (Leurs et al. 2021). Fins are dried and appear mostly to be destined to Asian markets through complex regional trade routes.

Rhinobatos schlegelii occurs in the northwest Pacific Ocean from Japan to Taiwan Province of China, including the Republic of Korea and China. This species is subject to heavy fishing pressure on its coastal and shelf habitats across its entire range. It is captured in industrial, artisanal, and subsistence fisheries with multiple fishing gears and is retained for the meat and fins. In Taiwan Province of China, fishing occurs in shallow inshore areas in a nursery area at Penghu Island where most of the landings of this species are of gravid females with near-term embryos.

4.1 Habitat trends

All Rhinobatidae species occur in relatively shallow coastal waters where they are subject to habitat deterioration due to a large variety of causes, including bottom trawling, coastal development, coastal habitat destruction and degradation, conversion of coastal lagoons and mangrove deforestation for agriculture (e.g., rice) and aquaculture (e.g., shrimp, fish culture, and fish production); noise pollution, oil and gas exploration, drilling, and production; urban expansion, unplanned tourism development; pollution (such as sewage effluents, agricultural runoff, hydrocarbon, and heavy metals); sedimentation and siltation; changes to the nearshore habitats from river dams, and more.

4.2 Population size

Unknown.

4.3 Population structure

Unknown.

4.4 Population trends (based largely on recent IUCN Red List of Threatened Species assessments).

Acroteriobatus variegatus - This species is regularly caught in southern India. While there are no species-specific data available on this species; though elasmobranchs are heavily exploited in Tamil Nadu and Kerala. Significant declines in guitarfish and wedgefish landings have been documented in Tamil Nadu; this is the equivalent to a >97% local decline for *A. variegatus* over the last three generation periods. During this period, trawler hours doubled, and consequently, catch rate declined by 60% (Raje & Zacharia 2009). This would equate to an overall decline of approximately 60% over a period of three generation spans of the species (Kyne et al. 2017).

Pseudobatos horkelii - Commercial and artisanal fisheries pressure is intense on the southern Brazilian shelf off Rio de Janeiro and São Paulo, and it is likely that a steep population reduction of this species has occurred there. In Rio Grande do Sul, Brazil, total landings declined from 1,804 t in 1984, to 157 t in 2001, which is equivalent to reduction of approximately 99% scaled over three generations (55.5 years). While formerly abundant, this guitarfish was scarce in coastal waters by 2004 (Vooren et al. 2005). Fishing pressure has not ceased in Brazil. Despite protection, this species is still landed and traded, and a further reduction in population size is suspected. In Uruguay, the catches from research trawls in the

1980s and early 1990s were on average about 1,400 kg/h, and between 2013 and 2017 were only just over 480 kg/h, equivalent to a 94% reduction over three generations. Overall, the species has undergone a population reduction of >80% over the past three generations (Pollom et al. 2020).

Rhinobatos albomaculatus - The greatest fishing effort and largest reported elasmobranch fisheries in the whole of Africa, are the west African countries of Nigeria, Senegal and Ghana. Both catch and effort have continued to rise. Given the lack of reporting from artisanal fisheries and the large number of nations fishing in African waters, actual landings are likely to be much higher than reported. Although this species was never very abundant, it has become increasingly rare. There have been limited records of this species in the past decade from across the region. *R. albomaculatus* was reported in only half of guitarfish fishing communities surveyed in Ghana, where 59% of interviewed fishers reported their catches of the smaller guitarfish species, including *R. albomaculatus*, have declined by 40-60% (Seidu et al. 2022). Overall, considering these declining catch trends and that fishing pressure is intense and rising throughout its range, it is suspected that the species has undergone a population reduction of >80% over the last three generation lengths (Jabado et al. 2021a).

Rhinobatos irvinei - There have been limited records of this species in the past decade from across the region. Severe population reduction is suspected from actual levels of exploitation, as well as several historical accounts and contemporary datasets for landings and catch rates for all sharks and rays in the region. It is suspected that the species has undergone a population reduction of >80% over the past three generation lengths (30 years) due to high levels of exploitation (Jabado et al. 2021b).

Rhinobatos rhinobatos – This species has a relatively large range, but it is also under intense fishing pressure, and suffers from severe habitat degradation. The species was prevalent in the 1970s and 1980s along the north African coast and eastern basin of the Mediterranean. By 1990, this species was extinct from the western, and central regions of the Mediterranean (the coastal waters of Spain, France, and Italy), based on a combination of fishers' knowledge and data from the Mediterranean International Trawl Survey (MEDITS). This species is still caught in Tunisia and Egypt. It is not uncommon in Turkey, Lebanon and Israel (Chaikin et al. 2020). It is fully protected in Israel and not landed there. In Mauritanian waters, species-specific population trend data show an annual rate of decrease of 4.6%, consistent with an estimated 85% reduction in population over three generation lengths (Meissa & Gascuel 2015). Landings in north Africa indicate declines in abundance with catches containing a large proportion of immature individuals (Newell 2017). Most Ghanaian guitarfish fishers interviewed (71%) stated that catches of the two larger guitarfishes (*Glaucostegus cemiculus* – already listed in Appendix II – and *R. rhinobatos*) have declined by 80–90%, based on their recollection (Seidu et al. 2022). This species' reduction in range, the ongoing high levels of exploitation in some areas, and available species-specific trend data, suggest a severe population reduction. Overall, fishing pressure is high and increasing across the west African range of the species (e.g. Seidu et al. 2022) and there has been a long history of fisheries overexploitation in the Mediterranean Sea part of its range, which is ongoing. It is therefore inferred that the species has undergone a population reduction of >80% over the last three generation lengths (Jabado et al. 2021c).

Rhinobatos schlegelii - This species is subject to intense fishing pressure across its entire range. The species is now rare in Japan. It has virtually disappeared from the Republic of Korea over the past 20–25 years, and as such has declined there by 75–96% over the past three generation lengths (30 years). Overall, it is inferred that the species has undergone a population reduction of >80% over the past three generation lengths (Rigby et al. 2021).

5. Threats

The major threats to all of the species in this proposal are unsustainable capture rates and habitat deterioration; these are discussed in detail in Section 4, above.

Target fisheries for guitarfish currently exist in several countries, particularly in the Indo-west Pacific and in west Africa. Fins of many species apparently enter the international fin trade for the Asian market. Due to their life history traits (slow growth, late age at maturity, and low fecundity) they are particularly vulnerable. Moreover, their breeding behavior (with pregnant females coming into shallow waters to give birth), makes them particularly susceptible to coastal fisheries. They are readily caught in a variety of fishing gear especially artisanal gillnets, trawls, line, trammel nets and seine nets, including as bycatch by demersal trawls and gillnets. Their occurrence along inshore areas of the continental shelf makes them an easy target.

Fishers are often not able to tell the difference between the species from this family and the juvenile giant guitarfishes (family Glaucostegidae), such that an Appendix II listing of the family Rhinobatidae should promote better emphasis on capacity-building in this regard.

6. Utilization and trade

There are no known captive-breeding facilities for any of these species; all specimens in trade are from the wild. The guitarfishes are used commercially mainly for their meat, skin and dorsal and caudal fins, and there is likely also use of oil and other derivatives. The guitarfishes are intensely fished, often as bycatch of demersal fisheries, such as shrimp bottom trawlers. In addition, there are also directed fisheries for guitarfishes in many countries throughout their range, some legal and some illegal. A small number of live juveniles, apparently wild-sourced, are sold for the aquarium trade, but these are not in great numbers.

Although the dorsal and caudal fins of the Rhinobatidae tend to be smaller than those of many large sharks and of the giant guitarfishes (family Glaucostegidae), they are in great demand as being considered high-quality fins. Because the stiff filaments of elastic protein (ceratotrichia) that support the fin webs are very densely packed in the Rhinobatidae, they are of very high value for shark fin soup, even when the fins are relatively small (Seidu et al. 2002). Therefore, the fins from Rhinobatidae have been specifically targeted and fished for the international trade in shark fins (Diop & Dossa 2011).

6.1 National utilization

In many regions, guitarfish meat is generally directed into domestic use, or consumed in nearby countries, for example guitarfish meat is often exported from Mauritania, Senegal and Guinea to Ghana along with the fins (R. Jabado, pers. comm.). Fins and skins, however, are almost always destined for international trade.

6.2–6.4 Legal trade, illegal trade, and parts and derivatives in trade

Landing and capture data:

The capture databases held by FAO and the regional fishery bodies (RFB), contain information from those countries that report to FAO and are Party to RFBs (respectively). It can be difficult to assess the accuracy or completeness of these data, particularly if records for several taxa are combined, and it can therefore be impossible to determine which species has actually been caught. Despite its limitations, the FAO database shows that some countries have reported large catches of Rhinobatidae over the past few years (Table 1).

Table 1. The top eleven countries with the highest total reported captures of Rhinobatidae for the years 2018 to 2020. (Source: FAO Global Capture Database, accessed on 17 May 2022)

Country	Total for 3 years, 2018–2020 (Tons of live weight)
Mauritania	9,160
Pakistan	3,632
Indonesia	3,567
Senegal	1,620
Benin	1,090
Iran	824
Côte d'Ivoire	722
Peru	394
Liberia	372
Libya	216
Uruguay	113

Another source of fish catch data is from Sea around Us, <https://www.seaaroundus.org/data/>. According to this limited database, the three countries with the largest Rhinobatidae capture during the years 2010 to 2018 were (from most to least) Pakistan, Mexico and Iran.

In the last few years there have been numerous studies published that provide new insights regarding Rhinobatidae capture in local areas. Some examples are: the Arabian Seas and adjacent areas (Jabado et al. 2018), Bangladesh (Haque & Spaet 2021), Brazil (Alvarenga et al. 2021; Araujo et al. 2020), Ghana (Leeney & Quayson 2022; Seidu et al. 2022), India (Najmudeen & Zacharia 2019), Indonesia (Lindfield & Jaiteh 2019), Pakistan (Moazzam & Osmany, 2020), Sri Lanka (Perera & Jayathilake 2021), Uruguay (Silveira et al. 2018), and USA (Jannot et al. 2021). This is definitely not a comprehensive list, as there are likely more recently-published papers that we have overlooked. These reports do not provide trade analysis based on different parts and derivatives (meat, fins, skins, oil etc.). Nevertheless, all these papers show a picture of exploitation and use based on overall capture data

(usually expressed by weight) and thus lend credence to the IUCN Red List assessments that most Rhinobatidae species are threatened, and that fishing (i.e. legal and illegal; directed fisheries as well as unintentional by-catch) is the major cause of these declines, as shown also by Dulvy et al. (2021). Moreover, recent research has shown how some fishers are now pivoting to targeting guitarfishes for their fins, following the local elimination of larger sawfishes, wedgefish and giant guitarfish (Seidu et al. 2022).

Rhinobatidae in international trade

As mentioned above, guitarfishes are utilized for their meat, skin and fins (dorsal and caudal fins). Often the meat is for domestic use, while skin and fins often enter international trade. There is little evidence in the published literature to date of international trade in fins from the family, however it is known that their products are traded internationally. For example, in Mauritania the meat is exported to Ghana, while the fins are either retained for sale to other countries or also exported to Ghana. In Senegal, all the fins are for export (Jabado, pers. comm.). A recent study examined for the first time the global trade in smaller shark and ray fins (Cardenosa 2020), and found a very different composition, compared to the results from studies that had focused on trade in larger fins (e.g. Fields 2018). This initial study is based on a limited dataset, and further studies on this trade in smaller fins would likely provide additional information on the trade in the fins of the family Rhinobatidae. An Appendix II listing of the family Rhinobatidae will better enable data collection.

A study by Hau et al. (2018) looked specifically at trade in shark-like rays (guitarfishes, wedgefishes, and giant-guitarfishes). Using genetic analyses, they found that dried fins obtained from shark-like rays are often marketed in Hong-Kong SAR and Guangzhou markets under the unique trade category of "Qun chi" (in Chinese 群翅 / 裙翅). These are the higher-priced quality ray fins, recognized as the "King of shark fins" due to their special quality and texture, as opposed to the most common shark-fin category, "Ya jian", 牙 揀, which are from sharks (mainly *Prionace glauca*). Availability of Qun chi in the Chinese dried seafood markets shows that there is a considerable demand for shark-like ray fins in Chinese markets, yet Hong Kong's official Register of Marine Species (HKRMS) shows that shark-like ray species do not occur in local waters. It is therefore reasonable to assume that all the shark-like ray fins in the Hong Kong SAR market were imported via international trade (Hua et al. 2018).

This information shows that there is considerable opportunity and motivation for international trade in Rhinobatidae parts and derivatives, and there is ample eye-witness information showing that such trade (legal and illegal) indeed occurs. However there is a very little information on the trade routes for the fins or on the quantities traded. The Appendix II listing should assist in gaining better information about the extent of this trade and its impacts. Concurrent enforcement efforts against illegal trade in fins of all elasmobranchs are also likely to improve the conservation status of the Rhinobatidae.

6.5 Actual or potential trade impacts

An Appendix II listing of all the Rhinobatidae will not stop domestic trade or legal international trade in these species, but it will enable collection of better trade data, and it should ensure that legal international trade is not detrimental to the survival of these species in the wild. The Appendix II listing of these species is not expected to have any impact on domestic use by indigenous peoples and local communities (IPLCs).

An Appendix II listing will require the exporting countries of these species to issue export permits in accordance with Article IV of the Convention, as with all Appendix-II species. In accordance with the Convention, the exporting country may also be asked to present a non-detriment finding and/or a legal acquisition finding for the proposed export.

It is difficult to predict how the listing will impact upon international trade of these species. Hopefully it will reduce the levels of international trade in the threatened species and improve their conservation status in the wild.

7. Legal instruments

7.1 National

As mentioned above, approximately 110 countries are range countries for Rhinobatidae. With such a large group of countries, we were not able to assess all the national legal instruments. We found only

a few Parties with specific regulations protecting some or all species of Rhinobatidae, such as Bangladesh, Brazil, European Union, Israel, Kuwait, Pakistan, Mexico, Saudi Arabia, and USA, but there are likely others.

In many of the range states there are no specific regulations against fishing the species in this proposal. However, in some countries there are lists of specific guitarfish species that are allowed, and designated fishing areas, or fishing seasons for some Rhinobatidae. The direct legal measures regarding the species in this proposal that are in force in some countries, such as protected species regulations and fishing regulations, can be complex and varied, as they can include restrictions on fishing based on species, size, sex, area, dates, equipment, methods, as well as rules on by-catch and disposal of protected species caught unintentionally, and on reporting requirements.

Many countries also have various restrictions or bans on finning and on trawling, which can indirectly help reduce fishing mortality for the species in this proposal. In many countries Marine Protected Areas (MPAs) provide legal protection to various degrees for many of the species in this proposal, as do Shark Sanctuaries (Ward-Paige 2017).

7.2 International

CITES: None of the species of the family Rhinobatidae is listed in any of the CITES Appendices, although, as mentioned above, 3 out of 5 of the families of shark-like rays are currently listed in the CITES Appendices.

The Convention on Migratory Species of Wild Animals (CMS): One species of Rhinobatidae, the common guitarfish *R. rhinobatos*, is listed in CMS Appendix II, while the same species' Mediterranean Sea population is listed in CMS Appendix I. CMS Parties are required to provide protection for Appendix I species; and are encouraged to enter into agreements to protect Appendix II species. The same species, *R. rhinobatos* is also listed in Annex II of the Memorandum of Understanding on the Conservation of Migratory Sharks (Sharks-MOU), which is a non-binding daughter agreement under the CMS. In 2020, CMS also adopted two 'Concerted Actions'⁴ aimed at facilitating international conservation of *R. rhinobatos*, which has an unfavorable conservation status, as defined under the CMS.

The Barcelona Convention and the Mediterranean Action Plan: *R. rhinobatos* is listed in Annex II of the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol) of the Barcelona Convention. Parties that have ratified this protocol are required to provide legal protection for the species.

The Food and Agriculture Organization of the United Nations (FAO) adopted in 1999 an International Plan of Action for the Conservation and Management of Sharks (IPOA) to encourage all States contributing to fishing mortality on an elasmobranch species to participate in its management, and that each State should develop a National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks), which includes also the family Rhinobatidae. In addition, the FAO oversees the world's 50+ regional fisheries bodies (RFBs) and the regional fisheries management organizations (RFMOs). Many of these RFBs are purely advisory, but the RFMOs have some management powers, which may include setting quotas and guidelines for fishing. We are aware of only one RFMO with a restriction on Rhinobatidae; members of the General Fisheries Commission for the Mediterranean (GFCM) are not permitted to retain *R. rhinobatos*⁵.

8. Species management

8.1 Management measures

Some countries have daily quotas or limited fishing seasons to protect the species in this proposal from over-exploitation, for example limitations during the breeding season. In many countries the species occur in Marine Protected Areas, and therefore they have *de facto* protection in those MPAs. Many countries have outlawed finning, and more countries are also outlawing or greatly limiting bottom-

⁴ CMS Concerted Actions 13 S.8 and 13.9. See: <https://www.cms.int/en/documents/concerted-actions>

⁵ Rec. GFCM/36/2012/3 on fisheries management measures for conservation of sharks and rays in the GFCM area. <https://www.fao.org/3/a-ax385e.pdf>

trawling. All these measures can certainly assist the conservation status of these species, so long as enforcement is effective.

8.2 Population monitoring

Only a few of the species in this proposal have been subject to regular direct population monitoring. One of the most widely studied species is *R. rhinobatos*, which is monitored by a number of Mediterranean countries such as Israel, Tunisia and Turkey; these results appear in the scientific literature.

Many countries conduct regular monitoring of the ichthyofauna (fish species) in MPAs and other coastal areas using scuba divers or remotely operated vehicles (ROVs), and data on the species in this proposal are collected as part of these surveys.

Most coastal countries are Party to one or more of the numerous RFBs around the globe and report catches to them as well as to FAO in various degrees of accuracy and regularity. These data provide partial information on landings of some of the species in this proposal, and inference of population size and demographics can be estimated from them.

8.3 Control measures

8.3.1 International

The International Consortium to Combat Wildlife Crime (ICCWC) and its member organizations have been working for many years to combat illegal international trade (trafficking) in elasmobranch fins. Other international organizations such as FAO and many NGO's have also invested resources to fight finning and trafficking of elasmobranch fins in a wide variety of ways.

8.3.2 Domestic

Since the Rhinobatidae occur in over 110 countries we did not conduct a review of domestic control measures.

8.4 Captive breeding and artificial propagation

We are not aware of any projects for captive breeding or artificial propagation on a commercial scale of any of the species in this proposal.

8.5 Habitat conservation

All the range states of the species in this proposal have some coastal areas and/or shallow parts of the continental shelf that have been designated with various levels of protection, such as declaration as Marine Protected Areas (MPAs) or as areas with restricted fishing or trawling, with the intention to conserve and protect the habitat for marine life. Globally there exists a large variety of methods to protect habitats, including MPAs and other area-based conservation measures, OECMs (IUCN 2019), and also a large variance in the effectiveness of the enforcement of these measures and the efficacy of the protection on the habitat.

8.6 Safeguards

Not relevant.

9. Information on similar species

Essentially, without specialized knowledge or advanced techniques, such as DNA barcoding, it is very challenging for customs officials to distinguish from which species the dorsal and caudal fins of species in the family Rhinobatidae have been taken, both in comparison with species in the family itself and with the wider group of related species of shark-like rays, particularly juvenile Rhinidae (wedgetfishes) and Glaucostegidae (giant guitarfishes).

As mentioned above, the Rhinobatidae are one of the five families of shark-like rays. Like the Rhinobatidae, the Rhinidae (wedgetfishes) and Glaucostegidae (giant guitarfishes) are also demersal shark-like rays, and

their parts and derivatives, especially dorsal and caudal fins, are very similar to those of the Rhinobatidae, particularly in the case of juvenile specimens (which are also in demand in international trade). Whole specimens of Pristidae (sawfishes) are readily identifiable as they are unique in possessing teeth protruding along the extended snout or rostrum. However, their dorsal and caudal fins are also very similar to those of the Rhinobatidae, again, particularly for juveniles. The entire group of shark-like rays includes species that are known to have the highest value of all shark and ray fins in trade, raising the risk of increased targeting of family Rhinobatidae, now that the other families found in trade are listed in CITES Appendix II.

As it is challenging to distinguish Rhinobatidae fins from those of other shark-like rays, they are often marketed together, putting the six Critically Endangered species in this proposal at risk of further declines, and creating an avenue for the laundering of CITES-listed Glaucostegidae and Rhinidae fins. This further justifies a family level Appendix II listing approach of the entire family Rhinobatidae.

10. Consultations

Since over 110 Parties are range states for Rhinobatidae, consultation was conducted via Notification to the Parties No. 2022/040, promulgated by the Secretariat on 24 May 2022 (as the Secretariat has done for other listing proposals). Responses received by 15 June 2022 appear in Annex 2 of this proposal, below.

The proponents consulted the IUCN Shark Specialist Group, academic experts, and various NGOs.

The proponents also consulted the nomenclature specialist of the Animals Committee for review, and for his input on the nomenclatural aspects of this proposal (see Section 11, Additional Remarks, below).

11. Additional remarks

Based on the recommendation of the Animal Committee's Nomenclature Specialist, this proposal hereby includes the adoption of Last et al. (2016a) as the nomenclatural standard reference for the family Rhinobatidae as defined therein, with the following supplementary references for the following seven newly-described species: *Acroteriobatus andysabini* and *A. stehmanni* (Weigmann et al. 2021), *A. omanensis* (Last et al. 2016b), *Pseudobatos buthi* (Rutledge 2019), *Rhinobatos austini* (Ebert & Gon 2017), *R. manai* (White et al. 2016), and *R. ranongensis* (Last et al. 2019).

The Nomenclature Specialist also recommends that the species in this proposal should appear in CITES Appendix II as "Rhinobatidae spp.", in order to account for any newly identified species in the future and for any future changes in nomenclature.

12. References

- Alvarenga, M., Solé-Cava, A. M., & Henning, F. (2021). What's in a name? Phylogenetic species identification reveals extensive trade of endangered guitarfishes and sharks. *Biological Conservation*, 257, 109119.
- Araujo, N.L.F., Lopes, C.A., Brito, V.B., Santos, L.N.D., Barbosa Filho, M.L.V., Amaral, C.R.L.D., Siciliano, S. & Hauser-Davis, R.A., (2020). Artisanally landed elasmobranchs along the coast of Rio de Janeiro, Brazil. *Boletim do Laboratório de Hidrobiologia*, 30: 33-53.
- Başusta, N., Demirhan, S.A., Çiçek, E., Başusta, A. & Kuleli, T., (2008). Age and growth of the common guitarfish, *Rhinobatos rhinobatos*, in Iskenderun Bay (north-eastern Mediterranean, Turkey). *Journal of the Marine Biological Association of the United Kingdom*, 88: 837-842.
- Belhabib, D., Greer, K. & Pauly, D. (2018). Trends in industrial and artisanal catch per effort in West African fisheries. *Conservation Letters* 11(1): e12360.
- Blanco-Parra, M. del, F. Márquez-Farías, & F. Galván-Magaña (2009). Pesquería y relaciones morfológicas de el pez guitarra rayada, *Zapteryx exasperata* (Elasmobranchii, Rhinobatidae), en el Golfo de California, México. *Pan-American Journal of Aquatic Sciences*, 4: 456-465.
- Cardeñosa, D., Shea, K. H., Zhang, H., and 3 more authors (2020). Small fins, large trade: a snapshot of the species composition of low-value shark fins in the Hong Kong markets. *Animal Conservation*, 23(2), 203-211.
- Chaikin, S., Belmaker, J., & Barash, A. (2020). Coastal breeding aggregations of threatened stingrays and guitarfish in the Levant. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 30: 1160-1171.
- Diop, M. & Dossa, J. (2011) 30 Years of shark fishing in West Africa. Corlet/ Condé-sur-Noireau (France): Fondation internationale du Bassin d'Arguin, Regional Marine and Coastal Conservation Programme for West Africa, and the Sub-Regional Fishing Commission.

- Dulvy, N.K., Fowler, S.L., Musick, J.A., Cavanagh, R.D., Kyne, P.M., and 18 more authors (2014). Extinction risk and conservation of the world's sharks and rays. *elife*, 3, p.e00590
- Dulvy, N.K., Pacoureau, N., Rigby, C.L., Pollom, R.A., Jabado, R.W., and 19 more authors (2021). Overfishing drives over one-third of all sharks and rays toward a global extinction crisis. *Current Biology*, 31(21), pp.4773-4787.
- Ebert, D. A., Carlson, P., Aitchison, R. M., Huerta-Beltran, B. L., & Kyne, P. M. (Eds.) (2021). Report on the American Elasmobranch Society Global Wedgefish & Guitarfish Symposium 2021. Moss Landing Marine Laboratories, San Jose State University.
- Ebert, D. A., & Gon, O. (2017). *Rhinobatos austini* n. sp., a new species of guitarfish (Rhinopristiformes: Rhinobatidae) from the southwestern Indian Ocean. *Zootaxa*, 4276(2), 204-214.
- Fields, A.T., Fischer, G.A., Shea, S.K., and 5 more authors (2018). Species composition of the international shark fin trade assessed through a retail-market survey in Hong Kong. *Conservation Biology*, 32: 376-389.
- Fricke, R., Eschmeyer, W. N. & Van der Laan, R. (eds) (2022). Eschmeyer's Catalog of Fishes: Genera, Species, References. On-line electronic version accessed 9 May 2022.
<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>
- Haque, A. B., & Spaet, J. L. (2021). Trade in threatened elasmobranchs in the Bay of Bengal, Bangladesh. *Fisheries Research*, 243, 106059.
- Hau, CY, Abercrombie, DL, Ho, KYK, & Shea, KHS (2018). "King of Shark Fins" not quite sharks ... so what is in my shark fin soup?: A rapid survey on the availability of shark-like batoid fins in Hong Kong SAR and Guangzhou, China retail markets. Publ. by Bloom Hong Kong Shark Foundation. 31 pp.
https://citessharks.org/s/Revised_King-of-shark-fins-not-quite-sharks.pdf
- International Union for Conservation of Nature – IUCN (2019). Recognising and reporting other effective area-based conservation measures. Protected Area Technical Report Series, No. 3, Published by the IUCN World Commission on Protected Areas (WCPA), Task Force on Other Effective Area-based Conservation Measures.
- Jabado, R. W. (2018). The fate of the most threatened order of elasmobranchs: Shark-like batoids (Rhinopristiformes) in the Arabian Sea and adjacent waters. *Fisheries Research*, 204: 448-457.
- Jabado, R. W., Kyne, P. M., Pollom, R. A., and 22 more authors (2018). Troubled waters: Threats and extinction risk of the sharks, rays and chimaeras of the Arabian Sea and adjacent waters. *Fish and Fisheries*, 19: 1043-1062.
- Jabado, R.W., Dia, M., De Bruyne, G., and 12 more authors (2021a). *Rhinobatos albomaculatus*. The IUCN Red List of Threatened Species 2021. Accessed on 11 June 2022.
- Jabado, R.W., Chartrain, E., Dia, M., and 13 more authors. (2021b). *Rhinobatos irvinei*. The IUCN Red List of Threatened Species 2021b. Accessed on 11 June 2022.
- Jabado, R.W., Pacoureau, N., Diop, M., and 16 more authors (2021c). *Rhinobatos rhinobatos*. *The IUCN Red List of Threatened Species* 2021. Accessed on 25 May 2022.
- Jannot, J. E., Bjorkland, R., Somers, K. A., Mitchell, T., Tuttle, V. J., & McVeigh, J. (2021). Elasmobranch bycatch in US West Coast groundfish fisheries. *Endangered Species Research*, 45: 109-126.
- Jaureguizar, A.J., Cortés, F., Milessi, A.C., Cozzolino, E. & Allega, L. (2015). A trans-ecosystem fishery: environmental effects on the small-scale gillnet fishery along the Río de la Plata boundary. *Estuarine, Coastal and Shelf Science* 166: 92-104.
- Kyne, P.M., Simpfendorfer, C., Bineesh, K.K., Moore, A., Jabado, R.W. & Valinassab, T. (2017). *Acroteriobatus variegatus*. The IUCN Red List of Threatened Species 2017. Accessed on 11 June 2022.
- Kyne PM, Jabado RW, Rigby CL, and 7 more authors (2020). The thin edge of the wedge: Extremely high extinction risk in wedgefishes and giant guitarfishes. *Aquatic Conservation: Marine and Freshwater Ecosystems*. 30:1337-61.
- Last, P. R., Seret, B., & Naylor, G. J. (2016a). A new species of guitarfish, *Rhinobatos borneensis* sp. nov. with a redefinition of the family-level classification in the order Rhinopristiformes (Chondrichthyes: Batoidea). *Zootaxa*, 4117(4), 451-475. DOI 10.11646/zootaxa.4117.4.1
- Last, P. R., Henderson, A. C., & Naylor, G. J. (2016b). *Acroteriobatus omanensis* (Batoidea: Rhinobatidae), a new guitarfish from the Gulf of Oman. *Zootaxa*, 4144: 276-286.
- Last, P.R., Seret, B., & Naylor, G.J. (2019). Description of *Rhinobatos ranongensis* sp. nov. (Rhinopristiformes: Rhinobatidae) from the Andaman Sea and Bay of Bengal with a review of its northern Indian Ocean congeners. *Zootaxa*, 4576(2).

- Leeney, R. H., & Quayson, E. (2022) Short note: An assessment of the status of sawfishes and of guitarfish landings in artisanal fisheries in Ghana. *Aquatic Conservation: Marine and Freshwater Ecosystems*.
- Lessa, R., Vooren, C.M. & Lahaye, J. (1986). Desenvolvimento e ciclo sexual das fêmeas, migrações e fecundidade da Viola, *Rhinobatos horkelii* (Müller and Henle, 1841) do Sul do Brasil. *Fundação Universidade Federal do Rio Grande. Atlântica* 8: 5-34.
- Leurs, G., and 8 more authors (2021). Industrial fishing near West African Marine Protected Areas and its potential effects on mobile marine predators. *Frontiers in Marine Science* 8 (2021): 177.
- Lindfield, S., & Jaiteh, V. (2019). Assessing shark and ray bycatch in Indonesian deepwater snapper-grouper fisheries. *The Nature Conservancy Indonesia*, 1-13.
- Meissa, B. & Gascuel, D. (2015). Overfishing of marine resources: some lessons from the assessment of demersal stocks off Mauritania. *ICES Journal of Marine Science* 72(2): 414-427.
- Moore, A. B. (2017). Are guitarfishes the next sawfishes? Extinction risk and an urgent call for conservation action. *Endangered Species Research*, 34, 75-88.
- Moore, A.B.M., Séret, B. & Armstrong, R. (2019). Risks to biodiversity and coastal livelihoods from artisanal elasmobranch fisheries in a Least Developed Country: The Gambia (West Africa). *Biodiversity & Conservation* 28(6).
- Moazzam, M., & Osmany, H. B. (2020). Species composition, commercial landings, distribution and some aspects of biology of guitarfish and wedgefish (Class Pisces: Order Rhinopristiformes) from Pakistan. *International Journal of Biology and Biotechnology*, 17: 469-489.
- Najmudeen, T. M., & P. U. Zacharia. (2019). Status of Commercially Exploited Demersal Fishery Resources of India. Chapter 2 *in*: Training Manual on Advances in Marine Fish Production in India: 5-20.
- Newell, B.M. (2017). Status Review Report of Two Species of Guitarfish: *Rhinobatos rhinobatos* and *Rhinobatos cemiculus*. Report to US National Marine Fisheries Service, Office of Protected Resources.
- Pacoureau, N., Rigby, C. L., Kyne, P. M., Sherley, R. B., and 16 more authors. (2021). Half a century of global decline in oceanic sharks and rays. *Nature*, 589(7843), 567-571.
- Perera, H. A. C. C., & Jayathilake, R. A. M. (2021). Species composition of Batoids in a coastal gillnet fishery operated in the northern coastal waters of Sri Lanka. *J. Mar. Biol. Assoc. India*, 63(1).
- Pollom, R., Barreto, R., Charvet, P., and 8 more authors. (2020). *Pseudobatos horkelii*. The IUCN Red List of Threatened Species 2020. Accessed on 11 June 2022.
- Raje, S.G. & Zacharia, P.U. (2009). Investigations on fishery and biology of nine species of rays in Mumbai waters. *Indian Journal of Fisheries* 56(2): 95-101.
- Rigby, C.L., Walls, R.H.L., Derrick, D., and 8 more authors. (2021). *Rhinobatos schlegelii*. The IUCN Red List of Threatened Species 2021. Accessed on 11 June 2022.
- Rutledge, K. M. (2019). A new guitarfish of the genus *Pseudobatos* (Batoidea: Rhinobatidae) with key to the guitarfishes of the Gulf of California. *Copeia*, 107: 451-463.
- Seidu, I., Brobbey, L.K., Danquah, E., Opong, S.K., van Beuningen, D. & Dulvy, N.K. (2022) “Every fish in the sea is meat and so are guitarfishes”: Socio-economic drivers of a guitarfish fishery in Ghana. *Marine Policy* 143, 105159.
- Silveira, S., Laporta, M., Pereyra, I., Mas, F., Doño, F., Santana, O. & Fabiano, G. (2018). Análisis de la captura de condrictios en la pesca artesanal oceánica del Uruguay, Atlántico Sudoccidental. *Frente Marítimo* 25: 301–324.
- Venerus, L.A. & Cedrola, P.V. 2017. Review of marine recreational fisheries regulations in Argentina. *Marine Policy* 81: 202-210.
- Vooren, C.M., Lessa, R.P. & Klippel, S. (2005). Biologia e status de conservação da viola *Rhinobatos horkelii*. In: C.M. Vooren and S. Klippel (eds). *Ações para a conservação de tubarões e raias no sul do Brasil*, pp. 33-56. Porto Alegre: Igaré.
- Ward-Paige, C.A. (2017). A global overview of shark sanctuary regulations and their impact on shark fisheries. *Marine Policy*, 82: Pages 87-97.
- Weigmann, S., Ebert, D. A., & Séret, B. (2021). Resolution of the *Acroteriobatus leucospilus* species complex, with a redescription of *A. leucospilus* (Norman, 1926) and descriptions of two new western Indian Ocean species of *Acroteriobatus* (Rhinopristiformes, Rhinobatidae). *Mar. Biodivers.*, 51(4), 1-30.
- White, W. T., Last, P. R., & Naylor, G. J. (2016). *Rhinobatos manai* sp. nov., a new species of guitarfish (Rhinopristiformes: Rhinobatidae) from New Ireland, Papua New Guinea. *Zootaxa*, 4175(6), 588-600.
- Yan, H.F., Kyne, P.M, Jabado, R.W., and 7 more authors (2021). Overfishing and habitat loss drive range contraction of iconic marine fishes to near extinction. *Science Advances*. 10;7(7):eabb6026.

Annex 1 (next page) List of the 37 currently accepted valid species in the family Rhinobatidae (Fricke et al., 2022), with common names, distribution, and status in the IUCN Red List of Threatened Species.

Abbreviations used in the table in Annex 1:

- C Central;
- E East or Eastern;
- N North or Northern;
- S South or Southern;
- O Ocean;
- W West or Western

Species, including author and year	Scientific Synonyms	Common names (L-language)	Distribution	IUCN Red List Global Status: year published	IUCN Status trend
1. <i>Acroteriobatus andysabini</i> Weigmann, Ebert & annulatus (Smith 1841)		Malagasy blue-spotted guitarfish (E) Lesser Sandshark (E); Lesser Guitarfish (E)	Madagascar SE Atlantic O and W Indian O	New species, not assessed VU ; A2bcd; 2020	Unknown Decreasing ↘
3. <i>Acroteriobatus blochii</i> (Müller & Henle 1841)	<i>Rhinobatos blochii</i>	Bluntnose guitarfish (E)	SE Atlantic O from S Angola to Cape Town	LC; 2019	Stable
4. <i>Acroteriobatus leucospilus</i> (Norman 1926)	<i>Rhinobatus leucospilus</i>	Grayspotted guitarfish (E)	SE Atlantic O and W Indian O	EN ; A2d; 2019	Decreasing ↘
5. <i>Acroteriobatus ocellatus</i> (Norman 1926)	<i>Rhinobatus ocellatus</i>	Speckled Guitarfish (E)	SE Atlantic O and W Indian O, South Africa and Mozambique	DD; 2019	Decreasing ↘
6. <i>Acroteriobatus omanensis</i> Last, Henderson & Naylor 2016		Oman guitarfish (E)	Sea of Oman	DD; 2017	Unknown
7. <i>Acroteriobatus salalah</i> (Randall & Compagno)	<i>Rhinobatos salalah</i>	Salalah guitarfish (E)	Oman	NT; A2d+3d; 2017	Decreasing ↘
8. <i>Acroteriobatus stehmanni</i> Weigmann, Ebert & variegatus (Nair & Lal Mohan)		Socotra blue-spotted guitarfish (E) Stripenose guitarfish (E)	Socotra Island, Yemen Arabian Seas; S India and Sri Lanka	New species, not assessed CR ; A2cd+3cd; 2017	Unknown Decreasing ↘
10. <i>Acroteriobatus zanzibarensis</i> (Norman 1926)	<i>Rhinobatos zanzibarensis</i>	Zanzibar guitarfish (E)	Zanzibar Island, Tanzania	NT; 2016	Unknown
11. <i>Pseudobatos buthi</i> Rutledge 2019			Gulf of California	VU ; A2d; 2021	Decreasing ↘
12. <i>Pseudobatos glaucostigma</i> (Jordan & Gilbert)	<i>Rhinobatus glaucostigma</i>	Speckled guitarfish (E)	E, C and SE Pacific O from Magdalena Bay, Mexico to	VU ; A2d; 2020	Decreasing ↘
13. <i>Pseudobatos horkelii</i> (Müller & Henle 1841)	<i>Rhinobatus horkelii</i>	Brazilian guitarfish (E); Viola (S)	SW Atlantic O from Rio de Janeiro, Brazil, to N Argentina	CR ; A2bd; 2020	Decreasing ↘
14. <i>Pseudobatos lentiginosus</i> (Garman 1880)	<i>Rhinobatos lentiginosus</i>	Atlantic guitarfish (E)	W C Atlantic O from N Carolina, USA to Nicaragua	VU ; A2cd; 2020	Decreasing ↘
15. <i>Pseudobatos leucorhynchus</i> (Günther 1867)	<i>Rhinobatos leucorhynchus</i>	Whitesnout guitarfish (E); Guitarra Trompa Blanca (S)	E, C and SE Pacific O from Baja California, Mexico to	VU ; A2d; 2020	Decreasing ↘
16. <i>Pseudobatos percellens</i> (Walbaum 1792)	<i>Rhinobatus electricus</i> , <i>Rhinobatus glaucostictus</i> , <i>Raja percellens</i> , <i>Rhinobatos stellio</i> , <i>Rhinobatos</i>	Chola guitarfish (E); Guitarra Chola (S)	W, C and SW Atlantic O	EN ; A2cd; 2020	Decreasing ↘
17. <i>Pseudobatos planiceps</i> (Garman 1880)	<i>Rhinobatos planiceps</i>	Pacific guitarfish (E)	S Mexico to N Chile incl. Galapagos Islands	VU ; A2d; 2020	Decreasing ↘
18. <i>Pseudobatos prahli</i> (Acero P. & Franke 1995)	<i>Rhinobatos prahli</i>	Gorgona guitarfish (E)	S Mexico to N Peru	VU ; A2d; 2020	Decreasing ↘

Species, including author and year	Scientific Synonyms	Common names (Language)	Distribution	IUCN Red List Global Status; year published	IUCN Status trend
19. <i>Pseudobatos productus</i> (Ayres 1854)	<i>Rhinobatus productus</i>	Shovelnose guitarfish (E)	San Francisco, USA, to S Gulf of California, Mexico	NT; 2016	Decreasing ↓
20. <i>Rhinobatos albomaculatus</i> Norman 1930		Whitespotted guitarfish (E); Guitarra Pecosá (S)	Mauritania to Angola	CR; A2d; 2021	Decreasing ↓
21. <i>Rhinobatos annandalei</i> Norman 1926		Annandale's guitarfish (E)	UAE and Iran to Bangladesh, incl. Sri Lanka	CR; A2d; 2021	Decreasing ↓
22. <i>Rhinobatos austini</i> Ebert & Gon 2017		Austin' s guitarfish (E)	W Indian O from KwaZulu-Natal, South Africa to C. Mozambique	DD; 2019	Decreasing ↓
23. <i>Rhinobatos borneensis</i> Last, Séret & Naylor 2016		Borneo guitarfish (E)	N Borneo, Malaysia	EN; A2d; 2021	Decreasing ↓
24. <i>Rhinobatos holcorhynchus</i> Norman 1922	<i>Rhinobatus holcorhynchus</i> , <i>Rhinobatus natalensis</i>	Slender guitarfish (E)	KwaZulu-Natal, South Africa to Kenya	DD; 2019	Decreasing ↓
25. <i>Rhinobatos hymnicephalus</i> Richardson 1846		Angel fish, Ringed guitarfish (E)	NW Pacific; Japan to Viet Nam, incl. Korea and China	EN; A2cd; 2020	Decreasing ↓
26. <i>Rhinobatos irvinei</i> Norman 1931		Spineback guitarfish (E); Irvine Guitarra (S)	Morocco to Angola, incl. Cape Verde	CR; A2d; 2021	Decreasing ↓
27. <i>Rhinobatos jimbaranensis</i> Last, White & Fahmi 2006		Jimbaran shovelnose ray (E)	S Bali, Indonesia and W peninsular Malaysia	CR; A2d; 2021	Decreasing ↓
28. <i>Rhinobatos lonotus</i> Norman 1926		Smoothback guitarfish (E)	India to Myanmar, incl. Sri Lanka and Bangladesh	CR; A2d; 2021	Decreasing ↓
29. <i>Rhinobatos manai</i> White, Last & Naylor 2016		Papuan guitarfish (E)	New Ireland, Papua New Guinea (known from only 1 specimen)	LC; 2021	Stable
30. <i>Rhinobatos nudidorsalis</i> Last, Compagno & Nakaya 2004			Mascarene Ridge, W Indian O (known from only 1 specimen)	DD; 2019	Unknown
31. <i>Rhinobatos penggali</i> Last, White & Fahmi 2006		Indonesian shovelnose ray (E)	S Java, Bali and Lombok, C Indonesia	EN; A2d; 2021	Decreasing ↓
32. <i>Rhinobatos punctifer</i> Compagno & Randall 1987		Spotted guitarfish (E)	N Red Sea to Sea of Oman and Persian Gulf	NT; A2d+3d; 2017	Decreasing ↓
33. <i>Rhinobatos ranongensis</i> Last, Séret & Naylor 2019		Ranong guitarfish (E)	Myanmar	VU; A2d; 2021	Decreasing ↓
34. <i>Rhinobatos rhinobatos</i> (Linnaeus 1758)	<i>Raja ciodera</i> , <i>Squatinatoraja colonna</i> , <i>Rhinobatis</i>	Common guitarfish (E); Guitarra común (S); Guitare De Mer Commune (F)	E Atlantic O and Mediterranean Sea; from S Bay of Biscay to Angola	CR; A2bd; 2021	Decreasing ↓
35. <i>Rhinobatos sainsburyi</i> Last 2004		Goldeneye shovelnose (E)	NW Australia	LC; 2015	Decreasing ↓
36. <i>Rhinobatos schlegelii</i> Müller & Henle 1841	<i>Rhinobatus formosensis</i> , <i>Rhinobatos schlegelii</i>	Brown guitarfish (E)	NW Pacific O; Japan to Taiwan, incl. Korea and China	CR; A2bd; 2021	Decreasing ↓
37. <i>Rhinobatos whitei</i> Last, Corrigan & Naylor 2014		Philippine guitarfish (E)	C and S Philippines	CR; A2d; 2021	Decreasing ↓

Annex 2. Responses to the request for consultations (CITES Notification No. 2022/040) are copied here as received, and in the order received.

United States of America

United States Information and Comments: Israel Proposal to include the family Rhinobatidae (guitarfishes) in CITES Appendix II (in response to CITES Notification No. 2022/040)

The United States is a range country for the following species:

- Atlantic guitarfish (*Pseudobatos lentiginosus*)
- Shovelnose guitarfish (*Pseudobatos productus*)

Conservation status:

Both species are not in threat of extinction in U.S. waters. According to the IUCN Red List Assessment, the trend for Atlantic guitarfish is increasing. They are listed as Vulnerable due to fisheries outside of U.S. waters.

U.S. harvest:

In the Gulf of Mexico, the Atlantic guitarfish is caught as bycatch in the shrimp trawl fishery. However, that value is less than 0.01% of the total (Scott-Denton et al 2011), and they are largely discarded.

U.S. trade:

There seems to be no U.S. trade in these species (please see response above). However, we have requested LEMIS data from our Office of Law Enforcement that if there are any import/export records to/from the United States we can supply them at a later time.

1. Do you think that an Appendix II listing will contribute to data collection on international trade in guitarfish specimens?

An Appendix II listing of guitarfish could provide additional information on the trade at the family level. Currently, there is a lack of data available on the international trade of some species of guitarfish.

2. How do you think the listing proposal will affect the conservation of living guitarfishes?

In terms of global conservation, guitarfish are one of the most threatened of all elasmobranchs. 66% are Threatened with Extinction whereas 11% are Near Threatened and 8% are Least Concern (only 3 of 35 species). Moreover, 15% are still Data Deficient. Guitarfish are shallow-water inshore and coastal species that are susceptible to a wide range of fishing gears and bycatch mortality. The meat of guitarfish is generally retained for local consumption.

According to Dulvey et al (2014), "Shark-like rays, especially sawfishes, wedgefishes and guitarfishes, have some of the most valuable fins and are highly threatened." These highly valuable fins in Asian markets fall into a trade category called "Qun chi" and, based on a U.S. expert's experience in Hong Kong (Sheung Wan and Sai Ying Pun districts) and in Guangzhou (mainland China), are derived from wedgefish (Rhinidae), Giant guitarfish (Glaucostegidae), and potentially sawfish (Pristidae), but not species in the Family Rhinobatidae.

The fins from Rhinobatidae species can be distinguished from those derived from wedgefish, sawfish and giant guitarfish. However, the fins of guitarfish species are very difficult to tell apart, and currently, there are no identification guides.

Domestic consumption of meat and bycatch mortality in artisanal fisheries likely pose greater threats than the international fin trade for species in the Family Rhinobatidae. However, data is severely lacking for the majority of species in this Family.

3. Would your country be interested in being a co-sponsor of the proposal?

The United States was not aware that Israel planned to submit a proposal to include the guitarfish family in Appendix II when soliciting comments from U.S. stakeholders on potential proposals to be considered at the 19th meeting of the Conference of the Parties. Therefore, it is premature to provide our view on the proposal. The United States looks forward to discussing the proposal further with Israel.

4. Any other comments? None.

Republic of Korea

Dear Colleagues,

Please be advised of our replies to your questions regarding the proposal to include the family Rhinobatidae (guitarfishes) in Appendix II as follows:

1. Do you think that an Appendix II listing will contribute to data collection on international trade in guitarfish specimens?

We believe the Appendix II listing of guitarfish specimens will contribute to data collection on international trade because international trade requires the documentation issued by the government (i.e. NDFs or catch certificates).

2. How do you think the listing proposal will affect the conservation of living guitarfishes?

Currently, the proposed 37 species, including 2 species that live in the coastal sea of the Republic of Korea (ROK), are not caught for commercial purposes in the deep-sea fisheries and coastal fishing of the ROK. In addition, domestic research of coastal resources and scientific research through the international observer of the deep-sea fishery both have little data on those; therefore, we are unable to declare the effects of the conservation of living guitarfishes without the specific and detailed information or data on them.

3. Would your country be interested in being a co-sponsor of the proposal?

Because we do not have enough data/information on those 2 species which inhabit the coastal sea of ROK, we would like to have a more deliberate approach to the proposal. In this context, we are afraid to say that the current domestic data on the specimens is not enough for us to consider being a co-sponsor of the proposal.

4. Any other comments.

In order to list those species on the Appendix II, enough data on the resource status of the range states on basis of their scientific evidence and thorough reviews of them will be instrumental.

Please do not hesitate to contact us if you have any further questions.

Best regards,

CITES Management Authority
Biodiversity Division
Nature Conservation Policy Bureau
Ministry of Environment
Republic of Korea

Japan

Japan's comments on the CITES Notification No. 2022/040

The Resolution Conf.8.21 requires Parties proposing amendments to Appendices I and II to conduct consultations with range States since amendments to Appendices I and II may affect the interests of range States, as pointed out in the preambular part of the Resolution, and since successful implementation of international treaties depends upon cooperation and mutual respect by parties involved. However, Israel, the proposing Party, at this time informed their proposal to potential range States via Secretariat in the form of Notification 2022/040 without providing any scientific information necessary for range States to appropriately understand and review "the substance of the proposal" requested by Res Conf 8.21, including scientific grounds of meeting the CITES Appendix listing criteria. Israel simply requested range States to provide any available information on the proposed species.

It is essential and prerequisite in the context of CITES that any proposal be examined in accordance with the listing criteria as provided in the Resolution Conf. 9.24 supported by scientific evidence in order to determine the appropriateness of the listing of the proposed species on a species-by-species basis. In light of this principle, listing all the 37 species in the Rhinobatidae family in one-go cannot be considered an appropriate approach that would enable reviews based on scientific evidence, as this does not pay proper attention to the fact that the stock status and the utilization of each species are quite different from one species to another. As such, it is impossible for Parties to scientifically consider such information in light of the listing criteria.

It is not only procedurally wrong but also impossible nor unrealistic to scientifically examine the listings of all 37 species in the *Rhinobatidae* family at once during CoP19.

The Notification states that 35 of the 37 species meet the biological criteria for listing in Appendix II as their populations are in decline. However, many of these species are assessed as "Least Concern (LC)" or "Data Deficient (DD)" by IUCN. It is, therefore, necessary for proposing Party to present rationale behind listing in Appendix II those species assessed and categorized as LC or DD.

Based on these observations mentioned above, Japan is not in a position to consider that this Notification 2022/040 constitutes legitimate prior consultations with range States.

European Union

I would like to thank you again for sharing the proposal to include the family *Rhinobatidae* (guitarfishes) in Appendix II, which has also been shared with the EU Member States, including the members of the Scientific Review Group (SRG) for their provisional comments. Based on a review of the draft proposal please see below some comments from our side:

- The proposal covers 37 species of shark-like rays in three genera (*Rhinobatos* spp., *Acroteriobatus* spp. and *Pseudobatos* spp.). Two other Families within the common Order *Rhinopristiformes* ("shark-like rays") are already listed on the Appendices of the Convention with the *Pristidae* ("sawfishes") listed in Appendix I and the *Glaucostegidae* ("violinfishes") listed in Appendix II (since CoP18).
- Guitarfishes (*Rhinobatidae*) in Union waters of ICES subareas 1-10 and 12 are listed as a prohibited species in the Technical Measures Regulation. This means that there likely will not be specific management issues involved with a listing. The Common guitarfish (*Rhinobatos rhinobatos*) in the Mediterranean is listed as a prohibited species in the Fishing Opportunities Regulation for 2022. This species, *R. rhinobatos*, was listed on CMS Appendix I and II in 2017.
- The conservation status of this family is noticeably poor, with 66% of species assessed as threatened in the IUCN Red List (CR, EN, VU) and only 9% Least Concern. According to the proposal 35 of the 37 species meet the biological criteria for listing in Appendix II as their populations are in decline. Moreover 23 of the species are classified by IUCN as endangered due to international trade and domestic exploitation, both legal and illegal.
- The present proposal suggests listing the Family *Rhinobatidae* exclusively on the basis of the look-alike provision. In this case, the proposal should include the most endangered species explicitly. This would provide the scientific rationale for listing and make the inclusion of the look-alike provision valid. As many of the species have recently been assessed by IUCN, the necessary scientific information is available.
- Although it is evident that there are problems to identify parts and derivatives of guitarfishes, the application of the "look-alike provision" has not been well founded. Moreover, in the proposal it is stated that the authors " .. found no comprehensive studies of guitarfish in international trade..". The look-alike provision is specifically for those species in international trade. An overview of the "look-alikes" species within in the family *Rhinobatidae*, as well as with species from the guitarfishes and wedgefishes ('shark-like rays') which are already on Appendix II is needed in order to see exactly what the look-alike situation is. Only then can it be determined if Article II, paragraph 2 (b) (the look-alike provision) is met.

Based on all this, the SRG finds that at this stage the proposal does not meet the required scientific standards. Given that several species in this proposal might fulfil the conditions for inclusion in Appendix II and some even for Appendix I, and that for some of the species data on threats, conservation and trade appears to be available (e.g. from range states or the CMS proposal) and could be incorporated in a more cohesive manner so as to justify fulfilment of the listing criteria. We would be open to supporting a revised proposal at CoP19 if our scientific concerns are sufficiently addressed. We hope that Israel is in a position to advance the proposal and to submit it before June 17th and would be happy to assist and to review a new proposal.

Finally, we would be interested in hearing your feedback to these comments and queries. In particular, we would like to know to which extent you could consider including the species that might fulfil Appendix I or II listing criteria in their own right.

Thanks in advance.

Best regards,

Jorge RODRIGUEZ ROMERO
Acting Head of Unit
European Commission
DG Environment
Unit ENV F.3 – Global Environmental Cooperation and Multilateralism

Colombia

We write to you on behalf of the Colombian Government regarding Notification 2022/040 on the proposal for CoP19 to include the family *Rhinobatidae* (guitarfishes) in Appendix II. Here below please find the answers to the questions raised by the Israeli government:

Do you think that an Appendix II listing will contribute to data collection on international trade in guitarfish specimens?

Answer: Yes, this allows to know the amount of product that is exported in each country. Likewise, with the elaboration of the NDF it is necessary to have relevant information that allows knowing the status of the species.

How do you think the listing proposal will affect the conservation of living guitarfishes?

Answer: It is considered that it would have a positive effect, since the inclusion of the species in Appendix II would make it possible to control its trade, reduce illegality and have biological, fishing and commercial information related to the species.

Would your country be interested in being a co-sponsor of the proposal?

Answer: Colombia considers that the initiative that is being presented is very important. We support this proposal but we are not in a position to co-sponsor it since our technical experts believe that there is little information on the subject to contribute in this case.

Any other comments.

*Answer: In Colombia, the Guitar Ray *Pseudobatos leucorhynchus* is listed in the Red Book as a Vulnerable species, and *Pseudobatus prahli* is near to be considered as threatened.*

We remain at your disposal for any questions and comments that you may have.

Best regards,

María Juliana Tenorio Quintero
Minister Counsellor
Coordinator of Environmental Affairs (a.i)
maria.tenorio@cancilleria.gov.co
Tel: 57(1) 381 4000
Cra. 6 N° 9 -46, Bogotá. Colombia
www.cancilleria.gov.co