

## Inclusion of all species of Devil Rays in the genus *Mobula* in Appendix II

**Proponents: Bahamas, Bangladesh, Benin, Brazil, Burkina Faso, Comoros, Costa Rica, Ecuador, Egypt, European Union, Fiji, Ghana, Guinea, Guinea-Bissau, Maldives, Mauritania, Palau, Panama, Samoa, Senegal, Seychelles, Sri Lanka and United States of America**

**Summary:** The genus *Mobula*, the Mobulas or Devil Rays, includes nine described species of marine ray that grow to wingspan or disc widths (DW) of one to over five metres. The genus is widely distributed in temperate and tropical seas. Different species may be confused with each other and precise distributions in most cases are poorly known. All are believed to have very low productivity. Females give birth to a single live young following a gestation period of around one year and are thought often to undergo protracted periods, perhaps two or three years, between pregnancies. All species are believed to be largely epipelagic (i.e. occur mainly in surface waters) although some also dive deep<sup>1</sup>. The three largest species are *Mobula japonica*, *M. mobular* and *M. tarapacana*; of these, *M. japonica* and *M. tarapacana* are the most widespread and feature most prominently in fisheries.

***Mobula japonica*** is circumglobal in temperate and tropical seas, but its distribution is not completely defined. The species is usually encountered as solitary individuals but has also been recorded travelling in schools and tagged individuals have been monitored travelling long distances. In parts of the range populations appear to make regular migratory movements and form seasonal aggregations. Elsewhere the species is recorded year-round. *M. japonica* grows to a maximum of 310cm DW, and age at maturity has been estimated at five to six years (ca. 210cm DW). Generation time has been estimated at approximately 10 years. Pupping may take place offshore, around seamounts or islands. Population size and structure are unknown. The species was classified by IUCN as Near Threatened in 2006.

***Mobula tarapacana*** has a circumglobal range in temperate, subtropical and tropical waters of the Indian, Pacific and Atlantic Oceans, however is patchily distributed within this range. It is primarily oceanic but is also found in coastal waters<sup>1</sup>. As with *M. japonica*, individuals are known to migrate long-distances and at least some populations make seasonal movements and form regular aggregations. Maximum verified size is 314cm DW. Estimated age of maturity is five to six years, minimum life span is 14 years, and generation length has been inferred at approximately 10 year<sup>1</sup>. Population size and structure are unknown. The species was classified as Vulnerable by IUCN in 2016.

***Mobula mobular*** is confined to the Mediterranean and possibly adjacent North Atlantic, although it is believed that records here may be of *M. japonica* with which it is easily confused. It appears to occur at low densities, generally as solitary individuals or in groups of two to four, although larger seasonal aggregations are known. The species may reach over 5m DW and generation time has been estimated at 20 years. Recent aerial surveys estimated a population in the south central Adriatic of ca. 1600 individuals (coefficient of variation, CV, 25%), and of >12,700 individuals in the north western Mediterranean (CV 53%)<sup>2</sup>. The species was classified as Endangered by IUCN in 2015, and a Mediterranean regional assessment classified this population as Endangered in 2016.

***Mobula thurstoni*** is probably circumglobal in all temperate and tropical seas, but its distribution is not completely defined. It is usually found in pelagic, but shallow waters (<100m), reaches a maximum DW of 180cm and maturity at 150cm DW. The species was classified as Near Threatened in 2016 by IUCN.

***Mobula eregoodootenkee*** is locally common within its wide tropical Indo-west Pacific and northern Indian Ocean distribution, with a DW up to 100cm<sup>3</sup>. The species was classified in 2003 as Near Threatened.

***Mobula hypostoma*** is endemic to the western Atlantic, found from North Carolina (USA) to northern Argentina, including the Gulf of Mexico, and Greater and Lesser Antilles. It has a DW up to 120cm and occurs primarily in coastal waters, although it occasionally enters oceanic waters<sup>4</sup>. The species was classified as Data Deficient in 2009 by IUCN.

***Mobula kuhlii*** is an uncommon, inshore ray with a patchy distribution in the Indian Ocean and western central Pacific, reaching 120cm DW. Of 409 mobulid rays observed at four landing sites in eastern Indonesia from April 2001 to October 2005, *M. kuhlii* was the most rarely recorded and composed only 2% of the total rays in this part of its range<sup>5</sup>. The species was classified as Data Deficient by IUCN in 2009.

*Mobula munkiana* is an inshore species occurring in the Eastern Pacific from the Gulf of California, Mexico to Peru. It reaches 110cm DW; females mature at 97cm DW and males at ~87cm DW. It is known to form large aggregations<sup>6</sup>. The species was assessed as Near Threatened in 2006 by IUCN.

*Mobula rochebrunei* has a status that is still uncertain<sup>7</sup>, although from currently available information is believed to be found in the eastern Atlantic from Mauritania to Angola and from two possible records off Brazil in the Southwest Atlantic, where it is probably rare. It is known to form large aggregations; maximum size is 133cm DW<sup>8</sup>. IUCN classified *M. rochebrunei* as Vulnerable in 2009.

*Mobula* species are closely related and similar to, though generally smaller than, Manta Rays *Manta* species which were included in CITES Appendix II at CoP16 (2013). Collectively the two genera are often referred to as mobulids. Most catch and trade data do not distinguish the two.

*Mobula* species may be affected by various factors such as climate change, pollution and ingestion of marine debris but by far the most important impact on populations is believed to come from targeted and incidental catch in both artisanal and large-scale fisheries. Studies of the small-scale artisanal Mexican fishery (which ceased in 2007) concluded that fishing rates were twice as high as their estimate of maximum intrinsic rate of population increase<sup>9</sup>.

The meat is generally not highly sought after although some artisanal fisheries do target *Mobula* species for food and local products. In the past individuals caught incidentally were often discarded or released. The principal driver for directed fisheries and retention of incidental catch is the international market for gill plates, demand for which has increased greatly in recent years in Asia. This has led to *Mobula* species being increasingly targeted and retained.

A 2015 review identified 13 fisheries (mostly artisanal) in 12 countries that specifically targeted *Mobula* species and 30 fisheries in 23 countries that incidentally caught them. They were reported as incidental catch in nine large-scale fisheries in 11 countries using driftnets, trawls and purse seines, and in 21 small-scale fisheries in 15 countries using driftnets, gillnets, traps, trawls and longlines<sup>10</sup>. Five countries - Sri Lanka, India, Peru, Indonesia and China (the latter fishing in international waters) – are between them believed to account for the great majority, perhaps as much as 95%, of worldwide *Mobula* catch. There are examples of evolving/new *Mobula* fisheries in response to demands for gill plates for East Asian markets such as a new mechanized gillnet fishery formed in India in 2005 and offshore gillnet fishing in Myanmar, which started in 2014. Individual fisheries generally catch more than one *Mobula* species, complicating analysis. There is a single-species targeted fishery for *M. mobular* in the eastern Mediterranean - these are used for meat; gill plate export from the region is not confirmed<sup>11</sup>.

FAO catch data do not distinguish between catch of *Manta* and *Mobula*, and are apparently incomplete. FAO fisheries data reported in the “manta/devil ray” category, is restricted mainly to Indonesia (24,059t reported between 2004 and 2013) and Liberia (3651t between 1998 and 2006, with no reported landings since then). Other countries report very small quantities in this specific category, but they may be reporting large quantities under “rays, stingrays, manta nei (not elsewhere included)”. There is, however no way of establishing the proportion of *Mobula* species within these more general categories. Total reported catches of “manta/devil rays” increased from 342t in 1998 to 931t in 2000, decreasing to around 100t per year between 2001 and 2003, and increasing again to over 4000t in 2008 and 6000t in 2013.

*Mobula japonica* and *M. tarapacana* are both known to be targeted and landed in Indonesia, Malaysia, Sri Lanka and the Philippines, and previously Mexico. *M. japonica* is also landed in China, Taiwan (Province of China), India, Myanmar and Oman and *M. tarapacana* in Senegal. *M. thurstoni* is known to be landed in Indonesia, Philippines, India, Sri Lanka, Malaysia, Myanmar, Guatemala, Peru and Guinea and likely elsewhere across its range. *M. eregoodootenkee* is known to be fished in Philippines, India and marketed in Thailand and probably elsewhere in Southeast Asia. In 2009, *M. hypostoma* was known to be caught in longline, net and possibly other fisheries but not landed for international trade. Given trends in other species, it is conceivable that some catch is now retained for trade. *M. kuhlii* is taken in fisheries in Indonesia, in small scale fisheries in Mozambique, Tanzania, South Africa, the Arabian/Persian Gulf<sup>12</sup> and Gulf of Oman and likely throughout much of its range. *M. munkiana* was the dominant mobulid landed round Bahía la Ventana, Baja California Sur, Mexico in 2001 and is known to be landed in Peru. *M. rochebrunei* is said to be the predominant species in mobulid catches in Guinean catches at three survey sites.

Population trend information for all *Mobula* species is restricted to population declines inferred from landing data/observations, market surveys and community interviews from a few specific fishing areas, and gill plate markets in East Asia. At Cocos Island (eastern Pacific, Costa Rica), a 78% decline in *Mobula* species was

estimated from diver surveys (who reported that *M. tarapacana* is generally the species sighted in the area) over 21 years<sup>13</sup>. In Sri Lanka, the overall decline in catch landings of *Mobula* species was 51% over three years<sup>14</sup>. Despite an increase in fishing effort, recent declines in *M. japonica* and *M. tarapacana* landings between 2001/2002 and 2014 of between 50 and 99% have been reported in three different regions of Indonesia. Reported landings of *Mobula* species in Guinea declined by 60% between 2004 and 2008 despite reported increase in fishing effort; landings of *Mobula* species at Tumbes, Peru, declined by 90% between 1999 and 2013; landings would have included both *M. japonica* and *M. thurstoni* and to a lesser extent *M. tarapacana*. The Inter-American Tropical Tuna Commission (IATTC) catch and bycatch data for *Mobula* from purse seine fisheries in the eastern Pacific between 1998 and 2009 show a significant increase from <1t in 1998 to >80t in 2006, and a subsequent decline over three years until 2009, when the reported catch was 40t<sup>15</sup>.

Mobulid gill plates, used medicinally, are commonly sold under the trade names “Peng Yu Sai” (translated as “Fish Gills”). Three types of gill plates have been identified; 1) *Manta* species 2) *M. tarapacana* specifically referred to as “Flower Gills” (white or bi-coloured gills) and 3) smaller gill plates of *M. japonica* (black gill plates), *M. thurstoni* and possibly other *Mobula* species.

Based on gill plate market surveys, the total estimated global market for Mobulids tripled between 2011 and 2013, from ca. 48,000 individuals to ca. 130,000 individuals. Of this around 4500 per year were *Manta* species and the remainder *Mobula*. In 2013 the global mobulid market was estimated to comprise 110,000 (83%) *M. japonica* and other ‘black gill’ *Mobula* species, 17,000 (13%) *M. tarapacana*, and 5,000 (4%) *Manta* species.

Plates of *M. tarapacana* and *M. japonica* are said to be the most important *Mobula* products in international trade, with the largest plates selling for a few hundred USD per kilo<sup>16</sup>. It can be difficult to distinguish visually between the dried gill plates of small *Manta* and large *M. japonica*, and dried gill plates from *M. japonica* are very similar in size and appearance to *M. thurstoni*, and *M. kuhlii*. Gill plates of *M. tarapacana* are bi-coloured and resemble those of some *M. thurstoni* and *M. hypostoma*.

Several countries prohibit harvest of all *Mobula* species, but globally there is little or no protection for most coastal and high seas habitats. There have been no stock assessments, monitoring, or management of *Mobula* fisheries in the range States with the largest fisheries.

All species of *Mobula* were recently listed in Appendices I and II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and in July 2015 the IATTC passed a resolution to prohibit retention, unless accidentally captured on purse seine vessels, and mandate safe release of all *Mobula* species in the RFMO fisheries in the eastern Pacific Ocean. The General Fisheries Commission for the Mediterranean (GFCM) has also passed a resolution to regulate catch of *Mobula* species. Publication of a field guide for *Mobula* and *Manta* species and increased awareness of the vulnerability of this group of species has reportedly improved data collection in industrial tuna fisheries.

**Analysis:** *Mobula* species are widely distributed in tropical and temperate seas worldwide. All have very low productivity and are taken in artisanal and large-scale fisheries, both as directed and incidental catch. The major driver for retention of catch is believed to be the international trade in gill plates, which are used for medicinal purposes in Asia, particularly in China. Market surveys indicate a significant increase in the market in recent years, with the most important products in trade being the plates of *Mobula japonica* and *M. tarapacana*. There is very little numerical population information although there is an estimate for one species (*M. mobular*) of ca. 15,000 individuals in the north western Mediterranean and south central Adriatic combined. Population declines have generally been inferred from declining catches despite increases in fishing effort in a number of locations. Some such declines have been very steep. Given the very low productivity of these species, the marked increase in the international market and evidence of declining catches it is possible that at least some species meet the criteria for inclusion in Appendix II in Annex 2 a of Res. Conf. 9.24 (Rev. CoP16).

Large gill plates of *M. japonica* resemble smaller plates of Appendix-II listed *Manta* species. This species appears to meet the criteria in Annex 2 b of Res. Conf. 9.24 (Rev. CoP16) (lookalike criteria). There is general similarity between gill plates of different *Mobula* species although some gill plates are bi-coloured and some are not. If any *Mobula* in either category (bi-coloured or black) were to be listed under the criteria in Annex 2 a, the others in that category would meet the criteria in Annex 2 b (lookalike criteria).

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Information not referenced in the Summary section is from the Supporting Statement.

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