Inclusion of the Genus *Manta* (including *Manta birostris*, *Manta alfredi* and any putative species of *Manta*) in Appendix II

Proponent: Ecuador, Brazil and Columbia

Summary: Manta rays (genus *Manta*) are large elasmobranch fishes circumglobal in range. Until recently, the genus was considered to comprise a single species, but two species are now recognised whose distributions overlap in some locations. *M. birostris* is widely distributed, inhabiting tropical, subtropical and temperate waters, while *M. alfredi* is less widely distributed and is found in tropical and subtropical waters. They occur frequently in inshore waters, being particularly associated with productive areas associated with upwellings.

Relatively little is known about life history parameters of manta rays; they are slow-growing and long-lived (>20 years *M. alfredi*; >31 years *M. birostris*) with low fecundity and reproductive output (one pup every two to five years; possibly 5-15 pups over a lifetime) and long generation times. The median intrinsic rate of population increase appears to be extremely low (0.11 yr^{-1}), and among the lowest for any elasmobranch studied to date. Mantas appear to show high site fidelity, congregating at well-known aggregation sites and following migratory pathways. There are indications that there may be little, if any, interchange between different sub-populations. There are no reliable overall population estimates for either species; estimates have been made for some sub-populations, including those of the Maldives (around 5000) and Mozambique (around 600 in the mid-2000s), although it is unclear how representative these are or how many sub-populations there may be in total.

Mantas are harvested in targeted fisheries and retained as a valuable secondary catch. Directed fisheries occur in China, Ghana, India, Indonesia, Mexico (Pacific and Atlantic), Peru, Philippines, Sri Lanka and Thailand. Their behaviour and very large size allows them to be harvested in such fisheries with relatively high catch per unit effort. The gill plates, which *Manta* spp. use to filter planktonic food from the water, are highly valued in international trade, particularly in Asian markets. A single mature *M. birostris* can yield up to 7 kg of dried gills that retail for up to USD680 per kg in China. Records cannot be quantified fully, due to a lack of species- and product-specific data, but aggregation of data from a number of sources indicates annual manta landings from known fisheries to be around 3000 individuals. Total catch is believed to be somewhat higher, owing to unreported landings in some areas. An analysis of surveys in the major *Manta* spp. gill plate markets has resulted in an estimate of around 21 000 kg of gill plate of *Manta* spp. in trade annually, equivalent to 4500-5000 individuals. Reports from fishermen, traders and retailers indicate that manta gills are becoming harder to source. Cartilage and skins are traded internationally. Artisanal fisheries also target mantas for food and local products. Small numbers of *M. birostris* and *M. alfredi* are also caught and transported to aquaria for use in large display tanks in the USA, Bahamas, Portugal, Japan and South Africa. All use and trade in the products of mantas is derived from wild-caught animals.

FAO catch data do not distinguish between manta and devil ray catch, and are apparently incomplete. Reported catches for the two groups combined increased from 342 t in 1998 to 931 t in 2000, decreasing to around 100 t per year between 2001 and 2003, increasing to over 4000 t in 2008 and decreasing subsequently.

Reported population declines for both *M. birostris* and *M. alfredi* appear high in several locations with reported local declines as high as 50-86% over one generation or less in areas with targeted fisheries. In contrast, some sub-populations that are not fished or are within protected areas in Hawaii (USA), Maldives, Palau and Yap (Federated States of Micronesia) appear stable. Both *M. birostris* and *M. alfredi* are listed globally as Vulnerable on the *IUCN Red List*.

A number of range States have legislation that prohibits the catch of or trade in *Manta* spp. However, the effectiveness of these measures varies and the three countries that have reported highest landings in recent years are not known to have any landing restrictions or population monitoring programmes. *M. birostris* is listed in both Appendix I and II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), but *M. alfredi* is not. No

Regional Fisheries Management Organisations (RFMO) have adopted binding measures specifically to protect or regulate landings of *Manta* spp.

All *Manta* spp. are proposed for inclusion in Appendix II under *Resolution Conf. 9.24 (Rev. CoP15)* Annex 2 aA because of their low productivity and increasing international trade in manta gill plates, and to a lesser degree skins and cartilage.

Analysis: Manta rays are very large, slow-growing fishes with extremely low productivity. Their behaviour makes them highly susceptible to over-exploitation. Mantas are exploited for their gill plates, which enter international trade. Available information indicates that trade in the gill plates has increased considerably in recent years. There are also indications of recent declines in some exploited sub-populations that appear to be consistent with the indicative guidelines for commercially exploited aquatic species with low productivity suggested in the footnote to Annex 5 of *Resolution 9.24 (Rev. CoP15).* There are indications that interchange between sub-populations is low, so that serial depletion of exploited sub-populations may be expected. Other sub-populations that are not currently subject to fishing pressure appear to be stable; however, it is not known what proportion of the total population these represent. Most of the populations known to be heavily exploited are not currently covered by any landing restrictions and no RFMOs have binding regulations covering mantas. Overall, it appears that *Manta* spp. may meet the criteria for inclusion in Appendix II under *Resolution Conf. (Rev. CoP15)* Annex 2 aB, in that regulation of trade may be required to ensure that harvest from the wild is not reducing the population to a level at which is survival might be threatened by harvesting or other influences.

Manta spp. are often confused with the devil rays (*Mobula* spp.) also in family Mobulidae. Fisheries for *Mobula* spp. generally occur in the same locations as fisheries for *Manta* spp. Mobula rays are also targeted for international trade in their gill plates. The same term is commonly used in international trade to describe gill plates from both genera so that differentiating the two may pose problems in enforcement. A manual has been prepared to assist in gill plate identification for these groups.

Supporting Statement (SS)	Additional information
Taxonomy	
The Manta genus was split into two species in 2009 - *Manta birostris* and *Manta alfredi* - (prior to this, the genus consisted only of *M. birostris*), and a third species may soon be declared (*Manta cf. birostris*).	
Range	
Manta spp. are circumglobal in range, with the two described species overlapping in some locations and not in others. *M. birostris* is more widely distributed, inhabiting tropical, subtropical and temperate waters, while *M. alfredi* is found in tropical and subtropical waters. *M. cf birostris* appears to be a regional endemic throughout the Gulf of Mexico, the Caribbean and along the eastern coast of the US.	
Range states	
Manta birostris: Azores and Madeira Islands, Canary Islands, Cape Verde Islands, Senegal, Nigeria,	**Manta birostris** *French Polynesia (Marquesas Islands) (Mourier, 2012).*

Supporting Statement (SS)	Additional information
Angola, Ascension Island, South Africa, Mozambique, Madagascar, United Republic of Tanzania, Kenya, Israel, Egypt, Saudi Arabia, Sudan, Djibouti, Seychelles, Maldives, India, Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia, Cocos Islands, Christmas Island, Australia, Philippines, Ryukyu and Nampo-shoto Archipelagos, Taiwan POC, Northern Mariana Islands and Guam, New Zealand, Hawaiian Islands, Mexico, Clipperton Island, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, United States Continent, Bermuda, The Bahamas, Cuba, Cayman Islands, Jamaica, Dominican Republic, Grenada, Netherlands Antilles, ABC Islands (Bonaire), Trinidad and Tobago, Venezuela, Guyana, French Guiana, Brazil, Uruguay. ***Manta alfredi*:** Canary Islands, South Africa, Mozambique, Madagascar, Comoros - Mayotte, Egypt, Saudi Arabia, Sudan, Djibouti, Yemen, Oman, Seychelles, Chagos Archipelago, Maldives, India, Thailand, Malaysia, Indonesia, Cocos Islands, Australia, Philippines, Ryukyu and Nampo-shoto Archipelagos, Northern Mariana Islands and Guam, Federated States of Micronesia, Palau, Papua New Guinea, Solomon Islands, New Caledonia, Vanuatu, Marshall Islands, Fiji, Tuvalu, Tonga, Cook Islands, Kiribati, Line Islands, Hawaiian Islands, French Polynesia. ***Manta cf. birostris:*** Appears to be a regional endemic with a reported distribution throughout the Gulf of Mexico, the Caribbean and along the eastern coast of the US. FAO Fisheries Areas *Manta birostris*: 31, 34, 41, 47, 51, 57, 71, 77, 81, 87. *Manta alfredi*: 51, 57, 71, 77, 81.	
IUCN Global Category	
Manta birostris: Globally VU. *Manta alfredi*: Globally VU.	*Globally: VU A2abd+3bd+4abd (Assessed 2011).* *Globally: VU A2abd+3bd+4abd (Assessed 2011).* Manta *c.f.* birostris: *Not currently listed.*
Biological and trade criteria for inclusion in Appendix II (Res. Conf. 9.24 (Rev. CoP15) Annex 2 a)	
A) Trade regulation needed to prevent future inclusion in Appendix I	
Little is known about life history parameters but it is likely that Mantas are low productivity species. They are thought to be slow-growing and long-lived with low fecundity and reproductive output and long generation times (estimated at 25 years).	*Although the supporting statement suggests that they are highly migratory, active research into the degree of interchange of individual manta rays between sub-populations has uncovered no genetic or photographic evidence of exchange, but it is*

Supporting Statement (SS)	Additional information
Longevity is estimated to be at least 40 years and natural mortality is estimated to be low. Mantas are among the least fecund of all elasmobranchs, bearing only one pup on average every two to five years. With such conservative life history characteristics, a female manta ray can produce no more than 5-15 pups over her lifetime. Sub-populations are therefore exceptionally vulnerable to extirpation, slow to recover once depleted and the possibility of successful recolonisation is low. While these sub-populations have not been verified through genetic analysis to meet the criteria for CITESõs definition of sub-population, the distance between aggregation sites combined with satellite tagging data and active efforts to identify interchange among groups through photo identification databases, strongly suggest that all studied populations meet the definition of ñgeographically or otherwise distinct groups in the population between which there is limited genetic exchangeò	*assumed to be low (Marshall* et al., *unpubl. data 2011).* *As yet, there have been no published studies on the age and growth of* Manta *spp. (Couturier* et al., *2012).* *Evidence of wild longevity is based on long-term photographic re-sightings and therefore likely to be conservative (Pierce* in litt., *2012.).* *Longevity is >20 years in* M. birostris *(Couturier* et al., *2012) and >31 years in* M.alfredi *(Clark 2010, as cited in Couturier* et al., *2012).* *Four captive-breeding events and births in consecutive years (2007–2010) have been reported from a pair of Reef Manta Rays in Churaumi Aquarium, Japan; gestation was 367-374 days (Anon 2007; Matsumoto* et al., *2008).* *Lifetime reproductive output does not consider juvenile mortality, so it is likely to be very near replacement rate (Pierce* in litt., *2012.).* *The information presented in the SS is based on a handful of studies (*M. alfredi *= 14;* M. birostris *= 9;* M. *c.f.* birostris *= 1). It is unclear how these sub-population sizes would translate in estimations of the total population size of each species. No population size estimates are available for each species.* *Dulvy, Pardo and Simpfendorfer (*in litt.*, 2012) calculated a median maximum intrinsic rate of population increase for manta rays of 0.11 (95% confidence interval = 0.089–0.137). They also found that manta rays had one of the lowest rates; only six species out of 106 had lower values and these were nearly all deepwater squaloid sharks, along with the Basking Shark* Cetorhinus maximus.
Manta birostris are thought to be seasonal visitors along productive coastlines with regular upwelling, in oceanic island groups, and near offshore pinnacles and seamounts. They visit cleaning stations on shallow reefs, are sighted feeding at the surface inshore and offshore. *M. alfredi* are commonly sighted inshore, but are also observed around offshore coral reefs, rocky reefs and seamounts. This species is often resident in or along productive near-shore environments, such as island groups, atolls, or continental coastlines, and may also be associated with areas or events of high primary productivity (e.g., upwelling), *Manta cf birostris* exhibits similar habitat preferences to *M. alfredi.* Their highly migratory behaviour combined with predictable aggregations in easily accessible coastal areas, makes them vulnerable to fisheries in coastal areas and the high seas.	

Supporting Statement (SS)	Additional information
A) Small wild populations There are no calculations of total population size for either species. ***Manta birostris*** *M. birostris* is sparsely distributed with small sub-populations (one subpopulation estimate of 600 individuals). ***Manta alfredi*** *M. alfredi* sub-populations appear to be small with the number of identified individuals recorded at most monitored aggregation sites ranging between 100 and 5000. ***Manta c.f. birostris*** 70 recorded individuals at Flower Garden Banks. B) Restricted area of distribution *Manta* spp. are circumglobal in range, with the two described species overlapping in some locations and not in others. *M. birostris* is more widely distributed, inhabiting tropical, subtropical and temperate waters, while *M. alfredi* is found in tropical and subtropical waters. *M. cf birostris* appears to be a regional endemic throughout the Gulf of Mexico, the Caribbean and along the eastern coast of the US. Within this range *Manta* spp. are sparsely distributed and highly fragmented *Manta birostris* n/a *Manta alfredi* n/a C) Decline in number of wild individuals Summary: The extent of population reduction for both *M. birostris* and *M. alfredi* appears high in several regions to less than 15% of baseline, with local declines as high as 50-86% over one generation or less in areas with targeted fisheries. Reports from fishermen, traders and retailers indicate that Manta gills are becoming harder to source. In contrast, some sub-populations that are not fished or are within protected areas in the Maldives, Yap, Palau and Hawaii appear stable.	*C) Decline in number of wild individuals* *Decline information is presented from landings, market surveys and manta researcher and scuba diver sightings over various time periods. The reported declines do not appear to have been adjusted for effort and six of the 14 reported declines are qualitative rather than quantitative. Declines presented are mainly for* Manta *spp. and there is no indication how this relates to each species. However, this is difficult given that reports are often mixed as the splitting of the genus occurred very recently. Historical reports can often be confusing as well, without adequate descriptions or photographs. Care should be taken when using reports or accounts of* M. birostris *that*

Supporting Statement (SS)	Additional information
	they are not referring to M. alfredi *(or vice versa)" (Marshall* et al., *2011a, b) although the fact that they are rarely sympatric makes it reasonably easy to establish which was the primary target species (Pierce* in litt., *2012).*
Manta alfredi	
Mozambique: 86% decline in scuba diver sightings over 8 years (2003-2011) *Manta* spp. Indonesia: 56% decline in landings over 9 years (2001-2010) Indonesia: 57% decline in landings over 6-7 years (2007-2012) Phillippines: 50-67% decline in scuba diver sightings over 7 years (late 1980s ï 1996) Thailand: 76% decline in scuba diver sightings (2006-2012) Madagascar: large decline in scuba diver and fishermen sightings over ~10 years India: ópossible commercial extinctionôover ~10 years Japan: 71% decline in scuba diver sightings over 17 years (1980-1997) NOTE: The majority of trade data are not distinguished by species; however, all species are targeted for their very similar gill plates, and all (sub) populations are suffering similar declines driven by international trade.	*Decline rates in Mozambique also factored in potential environmental drivers (Pierce* in litt*., 2012).* *The proposal states that population reduction for both species "appears to be high in several regions to less than 15% of baseline" and is attributed to the Red List Assessment for* M. alfredi *and* M. birostris *(Marshall* et al., *2011a, b), possibly on the basis that this states that some sub-populations have been subject to the 50-86% declines. There is also no indication of the likely proportion of the total populations of each species to which these declines apply, especially given that some sub-populations are not fished or are within protected areas appear stable (various pers. comms, Marshall* et al., *2011a).* *It is unclear where this information has come from, considering the fact that the IUCN Red List Assessment states "the rate of population reduction appears to be high in several regions, up to as much as 80% over the last three generations (approximately 75 years), and globally a decline of 30% is strongly suspected." yet gives no indication of how a baseline was calculated and what it actually is in numbers.*
B) Regulation of trade required to ensure that harvest from the wild is not reducing population to level where survival might be threatened by continued harvest or other influences	
Manta birostris	
Sri Lanka: unspecified decline from fishermen interviews over 5-10 years (2000-2011)	
Western Australia: large decline in sightings from large seasonal groups to rare over ~10 years (2001-2011).	*Populations on the east coast of Australia are in the Great Barrier Reef marine park and are unlikely to have suffered declines (Heupel* in litt*., 2012.).*
***Manta* spp.**	
Phillipines: 50% decline in catch over 30 years (1960s ï 1997). Mexico: ópopulation collapseôover ~10 years (1980s ï 1990s). Mexico: decline from 3-4 per dive to 0 in 2 years in diver sightings (1981 ï 1991). Mexico: ón every major reefô to rarely seen by scuba diving and recreational fishing operation over 10 years (1980 ï 1990).	

Supporting Statement (SS)	Additional information
Trade The gill plates which *Manta* spp. use to filter planktonic food from the water, are highly valued in international trade. Cartilage and skins are also traded internationally. A single mature *M. birostris* can yield up to 7 kg of dried gills that retail for up to USD680 per kg in China. All utilisation and trade in the products of *Manta* spp. are derived from wild-caught animals. Records cannot be quantified fully, due to a lack of species and product-specific codes, catch, landings or trade data. Instead, an estimate of the total volume of the gill plate trade has been produced from an analysis of market surveys in the major *Manta* spp. gill plate markets. These surveys estimated the annual volume of the gill plate trade as ~21000 kg of dried *Manta* spp. gill plates, worth USD5 million and representing an estimated 4652 manta rays. Annual Manta ray landings, (catch data from a number of published and unpublished sources) from known fisheries are estimated at 3100 individuals, but are expected to be somewhat higher due to unreported landings in some areas. The extent of illegal trade is not known because no mechanisms have been implemented to monitor and regulate trade. A few range States have protected these species or have banned the possession or export of any ray products, and illegal landings and trade of *Manta* spp. in these range States have been reported (e.g. Philippines). There is no documented domestic use of *Manta* spp. Gill plates in the three largest *Manta* spp. fishing range states (Indonesia, Sri Lanka and India). The meat of *Manta* spp. taken in these and other domestic fisheries is used locally for shark bait, animal feed and human consumption or discarded, while high value products are exported for processing elsewhere. Landings in China, reportedly from the South China Sea and international waters, are not exported for processing. The gill plates are sold directly to buyers. An Appendix II listing of *Manta* spp. would not necessarily affect the national use of these species and their products. The greatest threat *to Manta* spp. is excessive targeted and incidental take in fisheries increasingly driven by international trade in gill plates for use in Asian markets. Artisanal fisheries also target *Manta* spp. for food and local products. They are captured by harpooning, netting and trawling. Directed fisheries occur in Peru, China, Mexico (Pacific and Atlantic), Indonesia, Sri Lanka, India, Thailand, Philippines and Ghana.	*Trade* *Trade of Mantas may go back to the early 1980s (Zhongguo yao yong dong wu zhi xie zuo zu bian zhu, Ed. 1983: as cited in Couturier* et al., *2012).* *2300 kg of various dried marine products (including manta and sting rays) worth PHP10 million (~USD245 000) were found on a boat in Manila in violation of Philippine Fisheries laws (August 2012).* *FAO FishStat catch reports (manta and devil ray catch—reported catches not distinguishing between the two taxonomic groups) were shown to increase from 342 t in 1998 to 931 t in 2000, drop down to ~100 t per year between 2001 and 2003, then increase to 4309 t in 2008. Catches reported have decreased since 2008—2414 and 2447 t in 2009 and 2010, respectively. Furthermore, the catch reporting is only from Liberia (1998–2006), Indonesia: Indian Ocean, Eastern (2007–2010) and Indonesia: Pacific, Western Central (2005–2010) (FAO, 2009).*

Supporting Statement (SS)	Additional information
The behaviour of *Manta* spp. allow for it to be targeted at well-known aggregation sites and migratory pathways where numerous individuals can be targeted with relatively high catch-per-unit-effort. Small numbers of *M. birostris* and *M. alfredi* are also caught and transported to aquaria for use in large display tanks in the US, Bahamas, Portugal, Japan and South Africa.	

Inclusion in Appendix II to improve control of other listed species

A) Specimens in trade resemble those of species listed in Appendix II under Res. Conf. 9.24 (Rev. CoP15) Annex 2 a or listed in Appendix I

Manta spp. are often confused with rays of the genus *Mobula*, also in family Mobulidae. Fisheries for *Mobula* spp. generally occur in the same locations as fisheries for Manta spp. - in most cases larger numbers of *Mobula* spp. are landed. Mobula rays are also targeted for international trade in their gill plates. Fish gills or ɸpeng yu saiôare commonly used to describe gill plates from both genera.	*A Manta gill plate identification guide has been created that suggests that it is relatively simple to determine the difference between manta and mobulid gill plates (Stevens, 2012).* *No species in the genus* Mobula *is listed in the CITES Appendices.*

B) Compelling other reasons to ensure that effective control of trade in currently listed species is achieved

Mobulid rays (Genus *Manta*; Genus *Mobula*) are the pelagic species most vulnerable to climate change, since plankton, a primary food source, may be adversely affected by the disruption of ecological processes brought about by changing sea temperatures.	*The assertion that climate change will affect general plankton resources in such a way that it will negatively impact* Manta *spp. populations is not sufficiently well substantiated. More evidence will be needed to support this pathway of change conclusively (McCauley* in litt.*, 2012).* *The statement technically is accurate; this group is the most vulnerable of the pelagic group, which is ranked as low risk as a group. However, Chin and Kyne (2007) state the following: "species in this group had low exposure to climate change drivers except for ocean circulation (high) and the direct effects of temperature change (moderate)" and "the devil rays (*Manta birostris, Mobula thurstoni *and* M eregoodootenkee*) and Whale Shark* Rhincodon typus *are the most vulnerable species in this group as they are plankton feeding specialists, and the Whale Shark and Bentfin Devil Ray* Mobula thurstoni *are relatively rare. However, these species have low exposure to most climate change drivers so are ranked as having low risk overall."*

Other information

Threats

In addition to the directed fisheries described above, incidental bycatch of *Manta*	

Supporting Statement (SS)	Additional information
spp., which is retained as a secondary but valuable catch, occurs throughout the Atlantic, Pacific and Indian Oceans. They are most frequently caught in purse seines, gillnet and longlines, as well as in shark control bather protection nets. Other threats that may affect *Manta* spp. populations include the loss of some coral reef habitats, alterations to terrestrial ecosystems (replacement of native trees with human propagated palms on Palmyra Atoll), climate change, boat strikes and various types of marine debris including ghost nets, plastics and pollution from vessels.	
Conservation, management and legislation	
National The following range States have legislation that prohibits the catch and/or trade of *Manta* spp.: Ecuador, Maldives, Mexico, New Zealand, Philippines, Yap (FSM), and some US States/Territories. However, the effectiveness of these measures varies. Some manta ray legislation defines ñmanta rayòas ñ*Manta birostris*ò. The recently described *M. alfredi* and *M. c.f. birostris*, should it be determined a distinct species, are therefore potentially vulnerable even where ñmanta rayòprotection is in place. There are no landing restrictions or population monitoring programs for *Manta* spp. in the top three *Manta* spp. fishing nations (Indonesia, Sri Lanka and India). There are no national government fishery or population monitoring programmes for *Manta* spp. Monitoring does occur by a number of privately funded projects throughout the world. International *M. birostris* is listed in both Appendix I and II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), but *M. alfredi* is not. Furthermore, before they will be specifically considered under the MoU Conservation Action Plan, both *Manta* spp. also need to be listed in the Annex to the CMS Memorandum of Understanding on Migratory sharks. However, many *Manta* spp. fishing States have not yet signed the CMS Shark MoU. No RFMOs have adopted binding measures specifically to protect or regulate landings of *Manta* spp. There are no controls, monitoring systems or marking systems in place to regulate, track or assess international trade in *Manta* spp.	*In September 2012, Australia added* Manta birostris *to their list of Migratory Species governed by the Environment Protection and Biodiversity Conservation Act 1999. Under the protections, the Giant Manta Ray will be listed as a migratory species, making it an offence to take, trade, keep, or move the species from Commonwealth waters. Fishers will now also have to report any interactions with a Giant Manta Ray.*

Supporting Statement (SS)	Additional information
Captive breeding/Artificial propagation	
Four captive breeding events have been reported all coming from a pair of *M. alfredi* in Churaumi Aquarium, Japan. The potential for captive breeding is extremely limited and only likely to provide a small number of animals for display.	
Other comments	
The majority of trade data are not distinguished by species; however, all species are targeted for their very similar gill plates, and all (sub) populations are suffering similar declines driven by international trade.	*A trained observer would be likely to be able to identify* M. birostris*,* M. alfredi *visually and possibly the third putative species when alive or landed whole, and a manta gill plate identification guide has been created which suggests that it is relatively simple to determine the difference between manta and mobulid gill plates (Stevens, 2012).*
Additional trade impacts include the significant economic consequences for existing (and potential) high value, non-consumptive sustainable ecotourism operations, which have the potential to yield much larger and longer term benefits to range States than short-term unsustainable fisheries.	*However, tourism-related industries can also negatively impact individual behaviour, entire populations and critical habitat for this species, thus the responsible development of these industries is recommended (Marshall* et al.*, 2011a, b).*

Reviewers: D. McCauley, M. Heupel, G. Notarbartolo di Sciara, S. Pierce, G. Sant.

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