

## Transfer of Freshwater Sawfish *Pristis microdon* from Appendix II to Appendix I

### Proponent: Australia

**Summary:** The Freshwater Sawfish *Pristis microdon* is an Indo-Pacific species occurring in rivers, estuaries and marine environments up to 100 km offshore and 400 km upstream. There are very few records from many parts of its extensive former range. This, and taxonomic uncertainty regarding the status of some *Pristis* populations, makes it difficult to determine current occurrence accurately. States where populations ascribed to this species are known to occur or to have occurred in the relatively recent past include Australia, Cambodia, India, Indonesia, Myanmar, Papua New Guinea; Philippines and Thailand. Sub-populations found in northern Australia are likely to comprise a high proportion of the remaining global population. Almost nothing is known about the reproductive biology of *P. microdon*; however, it is thought that females produce 1. 12 pups after a five-month gestation period. It is not known if *P. microdon* produces pups annually or every two years. Maximum age of a known individual was 28 years, but theoretical modelling suggests that individuals could live as long as 80 years. Genetic studies have shown that Freshwater Sawfishes are thought to display strong sex-biased dispersal patterns, with females possibly remaining near their birth sites while males may move more broadly between populations. The sedentary nature of females may lead to effective fragmentation of populations, with limited opportunity for re-establishment if local extinctions occur. Of the few adults that have been recorded, most have been reported from marine and estuarine environments; young individuals, in contrast, are primarily recorded in the freshwater reaches of rivers and estuaries.

*Pristis microdon* is affected throughout its range by artisanal, commercial and recreational fisheries, and also by large-scale habitat modification, and destruction. Climate change and the impacts of diversification of energy sourcing are possible future threats. Sawfishes were once targeted in some parts of their range, but they are now mainly taken as incidental catch: the large toothed rostrum makes them very prone to entanglement in nets. There is very little quantitative information on changes in sawfish populations, but many anecdotal accounts indicating often drastic declines and local extirpations in much of their range. *P. microdon* is listed globally as Critically Endangered on the *IUCN Red List of Threatened Species*. There is national legislation to protect *P. microdon* in parts of its range.

The toothed rostra, fins and meat of sawfishes are all highly valued, and live individuals are highly prized exhibits in public aquaria. International trade in many sawfish products has been documented but few data are available to quantify the international trade. Sawfish fins are regarded as some of the highest quality elasmobranch fins (with high needle content), with a long history of international trade (since at least the 1870s). While pricing information for sawfish fins in the fin trade is hard to come by, some studies have shown the value of the fins (to around USD4000 per set) and rostrum (up to USD1450).

The family Pristidae was included in the CITES Appendices in 2007, with the entire family being included in Appendix I with the exception of *P. Microdon*, which was included in Appendix II for the exclusive purpose of allowing international trade in live animals to appropriate and acceptable aquaria for primarily conservation purposes. This was agreed because it was thought that populations in Australia were sufficiently robust to support a small harvest for the purposes of providing animals to recognised public aquaria. Since then, nine live animals have been exported by Australia. Prior to the listing, Australia issued permits for the export of 13 live animals during the period 2003 to 2006.

*Pristis microdon* is proposed for transfer from Appendix II to Appendix I because of the historical range decline, inferred and observed decreases in area of distribution and numbers of individuals resulting in fragmented populations, combined with its vulnerability to intrinsic and extrinsic factors. While *P. microdon* is listed in Appendix II for the exclusive purpose of allowing international trade in live animals to appropriate and acceptable aquaria primarily for conservation purposes, in 2011 the Australian CITES Scientific Authority for Marine Species reviewed the 2007 non-detriment finding for the export of *P. microdon* and found that it was not possible to conclude with a reasonable level of certainty that any harvest of *P. microdon* for export purposes would not be detrimental to the survival or recovery of the species. Therefore, Australia has now stopped issuing non-detriment findings for this species. Inclusion of *P. microdon* in

Appendix I would align the listing of this species with those of all other Pristidae species, ensuring easier enforcement of all listings of this family.

**Analysis:** *Pristis microdon* was included in Appendix II for the exclusive purpose of allowing international trade in live animals to appropriate and acceptable aquaria for primarily conservation purposes. All other species in the genus *Pristis* are listed in Appendix I. Sawfish were once targeted, but they are now mainly taken as incidental catch, notably because their large toothed rostrum makes them very liable to entanglement in nets.

Since the Appendix-II listing, Australia has exported nine live *P. microdon*. However, Australia has recently decided that it cannot determine that trade would be non-detrimental and has stopped issuing non-detriment findings for the species.

There are no estimates of population size for *P. microdon* across any part of its extensive range, nor are there empirical long-term data documenting population trends in *P. microdon*. However, anecdotal evidence and records suggest that, globally, populations of *P. microdon* have been extirpated or nearly extirpated from large areas of their former range. The species is vulnerable to exploitation because of several life history characteristics and also because of severe fragmentation of its population. Given the historic range decline, inferred and observed decreases in area of distribution and numbers of individuals resulting in fragmented populations, it is possible the species meets the biological criteria for inclusion in Appendix I.

Supporting Statement (SS)	Additional information
<u>Taxonomy</u>	
<p>Synonyms- <i>Pristis leichhardti</i>, <i>Pristiopsis leichhardti</i>, <i>Pristis pristis</i>.</p>	
<p>There has been a recent revision of the Pristidae family and the scientific name of <i>Pristis microdon</i> may change to <i>Pristis pristis</i> however at this stage this work has not been published.</p>	<p>Revision described in Faria et al. is in press.</p>
<u>Range</u>	
<p><i>Pristis microdon</i> is considered to occur/have once occurred widely in the Indo-West Pacific.</p>	<p>CITES species database lists range States as: Australia, Cambodia, India, Indonesia, Madagascar, Malaysia, Myanmar, Papua New Guinea, South Africa, Thailand, Viet Nam.</p>
<p>Present or former range States include: Australia, Cambodia, India, Indonesia; Myanmar, Papua New Guinea, Philippines, Thailand.</p>	
<p>The occurrence of <i>P. microdon</i> elsewhere, including Madagascar, Mozambique, Nicaragua, Oman, Pakistan, the Red Sea, South Africa, Sri Lanka and Zimbabwe is dependent on the taxonomic understanding of the genetic relationship with other pristid species.</p>	
<u>IUCN Global Category</u>	
<p>Critically Endangered.</p>	<p>Critically Endangered A2abcd+3cd+4bcd (Assessed 2006, Criteria version 3.1.</p>

Supporting Statement (SS)	Additional information
<p><b>Biological criteria for inclusion in Appendix I</b></p> <p><b>A) Small wild population.</b>  <b>(i) Population or habitat decline; (ii) small sub-populations; (iii) concentrated geographically during one or more life-history phases; (iv) large population fluctuations; (v) high vulnerability</b></p> <p>There are no estimates of population size for <i>P. microdon</i> across any part of its range.</p> <p><i>P. microdon</i> has high vulnerability given its long lifespan and slow reproduction. Although there is little information on the fecundity of <i>P. microdon</i>, there is evidence of one female that produced 12 pups after a 5-month gestation period. It is also uncertain if <i>P. microdon</i> produces pups annually or every two years. Maximum age of a known individual was 28 years but theoretical modelling suggests they could live as long as 80 years.</p> <p><b>B) Restricted area of distribution:</b>  <b>(i) Fragmented or localised population; (ii) large fluctuations in distribution or sub-populations; (iii) high vulnerability; (iv) decrease in distribution, population, area or quality of habitat, or recruitment)</b></p> <p><i>P. microdon</i> occurs in northern Australia (Western Australia, Northern Territory and Queensland) where it is found in rivers, estuaries and marine environments up to 100 km offshore and 400 km upstream.</p> <p><i>P. microdon</i> has suffered severe declines since the 1960s and is considered to have been extirpated or nearly extirpated from large parts of its range, including considerable parts of its former Indo-West Pacific range. It is considered to have once occurred throughout the Indo-West Pacific (Indonesia, Papua New Guinea, Malaysia, Thailand, Cambodia, Philippines, Myanmar and India; possibly South Africa); however the extent of this occurrence is now unclear because there are few records and there has been little survey effort throughout the region. Furthermore, the occurrence of <i>P. microdon</i> in South Africa, Sri Lanka, Pakistan, Oman, the Red Sea, Madagascar, Mozambique, and Zimbabwe is dependent on the taxonomic understanding of the genetic relationship with other Pristid species.</p> <p>Genetic studies have shown that <i>P. microdon</i> display strong sex-biased dispersal patterns, with females exhibiting patterns of natal philopatry while males move more broadly between populations. This means that any reduction in female abundance in one region is not likely to be replenished by migration from another region. Thus, the</p>	<p><i>Van der Elst (in litt., 2012) considers that some information in the supporting statement is misleading: pup number of 12 is too high and Chidlow (2007) does not report on pups and cites Wilson (1999) and a range of 1-12 pups per litter. The 28-year-old specimen may not have been <i>P. microdon</i> (van der Elst in litt., 2012).</i></p> <p><i>This information may be misleading; very little is known about the reproductive biology of <i>P. microdon</i> (Morgan in litt., 2012).</i></p> <p><i>Philopatry is an important factor for this species, especially if the natal home is under threat. For example, the St Lucia estuary, South Africa, Africa's largest estuary, has effectively declined as a habitat for sawfish—whereas it once was central to the region's sawfish stocks (van der Elst in litt., 2012). In the early 1970s, up to 15 Pristis</i></p>

Supporting Statement (SS)	Additional information
<p>population is fragmented into sub-populations, with limited opportunity for re-establishment. Furthermore, sub-populations found in northern Australia are likely to comprise a high proportion of the remaining global population and the region therefore represents a globally significant area for the species.</p> <p>It is likely that suitable habitat has not only declined in quantity but quality from: agriculture, urban development, dam construction, channel dredging, boating and diversion of freshwater runoff.</p>	<p><i>individuals could be caught and tagged in two days: since drought and excessive water extraction, none has been recorded (van der Elst in litt., 2012.).</i></p> <p><i>Poulakis (in litt., 2012) considers that studies on showing philopatry give more of an indication of inter-annual site fidelity rather than true philopatry but still of great importance.</i></p>
<p><b>C) Decline in number of wild individuals</b>  <b>(i) Ongoing or historic decline; (ii) inferred or projected decline due to decreasing area or quality of habitat, levels of exploitation, high vulnerability, or decreasing recruitment</b></p>	
<p>There are no empirical long-term data documenting population trends in <i>P. microdon</i> across any part of its range. However, anecdotal evidence and records of sawfish landings in general suggest that globally, populations of all sawfish species including <i>P. microdon</i> have been extirpated or nearly extirpated from large areas of their former ranges.</p> <p>FAO landings of Pristids have declined rapidly from a peak in 1978 of 1759 metric tonnes to approximately 50 metric tonnes averaged over the past 5 years. There is also increasing evidence of large-scale disappearance and presumed extinction of <i>P. microdon</i> in parts of the Indo-West Pacific.</p> <p>There is anecdotal evidence that Australian populations of <i>P. microdon</i> have undergone a significant decline although the magnitude is unknown. Despite this, the Australian populations are the only remaining viable population of the species in the world. Data from the Australia Shark Control Program in Queensland show a clear decline in sawfish catch (non species-specific) over a 30 year period from the 1960s on the east coast and the complete disappearance from southern regions.</p> <p>There have been no confirmed sightings in South Africa since the 1990s and the species may be locally extinct.</p>	<p><i>Landings reported in FAO data may have been a mis-identification (van der Elst in litt., 2012).</i></p> <p><i>While there are few quantitative species-specific data on sawfish abundance in Australia, their numbers appear to have declined drastically along the east coast with sawfish now virtually extinct in New South Wales and South East Queensland (Stevens et al., 2005 as cited in IUCN and TRAFFIC, 2007). Anecdotal reports from recreational fishers as far north as Townsville suggest that <i>P. microdon</i> was once "very common" in the Ross River but over the past 10–15 years has not been recorded (Stevens et al., 2005; as cited in IUCN and TRAFFIC, 2007).</i></p> <p><i>Reported by-catch of sawfish in Northern Territory, Australia declined from 1994–1999 (NTDPIF, 2000, cited in Pogonoski et al., 2002).</i></p> <p><i><i>P. microdon</i> has been recorded in South African catches but due to challenges in species identification there are no certainties regarding identification as <i>P. microdon</i>/<i>P. zijson</i> nor regarding previous levels of abundance of the species. The last recorded capture of any sawfish (not identified to species level) in KwaZulu-Natal was in 1999 and the genus is considered to be locally extinct (Everett in litt., 2012).</i></p> <p><i>A survey amongst Mozambique fishers around Maputo indicated 1-2 <i>Pristis</i> spp. caught in that region in the decade 1990–2000 (van der Elst in litt., 2012.). A more recent rapid by-catch assessment for South West Indian Ocean Fisheries Project,</i></p>

Supporting Statement (SS)	Additional information
<p><i>P. microdon</i> were historically regularly seen in the Cambodian Mekong, but none have been seen for several decades and numbers have decreased considerably.</p> <p>New Guinea, Lake Sentani . The demise of <i>P. microdon</i> has been recorded because of the increased use of gillnets.</p> <p>In Borneo <i>P. microdon</i> was once reported as common in the 1970s but almost absent 20 years later.</p> <p>In Indonesia between 2001 and 2005, 200 days of surveys were undertaken and 40 000 elasmobranchs were recorded, among which only two were <i>P. microdon</i>. It is suspected that these two were actually caught in Australian waters. Dried rostra were observed in some Indonesian landing sites but fishers indicated that they were caught many years ago and that the species has not been seen in at least 20 years.</p>	<p>including artisanal fisheries in Mozambique, Tanzania, Kenya and Mauritius, indicated that only in Zanzibar was there evidence of sawfish (1–2) capture for the previous year—2010. None in other countries surveyed. (Kiszka, 2012)</p> <p>Sawfish are now absent or very rare in the Great Lake of Tonle Sap, Cambodia, with the most recent capture 40 years ago which may have been of either <i>P. microdon</i> or <i>P. clavata</i> (Roberts and Warren, 1994, as cited in IUCN and TRAFFIC, 2007).</p>

### Trade criteria for inclusion in Appendix I

#### The species is or may be affected by trade

International trade in *P. microdon* is presently allowed to appropriate and acceptable aquaria primarily for conservation purposes and since the 2007 listing nine live *P. microdon* have been exported from Australia (six to the USA and three to Europe). Prior to the CITES listing, Australia issued permits for the export of 13 live animals between 2003 and 2006.

In addition to these live specimens, since 2005 100 mg of sawfish ear bones were exported for scientific research purposes, as well as the export or re-export of three rostra since 2005 as personal effects.

There is undoubtedly some illegal trade in sawfish rostra and fins. *P. microdon* has been identified in the catch of apprehended IUU fishing vessels and live animals have been released from illegal fishing nets by Australian fisheries inspectors.

International trade since 1998 was about 30 to 40 animals in total in Australia with most of these happening before the 2007 listing in CITES Appendix II.

In the CITES trade database, reported exports from Australia number eight, however, an additional live specimen has been reported as imported by Germany in 2011. The records for 2011 are likely to be incomplete.

The 2007 proposal (CoP14 Prop. 17) stated that there was evidence from some countries that demand for rostra and fins continued to drive sawfish fisheries and that demand for the aquarium trade also drove some fisheries, particularly in northern Australia. However, the IUCN and TRAFFIC (2007) analysis stated that it was perhaps more accurate to suggest that demand for sawfish products was driving retention of sawfish in fisheries that captured them incidentally (Simpfendorfer 2007, as cited in IUCN and TRAFFIC, 2007).

The few published studies on the international fin trade have focused on shark species and not the high value batoids in the trade, including sawfish (McDavitt, 2007, as cited in IUCN and TRAFFIC, 2007).

Sawfish rostra are still for sale on eBay clearly indicating that the market for the rostra still exists. As of 26 October 2012, there were 10 sawfish rostra for sale, the majority

Supporting Statement (SS)	Additional information
	<i>of which were offered for international shipping (McDavitt in litt., 2012).</i>

**Other information**

*P. microdon* is threatened throughout the Indo-West Pacific mainly by artisanal, commercial and recreational fisheries, but also by large-scale habitat modification, and the destruction of coastal and freshwater habitat. Sawfish were once targeted but they are now mainly taken as incidental catch particularly because of their large toothed rostrum becoming caught in nets. However, directed fisheries still remain in the region to supply public and private aquariums and may be opportunistically targeted for meat and the shark fin trade.

**Threats**

*The requirement for “clean energy” is prompting liquid natural gas exploration, as well as the development of tidal energy, river dams and tidal barrages, which may alter freshwater flows and habitat productivity (Dulvy in litt., 2012).*

*There is evidence that climate change could have an impact on sawfishes: Pristis microdon (and three other sawfish species) were all assessed as having moderate overall vulnerability to climate change, based on calculations of exposure, sensitivity and adaptive capacity (Chin et al., 2010).*

**Conservation, management and legislation**

International trade in *P. microdon* is restricted under CITES Appendix II and is only allowed to appropriate and acceptable aquaria primarily for conservation purposes. In 2011 the Australian CITES Scientific Authority for Marine Species reviewed the 2007 non-detriment finding for the export of *P. microdon* and found that it was not possible to conclude without a reasonable level of certainty that any harvest of *P. microdon* for export purposes would not be detrimental to the survival or recovery of the species. As a result of this finding, the international trade in freshwater sawfish from Australia has now stopped.

National legislation exists to protect *P. microdon* in Nicaragua (only in Lake Nicaragua), India, Indonesia (only in Lake Sentani), Malaysia, Myanmar, Bangladesh and Australia.

In addition to the national legislation mentioned above, Australia has a number of management measures in place for *P. microdon*, which differ by state and territory. These include restrictions on fishing, education campaigns and support of further research into their abundance, distribution and movement patterns. It is also an offence, in Australia, to kill, injure, take, trade, keep or move any individual without a permit. *P. microdon* is also considered a matter of national environmental significance (MNES), and any action that may have an impact on a MNES must be referred to the minister responsible for the environment for assessment and approval.

In Australia, Marine Reserves and National Parks across northern Australia and on the Queensland east coast offer some protection from commercial and recreational fishing impacts.

*Also fully protected in South Africa and protection planned for Mozambique (van der Elst in litt., 2012).*

Supporting Statement (SS)	Additional information
<u>Similar species</u>	
<p>All sawfish species of the family Pristidae . except <i>P. microdon</i> . were listed in Appendix I of CITES at the 2007 14<sup>th</sup> meeting of the CITES Conference of the Parties.</p>	<p>Sawsharks, Order Pristiophoriformes, are superficially similar but smaller (up to 1.5 m) deepwater to coastal sharks that also have a long, flat, saw-like snout. Sawshark rostra differ from those of Pristidae species in having long, string-like ventral barbels in front of the nostrils, close-set rows of small ventral sawteeth as well as small to large lateral sawteeth (CoP14. Prop. 17). They can also be distinguished by the position of their gills: sawfish gills are on the underside of their body; sawshark gills are on the sides of their head. Sawsharks are not listed in the Appendices.</p>
<u>Captive breeding/Artificial Propagation</u>	
<p>No known captive breeding programmes exist for <i>P. microdon</i> but <i>P. pectinata</i> pups were recently born in captivity at the Atlantis Paradise Island in the Bahamas.</p>	
<u>Other comments</u>	
<p>An Appendix I listing will further restrict the trade of <i>P. microdon</i> for commercial benefit and potentially reduce the demand for live sawfish or sawfish parts internationally.</p> <p>As noted in the original proposal in 2007, enforcement provisions are more difficult when species are included in different Appendices due to taxonomic uncertainty regarding the number of sawfish species, their similarity to each other, and the difficulty of distinguishing between parts in trade of different [Pristis] species.</p>	

**Reviewers:** R. van der Elst, D. Morgan, G. Poulakis, G. Sant.

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