

November 30, 1999

The Honorable William M. Daley  
Secretary of Commerce  
U.S. Department of Commerce  
14<sup>th</sup> Street and Constitution Avenue, NW  
Washington DC 20230

**RE: Petition to list North American populations of sawfish (*Pristis pectinata* and *Pristis perotteti*) as endangered pursuant to the Endangered Species Act of 1973, 16 U.S.C. §1533**

Dear Secretary Daley:

The Center for Marine Conservation (CMC) hereby petitions you, pursuant to Section 4 of the Endangered Species Act (ESA) (16 U.S.C. §1533), to list the smalltooth sawfish, *Pristis pectinata*, and the largetooth sawfish, *Pristis perotteti*, as endangered species. *P. perotteti* and *P. pectinata* are the only species of sawfish known to inhabit U.S. waters of the western Atlantic Ocean. Based on the best scientific and commercial data available, each of these two species is endangered within the meaning of the ESA (16 U.S.C. § 1532(6)).

These large, conspicuous fishes of the family Pristidae were once abundant and commonly encountered around the globe in estuarine and coastal waters, and in some cases fresh water. Sawfish are long-lived species that grow slowly, mature late and produce a small number of young. These combined characteristics result in a very low intrinsic rate of population increase and are associated with the life history strategy known as “k-selection.” K-selected animals are usually successful at maintaining relatively small population sizes in relatively constant environments. Consequently, they are not able to respond effectively (rapidly) to additional and new sources of mortality resulting from changes in their environment. Such changes include overexploitation and habitat degradation (Musick 1999).

Today sawfish are among the most endangered elasmobranchs (sharks, skates and rays) in the world. Four species (including the two considered here) are included on the World Conservation Union (IUCN) Red List of Threatened Animals as either “endangered” or “critically endangered.” The National Marine Fisheries Service (NMFS) has identified both *P. pectinata* and *P. perotteti* as candidates for possible addition to the List of Endangered and Threatened Species [64 Fed. Reg. 33467 (June 23, 1999)]. Furthermore, the United States was the proponent of a proposal at the 10<sup>th</sup> Conference of the Parties (Zimbabwe, June 1997) to the Convention on International Trade in Endangered Species (CITES) to include all species of sawfish on Appendix I of the Convention, thereby prohibiting their international trade. We submit that the United States’ CITES proposal, portions of which are excerpted below, provides ample support for listing these species under the ESA. A summary of some of the considerations made in the CITES proposal are:

- 1) “k-selected life history”;
- 2) “behavior; narrow depth ranges and often restricted habitats”;
- 3) “population vulnerability (based on declines and disappearances in by-catch from commercial fisheries); and
- 4) “sensitivity to habitat degradation and destruction.”

These factors also recently prompted action regarding these two sawfish species on behalf of the American Elasmobranch Society (AES), the largest scientific society dedicated to the study of sharks, skates, rays and chimaeras. At their June 1999 meeting, the AES unanimously adopted a resolution requesting “NMFS to begin a review as soon as possible of the status of the smalltooth (*Pristis pectinata*) and largetooth (*Pristis perotteti*) sawfishes to evaluate their listing as Threatened or Endangered under the U.S. Endangered Species Act of 1973.”

## **Species Accounts**

### **A. *Pristis pectinata***

#### Taxonomy:

Common Name:	Smalltooth sawfish
Class:	Chondrichthyes
Order:	Pristiformes
Family:	Pristidae
Genus:	<i>Pristis</i>
Species:	<i>pectinata</i>

Characterized by narrow-based, slightly tapered, rostral saws, with numerous, small teeth (25-32 pairs); no lower caudal lobe (Bigelow and Schroeder, 1953).

#### Distribution

This species had a greater geographic range than any other sawfish family member, historically occurring in all tropical to sub-tropical regions of the Atlantic, Pacific, and Indian Oceans. In U.S. waters, *P. pectinata* historically occurred from North Carolina south through the Gulf of Mexico, where it was sympatric with the largetooth sawfish (west and south of Port Arthur, TX) (Adams and Wilson, 1995). It also was an occasional visitor to waters as far north as New York. As with all sawfishes, it is euryhaline, occurring in fresh water, nearshore estuaries and in coastal waters to depths of 25 meters.

#### Biology

*Pristis pectinata* is the largest of the sawfishes, reported to reach 760 cm while more commonly growing to 550 cm (Last and Stevens 1994). Bigelow and Schroeder (1953) reported litter size of 15-20 embryos. Overall, life history parameters for this species are largely unknown.

Using demographic analyses, Simpfendorfer (in press) estimated the annual rate of increase for *P. pectinata* at 8.3% to 13.9%, which translates to population doubling times of 5.4 years to 8.5 years. These rates are similar to those estimated for species of large sharks (Simpfendorfer in press).

### Population Status

There are virtually no quantitative data available to conduct a formal stock assessment for smalltooth sawfish. There have been no known directed fisheries for these animals in U.S. waters. Their capture has been incidental to other fisheries, or by sporadic surveys by state and federal agencies. While anecdotal, the record, when assembled historically (Adams and Wilson 1995), presents a clear picture of serious depletion. *P. pectinata* may well have been extirpated in all but a few protected areas in the Florida Keys and Everglades National Park (Simpfendorfer, in press).

Henshall (1895) reported that smalltooth sawfish were so plentiful in Florida waters that an eyewitness writes of seeing hundreds of them, ‘big and little,’ on the west coast of the peninsula. About the same time, one fisherman reported the capture of 300 in his nets in the Indian River in a single season (Everman and Bean, 1897). Bigelow and Schroeder (1953) reported that *P. pectinata* was “abundant” in Texas and “plentiful” in Florida.

Today, official records of *P. pectinata* landings are rare throughout the U.S. range. Adams and Wilson (1995) summarized New York to Texas state fishery agencies’ recent recorded smalltooth sawfish landings (Table A). In addition, a 414 cm TL specimen was caught in the Atlantic Ocean off Ft. Pierce, Florida in June 1979 (Snelson and Williams 1981). The most recent landings in the Gulf of Mexico were one adult from Florida in 1994 and one adult (perhaps not sexually mature) from Texas in 1984. Louisiana recorded landings of 20 to 2000 lbs between 1978 and 1992 (lumped for confidentiality reasons).

**Table A.** Recent records of *Pristis pectinata* in Atlantic and Gulf waters

ALL	National Museum Natural History	No recent records
NY	NY State Dept. Environmental Conservation	No recent records
NJ	NJ Division of Fish, Game, and Wildlife	No recent records
DE	DE Dept. Natural Resources & Environmental Control	No recent records
MD	MD Department of Natural Resources	No recent records
VA	VA Institute of Marine Science	No records since . collecting began in 1967
NC	NC State Museum of Natural History	No recent records

NC	NC Institute of Marine Science	Last record for state, 27 June 1963, 0.5mi off Carolina Beach (4600mmTL)
SC	SC Wildlife & Marine Resources Department	Last known record, 7 August 1958, off Georgetown (4572mmTL)
GA	GA Department of Natural Resources	No recent records
FL	FL Museum of Natural History Fish Collection	Six specimens between 1953 and 1983, all Gulf
FL	FL Department of Environmental Protection	Two specimens, both 27 May 1959, Old Tampa Bay, 897 mm and 810mmTL); One specimen, 27 January 1994, between Key West and Dry Tortugas (4310mmTL)
AL	AL State Department of Conservation and Natural Resources	Last specimen in 1968, only anecdotal reports since
MS	MS Department of Wildlife, Fisheries & Parks	Gulf Coast Research Laboratory Museum Two records: 1) 19 July 1960, Belle Fontaine Point (young specimen); 2) 10 August 1966 Mississippi Sound near Dear Island (young specimen)
LA	LA Department of Wildlife and Fisheries	Between 1978 and 1992, landings in 7 years: between 20 and 2000 lbs per year of record
TX	TX Parks and Wildlife Department	Two records since 1974: 1) 7 August 1979, Carancahua Bay (1700mmTL); 2) 24 April 1984, Aransas Bay, (1500mmTL) ”

Updated collection records from the Florida Museum of Natural History of the University of Florida include 13 records of *P. pectinata* from 1912 to 1998 (with one record not dated). Nine of these specimens were recorded from the Gulf of Mexico off Florida, three came from the Atlantic side of Florida, and one animal was caught in Pacific waters off Ecuador. Three additional records of smalltooth sawfish from the Atlantic coast of Florida have yet to be cataloged in this collection: one specimen is from 1979; the second is not dated (the Museum received both these fish from the Harbor Branch Oceanographic Institute); a third specimen was landed May 22, 1998 from the Indian River (Burgess, pers. comm.). The Museum also has a record of a fourth specimen caught and released alive south of Key West on September 9, 1999 (Burgess, pers. comm.). The Florida Department of Environmental Protection has reported that a 421 mm female was taken between Key West and the Dry Tortugas on January 27, 1994 (Adams, pers. comm.).

In addition, records from the Commercial Shark Fishery Observer Program of the Florida Museum of Natural History reveal the capture and release of two smalltooth sawfish in 1996 and 1998 (Burgess, pers. comm.).

Another information source that points to the scarcity of sawfish in U.S. waters is the Gulf Coast Shark Census, an annual, week-long, recreational, catch and release shark fishing competition supervised by Mote Marine Laboratory of Sarasota, Florida. Between 1991 and 1999, only four smalltooth sawfish have been captured (and released) in 20,000 line hours of fishing effort. The saws of two of these four animals had been removed prior to capture in the tournament. Sawfish represent only 0.08% of the animals caught in this tournament (Simpfendorfer, pers. comm.).

## **B. *Pristis perotteti***

### Taxonomy

Common Name:	Largetooth sawfish
Class:	Chondrichthyes
Order:	Pristiformes
Family:	Pristidae
Genus:	<i>Pristis</i>
Species:	<i>perotteti</i>

Characterized by broad-based, tapered, rostral saws with 19-20 pairs of teeth (fewer and larger than *P. pectinata*); small sub-caudal lobe (Bigelow and Schroeder, 1953).

### Distribution

Though *P. perotteti* occurs in both the Atlantic and Pacific Oceans (off other countries), its range in U.S. waters is narrower than that of *P. pectinata*, as it apparently does not occur outside the Gulf of Mexico, west of the Mississippi. Its range therefore overlaps with *P. pectinata* in Texas and Louisiana. The largetooth sawfish is even more closely restricted to shallow water than the smalltooth sawfish, and more frequently found in fresh water. In the U.S., *P. perotteti* was once found upstream in rivers (Bigelow and Schroeder, 1953).

The species has been recorded 1340 km from the mouth of the Amazon (Thorson 1974). This range makes *P. perotteti* exceptionally vulnerable to overexploitation and habitat destruction.

### Biology

Bigelow and Schroeder (1953) suggest that largemouth sawfish may grow larger than the smallmouth sawfish; one specimen from Texas measured 18 feet, 7 inches and weighed 1200 pounds. Like *P. pectinata*, *P. perotteti* has a k-selected life history and therefore is exceptionally susceptible to overexploitation. Its restricted range exacerbates this vulnerability. Studies of *P. perotteti* in Lake Nicaragua (Thorson 1976) report litter sizes of 1-13 individuals, with a mean of 7.3 (likely every second year), a gestation period of approximately 5 months; Thorson (1982a) estimated the size at birth (75 cm), size and age at maturity (300 cm, 10 years) and maximum size and age (430 cm, 30 years).

Using demographic analyses, Simpfendorfer (in press) estimated the annual rate of increase for *P. perotteti* at 5.1% to 7.2%, which translates to population doubling times of 10.3 years to 13.5 years. These rates are similar to those estimated for species of large sharks (Simpfendorfer, in review).

### Population Status

As with the smallmouth sawfish, quantitative data needed for largemouth sawfish stock assessment are lacking (except for Lake Nicaragua), and again we must rely on the historic record of field observations. *P. perotteti* was characterized as common throughout its range as late as the mid-1950s; in the summer of 1943, seven large specimens were reported taken by one fisherman near Galveston, Texas (Bigelow and Schroeder, 1953). The same account states that the population in Lake Nicaragua was so large that an angler caught four in one day.

Fisheries for *P. perotteti* have been known to devastate local populations, most notably in Lake Nicaragua. Thorson (1987) reports catching 252 sawfish for tagging in 43 days in 1970 in Lake Nicaragua. Targeted commercial fishing began that year; by 1974 it was difficult to catch sawfish. In 1976-77, Thorson (1987) placed crews at two locations on the lake and caught only 11 sawfish in 12 months.

### **Application of Section 4(a)(1) Factors**

The decline of *P. pectinata* and *P. perotteti* is due to at least four of the five criteria listed under Section 4(a) of the ESA (16 U.S.C. § 1533(a)):

- 1) present or threatened destruction, modification, or curtailment of habitat or range;
- 2) overutilization for commercial, recreational or scientific purposes;
- 3) inadequacy of existing regulatory mechanisms; and
- 4) other natural or manmade factors affecting the species' existence.

### Destruction, Modification or Curtailment of Habitat or Range

The restricted habitat of sawfish poses challenges for recovery of the population, as these fish are vulnerable to all of the pressures attendant to human population growth and subsequent development of the coastal zone. In addition, although widespread geographically, *P. pectinata* exists in disjunct population units, making them more vulnerable to local declines with little chance of recruitment from other stocks (CITES proposal 1997). Such small populations are also at risk for adverse genetic effects (Frankel and Soule 1981).

#### Overutilization for Commercial, Recreational, Scientific or Educational Purposes

There are no records of directed, sawfish fisheries in the U.S. Although occasional sport fishing may not have been inconsequential, overexploitation from incidental commercial catch (the toothed rostra are easily entangled in nets) was likely the most significant factor in the population's decline. Intense fisheries for more productive and resilient species often result in overexploitation of k-selected species (Musick 1999). Snelson and Williams (1981) suggest the dramatic disappearance of *P. pectinata* from Florida's Indian River Lagoon system may be related entirely to heavy mortality from incidental capture in commercial fisheries, since the decline apparently predated most major, human-made, environmental alterations.

Other factors potentially affecting the *P. pectinata* population include past and present trade in whole animals for aquaria and public display, or parts (e.g. saws for curios or Asian medicine, and hides for leather). Sawfish fins are highly prized in the shark fin trade (Camhi et al. 1998). There is no record of successful captive breeding (Camhi et al. 1998). In 1998, the National Marine Fisheries Service received two requests for permits to collect sawfish; one request sought seven animals (Schulze, pers. comm).

Prompted in part by the grave situation outlined above, the U.S. government proposed sawfish for listing under CITES Appendix I at the 1997 Conference of the Parties. The following quote from the Federal Register clearly states the U.S. position:

*“Most species have exhibited either severe population declines or have an extremely localized distribution. Four species (*P. pristis*, *pectinata*, *perotteti*, and *microdon*) are considered endangered by IUCN (other species have not been evaluated). Although data on international trade and other forms of exploitation of sawfishes are sketchy, localized effects can be seen in individual populations. Quantitative trade data are very limited but sawfish are known to be targeted commercially in artisanal fisheries, taken as live specimens for public aquaria, for the curio trade (rostral saws), for traditional Asian medicines (rostral saws of *Anoxypristis cuspidata*), and for fine leather (hides)....*

*“Arguments in favor of the proposal were mainly based on the intrinsic vulnerability resulting from the biological attributes described above, the population declines evidenced by declines in by-catch, and also the existence of much more evidence of past and present trade (including provision of biological supply houses with rostral saws) than suggested by those opposed. The CMC also pointed out that evidence of trade is not necessarily a prerequisite to inclusion of taxa in Appendix I (the Service strongly agrees that the criteria in Resolution Conf. 9.24 are unequivocal in this regard)....*

“Notwithstanding the absence of strong quantitative information on population status, the United States believes that the obvious rarity of these species, and the consistency of anecdotal evidence of population declines wherever data are available, are clear indicators of their vulnerability to any form of use, including international trade. On this basis, the *Pristiformes* meet the criteria for inclusion in Appendix I, and the United States has submitted a proposal to this effect....” (62 Fed. Reg. 18567-68 (Apr. 16, 1997)).

In U.S. waters, largemouth sawfish populations face the same threats as smallmouth sawfish (see above), likely exacerbated by this species’ more restricted range. Although directed fisheries for *P. perotteti* do not occur in U.S. waters, the Lake Nicaragua population provides a clear example of how exceptionally vulnerable this species is to overexploitation.

### Inadequacy of Existing Regulatory Mechanisms

Although the U.S. proposed a CITES listing for sawfish, thereby recognizing the need for stringent protective measures, smallmouth sawfish are not protected by any Federal regulatory mechanisms. Smallmouth sawfish have been designated as prohibited species in Florida and Louisiana state waters (Camhi 1998, Camhi in press).

Restrictions on fishing gear in Gulf of Mexico and Southeast state waters may also provide some protection. Most notably, Florida and Texas have banned the use of entangling nets including gillnets, purse seines, and trammel nets (Camhi 1998). Louisiana has not allowed entangling nets since 1997, except in mullet and pompano fisheries. A recent Mississippi requirement that gillnets be made of biodegradable material has decreased gillnet use in state waters (Camhi in press). Virginia has banned longlines and trawls in state waters while Georgia has prohibited longlines and gillnets since the 1950s (Camhi 1998).

As is the case for smallmouth sawfish, there are no U.S. federal regulations protecting largemouth sawfish and the largemouth sawfish is designated as a prohibited species under Florida and Louisiana state regulations. Other conservation measures adopted by Atlantic and Gulf of Mexico states (see above) may provide some additional protection (Camhi 1998, Camhi in press).

*P. pectinata* is listed as “endangered” on the IUCN Red List of Threatened Animals (Baillie and Groombridge 1996). *P. perotteti* is listed as “critically endangered” under the IUCN Red List of Threatened Animals (Baillie 1996).

### Conclusion

In summary, both smallmouth and largemouth sawfish (*Pristis pectinata* and *Pristis perotteti*) have suffered near extirpation from their former U.S. range and require greater protection in order to recover. Once abundant off the southeast coast and Gulf of Mexico states, they are now rarely, if ever, reported. The decline for both species is well-documented by anecdotal reports. While numerical abundance data are scarce for both of these species, this paucity of data is itself evidence of the rarity of these animals and corroborates the historical record.



Sawfish are exceptionally vulnerable to overexploitation due to their low intrinsic rates of increase, their exceptional propensity for entanglement in all kinds of net gear and their now restricted ranges. Because of these characteristics, recovery of U.S. populations to levels where extinction risk is low will take decades (Simpfendorfer, in press).

Indeed, sawfish are seriously threatened by human activities worldwide. Their grave global population status prompted the United States to call for international protection under CITES. In that proposal, the U.S. clearly presented the need for immediate and stringent protective measures. The U.S. should do no less than grant the full protection provided under our Endangered Species Act for sawfish in U.S. waters.

Accordingly, for the reasons presented here, we respectfully petition you to designate the smalltooth sawfish (*Pristis pectinata*) and the largetooth sawfish (*Pristis perotteti*) as endangered species pursuant to Section 4 of the Endangered Species Act. 16 U.S.C. § 1533.

Thank you for your consideration of this petition. If you have any questions, please contact us at (202) 429-5609.

Sincerely,

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Fisheries Project Manager

Stephanie Mairs  
Marine Wildlife Counsel

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