

(b) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Smalltooth sawfish have historically been caught as bycatch in various fishing gears throughout their historic range, including gillnet, otter trawl, trammel net, seine, and, to a lesser degree, hand line. There are frequent accounts in early literature of smalltooth sawfish being entangled in fishing nets from areas where smalltooth sawfish were once common, but are now rare or extirpated (Evermann and Bean, 1898). Their long, toothed rostrum makes it difficult to avoid entanglement in virtually any kind of large mesh gillnet gear. The saw penetrates easily through nets and causes the animal to become entangled when it attempts to escape. Shrimp trawling is another source of incidental mortality on smalltooth sawfish. Entangled specimens frequently have to be cut free, causing extensive damage to nets and presenting a substantial hazard if brought on board. For these reasons, most smalltooth sawfish caught by fishermen are either killed outright or released only after removal of their saws.

Large-scale directed fisheries for smalltooth sawfish have not existed; however, smalltooth sawfish bycatch has been commercially landed in various regions, primarily in Louisiana. Total Gulf of Mexico landings dropped continually from 1950 to 1978, ranging from a high of 9.3 metric tons to less than 0.1 metric tons during this time period. NMFS does not have any records of landings since 1978 (NMFS Fisheries Statistics and Economic Division's Database, commercial landings data).

A data set from "Fisheries Statistics of the United States" (1945–1978) of smalltooth sawfish landings in Louisiana by shrimp trawlers, containing both landings data and crude information on effort (number of vessels, vessel tonnage, number of gear units), underscores that landings have dramatically declined, even as fishing effort increased. Annual smalltooth landings in Louisiana declined from a high of 34,900 lbs (15,830 kg) in 1949 to less than 1,500 lbs (680 kg) in most years after 1967. During this period of time, the number of fishing vessels, the size of the fishing vessels, and the amount of gear that they deployed increased substantially. Landings per unit effort (LPUE) was calculated using three different units of effort (number of vessels, tonnage of vessels, and number of gear units). All three data series showed dramatic declines in LPUE, from high levels in the 1950s to very

low levels in the 1970s. The magnitude of these declines is such that the LPUE values in the 1970s are less than one percent of those in the 1950s, indicating a severe decline in the population. The lack of landings since 1978 shows that smalltooth sawfish have been commercially unavailable for over 20 years.

Anecdotal information collected by NMFS port agents indicates that smalltooth sawfish are now taken very rarely in the shrimp trawl fishery. The most recent records from Texas are from the 1980s. Through 1999, smalltooth sawfish were still occasionally documented in shrimp trawls in Florida (4 from 1990 to 1999). Mote Marine Laboratory records documented a smalltooth sawfish taken in a shrimp trawler and one caught on a long-line off the coast of Florida, in 2002. (Simpfendorfer, pers. comm., 2002).

In historical recreational fisheries records, smalltooth sawfish have occasionally occurred as bycatch. Occasional takes with harpoon or hook-and-line by recreational fishers in Florida were recorded during the first half of the twentieth century. In Texas, many sawfish were reportedly taken incidentally by sport fishermen in the bays and surf prior to the 1960s. Most of these fish were released. However, prior to their live release the saws of many individuals were removed. This practice may have contributed to the decline of smalltooth sawfish in Texas.

Today, recreational catches of sawfish are very rare, and poorly documented for the most part, except within the Everglades National Park. Long-term abundance data are not available, but there are recent (1989–1999) recreational catch per unit effort (CPUE) data for the Everglades. These CPUE data indicate that a sustaining population still exists there, with consistent annual catches by private recreational anglers and guide boats. Direct take of smalltooth sawfish has been of little importance or remains obscure. Although there is a market for smalltooth sawfish saws, the species is not commonly taken and any captures are apparently incidental. Smalltooth sawfish have also been taken by collectors and sold live to aquaria. The recent high prices aquaria are willing to pay for this species (\$1,000 per ft; \$3,200 per m) may be providing increased incentive for their collection. The smalltooth sawfish has rarely been taken for scientific purposes.

(c) Disease or Predation

There is no information regarding predation or disease affecting smalltooth

sawfish. The decline of the species appears to have been one of slow attrition over the course of the twentieth century, primarily from bycatch in fisheries and secondarily by coastal habitat destruction rather than from some acute epizootic event. The few living specimens examined (Colin Simpfendorfer, Mote Marine Laboratory and Jose Castro, NMFS, pers. comm., 2000) appear to be in good health.

(d) Inadequacy of Existing Regulatory Mechanisms

Numerous Federal, state, and inter-jurisdictional laws, regulations and policies govern activities in U.S. waters that have the potential to affect the abundance and survival of smalltooth sawfish and their habitat. While these laws, regulations, and policies lead to overall environmental enhancements indirectly aiding smalltooth sawfish, very few have been applied specifically for the protection of smalltooth sawfish. For example, NMFS and FWS consult with other agencies on projects that may impact fish and wildlife and provide recommendations to avoid any adverse impacts, but there has never been a recommendation directed at the protection of sawfish. Any general recommendations that are implemented and reduce habitat loss in shallow coastal areas may provide some benefit to smalltooth sawfish by curbing increased habitat degradation.

There are no Federal regulations for the protection of sawfish. With the exception of Florida and Louisiana, smalltooth sawfish can also still be legally harvested in state waters.

As noted above, a century of net fisheries combined with the low reproductive potential of the sawfish (typical of most elasmobranchs) has resulted in a very severe decline in sawfish populations. Smalltooth sawfish bycatch in gillnets has likely been reduced due to recent regulations prohibiting or limiting the use of gillnets in some state waters, but bycatch in other gears such as trawls may still present a threat to this species. Recent reports of smalltooth sawfish caught with their saws already removed indicate that smalltooth sawfish are still being harmed by commercial or recreational fishing activities. Based on this information, NMFS believes that existing Federal and state laws, regulations, and policies are inadequate to protect smalltooth sawfish.

(e) Other Natural or Manmade Factors Affecting its Continued Existence

Current and future abundance of smalltooth sawfish is limited by its life history characteristics. While little is