

known directly about smalltooth sawfish life history, inferences can be drawn from closely related species for which more information is available, such as the largemouth sawfish and other elasmobranchs. These species have slow growth, late maturity, a long life span, and low fecundity, and it is highly likely that smalltooth sawfish share these characteristics. 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, persistent population sizes in relatively constant environments. Conversely, they are not able to respond effectively (rapidly) to additional sources of mortality, such as overexploitation and habitat degradation. Smalltooth sawfish have been and are currently subjected to both overexploitation and habitat degradation.

The intrinsic rate of population growth can be a useful parameter to estimate the capacity of a species to withstand exploitation. Animals with low intrinsic rates of increase are particularly vulnerable to excessive mortalities and rapid stock collapse, after which recovery may take decades. The estimated intrinsic rate of natural increase for smalltooth sawfish ranges from 0.08 per year to 0.13 per year, and population doubling times range from 5.4 years to 8.5 years (Simpfendorfer, 2000a). The American Fisheries Society considers smalltooth sawfish in North America to be at a high risk of extinction (Musick et al., 2000).

#### Listing Determination

The U.S. DPS of smalltooth sawfish is at a critically low level of abundance based on the status review team's review of literature accounts, museum collection specimens, and other records of the species. The U.S. DPS of smalltooth sawfish continues to face threats from: (1) loss of wetlands, (2) eutrophication, (3) point and non point sources of pollution, (4) increased sedimentation and turbidity, (5) hydrologic modifications, and (6) incidental catch in fisheries. Commercial bycatch has played the primary role in the decline of this DPS. Quantitative data are limited, but indicate that smalltooth sawfish have been taken by commercial fishermen and that this species has experienced severe declines in its abundance. While Federal, state, and interjurisdictional 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. Based on the species' low intrinsic rate of increase resulting from their slow growth, late maturation, and low fecundity, population recovery potential for the species is limited and the species is at risk of extinction. Therefore, under current circumstances, the U.S. DPS of smalltooth sawfish is in danger of extinction.

Current protective measures and conservation efforts underway to protect the U.S. DPS of smalltooth sawfish are confined to: actions directed at increasing general awareness of this species and the risks it faces; possession prohibitions in the state waters of Florida and Louisiana; and research being pursued by the Mote Marine Laboratory's Center for Shark Research. There are no Federal or state conservation plans for the smalltooth sawfish.

#### Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the ESA include development and implementation of recovery plans, requirements that Federal agencies use their authorities to conserve the species, and prohibitions against certain practices, such as taking individuals of the species. Recognition through listing encourages and results in conservation actions taken by Federal agencies, state agencies, private organizations, groups, and individuals. The ESA also provides for possible land acquisition and cooperation with the states. The conservation measures required of Federal agencies and the prohibitions against taking and harm are discussed, in part, here.

The ESA and its implementing regulations set forth a series of general prohibitions that apply to all endangered wildlife. The prohibitions of section 9 of the ESA, in part, make it illegal for any person subject to the jurisdiction of the United States to take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct), to import into, or export from, the United States, to ship in interstate or foreign commerce in the course of commercial activity, or to sell or offer for sale in interstate or foreign commerce any endangered wildlife. To possess, sell, deliver, carry, transport, or ship endangered wildlife that has been taken illegally is also prohibited.

Section 7 of the ESA imposes special duties on Federal agencies for the protection and conservation of endangered and threatened species. Section 7(a)(1) requires Federal agencies to use their authorities to conserve

listed species and their habitats by carrying out conservation programs for endangered and threatened species. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the NMFS or the FWS. Regulations implementing this interagency cooperation provision of the ESA are codified at 50 CFR part 402.

ESA sections 10(a)(1)(A) and 10(a)(1)(B) provide NMFS with authority to grant exceptions to the section 9 takings prohibitions. Section 10(a)(1)(A) scientific research and enhancement permits may be issued to entities (Federal and non-Federal) conducting research that involves a take of listed species. NMFS has issued section 10(a)(1)(A) research and enhancement permits for other listed species for these purposes. ESA section 10(a)(1)(B) incidental take permits may be issued to non-Federal entities performing activities that may incidentally take listed species. The types of activities potentially requiring a section 10(a)(1)(B) incidental take permit include agricultural or development activities that affect sawfish habitat and the management of state fisheries that may interact with sawfish.

The ESA also provides some exceptions to the prohibitions, without permits, for certain antique articles and species held in captivity at the time of listing. ESA section 10(h) allows antique articles of listed species to be excluded from essentially all the ESA prohibitions as long as they are at least 100 years old and meet certain other specified conditions. Section 9(b)(1) provides a narrow exemption for animals held in captivity at the time of listing; those animals are not subject to the import/export prohibition or to protective regulations adopted by the Secretary, so long as the holding of the species in captivity, before and after listing, is not in the course of a commercial activity; however, 180 days after listing there is a rebuttable presumption that the exemption does not apply. Thus, in order to apply this exemption, the burden of proof for confirming the status of animals held in captivity prior to listing lies with the holder. The section 9(b)(1) exemption for captive wildlife would not apply to any progeny of the captive animals that may be produced post-listing.