
Conservation and the Endangered Species Act: The National Marine Fisheries Service's Cooperative and Proactive Approaches

INTRODUCTION

In signing the Endangered Species Act (ESA) into law on 28 December 1973, President Richard M. Nixon noted,

“Nothing is more priceless and more worthy of preservation than the rich array of animal life with which our country has been blessed. It is a many-faceted treasure, of value to scholars, scientists, and nature lovers alike, and it forms a vital part of the heritage we all share as Americans” (Wooley and Peters, 1999–2009).

The ESA evolved from two earlier pieces of legislation, the Endangered Species Conservation Act of 1969 and the Endangered Species Preservation Act of 1966.¹ However, it was President Nixon's signing of the 1973 law that set in motion a comprehensive national program to protect wildlife threatened with extinction.

Today, the ESA is arguably one of the most important and most controversial of the Federal environmental protection laws. Controversy generally arises from the regulatory nature of ESA programs and the length of time that is often required to recover listed species. However, in recent years the National Marine Fisheries Service (NMFS) has placed additional emphasis and resources into re-

covery and conservation programs. Most notable among these programs are a cooperative program that involves state partners in the recovery of listed species (Section 6 Program) and a newly developed program that addresses species of concern before population declines warrant ESA protection (Species of Concern Program). In this article we review how these two programs are currently working to recover listed species and conserve species of concern before listing under the ESA becomes necessary.

BACKGROUND: IMPLEMENTATION OF THE ENDANGERED SPECIES ACT OF 1973

Currently, there are 1,925 threatened and endangered species listings under the ESA, with 1,351 of those species found in the United States or its waters, and the remainder occurring in international waters or foreign countries. NMFS and the U.S. Fish and Wildlife Service (USFWS) share responsibility for implementing the ESA but have divided jurisdiction over most species. In general, USFWS manages terrestrial and freshwater species, while NMFS manages marine species, including most anadromous fishes (species such as salmon that reside in salt water and return to fresh water to spawn). Under the ESA, species include any subspecies of fish or wildlife or plants, and any distinct population segment of vertebrate fish or wildlife which interbreeds when mature.² Two poli-

¹H.R. 9424 (Endangered species preservation) Public Law 89-669 (80 Stat. 926).

²Section 3 of the ESA (16 U.S.C. 1532).

Feature Article 4

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An exposed male sockeye salmon (*Oncorhynchus nerka*).

cies provide guidance on the definition of distinct population segments for Pacific salmon (NMFS, 1991) and other vertebrate species (NMFS, 1996). At the present time, NMFS is responsible for 66 listed species.³

In order to receive protection under the ESA, a species must first be listed as endangered or threatened. A species is considered endangered if it is “in danger of extinction throughout all or a significant portion of its range,” and a species is considered threatened if it “is likely to become an endangered species within the foreseeable future.”⁴ The ESA requires that listing decisions be based solely on the best scientific and commercial data available. The ESA also requires NMFS or USFWS to determine whether any species is endangered or threatened because of any of the following factors:

- present or threatened destruction, modification, or curtailment of the species’ habitat or range;
- overutilization for commercial, recreational, scientific, or educational purposes;
- disease or predation;
- inadequacy of existing regulatory mechanisms; and
- other natural or manmade factors affecting the species’ continued existence.

³A complete list of threatened and endangered species currently under NMFS’ jurisdiction can be found in Appendix 7 and is also available at <http://www.nmfs.noaa.gov/pr/species/esa.htm>.

⁴Section 3 of the ESA (16 U.S.C. 1532).

Once a species is listed as endangered, it is generally protected from take (defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) by any individual or organization. This take prohibition may also be, and often is, extended to threatened species by regulation.

Because habitat loss and modification is a major threat to many imperiled species, the ESA requires that critical habitat be designated for species listed under the ESA. Critical habitat includes specific areas within the geographical range occupied by the species at the time of listing containing physical or biological features essential to conservation that may require special management considerations or protection; and specific areas outside the geographical range occupied by the species if NMFS determines that the area itself is essential for conservation. Maps of critical habitat can be found at <http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm>.

Additionally, under Section 7 of the ESA, Federal agencies are obligated to

“Ensure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat . . . which is determined . . . to be critical.”⁵

⁵Section 7 of the ESA (16 U.S.C. 1536).

In order to meet this requirement, Federal agencies consult with NMFS on any activities that may affect a listed species under NMFS jurisdiction (known as an interagency or Section 7 consultation). The ESA also requires Federal agencies to use their authorities to carry out programs for the conservation of species. This section of the ESA provides NMFS with a powerful tool for working with a number of Federal agencies to design programs and activities in a manner that provides for the conservation of listed species.

To promote the recovery of a species once it has been listed, a recovery plan is prepared that identifies the conservation measures necessary to recover the species. Most recent plans can be found online at <http://www.nmfs.noaa.gov/pr/recovery/plans.htm>. NMFS works with other Federal agencies, state and local governments, and private entities to implement the measures in these plans. One means of supporting such measures is through funding associated with cooperative agreements with the states under Section 6 of the ESA.

COOPERATION WITH STATES: THE ESA SECTION 6 PROGRAM

States play an essential role in the conservation and recovery of endangered and threatened species. Protected species under NMFS' jurisdiction may spend part or all of their lifecycles in state waters, and success in conserving these species depends in large part on working cooperatively with state agencies. In Section 2 of the ESA, Congress declared that

“Encouraging the states and other interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs which meet national and international standards is a key to meeting the Nation's international commitments and to better safeguarding, for the benefit of all citizens, the Nation's heritage in fish, wildlife, and plants.”⁶

Under the authority of Section 6 of the ESA, NMFS is explicitly authorized to work coopera-

⁶Section 2(5) of the ESA.

Box 1

States currently holding ESA Section 6 agreements with NMFS; year effective noted in parentheses.

Delaware (2007)	New Jersey (2004)
Florida (2003)	New York (1992)
Georgia (1990)	North Carolina (2000)
Hawaii (2006)	Puerto Rico (2003)
Maine (2005)	South Carolina (1984)
Maryland (1998)	U.S. Virgin Islands (2003)
Massachusetts (1996)	Washington (2008)

tively with states⁷ and provide Federal assistance to support the development of state conservation programs for listed marine and anadromous species (Box 1). States may also receive support for monitoring of candidate and recently recovered species.⁸ Section 6 requires state matching (at 10% to 25%) of Federal funding, thereby leveraging what are typically very limited Federal dollars. This program also capitalizes on the existing expertise and knowledge of state natural resource agencies and their existing intrastate partners to better protect and recover the listed species that reside within a particular state. Because of its emphasis on cooperative partnerships, the Section 6 Program is an excellent example of the type of Federal–state partnership articulated in President George W. Bush's 2004 Executive Order 13352, Facilitation of Cooperative Conservation.

The mechanism for formalizing these Federal–state partnerships is a Section 6 cooperative agreement. A state interested in entering into a cooperative agreement submits information to NMFS regarding the state's legal authorities and conservation programs for threatened and endangered species. Once a state's conservation program is

⁷The term “state” is used here as defined in Section 3 of the ESA and therefore includes U.S. territories.

⁸Candidate species are those species that are actively being considered for listing under the ESA, but are not yet the subject of a proposed rule (50 CFR 424.02). NMFS' definition of a candidate species includes petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the Federal Register.

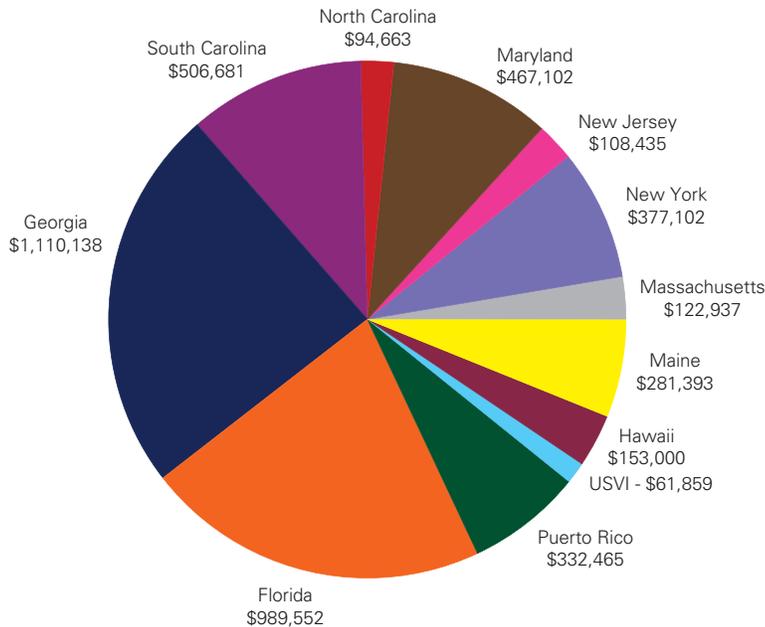


Figure 1 (above)

Total funding through the Protected Species Cooperative Conservation Grant Program by state for Fiscal Year (FY) 2003–07 grant cycles; amounts include funding awarded but not yet obligated for out-years of multiyear projects, which extend into FY2009. Maine and Hawaii each submitted proposals for the first time to the FY2007 grant cycle. Funding decisions for the FY2008 cycle had not yet been finalized when this article was prepared.

Photo (below)

A newborn smalltooth sawfish (*Pristis pectinata*) measuring 812 mm (total length) captured as part of the Florida Fish and Wildlife Conservation Commission's long-term monitoring project.



found to be adequate and active in accordance with the criteria of Section 6(c) of the ESA, the state, through its respective natural resources agency or agencies, enters into an agreement with NMFS. The state then becomes eligible to receive Federal funding to support development of conservation programs for listed species and monitoring of candidate and recovered species residing within that state. NMFS and the states often work together to identify priority projects that address a particular state's needs, recovery actions identified in a NMFS recovery plan, or both. Currently, NMFS holds agreements with 14 states, the newest agreement being with Washington, which was signed in 2008 (Box 1). Since NMFS received new funding from Congress in Fiscal Year (FY) 2003 to support this program, the number of ESA Section 6 agreements

has more than doubled. NMFS anticipates that this program will continue to grow at a pace of at least one new agreement per year until all eligible states are included in the program.

Using the funding provided by Congress in 2003 and thereafter, NMFS instituted the Protected Species Cooperative Conservation Grant Program. This grant program has provided between \$750,000 and \$950,000 annually to support conservation of endangered, threatened, and candidate species (Figure 1). Funded projects have involved development and implementation of management plans, scientific research, and public education and outreach efforts. Project budgets have ranged in size from small management measures costing several thousand dollars to large multiyear research projects costing hundreds of thousands of dollars. Funding has supported work for most of the listed species that occur within the waters of partner states, particularly sea turtles, sturgeons, and smalltooth sawfish (Figure 2). A complete list of previously funded projects is available at <http://www.nmfs.noaa.gov/pr/conservation/states/funded.htm>.

An excellent example of a small, cost-effective management project is the ongoing work being conducted in the U.S. Virgin Islands (USVI) to reduce injury and mortality of leatherback sea turtles as a result of boat collisions. The USVI Division of Fish and Wildlife (DFW) has documented an increase in the number of injured and stranded leatherbacks during several recent nesting seasons in the area of Sandy Point National Wildlife Refuge, the largest nesting beach for leatherbacks in the United States and the first sea turtle nesting beach ever to be proposed as critical habitat (FWS, 1978; Figure 3). During this same time period, off the southern shore of the refuge, there has also been an increase in boat traffic associated with the seasonal mutton snapper fishery. Observation of propeller wounds on leatherbacks confirms that the injuries are often the result of boat strikes. Although there are speed restrictions in this area, most boaters are unaware of these restrictions or are unaware of the presence of endangered leatherbacks so close to shore. To address this issue, the DFW has partnered with the West Indies Marine Animal Research and Conservation Service (WIMARCS) to install marker buoys around Sandy Point Wildlife Refuge, establish a no-wake zone, and increase lo-

cal fishermen and recreational boaters' awareness of the presence of leatherbacks in this area. With no available territorial funding, funding through the Protected Species Cooperative Grant (\$41,859) is essential to conducting this project.

Large, multiyear research projects supported through this grant program include ongoing long-term monitoring of the endangered smalltooth sawfish in Florida. The U.S. population of smalltooth sawfish has been extirpated from most of its range and was listed as endangered in 2003 (NMFS, 2003). In the United States, smalltooth sawfish once ranged from Texas to Florida and up the Atlantic coast to Cape Hatteras; smalltooth sawfish are now mainly found only around the southern part of Florida. NMFS has provided over \$200,000 through the Protected Species Cooperative Conservation Grant Program to the Florida Fish and Wildlife Conservation Commission (FWCC) to

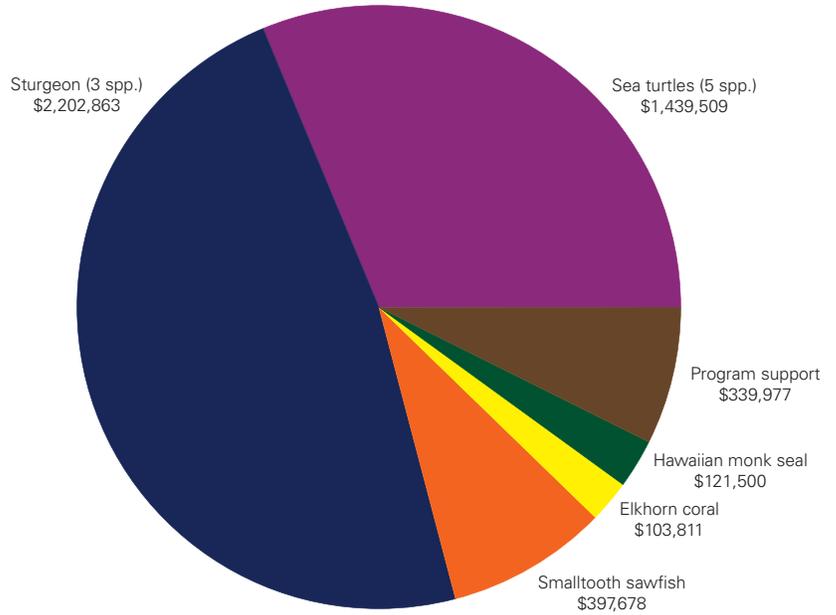


Figure 2 (above)

Grants awarded under the Protected Species Cooperative Conservation Grant Program by species for Fiscal Year (FY) 2003–07 grant cycles. Amounts include funding awarded but not yet obligated for out-years of multiyear projects, which extend into FY2009. Sea turtle species include green, leatherback, Kemp's ridley, loggerhead, and hawksbill. Sturgeon species include shortnose, Atlantic, and Gulf sturgeon. Program support includes funding for workshops, meetings, and general program development. Elkhorn coral first became eligible to receive funding during the FY2005 grant cycle after it became a candidate for listing in June 2004 (NMFS, 2004).



Figure 3 (left)

Critical habitat (yellow lines) for leatherback sea turtles consists of both a nesting beach (bold black line) and waters adjacent to Sandy Point, St. Croix, up to and inclusive of waters from the 100-fathom curve shoreward to the level of mean high tide. The mutton snapper closed area is shown within this critical habitat. Map courtesy of WIMARCS.

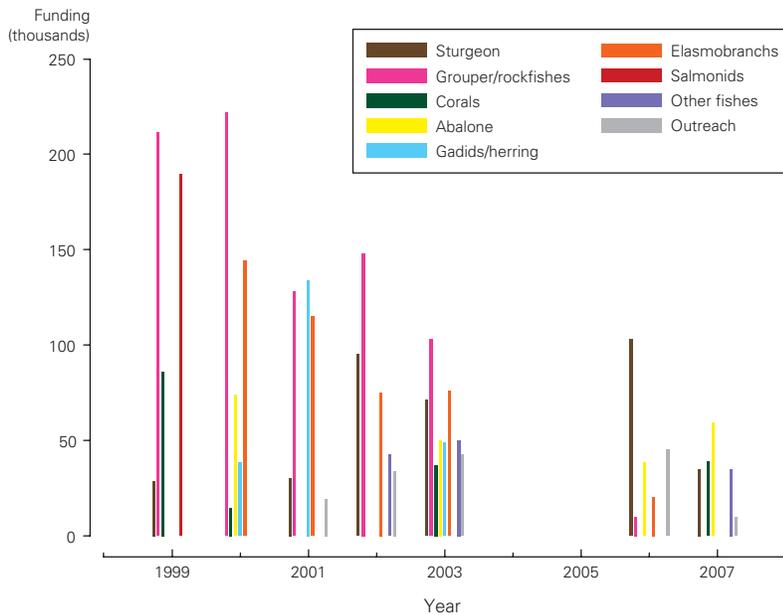


Figure 4
Fiscal year 1999–2007 allocation of species of concern research and outreach funds (in thousands of dollars).

continue monitoring this species and to examine the movements and distribution of smalltooth sawfish in relationship to physical characteristics of the habitat. Results of this research will be valuable in NMFS’ effort to identify and designate critical habitat for this species.

PROACTIVE CONSERVATION: THE SPECIES OF CONCERN PROGRAM

In addition to the conservation efforts being made through the Section 6 Program, NMFS is also engaged in proactive conservation efforts that address species potentially at risk before protections of the ESA can or should be applied. In April 2004 NMFS established the Species of Concern Program specifically to 1) identify species potentially at risk; 2) identify data deficiencies and uncertainties in species’ status and threats; 3) increase public awareness about these species; 4) stimulate cooperative research efforts to obtain the information necessary to evaluate species status and threats; and 5) foster voluntary efforts to conserve these species before ESA listing becomes warranted. Species of Concern are defined as those species about which NMFS has some concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the ESA (NMFS, 2004). Currently, there are 42 species of

concern (see fact sheets at <http://www.nmfs.noaa.gov/pr/species/concern/> and a list in Appendix 7). Boxes 2, 3, and 4 provide information about a few of these species of concern and current efforts to conserve them.

Before establishing the Species of Concern Program, NMFS maintained many of these species on its list of candidate species. However, most of these species did not fit NMFS’ definition of a candidate species, and a species of concern list was considered a better way of highlighting these species for conservation purposes. Neither candidate species nor species of concern designations carry any procedural or substantive protections under the ESA.

NMFS funds conservation efforts for species of concern through one of two mechanisms: 1) an annual allocation among NMFS Regions and Science Centers for research and outreach projects, and 2) the newly established Proactive Species Conservation Grant Program, which funds states and other non-Federal management entities for on-the-ground conservation efforts. The information gained and conservation actions taken through these projects are designed to benefit the species by addressing known threats to their existence.

From FY1999 through FY2007, NMFS has provided over \$2.7 million to NMFS Regional Offices and Science Centers for research and outreach projects through its annual allocation (Figure 4). Some of the species groups that have benefited from these funds include corals, sturgeon, salmonids, and groupers. Table 1 lists the 7 projects that were funded with the \$178,316 available for FY2007.

The Proactive Species Conservation Grant Program is a competitive grant program that provides funds to states, counties, or other non-Federal entities with management authority over a species of concern so that they can conserve these species. An applicant submits a proposal that must meet certain criteria. The main evaluation criteria are importance/relevance and applicability; technical/scientific merit; overall applicant qualifications and project costs; and outreach and education. In FY2006 (the inaugural year of the grant program) and FY2007, \$490,000 was available each year and was awarded in two separate grants: a Mississippi Department of Natural Resources (MDNR) project on the saltmarsh topminnow, *Fundulus jenkinsi*

(\$143,095), and a Maine Department of Marine Resources project on Atlantic sturgeon, Atlantic salmon, and rainbow smelt (\$836,905). Neither of these 5-year projects is far enough along to discuss results, but some details on the MDNR project are provided in Box 3.

SUMMARY

While the ESA is highly regulatory in nature, NMFS has established programs that take cooperative and non-regulatory approaches to conserving listed species and species of concern. In particular, NMFS has made small, but increasingly significant, steps in developing both the ESA Section 6 and the Species of Concern programs. Federal funding through these programs has supported research, management, and outreach projects for over a dozen species in about a dozen states. For the external partners, Federal support through these programs has been invaluable, because other funds are largely unavailable for this work.

The Section 6 Program has been, and continues to be, a critical component of recovery efforts for listed species. Work supported through this program often directly addresses recovery priorities identified in NMFS Recovery Plans. Since the beginning of 2006, NMFS has drafted or revised 13 recovery plans, including new recovery plans for white abalone and smalltooth sawfish. As the number of state partners engaged in this program increases, so too will the number of species and recovery actions implemented for these species. Continuing to invest in the Section 6 Program means continuing to invest in recovery efforts for species listed under the ESA.

Although still in its infancy, the Species of Concern Program has evolved from a small amount of agency research and outreach effort into a national program that engages external partners in proactive conservation efforts. Funding remains limited for this program, but over time and with some demonstrated success in preventing the need to protect species of concern under the ESA, this program is expected to grow. Overall, these proactive efforts will serve to increase our knowledge of potentially at-risk species and provide a measure of protection before more costly and cumbersome regulatory mechanisms are required.

Project	Funding
Black abalone status review and population assessment	\$25,000
Estimating the size of green sturgeon populations	\$35,000
SOC national education and outreach proposal	\$9,751
Biological relevance of morphologically indistinguishable but genetically distinct pinto abalone	\$34,426
Field surveys in Hawaii for Hawaiian reef coral, <i>Lingula reevii</i> , and inarticulated brachiopod, <i>Montipora dilatata</i>	\$16,150
Using meta-analysis to determine the status of the U.S. population of sand tiger shark, <i>Carcharias taurus</i>	\$35,000
Coral recovery planning	\$22,989

Table 1

Projects funded for Fiscal Year 2007 Science Center and Region projects through the Proactive Species Conservation Grant Program.

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Box 2: Green sturgeon (Northern DPS)



Oregon Department of Fish and Wildlife

Year Identified as a Species of Concern: 2003

Other Conservation Designations: International Union for Conservation of Nature and Natural Resources—Near Threatened; American Fisheries Society—Endangered; California—Species of Greatest Conservation Need

The green sturgeon is an ocean-oriented sturgeon found in nearshore waters from Baja Mexico to Canada. It is anadromous and spawns in the spring. Green sturgeon differ from co-occurring white sturgeon by the number of side-body scutes (23–30, compared to >38 for white sturgeon), the presence of 1–2 scutes behind the dorsal fin (white sturgeon have none), and a longer snout with barbels closer to the mouth. While many green sturgeon are olive-green dorsally, they can also be gray or golden brown. Green sturgeon can reach 7 feet in length and 350 pounds, and feed mainly on burrowing shrimps. Two distinct population segments (DPS's) have been defined under the ESA—a northern DPS that spawns in the Klamath and Rogue Rivers and a southern DPS that spawns in the Sacramento River (Figure 5). The southern DPS was listed as threatened in 2006, while the northern DPS was identified as a species of concern because of remaining uncertainties in its status.

An 88% decline in commercial landings of all sturgeon occurred from 1887–1901. The best contemporary abundance indicator for the northern DPS appears to be the Klamath Tribal salmon gillnet harvest, in which green sturgeon are bycatch (Figure 6). Data from this fishery indicates that catch has declined slightly over 20+ years, with 200–400 fish taken per year. Spawning populations in the Eel and Trinity Rivers in California have been lost. In addition to historical overfishing, threats to green sturgeon include habitat destruction and alteration from water devel-



Figure 5

Distribution of the northern and southern DPS's of green sturgeon. Map courtesy of S. Lindley, NMFS.

Box 2: Green sturgeon (continued)

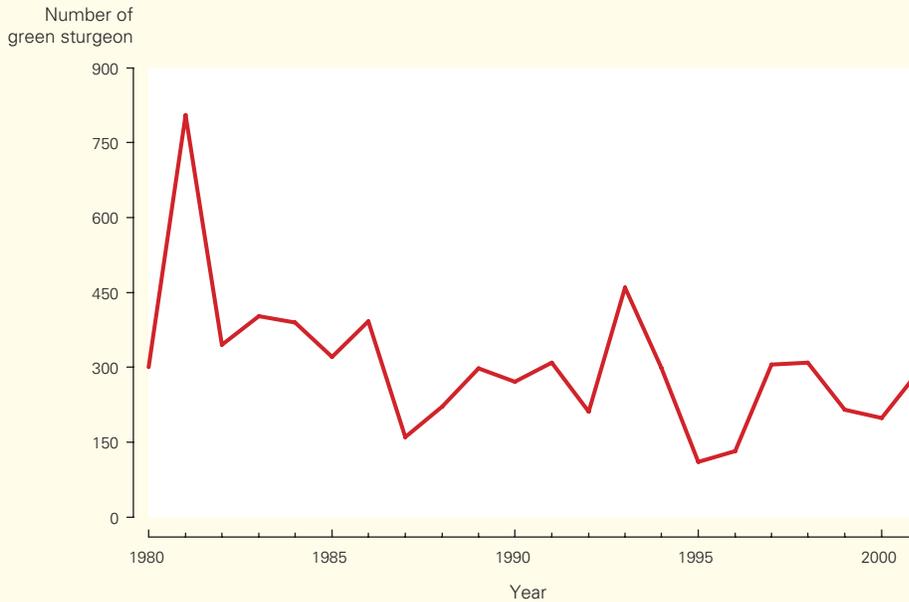


Figure 6
Catch of green sturgeon in the Yurok Tribal salmon gillnet fishery on the Klamath River. Data courtesy of NOAA.

opment, dams, and land-use practices in the Sacramento and Klamath Rivers. Green sturgeon also have many characteristics that make them vulnerable including large size, late maturity, low reproductive productivity, and long life span.

The Species of Concern Program has funded recent projects entitled Modeling the Freshwater Habitat of Green Sturgeon from Sightings Data; Marine Migration and Estuary Use of Green Sturgeon; and Seasonality and Habitat Use of Green Sturgeon in Washington Estuaries. The marine migration study found that green sturgeon migrate north in the fall into Canada, often as far as the north end of Vancouver Island, and return south in the spring. The Washington estuary project indicated that green sturgeon use estuaries throughout their migratory range, and use them in the summer when estuary water temperature is at least 4°F warmer than coastal marine waters (Moser and Lindley, 2007). Overall, these projects suggest a higher risk than previously expected of green sturgeon ending up as bycatch in other fisheries due to their frequent and long-distance movements.

Box 3: Saltmarsh topminnow



Florida Fish and Wildlife Comm.

Year Identified as a Species of Concern: 1991

Other Conservation Designations: International Union for Conservation of Nature and Natural Resources—Not Evaluated; American Fisheries Society—Threatened in Florida, Vulnerable elsewhere; Florida, Louisiana, Mississippi—Species of Greatest Conservation Need

The saltmarsh topminnow is endemic to brackish water estuaries, coastal salt marshes, and backwater slough areas from Galveston Bay, Texas, to Escambia Bay in the western panhandle of Florida. It is one of the smallest members of the topminnow/killifish family (Fundulidae), seldom exceeding 1.75 inches total length, with most individuals ranging from 1 to 1.4 inches. They have cross-hatching on the back and sides that may be gray-green or fainter, and 12–30 dark round spots are often arranged in rows along the midside of the body from above the pectoral fin to the base of the caudal fin. Females become slightly larger than males. Saltmarsh topminnows are tolerant to salinities of 1–20 parts per thousand (ppt). Abundance is highest in *Spartina* and *Juncus* salt marshes with salinity of <12 ppt and depths of 1–2 feet. They belong to the guild of species that mostly uses the edge (rather than the interior) of saltmarshes adjacent to tidal creeks. Other pupfishes (Family Cyprinodontidae) use the marsh interior more. No information is available on diet or feeding habits. Breeding occurs from March to August in shallow flooded marshes. Few adults survive beyond breeding in their second year of life.

Abundance has likely declined as a result of extensive loss of habitat. Habitat alteration, dredging, and marsh erosion are the most serious threats to this species. The conversion of marsh to deeper, open water eliminates important feeding, sheltering, and breeding areas. Dock and other construction along marsh edges may prevent saltmarsh topminnows from accessing flooded marsh. Hurricanes have further reduced available saltmarsh habitat.

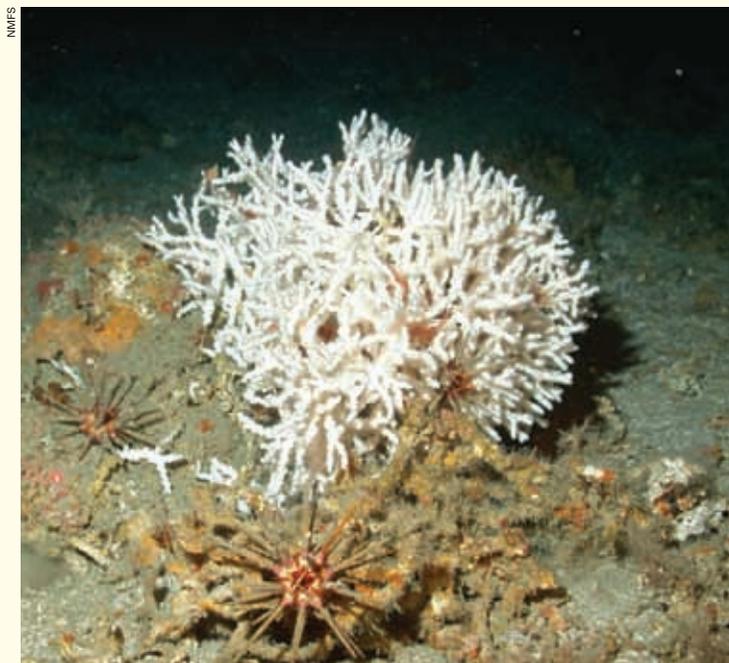
In 2006 and 2007 the Species of Concern Program provided the Mississippi Department of Marine Resources (MDMR) \$143,095 for the study *Fundulus jenkinsi*, Saltmarsh Topminnow: Conservation Planning and Implementation. The MDMR is working cooperatively with The Nature Conservancy and the University of Southern Mississippi on this project. Sampling of saltmarsh topminnow began in March 2007 and continues quarterly using Geographic Information Systems (GIS) to map the species distribution and abundance. In later years of this 5-year project, the MDMR will use this information to focus conservation efforts in areas found to be most important to the species. Bulkhead construction is popular in the areas suspected to be important saltmarsh topminnow habitat; if the research indicates that these areas are in fact important to this species, then the state could address threats to the species through its permitting process. This project is also being conducted in collaboration with three National Estuarine Research Reserves (NERR's) in the area. NERR's are also collaborations between NOAA and the states.

Box 4: Ivory bush coral

Year Identified as a Species of Concern:
1991

Other Conservation Designations: International Union for Conservation of Nature and Natural Resource—Not Evaluated

Ivory bush coral, which is more commonly known by its scientific name, *Oculina varicosa*, is endemic to the southeastern United States and ranges from Cape Hatteras, North Carolina, through the Gulf of Mexico and Caribbean, although the main population occurs off east-central Florida. Colonies are arborescent, with highly clumped, irregular, bushy branches; branches average 1/4 inch in diameter, and colonies can be 4–5 feet tall. Colonies are found to depths of 500 feet on limestone rubble, low-relief limestone



outcrops, and high-relief, steeply sloping prominences. Colonies are semi-isolated, patchy, and low-growing in shallow water, or form larger, massive coalescing aggregates (thickets) with substantial topographic relief in depths over 160 feet. Shallow-water colonies are golden to brown due to symbiotic algae (zooxanthellae), and have shorter, stout branches with closely-spaced corallites. Deep-water colonies are lavender to white in color (they lack symbiotic algae) and have thinly tapered branches. The deeper individuals have an approximately 50% faster growth rate than shallow individuals. The taxonomy of the *Oculina* genus is unclear, and there is debate whether the deep-water and shallow-water forms are the same species. *Oculina* filter-feed on planktonic organisms. *Oculina* serves as a keystone species by providing important habitat; over 300 species of invertebrates have been found living in its branches. The abundances of economically valuable fishes (e.g. grouper, snapper, sea bass, and amberjack) are often higher in areas with high *Oculina* coral cover.

The Species of Concern listing is based on well-documented declines in the *Oculina* Banks area, which lies off the central east coast of Florida. Banks containing partially dead colonies of *Oculina* were first observed in the late 1970's. Submersible surveys performed in 1995–1997 indicated extensive habitat damage. Damage to corals in the *Oculina* Banks area has resulted from the use of mechanical fishing gear, including dredges, bottom long lines, trawl nets, and anchors. As of 2001, it was estimated that only 10% of *Oculina* coral habitat there remained intact. Colonies may also be negatively impacted by sediments and red tides.

In 1984, the South Atlantic Fishery Management Council established the 122 mi² *Oculina* Habitat Area of Particular Concern (HAPC), the world's first protection granted specifically to deep coral habitat. In 2000, the South Atlantic Council expanded the *Oculina* HAPC to 397 mi² and prevented trawling in that area. Current research is focusing on clarifying the uncertain taxonomy of this species. Systematic monitoring of the *Oculina* Banks area began in 2005, and the Species of Concern Program recently provided partial funding for an update of the species' status.

