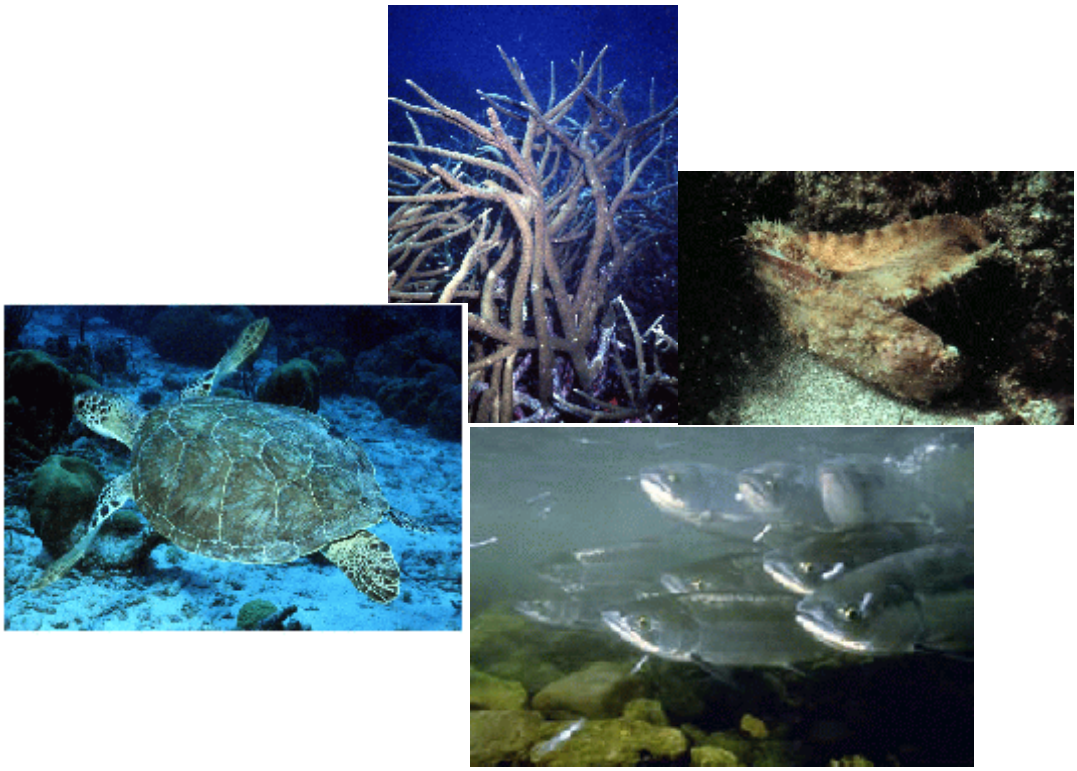
Biennial Report to Congress
On the Recovery Program For Threatened and Endangered Species

October 1, 2000 - September 30, 2002



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Introduction

The Endangered Species Act of 1973 (ESA) has as its primary purpose the conservation of endangered and threatened species and the ecosystems on which they depend. The ultimate goal of such conservation is the recovery of endangered and threatened species and their ecosystems, so that they no longer need the conservation measures afforded them under the ESA. Among other things, the Act requires the development of recovery plans for listed endangered or threatened species (except for those species where it is determined that such a plan will not promote the conservation of the species), which serve as an important tool to organize and guide the recovery process, and ensure that recovery is achieved.

The Endangered Species Act amendments of 1988 included a requirement that the Secretaries of the Interior and Commerce report to Congress every two years on the status of efforts to develop and implement recovery plans, and the status of all species for which recovery plans have been developed. This is the seventh Report to Congress on the status of the recovery program for federally listed endangered and threatened species under the Secretary of Commerce's jurisdiction. The Secretary has delegated responsibility for endangered species recovery to the National Marine Fisheries Service (NOAA Fisheries).

Recovery is the cornerstone and ultimate purpose of the endangered species program. Recovery is the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term conservation and survival in nature can be ensured. The goal of this process is to restore listed species to a point where they are self-sustaining components of their ecosystem and, thus, to allow delisting.

Recovery of threatened and endangered species is a tremendous challenge. It must reverse declines that often have occurred over long periods of time, sometimes centuries. Many listed species are facing multiple threats. Reversing long-term declines of listed species takes many years of research, restoration, protection, and active management. Recovery tasks for a species might include: defining threats through research on biological requirements, managing threats through habitat protection and restoration, imposing conservation measures on user groups, or in some cases, augmenting a population with captive breeding.

This report summarizes efforts to recover species under NOAA Fisheries' jurisdiction from October 1, 2000 through September 30, 2002. Along with recovery activities are accounts of the most recent status and trends of these species. NOAA Fisheries is responsible for 56 species including salmon, sturgeon, other fish, sea grass, mollusks, sea turtles, and marine mammals. The conservation and status of listed marine mammals is most recently reported in the Marine Mammal Protection Act Annual Report to Congress 1999-2000 and is not included in this report.

As of September 30, 2002, 33 U.S. non-marine mammal species (including 26 Pacific salmon

ESUs) under the jurisdiction of NOAA Fisheries were listed as threatened or endangered under the ESA. By the end of fiscal year 2002, 17 (36%) of the U.S. endangered or threatened species had been stabilized or were improving while 15 (31%) are known to be declining and 16 (33%) are unknown or mixed in their status. The numbers are encouraging, especially given the large number of highly imperiled species that have been listed in the past decade. A list of species for which NOAA Fisheries is responsible is provided in Table 1.

Recovery plans can be obtained by writing to:

Endangered Species Division - Recovery Plans
Office of Protected Resources - F/PR3
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3226

This report is available on-line via the NOAA Fisheries-Office of Protected Resources Website at: **http://www.nmfs.noaa.gov/prot_res/readingrm/ESABiennial/2002bien.pdf.**

Recovery plans are available electronically at:
http://www.nmfs.noaa.gov/prot_res/PR3/recovery.html.

The Marine Mammal Protection Act Annual Report to Congress 1999-2000 is also available electronically at:
http://www.nmfs.noaa.gov/pr/PR2/MMPA_Annual_Report/annualreport.html

Table 1: Species Protected By NOAA Fisheries Under the Endangered Species Act

Species	Year of Listing	Status and Population Trends
Loggerhead Sea Turtle	1978	Threatened - Stable
Green Sea Turtle	1978	Endangered/Threatened - Declining
Leatherback Sea Turtle	1970	Endangered - Declining
Hawksbill Sea Turtle	1970	Endangered - Declining
Kemps's Ridley Sea Turtle	1970	Endangered - Increasing
Olive Ridley Sea Turtle	1978	Endangered/Threatened - Declining
Shortnose Sturgeon	1967	Endangered - Mixed
Gulf Sturgeon	1991	Threatened - Stable
White Abalone	2001	Endangered - Declining
Atlantic Salmon	2000	Endangered - Declining
Coastal Cutthroat	1999	Threatened - Unknown
Chum Salmon		
Columbia River	1999	Threatened - Mixed
Hood Canal Summer-run	1999	Threatened - Increasing
Coho Salmon		
Oregon Coast	1998	Threatened - Increasing
Southern Oregon/Northern California Coast	1997	Threatened - Mixed
Central California Coast	1996	Threatened - Declining
Puget Sound/Straight of Georgia	1995	Candidate- Unknown
Lower Columbia River/SW Washington	1995	Candidate - Declining
Steelhead Trout		
Snake River	1997	Threatened - Mixed
Upper Columbia River	1997	Endangered - Increasing
Southern California	1997	Endangered - Unknown
Middle Columbia River	1999	Threatened - Increasing
Lower Columbia River	1998	Threatened - Declining
Upper Willamette River	1999	Threatened - Declining
Oregon Coast	1999	Candidate - Unknown
Klamath Mountatins Province	1998	Candidate- Unknown
Northern California	2000	Threatened - Declining
South Central California Coast	1997	Threatened - Unknown
California Central Valley	1998	Threatened - Declining
Sockeye Salmon		
Snake River	1991	Endangered - Unknown
Ozette Lake	1999	Threatened - Unknown
Baker River	N/A	Not Warranted - Unknown

Table 1: Species Protected By NOAA Fisheries Under the Endangered Species Act

Species	Year of Listing	Status and Population Trends
Chinook Salmon		
Central Valley California, spring-run	1999	Threatened - Increasing
Snake River fall-run	1992	Threatened - Increasing
Sacramento River Winter-run	1994	Endangered - Increasing
Snake River Spring/Summer-run	1992	Threatened - Increasing
Central Valley, fall/late fall-run	1999	Candidate - Increasing
California Coastal	1999	Threatened - Unknown
Puget Sound	1999	Threatened - Mixed
Lower Columbia River	1999	Threatened - Declining
Upper Willamette River	1999	Threatened - Declining
Upper Columbia River, Spring Run	1999	Endangered - Declining
Smalltooth Sawfish	2001	Proposed Endangered - Unknown
Johnson's Sea Grass	1998	Threatened - Unknown
Gulf of California Harbor Porpoise	1985	Endangered - Unknown
Steller Sea Lion		
Eastern Stock	1990	Threatened - Increasing
Western Stock	1997	Endangered - Declining
Caribbean Monk Seal	1967	Endangered - Declining
Guadelupe Fur Seal	1967	Threatened - Increasing
Hawaiian Monk Seal	1976	Endangered - Increasing
Blue Whale	1970	Endangered - Increasing
Bowhead Whale	1970	Endangered - Increasing
Fin Whale	1970	Endangered - Unknown
Humpback Whale	1970	Endangered - Increasing
Northern Right Whale	1970	Endangered - Declining
Sei Whale	1970	Endangered - Unknown
Sperm Whale	1970	Endangered - Unknown

Table 1: Species Protected By NOAA Fisheries Under the Endangered Species Act

Species	Most Recent Action	Month and Year
Alabama Shad	Added to Candidates list	July, 1997
Atlantic Sturgeon	Added to Candidates list	August, 1988
Barndoor Skate	Petitioned. Found not warranted for listing. Retained as a candidate	September, 2002
Black Abalone	Added to Candidates list	June, 1999
Boccacio	Added to Candidates list	June, 1999
Dusky Shark	Added to Candidates list	June, 1997
Elkhorn Coral	Added to Candidates list	June, 1999
Goliath Grouper (formerly "jewfish")	Added to Candidates list	June, 1991
Green Sturgeon	Petitioned and status review completed.	June, 2002
Key Silverside	Added to Candidates list	June, 1991
Largetooth Sawfish	Petitioned. Found not warranted for listing. Retained as a candidate	April, 2001
Mangrove Rivulvus	Added to Candidates list	July, 1997
Nassau Grouper	Added to Candidates list	June, 1991
Night Shark	Added to Candidates list	July, 1997
Opposum Pipefish	Added to Candidates list	June, 1991
Pacific Hake	Petitioned. Found not warranted for listing. Georgia Basin population added to candidates list	November, 2000
Saltmarsh Topminnow	Added to Candidates list	June, 1991
Sandtiger Shark	Added to Candidates list	June, 1991
Smalltooth Sawfish	Proposed endangered	April, 2001
Speckled Hind	Added to Candidates list	July, 1997
Staghorn Coral	Added to Candidates list	June, 1999
Warsaw Grouper	Added to Candidates list	July, 1997
White Marlin	Petitioned. Found not warranted for listing. Added to candidates list. NMFS to reevaluate in 2007	September, 2002

Sea Turtle Recovery

NOAA Fisheries and the U.S. Fish and Wildlife Service share responsibilities for the research, management, and recovery of listed sea turtles. Although both agencies work closely together on many marine turtle recovery activities, NOAA Fisheries is primarily responsible for recovery actions in the marine environment and the USFWS is primarily responsible for recovery actions in the terrestrial environment (i.e., nesting beaches).

Green Turtle - Atlantic Population (*Chelonia mydas*)
The Florida breeding population of green turtles has been designated as endangered, while all other Atlantic populations have been declared threatened. A Recovery Plan was approved on October 29, 1991.

Recovery Criteria:
- The level of nesting in Florida has increased to an average of 5,000 nests per year for at least 6 years.
- At least 25% (105km) of all available nesting beaches (420 km) is in public ownership and encompasses greater than 50% of the nesting activity.
- A reduction in stage class mortality is reflected in higher counts of individuals on foraging grounds.
- All Priority #1 tasks have been successfully implemented.

Major Recovery Actions Needed:
- Provide long-term protection to important nesting beaches.
- Ensure at least 60% hatch success on major nesting beaches.
- Implement effective lighting ordinances or lighting plans on nesting beaches.
- Determine distribution and seasonal movements for all life stages in marine environment
- Minimize mortality from commercial fisheries.
- Reduce threats to population and foraging habitat from marine pollution.

Green Turtle - Pacific Population
All United States Pacific populations of the green turtle are designated at threatened. A Recovery Plan was approved on January 12, 1998.

Recovery Criteria:
- All regional stocks that use U.S. waters have been identified to source beaches based on reasonable geographic parameters.
- Each stock must average 5,000 (or a biologically reasonable estimate based on the goal of maintaining a stable population in perpetuity) females estimated to nest annually (FENA) over six years.
- Nesting populations at "source beaches" are either stable or increasing over a 25-year monitoring period.
- Existing foraging areas are maintained as healthy environments.

- Foraging populations are exhibiting statistically significant increases at several key foraging grounds within each stock region.
- All Priority #1 tasks have been implemented.
- A management plan to maintain sustained populations of turtles is in place.
- International agreements are in place to protect shared stocks.

Major Recovery Actions Needed:

- Stop the direct harvest of green turtles and their eggs, through education and law enforcement actions.
- Eliminate the threat of fibropapillomas to green turtle populations.
- Reduce incidental harvest of green turtles by commercial and artisanal fisheries.
- Determine population size and status through regular nesting beach and in-water censuses.
- Identify stock home ranges using DNA analysis.
- Support conservation and biologically viable management of green turtle populations in countries that share U.S. green turtle stocks.
- Identify and protect primary nesting and foraging areas for the species
- Eliminate adverse effects of development on green turtle nesting and foraging habitats.
- Control non-native predators of eggs and hatchlings, e.g., mongoose, feral cats, and pigs, in the Hawaiian population.

Green Turtle - East Pacific Population

The Mexican breeding population of green turtles is considered to be endangered. A Recovery Plan was approved on January 12, 1998.

Recovery Criteria: See Green Turtle-Pacific Population

Major Recovery Actions Needed:

- Minimize boat collision mortalities, particularly within San Diego County, California.
- Minimize incidental mortalities of turtles by commercial fishing operations.
- Support the efforts of Mexico and the countries of Central America to census and protect nesting east Pacific green turtles, their eggs and nesting beaches.
- Determine population size and status in U.S. waters through regular surveys.
- Identify stock home range(s) using DNA analysis.
- Identify and protect primary foraging areas in U.S. jurisdiction.

Status of the Species

Ggreen turtles are thought to be declining throughout the Pacific Ocean, with the exception of Hawaii, as a direct consequence of overexploitation, incidental take in fisheries, and habitat loss. In the western Atlantic, nesting populations in Florida and Costa Rica have shown increasing trends in recent years. Historically, green turtles were highly prized for their flesh, fat, eggs, and shell, and fisheries in the United States and other parts of the world contributed significantly to the decline of the species. In Texas, Laguna Madre once supported a significant green turtle population which was heavily exploited

in the late 19th and early 20th centuries. Today, directed take of green turtles for local consumption and for commercial purposes remains a major threat in some areas outside of the United States.

Total population size for the green turtle is not known, and trends are particularly difficult to assess because of wide year-to-year fluctuations in numbers of nesting females, difficulties of conducting research on early life stages, and long generation times. Present estimates of females nesting each year in the U.S. average approximately 700 in Florida and 1,000 in Hawaii. Nesting in Florida is likely reduced from historical levels however, recent data indicate that nesting may now be stable or increasing. In Hawaii, nesting numbers are lower than historical levels but have shown a gradual increase. However, the green turtle population in Hawaii and Florida is afflicted with a tumor disease, known as fibropapillomatosis, which is of an unknown etiology and often fatal. Fibropapillomatosis is considered an inhibiting factor to the full recovery of the Hawaiian green turtle population and threatens the recovery of the Florida population as well.

Hawksbill Turtle - Atlantic Population (*Eretmochelys imbricata*)
The Atlantic populations of hawksbill turtles are listed as endangered. A Recovery Plan was approved on November 24, 1993.

Recovery Criteria:
- The adult female population is increasing, as evidenced by a statistically significant trend in the annual number of nests on at least five index beaches, including Mona Island and Buck Island Reef National Monument.
- Habitat for at least 50 percent of the nesting activity that occurs in the U.S. Virgin Islands (USVI) and Puerto Rico is protected in perpetuity.
- Numbers of adults, subadults, and juveniles are increasing, as evidenced by a statistically significant trend on at least five key foraging areas within Puerto Rico, USVI, and Florida.
- All Priority #1 tasks have been successfully implemented.

Major Recovery Actions Needed:
Provide long-term protection to important nesting beaches.
- Ensure at least 75 percent hatching success rate on major nesting beaches.
- Determine distribution and seasonal movements of turtles in all life stages in the marine environment.
- Minimize threat from illegal exploitation.
- End international trade in hawksbill products.
- Ensure long-term protection of important foraging habitats.

Hawksbill Turtle - Pacific Population
All populations of the Pacific hawksbills are listed as endangered. A Recovery Plan was approved on January 12, 1998.

Recovery Criteria:
- All regional stocks that use U.S. waters have been identified to source beaches based on

reasonable geographic parameters.

- Each stock must average 1,000 females estimated to nest annually (FENA) (or a biologically reasonable estimate based on the goal of maintaining a stable population in perpetuity) over six years.
- All females estimated to nest annually (FENA) at "source beaches" are either stable or increasing for 25 years.
- Existing foraging areas are maintained as healthy environments.
- Foraging populations are exhibiting statistically significant increases at several key foraging grounds within each stock region.
- All Priority #1 tasks have been implemented.
- A management plan designed to maintain sustained populations of turtles is in place.
- Ensure formal cooperative relationship with regional sea turtle management programs (South Pacific Regional Environment Program [SPREP]).
- International agreements are in place to protect shared stocks.

Major Recovery Actions Needed:

- Stop the direct harvest of hawksbill turtles and eggs, through education and law enforcement actions.
- Reduce incidental mortalities of hawksbills by commercial and artisanal fisheries.
- Determine population size, status and trends through long-term regular nesting beach and in-water censuses.
- Identify stock home ranges using DNA analysis.
- Support conservation and biologically viable management of hawksbill populations in countries that share U.S. hawksbill stocks.
- Identify and protect primary nesting and foraging areas for the species.
- Eliminate adverse effects of development on hawksbill nesting and foraging habitats.
- Control non-native predators of eggs and hatchlings, e.g., mongoose, feral cats, and pigs, in the Hawaiian population.

Status of the Species

The species is severely depleted throughout its range as a result of decades of intensive harvest of hawksbills. Today, most nesting populations continue to decline, a few appear stable, and a few have begun to improve as a result of years of intensive conservation efforts. Major causes of the continued decline of the hawksbill turtle include commercial exploitation driven by the continuing demand for hawksbill shell (bekko), directed harvest of eggs, poaching of adult and immature turtles for meat, and destruction and degradation of coral reef habitats that provide critically important foraging areas.

Kemp's Ridley Turtle (*Lepidochelys kempii*)

Kemp's ridley turtles are listed as endangered range-wide. A Recovery Plan was approved on August 21, 1992.

Recovery Criteria:

- Continue complete and active protection of the known nesting habitat, and the waters adjacent

to the nesting beach (concentrating on the Rancho Nuevo area) and continue the bi-national protection project.

- Eliminate mortality from incidental catch in commercial shrimping in the United States and Mexico through use of Turtle Excluder Devices (TEDs) and achieve full compliance with the regulations requiring TED use.
- Attain a population of at least 10,000 nesting females in a season.
- Successfully implement all Priority #1 recovery tasks.

Major Recovery Actions Needed:

- Assist Mexico to ensure long-term protection of the major nesting beach and its environs, including the protection of adult breeding stock and enhanced production/survival of hatchling turtles.
- Continue TED regulation enforcement in U.S. waters, expanding the areas and seasonality of required TED use to reflect the distribution of the species. Encourage and assist Mexico to incorporate TEDs in their Gulf of Mexico shrimp fleet.
- Fill in gaps in knowledge of Kemp`s ridley life history that will result in better management. In order to minimize threats and maximize recruitment we should: determine distribution and habitat use for all life stages, determine critical mating/reproductive behaviors and physiology, determine survivorship and recruitment.

Status of the Species

The Kemp's ridley population declined precipitously through the 1900's. Film footage taken in 1947 revealed an estimated 42,000 females nesting in one day, but, by the mid 1980's fewer than 1,000 females were estimated to nest during an entire season. The decline of this species resulted from two primary causes: collection of eggs and harvest of nesting females and accidental capture and drowning of Kemp's ridleys of all ages in shrimp trawls. Today, under strict protection, and as a result of extraordinary bi-lateral efforts by Mexico and the United States, the population appears to be in the early stages of recovery. The nesting population is estimated to be increasing at approximately 10% each year. The increase can be attributed to two primary factors: full protection of nesting females and their nests in Mexico, and the requirement to use turtle excluder devices in shrimp trawls in the United States and in Mexico.

Leatherback Turtle - Atlantic Population (*Dermochelys coriacea*)

The Atlantic population of the leatherback turtle is listed as endangered. A Recovery Plan was approved on April 6, 1992.

Recovery Criteria:

- The adult female population increases over the next 25 years, as evidenced by a statistically significant trend in the number of nests at Culebra, Puerto Rico; St. Croix, USVI; and along the east coast of Florida.
- Nesting habitat encompassing at least 75% of nesting activity in the U.S. Virgin Islands, Puerto Rico and Florida is in public ownership.
- All Priority #1 tasks have been successfully implemented.

Major Recovery Actions Needed:

- Provide long-term habitat protection for important nesting beaches.
- Ensure at least 60 percent hatch success on major nesting beaches.
- Determine distribution and seasonal movements for all life stages in marine environment.
- Reduce threat from marine pollution.
- Reduce incidental capture by commercial fisheries.

Leatherback Turtle - Pacific Population

All populations of the Pacific leatherback turtle are listed as endangered. A Recovery Plan was approved on January 12, 1998.

Recovery Criteria:

- All regional stocks that use U.S. waters have been identified to source beaches based on reasonable geographic parameters.
- Each stock must average 5,000 (or a biologically reasonable estimate based on the goal of maintaining a stable population in perpetuity) females estimated to nest annually (FENA) over six years.
- Nesting populations at "source beaches" are either stable or increasing over a 25-year monitoring period.
- Existing foraging areas are maintained as healthy environments.
- Foraging populations are exhibiting statistically significant increases at several key foraging grounds within each stock region.
- All Priority #1 tasks have been implemented.
- A management plan designed to maintain sustained populations of turtles is in place.

Major Recovery Actions Needed:

- Eliminate incidental take of leatherbacks in U.S. and international commercial fisheries.
- Support the efforts of Mexico and the countries of Central America to census and protect nesting leatherbacks, their eggs, and nesting beaches.
- Determine movement patterns, habitat needs and primary foraging areas for the species throughout its range.
- Determine population size and status in U.S. waters through regular aerial or on-water surveys.
- Identify stock home ranges using DNA analysis.

Status of the Species

Globally, nesting populations have declined in Mexico, Costa Rica, Malaysia, India, Sri Lanka, Thailand, Suriname, Trinidad, Tobago, and Papua New Guinea. The Malaysian nesting population, once one of the largest in the Pacific numbering several thousand nesters annually, is essentially extinct, with only two or three turtles now nesting each year. Nesting along the Pacific coast of Mexico declined at an annual rate of 22% over the last 12 years, with similar alarming declines in Pacific Costa Rica. Data collected on some of the smaller nesting colonies in the Atlantic, such as those of the USVI, Puerto Rico, and southeast Florida, clearly indicate increasing numbers of nests for the past 20 years.

However, nesting at the largest rookeries of the Atlantic, along the Guyanas, appears to be declining over the last decade. Other areas in Trinidad, Venezuela, Atlantic Costa Rica and Colombia have only recently begun to be monitored, and trends have not yet been determined. New census work underway along the West African coast indicates that significant numbers of leatherbacks are nesting there, and these populations will contribute to the overall population estimate for the Atlantic.

Loggerhead Turtle - Atlantic Population (*Caretta caretta*)
The U.S. Atlantic population of loggerhead turtles are listed as threatened. A Recovery Plan was approved on December 26, 1991.

Recovery Criteria:

- The adult female population in Florida is increasing and in North Carolina, South Carolina and Georgia, it has returned to pre-listing nesting levels (NC = 800 nests/season; SC = 10,000 nests per season; GA = 2,000 nests/season).
- At least 25 percent (560 km) of all available nesting beaches (2240 km) is in public ownership, is distributed over the entire nesting range and encompasses greater than 50 percent of the nesting activity.
- All Priority #1 tasks have been successfully implemented.

Major Recovery Actions Needed:

- Provide long-term protection to important nesting beaches.
- Ensure at least 60 percent hatch success on major nesting beaches.
- Implement effective lighting ordinances or lighting plans on all major nesting beaches within each State.
- Determine distribution and seasonal movements for all life stages in marine environment.
- Minimize mortality from commercial fisheries.
- Reduce threat from marine pollution.

Loggerhead Turtle - Pacific Population
The U.S. Pacific population of loggerhead turtles is listed as threatened. A Recovery Plan was approved on January 12, 1998.

Recovery Criteria:

- To the best extent possible, reduce the take in international waters (have and enforce agreements).
- All regional stocks that use U.S. waters have been identified to source beaches based on reasonable geographic parameters.
- All females estimated to nest annually (FENA) at "source beaches" are either stable or increasing for over 25 years.
- Each stock must average 5,000 FENA (or a biologically reasonable estimate based on the goal of maintaining a stable population in perpetuity) over six years.
- Existing foraging areas are maintained as healthy environments.

- Foraging populations are exhibiting statistically significant increases at several key foraging grounds within each stock region.
- All Priority #1 tasks have been implemented.
- A management plan designed to maintain stable or increasing populations of turtles is in place.
- Ensure formal cooperative relationship with a regional sea turtle management program (SPREP).
- International agreements are in place to protect shared stocks (e.g., Mexico and Japan).

Major Recovery Actions Needed:
- Reduce incidental capture of loggerheads by coastal and high seas commercial fishing operations.
- Establish bilateral agreements with Japan and Mexico to support their efforts to census and monitor loggerhead populations and to minimize impacts of coastal development and fisheries on loggerhead stocks.
- Identify stock home ranges using DNA analysis.
- Determine population size and status (in U.S. jurisdiction) through regular aerial or on-water surveys.
- Identify and protect primary foraging areas for the species.

Status of the Species
Recent evidence suggests that the number of females documented nesting in the U.S. Atlantic states of Georgia, South Carolina and North Carolina is at best stable but may be declining, while the number of nesting females in the south Florida nesting assemblage appears to be increasing. In the Pacific, there are no records of loggerhead nesting on beaches under U.S. jurisdiction. Rather, nesting in the Pacific basin is restricted to the western region, primarily Japan and Australia where marked declines in the nesting populations have been recorded. It is thought that between 1,000 to 3,000 female loggerheads may nest annually in all of Japan and as few as 300 in Queensland, Australia. Nesting beach monitoring at one site in Japan (Tokushima Prefecture) has been ongoing since 1954. Surveys at this site showed a marked decline in the number of nests between 1960 and the mid-1970s. Since then, the number of nests has fluctuated, but has been downward since 1985. Monitoring on several other nesting beaches, surveyed since the mid-1970s, revealed increased nesting during the 1980s before declining during the early 1990s. In the south Pacific, long-term trend data from Queensland indicate a 50 percent decline in nesting by 1988-89. The most significant threats to the loggerhead are incidental capture in various commercial fisheries and coastal development of nesting beaches.

Olive Ridley Turtle - Pacific Population (*Lepidochelys olivacea*)
The Mexican breeding population of the olive ridley turtle is listed as endangered while all other populations are listed as threatened. A Recovery Plan was approved on January 12, 1998.

Recovery Criteria:
- All regional stocks that use U.S. waters have been identified to source beaches based on reasonable geographic parameters.
- Foraging populations are statistically significantly increasing at several key foraging grounds

within each stock region.
- All females estimated to nest annually (FENA) at "source beaches" are either stable or increasing for over 10 years.
- A management plan based on maintaining sustained populations for turtles is in effect.
- International agreements are in place to protect shared stocks.

Major Recovery Actions Needed:
- Minimize incidental mortalities of turtles by commercial fishing operations.
- Support the efforts of Mexico and the countries of Central America to census and protect nesting olive ridleys, their eggs and nesting beaches.
- Identify stock home ranges using DNA analysis.

Status of the Species

The western North Atlantic (Surinam and adjacent areas) nesting population has declined more than 80 percent since 1967. Declines are also documented for Playa Nancite, Costa Rica, however other nesting populations along the Pacific coast of Mexico and Costa Rica appear stable or increasing. In the Indian Ocean, Gahirmatha located in the Bhitarkanika Wildlife Sanctuary, India, supports perhaps the largest nesting population. During 1999-2000, over 700,000 olive ridleys nested at Nasi islands and Babubali island, in the Gahirmatha coast. This population continues to be threatened by nearshore trawl fisheries and, annually, thousands of dead olive ridleys are documented as strandings on coastal beaches.

Significant nesting assemblages were once found along the Pacific coast of Mexico, but in recent years the Mexican arribadas have been largely restricted to one site, La Escobilla in the state of Oaxaca. In Costa Rica, a major nesting aggregation is found at Ostional and smaller arribadas also occur in Nicaragua and at several localities in Panama. The olive ridley has been recorded occasionally from Galapagos waters, but it is essentially very rare throughout the islands of the Pacific, and indeed even in the western Pacific it is scarce, although widespread low-density nesting occurs. In the Indian Ocean, four arribada sites have been reported in the Indian State of Orissa, the most important being Gahirmatha Beach. Minor nesting occurs in Sri Lanka, Pakistan, Mozambique, Madagascar, peninsular Malaysia, and various other localities.

Because of the continued existence of several large nesting populations in the Pacific and Indian Ocean, it is probable that the olive ridley is, in terms of absolute numbers of adult individuals in existence, the most abundant sea turtle species in the world. In the eastern Pacific, there is evidence of downward trends at several arribada beaches however, other nesting populations along the Pacific coast of Mexico and Costa Rica appear stable or increasing. In the Indian Ocean, Gahirmatha supports perhaps the largest nesting population however, the population continues to be threatened by incidental capture in by nearshore trawl fisheries. In the western Atlantic, there has been a decline in abundance of the nesting females (more than 80 percent since 1967), and this population may warrant reclassification as endangered.

Major Threats to Turtles in the Marine Environment (not in priority order)

- Outside of the U.S., direct harvest of immature and adult turtles is a serious threat. NOAA Fisheries continues to be an active member of the Inter-American Convention for the Protection and Conservation of Sea Turtles (ratified by the United States and came into force in 2001). The treaty aims to promote cooperation and coordination between countries of the western hemisphere region to recover sea turtles.
- A disease, known as fibropapillomatosis (FP), originally identified in green turtles, but now affecting loggerhead, Kemp's ridley, and olive ridley turtles as well, has emerged as a serious threat to sea turtle recovery. In the U.S., the disease is most notably present in green turtles of Hawaii, Florida, and the Caribbean, but is found at other sites around the world as well. FP is expressed as tumors which occur primarily on the skin and eyes, and the disease can be fatal. The cause of the disease remains unknown, however, a viral etiology is suspected. The expression of the disease has been systematically monitored in several locales in Hawaii. At a study site on southern Molokai, for example, where tumors were virtually unknown before 1988, the prevalence of tumored turtles ranged from 42-56% during the 1995-1997 surveys. In Florida, up to 50% of the juvenile green turtles captured in the Indian River Lagoon are infected, and there are similar reports from other sites in Florida, including Florida Bay, as well as from Puerto Rico, and the U.S. Virgin Islands. Fibropapillomatosis is considered the primary impediment to the full recovery of the Hawaii green turtle population and the disease may hinder the recovery of green turtle populations elsewhere as well. Research to determine the cause of this disease is a high priority and is underway at federal, state, and private institutions.
- The requirement to use TEDs in the commercial shrimp fleet of the U.S. and Mexico has greatly reduced the mortality of turtles in shrimp trawls. Turtles are also accidentally captured in non-shrimp trawls and efforts to reduce incidental capture in these fisheries are needed to enhance recovery. NOAA Fisheries recently required that TED escape openings be enlarged to allow larger turtles to escape the net. NOAA Fisheries also continues to implement TED inspections of foreign shrimp fleets in conjunction with the Department of State to ensure that shrimp sold to the U.S. was harvested in a manner that would not adversely impact sea turtles (i.e. TEDs are used in shrimp fisheries operating in areas where sea turtles are present).
- Several thousand commercial vessels and an extensive recreational fishery are involved in hook and line fishing for various coastal species. The capture of turtles in these fisheries is not uncommon, but the magnitude of the take is not known.
- Throughout the late 1980's and early 1990's, significant numbers of green turtles were killed by gill and trammel net fisheries off the east coast of central Florida. These takes were significantly reduced with the prohibition of gillnets in Florida waters in the mid-1990's. Recently, NOAA Fisheries and North Carolina have managed coastal gill nets to reduce interactions with sea turtles. However, gill nets fished in other areas of the remain a serious threat.
- Pound net fisheries are primarily a problem in Virginia waters, where turtles become entangled in the gear and can drown. To address the problem, NOAA Fisheries recently restricted the type of leaders that could be deployed in pound nets in the Chesapeake Bay.
- Turtles are incidentally taken by the U.S. pelagic longline fisheries in the Atlantic and eastern Pacific when they are hooked and/or become entangled with the mainline or buoy line. While

some turtles are released alive, others are dead when recovered and a percentage of those released alive will die from their injuries. NOAA Fisheries continues to implement time area closures and support or conduct research to identify gear modifications or changes in fishing practices that would reduce sea turtles interactions in this fishery.

- Traps, commonly used to capture crabs, whelk, lobster and reef fish result in incidental takes of turtles when they become entangled in the traps or trap lines and drown.
- Turtles can consume a wide variety of marine debris such as plastic and styrofoam pieces, tar balls, balloons, plastic bags, and plastic pellets. Effects of consumption include interference in metabolism or gut function, even at low levels of ingestion, as well as absorption of toxic byproducts. Discarded monofilament fishing line and abandoned netting can entangle turtles, causing injury and/or death.
- Illegal harvesting of turtles is uncommon in the mainland U.S. Illegal take of green turtles in the Caribbean, particularly near Puerto Rico, is a more significant problem; however, no estimates of take exist. Legislation and treaties to protect and conserve green turtles are more extensive than they have been in the past, although laws are often poorly enforced, especially among developing nations and smaller islands where resources and geography limit implementation.
- Turtles are at risk when encountering marine pollution such as oil spills. Respiration, skin, blood chemistry and salt gland functions are affected. Pesticides, heavy metals, and PCB's have been detected in turtles and eggs, but the effects are unknown.
- Dredging can result in habitat destruction by degrading nesting sites and/or foraging grounds. Hopper dredges can also kill turtles caught in dragheads. NOAA Fisheries has implemented restrictions on hopper dredging activities in the Gulf and Atlantic to reduce the likelihood of dredges encountering turtles.
- In areas where recreational boating, commercial fishing, and ship traffic are intense, propeller and collision injuries are common and likely play a significant role in hampering recovery. This is a particularly difficult issue to address, given the number of registered vessels and their wide-ranging activities.
- Marina and dock construction result in the degradation and/or destruction of turtle foraging habitat. This development also leads to increased boat traffic, increasing the risk of propeller and vessel collision injuries.
- Coastal power plants which draw their cooling water from nearshore and estuaries waters can entrain sea turtles and cause mortality. Measures have been put in place at some plants to reduce the risk to sea turtles.

Pacific Salmon Recovery

NOAA Fisheries is utilizing all the tools provided in the ESA and by Congress to bring about the recovery of Pacific salmon and steelhead. These include regulatory tools found in ESA sections 4(d), 7, and 10, and planning tools such as the recovery planning provisions of ESA section 4(f). The agency is also working to integrate these tools with other Federal, state, regional, local, tribal, and individual programs–both voluntary and regulatory–that also address salmon recovery to ensure that the region's resources and capacity are used as effectively as possible. Pacific salmon recovery will require improving survival throughout every salmon life-history phase. Recovery efforts must therefore address a broad range of activities (e.g., activities affecting harvest, hatchery management, habitat, and hydropower operations) and ecological components (e.g., fresh water, estuarine, and ocean environments). The complexity of this task reinforces the importance of integrating NOAA Fisheries' programs with other Federal and non-Federal programs to restore ecosystems to a point where they are capable of supporting sustainable salmon populations.

Two significant events occurred in 2001 that will bring about adjustments in the management of listed Pacific salmon and steelhead populations. First, a September 2001 ruling in a lawsuit involving Oregon Coast coho salmon (*Alsea Valley Alliance v. Evans*) concluded that NOAA Fisheries had violated provisions of the ESA by listing only part of an Evolutionarily Significant Unite, or ESU (i.e., NOAA Fisheries had included hatchery populations in the ESU but not listed them).[1] Although this ruling applied directly only to Oregon Coast coho salmon, the same situation (hatchery populations considered part of listed ESUs but not themselves listed) also applied to 24 of the 26 listed ESUs of Pacific salmon and steelhead. In response to the decision, NOAA Fisheries agreed to revise its policy on how it considers hatchery reared fish in its listing determinations and to conduct new status reviews for all 26 listed ESUs as well as for 1 candidate ESU.

Second, on April 30, 2002, NOAA Fisheries, as part of a consent decree in *National Ass'n of Home Builders v. Evans*, agreed voluntarily to vacate and remand the critical habitat designations for 19 ESUs for which critical habitat had been designated on February 16, 2000. This voluntary remand allowed NOAA Fisheries to revisit the economic analysis used in the designations in light of the 10th Circuit Court decision in *New Mexico Cattlegrowers Assn. v. U.S. Fish & Wildlife Service*. NOAA Fisheries plans to complete the re-designation of critical habitat for the affected ESUs, as well as the designation of critical habitat for the Northern California steelhead ESU (listed in 2000), in 2004.

[1]For the purposes of fulfilling the mandates of the ESA, NOAA Fisheries treats ESUs–or Evolutionarily Significant Units–as "species" as the Act defines the term ("...including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature") 16 U.S.C. 1531-1544.

Below is a discussion of recovery planning efforts underway for Pacific salmon and steelhead, a discussion of other ESA actions that are contributing to recovery, an update on the status of the species, and a description of major threats facing the species.

Pacific Salmonid Recovery Planning

NOAA Fisheries believes that it is critically important to ground the recovery planning process in the many state, regional, tribal, local, and private conservation efforts already underway throughout the region and has established a recovery planning process to maximize local involvement and capitalize on ongoing efforts. The ESA requires that recovery plans contain (1) objective, measurable goals for delisting; (2) a comprehensive list of the actions necessary to achieve the delisting goals; and (3) an estimate of the cost and time required to carry out those actions.

To develop recovery plans that meet ESA statutory requirements as well as goals for local involvement, NOAA Fisheries has organized the 26 listed ESUs into 8 recovery areas or "domains": Puget Sound, Willamette/Lower Columbia, Interior Columbia, Oregon Coast, Southern Oregon/Northern California, North-Central California Coast, South-Central California, and California Central Valley (see Table 1).

For each domain, a recovery plan will be developed that addresses all listed salmon and steelhead ESUs within that domain. A Technical Recovery Team (TRT) will be appointed for each domain, comprised of NOAA Fisheries scientists as well as technical experts from other entities. The TRTs will conduct technical analyses related to recovery goals and scenarios (Recovery Planning Phase I). To determine the actions that should be carried out to achieve the recovery goals, NOAA Fisheries will work with ongoing efforts in each domain to develop an appropriate policy and planning structure (Recovery Planning Phase II). Regardless of how the recovery planning process is structured, NOAA Fisheries will ensure that the time frame, degree of certainty, and economic cost for achieving recovery goals will be assessed for all recovery plans.

TRTs have now been established for 7 recovery domains, and the remaining TRT will be appointed shortly (see Table 1). For the Interior Columbia domain, NOAA Fisheries released interim recovery planning targets in the spring of 2002, and the Puget Sound and Willamette/Lower Columbia TRTs also produced draft documents related to recovery goals during the biennium. Phase II recovery planning policy groups have been established for the Puget Sound and Willamette/Lower Columbia recovery domains. These groups are currently evaluating salmon recovery scenarios and addressing issues of coordination and the overall structure and content of the recovery planning process.

NOAA Fisheries has also established a Recovery Science Review Panel (Panel) to guide the recovery planning process throughout the West Coast. The Panel will (1) review core scientific principles and elements of the recovery planning process; (2) ensure that well-accepted and consistent ecological and evolutionary principles form the basis for all recovery efforts; (3) review processes and products of all TRTs for scientific credibility and consistency; and (4) oversee a recovery plan peer review process.

Given adequate funding, NOAA Fisheries intends to complete formal recovery plans for all 26 listed ESUs by 2007.

Regulatory Activities

The regulatory tools of the ESA are being used to alleviate many threats to the species in the short term, while the ongoing recovery planning process assesses specific threats in each ESU and develops a suite of actions to remove those threats and rebuild sustainable populations over the longer term. These regulatory tools and their contributions to recovery are described below.

4(d) Rule Activities

When a species is listed as threatened, section 4(d) of the ESA requires NOAA Fisheries to issue regulations deemed "necessary and advisable to provide for the conservation of" the species. These regulations (referred to as "4(d) rules") may include any or all of the ESA section 9 prohibitions against take, which apply automatically to protect endangered species. In addition, they may contain specific proscriptions or exceptions instead of, or in addition to, the general prohibitions against take. Thus, a 4(d) rule can be used to "limit" application of the take prohibition to certain activities and programs so long as those activities and programs adequately protect the listed species. Incorporating such "limits" into a 4(d) rule is advantageous to both NOAA Fisheries and non-Federal entities. Activities carried out in accordance with 4(d) rule limits can help protect threatened species and their habitats while relieving non-Federal entities from liability for the "take" prohibitions of the ESA.

Twenty-one ESUs of West Coast salmonids are now listed as threatened. In general, the 4(d) rules for the ESUs that were listed, initially simply put in place the section 9 take prohibitions. On July 10, 2000, NOAA Fisheries issued a 4(d) rule (65 FR 42422) making the section 9 take prohibitions generally applicable to fourteen threatened ESUs with the exception of thirteen programs and circumstances that are adequately protective of the ESUs. These 13 "limits" on the take prohibitions either apply to specific programs (e.g., the Forest and Fish Agreement for forestry practices on private lands in Washington) or establish a process and criteria by which specific programs can receive the same ESA coverage in the future (e.g., limits for hatchery and harvest management plans, for road maintenance activities, for scientific research activities, and for municipal, residential, and commercial development). On Jan 9, 2002, NOAA Fisheries issued a second 4(d) rule (67 FR 1116) which applied the section 9 take prohibitions to three threatened salmonid ESUs in California and created similar take limits or exceptions for specific programs or categories of activities as the July 2000 4(d) rule.

In the biennium covered by this report, a total of 760 programs or activities have been approved or submitted for approval under the 4(d) rule (these included 681 research activities and 79 programs in areas such as hatchery and harvest management, road maintenance, and tribal resource management plans). These programs benefit salmon by addressing threats and by being conducted in a way that is adequately protective of listed ESUs. In turn, the non-Federal entities conducting the activities are benefitted by the certainty that they are in compliance with the ESA for those activities.

Section 7 Activities

Under section 7 of the ESA, NOAA Fisheries conducts hundreds of informal and formal consultations every year with Federal agencies that authorize, fund, or carry out actions that may affect Pacific salmonids. These consultations ensure that these actions are conducted in ways that are not likely to jeopardize the continued existence of listed species or adversely modify or destroy critical habitat. The scope of section 7 consultations includes actions related to land management, transportation, restoration, fill and removal of materials in stream channels, and hydropower operation.

Perhaps the most significant consultation completed in the biennium covered by this report was the consultation on the operation of the Federal Columbia River Power System. This consultation included the development of a Columbia Basinwide Salmon Recovery Strategy. The strategy outlines specific actions needed in habitat, harvest, hatcheries, and hydropower, which together are expected to prevent extinction of 12 ESA- listed salmonid populations and ultimately lead to their recovery without removal of four dams on the lower Snake River.

Section 10 Activities

ESA section 10 provides for authorization of take that may occur as a part of otherwise lawful activities carried out by non-Federal entities (e.g., timber harvest, water supply management, and other resource extraction and land management activities) or as part of scientific research or enhancement activities. Thus, ESA section 10 allows those conducting the activities to proceed with the certainty of ESA compliance and with the assurance that any adverse impacts caused to listed species by those activities are being avoided, minimized, or mitigated.

During the period covered by this report, NOAA Fisheries issued over 600 new and modified permits for scientific research and enhancement activities under ESA section 10. Activities covered by these permits included evaluation of the timing and abundance of juvenile salmonid migration to the ocean; evaluation of transport (e.g., trucking and barging) of juveniles around dams; and the management of artificial propagation programs to compensate for salmon production lost due to construction and operation of private and Federal hydroelectric facilities.

At the end of 2002, NOAA Fisheries' Northwest and Southwest regions were working on approximately 20 large-scale, long-term Habitat Conservation Plans (HCPs) under ESA section 10. Many of these HCPs concern the management of large tracts of timber on state or private forest lands in the Pacific Northwest and Northern California. Others address gravel mining, hydropower, or water management activities such as irrigation, wastewater treatment, or water supply management. A total of eleven HCPs were issued by NOAA Fisheries Northwest and Southwest regions during the biennium.

Pacific Coastal Salmon Recovery Fund

Another important element of salmon recovery is the Pacific Coastal Salmon Recovery Fund (PCSRF), which was established by Congress in FY2000 to provide grants to the states and tribes to assist state, local, and tribal salmon recovery efforts. The goals of the PCSRF are to make significant contributions to the conservation and restoration of healthy and sustainable Pacific salmon runs and the habitats upon which they depend across a wide range of environmental conditions, and to provide harvestable

surpluses to support treaty and non-treaty fishing opportunities consistent with existing law. The PCSRF supplements existing state, tribal, and federal programs to foster development of federal-state-tribal-local partnerships in salmon recovery and conservation and promotes efficiencies and effectiveness in local recovery efforts through enhanced sharing and pooling of capabilities, expertise, and information.

The PCSRF is funding many successful projects that are beginning to show direct benefits to anadromous fish, such as salmon using newly opened or improved habitat. A majority of the PCSRF has been spent on habitat restoration activities as this is where the greatest needs exist for salmon recovery. The PCSRF program has also filled a vital need in its initial years by supporting recovery planning and building organizational infrastructure so that the long-term goal of salmon recovery can be achieved. Over 2,000 projects have been funded from FY2000 through FY2002. A report on the PCSRF and funded activities can be obtained at: http://www.nwr.noaa.gov/pcsrf/index.htm.

Table 1. Status of NOAA Fisheries ESA Recovery Planning Efforts				
Recovery Planning Domain	ESU's included	Phase I Technical Recovery Team established	Phase II process established	Estimated date of completed recovery plan
Puget Sound	Puget Sound chinook Hood Canal Summer chum Ozette Lake Sockeye	X	X	2004
Willamette/ Lower Columbia	Upper Willamette River chinook Lower Columbia River chinook Lower Columbia River steelhead Columbia River chum Upper Willamette River Steelhead	X	X	2005
Interior Columbia	Upper Columbia River Spring chinook Snake River Spring/Summer chinook Snake River Fall chinook Upper Columbia River steelhead Mid-Columbia River steelhead Snake River steelhead Snake River sockeye	X		2005
Oregon Coast	Oregon Coast coho	X		2006
S. Oregon/N. California Coasts	Southern Oregon/Northern California Coasts coho	X		2006
N. Central California Coast	California Coast chinook Central California Coast coho Central California Coast steelhead Northern California steelhead	X		2006
S. Central California Coast	South-central California Coast steelhead Southern California steelhead			2007
California Central Valley	Central Valley Spring chinook Sacramento River Winter chinook Central Valley steelhead	X		2006

Status of the Species

Listing Actions

The only listing action related to Pacific salmon that occurred from October 1, 2000, to September 30, 2002, was the extension of the range of the Southern California steelhead ESU to the U.S./Mexico border. The range was extended to encompass additional watersheds in which steelhead have been observed. During this period the Klamath Mountains Province steelhead ESU was also determined to be not warranted for listing under the ESA

Critical Habitat

Critical Habitat designations are currently in place for 6 Pacific salmon ESUs. Critical habitat designations were vacated for 19 ESUs on April 30, 2002, as part of a consent decree in *National Ass'n of Home Builders v. Evans* (see additional discussion above). Critical habitat has not been designated for the Northern California steelhead ESU, which was listed in 2000.

Overall Status

NOAA Fisheries began a review of the status of all listed Pacific salmon and steelhead ESUs, and 1 candidate ESU, in February 2002 in response to the September 2001 ruling in *Alsea Valley Alliance v. Evans* (see additional discussion of this ruling above). Over the past two years, the abundance of both hatchery reared and naturally spawning populations of West Coast salmon and steelhead has generally increased. These increases for some listed ESUs are likely due to changes in ocean conditions, as well as to improvements in harvest regimes, operation of hydropower facilities, habitat, and hatchery management that have been put in place since the listings occurred. While improvements have occurred in some ESUs, others have exhibited mixed trends or have declined in abundance. Recent increases in salmon and steelhead returns should be viewed as an opportunity and a sign that recovery can be achieved, but not as an indicator that recovery has been achieved at this point. It will take several salmon generations of continued strong returns to achieve recovery and sustainability of the listed ESUs. The following figures show trends in abundance of listed ESUs for which data is available. These trends give an indication of how the runs have fluctuated over time, what their abundance was at the time of listing, and their current abundance relative to historic levels. While the goal of ESA recovery is not to achieve historic abundance, these historic levels do provide a benchmark to track recovery progress. Additionally, recovery is not measured by abundance alone, but also includes considerations of ESU productivity, population spatial structure, and diversity. As recovery plans are developed, we will develop specific recovery goals for each ESU.

The tables below were developed to describe the current status of the 26 listed and 1 candidate ESU(s) of Pacific salmon and steelhead. When viewing the table please keep in mind the following:

1. The ESA status of these 27 ESUs is currently under review.

2. The sources for historical abundance estimates vary considerably among the ESUs. Historical abundance estimates may be derived from past surveys or peak catch data, anecdotal accounts,

estimates of habitat carrying capacity, best professional judgment etc. Additionally, the timeframe referenced by historical abundance differs among ESUs ranging from 30 to over 100 years ago.

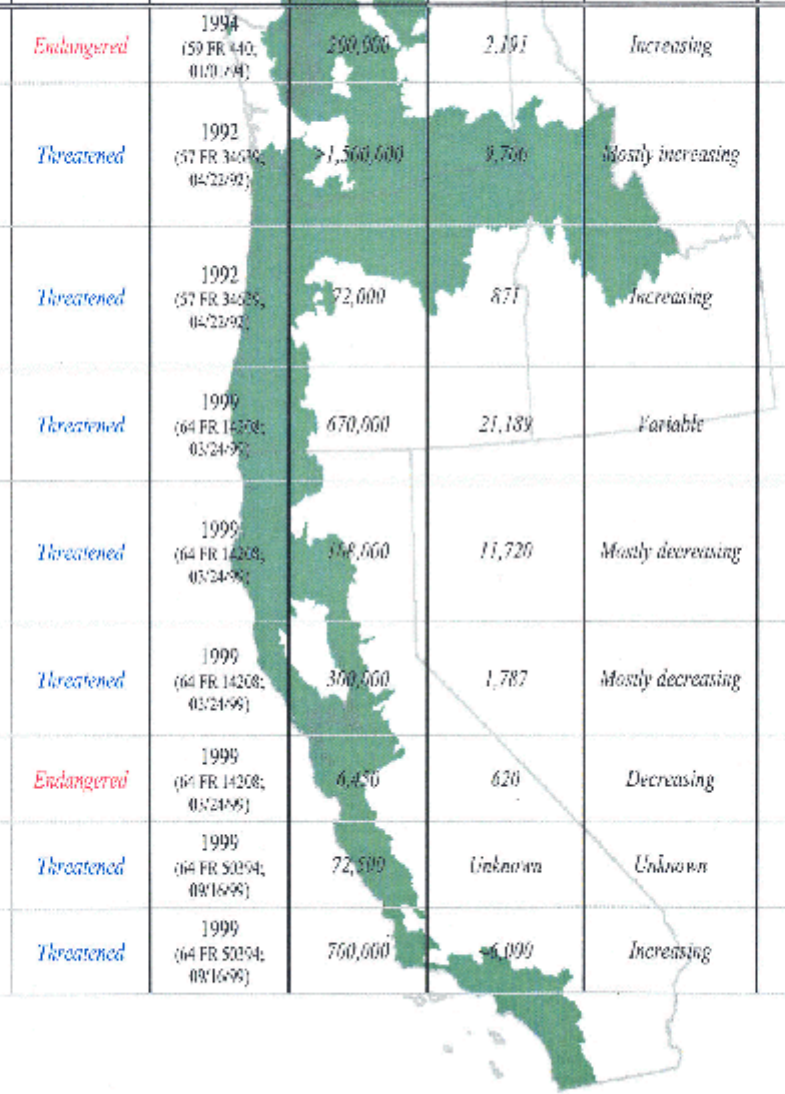
3. Abundance estimates were obtained from *Preliminary Conclusions Regarding the Updated Status of Listed ESUs of West Coast Salmon and Steelhead* (West Coast Biological Review Team. Co-manager review draft. February 2003). These recent estimates represent the sum of the geometric mean abundance for populations within the ESU (where available) over the most recent 5 years of data available. Additionally, the sources of the abundance data vary among and within ESUs, spanning the full spectrum of estimation methods (e.g., direct counts of returning salmon at dams, spawner estimates from redd surveys, etc.). The totals presented, therefore, represent only a very rough estimate of salmonid abundance in these ESUs. Many values were estimated indirectly (e.g., from a total run size of hatchery and natural fish utilizing an assumed fraction of natural returns or spawners) and should be regarded with healthy skepticism.

4. Trend evaluations are also obtained from *Preliminary Conclusions Regarding the Updated Status of Listed ESUs of West Coast Salmon and Steelhead* (West Coast Biological Review Team. Co-manager review draft. February 2003). Recent trends (for the most recent 5 years of abundance data available) have been calculated for many populations with these ESUs; however, trends are often not coherent among populations within an ESU. Accordingly, qualitative descriptions of recent trends for the ESU as a whole are provided. "Decreasing" describes ESUs for which all or almost all populations exhibited declining trends; "mostly decreasing" describes ESUs for which the majority of the populations exhibited declining trends; "mixed" describes ESUs for which populations exhibited increasing and declining trends and no overall pattern emerged; "mostly increasing" describes ESUs for which the majority populations exhibited increasing trends; and "increasing" describes ESUs for which all or almost all of the populations exhibited increasing trends. Please refer to the full Biological Review Team draft report cited above for population-specific trend information (the report can be found on-line at http://www.nwfsc.noaa.gov/cbd/trt/brt/brtrpt.html).

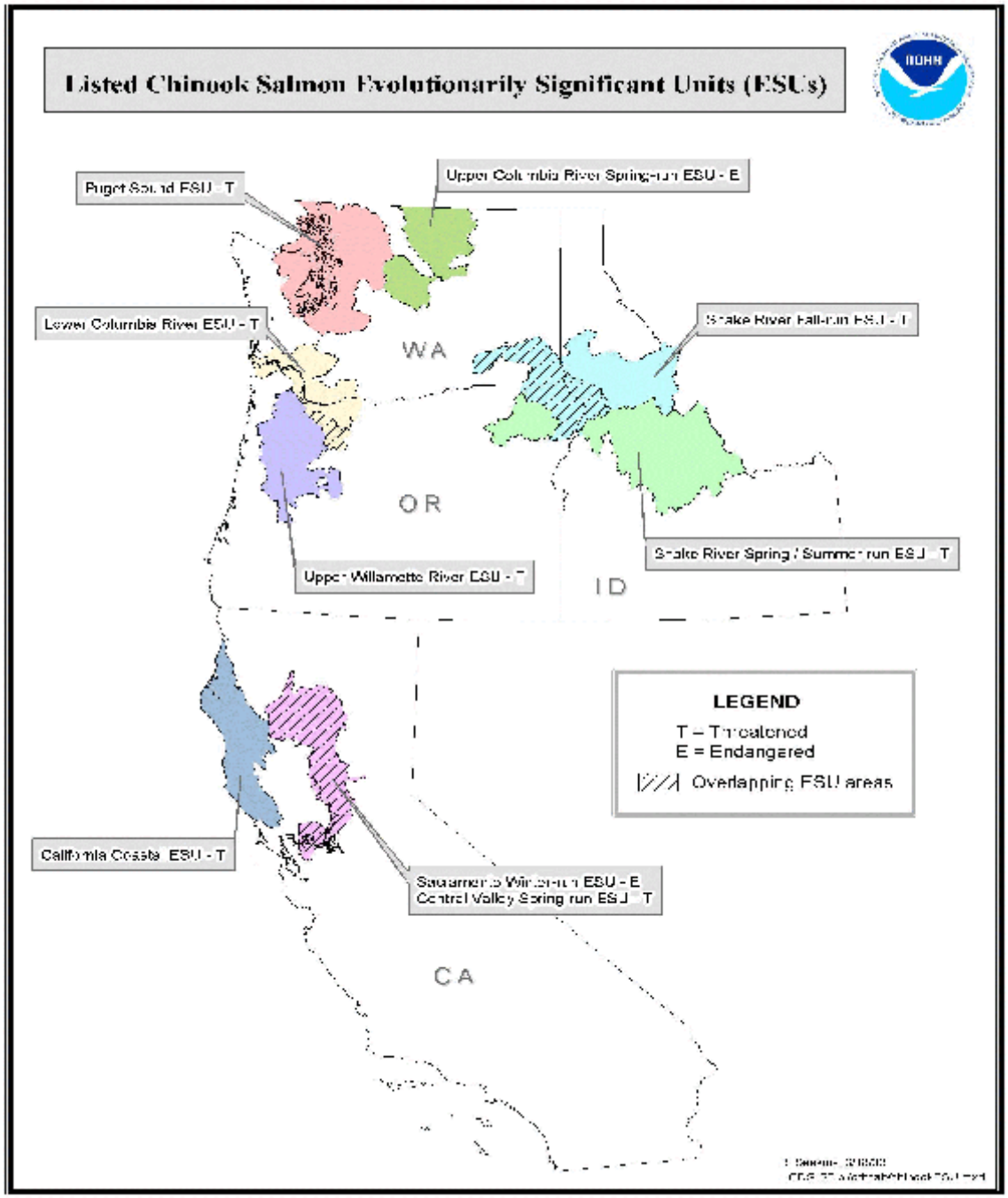
5. On April 20, 2002, the critical habitat for 19 ESUs of Pacific salmon and steelhead designated in 2000 were vacated by court order and remanded to NOAA Fisheries for new rulemaking ("vacated"). The critical habitat for 6 ESUs designated prior to the 2000 rulemaking, however, remain in place ("in effect").

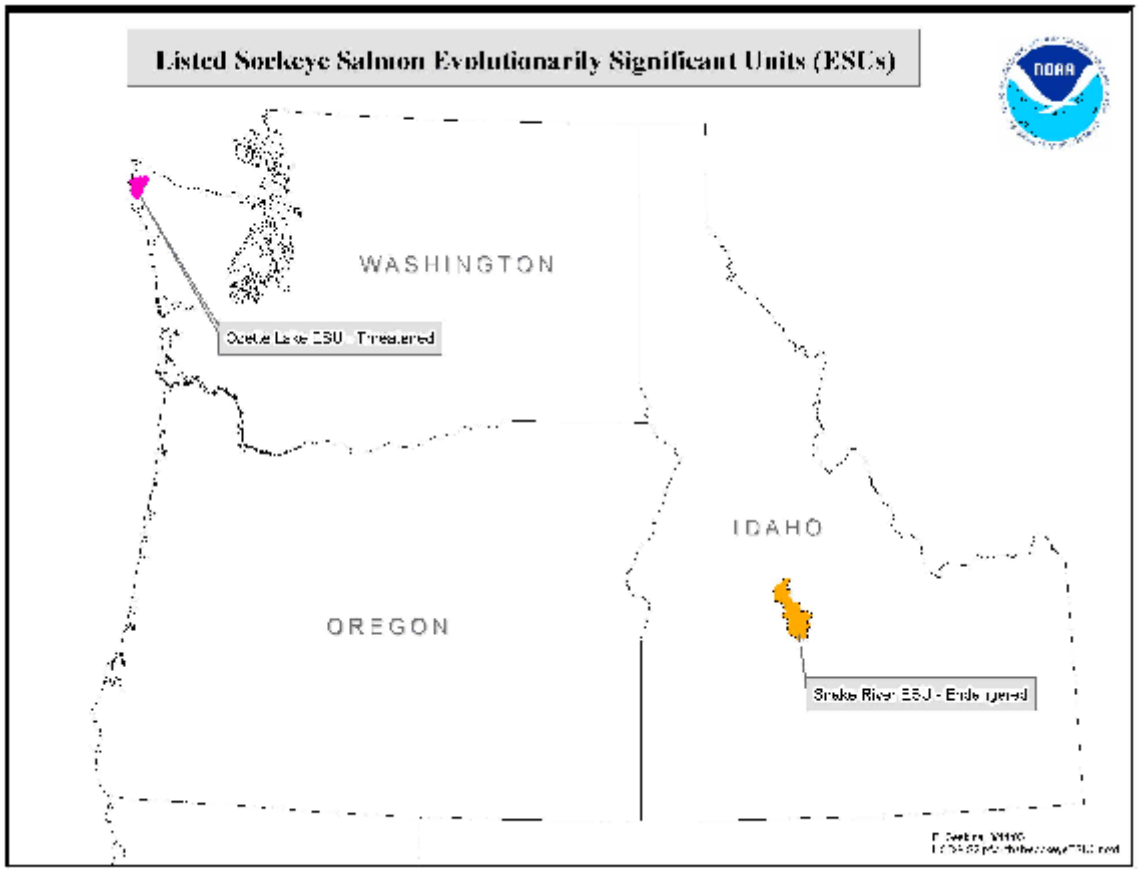
Chinook Salmon Evolutionarily Significant Units (ESUs) Listed Under the Endangered Species Act (ESA)

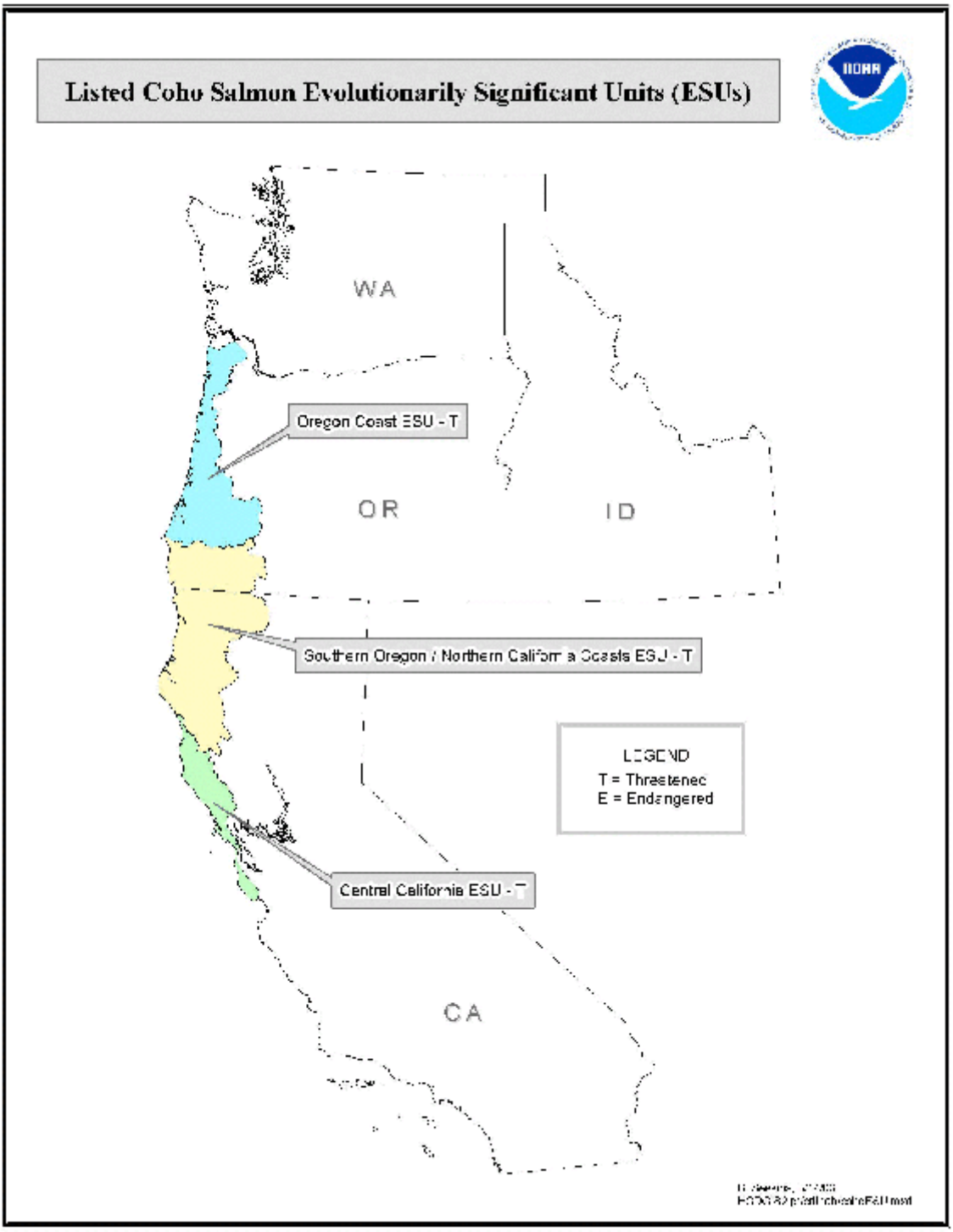
Salmonid Species	ESU Name	Current ESA Status[1]	Year Listed (FRN citation)	Historical Abundance[2]	Recent Abundance of Natural Fish[3]	Recent Trends in Natural Fish Abundance[4]	Critical Habitat Designation[5]	Threats
Chinook Salmon	Sacramento River Winter-run	*Endangered*	1994 (59 FR 440; 01/0[illegible]/94)	*200,000*	*2,191*	*Increasing*	*In effect*	• Loss of diversity • Fish passage
	Snake River Spring/Summer-run	*Threatened*	1992 (57 FR 34639; 08/22/92)	*>1,500,000*	*9,760*	*Mostly increasing*	*In effect*	• Habitat loss & degradation • Fish passage • Incidental harvest • Hatchery production
	Snake River Fall-run	*Threatened*	1992 (57 FR 34639; 08/22/92)	*72,000*	*871*	*Increasing*	*In effect*	• Habitat loss & degradation • Fish passage • Incidental harvest • Hatchery production
	Puget Sound	*Threatened*	1999 (64 FR 14308; 03/24/99)	*670,000*	*21,189*	*Variable*	*Vacated*	• Habitat loss & degradation • Fish passage • Hatchery production
	Lower Columbia River	*Threatened*	1999 (64 FR 14208; 03/24/99)	*[illegible],000*	*11,720*	*Mostly decreasing*	*Vacated*	• Habitat loss & degradation • Fish passage • Incidental harvest • Hatchery production
	Upper Willamette River	*Threatened*	1999 (64 FR 14208; 03/24/99)	*300,000*	*1,787*	*Mostly decreasing*	*Vacated*	• Habitat loss & degradation • Fish passage • Loss of diversity
	Upper Columbia River Spring-run	*Endangered*	1999 (64 FR 14208; 03/24/99)	*6,420*	*620*	*Decreasing*	*Vacated*	• Fish passage • Habitat degradation • Hatchery production
	California Coastal	*Threatened*	1999 (64 FR 50394; 09/16/99)	*72,500*	*Unknown*	*Unknown*	*Vacated*	• Low abundance • Few populations • Paucity of data
	Central Valley Spring-run	*Threatened*	1999 (64 FR 50394; 09/16/99)	*760,000*	*[illegible],000*	*Increasing*	*Vacated*	• Habitat loss • Loss of diversity • Hatchery production

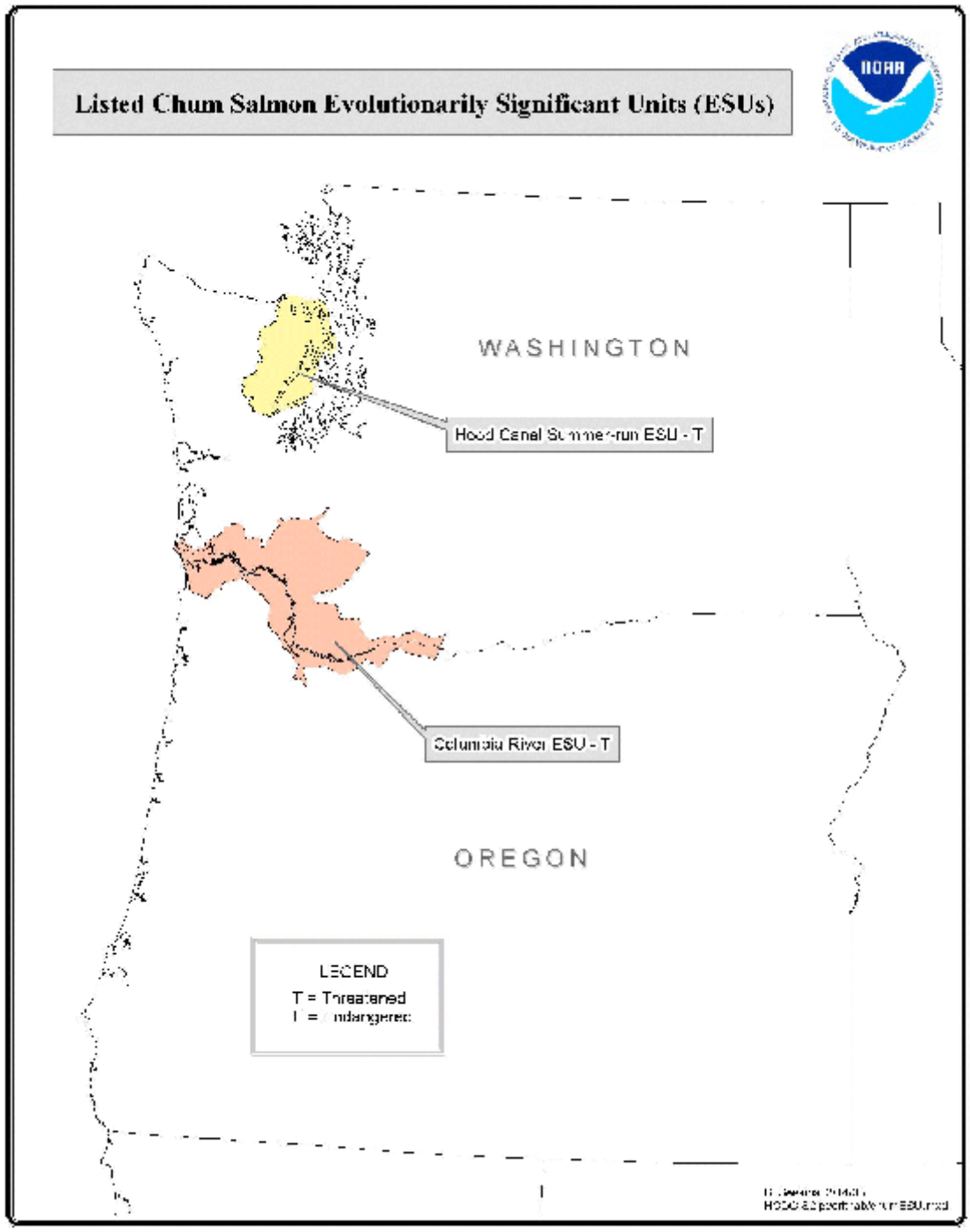


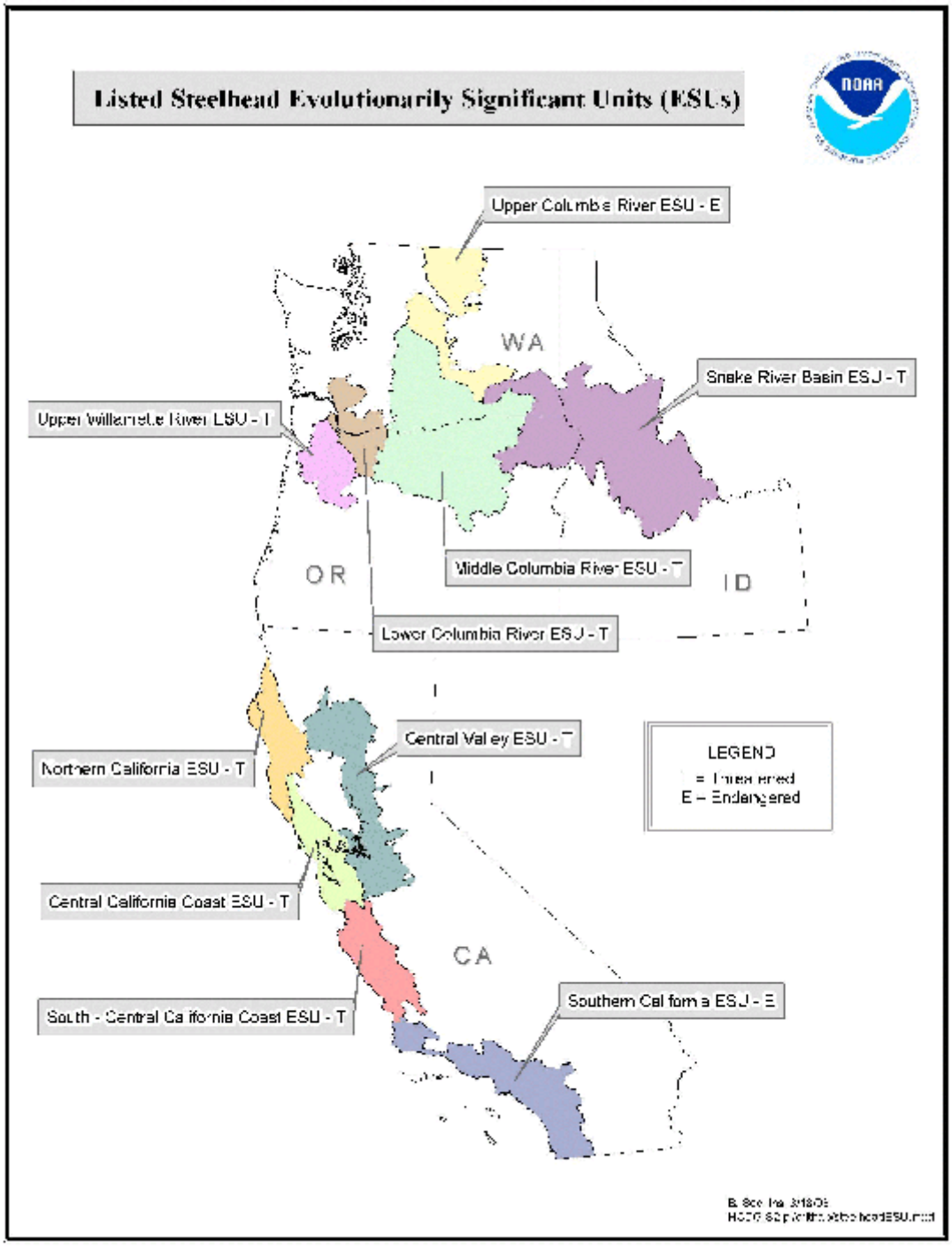
Steelhead Evolutionarily Significant Units (ESUs) Listed Under the Endangered Species Act (ESA)								
Salmonid Species	ESU Name	Current ESA Status[1]	Year Listed (FRN citation)	Historical Abundance[2]	Recent Abundance of Natural Fish[3]	Recent Trends in Natural Fish Abundance[4]	Critical Habitat Designation[5]	Threats
Steelhead	Southern California	*Endangered*	1997 (62 FR 43937; 08/18/97)	*32,000 -46,200*	*<500*	*Unknown*	*Vacated*	• Paucity of data • Broad extirpation • Habitat degradation & loss
	South-Central California Coast	*Threatened*	1997 (62 FR 43937; 08/18/97)	*> 26,000*	*Unknown (<1,500)*	*Unknown*	*Vacated*	• Habitat degradation • Historical decline • Loss of connectivity
	Central California Coast	*Threatened*	1997 (62 FR 43937; 08/18/97)	*94,000*	Unknown	Decreasing	*Vacated*	• Paucity of data • Historical decline • Marine mammal predation
	Upper Columbia River	*Endangered*	1997 (62 FR 43937; 08/18/97)	*4,100*	*1,252*	*Increasing*	*Vacated*	• Habitat loss & degradation • Fish passage • Incidental harvest • Hatchery production
	Snake River Basin	*Threatened*	1997 (62 FR 43937; 08/18/97)	*>82,000*	*14,766*	*Mixed*	*Vacated*	• Habitat loss & degradation • Fish passage • Hatchery production
	Lower Columbia River	*Threatened*	1997 (62 FR 43937; 08/18/97)	*23,000*	*4,050*	*Mostly decreasing*	*Vacated*	• Habitat loss & degradation • Fish passage • Loss of diversity • Hatchery production
	California Central Valley	*Threatened*	1998 (63 FR 13347; 03/19/98)	*40,000*	*1,952*	*Decreasing*	*Vacated*	• Habitat loss • Paucity of data • Historic decline
	Upper Willamette River	*Threatened*	1999 (64 FR 14517; 03/25/99)	*15,000*	*4,432*	*Decreasing*	*Vacated*	• Habitat loss & degradation • Fish passage • Harvest • Hatchery production
	Middle Columbia River	*Threatened*	1999 (64 FR 14517; 03/25/99)	*300,000*	*9,013*	*Increasing*	*Vacated*	• Fish passage • Habitat degradation
	Northern California	*Threatened*	2000 (65 FR 36074; 06/07/00)	*198,000*	Unknown	*Likely decreasing*	*Not designated*	• Paucity of data • Historical decline

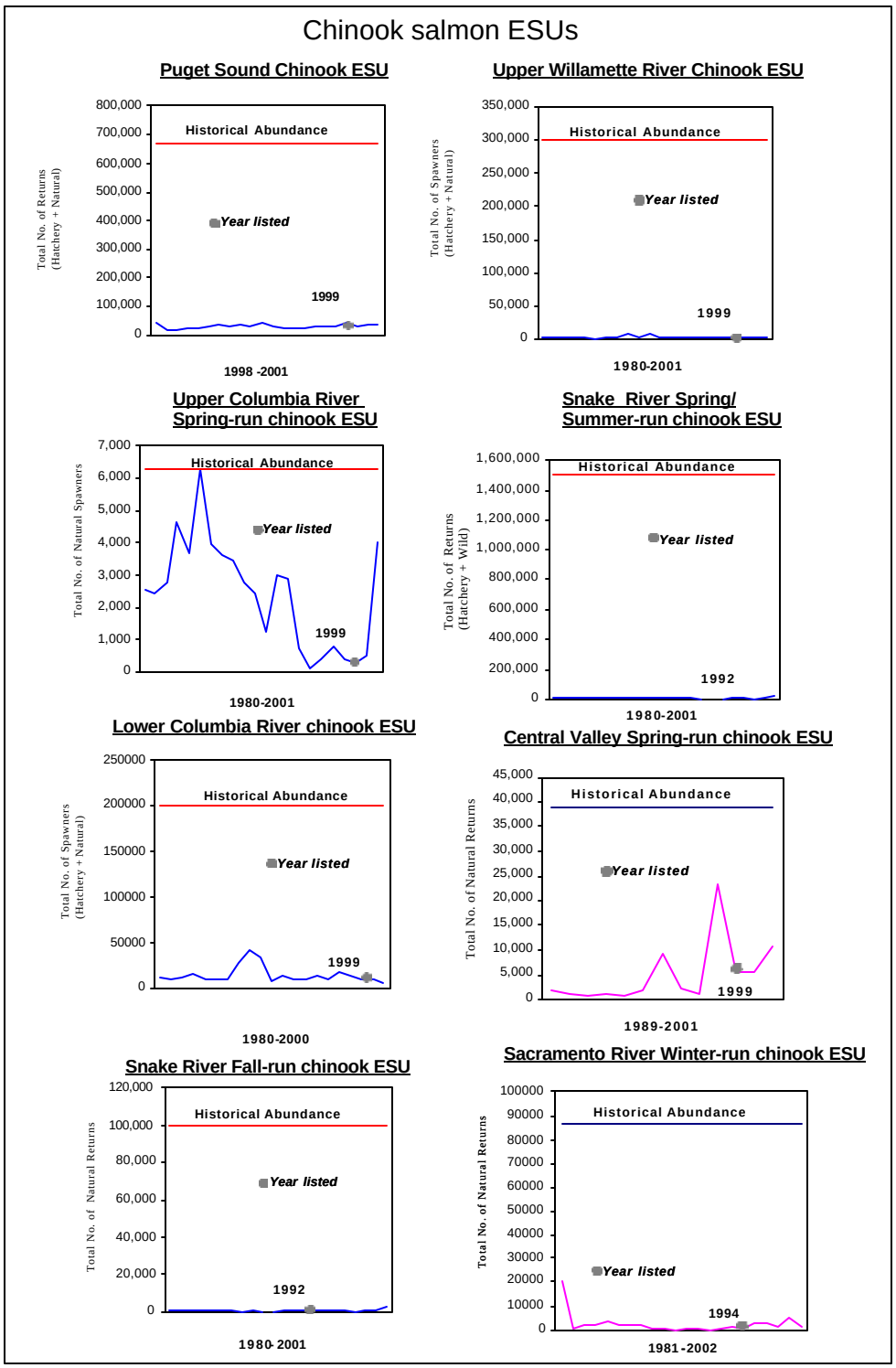

Listed Chinook Salmon Evolutionarily Significant Units (ESUs)
Puget Sound ESU - T
Upper Columbia River Spring-run ESU - E
Lower Columbia River ESU - T
Snake River Fall-run ESU - T
WA
OR
Snake River Spring / Summer-run ESU - T
Upper Willamette River ESU - T
ID
LEGEND
T = Threatened
E = Endangered
Overlapping ESU areas
California Coastal ESU - T
Sacramento River Winter-run ESU - E
Central Valley Spring-run ESU - T
CA


Listed Sockeye Salmon Evolutionarily Significant Units (ESUs)
NOAA
WASHINGTON
IDAHO
OREGON

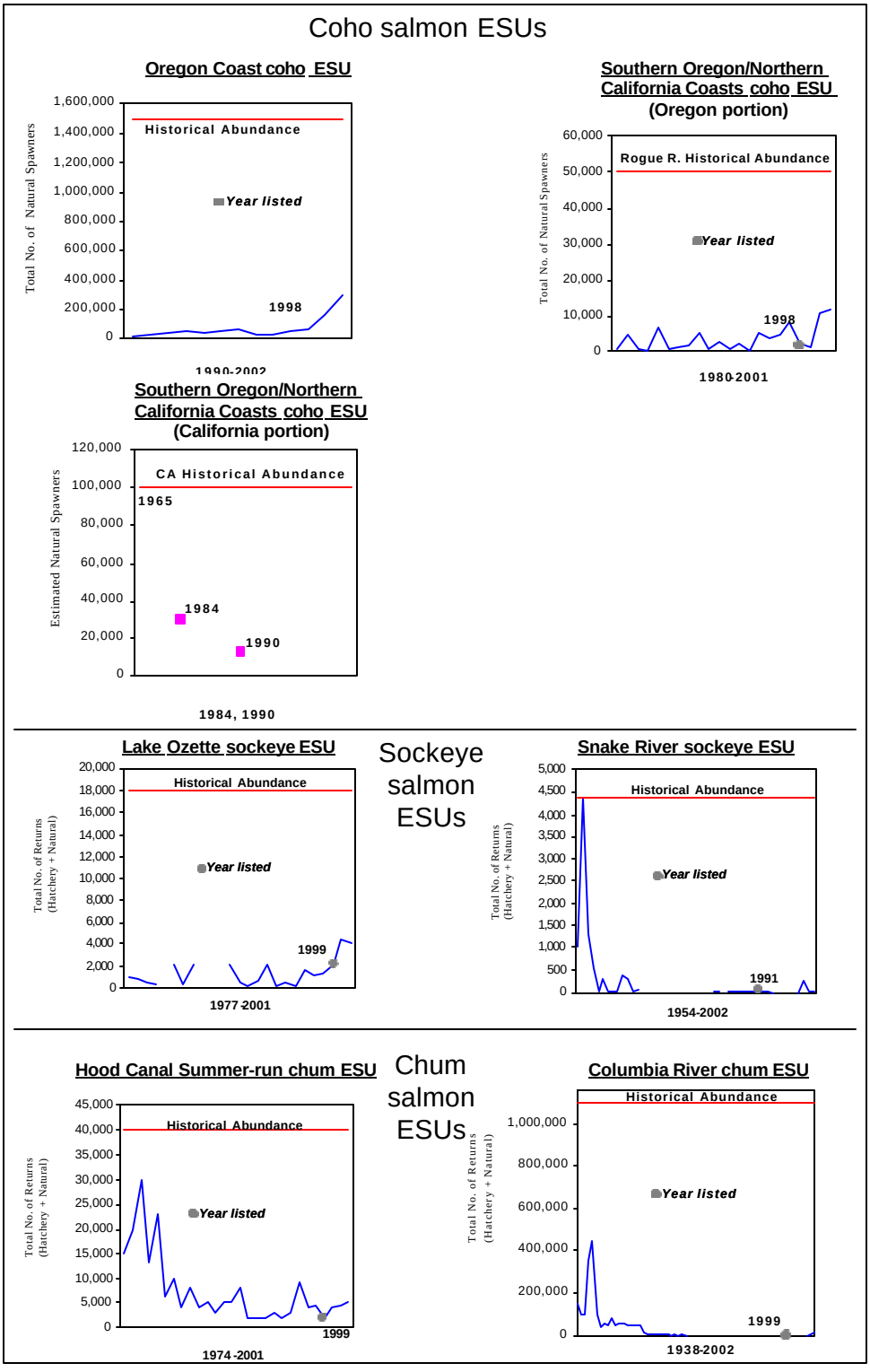

Listed Coho Salmon Evolutionarily Significant Units (ESUs)
WA
OR
ID
CA
Oregon Coast ESU - T
Southern Oregon / Northern California Coasts ESU - T
Central California ESU - T
LEGEND
T = Threatened
E = Endangered


Listed Chum Salmon Evolutionarily Significant Units (ESUs)
NOAA
WASHINGTON
Hood Canal Summer-run ESU - T
Columbia River ESU - T
OREGON
LEGEND
T = Threatened
E = Endangered

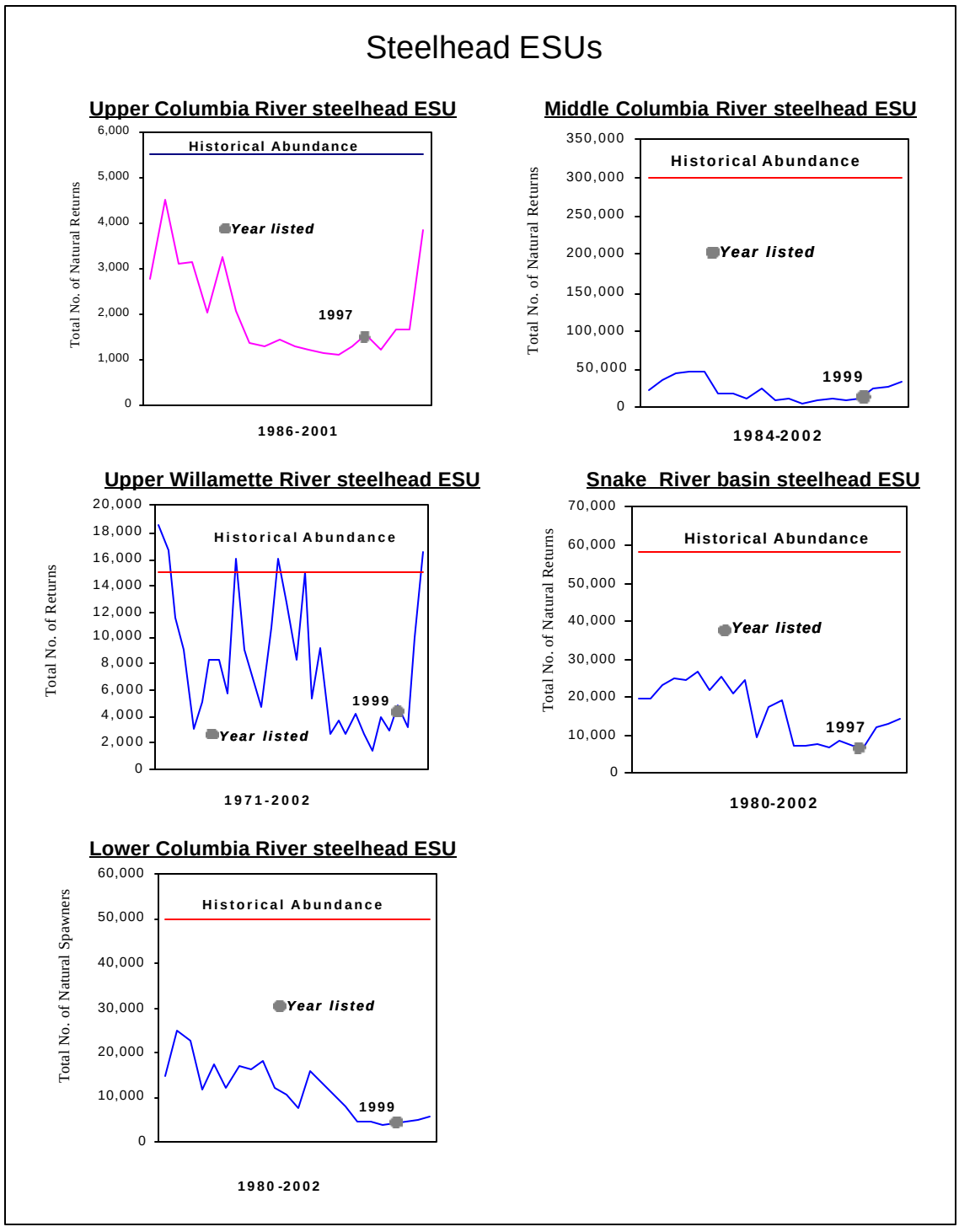

Listed Steelhead Evolutionarily Significant Units (ESUs)
Upper Columbia River ESU - E
WA
Snake River Basin ESU - T
Upper Willamette River ESU - T
OR
Middle Columbia River ESU - T
ID
Lower Columbia River ESU - T
Central Valley ESU - T
Northern California ESU - T
LEGEND
E – Endangered
Central California Coast ESU - T
CA
Southern California ESU - E
South - Central California Coast ESU - T



Trends in the abundance of listed chinook salmon ESUs. Trend information was not available for the California Coastal chinook ESU.



Trends in the abundance of listed coho, sockeye and chum salmon ESUs. Trend information was not available for the Lower Columbia River or Central California Coast coho ESUs.



Trends in the abundance of listed steelhead ESUs. Trend information was not available for the Southern California, South-Central California, Northern California, Central California Coast and California Central Valley ESUs.

Major Threats to Pacific Salmon Survival

Salmonid species on the West Coast of the United States declined to dangerously low levels of abundance in the decades leading up to the listing of 26 salmon and steelhead ESUs in the 1990s. It is also estimated that scores of historic populations are now extinct. These population declines and extinctions are the result of numerous habitat-affecting factors (such as hydropower development, land development, resource extraction, and other land uses), harvest practices, hatchery production, and other factors such as predation and the introduction of non-native species. Human actions that have constrained salmonid abundance, productivity, spatial structure, and diversity have also caused salmon to be more susceptible to natural environmental fluctuations such as poor ocean conditions and drought.

No single factor is solely responsible for the declines, and it is difficult to quantify precisely the relative contribution of any one factor to the decline of a given ESU. Furthermore, these factors affect each listed salmon and steelhead ESU differently. Some factors represent major impacts in particular ESUs, such as hydropower operations in the Columbia River basin, while other ESUs are more affected by factors such as harvest and habitat degradation. The recovery planning process currently underway will provide more specific information on the threats facing each listed ESU and on the specific actions needed to alleviate those threats and recover the ESU to self-sustaining levels.

Atlantic salmon (*Salmo salar*)

Recovery Plan Actions

Listing and critical habitat designation: NMFS and the U.S. Fish and. Wildlife Services (the Services) listed the Gulf of Maine Distinc Population Segment (DPS) of Atlantic salmon as an endangered species on November 17, 2000 (65 FR 69459). The Services identified eight rivers within the DPS that still support wild salmon populations. The listing has been controversial, with significant public support as well as opposition.

NMFS and FWS (the Services) had proposed to list Atlantic salmon in Maine as threatened under the Endangered Species Act (ESA) in 1995. After the State of Maine developed a Conservation Plan for Atlantic Salmon in Maine in 1997, the Services decided not to list Maine Atlantic salmon, citing anticipated conservation benefits of the plan. However, parts of the plan were not implemented, and the status of Maine salmon declined. In July 1999, NMFS updated the Atlantic Salmon status review, noting accomplishments and protected measures that are in place, but also considering all other available information. The updated status review stated "... under current circumstances... the Gulf of Maine DPS of Atlantic salmon is in danger of extinction." Therefore, the Services listed the Gulf of Maine Distinct Population Segment (DPS) of Atlantic salmon as endangered on November 17, 2000. The Services have deferred a decision whether to include the mainstem of the Penobscot River and its tributaries above the former site of the Bangor dam depending further analysis of this river as well as other rivers within the historic geographic range of the DPS.

The Governor of Maine opposed the listing of Atlantic salmon, criticizing the genetic data used by the Services as part of the information supporting the delineation of the Gulf of Maine DPS. The State of Maine sued NMFS, claiming that there were no wild salmon left in Maine to protect under the ESA. Because of the controversy, Maine Senators Olympia Snowe and Susan Collins requested the National Research Council's (NRC) advice on the science relevant to understanding and reversing the declines in Maine's salmon populations

On January 7, 2002, the NRC Committee on Atlantic Salmon in Maine released an interim report on the genetic makeup of these populations. The focus was on assessing whether Maine salmon populations differ from other Atlantic salmon populations (Canadian, European) and among themselves. Among their findings was that North American Atlantic salmon are clearly distinct genetically from European salmon. Further, despite the extensive additions of nonnative hatchery and aquaculture genotypes to Maine's rivers, the evidence indicates that the wild salmon in Maine are genetically distinct from Canadian salmon. These results support NMFS' assertion that the Gulf of Maine population is distinct from hatchery-raised and Canadian salmon. The final NRC report is expected in early 2003.

Maine salmon aquaculture is an important sector of the Maine economy, particularly in Downeast Maine where the industry is concentrated. The Maine salmon industry supplies approximately 18% of the US domestic salmon consumption but only about 2% of world consumption of farmed salmon. In addition to contesting the listing, the State has criticized the efforts of NOAA Fisheries to work with it and the industry on environmentally sound aquaculture practices. The Services are continuing to work

with the aquaculture industry and have made some progress in developing measures to minimize the threat posed by aquaculture to the DPS.

***Recovery Planning*:** The Services and the Maine Atlantic Salmon Commission (ASC) have prepared a draft recovery plan for the Gulf of Maine DPS of Atlantic salmon. The recovery plan maintains and expands ongoing collaborative conservation efforts, most notably actions described in the 1997 Atlantic Salmon Conservation Plan for Seven Maine Rivers. This draft will be made available for public comment before it is finalized. It is anticipated that the draft plan will be available in the spring of 2003.

Status of the species

The populations of anadromous Atlantic salmon present in the Gulf of Maine Distinct Population Segment represent the last wild remnant of U.S. Atlantic salmon. Restoration efforts for Atlantic salmon are ongoing in other watersheds where the locally-adapted stocks have been extirpated.

The original range of Atlantic salmon in the United States was from the Housatonic River in Connecticut, north to U.S. tributaries of the St. John River in New Brunswick, Canada. The historic Atlantic salmon run in the United States has been estimated to have approached 500,000 fish. The species began to disappear from U.S. rivers 150 years ago and currently, only remnant populations occur in a limited number of rivers in Maine. Throughout the past 24 years, the Dennys and Narraguagus rivers have had returns that averaged 20 percent of the escapement goal, and the Pleasant, Sheepscot, and Manchias rivers have had returns that averaged between 10 and 12 percent of the escapement goals. However, recent downward trends in abundance have put most of these seven rivers at less than 10 percent of their respective escapement goals.

Implementation

The Atlantic salmon recovery plan is being drafted and will provide a roadmap for recovery of this DPS. In the meantime, the Services continue to consult on Federal actions that may affect this DPS to minimize adverse impacts. The Services are continuing to fund and lead ongoing research to better understand such Atlantic salmon biology and threats. Notably, there has been a greater focus recently on partitioning mortality into various life stages and identifying factors causing mortality. Scientific evidence suggests that low natural survival in the marine environment is a major factor contributing to the decline of Atlantic salmon throughout North America. Recent research shows that much of the marine mortality occurs in nearshore waters soon after salmon leave the freshwater environment suggesting that a factor(s) within Maine rivers may be contributing significantly to low marine survival rates.

In August, 2002, NMFS scientists and managers facilitated the adoption of the Greenland Conservation Agreement. This annual agreement is renewable annually for up to five years and results in suspension of the commercial fishery for Atlantic salmon in Greenland, essentially through a buyout program. The total cost of the agreement is approximately $275,000 USD annually or $1.375 million over the course of five years. The substantial subsistence fishery is not included in the agreement. However, this still represents a positive step forward for the conservation of Atlantic salmon.

Major Threats and Impacts:
The Gulf of Maine DPS of Atlantic salmon is threatened by the low numbers of adult returns and low survival in the marine and freshwater environment. Threats are also posed by existing water withdrawals for agriculture, disease - particularly recent outbreaks of infectious salmon anemia (ISA) at US aquaculture sites, inadequate regulatory mechanisms for salmon aquaculture in Maine and continuing interactions between wild and aquaculture fish.

The construction of hydropower dams with either inefficient or non-existent fishways was a major cause for the decline of U.S. Atlantic salmon. Dams adversely impact Atlantic salmon by impeding both their upstream and downstream migration, increasing predation, altering the chemistry and flow pattern of rivers, increasing water temperature, and reducing available flow downstream. Currently there are no hydropower dams on the seven rivers that have the potential to adversely impact the species. Beaver and debris dams have been documented on these rivers and may partially obstruct passage.

Forest management practices can cause numerous short- and long-term negative impacts to Atlantic salmon, including siltation, shade reduction, and increased water temperature. Another significant land use in eastern Maine watersheds is lowbush blueberry agriculture. In addition, interest in cranberry cultivation is increasing . These agricultural activities can impact Atlantic salmon through water extractions and diversions and pesticide application. Currently regulatory mechanisms are in place such that forest practices and agricultural practices are not considered a major threat to Atlantic salmon.

Historically, the marine exploitation of U.S. origin Atlantic salmon occurred primarily in foreign fisheries. U.S. origin Atlantic salmon have been documented in the harvests of West Greenland, New Brunswick, Nova Scotia, Newfoundland, and Labrador. The United States is a party to the North Atlantic Salmon Conservation Organization (NASCO) which was formed for the purpose of managing salmon through a cooperative program of conservation, restoration and enhancement of North Atlantic stocks. Since 1987 there has been a Fishery Management Plan in place which prohibits the possession of Atlantic salmon in the Exclusive Economic Zone. The state of Maine has closed the recreational fishery for Atlantic salmon in all Maine rivers accessible to anadromous salmon.

Aquaculture facilities raising Atlantic salmon in net pens are located within 20 km of the mouths of five of the eight rivers still supporting wild salmon populations within the DPS. Atlantic salmon that have escaped from aquaculture pens are known to have entered some of these rivers. The escape of fish from Atlantic salmon aquaculture operations could pose a threat to the genetic integrity of Atlantic salmon within the DPS. I n addition, concentrations of aquaculture salmon could increase the vulnerability of wild stocks to disease and other adverse ecological interactions (i.e., competition for food and habitat).

Scientific evidence suggests that low natural survival in the marine environment is a major factor contributing to the decline of Atlantic salmon throughout North America. It appears that survival of the North American stock complex of Atlantic salmon is at least partly explained by sea surface water temperature during the period when Atlantic salmon are concentrated in winter months in habitat at the

mouth of the Labrador Sea and east of Greenland. As noted, recent research shows that much of the marine mortality occurs in nearshore waters soon after salmon leave the freshwater environment.

White Abalone (*Haliotis sorenseni*)

Recovery Actions

Listing and Critical habitat designation: White abalone was added to the list of ESA candidate species in July, 1997 (62 FR 37562). It was listed as endangered on May 29, 2001(66 FR 29046). In the final rule to list this species as endangered, NMFS determined that designating critical habitat for was not prudent because it would identify remaining white abalone concentrations, and could prompt increased poaching.

Status of the Species

The white abalone dwells in deep waters from Point Conception (southern California) southward to Baja California. Once occurring in numbers as high as 1 per square meter of suitable habitat, they now can be found only occasionally. Recent surveys found that densities average 1 per hectare in the Channel Islands of southern California. The population is estimated to be less than 2,600 - less than 0.1 % of its pre-exploitation level. Without aggressive rebuilding efforts, including a captive breeding program, this species will likely go extinct in less than 10 years.

Implementation

In November, 2001, NMFS hosted a white abalone restoration workshop which determined that the best approach to recovery was a captive breeding program whereby abalone would be collected from the wild and their progeny grown in aquaria and eventually returned to the wild. In summer, 2001, NMFS assembled a formal recovery team and, in September, 2002, NMFS held the first meting of the recovery team. NMFS and the recovery team have developed an outline of the recovery plan for white abalone, which included an emphasis on captive breeding. NMFS is planning on collecting wild abalone in summer, 2003 for broodstock in the captive breeding program.

In FY 2001, NMFS hired a white abalone recovery coordinator. This individual serves on the recovery team and coordinates all recovery activities.

Aside from NMFS' activities, there are numerous groups, both in the United States and internationally, doing work to gather more information and build programs to help save the white abalone. Some of these active groups include the Channel Islands National Park Service and the California Department of Fish and Game. These groups have a wealth of experience in abalone biology and culture, and will play an important role in white abalone recovery.

Major Threats and Impacts

A short lived commercial fishery for white abalone began in the early 1970s, peaked mid-decade and collapsed in the 1980s. Only occasional landings occurred after that time. White abalone was also highly sought after by recreational divers, but actual landings are unknown. Recent studies suggest that this species has likely suffered reproductive failure resulting from severe over-harvest. Regulations on harvesting of abalone were instated in the 1970s, including establishing minimum size limits, limiting harvest during the spawning season, and increasing diver fees. However, these regulations proved inadequate to stop the decline of the white abalone population, so the fishery was closed in 1996.

White abalone is highly valued in both domestic and foreign markets, and poaching remains a significant threat to the survival of the species.

Currently, the white abalone are frequently found alone, White abalone are "broadcast spawners" - they release eggs and sperm into the environment for external fertilization. Because of this reproductive strategy, white abalone does not actively seek out mates, and individuals more than 1-2 meters away from other abalone have little chance for successful fertilization. Therefore, simply reducing harvest of this species is not enough to ensure recovery.

Because populations are only small fractions of former numbers, recovery may be complicated by low genetic diversity within the species. Abalones are also vulnerable to various infections and diseases, particularly withering syndrome which affects the digestive glands. Other problems include bleeding to death because their blood is unable to clot, and fouling of their gills with sediments which suffocates them. Recent El Nino events have resulted in reduced food supply for white abalone, so competition for food may also have contributed to the species decline.

Gulf Sturgeon (*Acipenser oxyrynchus*)

Recovery Plan Actions

***Listing and Critical habitat designation*:** Gulf sturgeon were listed as threatened on September 30, 1991 (56 FR 49653). NMFS and FWS (collectively, the Services) share jurisdiction for this species under the Endangered Species Act. The Services published a proposed rule to designate critical habitat for Gulf sturgeon on June 6, 2002. The final designation is due February 28, 2003, under court order.

***Recovery planning*:** The Gulf Sturgeon Recovery Plan was approved on September 22, 1995.

Increased interest in Gulf sturgeon by government and non-government agencies and institutions have accomplished much toward its recovery. Genetic analyses of Gulf sturgeon indicate the population is divided into five genetically distinct stocks, each occupying a unique watershed or geographical unit. Gulf sturgeon spawning and resting habitat have been documented and characterized in three river systems. Population surveys and freshwater and marine movement and migratory behavior have been studied in six watersheds. In addition, Gulf sturgeon outreach activities have contributed much toward public education.

Recovery

The primary short-term recovery objective is to prevent further reduction of existing wild populations of Gulf sturgeon within the subspecies` range. The long-term recovery objective is to establish population levels that would allow delisting of the Gulf sturgeon in discrete management units. Delisting could be considered by 2023, if recovery criteria are met.

NMFS, U.S. Fish & Wildlife Service and the Gulf Coast Fishery management Council published a recovery plan for the Gulf sturgeon. The major actions recommended in the plan are:

- Conduct and refine field investigations to locate important habitats.
- Characterize riverine, estuaries, and neritic essential habitat. Develop and implement population sampling and monitoring techniques..
- Identify potential harmful chemical and water quantity and quality changes associated with surface water restrictions..
- Reduce or eliminate incidental mortality.
- Restore natural riverine habitats. Utilize existing authorities to protect habitat, and where inadequate, enact new laws and regulations.
- Identify dam and lock sites which offer the greatest flexibility for successful restoration of essential habitats.
- Modify specific navigation projects which alter riverine habitats or modify thermal or substrate characteristics of those habitats.
- Seek funding for recovery actions.

Status of the Species
Historically, the Gulf sturgeon occurred from the Mississippi River to Charlotte Harbor, Florida. It still occurs, at least occasionally, throughout this range, but in greatly reduced numbers. The fish is essentially confined to the Gulf of Mexico. River systems where the Gulf sturgeon are known to be viable today include the Mississippi, Pearl, Escambia, Yellow, Choctawhatchee, Appalachicola and Suwannee rivers. The status of Gulf sturgeon is not clear. However, researchers believe that the population decline has been arrested, and that the population is generally stable at low levels.

Implementation
A Recovery and Management Plan for Gulf sturgeon was completed in September 1995. In November, 1998, FWS published a special rule to protect Gulf sturgeon. The rule includes prohibiting take and possession of the species. In 2002, the Services published a proposed rule to designate critical habitat for this species. In this rule, the Services also divided and clarified consultation responsibilities, facilitating the consultation process for both the Services and Federal action agencies.

Genetic analyses of Gulf sturgeon indicate the population is divided into five genetically distinct stocks, each occupying a unique watershed or geographical unit. Gulf sturgeon spawning and resting habitat have been documented and characterized in three river systems. Population surveys and freshwater and marine movement and migratory behavior have been studied in six watersheds. Recent studies (2000 and 2001) have tracked Gulf sturgeon movements in the marine environment, and have identified feeding areas. This information was critical to proposing critical habitat.

In FY 2001, NMFS hired a shortnose sturgeon recovery coordinator. This individual also spends significant time coordinating Gulf sturgeon recovery implementation. Gulf sturgeon outreach activities have contributed much toward public education.

Major Threats and Impacts
As with sturgeon worldwide, dams have been a significant factor in the decline of the Gulf sturgeon. Three major rivers (the Pearl in Mississippi, the Alabama in Alabama, and the Appalachicola in Florida) within the range of the Gulf sturgeon have been dammed, preventing use of upstream areas for spawning. The Gulf sturgeon are unable to pass through dam and lock systems.

In addition to the structures preventing Gulf sturgeon from reaching spawning areas, dredging, desnagging, and spoil deposition carried out in connection with channel improvement and maintenance represent a threat to the Gulf sturgeon. Although exact spawning areas are not known for all river systems the Gulf sturgeon inhabit, indications are that submerged rock ledges and clean rock surfaces are important for spawning. Modification of such features, especially in rivers in which upstream migration is limited by dams, could further jeopardize the reduced stocks of the Gulf sturgeon.

Shortnose Sturgeon (*Acipenser brevirostrum*)

Recovery Plan Actions

Listing and Critical habitat designation: Shortnose sturgeon were listed as endangered under the Endangered Species Preservation Act on March 11, 1967 (32 FR 4001). It was later included on the original list of endangered species under the Endangered Species Act in 1973. Because shortnose sturgeon was listed prior to the inclusion of the critical habitat provisions of the ESA, no critical habitat has been designated.

Recovery planning: In December 1998, NMFS published the Final Recovery Plan for the Shortnose Sturgeon was published, emphasizing the need to protect shortnose sturgeon by populations. NMFS's goal is to recover shortnose sturgeon populations throughout their range to levels of abundance at which they no longer require protection under the ESA.

Shortnose sturgeon is listed as a single species, and distinct population segments (DPSs) have not been individually listed. However, the recovery plan recognizes 19 river populations of shortnose sturgeon that are substantially isolated, and may in fact qualify as DPSs. The recovery plan indicates that each population segment must be protected to ensure the conservation of the species. For each population segment, the minimum population size will be large enough to maintain genetic diversity and avoid extinction. This minimum population size for each population segment has not yet been determined. Therefore, establishing endangered and threatened population size thresholds is a priority 1 recovery task.

Recovery Actions include:

- Establishing delisting criteria for shortnose sturgeon population segments
- Determine minimum habitat for shortnose sturgeon population segments.
- Protect Shortnose Sturgeon and their Habitats
- Ensure agency compliance with the ESA.
- Reduce bycatch of shortnose sturgeon
- Determine if critical habitat designations are prudent for shortnose sturgeon population segments
- Formulate a public education program to increase awareness of shortnose sturgeon and their status
- Coordinate federal, state, and private efforts to implement recovery tasks
- Restore habitats and their functions in the life histories of each population segment
- Develop a breeding and stocking protocol for shortnose sturgeon

Status of the Species

Shortnose sturgeon occur in most major river systems along the eastern seaboard of the United States from the St. Johns River in Florida to the St. John River in New Brunswick, Canada. No estimate of the historical population size of shortnose sturgeon is available. While the shortnose sturgeon was rarely the target of a commercial fishery, it often was taken incidentally in the commercial fishery for Atlantic sturgeon. In the 1950s, Atlantic sturgeon fisheries declined on the east coast which resulted in a lack of

records of shortnose sturgeon. This led the Fish and Wildlife Service (FWS) to conclude that the fish had been eliminated from the rivers in its historic range (except the Hudson River) and was in danger of extinction. FWS believed the population level of the shortnose sturgeon had declined because of pollution and overfishing, both directly and incidentally in shad gillnets.

The status of many shortnose sturgeon populations remains unclear. However, NMFS is funding research to study these populations. As each is studied, more information has become available. In general, northern populations are healthier than those in the south. The Hudson River population has shown the most dramatic improvement and may be hailed as a clear success of the ESA. The Hudson population which was estimated to be 30,000 as of 1980, has now grown to be approximately 60,000. This population may soon be a candidate for downlisting to "threatened." The Delaware population is also showing signs of improvement, with population numbers near 10,000.

Recent information has indicated that some populations previously thought to be extirpated (i.e. locally extinct) are still extant. Prior to 1996, NMFS' and other scientists thought shortnose sturgeon were extirpated from the Chesapeake Bay and its tributaries. New studies have now captured several dozen sturgeon in the Chesapeake Bay, including six in the Potomac River. In the Saint Johns River, FL, a single shortnose sturgeon was recently collected in a NMFS-sponsored survey. This is first sighting of this species since the late 1970s.

Implementation

In May 2000, NOAA Fisheries published "A Protocol for use of Shortnose and Atlantic Sturgeons." This protocol set guidelines for the handling and sampling of sturgeons for their protection and to facilitate standardization of methodologies used by sturgeon researchers. A sampling protocol was needed to establish whether sturgeon are present in systems where their status is unknown. In July 2000, NOAA Fisheries and FWS held a joint workshop, the "Recovery and Restoration of East Coast Sturgeons in the Neuse and St. John's River Systems." The purpose of the workshop was to discuss and refine appropriate recovery plan strategies for work with sturgeon in the two river systems.

In FY 2001, NMFS hired shortnose sturgeon coordinators in both the Northeast and Southeast Regional Offices. With these personnel in place, implementation of the shortnose sturgeon recovery plan has accelerated.

In July, 2002, NMFS met with sturgeon researchers and geneticists from FWS and other Federal and state agencies to discuss research needs for shortnose sturgeon, with a focus on the Chesapeake Bay. One result of this meeting was commitment of money and personnel to perform studies on the Potomac River to determine, among other things, if sturgeon spawn near Little Falls. This work will extend for four years, and will begin in early spring, 2003.

NMFS continues to consult with Federal Agencies on actions that may affect shortnose sturgeon. With the new information that shortnose sturgeon still inhabit the Chesapeake Bay, NMFS has begun consulting on projects that may affect this population of sturgeon. Through these consultations, NMFS has worked effectively with Federal agencies such as the Environmental Protection Agency, the Army

Corps of Engineers and the Federal Highway Administration to ensure that they carry out their actions in a manner that will not jeopardize the continued existence of shortnose sturgeon in the Chesapeake or its tributaries.

Major Threats and Impacts

Bycatch in Atlantic sturgeon fisheries was likely the primary cause of the decline of shortnose sturgeon. Commercial exploitation of shortnose sturgeon occurred throughout its range starting in colonial times and continued periodically into the 1950's. With current prohibitions on catching Atlantic and shortnose sturgeons, fishing pressure has been greatly reduced. However, illegal poaching poses an unknown degree of ongoing threat.

Construction of dams and pollution of many large northeastern river systems during the period of industrial growth in the late 1800's and early 1900's may have resulted in substantial loss of suitable habitat. In addition, habitat alterations from discharges, dredging or disposal of material into rivers, or related development activities involving estuaries/riverine mudflats and marshes, remain constant threats.

Threats have been reduced in some rivers to allow shortnose sturgeon populations to grow or stabilize. In other rivers, particularly in the south, sturgeon populations remain low or are the status is unknown. NMFS continues to fund the necessary research to identify and reduce continuing threats.

Johnson's Seagrass (*Halophila johnsonii*)

Recovery Actions

Listing and Critical habitat designation: Johnson's seagrass was classified as a candidate for listing on June 11, 1991 (56 FR 26797). It was listed as a threatened species on September 18, 1998 (63 FR 49035). Designation of critical habitat was initially proposed on August 4, 1994 (59 FR 39716). In December, 1999, NOAA Fisheries published a revised proposed critical habitat designation in the Federal Register. The final critical habitat designation was published on April 5, 2000 (65 FR 17786)

Recovery planning: NOAA Fisheries published a notice of availability for the draft recovery plan for Johnson's seagrass on June 26, 2000 (65 FR 39369). The recovery plan was finalized in September, 2002.

Status of the Species

Johnson's seagrass has a very limited distribution and it is one of the least abundant seagrasses within its range. The species is only known to reproduce asexually and may be limited in distribution because of this characteristic. It plays a major role in the viability of benthic resources and has been documented as a food source for endangered West Indian manatees and threatened green turtles. NOAA Fisheries is continuing to conduct ecological research on the species to better understand its life history and to use in conservation decisions affecting the seagrass ecosystems.

Johnson's seagrass is found in disjunct and patchy distribution along the east coast of Florida from central Biscayne Bay to Sebastian Inlet. The largest patches have been documented inside Lake Worth Inlet. The southernmost distribution is reported to be in the vicinity of Virginia Key in Biscayne Bay**.**

Implementation

The Johnson's seagrass recovery plan was finalized in September, 2002. NMFS continues to consult on Federal actions that may affect Johnson's seagrass and its critical habitat. Through the consultation process, NMFS works with Federal action agencies to reduce negative impacts to this species. In FY 2001, NMFS hired a Johnson's seagrass coordinator to oversee development of the recovery plan, and who will be responsible for implementing its recovery tasks.

Major Threats and Impacts

Johnson's seagrass is the rarest species of its genus, has limited distributional characteristics, restricted reproductive capacity (being asexual), and is dependent on substrate stability. Potential for continued existence and recovery may be limited due to habitat alteration by a number of human and natural perturbations. Such perturbations include (1) prop scoring, (2) dredging, (3) storm action, (4) siltation and (5) altered water quality.

Alteration and subsequent destruction of the benthic community due to boating activities, propeller scoring and anchor mooring has been observed in Johnson's seagrass sites. Such activities result in breaking root systems, severing rhizomes and significantly reducing the physical stability of this ecosystem. Dredging redistributes sediments, buries plants and destroys bottom topography. Some abundant populations are located in close proximity to inlets, and are likely to experience erosional

forces and siltation associated with severe storms. During hurricanes, storm surge may scour and redistribute sediments, thereby eroding or burying existing populations.

Siltation due to human disturbance and increased land-use can also threaten viability of the species. Degradation of water quality due to human impact is also a threat to the viability of ecologically important seagrass communities. Nutrient over enrichment, caused by inorganic and organic nitrogen and phosphorus loading via urban and agricultural land run-off, can stimulate increased algal growth that may smother Johnson's seagrass by shading rooted vegetation and diminishing the oxygen content of the water.

Candidate Corals: **Elkhorn Coral** (*Acropora palmata*) and **Staghorn Coral** (*Acropora cervicornis*)

Recovery Actions
Elkhorn and stagnorn corals were listed as Candidates on June 23, 1999.

Status and Distribution
Elkhorn and staghorn corals are the two major reef-building corals in Florida and throughout the Caribbean that once formed dense thickets at shallow and intermediate depths, contributing significantly to reef growth, island formation, coastal protection, fisheries habitat and coral reef biodiversity. These species have declined in abundance throughout most of their range by 80-98% of their 1970s baseline, converting three-dimensional, high-relief habitat into flat "parking lot" stretches of seascape. Both species still occupy their historic range, although localized range reductions and extirpations have occurred.

Implementation
At a NMFS/PR led workshop (April, 2001), participants compiled recent information on the status and trends, threats, role of biological and ecological parameters in recovery, adequacy of existing management measures and new measures that are needed for conservation, and information needs. This information is being included in a status review that is being conducted by NMFS in coordination with other federal and state agencies and coral reef experts, slated for completion in FY04. The status review will be used to making a listing decision.

Major Threats
Disease outbreaks are the major cause of coral loss, with cumulative impacts from habitat loss, storm damage, coral bleaching, outbreaks of predators, degraded water quality, physical damage from anchoring and ship groundings and other human impacts.

Recent information is available on the status and trends of populations from 60-75% of all reefs where they once occurred. However, research is needed on reproductive biology; genetic studies to determine linkages among populations and degree of genetic exchange among populations; demographic parameters and habitat-based variables, including methods to predict risk; causes of diseases and techniques to mitigate disease; and an evaluation of strategies to enhance recovery.

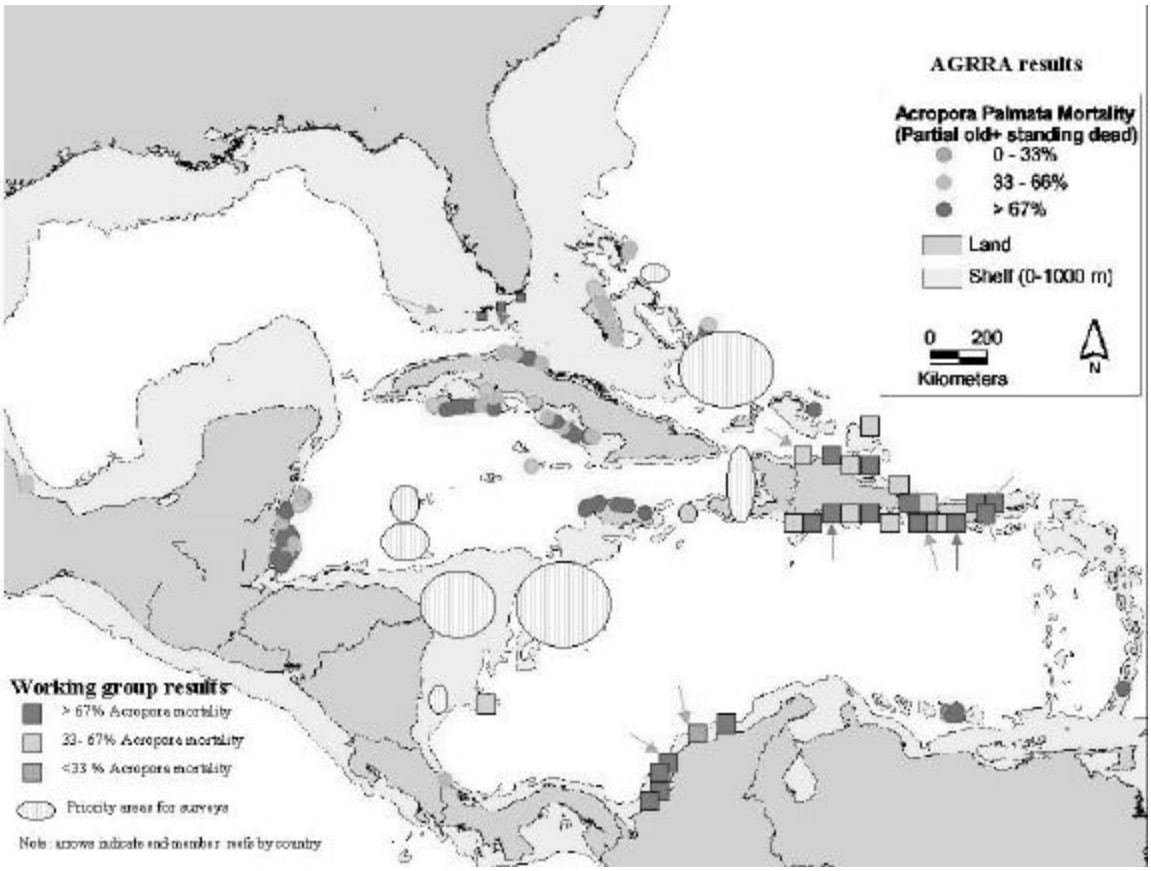


Fig. 1. A map of the wider Caribbean showing locations where *Acropora* spp. populations were examined (solid circles and squares) and areas where surveys have not been conducted (cross-hatched circles). Areas with survey information are classified into three categories, based on the amount of mortality (<33%, 33-67% and >67%) with data compiled from recent Atlantic and Gulf Rapid Assessment program surveys (circles) and from workshop participants (squares).