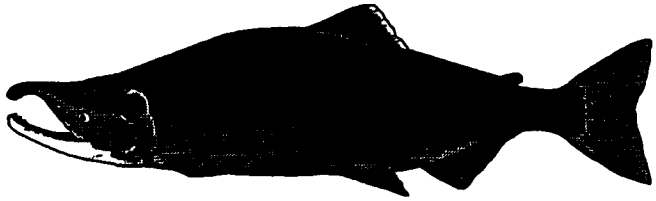
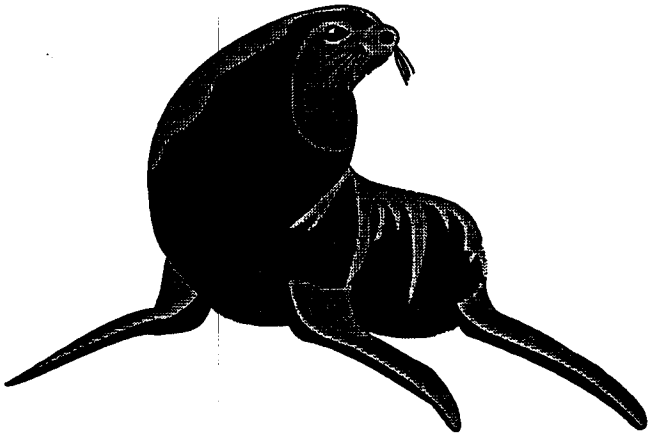
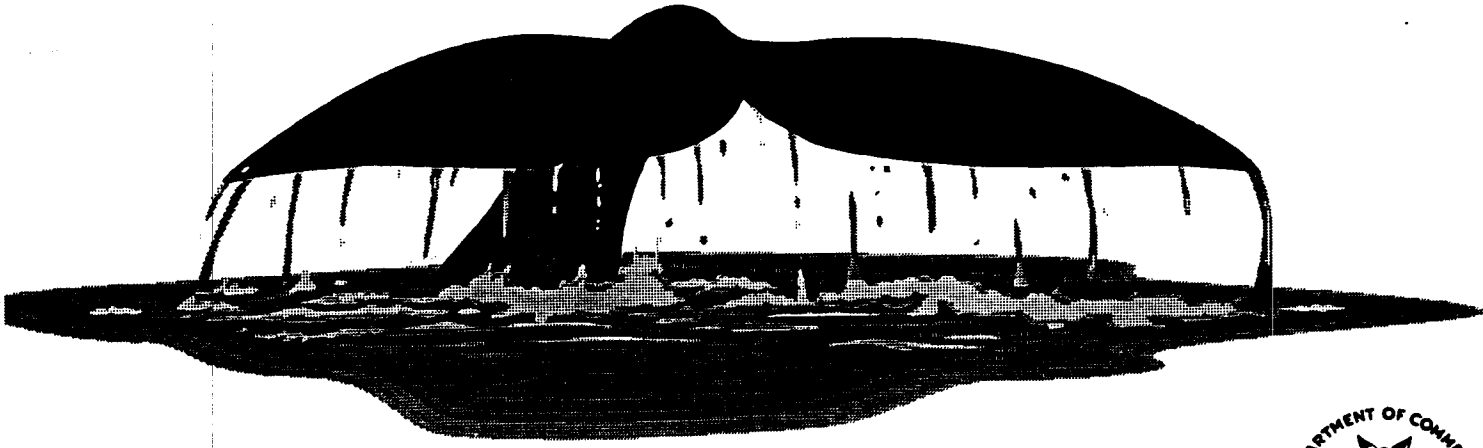
Endangered Species Act
Biennial Report to Congress

Status of Recovery Programs
January, 1992 - June, 1994







U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Protected Resources

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1335 East-West Highway
Silver Spring, MD 20910
THE DIRECTOR

SEP 8 1994

The Honorable Ernest Hollings
Chairman, Committee on Commerce,
Science and Transportation
United States Senate
Washington, D.C. 20510-2602

Dear Sir:

I am pleased to submit the Biennial Report for January 1992-June 1994 of the National Marine Fisheries Service (NMFS) regarding the status of efforts to develop and implement recovery plans for species listed pursuant to section 4 of the Endangered Species Act (ESA). The report includes the status of all species for which recovery plans have been developed, as required by section 4(f)(3) of the ESA, the status of all other species listed under NMFS' jurisdiction, species proposed for listing, and species listed as depleted under the Marine Mammal Protection Act.

Sincerely,

Rolland A. Schmitten

Enclosure

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1335 East-West Highway
Silver Spring, MD 20910
THE DIRECTOR

SEP 8 1994

The Honorable Gerry E. Studds
Chairman, Committee on Merchant
Marine and Fisheries
House of Representatives
Washington, D.C. 20510-2110

Dear Sir:

I am pleased to submit the Biennial Report for January 1992-June 1994 of the National Marine Fisheries Service (NMFS) regarding the status of efforts to develop and implement recovery plans for species listed pursuant to section 4 of the Endangered Species Act (ESA). The report includes the status of all species for which recovery plans have been developed, as required by section 4(f)(3) of the ESA, the status of all other species listed under NMFS' jurisdiction, species proposed for listing, and species listed as depleted under the Marine Mammal Protection Act.

Sincerely,

Rolland A. Schmitten

Rolland A. Schmitten

Enclosure

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

BIENNIAL REPORT

INTRODUCTION

During the 1988 reauthorization of the Endangered Species Act of 1973 (ESA), an amendment was added to the Act requiring the Secretaries of Commerce and the Interior to prepare a biennial report "on the status of efforts to develop and implement recovery plans for all species listed pursuant to this section and on the status of all species for which such plans have been developed."

To satisfy this reporting requirement, a summary of recovery efforts for species under National Marine Fisheries Service (NMFS) jurisdiction for the period 1992 through 1993 has been prepared. Included in this report is the most current species status and trends information available.

Comprehensive Federal efforts to protect endangered and threatened species began with the passage of the Endangered Species Preservation Act of 1966. The Endangered Species Conservation Act of 1969 strengthened the initial provisions. International conservation efforts mandated under the 1969 Act provided the impetus for the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora. Congress recognized that a more comprehensive effort than authorized in these Acts was needed in order to avoid continued losses of species. Passage of the Endangered Species Act of 1973 enhanced Federal abilities to protect endangered species and to develop measures for their recovery.

During each reauthorization of the Act, amendments have been added reflecting experience gained in administering its provisions. The 1978 amendments contained a requirement that the U.S. Fish and Wildlife Service (FWS) and NMFS develop and implement recovery plans for species under their jurisdiction.

In 1987, the General Accounting Office conducted an evaluation of progress by NMFS and FWS in the implementation of domestic recovery programs. The study was completed in 1988. The report stated that recovery plans had not been prepared for many listed species, and responsible agencies had not always implemented completed recovery plans. In addition, neither FWS nor NMFS had mechanisms for tracking and updating the status of species.

NMFS has developed an information management system that tracks: (1) the status of endangered or threatened marine species; (2) the development and implementation of recovery plans to promote survival of species; and (3) expenditures and resources utilized in these efforts. This report was generated from the data in the information management system.

The ESA requires development and implementation of recovery plans unless such plans will not promote the conservation of the species. Although the Act does not differentiate between domestic and foreign species in this regard, specific management actions are often not feasible for species whose range is either totally or primarily outside of U.S. jurisdiction. The range of a number of listed marine species is totally outside U.S. jurisdiction. In other cases, the range in areas under the jurisdiction of the United States is limited, and management actions in the U.S. portion of their range are not likely to contribute to recovery. Therefore, NMFS has focused recovery plans to those species primarily under U.S. jurisdiction.

Since NMFS' last Biennial Report for FY 1989-1991, eight recovery plans have been approved:

Green turtle - U.S. Atlantic population	10/29/91
Humpback whale	11/01/91
Northern right whale	12/01/91
Loggerhead turtle - U.S. Atlantic population	12/26/91
Leatherback turtle - U.S. Caribbean/Atlantic/ Gulf of Mexico	04/06/92
Kemp's ridley turtle	08/21/92
Steller (Northern) sea lion	12/30/92
Hawksbill turtle - U.S. Caribbean/Atlantic/ Gulf of Mexico	11/24/93

Recovery plans are in progress for Snake River salmon, the gulf sturgeon, and the shortnose sturgeon. The Hawaiian monk seal recovery plan, approved in 1983, is updated annually and a monitoring plan has been developed for the gray whale.

Also included in this report is information on species proposed for listing under the ESA; the Gulf of Maine population of harbor porpoise and Johnson's sea grass; as well as information on species designated as depleted under the Marine Mammal Protection Act; the Northern fur seal and the Mid-Atlantic coastal migratory population of bottlenose dolphins.

Recovery Programs

STATUS OF RECOVERY PROGRAM
GREEN TURTLE - ATLANTIC POPULATION

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 10/29/91

SPECIES COVERED

GREEN TURTLE
(ATLANTIC)

RECOVERY PLAN STATUS

The Final Recovery Plan was approved and distributed in 1991.

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, green turtles are protected by ensuring that Federal actions are not likely to jeopardize the continued existence of the species. Minerals Management Service's authorization of oil and gas activities, Army Corps of Engineers' authorization of oil and gas and dredging activities, Navy explosive testing programs, and Environmental Protection Agency designations of dredged material disposal sites have been subject to consultations.

The major actions recommended in the plan are:

Protect and manage nesting habitat.

Evaluate current laws on beach armoring, and strengthen laws if necessary.

Ensure laws regulating construction and beach armoring are enforced.

Acquire in fee-title all undeveloped nesting beaches between Melbourne and Wabasco Beach, Florida.

Protect and manage populations on nesting beaches.

Monitor trends in nesting activity by means of standardized surveys.

Evaluate nest success and implement appropriate nest protection measures.

Protect and manage populations in the marine environment.

Determine seasonal distribution, abundance and status of sea turtles in the nearshore marine environment.

Determine etiology of sea turtle fibropapillomas and monitor mortality of those turtles affected.

NMFS has made a major effort to reduce green turtle mortality in the shrimp trawl fishery. In 1989, regulations requiring the use of Turtle Excluder Devices (TEDs) in all areas, year round, became effective. Many of the other tasks identified in the recovery plan have been initiated in the last 2 years.

NMFS has provided the resources to collect a range of basic biological information on sea turtles. Projects are being conducted to determine species composition, relative abundance, and seasonal distribution of sea turtles in the inshore waters of North Carolina and South Carolina. A continuing project to determine distribution and species composition is being carried out in the Cedar Key area of Florida's west coast. Historically, this area supported large numbers of green turtles. A similar study has been initiated to determine distribution and size/species composition in pelagic waters.

NMFS laboratories are conducting research on sea turtle habitat utilization in the Gulf of Mexico. The project focuses on known sea turtle developmental habitats.

Analyses of sea turtle strandings have been conducted to monitor the level of strandings and possible causes of mortality.

Research has been conducted on the effects of pollutants on sea turtles.

NFMS is currently conducting research on the etiology and epidemiology of fibropapillomas in green turtles from Hawaiian waters and the Atlantic.

STATUS OF RECOVERY PROGRAM
GREEN TURTLE - ATLANTIC POPULATION

RECOVERY GOALS

The Atlantic population of the green turtle in the United States can be delisted if, over a period of 25 years, the following conditions are met:

1. The level of nesting in Florida has increased to an average of 5000 nests per year for at least 6 years;

2. At least 25% (105km) of all available nesting beaches (420km) is in public ownership and encompasses greater than 50% of the nesting activity;

3. A reduction in mortality is reflected in higher counts of individuals on foraging grounds; and

4. All priority 1 tasks have been successfully implemented.

Six major actions are needed to achieve recovery:

1. Provide long-term protection to important nesting beaches;

2. Ensure at least 60% success on major nesting beaches;

3. Implement effective lighting ordinances or lighting plans on nesting beaches;

4. Determine distribution and seasonal movements for all life stages in marine environment;

5. Minimize mortality from commercial fisheries; and

6. Reduce threats to population and habitat from marine pollution.

STATUS OF RECOVERY PROGRAM
HAWKSBILL TURTLES - ATLANTIC POPULATION

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 11/24/93

SPECIES COVERED

HAWKSBILL TURTLE
(ATLANTIC)

RECOVERY PLAN STATUS

A recovery plan for the Atlantic population of the hawksbill sea turtle was approved in September 1984. A new recovery team was established in 1989 to revise the plan. The revised recovery plan for the Atlantic population was approved in December, 1993.

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, hawksbill turtles are protected by ensuring that Federal actions are not likely to jeopardize the continued existence of the species.

Some recovery actions identified in the original plan and included in the revised plan have been initiated in the last 2 years.

To eliminate commercial trade in hawksbill turtles, the Secretaries of Commerce and the Interior certified Japan under the Pelly Amendment to the Fishermen's Protective Act of 1967 for engaging in activities that diminish the effectiveness of CITES. The Pelly amendment provides that the President may prohibit the importation of wildlife products from the offending country. After negotiations with the U.S. government, Japan announced on June 19, 1991, that it would end all trade in hawksbill turtles by the end of 1992 and withdraw its CITES reservation for hawksbills on July 1, 1994.

NMFS is involved with protecting nesting beaches and conducting surveys on primary hawksbill nesting areas in the Caribbean. In 1992, regulations requiring the use of TEDs in all areas at all times became effective, reducing hawksbill turtle mortality in the shrimp fishery.

Analyses of sea turtle strandings have been conducted to monitor the level of strandings and possible causes of mortality.

The major actions recommended in the plan are:

Identify important nesting beaches.

Ensure long-term protection of important nesting beaches.

Ensure long-term protection of marine habitat.

Prevent degradation or destruction of marine habitats from upland erosion and siltation.

Prevent degradation of reef habitat from oil, sewage, and other pollutants.

Monitor trends in nesting activity.

Evaluate nest success and implement nest protection measures.

Ensure law enforcement activities prevent poaching on nesting beaches.

Determine nesting beach origins for juvenile and adult populations.

Quantify threats to adults and juveniles on foraging grounds.

Increase law enforcement to reduce poaching in U.S. waters.

STATUS OF RECOVERY PROGRAM
KEMP'S RIDLEY TURTLE

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 08/21/92

SPECIES COVERED

KEMP'S RIDLEY TURTLE
(ATLANTIC)

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, Kemp's ridleys are protected by ensuring that Federal actions are not likely to jeopardize the continued existence of the species. Minerals Management Service's authorizations of oil and gas activities, Army Corps of Engineers' authorizations of oil and gas and dredging activities, Navy explosive testing programs, and Environmental Protection Agency designations of dredged material disposal sites have been subject to consultations.

NMFS has made a major effort to reduce Kemp's ridley mortality in the shrimp trawl fishery. During 1992, regulations requiring the use of turtle excluder devices (TEDs) became effective. In addition, NMFS has provided technical assistance to the Government of Mexico on TED utilization.

Projects are being conducted to determine species composition, relative abundance, and seasonal distribution in Atlantic and Gulf of Mexico waters. A continuing project to determine distribution and species composition is being carried out in the Cedar Key area of Florida's west coast. Historically, this area supported large numbers of Kemp's ridleys.

NMFS laboratories are conducting research on sea turtle habitat utilization in the Gulf of Mexico. The project focuses on known sea turtle developmental habitats. Kemp's ridleys are tracked with radio and sonic transmitters to determine their temporal and spacial utilization of these areas.

Analyses of sea turtle strandings have been conducted to monitor the level of strandings and possible causes of mortality.

Physiological research has been conducted on the effects of forced submergence on Kemp's ridleys.

RECOVERY GOALS

Because of Kemp's ridleys' aggregated nesting behavior, restricted breeding range, and increasing threats from the expanding global human population and general environmental degradation, complete recovery (delisting) may not be achievable. Since the principal nesting beach is in Mexico, continued, long-term cooperation between the U.S. and Mexico is necessary to recover the species. The goal of this recovery plan is to upgrade the species from endangered to threatened status. Criteria for delisting will be addressed in future revisions of the recovery plan.

Criteria for upgrading the status are as follows:

1) 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.

2) 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.

(3) Attain a population of at least 10,000 nesting females per year.

(4) Successfully implement all priority 1 recovery tasks.

The major actions necessary for recovery are to:

1) 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 hatching turtles.

2) 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.

3) Fill in gaps in knowledge of Kemp's ridley life history that will result in better management decisions.

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.

The major actions recommended in the plan are:

Encourage Mexico to expand and codify the Kemp's Ridley Natural Reserve at Rancho Nuevo.

Redefine and codify regulations for better reserve protection.

Encourage Mexico to restrict development that may degrade the nesting habitat.

Identify important marine habitat.

Protect nesting females at Rancho Nuevo.

Protect nests and increase hatchling protection at Rancho Nuevo.

Monitor population trends at Rancho Nuevo.

Determine juvenile and subadult nearshore habitat use.

Determine migration routes and foraging areas of adults.

Enforce and expand TED regulations.

Enforce the trawling prohibitions near Rancho Nuevo.

Promote TED use in Mexico.

STATUS OF RECOVERY PROGRAM
LEATHERBACK TURTLES - ATLANTIC POPULATION

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 04/06/92

SPECIES COVERED

LEATHERBACK TURTLE
(ATLANTIC)

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, leatherback turtles are protected by ensuring that Federal actions are not likely to jeopardize the continued existence of the species. Minerals Management Service's authorizations of oil and gas activities, Army Corps of Engineers' authorizations of oil and gas and dredging activities, Navy explosive testing programs, and Environmental Protection Agency designations of dredged material disposal sites have been subject to consultations.

Analyses of sea turtle strandings have been conducted to monitor the levels of strandings and possible causes of mortality.

The major actions recommended in the recovery plan are:

Identify and ensure long-term protection of important nesting beaches.

Identify important marine habitat.

Monitor trends in nesting activity on important nesting beaches with standardized surveys.

Evaluate nest success and implement appropriate nest protection measures.

Implement measures to reduce capture and mortality in the shrimp trawl fishery.

Evaluate extent of entanglement in and ingestion of marine debris.

Implement and enforce MARPOL.

RECOVERY GOALS

The goal of the recovery plan is to delist the U.S. population of leatherback turtles. Delisting would be considered when the following conditions are met:

1) The adult female population increases over the next 25 years, as evidenced by a statistically significant increase in the number of nests at Culebra, Puerto Rico; St. Croix, USVI; and along the east coast of Florida.

2) Nesting habitat encompassing at least 75% of nesting activity in the U.S. Virgin Islands, Puerto Rico and Florida is in public ownership.

3) All priority 1 tasks have been successfully implemented.

STATUS OF RECOVERY PROGRAM
LOGGERHEAD TURTLE - ATLANTIC POPULATION

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 12/26/91

SPECIES COVERED

LOGGERHEAD TURTLE
(ATLANTIC)

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, loggerhead turtles are protected by ensuring that Federal actions are not likely to jeopardize the continued existence of the species. Minerals Management Service's authorizations of oil and gas activities, Army Corps of Engineers' authorizations of oil and gas and dredging activities, Navy explosive testing programs, and Environmental Protection Agency designations of dredged material disposal sites have been subject to consultations.

NMFS has made a major effort to reduce loggerhead turtle mortality in the shrimp fishery. In 1992, regulations requiring the use of TEDs in all waters, year round became effective.

Analyses of sea turtle strandings have been conducted to monitor the level of strandings and possible causes of mortality.

The major actions recommended in the plan are:

Evaluate current laws on beach armoring.

Enforce laws regarding coastal construction.

Acquire nesting beaches between Melbourne and Wabasso Beach, FL.

Monitor trends in nesting activity.

Evaluate nest success and implement nest protection measures.

Determine seasonal distribution, abundance, population characteristics, and status in inshore and nearshore waters.

Implement and enforce TED regulations.

STATUS OF RECOVERY PROGRAM
INTERIM PLAN FOR HAWAIIAN SEA TURTLES

GENERAL

PLAN STAGE: INTERIM
PLAN APPROVED DATE: N/A

SPECIES COVERED

HAWKSBILL TURTLE
(PACIFIC)

LEATHERBACK TURTLE
(PACIFIC)

GREEN TURTLE
(PACIFIC)

OLIVE RIDLEY TURTLE
(PACIFIC)

RECOVERY PLAN STATUS

A recovery plan for Hawaiian sea turtles was drafted by a recovery team appointed in 1985. This was published as an Interim Plan in February of 1992.

RECOVERY ACTIONS

Hawksbill turtles:
The major actions recommended for hawksbill turtles in the interim plan are:

Eliminate adverse human induced habitat alteration in order to maintain foraging and resting habitats and nesting beaches.

Monitor trends in nesting activity and develop an index to track the population.

The major actions recommended for green turtles in the interim plan are:

Continue census of adults through mark-recapture methods.

Monitor subadults and adults in resident nearshore habitat.

Investigate etiology of fibropapillomas, a significant tumor disease of the population.

Recovery actions for leatherback and olive ridley turtles will have to focus on international cooperative efforts, since there are no known nesting colonies of these two species under U.S. jurisdiction in the Pacific region.

RECOVERY GOALS

Goals of the Interim Recovery Plan are to secure habitat, and restore and maintain Hawaiian sea turtle populations at levels of abundance that provide for maximum hatchling production. Criteria for recovery have been set for the various Hawaiian stocks as follows:

Hawksbill turtle:

Recovery of the Hawaiian hawksbill population will be reached when the numbers of females nesting at each currently used nesting beach have been restored and maintained at levels that ensure maximum hatchling production.

The first step in this recovery process will be to reduce and overcome limiting factors affecting the immediate survival of the population to the extent that it is no longer in danger of becoming extinct (e.g. reclassified from endangered to threatened status).

Green turtle:

Recovery of the Hawaiian green turtle population will be reached when the numbers of females nesting at each currently used nesting beach have been restored and maintained at levels that ensure maximum hatchling production.

Leatherback and olive ridley turtles:

A determination of conditions for the recovery of the leatherback and olive ridley in Hawaiian waters will only be possible when adequate knowledge becomes available on their life history and ecology.

STATUS OF RECOVERY PROGRAM
LOGGERHEAD TURTLE - PACIFIC POPULATION

GENERAL

PLAN STAGE: NONE
PLAN APPROVED DATE: N/A

SPECIES COVERED

LOGGERHEAD TURTLE
(PACIFIC)

RECOVERY PLAN STATUS

A Pacific Basin Sea Turtle recovery team has been appointed, but no plan has been prepared. A draft recovery plan is expected to be available by December, 1994.

STATUS OF RECOVERY PROGRAM
SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON

GENERAL

PLAN STAGE: PENDING
PLAN APPROVED DATE: N/A

SPECIES COVERED

CHINOOK SALMON
(SACRAMENTO RIVER WINTER-RUN)

RECOVERY PLAN STATUS

The Sacramento River winter-run chinook salmon was listed as threatened on an emergency basis on August 4, 1989, and was listed as threatened on November 30, 1990. In response to a petition received in June 1991, NMFS reclassified this species as endangered in January 1994. A recovery team has been appointed and plans to submit a recovery plan in early 1994.

RECOVERY ACTIONS

Most of the recovery actions for the winter-run chinook salmon involve consultations under section 7 of the ESA with Federal agencies that either control the diversion of water in the river or permit activities by other water users. This species' depends on an adequate flow of water at a specific temperature in the Sacramento River where drought conditions have existed for the past 7 years.

NMFS is a member of the Bureau of Reclamation's Temperature Advisory Committee, and is working with the Bureau on temperature management strategies to attract winter-run as far up the Sacramento River as possible and increase the amount of spawning in the reach of the river that the Bureau can manage with available water. NMFS is also working with the State of California by reviewing impacts of state actions on winter-run chinook.

In 1988, NMFS, the State of California, the Fish and Wildlife Service, and the Bureau of Reclamation signed a cooperative agreement to restore Sacramento River winter-run chinook. The Ten-Point Winter-Run Restoration Plan includes actions such as raising the gates at the Bureau's Red Bluff Diversion Dam from December 1 through April 1 to allow free passage of adult winter-run chinook to suitable spawning habitat and maintaining water temperatures at levels below lethal limits in the reach of river above Red Bluff Dam that is used for spawning. A biological opinion issued in 1993 to the Bureau of Reclamation on the operation of its Central Valley Project, and the State Water Project controls activities in most of the species' important habitats.

In June 1991, NMFS issued a biological opinion to the Army Corps of Engineers stating that issuance of a permit to the Glenn-Colusa Irrigation District (GCID) would likely jeopardize the continued existence of the Sacramento River winter-run chinook because GCID did not plan to install new fish screens that would exclude fish when water is diverted from the Sacramento River. NMFS requested that GCID take immediate action to prevent a take of juvenile winter-run chinook before they would pass GCID's pumping station. NMFS requested the Department of Justice move to enjoin the operation of the pumping plant when the fish are likely to be taken. A Federal District Court Judge issued a temporary restraining order against GCID which was effective on August 19, 1991, and cuts diversion of water by about 50 percent. GCID currently operates under a court-approved plan that protects winter-run chinook salmon.

NMFS has consulted under section 7 with the Pacific Fishery Management Council. Because a direct take of Sacramento River winter-run chinook salmon by sport or commercial fishermen is not allowed, the biological opinion includes measures in the incidental take statement to decrease the potential incidental take of the species. These measures include not approving an early opening of the commercial fishery south of Point Arena, California, and delaying the recreational fishery for 2 weeks and closing it 2 weeks early south of Point Arena.

STATUS OF RECOVERY PROGRAM
SNAKE RIVER LISTED SALMON

GENERAL

PLAN STAGE: PENDING
PLAN APPROVED DATE: N/A

SPECIES COVERED

CHINOOK SALMON
(SNAKE RIVER SPRING/SUMMER)

CHINOOK SALMON
(SNAKE RIVER FALL)

SOCKEYE SALMON
(SNAKE RIVER)

RECOVERY PLAN STATUS

A Snake River Salmon Recovery Team was formed in 1991. The team submitted recommendations for a NMFS recovery plan in June 1994. NMFS is preparing a draft recovery plan for public comment. The draft will include a section contrasting any differences between the team's recommendations and the draft recovery plan. An approved Snake River Salmon Recovery Plan is expected in late December, 1994.

STATUS OF RECOVERY PROGRAM
GULF STURGEON

GENERAL

PLAN STAGE: DRAFT
PLAN APPROVED DATE: N/A

SPECIES COVERED

GULF STURGEON

RECOVERY PLAN STATUS

The U.S. Fish & Wildlife Service has released a draft 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, estuarine, and neritic essential habitat.

Develop and implement population sampling and monitoring techniques.

Eliminate potential for introductions of non-native stock or other sturgeon.

Conduct life history studies on the requirements of little-known life stages.

Identify potential harmful chemical and water quantity and quality changes associated with surface water restrictions.

Identify and eliminate point and non-point sources of chemical contaminants.

Seek resolution of conflict between authorized projects and restoration of fish populations.

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.

Implement projects or actions which will achieve recovery plan objectives.

Increase effectiveness and enforcement of state and federal take prohibitions.

Seek funding for recovery actions.

Identify and eliminate known and potential impacts to water quantity and quality associated with existing and proposed uses and water diversions.

Assess the relationship between groundwater pumping and reduction of groundwater flows and quantify loss of riverine habitat related to reduced groundwater in-flows.

RECOVERY GOALS

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 within 30 years. Following delisting, a long-term fishery management objective is to establish a self-sustaining population that could withstand directed fishing pressure within discrete management units.

STATUS OF RECOVERY PROGRAM
SHORTNOSE STURGEON

GENERAL

PLAN STAGE: PENDING
PLAN APPROVED DATE: N/A

SPECIES COVERED

SHORTNOSE STURGEON

RECOVERY PLAN STATUS

A new shortnose sturgeon recovery team was appointed by NMFS in 1993. A team appointed in the late 1970s did not continue meeting after submitting a draft recovery plan to NMFS in 1981. The new team, which began meeting in November, 1993, will submit a draft recovery plan by Fall, 1994.

RECOVERY ACTIONS

While the recovery plan is being drafted, NMFS is implementing recovery actions through the ESA section 7 consultation process and has issued scientific research permits directed at recovery of the species.

Recently issued scientific research permits allow studies in the southern rivers where there is a lack of information on shortnose sturgeon. Current research is being conducted by the U.S. Fish and Wildlife Service, the Georgia Department of Natural Resources, the South Carolina Wildlife and Marine Resources Department, and North Carolina State University.

STATUS OF RECOVERY PROGRAM
HAWAIIAN MONK SEAL

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 04/01/83

SPECIES COVERED

HAWAIIAN MONK SEAL

RECOVERY PLAN STATUS

The first Hawaiian Monk Seal Recovery Team, appointed in 1980, submitted its final recovery plan to NMFS in 1982. The plan, which includes a comprehensive research and management plan for the recovery of the Hawaiian monk seal, was published by NMFS in March 1983. A new recovery team was appointed by NMFS in 1989. After the new team's first meeting in 1989, recommendations were submitted to NMFS. Subjects addressed included research programs, data analyses, the Kure Atoll Head Start Project, a male mobbing problem, population monitoring, recovery actions at Midway Island, the repair of facilities at Tern Island, and priorities for the 1990 field season. The team has recommended placing observers aboard long-line swordfish vessels operating near the Northwest Hawaiian Islands. In December, 1993, the point at which Hawaiian monk seals may be considered recovered was discussed.

The new recovery team concluded that the 1983 recovery plan still provides a useful guide to overall recovery needs. Instead of producing a new plan, the team recommended updating the 1983 plan with results of subsequent annual program reviews.

The major actions recommended in the plan are:

1. Identify and, where possible, mitigate the natural factors causing or contributing to the decreased survival and productivity of monk seals.

2. Characterize the marine and terrestrial habitat requirements of the monk seal, including use patterns and feeding habits.

3. Assess the monk seal population and monitor population trends.

4. Document, and where possible, mitigate the direct and indirect effects of human activities on monk seals.

5. Implement appropriate management actions leading to conservation and recovery of the species.

6. Develop an education program to foster greater conservation efforts among the users of the Northwestern Hawaiian Islands and the public.

RECOVERY ACTIONS

In May 1988, NMFS designated critical habitat for the Hawaiian monk seal out from shore to 20 fathoms in 10 areas of the Northwestern Hawaiian Islands. NMFS believes these areas require special management consideration or protection now and in the reasonably foreseeable future. Critical habitat designation directly affects only Federal agencies and those who need Federal authorization or funding for their actions. The agencies most likely to be affected by this designation include the U.S. Coast Guard, U.S. Navy, U.S. Fish and Wildlife Service, Minerals Management Service, Western Pacific Regional Fishery Management Council, and NMFS.

Using the 1983 recovery plan, the recommendations of the recovery team, and the recommendations of the Marine Mammal Commission, NMFS has developed a draft 3-year comprehensive work plan that will serve as the mechanism for identifying funding needs for fiscal years 1994-1996. The identified tasks focus on recovery of monk seal populations in the western portion of the species' range, resolution of the mobbing problem at Laysan and Lisianski Islands and monitoring monk seal populations at the five major breeding locations of French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, and Kure Atoll.

Since 1985, NMFS has been studying abnormal mobbing behavior by adult male seals at Laysan Island. This behavior can result in the death or serious injury of adult females and young animals. Since 1982, 43 seals were known to have died from mobbing, and an additional 17 disappeared after receiving severe wounds from mobbing. Of these 60 seals, 28 were adult females. With the concurrence of

the recovery team, NMFS has proposed to remove up to 30 adult male monk seals from the Laysan Island population in order to decrease the incidence of mobbing attacks and thereby increase female survival. Removals are scheduled to begin in 1994. Males will be placed in captivity or relocated in the wild.

From 1981-1991, NMFS considered a Head Start Project to help rebuild a breeding population at Kure Atoll. The program involved removing newly weaned female pups from the beaches of Kure, placing them in an enclosed pen on the shoreline, raising them through their first summer of life, and then releasing them at Kure. From 1981 to 1991, a total of 33 pups were headstarted, 21 of which were alive in 1993. To supplement these efforts, small pups unlikely to survive on their own were taken from French Frigate Shoals, rehabilitated at facilities in Honolulu, and released at Kure. From 1985 to 1993, 20 rehabilitated pups were released at Kure Atoll, 14 of which were alive in 1993. Also, five normal-sized female pups were taken from French Frigate Shoals after weaning and released at Kure in 1990. The efforts to rebuild the Kure population have been successful. Average beach counts have increased at an estimated 3% per year since 1981.

Based on recommendations made in the recovery plan, NMFS has monitored populations of monk seals at all primary breeding locations since 1983. Each site requires individual attention since each area is unique. Some counts include information on the age and sex composition of the population which helps to predict future trends. The ratio of juveniles and subadults to adults varies significantly among atolls. Tagging of seals on these five sites has shown high survival of immature monk seals, but three island populations are not growing. The decline in the Laysan and Lisianski Island populations since the late 1950's appears to have been sustained through the last decade because of mobbing activity. At French Frigate Shoals, birth rate and juvenile survival have dropped dramatically, and the population has declined by approximately 14% per year since 1989. These changes appear to be from a reduction in prey availability, which is thought to be related to an increase in ocean temperature and a decrease in marine productivity. The precipitous decline of this population continued in 1993.

In response to reports of Hawaiian monk seals being incidentally taken by long-line swordfish operations off French Frigate Shoals, NMFS investigated island beaches for evidence of interactions between monks seals and fishing operations. Enforcement agents interviewed all long-line, lobster, and bottomfish fishermen returning from fishing trips. In November 1990, NMFS published an emergency rule submitted by the Western Pacific Fishery Management Council that requires any fishing vessel operating within 50 miles of the Northwest Hawaiian Island to notify NMFS who will then determine whether that vessel should carry an observer. It also requires long-line vessels to obtain permits from NMFS and submit daily fishing logs on interactions with monks seals and other protected species. A final rule implementing the above was published in October 1991.

Because of the limited terrestrial habitat available to the Hawaiian monk seal, pupping, nursing and haulout areas are critical to the survival of the species. Also, any former habitat than can be regained will promote recovery. Recently, monk seals have been sighted regularly around Kauai, the westernmost of the main Hawaiian Islands. The boundaries of the small Kilauea Point National Wildlife Refuge which serves as monk seal habitat on the island, do not extend seaward of the shoreline. The nearshore waters are included in the proposed "Humpback Whale National Marine Sanctuary."

Tern Island, which has served as a permanent field station for the U.S. Fish and Wildlife Service since 1979, provides an essential base for NMFS to monitor all islands in French Frigate Shoals. These shoals provide habitat for nearly half of the total population of Hawaiian monk seals. In the late 1980s, USFWS considered abandoning the station because of the expense involved in its operation and maintenance. However, after completing recommendations for a long-term course of action for the field station at Tern Island, USFWS has refurbished a portion of the island's facilities. Restoration of the island's seawall will require the cooperation of USFWS, Navy, Corps of Engineers, and Coast Guard.

RECOVERY GOALS

At the present time, "recovery" has not been

23

quantitatively defined by the Hawaiian Monk Seal Recovery Team because 1) the species continues to decline and its status is, at best, perilous, 2) the species has experienced at least three episodes of catastrophic decline since the late 1950's, none of which can be fully explained, and 3) even with complete reversal of downward trends and population growth at the maximum rate, monk seal populations would probably not reach historic levels for 20-30 years.

However, the following goals have been identified: (1) Stopping the downward trend in numbers of monk seals in the central and western portions of the species range; (2) Taking action to develop positive growth rates at most or all islands; (3) Identifying or preventing human activities that could result in the degradation or destruction of habitats or habitat components critical to the survival and recovery of the species; and (4) Determining the population level which will result in maximum net productivity.

The major areas of action described in the Recovery Plan Status are designed to stop the downward population trends in the central and western portions of the species' range, stimulate positive growth at all depleted populations, and prevent human activities that could result in the degradation or destruction of monk seal habitat essential to their survival and recovery.

STATUS OF RECOVERY PROGRAM
STELLER (NORTHERN) SEA LION

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 12/30/92

SPECIES COVERED

STELLER (NORTHERN) SEA LION

RECOVERY PLAN STATUS

On November 21, 1989, the Environmental Defense Fund and 17 other environmental organizations petitioned NMFS to publish an emergency rule listing the Steller sea lion as an endangered species and to initiate a rulemaking to make the listing permanent. On February 22, 1990, NMFS determined that under Section 4 of the ESA, the petition presented substantial information indicating that the action may be warranted and requested comments (55 FR 6301). On April 5, 1990, NMFS issued an emergency interim rule (55 FR 12645) listing the Steller sea lion as threatened.

On July 20, 1990, NMFS proposed listing the Steller sea lion as a threatened species. (55 FR 29793) On the same date, NMFS also issued an advanced notice of proposed rulemaking (55 FR 29792) requesting public comments to assist NMFS in its efforts to develop separate, more comprehensive protective regulations and critical habitat designation.

NMFS took this dual-track rulemaking approach because it wanted to avoid any lapse between the expiration of the emergency interim listing and the final listing. There was not sufficient time to issue a proposed rule with comprehensive protective regulations including a proposed critical habitat designation, solicit public comments, provide an opportunity for public hearings, conduct the required regulatory and economic analyses, and issue a final rule by the time the emergency listing expired at the end of the 240 days on December 3, 1990.

Further NMFS believed that it was preferable to consider the information provided in the recovery plan prior to publishing comprehensive protective regulations. Therefore, NMFS listed the Steller sea lion as a threatened species on November 26, 1990 (55 FR 49204) with a limited set of protective measures and proposed more comprehensive protective regulations and critical habitat in a separate rulemaking.

In March 1990, NMFS appointed the Steller Sea Lion Recovery Team which was responsible for drafting a recovery plan and providing recommendations to NMFS on necessary protective regulations for the Steller sea lion. The draft Steller Sea Lion Recovery Plan was completed and made available for public comment on March 15, 1991 (56 FR 11204). The comments were reviewed and the draft recovery plan revised. A final recovery plan was approved and distributed in December of 1992.

The major actions recommended in the plan are:

1. Identify species habitat requirements and protect areas of special biological significance.

2. Identify specific management stocks.

3. Monitor population status and trends.

4. Conduct age class sex ratio studies on rookeries and tag animals for future studies.

5. Determine and minimize causes of mortality.

6. Investigate feeding ecology and factors affecting energetics.

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, Steller sea lions are protected from Federal actions that are likely to jeopardize the continued existence of the species. Activities that present a potential conflict include fisheries and oil exploration.

A number of recovery actions identified in the recovery plan have already been initiated. Population surveys and research on population dynamics are continuing. Research to determine primary prey species has been conducted. Analyses of tissues have been done to determine levels of organochlorine pollutant residues and levels of heavy metals. Satellite telemetry is being used to monitor steller sea

lion movements and to identify areas that need to be designated as critical habitat.

The following protective regulations have been adopted:

1. Discharge of a firearm at or within 100 yards of a Steller sea lion is prohibited with certain exceptions. Exceptions include: for government officials if taking is in a humane manner, for the protection or welfare of the animal, the protection of the public health and welfare, or the nonlethal removal of nuisance animals; and for subsistence purposes.

2. Buffer zones of 3 nautical miles were established around all principal Steller sea lion rookeries in the Gulf of Alaska and the Aleutian Islands. Generally, no vessel will be allowed to operate within the 3-mile buffer zones and no person will be allowed to approach on land closer than one-half mile with certain exceptions. Exceptions include: for government officials if taking is in a humane manner, for the protection and welfare of the animal, the protection of the public health and welfare, or the nonlethal removal of nuisance animals; for government officials conducting activities necessary for national defense or the performance of other legitimate government activities; and for emergency situations that present a threat to the health, safety or life of a person or a significant threat to a vessel or property. Additionally, a mechanism is provided where the Alaska Regional Director may issue exemptions for traditional or historic activities (including subsistence taking) that do not have a significant adverse effect on sea lions and for which there is no readily available and acceptable alternative. Notice of all such exemptions will be published in the Federal Register.

3. An annual incidental kill quota of 675 Steller sea lions was established for Alaskan waters and adjacent areas of the Exclusive Economic Zone (EEZ) west of 141 W. Longitude. To monitor this quota, NMFS retained the observer authority of the emergency rule to allow the Alaska Regional Director to place an observer on any vessel. If collected data indicate that the quota is being approached, NMFS will issue emergency rules to close areas to fishing, allocate the remaining quota among fisheries, or take other action to ensure that commercial fishing operations do not exceed the quota.

In January 1992, NMFS amended the Bering Sea and Aleuthian Islands (BSAI) and Gulf of Alaska (GOA) Groundfish Fishery Management Plans (FMPs) to prohibit trawling year round within 10 miles of listed Steller sea lion rookeries in the Bering Sea, Aleutian Islands, and Gulf of Alaska. Trawl closures around six of the BSAI rookeries were expanded seasonally to 20 nautical miles during the BSAI winter pollock fishery. Coincident with the rookery closures, NMFS also amended the GOA FMP to spatially and temporally allocate GOA pollock harvests. These management actions were taken to reduce the possible adverse effects of spatially and temporally concentrated groundfish fishery removal on Steller sea lions and to reduce opportunities for incidental and intentional takes.

On April 1, 1993, NMFS proposed a rule to designate critical habitat for the Steller sea lion. The rule became final on August 27, 1993. Critical habitat includes all Steller sea lion rookeries and major haulouts within U.S. borders, and a 20 nautical mile zone around the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) Steller sea lion listed rookeries and major haulouts. Three aquatic zones have also been designated as critical habitat; one is located in the GOA (Shelikof Strait and adjacent waters), and two are located in the BSAI area (Bogoslof Island area and Sequam Pass) -- because of their geographic location relative to Steller sea lion areas of abundance, they are known foraging areas, and they support large concentrations (and a diversity) of prey items.

Because of a continuing decline in the Alaskan portion of the Steller sea lion population, NMFS initiated a status review in November 1993 to determine whether a change in status to endangered is warranted. The status review will incorporate results from the 1994 range-wide Steller sea lion population survey; a preliminary determination is expected in late 1994.

RECOVERY GOALS

The overall goal of this recovery plan is to promote recovery of the Steller sea lion population to a level

24

appropriate to justify removal from ESA listings. The primary purpose of the plan is to propose a set of actions that will minimize any human-induced activities that may be detrimental to the survival or recovery of the population. Immediate objectives are to identify factors that are limiting the population, actions necessary to stop the population decline, and actions necessary to cause the population to increase. Although it is not clear what factors have contributed to the Steller sea lion population decline, and it is apparent that a great deal of information vital to the effective management of the species is lacking, there is an urgent need to take immediate actions to safeguard against further population declines, and to provide for recovery of the species.

STATUS OF RECOVERY PROGRAM
BOWHEAD WHALE

GENERAL

PLAN STAGE: NONE
PLAN APPROVED DATE: N/A

SPECIES COVERED

BOWHEAD WHALE
(WESTERN ARCTIC)

RECOVERY PLAN STATUS

No recovery plan for this species has been prepared, nor has a recovery team been established. The principal cause of the decline in bowhead whales was commercial whaling. There is a prohibition on commercial harvest of this species. Although there is a limited subsistence take, the magnitude of the threat from direct takes is low.

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, the species is protected by ensuring that Federal actions are not likely to jeopardize the species. Regulations that allow a take of bowhead whales incidental to energy exploration in the Arctic include requirements to monitor the effects of these activities on bowhead whales. Research data on the reaction of whales to various oil exploration noises is being acquired. Although a recovery plan has not been prepared, NMFS has supported a number of studies to gain basic biological information on this species. During 1990, an analysis of data accumulated between 1984 and 1990 on life history and ecology was initiated. In 1992 and 1993 hydroacoustical surveys were conducted to determine population abundance.

At present, research on bowhead whales is coordinated through the NMFS Office of the Alaska Regional Director. Research is being conducted by the Alaska Eskimo Whaling Commission, the Minerals Management Service, the North Slope Borough, and by NMFS. Issues that address habitat degradation caused by noise associated with vessel traffic, seismic operation and oil-rig operations are also coordinated by the Alaska Regional Office.

The International Whaling Commission (IWC) is going to undertake a population assessment of bowhead whales at its 1994 meeting. To date, the IWC has not initiated the development of a management scheme for aboriginal whaling, as it has for commercial whaling. Efforts have been initiated within the U.S. IWC delegation to evaluate the implications of applying a management scheme to subsistence whaling. This issue will also be addressed at the 1994 IWC meeting. A current population model for the western Arctic stock of bowhead whales was presented at the 1993 IWC meeting.

Also, the western Arctic bowhead whale population is increasing, albeit at a slow rate. In May, 1991, the IWC's Scientific Committee estimated that the population was approximately 7500 individuals, and increased at a rate approaching 3 percent per year between 1978 and 1988. These estimates may have been optimistic as current assessments indicate an increase much closer to 1.5 percent per year. This is a recovery rate lower than that expected for large whales, and activity in the western Beaufort, as well as subsistence, have been implicated as inhibiting the maximum growth potential for this population.

A recovery plan developed following the 1994 IWC meeting will be based on the latest scientific information, and a more significant contribution to the recovery of the species.

STATUS OF RECOVERY PROGRAM
GRAY WHALE

GENERAL

PLAN STAGE: NONE
PLAN APPROVED DATE: N/A

SPECIES COVERED

GRAY WHALE
(EASTERN NORTH PACIFIC)

RECOVERY PLAN STATUS

No recovery plan for this species was prepared, nor has a recovery team been established.

Preparation of a recovery plan for the eastern Pacific stock is not under consideration because the species appears to have fully recovered from commercial whaling.

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, the species is protected from Federal actions that might adversely affect recovery.

In 1993, NMFS published a determination that the eastern North Pacific stock of gray whales had recovered and was no longer in danger of extinction.

In accordance with the requirements of the ESA, a 5-year research and monitoring plan to ensure that the eastern North Pacific stock of gray whales is no longer in danger of extinction has been designed by NMFS.

The following research is recommended for the first 5-year monitoring plan, in order of priority:

1) Estimation of abundance from biennial surveys (or other appropriate sampling period) during the southbound migration;

2) Estimation of calf production during the northbound migration;

3) Determination of potential biases in methods used to estimate abundance and calf production;

4) Determination of trends in pregnancy rates from animals taken in any subsistence harvests that may be conducted by Russia on behalf of its natives in Siberian Arctic;

5) Estimation of the number of animals killed in any subsistence harvests that may be conducted by Russia on behalf of its natives in Siberian Arctic;

6) Use of Bayesian synthesis to evaluate current status of the population;

7) Determination of the degree to which anthropogenic factors (e.g. chemical contaminants, marine noise) may compromise the viability of this population (including its habitat).

STATUS OF RECOVERY PROGRAM
HUMPBACK WHALE

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 11/01/91

SPECIES COVERED

HUMPBACK WHALE
(NORTH ATLANTIC)

HUMPBACK WHALE
(NORTH PACIFIC)

RECOVERY PLAN STATUS

During 1988/1989, the Humpback Whale Recovery Team developed a draft recovery plan, which was distributed to the public for comment in October 1989. Comments were received from Federal and state agencies, academia, scientific and environmental communities and the public. The recovery team reviewed and incorporated comments received and submitted a draft final plan to NMFS. The plan was approved and distributed in November of 1991.

The major actions recommended in the plan are:

1. Maintain and Enhance Habitats Used by Humpback Whales Currently or Historically.

   Identify and designate critical habitat.

   Examine history of occupancy and potential for repopulation of important habitats.

   Identify and minimize possible adverse impacts of human activities and pollution on important habitat.

   Monitor parasite load and anthropogenic contaminant level in tissues of whales and their prey.

   Develop Federal-state-local partnerships for protecting humpback whale habitats.

   Encourage multinational cooperation to protect humpback whale habitats.

2. Identify and Reduce Direct Human-Related Injury and Mortality.

   Continue prohibition on commercial hunting of humpback whales.

   Continue to identify sources and rates of human-induced injury and mortality and use information to reduce those factors (e.g. reduce fishing gear entanglement).

3. Measure and Monitor Key Population Parameters.

   Estimate and re-evaluate historic population sizes.

   Improve current population estimates by evaluating and reanalyzing existing data with improved techniques and systematize sampling methods for estimating population size.

   Maintain and develop facilities for obtaining, archiving, and analyzing data on humpback whales.

   Perform new field studies on population dynamics.

   Assess population status and trends.

4. Improve Administration and Coordination of Recovery Program for Humpback Whales.

   Improve coordination with governmental and non-governmental agencies.

   Appoint a recovery implementation team, update the recovery plan and prepare comprehensive work plans for each stock.

   Collect and archive available information on humpback whales, including translation of foreign literature.

   Improve process for obtaining permits to do research on marine mammals.

   Maintain coordination with other recovery programs.

30

Reassess, as appropriate, the goals for population recovery.

Develop educational materials in support of recovery plan objectives.

The plan summarizes the team's understanding of the status of those humpback whale populations that are wholly or partly under U.S. jurisdiction. It recommends management activities to assist these and other populations to increase in numbers, and research activities to measure rates of population change. It emphasizes two major ways to achieve population growth: (1) protection of habitats and (2) reduction of human activities that interfere with annual life cycle processes.

RECOVERY ACTIONS

Specific actions necessary for the recovery of the species have been identified, and many direct recovery actions are being implemented. During the last 2 years, projects have included: maintenance of an individual photo-identification system on both coasts so that reproductive rates can be determined; a project to estimate abundance on the east coast; a project to determine genetic relationships among whales; and a study of habitat requirements and utilization. Research on the North Atlantic population is being coordinated under an International research effort known as the Years of the North Atlantic Humpback (YONAH). Identification, behavioral, and genetic data have been collected from both winter mating/calving grounds and summer feeding grounds. These data will be used to determine the population status, stock structure, and habitat use of humpback whales throughout the North Atlantic range. Analysis will directly apply to recovery plan goals.

A formal Section 7 consultation on proposed Outer Continental Shelf Oil and Gas Lease Sale 149 (Lower Cook Inlet and Shelikof Strait) was completed in October, 1993. The consultation concluded that the activity is not likely to jeopardize humpback whales. The biological opinion recommended monitoring of whale activity in the area and further research on the species stock identification and distribution in the area.

A formal Section 7 consultation was initiated with EPA in 1993 to consider the effects of discharge from a pulp mill in Silver Bay near Sitka. Silver Bay is an important feeding area for humpback whales. The permit was subsequently withdrawn from consideration due to the closing of the pulp mill and the consultation was terminated.

NFMS continues to consult with the National Park Service regarding the impacts of vessel traffic in Glacier Bay on humpback whales. A biological opinion prepared in 1993 by the NMFS Alaska Region concluded that proposed numbers of vessel entries into Glacier Bay is not likely to jeopardize the North Pacific population of humpback whales.

All reported stranded humpback whales are receiving priority response by NFMS Regions in order to maximize the collection of biological information.

RECOVERY GOALS

The goal of the recovery plan is to increase humpback whale populations to at least 60% of either the number existing before commercial exploitation or the current environmental capacity. The interim goal is to double existing population sizes within the next 20 years. Acceptable evidence of ongoing population recovery will be data showing: (1) Statistically significant trends of population increase as determined by accepted analytical methods and (2) Statistically significant trends of population increase in portions of the range known to have been occupied in historical times.

21

STATUS OF RECOVERY PROGRAM
NORTHERN RIGHT WHALE

GENERAL

PLAN STAGE: FINAL
PLAN APPROVED DATE: 12/01/91

SPECIES COVERED

NORTHERN RIGHT WHALE
(NORTH ATLANTIC)

NORTHERN RIGHT WHALE
(NORTH PACIFIC)

RECOVERY PLAN STATUS

The Northern Right Whale Recovery Team was appointed in July 1987. A Draft Recovery Plan for the Northern Right Whale was distributed for public comment in February 1990. Comments were received from Federal, state and local governments, conservation organizations, and private individuals. Appropriate comments were incorporated into the plan. The plan was approved and distributed in December of 1991.

The major actions recommended in the plan are:

1. Reduce or eliminate injury or mortality caused by ship collision.

   Identify the causes of ship collisions with northern right whales and implement measures to reduce ship collisions.

2. Reduce or eliminate injury and mortality caused by fisheries and fishing gear.

   Develop or modify fishing gear to reduce the threat of entrapment or entanglement.

   Implement appropriate seasonal or geographic regulations for use of certain fishing gear in northern right whale habitats.

   Improve procedures for reporting and rescuing northern right whales entangled in fishing gear.

3. Protect habitats essential to the survival and recovery of the northern right whale.

   Characterize habitats of special importance to the northern right whale and protect habitats already known to be of special importance to the northern right whale.

   Improve knowledge of how northern right whales utilize their habitats.

   Identify other habitats used by the northern right whale and protect these newly discovered habitats.

4. Minimize effects of vessel disturbance.

   Determine the effects of whale watching on northern right whales and propose regulations as necessary.

   Establish a program to improve the educational aspects of whale watching.

   Implement appropriate controls on other vessel activities.

5. Continue international ban on hunting and other directed take.

6. Monitor the population size and trends in abundance of the northern right whale.

   Maintain the northern right whale photo-identification catalog and sighting database.

   Continue a program to monitor annual reproductive success.

   Design and implement other programs for population monitoring.

   Identify pre-exploitation population numbers for the western North Atlantic stock.

   Encourage development of new technology useful for population monitoring.

32

7. Maximize efforts to free entangled or stranded northern right whales and acquire scientific information from dead specimens.

Improve and maintain the system for reporting stranded or distressed northern right whales.

Develop an improved program for handling live stranded or distressed northern right whales.

Improve the existing program to maximize data collected from dead northern right whales.

Establish or identify funding sources for emergency rescue and rehabilitation efforts.

RECOVERY ACTIONS

Through interagency coordination under Section 7 of the ESA, northern right whales are protected from Federal actions that might jeopardize the species. A number of the recommended recovery actions are being implemented through the section 7 consultation process. Dredge projects along the southeast coast are required to have observers on board to watch for northern right whales when the dredges are transiting to and from spoil dump sites. The designation of dump sites are also subject to consultation, as are Outer Continental Shelf oil and gas activities.

A number of recovery actions identified in the final recovery plan have been implemented during the last 2 years. Research has been conducted on population dynamics and migration patterns. The agency has also provided funding for the maintenance of an individual photo-identification system. Research has also been conducted on habitat requirements and utilization.

NFMS has established a system of identifying the seasonal areas of concentration of right whales in the Great South Channel off Cape Cod, Massachusetts. Mariners are informed of the possibility of right whale and other endangered whales in the area during the spring months. They are advised to monitor NOAA Weather Radio and a special NFMS fishery broadcast frequency for updated locations provided by whale researchers and other interested boaters. NMFS has also established a program with EPA to have right whale and other endangered species tissue, obtained either through strandings or biopsy darts, to be analyzed for the presence of contaminants. In addition, NMFS has joined with nine other agencies and organizations in a collaborative effort to mitigate ship strikes on right whales in their wintering and calving grounds in coastal waters of the southeastern United States. Program components include education of mariners, an Early Warning Network, and research directed at providing information required for management decisions.

NMFS was petitioned by the recovery team to designate three areas along the Eastern Seaboard (Cape Cod Bay, Great South Channel, and the calving ground off the Florida/Georgia coast) as critical habitat for the northern right whale. Comments and further information were solicited from the public in July 1990. Based on the petition and ongoing research, NMFS proposed critical habitat for the northern right whale on May 19, 1993. Critical habitat was designated on June 3, 1994.

Southeast Implementation Team:
NMFS considers it imperative to protect breeding right whales while on the winter calving grounds off Georgia and Florida. Several Federal agencies are already participating in research and monitoring efforts to protect the northern right whale. The ACOE for example, has worked cooperatively with the United States Department of the Navy to protect right whales on their calving grounds in the southeastern United States from shipstrikes during hopper dredging activities. NMFS convened a meeting on August 26, 1993, to discuss the monitoring program that needed to be in place prior to the arrival of northern right whales on their winter ground. The following monitoring efforts were considered necessary to protect whales from December through March at the SEUS:

- Daily aerial surveys during the right whale calving season;
- Monitoring right whale movements, and habitat-use by mothers and calves during the right whale calving season;
- Restriction of vessel speeds when right whales are known to be in an area and visibility is limited. The actual speed reduction necessary is defined as the minimum safe speed to insure the safety of the vessel;
- Dedicated right whale observers that would accompany pilots on vessels as they enter and leave ports;

- An education program of all Federal, state and local parties that might adversely affect the species.

During the August 26th meeting, the Southeastern United States Right Whale Recovery Plan Implementation Team was formed. The team consists of representatives from the Georgia Department of Natural Resources (Chairman); Florida Department of Environmental Protection; NMFS/Southeast Fisheries Center and Southeast Regional Office; United States Navy, Naval Air Station, Jacksonville, Florida; United States Navy, Submarine Group, Kings Bay, Georgia; Georgia Ports Authority; Canaveral Port Authority; Glynn County Commission, Glynn County, Georgia; University of Georgia; United States ACOE, South Atlantic Division; United States Environmental Protection Agency; Port of Fernandina, Fernandina, Florida; and the United States Coast Guard. At this meeting several committees were established including: Education/Awareness, Early Warning Surveys/Communication; Funding of Surveys; Research; and Relocation of Ocean Disposal Sites.

A second meeting of the team occurred on December 14, 1993, and the following accomplishments of the various committees were discussed:

Awareness/Education Committee: The Canaveral Port Authority had developed an endangered species pamphlet covering whales, manatees and turtles and is being distributed regionally. As a group, the Port Authorities developed a series of posters describing the time right whales are in their waters, a phone number on who to contact if a whale is seen, and mention of right whale habitat. This poster is being distributed by the harbor pilots when they board a vessel for navigation.

A standard brochure on right whales in the SEUS is being developed with input from the Georgia Department of Natural Resources (DNR), Florida Department of Environmental Protection (DEP), New England Aquarium and others. The brochure is designed for boaters (commercial and public) but is also another educational tool to be given to the ship masters by the harbor pilots. The Port Authorities, Coast Guard, Navy, Georgia DNR and Florida DEP can use this brochure as the basis of awareness and education. Financial support for this brochure comes from the participating agencies.

The Georgia DNR and United States Coast Guard implemented a local Notice to Mariners broadcast about right whale calving grounds. This notice is broadcast four times daily by the United States Coast Guard on VHF. The first broadcast was December 6, 1993, and broadcasts will run through March 31, 1994. A slightly longer version is published in the Weekly local Notice to Mariners. This notice may also be published daily along with the tides and weather in regional newspapers.

Several press releases have occurred; the initial one occurred when the first right whales were sighted by a Savannah River Pilot Captain on December 4, 1993. A regional press release was also put out describing the implementation team, members to contact if a whale is seen, and other information on the need for protection of right whales in the SEUS.

The University of Georgia is surveying local groups and their right whale efforts, to ensure that there is no duplication in the development of educational materials and to provide a network to combine efforts.

Early Warning Committee: Daily monitoring is occurring in 1994 throughout the SEUS until March.

Communications Committee: A communication flow chart was developed to illustrate the communication network and how information should be distributed among the appropriate agencies/groups: priority/immediate notification from the air, daily notification after flights, and weekly notification. This network is considered the ideal communication scheme to relay right whale sightings from air to land-based operations, and back to the vessels. It is essential to the Early Warning System alerting mariners to the presence of right whales in the SEUS. The system is updated daily as locations of whales are sighted from the aerial surveys.

Recovery Plan and Research Committee: It was agreed that a Right Whale research initiative for the southeast needed to be reconsidered and a meeting was scheduled for January 1994.

Northeast Implementation Team:
Recovery Plan implementation for the northern right

34

whale has been ongoing at some level within the NMFS, Northeast Region (NER) since December 1990, and has involved most of the key agency staff and scientific experts in the area. NER began coordination with the Environmental Protection Agency (EPA), Region I, in April 1990. The most recent MWRA Biological Opinion (issued September 8, 1993), and associated conservation recommendations, make up a small part of the recommendations and programs that have been instituted since 1990 in the NER that address Recovery Plan tasks from both plans. NMFS is coordinating the development of a New England Right Whale and Humpback Whale Recovery Plan Implementation Team for the Northeastern United States. This team will address the possible cumulative impacts to right and humpback whales in Massachusetts Bay and Cape Cod Bay from discharge and disposal activities. The Recovery Plans also recognize that commercial fishing and large vessel traffic, through entanglement and ship-strike mortality, respectively, may potentially affect the recovery of protected whale species in these, and adjacent Gulf of Maine, waters. These issues will also be addressed by this implementation team. NMFS is planning the initial Northeast Implementation Team meeting in late June or early July 1994.

Recovery Plan Research Program.
In addition to the management (monitoring) program, NMFS began developing a 3-5 year research plan that will focus on implementing those priorities in the Northern Right Whale Recovery Plan that indicate serious gaps in our present understanding of the biology of the northern right whale. The current research program is the result of several meetings that have reviewed research priorities specified in the Recovery Plan, and the management and research objectives that may have a potential effect on the rate of species recovery. One meeting took place on April 14-15, 1992, in Silver Spring; a June 18, 1993, meeting convened in Brunswick, Georgia, to discuss implementation of the Northern Right Whale Recovery Plan in the southeast United States; and a July 16, 1993, NMFS meeting was held to review the Recovery Plan priority one items relative to the implementation of the Recovery Plan over the next 3-5 year period. Based on these discussions, the following goals were identified as priorities to be accomplished within this time period:

1. To determine the wintering location(s) of most of northern right whales in the northwest Atlantic through the deployment of satellite tags in the Bay of Fundy or Scotian Shelf may lead to the "other" winter ground(s);

2. to determine daily, local movements within the wintering/calving area. Tagging with VHF tags in the SEUS could determine the daily movements of these animals. This would be useful to determine a long-term monitoring program to reduce ship strikes in the SEUS;

3. to determine where the third matriline occurs in the summer. There are 3 matrilineal stocks of northern right whales that have been recognized. One of the stocks does not visit the Bay of Fundy but is seen in the GSC and CCB during spring. Satellite tagging in the GSC or CCB in the spring of a female from the third matriline (these have already been determined from mt DNA analyses and photoidentification) might lead to the location of the other summer location of northern right whales in the North Atlantic;

4. to determine "bottlenecks" in the rate of recovery. The northern right whale has a low reproductive rate relative to southern hemisphere right whales. The possible unbreedy of males is one possibility that can be determined from the genetic/molecular identification through mtDNA biopsy sampling, and sexing using molecular techniques; and

5. to determine the best location and methods to monitor the trends (recovery) of this population. The longest time-series of counts is at the GSC. Given the variance in counts and methods that have been used, and the small population that we are studying, several questions arise: How many years of monitoring would be required before a trend could be detected, and with what level of confidence can we monitor this trend? NMFS needs to determine whether we can address the success or lack-of-success of the implementation of the recovery plan through monitoring.

RECOVERY GOALS

The goal of the recovery plan is to achieve the level of 7000 animals for in the North Atlantic. The interim goal is to change the status from endangered to

35

threatened. For the North Atlantic Population, this change would be considered when the following conditions are met: 1) The size of the North Atlantic population recovers to a level of 6000 animals; 2) The population has been increasing for at least 20 years at a rate of 2% or more per year; and 3) An effective program is in place to control known mortality factors and ensure that deterioration of habitat is not likely to occur so as to prevent the species increase.

Due to the inherently slow rate of population increase and the small size of the population, it is likely to require 150 years or more for the North Atlantic population to achieve a level that would permit the changing of the status to threatened, and even longer than that for the North Pacific population, considering its smaller estimated current population size.

Specific conditions for the recovery of the North Pacific population have not yet been set.

36

Species Status

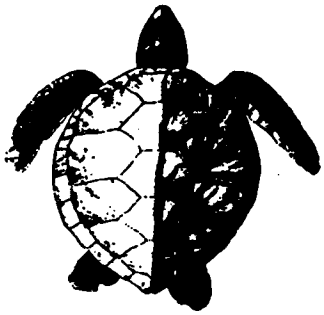
GREEN TURTLE
ATLANTIC

COMMON NAME: GREEN TURTLE
SCIENTIFIC NAME: *CHELONIA MYDAS*

LISTING DATE: 07/28/78
SPECIES STATUS: END/THREAT
SPECIES TREND: INCREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER NER



SPECIES POPULATION STATUS

The green turtle was listed as endangered/threatened on July 28, 1978, but populations have continued to decline. The breeding populations off Florida and the Pacific coast of Mexico are listed as endangered while all others are threatened.

Total population estimates for the green turtle are unavailable, 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 time. Presently there are 400-500 females nesting on U.S. beaches. The number of nests has increased on Hutchinson Island, Florida, over the period 1971 - 1989, although nesting levels have been low on other nesting beaches. Population estimates given are for the number of nesting females in Florida. Populations in Surinam, and Tortuguero, Costa Rica, may be stable, but there is insufficient data for other areas to confirm a trend. The recovery team for the green turtle concluded that the species status has not improved appreciably since listing.

The greatest cause of decline in green turtle populations is commercial harvest for eggs and food. Other turtle parts are used for leather and jewelry, and small turtles are sometimes stuffed for curios. Incidental catch by commercial shrimp trawlers is a continuing source of mortality that adversely affects recovery.

SPECIES BIOLOGY

Adult green turtles commonly reach a size of 1 m long and 150 kg mass. The carapace is smooth and is colored grey, green, brown and black. The plastron is yellowish white. Hatchlings weigh about 25 g, and are about 50 mm long. Hatchlings are black on top and white on the bottom. Age at sexual maturity is estimated at 20-50 years.

SPECIES DISTRIBUTION

In U.S. Atlantic waters, green turtles are found around the U.S. Virgin Islands, Puerto Rico, and the continental U.S. from Texas to Massachusetts. Important feeding grounds in Florida include Indian River Lagoon, the Florida Keys, Florida Bay, Homosassa, Crystal River and Cedar Key. The primary nesting sites in U.S. Atlantic waters are along the east coast of Florida, with additional sites in the U.S. Virgin Islands and Puerto Rico.

MAJOR IMPACTS

I) Impacts to nesting activities:

A) In the Unites States, killing of nesting green turtles is infrequent. However, in a number of areas, egg poaching is common.

B) Erosion of nesting beaches can result in loss of nesting habitat.

C) Development of beachfronts results in fortification

to protect property from erosion, resulting in loss of a dry nesting beach by preventing females from getting to nesting sites.

D) Beach nourishment during the nesting season buries nests and disturbs nesting turtles.

E) Artificial lighting can cause disorientation and misorientation of both adults and hatchlings. Turtle hatchlings are attracted to light, ignoring or coming out of the ocean to go towards a light source, increasing their chances of death or injury. In addition, as nesting females avoid areas with intense lighting, highly developed areas may cause problems for turtles trying to nest.

F) Repeated mechanical raking of nesting beaches by heavy machinery can result in compact sand and causes tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing of debris on the high beach can cover nests and may alter nest temperature.

G) The most serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.

H) The placement of physical obstacles on a beach can hamper or deter nesting attempts as well as interfere with the incubation of eggs and the emergence of hatchlings.

I) The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling success due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.

J) The invasion of a nesting site by non-native beach vegetation can lead to increased erosion and destruction of a nesting habitat. Trees shading a beach can also change nest temperatures, altering the natural sex ratio of the hatchlings.

II) Impacts in the marine environment

A) Dredging can result in habitat destruction by disrupting nesting or foraging grounds. Hopper dredges can also kill turtles caught in dragheads.
B) Green turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons 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. NMFS is currently analyzing stranding data and available necropsy information to determine the magnitude of debris ingestion.

C) Commercial fishing

1) It is estimated that before the implementation of TED requirements, the offshore commercial shrimp fleet captured about 925 green turtles a year, of which approximately 225 would die. Most turtles killed are juveniles and sub-adults. Bluefish, croaker and flounder trawl fishing are also serious threats.

2) Turtles are be taken by purse seine fisheries in the Atlantic and Gulf of Mexico, but the magnitude of take is currently not known.

3) Several thousand vessels are involved in hook and line fishing for various coastal species. The capturing of turtles is not uncommon, but the number is not known.

4) Significant numbers of turtles may be killed by gill and trammel net fisheries off the eastern coast of central Florida. An exact number is not known.

5) Pound net fisheries are primarily a problem in waters off of Virginia and North Carolina, where turtles get tangled in the gear and drown.

6) Over 330 sea turtles of various types (a few of which were green) were captured in the Atlantic and Gulf of Mexico EEZ in the Japanese tuna longline fishery from 1978-1981. Due to expansion of this type of fishing, it may have a significant impact on sea turtle recovery. The number of deaths is unknown.

7) Green turtles become entangled in trap lines and drown. The impact on the population has not been determined.

D) In areas where recreational boating and ship traffic is intense, propeller and collision injuries are not uncommon.

39

E) Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.

F) Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but their effect is unknown.

G) Marina and dock development can cause foraging habitat to be destroyed or damaged. It can also lead to increased boat traffic, increasing the risk of turtle/vessel collisions.

H) Turtles have been caught in saltwater intake systems of coastal power plants. The mortality rate of the turtles involved is estimated at 7%.

I) Underwater explosions (e.g. gas and oil structure removal and testing using explosives) can kill or injure turtles, and may destroy or damage habitat.

J) Turtles get caught in discarded fishing gear. The number affected is unknown, but is potentially significant.

K) Illegal harvesting of green turtles is uncommon in the U.S. No estimates of take exist. Illegal take of green turtles in the Caribbean, particularly near Puerto Rico, is a significant problem.

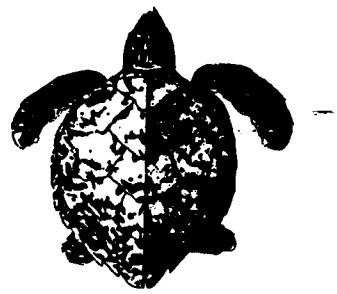
HAWKSBILL TURTLE
ATLANTIC

COMMON NAME: HAWKSBILL TURTLE
SCIENTIFIC NAME: *ERETMOCHELYS IMBRICATA*

LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: DECREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER



SPECIES POPULATION STATUS

The hawksbill turtle's status has not changed since it was listed as endangered in 1970. It is a solitary nester, and thus, population trends or estimates are difficult to determine. The decline of nesting populations is accepted by most researchers. In 1983, the only known apparently stable populations were in Yemen, northeastern Australia, the Red Sea, and Oman. Commercial exploitation is the major cause of the continued decline of the hawksbill sea turtle. There is a continuing demand for the hawksbill's shell as well as other products including leather, oil, perfume, and cosmetics. Prior to being certified under the Pelly Amendment, Japan had been importing about 20 metric tons of hawksbill shell per year, representing approximately 19,000 turtles. A negotiated settlement was reached regarding this trade on June 19, 1992. The hawksbill shell commands high prices (currently $225/kilogram), a major factor preventing effective protection.

SPECIES BIOLOGY

The hawksbill is a small to medium-sized sea turtle. In the U.S. Caribbean, nesting females average about 87 cm in curved carapace length. Weight is typically to 80 kg in the wider Caribbean, with a record weight of 127 kg. Hatchlings average about 42 mm straight carapace length and range in weight from 13.5-19.5 g. The following characteristics distinguish the hawksbill from other sea turtles: two pairs of prefrontal scales; thick, posteriorly overlapping scutes on the carapace; four pairs of coastal scutes; two claws on each flipper; and a beak-like mouth. The carapace is heart-shaped in very young turtles, and becomes more elongate or subovate with maturity. Its lateral and posterior margins are sharply serrated in all but very old individuals. The epidermal scutes that overlay the bones of the shell are the tortiseshell of commerce. They are unusually thick, and overlap posteriorly on the carapace in all but hatchlings and very old individuals. Carpacial scutes are often richly patterned with irregularly radiating streaks of brown or black on an amber background. The scutes of the plastron of Atlantic hawksbills are usually clear yellow, with little or no dark pigmentation. The soft skin on the ventral side is cream or yellow, and may be pinkish-orange in mature individuals. The scales of the head and forelimbs are dark brown or black with sharply defined yellow borders. There are typically four pairs of inframarginal scales. The head is elongate and tapers sharply to a point. The lower jaw is V-shaped.

Hawksbills utilize different habitats at different stages of their life cycle. Posthatchling hawksbills occupy the pelagic environment, taking shelter in weedlines that accumulate at convergence points. Hawksbills reenter coastal waters when they reach approximately 20-25 cm carapace length. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. The ledges and caves of the reef provide shelter for resting both during the day and night. Hawksbills are also found around rocky outcrops and high energy shoals, which are also optimum sites for sponge growth. Hawksbills are also known to inhabit mangrove-fringed bays and estuaries, particularly along the eastern shore of continents where coral reefs are absent. In Texas, juvenile hawksbills are associated with stone jetties.

41

HAWKSBILL TURTLE
ATLANTIC

Hawksbills utilize both low- and high-energy nesting beaches in tropical oceans of the world. Both insular and mainland nesting sites are known. Hawksbills will nest on small pocket beaches, and, because of their small body size and great agility, can traverse fringing reefs that limit access by other species. They exhibit a wide tolerance for nesting substrate type. Nests are typically placed under vegetation.

It is estimated that hawksbills recruited into the reef environment at 35 cm length would begin breeding 31 years later. However, the time required to reach 35 cm in length is unknown. As a result, actual age at sexual maturity is not known.

SPECIES DISTRIBUTION

The hawksbill occurs in tropical and subtropical seas of the Atlantic, Pacific and Indian Oceans. The species is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas); in the Greater and Lesser Antilles; and along the Central American mainland south to Brazil. Within the United States, hawksbills are most common in Puerto Rico and its associated islands, and in the U.S. Virgin Islands. In the continental U.S., the species is recorded from all the gulf states and from along the eastern seaboard as far north as Massachusetts, but sightings north of Florida are rare.

Hawksbills are observed in Florida with some regularity on the reefs off Palm Beach County, where the warm Gulf Stream current passes close to shore, and in the Florida Keys. Texas is the only other state where hawksbills are sighted with any regularity. Most sightings involve posthatchlings and juveniles. These small turtles are believed to originate from nesting beaches in Mexico.

Nesting within the southeastern United States occurs principally in Puerto Rico and the U.S. Virgin Islands, the most important sites being Mona Island and Buck Island. Nesting also occurs on other beaches of St. Croix, and on Culebra Island, Vieques Island, mainland Puerto Rico, St. John and St. Thomas. Within the continental United States, nesting is restricted to the southeast coast of Florida and Florida Keys.

MAJOR IMPACTS

I) Impacts in the nesting environment

A) The greatest threat on nesting beaches is poaching. Poaching of hawksbill eggs is a serious problem in Puerto Rico, and also occurs at lower levels in St. Thomas and St. Croix. Adult females are still butchered for their tortiseshell, but the practice is decreasing with better enforcement.

B) Erosion of nesting beaches can result in loss of nesting habitat. However, natural processes of beach erosion are not generally a significant threat.

C) Fortification of beachfronts to protect property from erosion can cause the loss of a dry nesting beach. It can also prevent females from getting to nesting sites and wash out nests. Beach nourishment buries nests and disturbs nesting turtles. Nourishment also results in heavy machinery, pipelines, increased human activity and artificial lighting on a project beach. This can create barriers for nesting sea turtles emerging from the ocean, preventing them from building nests, and it also disturbs nesting turtles on the beach.

D) Removal of sand for construction aggregate or renourishment of other beaches is a serious threat throughout the Caribbean. Sand removed from above the tide line is replaced very slowly from subtidal areas, a process which can take decades. Subtidal sand removal results in beach sand moving offshore.

E) Most nesting beaches are in private hands, and many of these have been developed. Development and landscaping of these nesting beaches can create impediments for nesting turtles. In addition, exotic plants such as sea oats can damage or destroy nests through root action.

F) Artificial lighting can cause disorientation or misorientation of both adults and hatchlings. Turtle hatchlings are attracted to light, ignoring or coming out of the ocean to go towards a light source, increasing their chances of death or injury. In addition, as nesting females avoid areas with intense lighting, highly developed areas may cause problems for turtles trying to nest.

G) Mechanical raking can result in heavy machinery repeatedly moving across a nest and compacting sand as well as causing tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing of debris on the high beach can cover nests and may alter nest temperature.

H) The most serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.

I) The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling success due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.

J) A variety of natural and introduced predators such as hogs, mongooses, ghost crabs and ants prey on hawksbill eggs and hatchlings.

II) Impacts in the marine environment

A) The extent to which hawksbills are killed or debilitated after becoming entangled in marine debris are unknown, but it is believed to be a serious and growing problem. Hawksbills have been reported entangled in monofilament gill nets, "fish nets", fishing line and rope. NMFS is currently analyzing stranding data and available necropsy information to determine the magnitude of debris ingestion and entanglement.

B) Hawksbill turtles eat a wide variety of debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons 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.

C) Incidental catch during fishing operations is an unquantified and potentially significant source of mortality. Gill nets, longlines and shrimp trawls all take turtles in Gulf of Mexico waters. In Puerto Rico, hawksbills are captured by a variety of fishing gear, including driftnets, gillnets, seines and spearguns. Gillnets and seines are widely deployed and are a particularly serious problem; these nets are sometimes set specifically for turtles.

D) In areas where recreational boating and ship traffic is intense, propeller and collision injuries are not uncommon.

E) In Puerto Rico, damage to coral reefs and other shallow water benthic systems from sedimentation and siltation has not been assessed as yet, but is known to be a serious problem in some areas, with some coral reefs completely destroyed by siltation.

F) Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but their effect is unknown.

G) Raw sewage in Puerto Rico and the U.S. Virgin Islands has been released directly into nearshore waters. While a regional treatment plant has just been completed in Puerto Rico, monitoring has not been initiated.

H) The illegal take of hawksbills at sea has not yet been fully quantified, but it is a continuing problem.

I) Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.

J) The hawksbill's dependence on coral reefs for shelter and food link its well-being to the condition of reefs. Destruction of reefs from vessels anchoring, striking or grounding is a growing problem. Cruiseships and yachts are destroying portions of coral reefs with their anchors and anchor chains in the USVI, Puerto Rico, the BVI and Cayman Islands, Belize, and elsewhere. There is also damage from recreational, diving and fishing boats anchoring indiscriminantly on reefs.

K) International commerce in hawksbill shell (bekko) is the single most significant factor endangering hawksbill populations around the world. Japanese imports of raw bekko between 1970 and 1989 totaled 713,850 kg, representing more than 670,000 turtles; more than half the imports originated in the Caribbean and Latin America. While hawksbills are protected under CITES, trade continues for several reasons:

1) Not all countries have ratified CITES;

43

2) Some treaty signatories participate in trade by falsifying documents of origin;

3) Some treaty signatories ignore the treaty and trade openly in hawksbills and hawksbill products; and

4) Some treaty signatories have exercised their right to take exemption to treaty provisions as they affect sea turtles.

L) In nearshore waters, hawksbills are periodically captured in the cooling water intakes of industrial facilities. In addition, illegal use of explosives for fishing is a concern, especially off the southeast coast of Puerto Rico.

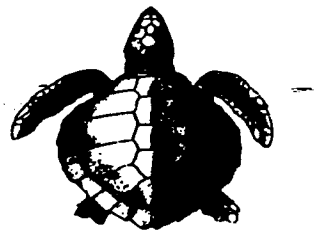
KEMP'S RIDLEY TURTLE
ATLANTIC

COMMON NAME: KEMP'S RIDLEY TURTLE
SCIENTIFIC NAME: *LEPIDOCHELYS KEMPI*

LISTING DATE: 12/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: STABLE
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER NER



SPECIES POPULATION STATUS

The Kemp's ridley was listed as endangered throughout its range on December 2, 1970, and its status has remained unchanged. The Kemp's ridleys population has declined since 1947 when an estimated 40,000 females nested in one day to a current nesting population of 700-800. The number of females nesting in Mexico is estimated at 400-600 at present. Since 1978 the number of nests have declined at a rate of approximately 14 nests per year. Numbers continue to decline despite protection of the Kemp's ridley primary nesting beach. The decline of this species was primarily due to human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of incidental take by shrimp trawlers which is believed to have adversely affected recovery.

SPECIES BIOLOGY

The Kemp's ridley and olive ridley sea turtles are the smallest of all extant sea turtles, with the weight of an adult generally being less than 45 kg and the straight carapace length around 65 cm. Adult Kemp's ridleys' shells are almost as wide as long. Coloration changes significantly during development from the grey-black carapace and plastron of hatchlings to the lighter grey-olive carapace and cream-white or yellowish plastron of adults. There are two pairs of prefrontal scales on the head, five vertebral scutes, five pairs of coastal scutes and generally twelve pairs of marginals on the carapace. In each bridge adjoining the plastron to the carapace, there are four scutes, each of which is perforated by a pore. This is the external opening of Rathke's gland which secretes a substance of unknown (possibly a pheromone) function. Males resemble the females in size and coloration. Secondary sexual characteristics of male sea turtles include a longer tail, more distal vent, recurved claws and, during breeding, a softened mid-plastron. Eggs are 34-45 mm in diameter and 24-40 g in weight. Hatchlings range from 42-48 mm in straight line carapace length, 32-44 mm in width and 15-20 g in weight.

Neonatal Kemp's ridleys feed on the available sargassum and associated infauna or other epipelagic species found in the Gulf of Mexico. In post-pelagic stages, the ridley is largely a crab-eater, with a preference for portunid crabs. Age at sexual maturity is not known, but is believed to be approximately 6-7 years, although other estimates of age at maturity range from 12 to 35 years.

SPECIES DISTRIBUTION

The major nesting beach for Kemp's ridleys is on the northeastern coast of Mexico. This location is near Rancho Nuevo in southern Tamaulipas. The species occurs mainly in coastal areas of the Gulf of Mexico and the northwestern Atlantic Ocean. Adults of this species are usually confined to the Gulf of Mexico, although adult-sized individuals are sometimes found on the eastern seaboard of the United States.

45

MAJOR IMPACTS

I) Impacts in the nesting environment

Threats to the nesting beach in Mexico are presently few, but potentially serious. Human population growth and increasing developmental pressure will result in increased threats to the nesting beach. Only the central part of the prime nesting area is protected by Mexican presidential decree. A primary concern is human encroachment and access along the entire nesting area. However, the wording of the Mexican decree is vague and construction of commercial fishing facilities proceeded in 1987 immediately adjacent to the main turtle camp at Rancho Nuevo. Occasionally plans for massive expansion of La Pesca (just to the north of the nesting area) as a fishing center or dredging of the Gulf Intercoastal Waterway from Brownsville, Texas to Barra del Tordo (in the south part of the nesting beach) are reported. These plans are alarming because of the assuredly detrimental and possibly disastrous effects that they could have on the nesting population if they were to be completed.

A threat resulting from management practices at Ranch Nuevo is relocating all of the nests in one corral to prevent poaching and predation. This concentration makes the eggs more susceptible to reduced viablility from the manipulation, disease vectors and inundation.

II)Impacts in the marine environment

A) It is estimated that before the implementation of TEDs, the commercial shrimp fleet killed 500-5000 Kemp's ridleys each year. Besides shrimp trawls, Kemp's ridleys have been taken in pound nets, trawls, gill nets, hook and line, crab traps, and longlines.

Commercial fishing camps are established along the nesting beach at Rancho Nuevo. While the fishing is of a nature not likely to have severe impacts on turtles, (small boats, small-mesh gill nets) accidental take of reproductively active adults cannot be ruled out and the proximity of the fishing facilities increases the likelihood of take. More importantly, there has been no at-sea enforcement of the fishing ban during the nesting season. Some trawling by Mexican and illegal U.S. vessels regularly occurs each season within and adjacent to the protected zone.

B) The Gulf of Mexico is an area of high density offshore oil extraction with chronic low-level spills and occasional massive spills. The two primary feeding grounds for adult Kemp's ridley turtles in the northern and southern Gulf of Mexico are both near major areas of near shore and offshore oil exploration and production. The nesting beach at Rancho Nuevo is also vulnerable and has been affected by oil spills.

C) The vast amount of floating debris in the Gulf of Mexico constitutes an increasingly serious threat to Kemp's ridley turtles of all ages. Plastics, monofilament, discarded netting and many other waste items are either eaten by Kemp's ridleys or become death traps when the turtles become entangled. Injestion of plastic, rubber, fishing line and hooks, tar, cellophane, rope amd string, wax, styrofoam, charcoal, aluminum cans and cigarette filters has occurred in sea turtles. NMFS is currently analyzing stranding data and available necropsy information to determine the magnitude of debris ingestion and entanglement.

D) Dredging operations affect Kemp's ridley turtles through incidental take and by degrading the habitat. Incidental take of ridleys has been documented with hopper dredges. In addition to direct take, channelization of the inshore and nearshore areas can degrade foraging and migratory habitat through spoil dumping, degraded water quality/clarity and altered current flow.

46

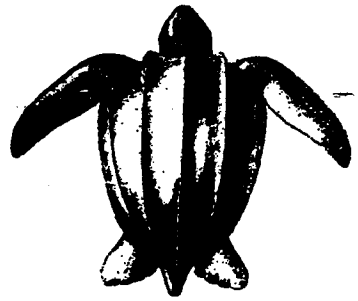
LEATHERBACK TURTLE
ATLANTIC

COMMON NAME: LEATHERBACK TURTLE
SCIENTIFIC NAME: *DERMOCHELYS CORIACEA*

LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: YES

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER NER



SPECIES POPULATION STATUS

The leatherback turtle was listed as endangered throughout its range on June 2, 1970. Nesting populations of leatherback sea turtles are especially difficult to discern because the females frequently change beaches. It is currently estimated that 21-100 females nest in the U.S. Carribean, Atlantic and Gulf of Mexico. Leatherbacks do not nest frequently enough in the United States to assess an accurate trend. The draft recovery plan for the leatherback sea turtle concludes that nesting trends in the United States appear stable, but the population faces significant threats from incidental take in commercial fisheries and marine pollution.

Populations have declined in Malaysia, India, Sri Lanka, Thailand, Trinidad, Tobago, and French Guiana. Habitat destruction, incidental catch in commercial fisheries, the harvest of eggs and flesh are the greatest threats to the survival of the leatherback.

SPECIES BIOLOGY

The leatherback is the largest living turtle. The carapace is distinguished by a rubber-like texture, about 4 cm thick, and made primarily of tough, oil-saturated connnective tissue. No sharp angle is formed between the carapace and the plastron, resulting in the animal being somewhat barrel-shaped. The average curved carapace length for adult turtles is 155 cm and weight ranges from 200-700 kg. Hatchlings are dorsally mostly black and are covered with tiny scales; the flippers are margined in white, and rows of white scales appear as stripes along the length of the back. Hatchlings average 61.3 mm long and 45.8 g in weight. In the adult, the skin is black and scaleless. The undersurface is mottled pinkish-white and black. In both adults and hatchlings, the upper jaw bears two tooth-like projections at the premaxillary-maxillary sutures. Age at sexual maturity is unknown.

SPECIES DISTRIBUTION

The leatherback turtle's range extends from Cape Sable, Nova Scotia, south to Puerto Rico and the U.S. Virgin Islands. Critical habitat for the leatherback includes the waters adjacent to Sandy Point, St. Croix, U.S. Virgin Islands, up to and inclusive of the waters from the hundred fathom curve shoreward to the level of mean high tide with boundaries at 17 42'12" N and 64 50'00" W. Nesting occurs from February - July with sites located from Georgia to the U.S. Virgin Islands. During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

MAJOR IMPACTS

1) Impacts in the nesting environment

A) Historically, leatherback turtles were rarely taken for their meat. However, a few have been killed in recent years. In Puerto Rico, adults are occasionally taken for meat and oil. In addition, the poaching of eggs from nests continues at low levels in the U.S. Virgin Islands and is widespread in Puerto Rico.

B) Leatherback turtles prefer to nest on open beaches. However, these beaches are prone to

U7

erosion, causing egg loss. Nests are also lost to hurricanes.

C) Development of beachfronts results in fortification to protect property from erosion, resulting in loss of a dry nesting beach. It can also prevent females from getting to nesting sites and wash out nests.

D) Beach nourishment impacts turtles by burial of nests and by disturbance to nesting turtles.

E) Artificial lights can cause disorientation or misorientation of both adults and hatchlings. Turtles are attracted to light, ignoring or coming out of the ocean to go towards a light source. This increases their chances of death or injury. In adddition, as nesting females avoid areas with intense lighting, highly developed areas may cause problems for turtles trying to nest.

F) Mechanical raking can result in heavy machinery repeatedly moving across a nest and compacting sand as well as causing tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing of debris on the high beach can cover nests and may alter nest temperature.

G) The most serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.

H) The placement of physical obstacles on a beach can hamper or deter nesting attempts as well as interfere with incubating eggs and the movement of hatchlings to the sea.

I) The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling successs due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.

2) Impacts in the marine environment

A) Leatherbacks become entangled in longlines, fish traps, buoy anchor lines and other ropes and cables. This can lead to serious injuries and/or death by drowning. The setting of "large mesh nets suitable for turtling" is common in the waters of Puerto Rico. Although the practice was outlawed in 1984, it still continues. The nets are intended for hawksbills and green turtles, but leatherbacks occasionally become entangled.

B) Leatherback turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons 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. NMFS is currently analyzing stranding data and available necropsy information to determine the magnitude of debris ingestion.

C) It is estimated that before the implementation of TEDs, the offshore commercial shrimp fleet captured about 640 leatherbacks a year. Of those captured, approximately 160 died, and many others were injured as a result of the difficulty of handling such a large animal on the deck of a shrimp boat. The use of TEDs is not expected to reduce leatherback captures and mortality significantly, because TEDs are generally incapable of passing adult leatherbacks through the exit opening.

D) Leatherbacks are vulnerable to boat collisions and strikes, particularly when in waters near shore. It is not known if open ocean collisions with large ships occur.

E) Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.

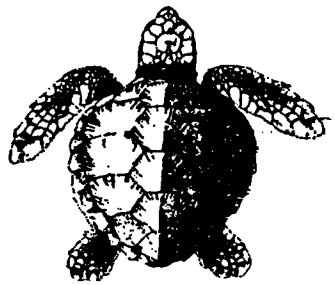
LOGGERHEAD TURTLE
ATLANTIC

COMMON NAME: LOGGERHEAD TURTLE
SCIENTIFIC NAME: *CARETTA CARETTA*

LISTING DATE: 06/02/70
SPECIES STATUS: THREATENED
SPECIES TREND: STABLE
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER NER



SPECIES POPULATION STATUS

The loggerhead turtle was listed as threatened throughout its range on June 2, 1970, and its status has not changed. Most recent evidence suggests that the number of nesting females in South Carolina and Georgia may be declining, while the number of nesting females in Florida may be stable or increasing. The estimate of nesting females in the southeastern U.S. is 20,000-28,000. The actual population size is greater, but is not known.

Current trends indicate that over the last 20-30 years, the population has declined at an alarming rate on nesting beaches in South Carolina and Georgia. However, Florida's Melbourne Beach and Hutchinson Island nesting populations have not declined and may possibly be increasing. The recovery team concluded that nesting trends for the loggerhead are generally declining with the most significant threats being coastal development, commercial fisheries, and pollution.

Loggerhead populations in Honduras, Mexico, Colombia, Israel, Turkey, Bahamas, Cuba, Greece, Japan, and Panama have been declining. This decline continues and is primarily attributed to shrimp trawling, coastal development, increased human use of nesting beaches, and pollution. Loggerheads are the most abundant species in U.S. coastal waters, and are often captured incidently in shrimp trawls. Shrimping is thought to have played a significant role in the population declines observed for the loggerhead.

SPECIES BIOLOGY

Adults and sub-adults have a reddish-brown carapace. Scales on the top and sides of the head and top of the flippers are also reddish-brown, but have yellow borders. The neck, shoulders and limb bases are dull brown on top and medium yellow on the sides and bottom. The plastron is also medium yellow. Adult average size is 92 cm long; average weight is 113 kg. Hatchlings are dull brown in color. Average size at hatching is 45 mm long; average weight is 20 g. Maturity is reached at 12-30 years. Mating takes place in late March-early June, and eggs are laid throughout the summer.

SPECIES DISTRIBUTION

The loggerhead turtle's range extends from Newfoundland to as far south as Argentina. During the summer, nesting occurs in the lower latitudes, but not in the tropics. The primary Atlantic nesting sites are along the east coast of Florida, with additional sites in Georgia, the Carolinas, and the Gulf Coast of Florida.

MAJOR IMPACTS

I) Impacts in the nesting environment

A) In the United States, killing of nesting loggerheads is infrequent. However, in a number of areas, egg poaching is common.

B) Erosion of nesting beaches can result in loss of nesting habitat.

C) Development of beachfronts results in fortification to protect property from erosion, resulting in loss of a dry nesting beach. It can also prevent females from getting to nesting sites and wash out nests.

D) Beach nourishment impacts turtles by burial of nests and by disturbance to nesting turtles.

E) Artificial lighting can cause disorientation or misorientation of both adults and hatchlings. Turtles are attracted to light, ignoring or coming out of the ocean to go towards a light source, increasing their chances of death or injury. In adddition, as nesting females avoid areas with intense lighting, highly developed areas may cause problems for turtles trying to nest.

F) Repeated mechanical raking of nesting beaches by heavy machinery can result in compact sand and causes tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing of debris on the high beach can cover nests and may alter nest temperature.

G) A serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.

H) The placement of physical obstacles on a beach can hamper or deter nesting attempts as well as interfere with incubating eggs and the sea approach of hatchlings.

I) The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling successs due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.

J) The invasion of a nesting site by non-native beach vegetation can lead to increased erosion and destruction of a nesting habitat. Trees shading a beach can also change nest temperatures, altering the natural sex ratio of the hatchlings.

II)Impacts in the marine environment

A) Dredging can destroy resting or foraging habitats. The use of hopper dredges can also kill turtles caught in dragheads.

B) Loggerhead turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and raw 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. NMFS is currently analyzing stranding data and available necropsy information to determine the magnitude of debris ingestion and entanglement.

C) Commercial Fishing:

1) It is estimated that before the implementation of TEDs, the offshore commercial shrimp fleet killed between 5,000-50,000 loggerheads each year. Most turtles killed are juveniles and sub-adults. Inshore catch and mortality for shrimp trawlers is not known, but is thought to be significant. Bluefish, croaker and flounder trawl fishing are also a serious threat.

2) Turtles are taken by purse seine fisheries in the Atlantic and Gulf of Mexico, but the number is currently not known.

3) Several thousand vessels are involved in hook and line fishing for various coastal species. The capturing of turtles is not uncommon, but the number is currently not known.

4) Significant numbers of turtles may be killed by gill and trammel net fisheries off the eastern coast of central Florida. An exact number is not yet known.

5) Pound net fisheries are primarily a problem in waters off of Virginia and North Carolina, where turtles get tangled in the gear and drown.

6) From 1978-1981, 330 turtles were captured in the Atlantic and Gulf of Mexico EEZ in the Japanese tuna longline fishery. Due to expansion of this fishery, it may have a large impact on turtle recovery.

7) Loggerhead turtles are vulnerable to entanglement in trap fishery lines, and subsequent drowning. The impact on the population has not been determined.

D) In areas where recreational boating and ship traffic is intense propeller and collision injuries are not uncommon.

E) Sea turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.

F) Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but the effect on them is unknown.

G) Marina and dock development can cause foraging habitat to be destroyed or damaged. It also leads to increased boat traffic, increasing the risk of turtle/vessel collisions.

H) Turtles have been caught in saltwater intake systems of coastal power plants. The mortality rate is estimated at 7%.

I) Underwater explosions can kill or injure turtles, and may destroy or damage habitat.

J) The effects of offshore lights are not known. They may attract hatchlings and interfere with proper offshore orientation, increasing the risk from predators.

K) Turtles get caught in discarded fishing gear. The number affected is unknown, but potentially significant.

L) Illegal harvesting of loggerhead turtles is uncommon in the U.S. and Caribbean. No estimates of take exist.

51

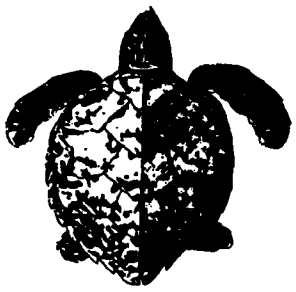
HAWKSBILL TURTLE
PACIFIC

COMMON NAME: HAWKSBILL TURTLE
SCIENTIFIC NAME: *ERETMOCHELYS IMBRICATA*

LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: N/A
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR



SPECIES POPULATION STATUS

The hawksbill sea turtle was listed as endangered throughout its range on June 2, 1970. Since the time of listing its status has not changed. The hawksbill turtle is a diffuse nester. Thus, population trends or estimates are difficult to determine. The decline of nesting populations is accepted by most researchers. In 1983, the only known apparent stable populations were in Yemen, northeastern Australia, the Red Sea, and Oman. Commercial exploitation is the major cause of the continued decline of the hawksbill sea turtle. There is a continuing demand for the hawksbill's shell as well as other products including leather, oil, perfume, and cosmetics. Prior to being certified under the Pelly Amendment, Japan had been importing about 20 MT of hawksbill shell per year, representing approximately 19,000 turtles. A negotiated settlement was reached regarding this trade on June 19, 1992. The hawksbill shell commands high prices (currently $225/kg), a major factor preventing effective protection.

SPECIES BIOLOGY

The hawksbill is a small to medium-sized sea turtle. In the Pacific Ocean, nesting females average between 60 and 93 cm in curved carapace length. Weights range between 36.4 and 77.3 kg in the Pacific. The following characteristics distinguish the hawksbill from other sea turtles: two pairs of prefrontal scales; thick, posteriorly overlapping scutes on the carapace; four pairs of coastal scutes; two claws on each flipper; and a beak-like mouth.

The carapace is heart-shaped in very young turtles, and becomes more elongate or subovate with maturity. Its lateral and posterior margins are sharply serrated in all but very old individuals. The epidermal scutes that overlay the bones of the shell are the tortiseshell of commerce. They are unusually thick, and overlap posteriorly on the carapace in all but hatchlings and very old individuals. Carpacial scutes are often richly patterned with irregularly radiating streaks of brown or black on an amber background. The scutes of the plastron are usually clear yellow, with little or no dark pigmentation. The soft skin on the ventral side is cream or yellow, and may be pinkish-orange in mature individuals. The scales of the head and forelimbs are dark brown or black with sharply defined yellow borders. There are typically four pairs of inframarginal scales. The head is elongate and tapers sharply to a point. The lower jaw is V-shaped.

Hawksbills utilize different habitats at different stages of their life cycle. Posthatchling hawksbills occupy the pelagic environment, taking shelter in weedlines that accumulate at convergence points. Hawksbills reenter coastal waters when they reach approximately 20 to 25 cm carapace length. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults and adults. This habitat association is undoubtably related to their diet of sponges, organisms which need solid substrate for attachment. The ledges and caves of the reef provide shelter for resting both during the day and night. Hawksbills are also found around rocky outcrops and high energy shoals, which are also optimum sites for sponge growth. Hawksbills are also known to inhabit mangrove-fringed bays and estuaries, particularly in areas where coral reefs are absent.

Hawksbills utilize both low- and high-energy nesting

12

beaches in tropical oceans of the world. Both insular and mainland nesting sites are known. Hawksbills will nest on small pocket beaches, and, because of their small body size and great agility, can traverse fringing reefs that limit access by other species. They exhibit a wide tolerance for nesting substrate type. Nests are typically placed under vegetation.

It is estimated that hawksbills recruited into the reef environment at 35 cm in length would begin breeding 31 years later. However, the time required to reach 35 cm in length is unknown. As a result, actual age at sexual maturity is not known.

SPECIES DISTRIBUTION

The hawksbill occurs in tropical and subtropical seas of the Atlantic, Pacific and Indian Oceans. In the Pacific Ocean, hawksbills have been observed in the Gulf of California as far as 29 N, throughout the northwestern states of Mexico, and south along the Central and South American coasts to Columbia and Ecuador. In the Hawaiian Islands, nesting occurs in the main islands, primarily on several small sand beaches on the Islands of Hawaii and Molokai. Two of these sites are at a remote location in the Hawaii Volcanos National Park.

MAJOR IMPACTS

I) Impacts in the nesting environment

A) The greatest threat on nesting beaches is poaching. Adult females are still butchered for their tortiseshell, but the practice is decreasing with better enforcement.

B) Erosion of nesting beaches can result in loss of nesting habitat. However, natural processes of beach erosion are not generally a significant threat.

C) Development of beachfronts result in fortification to protect property from erosion, resulting in loss of a dry nesting beach. It can also prevent females from getting to nesting sites and wash out nests. Beach nourishment impacts turtles by burial of nests and by disturbance to nesting turtles. Nourishment also results in heavy machinery, pipelines, increased human activity and artificial lighting on a project beach. This can create barriers for nesting sea turtles emerging from the ocean, preventing them from building nests, and it also disturbs nesting turtles on the beach.

D) Removal of sand for construction aggregate or renourishment of other beaches is a serious threat to hawksbill turtles. Sand removed from above the tide line is replaced very slowly from subtidal areas, a process which can take decades. Subtidal sand removal results in beach sand moving offshore.

E) When nesting beaches are in private hands, they may become hotel sites. Development and landscaping of these nesting beaches can create impediments for nesting turtles. In addition, exotic plants such as sea oats can damage or destroy nests through root action.

F) Artificial lighting can cause disorientation or misorientation of both adults and hatchlings. Turtles are attracted to light, ignoring or coming out of the ocean to go towards a light source, increasing their chances of death or injury. In addition, as nesting females avoid areas with intense lighting, highly developed areas may cause problems for turtles trying to nest.

G) Mechanical raking can result in heavy machinery repeatedly moving across a nest and compacting sand as well as causing tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing of debris on the high beach can cover nests and may alter nest temperature.

H) The most serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.

I) The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling successs due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.

J) A variety of natural and introduced predators such as hogs, mongooses, ghost crabs and ants prey on hawksbill eggs and hatchlings.

<3

II) Impacts in the marine environment

A) The extent to which hawksbills are killed or debilitated after becoming entangled in marine debris are unknown, but it is believed to be a serious and growing problem. Hawksbills have been reported entangled in monofilament gill nets, "fish nets", fishing line and synthetic rope.

B) Hawksbill turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and raw 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.

C) Incidental catch during fishing activities is an unquantified and potentially significant source of mortality. Gill nets, longlines and shrimp trawls all are known to take turtles.

D) In areas where recreational boating and ship traffic is intense, propellor and collision injuries are not uncommon.

E) Damage to coral reefs and other shallow water benthic systems from sedimentation and siltation has not been assessed as yet, but is known to be a serious problem in some areas, with some coral reefs completely destroyed by siltation.

F) Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but their effect is unknown.

G) The illegal take of hawksbills at sea has not yet been fully quantified, but it is a continuing problem.

H) Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.

I) The hawksbill's dependence on coral reefs for shelter and food link its well-being to the condition of reefs. Destruction of reefs from vessels anchoring, striking or grounding is a growing problem. Cruiseships and yachts are destroying portions of coral reefs with their anchors and anchor chains in a number of places. There is also damage from recreational, diving and fishing boats anchoring indiscrimiately on reefs.

K) International commerce in hawksbill shell (bekko) is the single most significant factor endangering hawksbill populations around the world. Japanese imports of raw bekko between 1970 and 1989 totaled 713,850kg, representing more than 670,000 turtles; more than half the imports originated in the Caribbean and Latin America. While hawksbills are protected under CITES, trade continues for several reasons:

1) Not all countries have ratified CITES;

2) Some treaty signatories participate in trade by falsifying documents of origin;

3) Some treaty signatories ignore the treaty and trade openly in hawksbills and hawksbill products; and

4) Some treaty signatories have exercised their right to take exemption to treaty provisions as they affect sea turtles.

L) In nearshore waters, hawksbills are periodically captured in the cooling water intakes of industrial facilities.

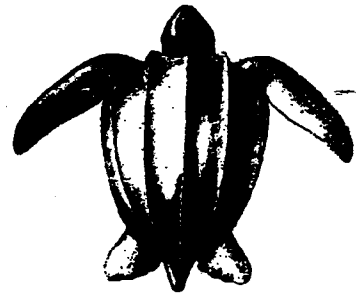
LEATHERBACK TURTLE
PACIFIC

COMMON NAME: LEATHERBACK TURTLE
SCIENTIFIC NAME: *DERMOCHELYS CORIACEA*

LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: N/A
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR



SPECIES POPULATION STATUS

It is estimated that approximately 55,000 leatherbacks nest in Western Mexico.

SPECIES BIOLOGY

The leatherback is the largest living turtle. The carapace is distinguished by a rubber-like texture, is about 4 cm thick, and made primarily of tough, oil-saturated connnective tissue. No sharp angle is formed between the carapace and the plastron, resulting in the animal being somewhat barrel-shaped. The average curved carapace length for adult turtles is 155 cm and weight ranges from 200-700 kg. Hatchlings are dorsally mostly black and are covered with tiny scales; the flippers are margined in white, and rows of white scales appear as stripes along the length of the back. Hatchlings average 61.3 mm in straightline carapace length and 45.8 g in weight. In the adult, the epidermis is black and scaleless. The undersurface is mottled pinkish-white and black. In both adults and hatchlings, the upper jaw bears two tooth-like projections at the premaxillary-maxillary sutures. Age at sexual maturity is unknown.

SPECIES DISTRIBUTION

Leatherbacks are commonly seen by fishermen in Hawaiian offshore waters, generally beyond the 100-fathom curve but within sight of land. Sightings often take place off the north coast of Oahu and the Kona coast of Hawaii. North of the Hawaiian Islands, a high seas aggregation of leatherbacks is known to occur at 35 -45 N, 175 -180 W.

MAJOR IMPACTS

1) Impacts in the nesting environment

A) Historically, leatherback turtles were taken only rarely for their meat. however, a few have been killed in recent years.

B) Leatherback turtles prefer to nest on open beaches. However, these beaches are prone to erosion, causing egg loss.

C) Development of beachfronts result in fortification to protect property from erosion, resulting in loss of a dry nesting beach. It can also prevent females from getting to nesting sites and wash out nests.

D) Beach nourishment impacts turtles by burial of nests and by disturbance to nesting turtles.

E) Artificial lights can cause disorientation or misorentation of both adults and hatchlings. Turtles are attracted to light, ignoring or coming out of the ocean to go towards a light source, increasing their chances of death or injury. In adddition, as nesting females avoid areas with intense lighting, highly developed areas may cause problems for turtles trying to nest.

F) Mechanical raking can result in heavy machinery repeatedly moving across a nest and compacting sand as well as causing tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing

of debris on the high beach can cover nests and may alter nest temperature.

G) The most serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.

H) The placement of physical obstacles on a beach can hamper or deter nesting attempts as well as interfere with incubating eggs and hatchlings movment to the sea.

I) The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling successs due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.

2) Impacts in the marine environment

A) Leatherbacks become entangled in longlines, fish traps, buoy anchor lines and other ropes and cables. This can lead to serious injuries and/or death by drowning.

B) Leatherback turtles eat a wide variety of debris items such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and raw plastic pellets. Effects of consumtion include interference in metabolism or gut function, even at low levels of ingestion, as well as absorption of toxic byproducts.

C) Leatherbacks are vulnerable to boat collisions and strikes, particularly when in waters near shore. It is not known if open ocean collisions with large ships occur.

D) Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.

E) Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but the effect on the species is unknown.

56

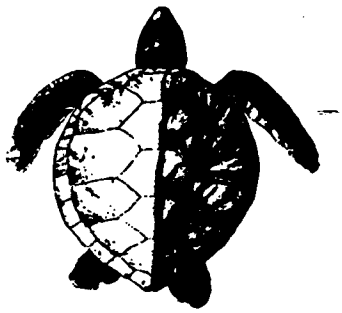
GREEN TURTLE
PACIFIC

COMMON NAME: GREEN TURTLE
SCIENTIFIC NAME: *CHELONIA MYDAS*

LISTING DATE: 07/28/78
SPECIES STATUS: THREATENED
SPECIES TREND: DECREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR



SPECIES BIOLOGY

Adult green turtles commonly reach a size of 1 m long and 150 kg mass. The carapace is smooth and is colored grey, green, brown and black. The plastron is yellowish white. Hatchlings weigh about 25 g, and are about 50 mm long. Hatclings are black on top and white on the bottom. Age at sexual maturity is 20-50 years.

SPECIES DISTRIBUTION

Green turtles are found throughout the North Pacific, ranging as far north as Eliza Harbor, Admiralty Island, Alaska, and Ucluelet, British Columbia. In the eastern North Pacific, green turtles have been sighted from Baja California to southern Alaska. In the central Pacific, green turtles can be found at most tropical islands. In U.S. Hawaiian waters, green turtles are found around most of the islands in the Hawaiian Archipelago. The primary nesting site is at French Frigate Shoals.

MAJOR IMPACTS

I) Impacts in the nesting environment

A) In the United States, killing of nesting green turtles is infrequent. However, in a number of areas, egg poaching is not uncommon.

B) Erosion of nesting beaches can result in loss of nesting habitat.

C) Development of beachfronts result in fortification to protect property from erosion, resulting in loss of a dry nesting beach. It can also prevent females from getting to nesting sites and wash out nests.

D) Beach nourishment impacts turtles by burial of nests and by disturbance to nesting turtles.

E) Artificial lighting can cause disorientation or misorentation of both adults and hatchlings. Turtles are attracted to light, ignoring or coming out of the ocean to go towards a light source, increasing their chances of death or injury. In adddition, as nesting females avoid areas with intense lighting, highly developed areas with bright lighting may cause problems for turtles trying to nest.

F) Mechanical raking can result in heavy machinery repeatedly moving across a nest and compacting sand as well as causing tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing of debris on the high beach can cover nests and may alter nest temperature.

G) The most serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.

H) The placement of physical obstacles on a beach can hamper or deter nesting attempts as well as interfere with incubating eggs and the sea approach of hatchlings.

57

I) The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling successs due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.

J) The invasion of a nesting site by non-native beach vegitation can lead to increased erosion and destruction of a nesting habitat. Trees shading a beach can also change nest temperatures, altering the natural sex ratio of the hatchlings.

II) Impacts in the marine environment

A) Dredging can result in habitat destruction by disrupting resting or foraging grounds. The use of hopper dredges can also kill turtles caught in dragheads.

B) Green turtles eat a wide variety of debris items such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and raw plastic pellets. Effects of consumtion include interference in metabolism or gut function, even at low levels of ingestion, as well as absorbtion of toxic byproducts.

C) In areas where recreational boating and ship traffic is intense propeller and collision injuries are not uncommon.

D) Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland function are affected.

E) Pesticides, heavy metals and pcb's have been detected in turtles and eggs, but the effect on them is unknown.

F) Marina and dock development can cause foraging habitat to be destroyed or damaged. It also leads to increased boat traffic, increasing the risk of turtle/vessel collisions.

G) Underwater explosives can kill or injure turtles, and may destroy or damage habitat.

H) The effects of offshore lights are not known. They may attract hatchlings and interfere with proper offshore orientation, increasing the risk from predators.

I) Turtles get caught in discarded fishing gear. The number affected is unknown, but potentially significant.

J) Illegal harvesting of green turtles is uncommon in the U.S. and Caribbean. No estimates of take exist.

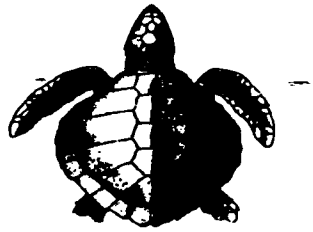
OLIVE RIDLEY TURTLE
PACIFIC

COMMON NAME: OLIVE RIDLEY TURTLE
SCIENTIFIC NAME: *LEPIDOCHELYS OLIVACEA*

LISTING DATE: 07/28/78
SPECIES STATUS: END/THREAT
SPECIES TREND: DECREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR



SPECIES POPULATION STATUS

The olive ridley turtle was listed as endangered for the "Mexican nesting population" and threatened for all other populations on July 28, 1978. Since listing, there has been a decline in abundance of this species, and it is recommended that the olive ridley be reclassified as endangered throughout the western hemisphere. The need for this classification is based on continued direct and incidental take throughout its range. In addition, there is information showing that olive ridleys move along the eastern Pacific coast from Mexico as far south as Ecuador and mix with other Central American populations. This mixing makes it impossible to differentiate among separate populations.

A decline in the number of nesting females and the low frequency of encounters with wild turtles indicates that populations are declining. Both eggs and adults are being heavily exploited. Olive ridleys in Mexico have been overharvested for international trade with Japan. There is evidence that the turtles are being taken in shrimp trawls and gill nets. In comments submitted to NMFS, reference is made to data from Fretey (1990) showing that olive ridleys appear to be attracted to trawling areas due to the abundance of discarded prey. The turtles are often captured and drowned in these trawls suggesting that trawling was a significant source of mortalities.

SPECIES BIOLOGY

In appearance, the olive ridley sea turtle is similar to the Kemp's ridley, but it has a thinner shell, and a smaller, more lightly built skull. The upper shell is generally higher than the Kemp's ridley and has a greater variation in the number of scutes. Other characteristics are two pairs of prefrontal scales, a pore near the rear of the plates bordering the upper and lower shells, and shell plates that do not overlap. The shell is heart-shaped to round, and may be grey-brown, black or olive in color. The underside of adults is usually yellow, but is white in immature turtles and grey to black in hatchlings.

As adults, the olive ridleys are the smallest of the sea turtles. They weigh as much as 45.5 kg, with shells generally between 60 and 75 cm long. Although subadult males and females look alike externally, the adult male's tail extends some distance beyond the rear edge of the shell. Males also have one of two claws on each forelimb enlarged and strongly curved.

Olive ridleys may be long-lived in the wild, but the exact lifespan is not known. At sexual maturity, which likely takes at least 7-9 years in wild populations, the shell usually is about 60-65 cm long and the turtle weighs about 36 kg.

Prey includes pelagic crabs, jellyfish and tunicates.

Nesting usually occurs in aggregations called arribadas (meaning arrival) on mainland beaches at night. Specific nesting times vary with location, occurring year round in Costa Rica, from June-August in Pacific Mexico,and from September-November in other areas of the eastern Pacific. Females usually nest in intervals ranging from 14 to 48 days, depositing 2-3 clutches of eggs. Mean clutch size varies between 105-116 eggs which take 50-70 days to hatch. Hatchlings emerge at any time and make their way to the ocean.

OLIVE RIDLEY TURTLE
PACIFIC

SPECIES DISTRIBUTION

In the Pacific Ocean, the main foraging areas are between Columbia and Mexico, along the northern coast of Australia, Vietnam, Malaysia, and Indonesia. In the Pacific, nesting sites are located along the Pacific coast from Mexico to Costa Rica and the east coast of Malaysia.

MAJOR IMPACTS

A) Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but the effect on them is unknown.

B) Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland function are affected.

C) Olive ridley turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and raw plastic pellets. Effects of consumtion include interference in metabolism or gut function, even at low levels of ingestion, as well as absorbtion of toxic byproducts.

D) In areas where recreational boating and ship traffic is intense, propeller and collision injuries are not uncommon.

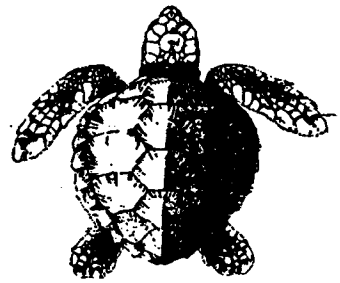
LOGGERHEAD TURTLE
PACIFIC

COMMON NAME: LOGGERHEAD TURTLE
SCIENTIFIC NAME: *CARETTA CARETTA*

LISTING DATE: 06/02/70
SPECIES STATUS: THREATENED
SPECIES TREND: DECREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR



SPECIES BIOLOGY

The loggerhead sea turtle is characterized by typically 5 pairs of lateral scutes, the anterior-most one touching the cervical, vertebral scutes broader than long, and three poreless inframarginals on the bridge. A median vertebral keel becomes smoother with age. The posterior marginal rim of the carapace is serrated in juveniles, but also becomes smoother with age. The carapace is reddish-brown, sometimes tinged with olive; the scutes are often bordered with yellow. Bridge and plastron are yellow to cream colored. The head is comparatively large, and varies from reddish or yellow chestnut to olive brown, often with yellow-bordered scales. Limbs and tail are dark medially and yellow laterally and below. Hatchlings are uniformly colored gray, or reddish or olive brown. Two claws occur on the forelimbs. Males have comparatively narrow shells gradually tapering posteriorly, and long, thick tails extending beyond the edge of the carapace. Adults normally weigh 80 to 150 kg. Adult females average 95 to 100 cm curved carapace length. Age at sexual maturity is estimated at between 12 and 30 years. No known nesting sites occur along the Pacific coast of North America. Diet primarily consists of benthic invertebrates.

SPECIES DISTRIBUTION

Loggerheads are circumglobal, inhabiting continental shelves, bays, estuaries, and lagoons in temperate, subtropical, and tropical waters. In the eastern Pacific, loggerheads are reported as far north as Alaska, and as far south as Chile. Occasional sightings are also reported from the coast of Washington, but most records are of juveniles off the coast of California. Southern Japan is the only known breeding area in the North Pacific.

MAJOR IMPACTS

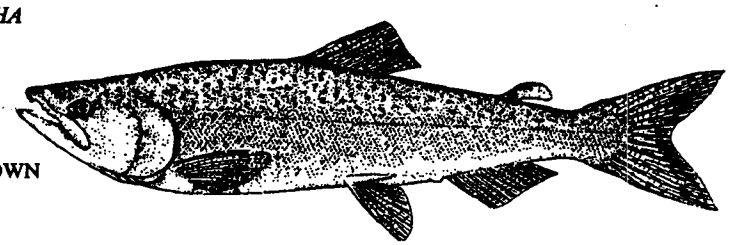
Little to no commercial exploitation of loggerhead turtles has occured in the Pacific Ocean. Loggerhead turtles were the most commonly caught sea turtle in pelagic driftnet fishing in the north Pacific, but with international agreements to stop driftnetting, this is no longer a major issue. Available evidence also indicates that loggerheads are the most common turtle hooked by pelagic longlining.

61

CHINOOK SALMON
SACRAMENTO RIVER WINTER-RUN

COMMON NAME: CHINOOK SALMON
SCIENTIFIC NAME: *ONCORHYNCHUS TSHAWYTSCHA*

LISTING DATE: 11/30/90
SPECIES STATUS: ENDANGERED
SPECIES TREND: N/A
CURRENT ESTIMATED POPULATION: UNKNOWN



CRITICAL HABITAT: YES

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR

SPECIES POPULATION STATUS

Winter-run chinook salmon in the Sacramento River, California, are unique and distinguishable from the other three runs of chinook salmon in the river based on the timing of their upstream migration and spawning season. For the most part, the winter-run chinook salmon population is comprised of three year-classes that return to spawn as 3-year-old fish. NMFS determined that the winter-run chinook salmon should be listed as threatened under the ESA because the run has declined more than 97% over a period of less than 20 years. From 1967 through 1969, average run size was about 84,000 fish; in 1982 through 1984, the average was about 2,000 fish. In 1989, only 550 salmon returned to the river; in 1990, the return was around 450 fish; in 1991, 191 fish returned; in 1992, 1180 fish returned; and in 1993, 341 returned.

The winter-run chinook has declined in the Sacramento River primarily due to water management projects which have modified the river and taken away spawning habitat in the upper Sacramento River through water diversion which lowers water level in the river and raises the temperature to a level that is lethal to salmon eggs. Winter-run chinook spawn from mid April to mid August with a peak in May and June. The eggs incubate and hatch in about 2 months. If the water temperature is too high (especially during the peak incubation and hatching months of July through September), the eggs do not hatch. Juveniles migrate to the sea from August into the spring months. Water diversions and other water management actions such as inadequate fish screens at diversion facilities can be lethal to migrating juveniles. Adult fish begin returning from the sea during the winter. While at sea, they may be taken incidentally to commercial and recreational fishing for other species of salmon.

On January 4, 1994, NMFS issued a determination that the Sacramento River winter-run chinook salmon should be reclassified from threatened to endangered (59 FR 440). This determination was based on the continued decline and increased variability of run sizes since its first listing as threatened in 1989, the expectation of weak returns in certain years as the result of two small year classes (1991 and 1993) and continuing threats to the population.

SPECIES BIOLOGY

The chinook salmon is noted for the black spotting on back, dorsal fin, and both lobes of caudal fin, black pigment along the bases of the teeth and loose conical teeth in mature individuals. Salmon over 14 kg are likely to be chinooks.

The Sacramento River winter-run chinook salmon spawns in the upper Sacramento River primarily between Red Bluff Diversion Dam and Keswick Dam from late April to mid-August. The juveniles emerge in late June through September, beginning their downstream migration within several weeks of hatching.

SPECIES DISTRIBUTION

The distribution of Sacramento River winter-run chinook salmon has been dramatically reduced to a portion of its former range. The construction of Shasta and Keswick Dams blocked access to all of the

winter-run's historic spawning grounds in the McCloud, Pit and Little Sacramento rivers. Current spawning takes place primarily between Red Bluff Diversion Dam and Keswick Dam. During migration, Sacramento River winter chinook migrate from the Sacramento-San Joaquin Delta up to the Upper Sacramento River.

MAJOR IMPACTS

1) Hydropower development has blocked and inundated of habitat; increased delay of juvenile migration through the Sacramento River; and increased delay of adults on their way to spawning grounds. Water withdrawal and storage, irrigation diversions, siltation and pollution from sewage, farming, grazing, logging, and mining have also degraded the Sacramento River salmon habitat.

2) Although winter-run chinook are subjected to a lower harvest rate than other Sacramento River chinook salmon, due to the timing of their run compared to the timing of the chinook salmon fishery, overutilization continues to threaten this species.

3) The impacts of numerous bacterial, protozoan, viral, and parasitic organisms on sacramento river winter-run chinook salmon are largely unknown. Predators include squawfish. The extent to which predation is a factor causing the decline of the winter-run chinook salmon is unknown.

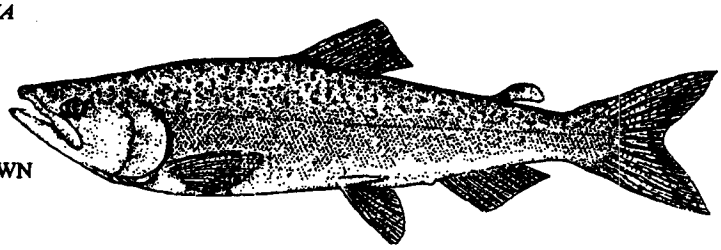
4) There are numerous unscreened or inadequately screened diversions on the Sacramento River. These result in an unknown loss of outmigrating juvenile salmon as a result of entrainment in unscreened diversions or impingement on inadequately designed diversions. NMFS has initiated a rule making process to require screens on all diversions.

63

CHINOOK SALMON
SNAKE RIVER SPRING/SUMMER

COMMON NAME: CHINOOK SALMON
SCIENTIFIC NAME: *ONCORHYNCHUS TSHAWYTSCHA*

LISTING DATE: 04/22/92
SPECIES STATUS: THREATENED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: UNKNOWN



CRITICAL HABITAT: PROPOSED

PRIMARY REGION RESPONSIBLE: NWR
REGIONS AFFECTED: NWR AKR

SPECIES POPULATION STATUS

Production in the Snake River probably exceeded 1.5 million spring/summer chinook salmon for some years during the late 1800's. By the early-1900's, production severely declined. An estimate of the average number of adults returning from 1950 to 1960 is 125,000. Using an expansion factor method (adult counts vs. number of redds), counts of adult wild fish at Lower Granite Dam averaged 9,674 from 1980 to 1990 (low of 3,343 in 1980, high of 21,870 in 1988). Based on the lowest return on record of jack spring and summer chinook salmon to Lower Granite Dam in 1990 (357 compared to 2,451 in 1989), adult and redd counts are expected to drop considerably over the next 2 years.

SPECIES BIOLOGY

The chinook salmon is noted for the black spotting on back, dorsal fin, and both lobes of caudal fin, black pigment along the bases of the teeth and loose conical teeth in mature individuals. Salmon over 14 kg are likely to be chinook. Snake River spring/summer chinook use small, higher elevation streams for spawning and early juvenile rearing. They migrate to sea as yearling smolts (stream-type). Detailed life history data are limited and inconsistent for wild populations. Age at spawning and associated fecundity differ between the adults returning to the Middle Fork and main Salmon Rivers and all other areas where information is available. In these two areas, 3-ocean adults with higher fecundity predominate, whereas 2-ocean adults with lower fecundity predominate in other areas. Adult spring-run chinook enter the Columbia River in spring, as early as February, reach the Snake River by late April, arrive in natal tributaries in May and June, hold in deep pools, and spawn in late August. Adult summer-run chinook reach the Snake River in June and July, arrive in natal tributaries by early July, and spawn in early September.

SPECIES DISTRIBUTION

Snake River spring/summer chinook spawn in the many streams associated with the large, complex Clearwater, Grande Ronde, and Salmon Rivers and in the mainstem of the Tucannon and Imnaha Rivers, as well as in Asotin, Granite, and Sheep Creeks (between Lower Granite and Hells Canyon Dams).

MAJOR IMPACTS

1) Overfishing for chinook salmon in the late 1800's contributed significantly to the population decline.

2) Hydropower development has resulted in the following: blockage and inundation of habitat; turbine-related mortality of juvenile fish; increased delay of juvenile migration through the Snake and Columbia rivers; increased predation on juvenile salmon in reservoirs; and increased delay of adults migrating to spawning grounds. Water withdrawal and storage, irrigation diversions, siltation and pollution from sewage, farming, grazing, logging, and mining have also degraded the Snake River spring/summer chinook salmon habitat.

3) Current ocean and river harvest levels have been greatly curtailed in the commercial, recreational, and tribal fisheries due to low escapements and efforts to

protect these runs. The majority of current harvest occurs in the Columbia River net fisheries. Some harvest also occurs in Columbia River recreational fisheries. Columbia River fisheries directed toward other species can also impact this run.

4) The impacts of potential bacterial, protozoan, viral, and parasitic organisms on Snake River spring/summer chinook salmon are largely unknown. Predators include the northern squawfish and marine mammals such as harbor seals and California sea lions. The extent to which predation is a factor causing the decline of spring/summer chinook salmon is unknown.

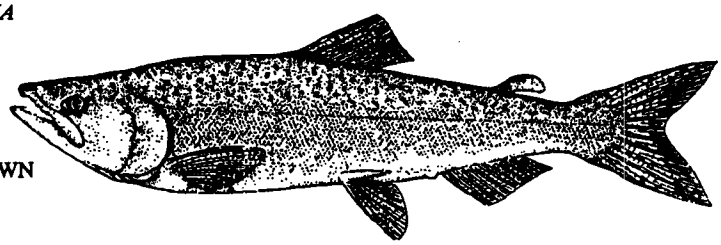
5) Drought and poor ocean survival are the principal natural condition that may have contributed to reduced spring/summer chinook salmon production. Hatchery programs may have contributed to the further decline of wild Snake River spring/summer chinook salmon through the taking of fish for broodstock purposes, behavioral and genetic interactions between wild and hatchery reared salmon, competition, predation and the spread of disease.

65

CHINOOK SALMON
SNAKE RIVER FALL

COMMON NAME: CHINOOK SALMON
SCIENTIFIC NAME: *ONCORHYNCHUS TSHAWYTSCHA*

LISTING DATE: 04/22/92
SPECIES STATUS: THREATENED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: UNKNOWN



CRITICAL HABITAT: PROPOSED

PRIMARY REGION RESPONSIBLE: NWR
REGIONS AFFECTED: NWR

SPECIES POPULATION STATUS

Returns of adult fall chinook salmon to the Snake River have declined to very low numbers in recent years. Yearly adult counts at the uppermost Snake River main-stem project affording fish passage averaged 12,720 from 1964 through 1968, 3,416 from 1969 through 1974, and 610 from 1975 through 1980. Estimates of wild Snake River fall chinook salmon escapement to Lower Granite Dam varied from 428 adults in 1983, to 295 in 1989, to 78 in 1990, to 855 in 1992. Wild escapement in 1991 was estimated to be 318. The number of fall chinook salmon redds observed over the remaining 102 miles (165 km) of the Snake River available to fall chinook salmon for the period 1987 through 1992 were 66, 57, 58, 37, 32, and 82 respectively.

SPECIES BIOLOGY

The chinook salmon is noted for the black spotting on back, dorsal fin, and both lobes of caudal fin, black pigment along the bases of the teeth and loose conical teeth in mature individuals. Salmon over 14 kg are likely to be chinook.

The Snake River fall chinook salmon spawns in the mainstem Snake River from the upper limit of the Lower Granite Dam Reservoir to Hells Canyon Dam (about 165 km) and the lower reaches of the Imnaha, Grande Ronde, Clearwater, and Tucannon Rivers or the lower parts of tributaries in October and November. Research in progress has identified five chinook redds below Lower Granite Dam that may be Snake River fall chinook. The juveniles emerge in March and April, beginning their downstream migration within several weeks of emergence. They move seaward slowly as subyearlings. Adults return from the ocean to the Snake River at ages 2-5, with age 4 the most common age at spawning.

SPECIES DISTRIBUTION

The distribution of Snake River fall chinook salmon has been dramatically reduced to a portion of its former range. The construction of Brownlee (1958), Oxbow (1961), and Hells Canyon (1967) Dams inundated spawning habitat and prevented access to the primary production areas of Snake River fall chinook salmon.

MAJOR IMPACTS

1) Hydropower development has resulted in the following: blockage and inundation of habitat; turbine-related mortality of juvenile fish; delay of juvenile migration through the Snake and Columbia Rivers; predation on juvenile salmon in reservoirs; and increased delay of adults on their way to spawning grounds. Water withdrawal and storage, irrigation diversions, siltation and pollution from sewage, farming, grazing, logging, and mining have also degraded the Snake River salmon habitat.

2) Current ocean and river harvest levels have been curtailed in the commercial, recreational, and tribal fisheries due to low escapements and efforts to protect these runs. The majority of current harvest occurs in the Columbia River net fisheries.

3) The impacts of potential bacterial, protozoan, viral, and parasitic organisms on Snake River fall chinook

106

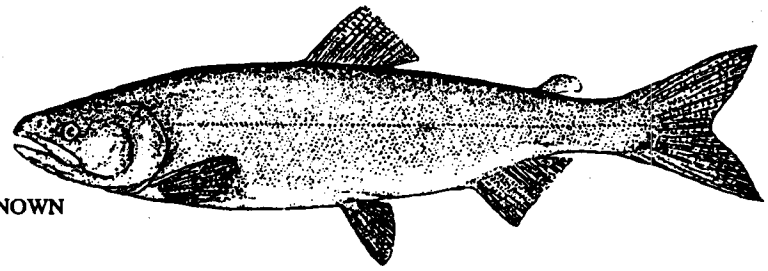
salmon are largely unknown. Predators include the northern squawfish and marine mammals such as harbor seals and California sea lions. The extent to which predation is a factor causing the decline of spring/summer and fall chinook salmon is unknown.

4) Drought and poor ocean survival are the principal natural factors that may have contributed to reduced fall chinook salmon production. The taking of Snake River fall chinook salmon for hatchery broodstock has reduced natural escapements, and the recent straying of fall chinook salmon from other areas into the Snake River threatens the genetic integrity of wild Snake River fall chinook salmon.

SOCKEYE SALMON
SNAKE RIVER

COMMON NAME: SOCKEYE SALMON
SCIENTIFIC NAME: *ONCORHYNCHUS NERKA*

LISTING DATE: 11/20/91
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: UNKNOWN



CRITICAL HABITAT: PROPOSED

PRIMARY REGION RESPONSIBLE: NWR
REGIONS AFFECTED: NWR

SPECIES POPULATION STATUS

Adult returns to Redfish Lake were 1, 0, 4, 1, and 8 in 1989, 1990, 1991, 1992 and 1993, respectively. NFMS considers the kokanee salmon in Redfish Lake to be part of the Snake River sockeye salmon population listed as endangered. This residual population shares the same spatial and temporal spawning distribution, and is genetically very closely linked to the anadromous sockeye gene pool.

SPECIES BIOLOGY

The sockeye salmon (anadromous) and kokanee (non-anadromous) are distinguished from other Pacific salmons by the 28 to 40 long, slender, closely spaced gill rakers on the first arch, by the few pyloric caeca, and the fine black speckling on the back. Taxonomically, the kokanee and sockeye salmon do not differ. Mature kokanee are generally smaller than sockeye salmon; the usual length is 20 to 23 cm, although individuals as large as 53 cm have been reported for some productive lakes. A typical 4-year-old Columbia River sockeye is 51 cm long and weighs 1.7 kg. Fork length of most sockeye salmon measured at Redfish Lake Creek Weir ranged from 48 to 64 cm.

Adult sockeye arrive at Redfish Lake in July and August, and they spawn on the beach areas during October and November, and then die. Fecundity in sockeye depends upon the size of the female, ranging from 1,478 to 4,446 eggs per female. Sockeye fry emerge from the gravel in early spring (April and May). Most sockeye in Redfish Lake remain in the lake for one or two years, migrate out to sea, and reside in the ocean for two to three years before returning to spawn.

SPECIES DISTRIBUTION

Sockeye salmon are found along the North American coastline from the Klamath River in California to the Yukon in Alaska but occur in considerable numbers only from the Columbia River north to Bristol Bay in Alaska. Along the coast of the eastern Pacific they are reported from Cape Chaplina in the northern part of the Bering Sea southward around the Kamchatka peninsula to the northern shore of the Okhotsk Sea. The only remaining population of Snake River sockeye salmon spawns in Redfish Lake, which is located near the head of the middle fork of the Salmon River. Adults of this population travel a greater distance from the sea (almost 900 miles) and to a higher elevation (6,500 feet) than adults of any other population.

MAJOR IMPACTS

1) Hydropower development has resulted in blockage of habitat, turbine-related mortality of juvenile fish, delay of juvenile migration through the Snake and Columbia rivers, increased predation on juvenile salmon due to residualism in reservoirs and increased predator populations due to ideal foraging areas created by impoundments, and delay of adults on their way to spawning grounds. Water withdrawal and storage and irrigation diversions and blockage of habitat for purposes such as agriculture have also contributed to the destruction of Snake River sockeye salmon habitat.

2) Available information indicates that commercial fisheries in the lower Columbia River and harvest on the spawning grounds were primary factors in the decline of Snake River sockeye salmon. The recreational harvest of sockeye salmon in the Columbia River is negligible. There is no information available to indicate that ocean harvest of Columbia River (including Snake River) sockeye salmon is significant.

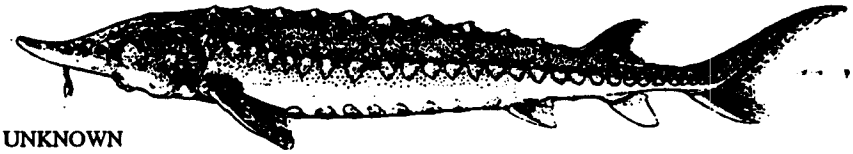
3) The effect of potential bacterial, protozoan, viral, and parasitic organisms on Snake River sockeye salmon is not documented. Predators include northern squawfish, birds, and marine mammals such as harbor seals and California sea lions. The extent to which predation is a factor causing the decline of Snake River sockeye salmon is unknown.

4) Drought is the principal natural condition that may have contributed to reduced Snake River sockeye salmon production. There is no direct evidence that artificially propagated fish have compromised the genetic integrity of Stanley Basin sockeye salmon. Artificial production of other species may have an adverse impact on Snake River sockeye salmon as they jointly migrate through the rivers, estuary and ocean, and may compete with sockeye salmon for food.

69

GULF STURGEON

COMMON NAME: GULF STURGEON
SCIENTIFIC NAME: *ACIPENSER OXYRYNCHUS DESOTOI*



LISTING DATE: 09/30/91
SPECIES STATUS: THREATENED
SPECIES TREND: N/A
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER

SPECIES BIOLOGY

The Gulf sturgeon, also known as the Gulf of Mexico sturgeon, is a subspecies of the Atlantic sturgeon. It is a large fish with an extended snout, vertical mouth, chin barbels, and with the upper lobe of the tail longer than the lower. Adults are 180 to 240 cm in length, with adult females larger than adult males. The skin is scaleless, brown dorsally and pale ventrally and imbedded with 5 rows of bony plates.

Adult fish are bottom feeders, eating primarily invertebrates, including brachiopods, insect larvae, mollusks, worms and crustaceans. Gulf sturgeon are anadromous, with reproduction occurring in fresh water. Most adult feeding takes place in the Gulf of Mexico and its estuaries.

The fish return to breed in the river system in which they hatched. Spawning is believed to occur in areas of deep water with clean (rock, gravel or sand) bottoms. The eggs are sticky and adhere in clumps or strings to snags, outcroppings, or other clean surfaces. Sexual maturity is reached between the ages of 8 and 12 years for females and 7 and 10 years for males.

SPECIES DISTRIBUTION

Historically, the Gulf sturgeon occurred from the Mississippi River to Tampa Bay, 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, possibly because this portion of the Gulf has predominantly hard bottoms that are better suited to the Gulf sturgeon's feeding habitat. Breeding takes place in the Appalachicola and Suwannee River systems, with adults returning to the same river systems in which they hatched in order to breed.

MAJOR IMPACTS

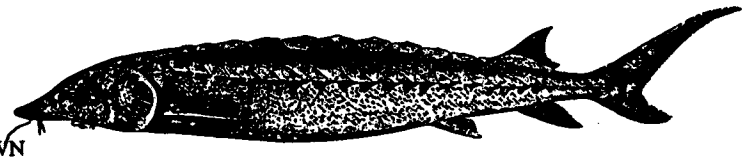
The Gulf sturgeon formerly ranged from the Mississippi River eastward to the Tampa Bay area on the west coast of Florida. Three major rivers (the Pearl in Mississippi, the Alabama in Alabama, and the Appalachicola in Florida) within the range of the Gulf sturgeon have been dammed, preventing use of upstream areas for spawning. The Gulf sturgeon is apparently unable to pass through dam 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 precise spawning areas are not known, indications are that deep holes and 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

COMMON NAME: SHORTNOSE STURGEON
SCIENTIFIC NAME: *ACIPENSER BREVIROSTRUM*

LISTING DATE: 03/11/67
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: UNKNOWN



CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: NER
REGIONS AFFECTED: SER NER

SPECIES POPULATION STATUS

The shortnose sturgeon was listed as endangered throughout its range on March 11, 1967. It is an anadromous fish that spawns in the coastal rivers along the east coast of North America from the St. John River in Canada to the St. Johns River in Florida. It prefers the nearshore marine, estuarine and riverine habitat of large river systems. Shortnose sturgeon, unlike other anadromous species in the region such as shad or salmon, do not appear to make long distance offshore migrations.

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, 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.

Placing the species on the endangered species list resulted in a great deal of research on the species in the northern river systems.

By the mid 1980s, NMFS had enough information on population levels in one mid-Atlantic and four northern rivers to recommend changes in the listing of the shortnose sturgeon. Also, in its 1987 status review, NMFS recommended listing the species according to river specific populations rather than as a single species. In the St. John River in Canada, and the Kennebec River in Maine, NMFS recommended delisting the sturgeon because the population numbers were stable and the species faced few adverse impacts to its habitat. Although the population levels are known and considered stable in the Connecticut, Hudson and Delaware Rivers, NMFS recommended listing as threatened (rather than delisting) due to some remaining habitat threats and a need for further information on population levels. In all other river systems, mainly southern rivers, NMFS recommended maintaining the endangered listing until further information on population levels could be obtained.

SPECIES BIOLOGY

The sturgeon family is among the most primitive of the bony fishes. The shortnose sturgeon shares the same general external morphology of all sturgeon. Its elongated fusiform body is moderately depressed, and its protractable subterminal mouth with barbels is well suited for bottom feeding and a generally benthic existence. The body surface contains five rows of bony plates or scutes. Sturgeon are large, long-lived fish that inhabit a great diversity of riverine habitat. Sturgeon are found from the fast-moving freshwater riverine environment downstream and, for some species, into the offshore marine environment of the continental shelf.

The shortnose sturgeon is the smallest of the three sturgeon species that occur in eastern North America, having a maximum known total length of 143 cm and weight of 23 kg. Growth rate and maximum size vary

11

with latitude, with the fastest growth occurring among southern populations. Maximum known age is 67 years for females, but males seldom exceed 30 years of age. Sex ratio among young adults is 1:1 but changes to a predominance of females (4:1) for fish larger than 90 cm fork length.

Males and females mature at the same length (45 to 55 cm fork length) throughout their range. However, age of maturation varies from north to south due to a slower growth rate in the north. Males may mature at 2 to 3 years of age in Georgia, at age 3 to 5 from South Carolina to New York, and at age 10 to 11 in the St. John River, Canada. Females exhibit a similar trend and mature at age 6 or younger in Georgia, at age 6 to 7 from South Carolina to New York, and at age 13 in the St. John River. Age of first spawning in males occurs 1 to 2 years after maturity, but among females is delayed for up to 5 years. Approximate age of a female at first spawning is 15 years in the St. John River, 11 years in the Hudson and Delaware Rivers, 7 to 14 years in the South Carolina rivers, and 6 years or less in the Altahama River, Georgia. Generally, females spawn every three years, although males may spawn every year.

Shortnose sturgeon are benthic feeders. Juveniles are believed to feed on benthic insects and crustaceans. Molluscs and large crustaceans are the primary food of adult shortnose sturgeon.

SPECIES DISTRIBUTION

The shortnose sturgeon is anadromous, living mainly in the slower moving riverine waters or nearshore marine waters, and migrating periodically into faster moving fresh water areas to spawn. One partially landlocked population is known in the Holyoke Pool, Conneticut River, and another landlocked group may exist in Lake Marion on the Santee River in South Carolina.

Shortnose sturgeon occur in most major river systems along the eastern seaboard of the United States. In the southern portion of the range, they are found in the St. Johns River in Florida; the Altamaha, Ogeechee, and Savannah Rivers in Georgia; and, in South Carolina, the river systems that empty into Winyah Bay and the Santee/Cooper River complex that forms Lake Marion. Data are lacking for the rivers of North Carolina. In the northern portion of the range, shortnose sturgeon are found in the Delaware River from Philadelphia, Pennsylvania to Trenton, New Jersey; the Hudson River in New York; the Connecticut River; the lower Merrimack River in Massachusetts and the Piscataqua River in New Hampshire; the Kennebec River in Maine; and the St. John River in New Brunswick, Canada. Data are lacking for the Chesepeake Bay area.

MAJOR IMPACTS

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 estuarine/riverine mudflats and marshes, remain constant threats.

Commercial exploitation of shortnose sturgeon occurred throughout its range starting in colonial times and continued periodically into the 1950's.

12

HAWAIIAN MONK SEAL

COMMON NAME: HAWAIIAN MONK SEAL
SCIENTIFIC NAME: *MONACHUS SCHAUINSLANDI*

LISTING DATE: 11/23/76
SPECIES STATUS: ENDANGERED
SPECIES TREND: DECREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: YES

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR

SPECIES POPULATION STATUS

The Hawaiian monk seal was listed as endangered throughout its range on November 23, 1976. Counts have been made at the atolls, islands and reefs where they haul out in the northwest Hawaiian Islands since the late 1950s. NMFS estimates that there are less than 1500 animals. In 1982, the highest count for all atolls was about 50 percent of the highest counts made in 1957-58. Since the mid-1980's, beach counts declined at five percent per year. The number of births declined significantly at all five major breeding locations in 1990, followed by some recovery in subsequent years. However, the number of births has not reached the level observed in the mid-to-late 1980's, and is not expected to in the near future because of the high losses of immature seals at French Frigate Shoals and mobbed seals at Laysan and Lisianski Islands.

The Hawaiian monk seal is most abundant on Kure Atoll, Pearl and Hermes Reef, Lisianski Island, Laysan Island, French Frigate Shoals, Necker Island and Nihoa Island. This species is vulnerable to human disturbance on pupping and haulout beaches, entanglement in marine debris, incidental take in commercial fisheries, possible die-offs from disease and naturally occurring biotoxins, male mobbing of female seals, and shark predation.

SPECIES DISTRIBUTION

The Hawaiian monk seal is currently found throughout the Northwestern Hawaiian Islands (NWHI), specifically: Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianki Island, Laysan Island, French Frigate Shoals, Gardner Pinnacles, Necker Island and Nihoa Island. These islands form a chain approximately 1840 km long. Hawaiian monk seals are also occasionally found in the main Hawaiian islands.

MAJOR IMPACTS

Factors which threaten the persistence and recovery of monk seal populations include disturbance by human activities, interactions with fisheries, mobbing mortality at certain locations, and shark predation. Although not directly responsible for monk seal mortality, human activity on beaches, even at low levels, can cause monk seals to abandon haul-out areas. Such disturbance is particularly disruptive to mother-pup pairs, and can force females to pup at suboptimal sites.

Interactions with active fisheries also pose a threat. Bottomfish, longline, and lobster fisheries have all directly affected monk seals. Indirectly, fisheries may affect seals through competition for prey or entanglement in fisheries debris, such as lost or discarded net and line.

Mortality due to mobbing attacks on adult and immature females is preventing the recovery of the Laysan and Lisianski populations. Attacks by adult males result in known (minimum) deaths of up to 10 or 11 seals annually at Laysan Island alone, roughly four percent of this island population.

Monk seals have been found dead with apparent shark-inflicted wounds, and sharks have been observed feeding on dead seals. Seals also have been sighted with all or part of an appendage missing, and

13

monk seal bones have been found in the stomach of large tiger sharks. Hence, sharks contribute to monk seal mortality, but their impact is probably not significant.

14

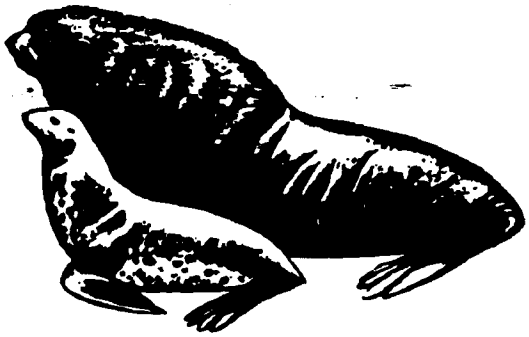
STELLER (NORTHERN) SEA LION

COMMON NAME: STELLER (NORTHERN) SEA LION
SCIENTIFIC NAME: *EUMETOPIAS JUBATUS*

LISTING DATE: 12/04/90
SPECIES STATUS: THREATENED
SPECIES TREND: DECREASING
CURRENT ESTIMATED POPULATION: 116000

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: AKR
REGIONS AFFECTED: SWR NWR AKR



SPECIES POPULATION STATUS

The Steller (northern) sea lion was listed as threatened throughout its range on December 4, 1990. There is not sufficient information to consider animals in different geographic regions as separate populations. The centers of abundance and distribution are the Gulf of Alaska and Aleutian Islands, respectively. Rookeries (breeding colonies) are found from the central Kuril Islands to Ano Nuevo Island, California; most large rookeries are in the Gulf of Alaska and Aleutian Islands. More than 50 Steller sea lion rookeries and a greater number of haulout sites have been identified.

During the 1985 breeding season, 68,000 animals were counted on Alaska rookeries from Kenai Peninsula to Kiska Island, compared to 140,000 in 1956-60. A 1988 Status Report concluded that the population size in 1985 was probably below 50 percent of the historic population size in 1956-60 and below the lower bound of its Optimum Sustainable Population level under the MMPA. A comparable survey conducted in 1989 showed that the number observed on rookeries from Kenai to Kiska declined to 25,000 animals. This indicates a decline of about 82 percent from 1956-60 to 1989 in this area. NFMS has conducted yearly Steller sea lion population censuses in Alaska since 1989. From 1989-1992, counts of adult and juvenile Steller sea lions at Kenai-Kiska index sites declined by 11 percent. From 1990-1993, pup counts declined at 10.7 percent per year from southeastern Alaska to the eastern Aleutian Islands, and by 12.7 percent per year from Kenai Peninsula to the eastern Aleutian Islands. These data indicate that the Steller sea lion population decline has not abated.

Species abundance estimates during the late 1970s ranged from 248,000 to 300,000 adult and juvenile animals. However, counts at rookeries and haulout sites throughout most of Alaska and the USSR in 1989, plus estimates from surveys conducted in recent years at locations not counted in 1989, provide a range-wide Steller sea lion population estimate of about 116,000.

SPECIES BIOLOGY

Steller sea lions are the largest otariid and show marked sexual dimorphism with adult males larger than adult females. The average length is 282 cm for adult males and 228 cm for adult females. Average adult weight is 566 kg for males and 263 kg for females. Pelage is light buff to reddish brown and slightly darker on the chest and abdomen. Naked parts of the skin are black. Adult males have long, coarse hair on the chest, shoulders and back; the chest and neck are massive and muscular. Newborn pups are about 1 m long, weigh 16-23 kg and have a thick, dark brown coat that molts to lighter brown after 6 months. Steller sea lions are polygamous, gregarious, and use traditional territorial sites for breeding and resting. The breeding season extends from late May to early July. Female sexual maturity is reached between 3 and 6 years. Males reach sexual maturity between 3 and 7 years, and reach physical maturity at age 10.

SPECIES DISTRIBUTION

The Steller sea lion's range extends around the North Pacific Ocean rim from the Kuril Islands and Okhotsk

Sea through the Aleutian Islands and Southern Bering Sea, along Alaska's southern coast and south to California. Most large rookeries are in the Gulf of Alaska and Aleutian Islands. Information on distribution has primarily been gathered during the summer. Fall and winter distribution is poorly known.

MAJOR IMPACTS

I. Natural impacts

A. Although Steller sea lions are preyed upon by other species, there is no evidence to suggest that the incidence of predation is a significant factor in the Alaska population decline.

B. The number of deaths attributable to parasitism and disease is assumed to be small. However, there has not been adequate research to assess the nature and importance of parasitism in sea lions.

C. Changes in physical factors might affect the suitability of the environment for Steller sea lions. Environmental changes could have an effect on food supply, adversely affecting survival and productivity of sea lions.

II. Human impacts

A. Although commercial hunting had a major effect in the past, there has been no commercial hunt since 1972.

B. Alaska natives have iconducted n the past and continue to conduct a subsistence harvest of Steller sea lions. The Alaska Department of Fish and Game estimated a 1992 subsistence harvest of approximately 548 animals.

C. Approximately 20,000 sea lions were taken incidental to fishery activity between 1966-88. Since the mid-1980's, the level of incidental take of Steller sea lions in commercial fisheries has been greatly reduced. Since 1990, NMFS estimates that incidental take in Alaska fisheries has been less than 30 sea lions per year. In addition, some sea lions were shot deliberately by fishermen, who though the animals were interfering with their catch. The magnitude of this intentional taking is not known; shooting at sea lions has been prohibited since the 1990 threatened species listing.

D. Commercial fisheries harvest several species that sea lions rely upon for food. However, limitations of data and models make it difficult to determine if fisheries have had an effect on sea lion populations.

E. There have been few analyses of Steller sea lion tissue to determine levels of organochloride pollutants. Preliminary results indicate that current levels of contaminants in Alaskan Steller sea lions are generally low.

F. While sea lions have been sighted entangled in packing bands and net fragments, it is a rare occurrence, and it is unlikely this is a major factor in the population decline.

G. The possible impacts on Steller sea lions of various types of disturbance have not been specifically studied. They include wildlife tourism, fisheries, and timber harvest. Development of outer continental shelf oil, gas and mineral resources may result in substantial amounts of off, on and near-shore activity that could result in disturbance having subtle but significant effects on the population.

76

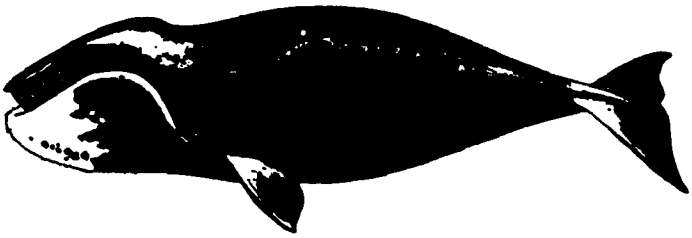
BOWHEAD WHALE
WESTERN ARCTIC

COMMON NAME: BOWHEAD WHALE
SCIENTIFIC NAME: *BALAENA MYSTICETUS*

LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: INCREASING
CURRENT ESTIMATED POPULATION: 7800

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: FPR
REGIONS AFFECTED: AKR



SPECIES POPULATION STATUS

The bowhead whale was listed as endangered throughout its range on June 2, 1970. The status of the bowhead whale stocks in the Okhotsk Sea (North Pacific Ocean), and Spitsbergen-East Greenland, Davis Strait-Baffin Bay, and Hudson Bay-Foxe Basin (North Atlantic Ocean), is unknown. Infrequent sightings of bowheads in these areas in recent years suggest that these stocks are very small, perhaps in the low hundreds.

The Western Arctic stock of bowheads in the Bering, Chukchi, and Beaufort Seas has increased since commercial whaling ended about 1914. Ice-based census sightings data collected between 1978 and 1988 suggest that the current rate of population growth is approximately 3.1% per year. The present stock size is estimated to be 7,800 animals. The initial stock size in 1848 is estimated to have been 18,000-20,000. Since the late 1970s, the take of bowhead whales by Alaskan Eskimos (including whales struck but lost) has been 25-40 animals per year.

SPECIES BIOLOGY

The bowhead is a rather large slow swimming baleen whale, reaching lengths of up to 24 meters and weighing about 3 MT per meter of length. Its large head, which makes up about one third of the animal's total bulk, is characterized by upward, arching jaws that create the bowed head appearance. This species lacks a dorsal fin, is black, dark brown or gray and usually has white marks on the chin, underside and on the tail. The large mouth of the bowhead has up to 600 of the longest baleen plates (up to 3.7 meters long) of any baleen whale. The great majority of the bowhead's food consists of euphausids, mysids, copepods, and pelagic amphipods. The Western Arctic stock spends its winters in the southwestern Bering Sea near the ice edge, and its summers in the Beaufort Sea between Point Barrow and Mackenzie Bay. The bowhead gives birth to a single calf after gestation of about one year. The female probably gives birth every 3 to 6 years. Although the age at sexual maturity is unknown for males, it appears to be 6 to 8 years for females. Calving period is March-June, peaking in May, and breeding period is January-June. Calves are nursed for 6 to 12 months.

SPECIES DISTRIBUTION

The Western Arctic stock contains the majority of the world's bowhead whales. Five stocks or populations existed at one time. One is thought to be extinct (Spitsbergen-East Greenland) and three others appear to exist in very low numbers (Davis Strait-Baffin Bay; Hudson Bay-Foxe Basin; Okhotsk Sea). The Western Arctic bowhead whale is thought to spend winter in the southwestern Bering Sea, near the ice edge, and summer feeding and calving in the Beaufort Sea off the coast of Canada and Alaska. During the spring (usually beginning in April), bowhead whales migrate from the Bering Sea through the Bering Strait into the Chukchi Sea (Arctic Ocean); then they follow the nearshore lead around Point Barrow to the Beaufort Sea area west of Banks Island and north of Mackenzie Bay. In September as the Arctic Ocean starts freezing up, they begin their return migration to the Bering Sea. The animals migrate westward from Mackenzie Bay past Kaktovik to Point Barrow and then proceed westward as far as

77

Wrangel Island before returning south to the Bering Strait.

MAJOR IMPACTS

Potential impacts are from subsistence hunting and offshore oil and gas development. The initial stock size of the Western Arctic bowhead is estimated to have been 18-20,000. By the end of the commercial whaling period (1914), the numbers were at 600-1000. Since cessation of commercial whaling the numbers have increased very slowly, with present estimated increase of the Western Arctic stock thought to be roughly 3% per year. Although the commercial harvest of this species is prohibited, there is a limited subsistence take by Alaskan Eskimos. The magnitude of the threat from these direct takes is low. Offshore oil and gas development within its range may present a conflict with this species. Regulations that allow a non-lethal take of bowhead whales incidental to energy exploration in the Arctic include requirements to monitor the effects of these activities on bowhead whales. Research data on the reactions of whales to various oil exploration noises is being acquired.

GRAY WHALE
EASTERN NORTH PACIFIC

COMMON NAME: GRAY WHALE
SCIENTIFIC NAME: *ESCHRICHTIUS ROBUSTUS*

LISTING DATE: 06/02/70
SPECIES STATUS: SEE COMMENTS
SPECIES TREND: INCREASING
CURRENT ESTIMATED POPULATION: 23109

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: FPR
REGIONS AFFECTED: SWR NWR AKR

SPECIES POPULATION STATUS

The gray whale was listed as endangered throughout its range on June 2, 1970. Two stocks of gray whales occur in the North Pacific Ocean. The status of the western North Pacific (Korean) stock of gray whales is uncertain, but is thought to be severely depleted. The eastern North Pacific (California) stock of gray whales has fully recovered and is at or above its initial unexploited stock size, and is increasing at a rate of 2.5-3.2% per year. The stock has increased in spite of direct competition with humans for coastal habitat, and a subsistence catch of 167 whales per year (5,006 total) by the Soviet Union during the past 30 years.

NMFS published a Notice of Determination to delist the gray whale on January 7, 1993 (58 FR 3121). The U.S. Fish and Wildlife Service published the final delisting on June 16, 1994 (59 FR 31094).

SPECIES BIOLOGY

The gray whale is easily recognized by its mottled gray color and lack of a dorsal fin. The adult is 11 to 15 meters in length. Gray whales, unlike most other large cetaceans, are a coastal species generally associated with the continental shelf. The stock migrates between feeding grounds in the Bering and Chukchi Seas and winter breeding and calving grounds in and around the coastal lagoons of Baja California. An unknown, but possibly significant, number remain year round off the coasts of California, Oregon and Washington.

Conception occurs on the southward migration with a 3-week period centering on 5 December. After a 418-day gestation period, calving takes place every two years, usually within a 5-6 week period centering on 27 January. Weaning occurs in approximately 7 months. Gray whales reach sexual maturity at about 8 years (5-11 years).

While feeding on benthic amphipods occurs predominantly in waters off Alaska, opportunistic feeding on pelagic organisms and in the kelp beds also occurs at other times of the year.

SPECIES DISTRIBUTION

Each year in the Eastern Pacific, gray whales undertake a 20,000 km trip between their feeding and breeding areas, the longest migration of any mammal. After 4 summer months in the Bering and Chukchi seas, the move south begins in late September and early October with pregnant females leading the way and other adults and yearlings following. They cross the Gulf of Alaska at a rate of about 185 km per day. They are first seen from land in late November and early December in Oregon and Northern California, arriving off San Francisco in mid-December and San Diego at Christmas time. The migration takes two routes off Santa Barbara, with some whales taking the island route on to Guadalupe and Socorro and the rest hugging the coast. Most whales go into Scammon and San Ignacio lagoons on the western shore of the Baja Peninsula, but some go on to the area of Jalisco inside the Gulf of California. The migration north begins in February and overlaps near San Diego with the last few stragglers still coming south. The northern movement is slower (because of the currents and the presence of young calves) with an average rate of 80 km per day. Females with calves tend to

79

stay close inshore, but most whales follow a more westerly route north. the last leaving U.S. coastal waters in May, massing off the Olympic Peninsula in Washington before setting off on a circular navigation route to the Aleutians.

MAJOR IMPACTS

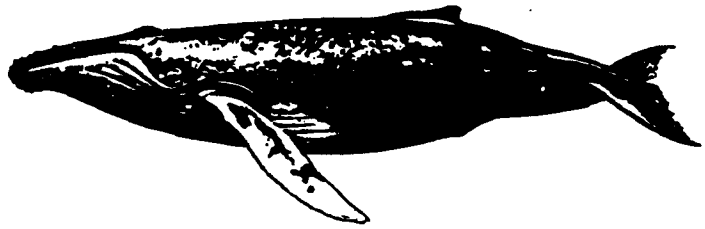
1) Subsistence hunting
Approximately 167 gray whales may be taken annually by Russia under a quota established by the IWC.

2) Interactions with fishing gear
Approximately 10 gray whales, usually juveniles, are killed annually interacting with commercial fishing gear.

3) Whale-watching activities
Since whale-watching occurs in the same areas that gray whales migrate or concentrate in, there is a potential for disturbance and displacement from essential habitat.

HUMPBACK WHALE
NORTH ATLANTIC

COMMON NAME: HUMPBACK WHALE
SCIENTIFIC NAME: *MEGAPTERA NOVAEANGLIAE*



LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: INCREASING
CURRENT ESTIMATED POPULATION: 5500

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: NER
REGIONS AFFECTED: SER NER

SPECIES POPULATION STATUS

The humpback whale was listed as endangered throughout its range on June 2, 1970. Humpback whales are the fourth most numerically depleted large cetacean worldwide. The right whale (Eubalaena glacialis), blue whale (Balaenoptera musculus), and bowhead whale (Balaena mysticetus), respectively, are the most depleted. Prior to commercial whaling the worldwide population is thought to have been in excess of 125,000. American whalers alone killed 14,164 to 18,212 humpbacks in the North Atlantic between 1805 and 1907 and the total North Pacific kill was estimated to be 28,000. Today, perhaps no more than 10,000 exist worldwide.

Humpback whales occur adjacent to human population centers and are affected by human activities throughout their range. Both habitat and prey are affected by human-induced factors that could impede recovery. These factors include subsistence hunting, incidental entanglement in fishing gear, collision with ships, and disturbance or displacement caused by noise and other factors associated with shipping, recreational boating, high-speed thrill craft, whale watching or air traffic. Introduction and persistence of pollutants and pathogens from waste disposal; disturbance and pollution from oil, gas or other mineral exploration and production; habitat degradation or loss associated with coastal development; and competition with fisheries for prey species may also impact the whales. These factors could affect individual reproductive success, alter survival, and limit availability of needed habitat.

SPECIES BIOLOGY

Humpback whales are distinguished from other whales in the same family by extraordinarily long flippers and the use of very long, complex, repetitive vocalizations. Maximum recorded size is 18 meters, with an average length of 14.5 meters for females and 13.5 meters for males. Calving occurs primarily in the winter. Age at sexual maturity is 4-6 years. Most females give birth every 2-3 years. Annual and multi-year (up to 5) calving also has been observed. Prey includes herring, sand lance, capelin, mackerel, pollock, haddock and krill.

SPECIES DISTRIBUTION

During summer, humpback whales in the Western North Atlantic migrate and feed over the continental shelf and along the coasts of Southwestern Greenland, Newfoundland and Labrador, as well as in the Gulf of St Lawrence and the Gulf of Maine. During the winter, the principal range for the Western North Atlantic population is around the Greater and Lesser Antilles. Primary areas are at Silver and Navidad Banks, and along the coast of the Dominican Republic. Other concentrations include the western edge of Puerto Rico and the area from the Lesser Antillles south to Venezuela. Whales also have been sighted around New England and Newfoundland, and some may remain there year-round. In addition, humpbacks have been sighted along the Atlantic and Gulf of Mexico coasts of Florida. The summer and winter grounds for the Eastern North Atlantic (Iceland-Norway, Spain-North Africa) are not well known.

91

MAJOR IMPACTS

1) Subsistence hunting -- Hunting from Bequia, St. Vincent continued through 1989. Only one whale was taken in 1987, and hunting has probably terminated.

2) Entanglement in fishing gear -- Humpback whales are caught in fishing traps and gillnets around Newfoundland, Canada, as well as along the east coast of the U.S.

3) Collisions with ships -- Whale/ship collisions are an increasing threat as ships get larger and faster. Major shipping lanes cross important humpback feeding grounds, such as Stellwagen Bank and the Great South Channel, in the Gulf of Maine. If whales either acclimate to the disturbance or ignore ships when feeding, the risk of a collision increases.

4) Acoustic disturbance

a) Noise from ships, boats and aircraft: Short-term disturbance of whales by vessel noise is being investigated. Observed responses included attempts to move away, changes in breathing and diving patterns, as well as possibly antagonistic behavior. Areas near Vieques, Puerto Rico, and in the mid-Atlantic, in the humpback wintering grounds, are currently used as ordinance ranges. In addition, the Canadian government is planning to establish a large bombing range off the Labrador coast, in the whales' summer grounds.

b) Commercial whale-watching boats and research boats: Since these activities frequently operate where whales concentrate for feeding and reproduction, disturbance may displace whales from important habitats.

c) Noise from industrial activities: The major sources of industrial underwater noise appear to be offshore oil, gas or mineral mining activities. These activities increase vessel traffic, produce loud sounds for seismic profiling, locate structures in areas used by whales, and introduce noises from drilling and production into the environment. Experiments have shown there to be no overall pattern of avoidance.

5) Habitat degradation

a) Chemical pollution, including petroleum: The overall impact of pollution on habitats used by humpback whales is unknown. Contaminants can be introduced through rivers, coastal runoff, wind, ocean dumping, sewage, and various industrial activities. The effects of short-term exposure to spilled oil or other petroleum compounds are being investigated. It is not known if humpbacks avoid oil spills. However, the greatest impact of a spill could occur indirectly, as a result of the destruction or shift in the distribution of a prey species.

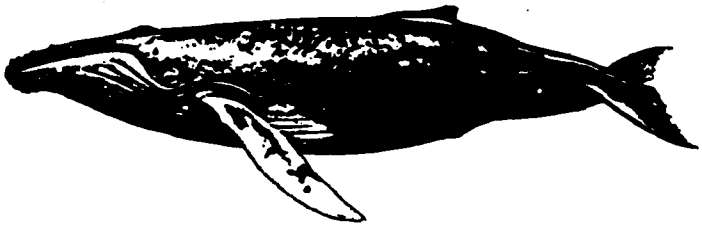
b) Coastal development: It is not certain if intensive human use of coastal areas has precluded use by humpback whales. However, it may not be a coincidence that Silver Bank, the primary remaining breeding site for the humpback, is located over 100 km from land, is relatively inaccessable to people and is protected from ship traffic by a fringing reef. Most other apparently suitable wintering habitat in the Antillean area is exposed to rapid human population growth, and the associated increase in industry, recreation and tourism. The degree to which these activities have restricted repopulation of the whales' wintering range is not known.

6) Competition for resources with humans -- Humpbacks and fishermen in Newfoundland compete for the same prey. Because of this, humpbacks are seen as pests by fishermen, and they tolerate the level of damage caused by the whales primarily because of the whales' endangered status. If damages increase with an increase in the whale population, the tolerance may end, and fishermen may not cooperate with programs to encourage population growth.

82

HUMPBACK WHALE
NORTH PACIFIC

COMMON NAME: HUMPBACK WHALE
SCIENTIFIC NAME: *MEGAPTERA NOVAEANGLIAE*



LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: 1500

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: FPR
REGIONS AFFECTED: SWR NWR AKR

SPECIES POPULATION STATUS

The humpback whale was listed as endangered throughout its range on June 2, 1970. Humpback whales are the fourth most numerically depleted large cetacean worldwide. The right whale (Eubalaena glacialis), blue whale (Balaenoptera musculus), and bowhead whale (Balaena mysticetus), respectively, are the most depleted. Prior to commercial whaling the worldwide population is thought to have been in excess of 125,000. American whalers alone killed 14,164 to 18,212 humpbacks in the North Atlantic between 1805 and 1907 with the total North Pacific kill estimated to be 28,000. Today, perhaps no more than 10,000 exist worldwide.

Humpback whales occur adjacent to human population centers and are affected by human activities throughout their range. Both habitat and prey are affected by human-induced factors that could impede recovery. These factors include subsistence hunting, incidental entanglement in fishing gear, collision with ships, and disturbance or displacement caused by noise and other factors associated with shipping, recreational boating, high-speed thrill craft, whale watching or air traffic. Introduction and persistence of pollutants and pathogens from waste disposal; disturbance and pollution from oil, gas or other mineral exploration and production; habitat degradation or loss associated with coastal development; and competition with fisheries for prey species may also impact the whales. These factors could affect individual reproductive success, alter survival, and limit availability of needed habitat.

SPECIES BIOLOGY

Humpback whales are distinguished from other whales in the same family by extraordinarily long flippers, a more robust body, more variable dorsal fin, and use of very long, complex, repetitive vocalizations. Maximum recorded size is 18 meters, with an average length of 14.5 meters for females and 13.5 meters for males. Calving occurs primarily in the winter. Age at sexual maturity is 4-6 years. Most females give birth every 2-3 years. Annual and multi-year (up to 5) calving has also been observed. Prey includes herring, sand lance, capelin, mackerel, pollock, haddock and krill.

SPECIES DISTRIBUTION

During summer, humpback whales in the North Pacific migrate and feed over the continental shelf and along the coasts of the Pacific Rim, from Point Conception, California north to the Gulf of Alaska, Prince Willliam Sound and Kodiak Island. Humpback whales spend the winter in three separate wintering grounds: the coastal waters along Baja California and the mainland of Mexico; the main islands of Hawaii; and the islands south of Japan.

MAJOR IMPACTS

1) Entanglement -- Humpbacks have been caught in gillnets in the California and Alaska coastal regions. Several have died as a result of entanglement.

2) Collisions with ships -- Whale/ship collisions are an increasing threat as ships get larger and faster. Major

83

shipping lanes cross important humpback feeding grounds, such as the Gulf of the Fallerones, crossed by commercial and military shipping near San Francisco. If whales either acclimate to the disturbance or ignore ships when feeding, the risk of a collision increases. Large ships, tugboats with long towlines and recreational boating pose potential collision threats along the coast of Hawaii. The number of physical injuries as a result of collisions has increased in Hawaiian waters.

3) Acoustic disturbance

a) Noise from ships, boats and aircraft: Short-term disturbance of whales by vessel noise is being investigated. Observed responses included attempts to move away, changes in breathing and diving patterns, as well as possibly antagonistic behavior. The area near Farallon de Madonilla, Commonwealth of the Northern Mariana Islands, in the humpback wintering grounds, is currently used as an ordinance range. In addition, the U.S. Navy plans to construct a nuclear submarine testing base in southeastern Alaska. The plans include intensive sonar arrays and high speed movement by submarines. Little is known about humpback whales in the region or about the potential effects of those activities on them.

b) Commercial whale-watching boats and research boats: Since these activities frequently operate where whales concentrate for feeding and reproduction, disturbance may displace whales from important habitats.

c) Noise from industrial activities: the major sources of industrial underwater noise appear to be offshore oil, gas or mineral mining activities. These activities increase vessel traffic, produce loud sounds for seismic profiling, locate structures in areas used by whales, and introduce noises from drilling and production into the environment. Experiments have shown there to be no overall pattern of avoidance.

4) Habitat degradation

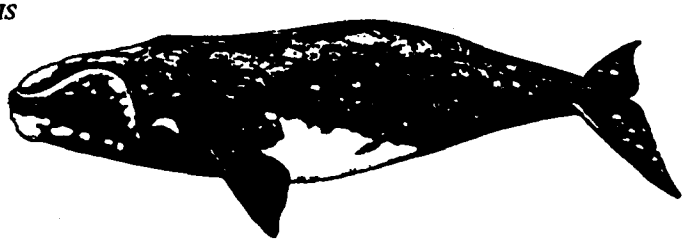
a) Chemical pollution, including petroleum: The overall impact of pollution on habitats used by humpback whales is unknown. Contaminants can be introduced through rivers, coastal runoff, wind, ocean dumping, sewage, and various industrial activities. The effects of short-term exposure to spilled oil or other petroleum compounds are being investigated. It is not known if humpbacks avoid oil spills. However, the greatest impact of a spill could occur indirectly, as a result of the destruction or shifting of prey species.

b) Coastal development: It is not known if intensive human use of coastal areas has precluded use by humpack whales. This may be occuring off Oahu Island, Hawaii, where humpback whales were present along the coast from the 1930's to the late 1960's, and have since appparently dissapeared. Although the apparent disappearance could be related to increased commercial hunting during the early 1960's, it is speculated that increased coastal development may have displaced the whales with noise from construction, increased runoff and increased boat and air traffic. Underwater noise, chemical contamination and increased turbidity may be the most important effects of development. These are particularly significant in Hawaii, because local waters are one of the primary sites for humpback whale reproducion.

84

NORTHERN RIGHT WHALE
NORTH ATLANTIC

COMMON NAME: NORTHERN RIGHT WHALE
SCIENTIFIC NAME: *EUBALAENA GLACIALIS GLACIALIS*



LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: 300-350

CRITICAL HABITAT: YES

PRIMARY REGION RESPONSIBLE: NER
REGIONS AFFECTED: SER NER

SPECIES POPULATION STATUS

The northern right whale was listed as endangered throughout its range on June 2, 1970. Current estimates of the northern right whale populations indicate there are no more than 600 individuals, with 300 to 350 found in the North Atlantic Ocean and 250 to 300 in the North Pacific Ocean. There are no other known northern right whale populations.

Commercial whaling was the major reason for the decline of the northern right whale. For a period that started more than 800 years ago and lasted well into the 20th century, the species was hunted extensively, primarily for its oil and baleen plates. The animal's commercially valuable products, slow swimming speed, the characteristic of floating when dead, and generally coastal distribution combined to make this whale the "right" whale to kill - hence its common name. Hunting was largely restricted to the eastern North Atlantic at first. As that population was depleted and knowledge of the world's oceans increased, hunting pressure shifted to the western North Atlantic and then to the Pacific, eventually encompassing the species' entire range.

Observers noted that the northern right whale was in trouble as early as the 19th century. By 1935, the species had declined to such low numbers that the League of Nations was able to get most whaling nations to agree to stop hunting the northern right whale. Since that time, hunting or other purposeful take has been responsible for the death of only a few additional animals, and is no longer a serious threat to the species.

The northern right whale remains in a precarious position because a combination of human actions and natural forces appears to be preventing significant increases in the number of animals. The preponderance of evidence suggests that certain human actions are significantly impeding the recovery of this species. Principal among these are (in decreasing order of importance) ship collisions, entanglement in certain types of fishing gear, degradation of the northern right whale's habitat (especially the areas where they feed), and disturbance.

There is reason to believe that if the human actions having a negative effect on the species were reduced or eliminated, the chance for recovery would be significantly improved. Limits of knowledge of the genetic restrictions imposed upon the species by its present low numbers prevent NMFS from declaring with certainty that, even if all adverse affects caused by humans were eliminated, the northern right whale would recover. In any case, recovery will be not be quick. Even in the best of circumstances, rapid recovery cannot be anticipated. It is not expected that the northern right whale will increase in numbers in the next 75 years to a point where efforts can be relaxed.

SPECIES BIOLOGY

The northern right whale is a robust, medium-sized baleen whale. Adults are 13.5 to 16.5 meters long. Distinctive features include: no dorsal fin, a large head, narrow upper jaw, strongly bowed lower jaw. Callosities are used to identify individuals. A photo identification catalog of 320 animals exists. The blow forms a distinctive "V" shape due to separated

85

blowholes. Calving occurs in the winter along the southeast coast of the U.S. Calves are about 4.5 meters long, and nurse for at least 9 months. Age at sexual maturity is 5-9 years, with females giving birth to one calf every 3-5 years.

SPECIES DISTRIBUTION

The North Atlantic population utilizes 5 areas:
1) coastal Florida and Georgia;
2) Great South Channel east of Cape Cod, MA;
3) Cape Cod and Massachusetts bays;
4) Bay of Fundy; and
5) Browns and Baccaro banks south of Nova Scotia.

The population migrates seasonally, spending spring and summer off the coast of New England, and late summer and fall in waters off southern Canada. The only known calving area is the coastal waters of Georgia and Florida.

MAJOR IMPACTS

1) Vessel interactions

a) Ship collisions: The whales' habit of resting at the surface, surface skim feeding and surface courtship groups make them susceptible to ship collisions, resulting in injury or death.

b) Disturbance from vessels: Data at this time is not conclusive. Studies indicate that sensitivity to engine noise exists but response varies. The effect of whale watching and scientific research cruises on whale behavior is unknown.

2) Entanglement in fishing gear

16 encounters with fishing gear have been recorded between 1975 and 1989. Analysis of photographic data shows that 58% of the catalogued whales have scars and injuries indicative of rope and net cuts. 3 whales are known to have died from entanglements.

3) Habitat degradation

Coastal marine habitats are undergoing general degradation. The potential exists for oil and gas leasing along the east coast of the U.S., as well as for phosphate mining off the North Carolina, South Carolina and Georgia coasts. The impact of industry related noise, ship traffic and other activities is unknown.

Several municipalities adjacent to Massachusetts and Cape Cod bays have proposed plans to discharge untreated wastewater into bay waters. Dump sites have been designated by EPA, the Corps of Engineers and the Commonwealth of Massachusetts. Studies and monitoring efforts will soon be initiated in the Massacghusetts Bay area to determine the effects of sewage discharge in the region. Dredging activities in the Bay also undergo continuous observation for endangered species presence.

Extensive dredging activites occur in the shipping channels, harbors and naval bases in North Carolina, Georgia and Florida. The effects of the dredging and disposal activities need to be studied.

The effect of habitat degradation on plankton distribution is unknown. Plankton density appears to be a major factor in the use of a certain area by whales.

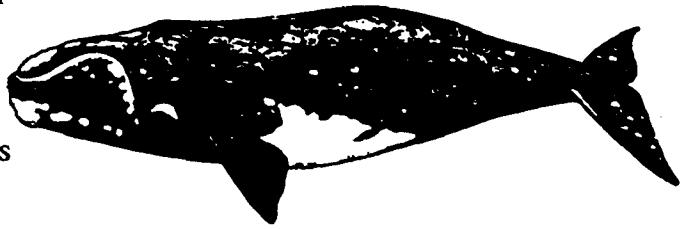
4) Hunting

Although hunting had a major effect on the northern right whale population in the past, hunting is no longer allowed, and has no effect on the current population.

86

NORTHERN RIGHT WHALE
NORTH PACIFIC

COMMON NAME: NORTHERN RIGHT WHALE
SCIENTIFIC NAME: *EUBALAENA GLACIALIS JAPONICA*



LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: 300 OR LESS

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: NWR
REGIONS AFFECTED: SWR NWR AKR

SPECIES POPULATION STATUS

The northern right whale was listed as endangered throughout its range on June 2, 1970. Current estimates of the northern right whale populations indicate that there are no more than 600 individuals, with 300 to 350 found in the North Atlantic Ocean and 250 to 300 in the North Pacific Ocean. There are no other known northern right whale populations.

Commercial whaling was the major reason for the decline of the northern right whale. For a period that started more than 800 years ago and lasted well into the 20th century, the species was hunted extensively, primarily for its oil and baleen plates. The animal's commercially valuable products, slow swimming speed, the characteristic of floating when dead, and generally coastal distribution combined to make this whale the "right" whale to kill - hence its common name. Hunting was largely restricted to the eastern North Atlantic at first. As that population was depleted and knowledge of the world's oceans increased, hunting pressure shifted to the western North Atlantic and then to the Pacific, eventually encompassing the species' entire range.

Observers noted that the northern right whale was in trouble as early as the 19th century. By 1935, the species had declined to such low numbers that the League of Nations was able to get most whaling nations to agree to stop hunting the northern right whale. Since that time, hunting or other purposeful take has been responsible for the death of only a few additional animals, and is no longer a serious threat to the species.

The northern right whale remains in a precarious position because a combination of human actions and natural forces appears to be preventing significant increases in the number of animals. The preponderance of evidence suggests that certain human actions are significantly impeding the recovery of this species. Principal among these are (in decreasing order of importance) ship collisions, entanglement in certain types of fishing gear, degradation of the northern right whale's habitat (especially the areas where they feed), and disturbance. There is reason to believe that if the human actions having a negative effect on the species were reduced or eliminated, the chance for recovery would be significantly improved. Limits of knowledge of the genetic restrictions imposed upon the species by its present low numbers prevent NMFS from declaring with certainty that, even if all adverse affects caused by humans were eliminated, the northern right whale would recover. In any case, recovery will be not be quick. Even in the best of circumstances, rapid recovery cannot be anticipated. It is not expected that the northern right whale will increase in numbers in the next 75 years to a point where efforts can be relaxed.

SPECIES BIOLOGY

The northern right whale is a robust, medium-sized baleen whale. Adults are 13.5 to 16.5 meters long. Distinctive features include: no dorsal fin, a large head, narrow upper jaw, strongly bowed lower jaw. Callosities are used to identify individuals. The blow forms a distinctive "V" shape due to separated blowholes.

82

NORTHERN RIGHT WHALE
NORTH PACIFIC

SPECIES DISTRIBUTION

The North Pacific population occurs across the entire North Pacific Ocean above 35 N, primarily in continental shelf regions. Sightings have occured as far south as Central Baja California and the Yellow Sea in the winter, and far north as the Bering Sea and the Sea of Okhotsk in the summer.

MAJOR IMPACTS

1) Vessel interactions

a) Ship collisions: no ship strikes have been reported from the North Pacific.

b) Disturbance from vessels: Data at this time is not conclusive. since northern right whales use low frequency vocalization to communicate, increased noise levels could disrupt these communications.

2) Entanglement in fishing gear

Extensive drift gillnet fishing occurs in the North Pacific. A dead North Pacific right whale was retrieved from a gilllnet in 1983. The type of gillnet and the circumstances of the entanglement are unknown.

3) Habitat degradation

Offshore oil and gas leasing has occurred in the eastern North Pacific portion of the whales' range. Increases in noise levels accompany exploratory activities, and could disturb whales near the operations. Although no oil spills have resulted from offshore drilling, whales might be vulnerable to a spill if they were involved in skim feeding behavior.

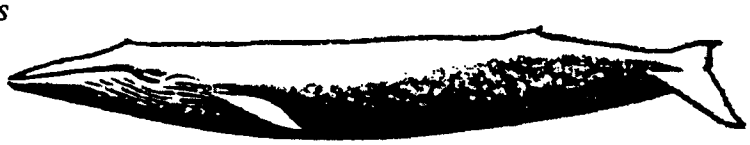
4) Hunting

Although hunting had a major effect on the northern right whale population in the past, hunting in the Pacific has been outlawed since 1946. However, between 1931 and 1982, at least 68 western North Pacific right whales were taken. 54 whales were taken intentionally, 23 were taken for scientific purposes and 1 was taken accidentally.

R4

BLUE WHALE
WORLDWIDE

COMMON NAME: BLUE WHALE
SCIENTIFIC NAME: *BALAENOPTERA MUSCULUS*



LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: INCREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: FPR
REGIONS AFFECTED: SER NER SWR NWR AKR

SPECIES POPULATION STATUS

The blue whale was listed as endangered throughout its range on June 2, 1970. Blue whales are severely depleted in all oceans of the world. The population status of blue whales in the Northern Hemisphere is unknown. Sightings have increased off central California and on the Pacific coast of Mexico and Central America, but these increases may be attributable to increased observer effort rather than trends in abundance. Blue whales have been studied in the Gulf of California, Mexico and the Gulf of St. Lawrence, Canada, but trends in abundance were not apparent. An increasing trend in abundance of 5.1 percent was reported between 1979 and 1988 west of Iceland.

The status of blue whales in the southern hemisphere is uncertain. Only seven sightings of calves have been made below 60 S. since 1965. An analysis of 6 years of sightings in Antarctic waters conducted under the auspices of the IWC suggests that blue whales may not be recovering from commercial whaling. However, the consensus of opinion on abundance of blue whales in the Antarctic is that stocks are certainly larger than 500, and considerably larger for all the southern oceans.

SPECIES BIOLOGY

Blue whales average 30 meters in length and 91 to 136 MT in weight. They are bluish-grey in color, mottled with light grey and white spots. They have an unusually small dorsal fin (less than 30 cm) and relatively short flippers. Blue whales are surface feeders, feeding almost exclusively on planktonic species such as krill. Gestation period is approximately 12 months. Females give birth every 2 to 3 years to calves 7 to 8 meters in length and 2.7 to 3.6 MT in weight.

SPECIES DISTRIBUTION

Blue whales are found worldwide, with a concentration in Antarctic waters.

MAJOR IMPACTS

Blue whales were severely depleted by commercial whaling, until the 1966 IWC ban.

89

FIN WHALE
WORLDWIDE

COMMON NAME: FIN WHALE
SCIENTIFIC NAME: *BALAENOPTERA PHYSALUS*

LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: 120000

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: FPR
REGIONS AFFECTED: SER NER SWR NWR AKR

SPECIES POPULATION STATUS

The fin whale was listed as endangered throughout its range on June 2, 1970. The status of stocks of fin whales is unknown, but the species was severely depleted by commercial whaling activities. In this century, over 700,000 animals were landed in all oceans of the world. The present world population estimate is 120,000 individuals. While the species is depleted relative to historical levels, it is considered abundant compared to other large whale species. No trend analyses for this species are available. The abundance estimate in continental shelf waters between Cape Hatteras and Nova Scotia is 5,000 in spring and summer and 1,500 in winter.

SPECIES BIOLOGY

Fin whales are the second largest baleen whale, with adults ranging from 19.8 to 22.9 meters long and weighing approximately 63 MT. Coloring is asymmetrical, with the main body, as well as the left baleen plate and lip a dark blue-gray and the right lip and baleen plate a yellow-white. The underside of the body is white. The back is distinctly ridged towards the tail, leading to the nickname "razorback whale."

Conception occurs during a 5-month period in winter. Young are born after a 12-month gestation period. Mean length at birth is approximately 6 meters. Calves are weaned at 7 to 11 months, at which point they have an average length of approximately 12 meters. Both male and female fin whales reach sexual maturity between ages 5 and 15. Mature females bear one calf every 2 to 3 years.

SPECIES DISTRIBUTION

Fin whales are found worldwide, between 20 and 75 N and between 20 and 75 S. Northern and southern hemisphere stocks are thought to be reproductively distinct.

MAJOR IMPACTS

There is currently a small subsistence take allowed in East Greenland.

SEI WHALE
WORLDWIDE

COMMON NAME: SEI WHALE
SCIENTIFIC NAME: *BALAENOPTERA BOREALIS*

LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: 25000

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: FPR
REGIONS AFFECTED: SER NER SWR NWR AKR

SPECIES POPULATION STATUS

The sei whale was listed as endangered throughout its range on June 2, 1970. The status of sei whales is unknown throughout the world. The species was severely depleted by commercial whaling primarily in the 1950s-1970s. Although the sei whale does not appear to be in immediate danger of extinction, no relevant new information on any stock is available.

SPECIES BIOLOGY

The sei whale is the third largest of the great whales, with an adult length of up to 18.3 meters. Coloring is grey, with a variable white area extending from the chin to the umbilicus. Like all balaenopterids, they have fringed baleen plates instead of teeth, and feed on swarms of small zooplankton.

Sexual maturity is reached between ages 5 and 15, with adult females bearing one calf every 2-3 years after a gestation period of about 1 year. Calves are approximately 4.4 meters long at birth.

SPECIES DISTRIBUTION

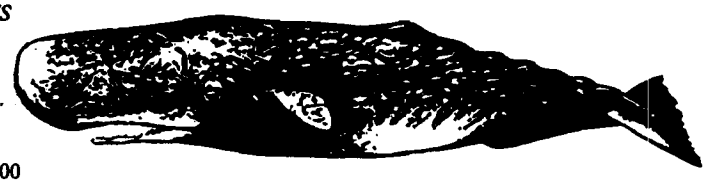
Sei whales are found worldwide in all oceans. They seasonally migrate from high latitude summer feeding grounds to lower latitude wintering areas. Populations north and south of the equator are assumed to be separate, as their migrations are 6 months out of phase. In the North Pacific, sei whales winter in waters from 20 N to 23 N, and summer from 35 N to 40-50 N. In the Antarctic, sei whales spend the summer between 40 S and 50 S. The winter distribution is unknown. In the North Atlantic, the northern summer limit is thought to be 72 N. Little is known about winter distribution.

MAJOR IMPACTS

After the decline of blue and fin whales, nations started hunting sei whales. All commercial hunting was ended in 1977 after sei whales were declared endangered and were protected.

SPERM WHALE
WORLDWIDE

COMMON NAME: SPERM WHALE
SCIENTIFIC NAME: *PHYSETER MACROCEPHALUS*



LISTING DATE: 06/02/70
SPECIES STATUS: ENDANGERED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: 2000000

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: FPR
REGIONS AFFECTED: SER NER SWR NWR AKR

SPECIES POPULATION STATUS

The sperm whale was listed as endangered throughout its range on June 2, 1970. During the past 2 centuries, commercial whalers took about 1,000,000 sperm whales. Despite this high level of take, the sperm whale remains the most abundant of the large whale species. The present world abundance is estimated at 2,000,000 individuals, which is over eight times greater than the combined total of the other seven large whale species.

SPECIES BIOLOGY

The sperm whale is the largest of the odontocetes (toothed whales), reaching a length of 18.3 meters in males and 12.2 meters in females. The sperm whale is distinguished by its extremely large head, which takes up to 25 to 35% of its total body length. It is the only living cetacean that has a single blowhole asymetrically situated on the left side of the head near the tip. The "Y"-shaped lower jaw contains two rows of 20 to 30 erupted teeth.

The interior of the mouth and the surrounding area are often white, in contrast to the rest of the body, which has been described as black, dark bluish-gray, slate gray, iron gray, purplish-brown, grayish-brown or blackish-brown. The sperm whale has no dorsal fin, however, a series of humps is present along the dorsal surface of the tail stock. The skin of the body is corrugated into many series of longitudinal ripples.

Sperm whales are noted for their ability to make prolonged, deep dives. Large adult males have been observed diving over 3.3 km deep in dives lasting almost an hour and a half.

Sperm whales feed mainly on squid, including the giant squid. Calves are born after a gestation period of about 15 months and are about 4 meters long. Females reach sexual maturity at about 9 years, and have a calf every 3-6 years. In males, puberty is prolonged, taking place between ages 9 and 20.

SPECIES DISTRIBUTION

Sperm whales inhabit all oceans of the world. Their distribution is dependent on their food source and suitable conditions for breeding, and varies with the sex and age composition of the group. Sperm whales tend to inhabit areas with a water depth of 600 meters or more, and are uncommon in waters less than 300 meters deep.

MAJOR IMPACTS

The primary threat to the species was commercial whaling. With the cessation of whaling efforts, this threat no longer exists.

CARIBBEAN MONK SEAL

COMMON NAME: CARIBBEAN MONK SEAL
SCIENTIFIC NAME: *MONACHUS TROPICALIS*

LISTING DATE: 04/10/79
SPECIES STATUS: ENDANGERED
SPECIES TREND: N/A
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

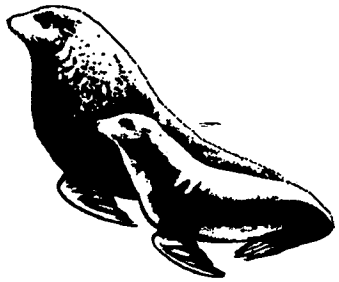
PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER

SPECIES POPULATION STATUS

The Caribbean monk seal was listed as endangered throughout its range on April 10, 1979. The last reliable sighting of a Caribbean monk seal occurred in 1952. None were seen in aerial surveys in 1973, and no confirmed sightings have been reported since then. Many scientists believe that the species has been extinct since the early 1950s.

GUADALUPE FUR SEAL

COMMON NAME: GUADALUPE FUR SEAL
SCIENTIFIC NAME: *ARCTOCEPHALUS TOWNSENDI*



LISTING DATE: 12/16/85
SPECIES STATUS: THREATENED
SPECIES TREND: INCREASING
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: SWR
REGIONS AFFECTED: SWR

SPECIES POPULATION STATUS

The Guadalupe fur seal was listed as threatened throughout its range on December 16, 1985. Although a systematic survey of population abundance has not been conducted for some time, there is anecdotal evidence that the population continues to increase. Mexican scientists have indicated that the numbers of animals on Guadalupe Island seem to be increasing. In addition, the species seems to be expanding its range. In addition to regular sightings of animals on San Miguel and San Nicolas Islands off the southern California coast, animals were observed hauled out on San Clemente Island during 1991.

SPECIES BIOLOGY

Guadalupe fur seals are sexually dimorphic in size, with the males being much larger than females, although few specimens have been measured. Individuals of both sexes are dark brown or dusky black, with the guard hairs on the back of the neck being yellowish or light tan. Pups are born with a black coat similar to that of adults.

Observations suggest that reproductive males are faithful to particular sites over a number of years. Tenure of territorial males lasts from 35-122 days. Births occur from mid-June through July, with most births taking place in June.

SPECIES DISTRIBUTION

Guadalupe fur seals breed along the eastern coast of Guadalupe Island, approximately 200 km west of Baja California. In addition, individuals have been sighted in the southern California Channel Islands, including two males who established territories on San Nicolas Island.

MAJOR IMPACTS

The major cause of the Guadalupe fur seal's decline was commercial hunting in the late 1700's and early 1800's. The species was exterminated in southern California waters by 1825. Commercial sealing continued in Mexican waters through 1894.

qd

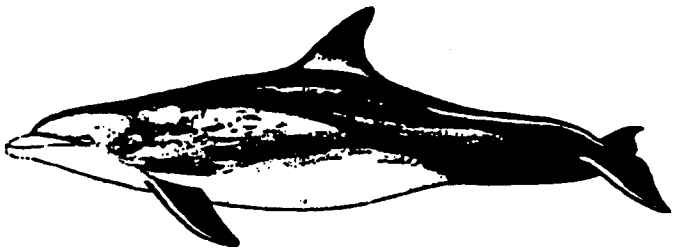
BOTTLENOSE DOLPHIN
MID-ATLANTIC COASTAL MIGRATORY

COMMON NAME: BOTTLENOSE DOLPHIN
SCIENTIFIC NAME: *TURSIOPS TRUNCATUS*

LISTING DATE: 04/06/93
SPECIES STATUS: DEPLETED
SPECIES TREND: UNKNOWN
CURRENT ESTIMATED POPULATION: 1200

CRITICAL HABITAT: N/A

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER NER



SPECIES POPULATION STATUS

The population estimate of 1200 is a minimum estimate from before the epizootic occurred in 1987-88. The best estimate is that 53% mortality occurred.

SPECIES BIOLOGY

The bottlenose dolphin has a medium sized, robust body, a moderately falcate dorsal fin and dark coloration, ranging from light grey to black dorsally and laterally, with a light belly. The flippers are convex with pointed tips, and the flukes are curved along the rear margin and notched in the center.

Adult lengths range from 2 to 4 meters, and are reached after approximately 12 years for males and 7 to 10 years for females. Females reach sexual maturity at approximately age 5 to 12, and males reach sexual maturity at age 10 to 13. Calves may be born at any time during the year, but are primarily born in the spring or summer. The gestation period is approximately one year, with calves averaging about 117 cm in length at birth. Lifespans longer than 40 years for males and longer than 50 years for females have been documented.

SPECIES DISTRIBUTION

The mid-Atlantic coastal migratory stock of bottlenose dolphins are a group of inshore animals that migrate from southern New England south throughout eastern Florida along the Atlantic coast. Limits to the range appear to be directly temperature related, or indirectly through distribution of prey. The mid-Atlantic migratory stock tends to inhabit waters with surface temperatures ranging from about 10 C to 32 C. They migrate seasonally, with a more southerly distribution in the winter.

MAJOR IMPACTS

Major impacts include:

1). Parasites and diseases -- During 1987-88 a massive die-off affected the mid-Atlantic coastal migratory bottlenose dolphin population. It is estimated that over half the population died during the 11-month epidemic. Possible causes include brevetoxin produced by red tide organisms, environmental contaminants, or natural diseases.

2) Human effects:

A. Fisheries Activities

Bottlenose dolphins are taken in coastal gillnet fisheries throughout the mid-Atlantic region. The magnitude of this take is not yet quantified.

B. Habitat encroachment and pollution:

The impacts of habitat alteration and pollution on the mid-Atlantic coastal migratory bottlenose dolphin population have not been studied systematically.

95

NORTHERN FUR SEAL

COMMON NAME: NORTHERN FUR SEAL
SCIENTIFIC NAME: *CALLORHINUS URSINUS*

LISTING DATE: N/A
SPECIES STATUS: DEPLETED
SPECIES TREND: STABLE
CURRENT ESTIMATED POPULATION: 986000

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: AKR
REGIONS AFFECTED: SWR NWR AKR

SPECIES BIOLOGY

Pronounced sexual dimorphism in size begins at birth. Although average length at birth is approximately 60 cm for both sexes, male neonates average 5.4 kg and female neonates average 4.5 kg. Adult females grow to an average of 140 cm and weigh 30-50 kg; males grow to an average of 210 cm and weigh 175-275 kg.

Individuals of both sexes have a relatively small head and a short, pointed snout. Rear flippers are extremely long and highly vascularized. Pups are black at birth, but change to a dark brown-black on the head and back, with a white or silvery chest or belly at about 4 months old, when they are weaned. Adult males are dark brown to black, with grey guard hairs on the back of the neck. Adult females have grayish-black backs and silver to gray bellies. Diet consists primarily of small schooling fish such as walleye pollock, herring, anchovy, capelin, and hake, in addition to squid.

Adult males arrive at the rookeries in late May/early June. They establish territories, within which they guard and herd groups of up to 40 or more females to breed with. Females arrive at rookeries thoughout June, and into early July and August. They give birth 2 days after arriving at the rookery, and remain ashore for 8 days before coming into estrus and mating.

Females are sexually mature when 4 years old. Approximately 57% of mature females give birth each year. Males also reach sexual maturity at age 4-5 but few breed before age 8-9. Bulls have a brief reproductive life; few breed for more than 2 seasons. Natural mortality averages nearly 50% for pups in their first year, 10-20% per year for 2-3 year olds, 32-38% for adult males and 10-11% for mature females. Maximum longevity for northern fur seals is about 26 years.

SPECIES DISTRIBUTION

Northern fur seals are endemic to the North Pacific Ocean. They occur from southern California north to the Bering Sea and west to the Okhotsk Sea and Honshu Island, Japan. In the eastern North Pacific Ocean, fur seals range from the Pribilof and Bogoslof Islands in the Bering Sea to the Channel Islands in southern California. The majority of the population breeds on the Pribilof Islands in the southern Bering Sea. Additional rookeries are found on the Commander Islands in the western Bering Sea, Robben Island in the Okhotsk Sea, the Kuril Islands in the western North Pacific Ocean, and San Miguel Island off southern California.

MAJOR IMPACTS

A. Commercial Fisheries

Direct Take (Commercial and Subsistence Harvest): Northern fur seals were harvested commercially until 1984. Commercial harvesting took 300,000 females between 1956 and 1968 as well as 21-28,000 juvenile males per year between 1976 and 1984. Since 1985, an annual subsistence harvest of 1258-3713 juvenile males has taken place on the Pribilof Islands.

96

Incidental Take: As certain types of commercial fishing have declined, (i.e. drift gillnet) the number of fur seals taken incidentally to commercial fishing has declined as well.

Prey Availability: The effect of removing potential fur seal prey by commercial fisheries in the North Pacific Ocean and the eastern Bering Sea is currently unknown. Cephalopods and groundfish are important prey for fur seals, and both these prey groups are heavily exploited, both directly and indirectly as bycatch, by commercial fishing. However, mycrophid fish are probably the most important prey that sustains many of the fur seals during their southern migration into the North Pacific during the nonbreeding season. No directed fishery exists for this resource.

Debris Entanglement: Fur seals become entangled and die in marine debris, principally trawl webbing, packing bands and monofilament nets.

B. Disturbance and Coastal Development

Information is lacking on long-term effects of disturbance on fur seals. Some rookeries on St. Paul Island have shown a greater decline than other rookeries. The island once had five rookeries in addition to those still being used. Although the inactive rookeries are located close to present human occupation, it is not known whether disturbance or other factors led to the abandonment of the rookeries. Repeated human intervention onto the rookeries, increasing vessel traffic close to shore, and low flying aircraft are all potential disturbances that might affect the long-term use of a rookery area. The development of onshore fish processing facilities, as well as the development of service industries related to Bering Sea groundfish fisheries, are causing economic development in the Pribilofs. Increased human populations on each island, and the potential effects of discharges of large volumes of fish processing wastes and other effluents into the nearshore environment are areas of concern.

C. Toxic Substances

Contaminants have the potential to affect the immune system, which could make fur seals more susceptible to disease. Some pollutant residues have been shown to cause reproductive failure in other species of pinnipeds, including California sea lions. Since northern fur seals migrate down the coast of California to San Miguel Island and forage along the way, there is significant potential for the contaminants to impact northern fur seals. Illegal discharge of petroleum products from the increasing vessel traffic is also a matter of concern.

D. Petroleum Industry

Fur seals are vulnerable to the physiological effects of oiling and subsequent loss of control of thermal conductance. Crude oil fouling of fur seals increases the heat conductance of the pelage, and thereby facilitates heat loss. Any spill occurring in areas where fur seals concentrate could cause significant mortality.

97

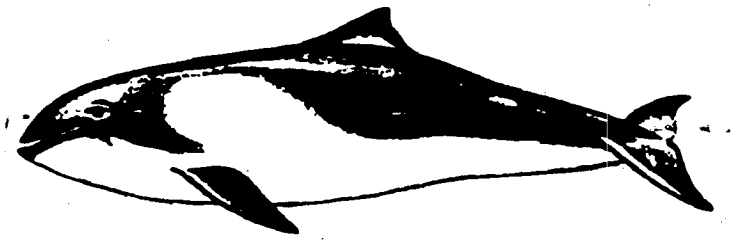
HARBOR PORPOISE
GULF OF MAINE/BAY OF FUNDY/US ATLANTIC COAST

COMMON NAME: HARBOR PORPOISE
SCIENTIFIC NAME: *PHOCOENA PHOCOENA*

LISTING DATE: N/A
SPECIES STATUS: PROPOSED
SPECIES TREND: DECREASING
CURRENT ESTIMATED POPULATION: 47200

CRITICAL HABITAT: NONE DESIGNATED

PRIMARY REGION RESPONSIBLE: NER
REGIONS AFFECTED: SER NER



SPECIES POPULATION STATUS

On September 18, 1991, NMFS was petitioned to list the harbor porpoise in the Gulf of Maine as threatened under the ESA, primarily due to mortality from gillnet fishing. This mortality level was estimated at 4-5% of population estimates for the Gulf of Maine, and is considered unsustainable. Mortality levels would have to be reduced, over 4 years, at least 50% to reach sustainable levels. A proposed rule to list this population of the harbor porpoise as threatened under the ESA was published on 1/7/93 (58 FR 3108).

SPECIES BIOLOGY

The harbor porpoise is the smallest cetacean in U.S. waters. Sexual maturity is reached at age 3 to 4. Females give birth to one calf per year until age 10 to 12. Primary prey is herring. Harbor porpoises have a limited capacity for population increase, and are unlikely to be able to sustain even moderate levels of incidental mortality. The best available estimate of maximum net productivity for harbor porpoises in the Gulf of Maine/Bay of Fundy/US Atlantic coast population does not exceed 4 to 5% of the population.

SPECIES DISTRIBUTION

There is a seasonal migration along the Atlantic coast. In the summer, harbor porpoises congregate in the Gulf of Maine and Bay of Fundy. The winter distribution is not well known. However, there is a southerly movement out of the northern Gulf of Maine/Bay of Fundy from October throughout winter. Strandings and bycatch in winter and spring occur from the Gulf of Maine south to Cape Hattaras, NC, but some strandings have been reported as far south as Florida.

MAJOR IMPACTS

The multispecies sink-gillnet fishery in the Gulf of Maine is a major cause of mortality for harbor porpoises, catching, on average, 2000 porpoises/year. The groundfish gillnet fishery in the Bay of Fundy is also a significant cause of porpoise mortality. In addition, weir fishing in the Bay of Fundy and along the Atlantic coast of the U.S. and coastal gillnet fishing in U.S. waters south of the Gulf of Maine also has an impact on the population.

NMFS will make a final determination in the fall of 1994 on the proposed rule. The final determination will depend, at least in part, on analyses of bycatch data through 1993; a demonstrated reduction in bycatch mortality in the demersal gillnet fishery, and a bycatch reduction program that will maintain a low level of bycatch.

98

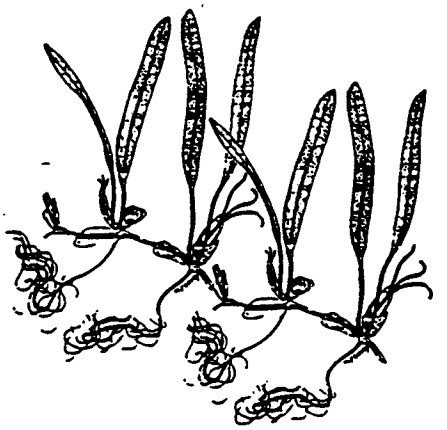
JOHNSON'S SEA GRASS

COMMON NAME: JOHNSON'S SEA GRASS
SCIENTIFIC NAME: *HALOPHILA JOHNSONII*

LISTING DATE: N/A
SPECIES STATUS: PROPOSED
SPECIES TREND: N/A
CURRENT ESTIMATED POPULATION: UNKNOWN

CRITICAL HABITAT: N/A

PRIMARY REGION RESPONSIBLE: SER
REGIONS AFFECTED: SER



SPECIES BIOLOGY

Identifying charachteristics of Johnson's seagrass include smooth foliage leaves in pairs 10-20 mm long, a creeping rhizome stem, sessile (attached to their bases) flowers, and longnecked fruits. The most outstanding difference between Johnson's seagrass and other similar species is its distinct difference in sexual reproductive characteristics, Johnson's seagrass reproducing asexually.

SPECIES DISTRIBUTION

Johnson's seagrass is found along the east coast of Florida from central Biscayne Bay to Sebastian Inlet. Johnson's seagrass is patchily distributed between St. Lucie and Sebastian Inlets. Extensive meadows have been documented inside Lake Worth Inlet. The southernmost distribution is reported to be in the vicinity of Virginia Key in Biscayne Bay. The species inhabits coarse sand substrates in tidal currents.

MAJOR IMPACTS

Habitat within the limited range in which Johnson's seagrass exists is at risk to destruction by a number of human and natural perturbations including:
1) dredging; 2) prop scoring; 3) storm surge; 4) altered water quality; and 5) siltation. Due to the fragile nature of its root system, the plants are vulnerable to human-induced disturbances to the sediment, and their potential for recovery may be limited. The resultant destruction of the benthic community due to boating activities, propeller scoring, and anchor mooring, has been observed in all Johnson's seagrass sites. This severely disrupts the benthic habitat, breaching root systems and severing rhizomes, and significantly reducing the viability of the community. Further, this condition is expected to worsen with the expected increase in boating activity. Maintenance dredging further jeopardizes essential habitat by redistributing sediments, burying plants, and destabalizing the bottom structure.

In addition, because the most abundant populations are located in close proximity to inlets, they 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.

Trampling due to human disturbance and increased land-use induced siltation can also threaten viability of the species. Degradation of water quality due to human impact is also a threat to the welfare of 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 the understory of Johnson's seagrass, shade rooted vegetation and diminish the oxygen content of the water.