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March 1980

**Selected Vertebrate Endangered Species
Of the Seacoast of the United States-**

GREEN SEA TURTLE



Fish and Wildlife Service

U.S. Department of the Interior

PREFACE

The purpose of this series of species accounts is to provide resource managers and the public with information about Federally listed endangered and/or threatened vertebrate species that occur along, or within 100 kilometers of, the seacoast of the United States. Information about life history, distribution, requirements and conservation of the subject species is included (range maps and other distributional data are not necessarily equivalent to critical habitat as defined in the Endangered Species Act of 1973, as amended).

This series of accounts is intended to complement the computerized Sensitive Wildlife Information System (SWIS) developed by the U.S. Army Corps of Engineers in coordination with the Offices of Endangered Species and Biological Services of the Fish and Wildlife Service. A 3-ring binder is used for this series to facilitate additions and deletions as new accounts are prepared or as the status of species is changed.

Suggestions or questions regarding SWIS should be directed to:

Office of Endangered Species
U.S. Fish and Wildlife Service
Interior Building
Washington, D.C. 20240

Suggestions or questions regarding this report should be directed to:

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Slidell, Louisiana 70458

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SELECTED VERTEBRATE ENDANGERED SPECIES
OF THE SEACOAST OF THE UNITED STATES--

GREEN SEA TURTLE

A Cooperative Effort
by the
National Fish and Wildlife Laboratory,
the Office of Endangered Species
and the
National Coastal Ecosystems Team,
Office of Biological Services

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Performed for
Coastal Ecosystems Project
Office of Biological Services
Fish and Wildlife Service
U.S. Department of the Interior



Credit: D. James

GREEN SEA TURTLE

Chelonia mydas Linnaeus

KINGDOM Animalia
CLASS Reptilia
ORDER Testudinata
FAMILY Cheloniidae
OTHER COMMON

NAMES Edible turtle, tortuga verde.

DATE

Entered into SWIS. to be determined.
 Updates. . . 22 September 1976, 8 February 1977.

LEGAL STATUS

Federal Endangered: waters of Florida and Pacific Coast of Mexico (43 FR 32800-32811, 28 July 1978).
 Threatened: elsewhere throughout its range (43 FR 32800-32811, 28 July 1978).

States: Endangered: Florida, Maryland, Mississippi, New Jersey, Texas.
 Protected: Alabama, Georgia, North Carolina, South Carolina.

REASONS FOR CURRENT STATUS

The green turtle's vulnerability while nesting has led to its overexploitation for food by local populations seeking a readily available source of protein food. Recent technological advances such as freezing and canning have increased its use for food, and an increase in demand for turtle products (leather, cosmetics, and pharmaceuticals) has placed considerable stress on the species. Nesting populations in Bermuda, Florida, the Greater Antilles, and Jamaica have been extirpated or nearly so (U.S. Department of Commerce 1976).

In many areas, excessive predation on eggs and hatchlings has substantially reduced recruitment, causing populations to decrease.

Relatively undisturbed beaches are necessary for nesting. Increasing development and use of beaches is incompatible with sea turtle reproduction. Illumination of beaches at night, for example, can distract hatchlings away from the sea (McFarlane 1963).

Sea turtles are caught incidentally to commercial fishing and shrimping activities. Some turtles are eaten by fishermen, some are sold in local markets, and some are mutilated or drowned as a result of entanglement in trawls (U.S. Department of Commerce 1976).

PRIORITY INDEX

Not assigned.

DESCRIPTION

The green turtle is a large sea turtle with a broad, heart-shaped shell and small head. Flippers are paddle shaped, each with a single claw. Adults are 91 to 122 cm long and weigh 100 to 200 kg.

The color varies widely. In general, hatchlings have black carapaces, white plastrons, and white margins on the shell and limbs. Adults have a smooth, keelless carapace, colored light to dark brown, with brown mottling. The plastron is whitish to light yellow; the upper surface of the head is light brown with yellow markings; sides of the head are brown with broad yellow margins; the neck is dusky above and yellow near the shell below. The tail and flippers are colored like the carapace and plastron.

The carapace can be identified by four costal plates, none of which borders the nuchal shield, and by the absence of jagged marginals. Large scutes on the carapace do not overlap. There is only one pair of prefrontals between the eyes.

This species is illustrated in Carr (1967), Parsons (1962), Ernst and Barbour (1972), Rebel (1974), and Riedman and Witham (1974).

RANGE

The green turtle is distributed world-wide in waters above 20°C in the coldest month. Juveniles are sometimes found over a wider temperature range and thus a greater area. Green turtles live in waters off the North American coast from Massachusetts to Mexico and from British Columbia to Baja California (U.S. Department of Commerce 1976). They are uncommon off California.

Major nesting grounds in the Western Hemisphere include the Michoacan Coast, Mexico; Tortuguero, Costa Rica; Shell Beach, Guyana; Bigi

Santi, Surinam; and Aves Island. See Hirth (1971) for nesting sites in the Eastern Hemisphere.

Known annual nesting in the continental U.S. is limited to small nesting populations of the east coast of Florida, from Brevard County to Broward County. Jupiter and Hutchinson Islands have the greatest number of nests. For detailed information on nesting at Hutchinson Island, see Gallager et al. (1972) and Worth and Smith (1976).

Their former distribution included nesting beaches on the Dry Tortugas, Cayman Islands, several other previously undisturbed islands, and more extensively in Florida (IUCN 1968).

A small population of Pacific green turtles (*Chelonia mydas agassizii*) bask and nest on some of the islands in the Hawaiian Islands National Wildlife Refuge. These islands are Federally owned and protected, although until recently, according to Balazs (1976), turtles had been harvested.

In Florida, green turtles have nested on publicly owned lands in Merritt Island and Hobe Sound National Wildlife Refuges, and St. Lucie and Sebastian State Parks. Other nesting beaches are privately owned and the Florida Department of Natural Resources, according to R. Witham (personal communication), protects all nesting on these beaches.

RANGE MAP

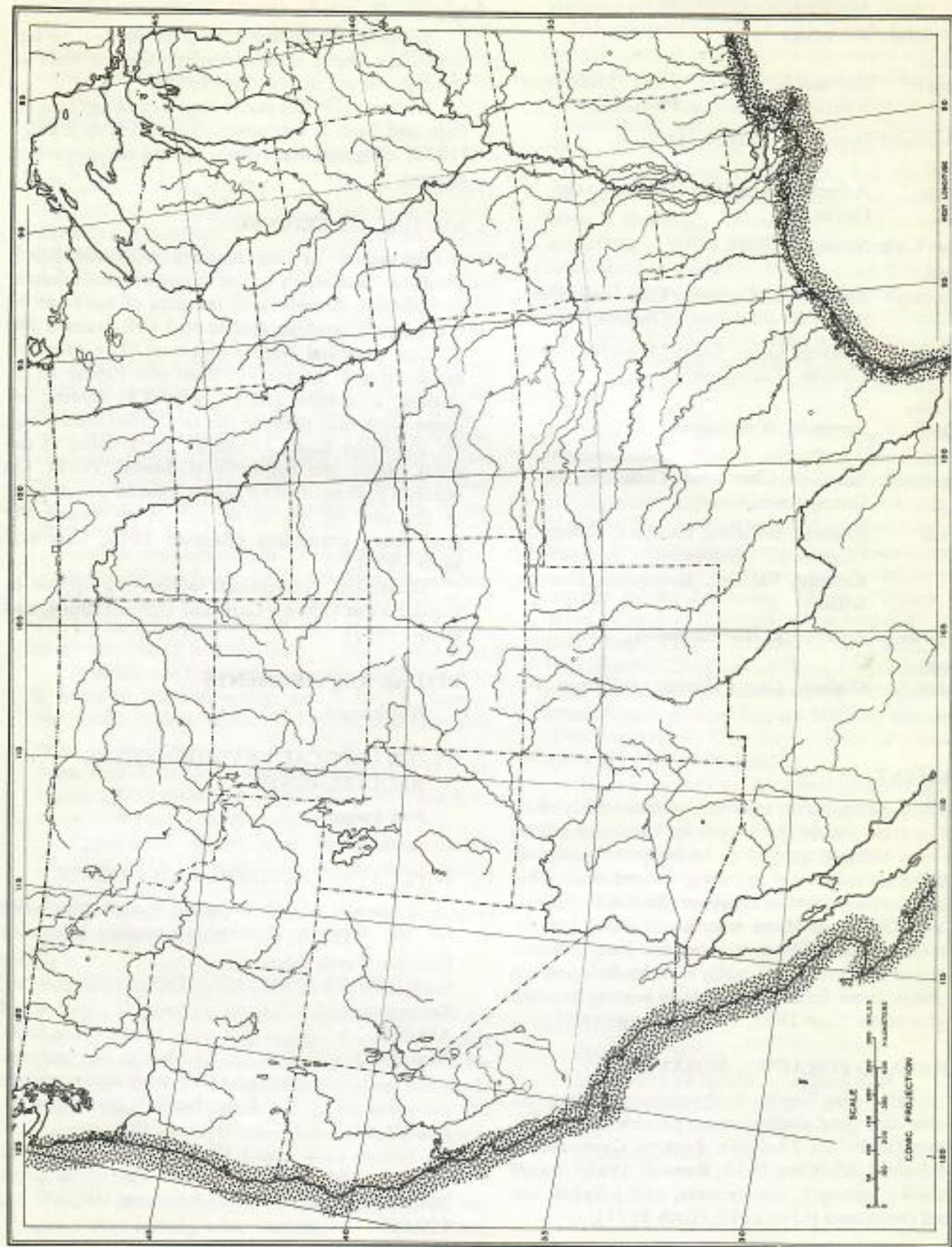
Distribution offshore continental U.S. is illustrated on the following maps by shading of the adjacent coastline; nesting beaches are depicted by dots.

STATES/COUNTIES

Alabama	Baldwin, Mobile.	Mobile.
California	Del Norte, Humboldt, Los Angeles, Marin, Mendocino, Monterey, Orange, San Diego, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Cruz, Sonoma, Ventura.	
Delaware	Sussex.	
Florida	Bay, Brevard, Broward, Charlotte, Citrus, Collier, Dade, Dixie, Duval, Flagler, Franklin, Gulf, Hernando, Hillsborough, Indian River, Jefferson, Lee, Levy, Manatee, Martin, Monroe, Nassau, Okaloosa, Palm Beach, Pasco, Pinellas, St. Johns, St. Lucie, Santa Rosa, Sarasota, Volusia, Wakulla, Walton.	
Georgia	Bryan, Camden, Chatham, Glynn, Liberty, McIntosh.	



Eastern distribution of green sea turtles offshore (shading) and nesting beaches (dots)



Western distribution of green sea turtles offshore (shading)

Louisiana (parishes)	Cameron, Iberia, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Mary, Terrebonne, Vermilion.
Maryland	Worcester.
Massachusetts	Barnstable, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth.
Mississippi	Hancock, Harrison, Jackson.
New Jersey	Atlantic, Cape May, Monmouth, Ocean.
New York	Nassau, Suffolk.
North Carolina	Brunswick, Carteret, Currituck, Dare, Hyde, New Hanover, Onslow, Pender.
Oregon	Clatsop, Coos, Curry, Douglas, Lane, Lincoln, Tillamook.
Rhode Island	Newport, Washington.
South Carolina	Beaufort, Charleston, Colleton, Georgetown, Horry.
Texas	Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Willacy.
Virginia	Accomack, Northampton.
Washington	Clallam, Grays Harbor, Jefferson, Pacific.

HABITAT

The green turtle inhabits comparatively shallow waters inside reefs and in bays and inlets. Favored habitat appears to be lagoons and shoals with an abundance of marine grass and algae. This habitat type occurs in much of the Gulf of Mexico and Caribbean shore waters and around many oceanic islands. Green turtles are long-distance migrants and are occasionally seen in the open sea en route from feeding grounds to nesting beaches or vice versa (Carr 1952, 1967).

FOOD AND FORAGING BEHAVIOR

Adults are largely herbivorous, feeding on marine algae and shallow water pastures of marine grasses (including *Thalassia*, *Zostera*, *Cymodocea*, and *Halophila*) (Carr 1952, Randall 1965). Small mollusks, sponges, crustaceans, and jellyfish are often consumed (Carr 1952, Hirth 1971).

SHELTER REQUIREMENTS

Pacific green turtles bask on reefs or uninhabited islands.

Some green turtles have been known to rest with their shells wedged under rocks or reefs on the bottom of the sea (Carr 1952).

Witham (1976b) states that hatchlings find refuge and food in sargassum (*Sargassum* sp.). Frick (1975) observed hatchlings resting on sargassum clumps.

NESTING OR BEDDING

Successful nesting requires a sloping beach platform with open ocean exposure and minimal disturbance. A variety of textures of sand can be used, but it must be friable and well drained (A. F. Carr personal communication). The presence or absence of vegetation does not appear to be critical; vegetation can be helpful in nesting because roots may prevent the sand from crumbling; on the other hand, it can be detrimental if the roots pierce the eggshells (Caldwell 1959). On beaches without rooted plants, rain or the wetting of the sand by the turtle aids in preventing the sand from crumbling (Bustard 1973, Carr and Main 1973).

Illustrated descriptions of nesting appear in Hendrickson (1958), Carr and Ogren (1960), and Hirth (1977).

RITUAL REQUIREMENTS

Not known.

OTHER CRITICAL ENVIRONMENTAL REQUIREMENTS

Not known.

POPULATION NUMBERS AND TRENDS

Estimates of the breeding female population for the Western Hemisphere nesting areas are:

Sarawak Turtle Islands	10,000
Surinam	2,500
Tortuguero	6,000
Aldabra	fewer than 1,000
Australia	75,000, but includes flatbacks (<i>Chelonis depressa</i>) and loggerheads (<i>Caretta caretta</i>)
Florida	50

(Hirth 1971, Lund 1974).

Ehrenfeld (1974) estimates the world population of green turtles at between 100,000 and 400,000.

Numbers fluctuate with losses of nesting beaches to storms or development. Thus, it is difficult to predict trends. According to A. F. Carr (personal communication), persons investigating green turtles around the world are concerned with the apparent decline in total numbers.

REPRODUCTION

Breeding season varies with locality:

Michoacan Coast, Mexico May to September
Tortuguero, Costa Rica June to November
Shell Beach, Guyana March to August
Bigi Santi, Surinam February to August
Aves Island March to December
Florida April to July
(Hirth 1971, Rebel 1974).

Nocturnal nesting occurs at 2-, 3-, or 4-year intervals (Carr and Ogren 1960, Hirth 1971). As many as seven clutches are laid in one season, with renesting occurring at 9- to 13-day intervals. Carr and Ogren (1960) plotted returns of turtles at Tortuguero in 1956 through 1959 and observed that renesting was usually within 1.5 km of the previous site.

Clutch size varies from 75 to 200 eggs with incubation taking from 48 to 70 days, depending on beach and water conditions (Carr and Hirth 1962). Hatchlings generally emerge at night within a period of 48 hours (IUCN 1968, Rebel 1974).

Animals are believed to reach maturity in 4 to 6 years in tropical waters and 5 to 13 years in temperate waters. Hirth (1971) estimates survival rates to maturity to be 1% to 3% of the hatchlings. A. F. Carr (personal communication to L. H. Ogren 1975) estimates survivorship in Costa Rica to be about 0.1% of the hatchlings.

Copulation occurs near the nesting beach (Bustard 1973). Whether the female stores sperm for successive laying seasons has not been determined. Photographs of courtship and mating appear in Booth and Peters (1972).

MANAGEMENT AND CONSERVATION

Carr (1969) has made several suggestions for protection of the green turtle: Export of turtle products should be discontinued and catches for local use should be strictly supervised. No turtle boats should be permitted to operate off the northern 20 km of Tortuguero Beach. The sale or storage of calipee in Costa Rica should also be prohibited.

The Survival Service Commission (1969) suggests that setting aside Ascension, Astove, Aves,

Aldabra, Jabal Aziz, Sabah Turtle Islands, and the French Frigate Shoal as turtle islands could help stabilize turtle populations in those areas.

Marquez M. (1976) recommends formation of several natural reserves for the coast of Mexico, which include the major Mexican sea turtle nesting sites. Two reserves, Playa de Rancho Nuevo, Tamaulipas State, and Isla Contoy, Quintana Roo State, are green turtle nesting areas.

Cayman Turtle Farm, Ltd., has made extensive efforts at captive breeding. At present, the farm is dependent on natural stocks of eggs, and according to Hirth (1971), the project cannot be considered a complete success until it is independent of those sources. Some biologists suggest that such a project may never be ecologically or economically efficient. Others are concerned that turtle production could increase demand and thus increase the pressure on natural stocks (Ehrenfeld 1974).

Hatcheries operate in Australia, Malaysia, Mexico, United States, and other countries. These and similar efforts to curtail natural predation could have a beneficial impact on numbers. Stocking has been attempted in many areas, but there have been no indications of definite success.

Green turtles are legally protected to varying degrees in the following places: Mexico, Costa Rica, Panama, Surinam, French Guiana, Ascension Island, Trust Territory of the Pacific, Tahiti, Fiji Islands, Kingdom of Tonga, Australia, Sarawak, British Indian Ocean and Seychelles Islands, Israel, South Africa, Europa Islands, and the U.S. (Pritchard 1969, U.S. Department of Commerce 1976, 43 FR 32800-32811).

Most populations are listed under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; commercial trade is subject to strict regulation, and both an export and import permit are necessary for trade by participating countries. Australian populations are listed under Appendix II, which requires export permits for trade in those populations.

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PREPARER'S COMMENTS

Nesting records for the U.S. are not complete, as the entire coast has not been surveyed. Recruitment in Florida is probably very low due to predation, particularly by raccoons (*Procyon lotor*).

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