Leatherback Turtle *(Dermochelys coriacea)*

Status

ESA Endangered - throughout its range
CITES Appendix I - throughout its range

Leatherback turtle
(Dermochelys coriacea)
Photo: Scott R. Benson, NMFS Southwest Fisheries Science Center

Taxonomy

Kingdom: Animalia
Phylum: Chordata
Class: Reptilia
Order: Testudines
Family: Dermochelyidae
Genus: *Dermochelys*
Species: *coriacea*

Species Description

Weight:	up to 2,000 pounds (900 kg) for adults; hatchlings are 40-50 grams (1.5-2 ounces)
Length:	6.5 feet (2 m) for adults; hatchlings are 2-3 inches (50-75 cm)
Appearance:	primarily black shell with pinkish-white coloring on their belly
Lifespan:	unknown
Diet:	soft-bodied animals, such as jellyfish and salps
Behavior:	females lay clutches of approximately 100 eggs several times during a nesting season, typically at 8-12 day intervals

Did You Know?

- Teacher at Sea explores the science behind leatherback sea turtle research.
- The largest leatherback on record (a male) stranded on the coast of Wales in 1988 and weighed almost 2,020 lbs (915 kg).
- Leatherbacks can dive deeper than 3,900 ft (1,200 m)!

The leatherback is the largest turtle--and one of the largest living reptiles--in the world.

The leatherback is the only sea turtle that doesn't have a hard bony shell. A leatherback's top shell (carapace) is about 1.5 inches (4 cm) thick and consists of leathery, oil-saturated connective tissue overlaying loosely interlocking dermal bones. Their carapace has seven longitudinal ridges and tapers to a blunt point.

Their front flippers don't have claws or scales and are proportionally longer than in other sea turtles. Their back flippers are paddle-shaped. Both their ridged carapace and their large flippers make the leatherback uniquely equipped for long distance foraging migrations.

After the Deepwater Horizon Oil Spill

Dr. Brian Stacy, NOAA veterinarian, cleans a young Kemp's ridley turtle
Photo: NOAA/GADNR

- **Sea Turtles, Dolphins, and Whales and the Gulf of Mexico Oil Spill**

Female leatherbacks lay clutches of approximately 100 eggs on sandy, tropical beaches. Females nest several times during a nesting season, typically at 8-12 day intervals. After about 2 months, leatherback hatchlings emerge from the nest and have white striping along the ridges of their backs and on the margins of the flippers.

- **Natural Resource Damage Assessment (NRDA)**

Videos: Leatherback Turtles in the Pacific Ocean
NMFS Southwest Fisheries Science Center

Videos: Leatherback Turtles in the Solomon Islands
NMFS Southwest Fisheries Science Center

Leatherbacks don't have the crushing chewing plates characteristic of other sea turtles that feed on hard-bodied prey (Pritchard 1971). Instead, they have pointed tooth-like cusps and sharp-edged jaws that are perfectly adapted for a diet of soft-bodied pelagic (open ocean) prey, such as jellyfish and salps. A leatherback's mouth and throat also have backward-pointing spines that help retain such gelatinous prey.

Habitat

Leatherbacks are commonly known as pelagic (open ocean) animals, but they also forage in coastal waters. In fact, leatherbacks are the most migratory and wide ranging of sea turtle species.

Thermoregulatory adaptations such as a counter-current heat exchange system, high oil content, and large body size allow them to maintain a core body temperature higher than that of the surrounding water, thereby allowing them to tolerate colder water temperatures. For example:

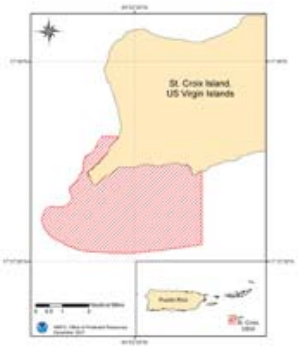
- Nesting female leatherbacks tagged in French Guiana have been found along the east coast of North America as far north as Newfoundland.
- Atlantic Canada supports one of the largest seasonal foraging populations of leatherbacks in the Atlantic.
- Leatherbacks have also been tagged with satellite transmitters at sea off Nova Scotia (James et al., 2005)

Leatherbacks mate in the waters adjacent to nesting beaches and along migratory corridors. After nesting, female leatherbacks migrate from tropical waters to more temperate latitudes, which support high densities of jellyfish prey in the summer.

Critical Habitat

U.S. Virgin Islands
In 1979, we designated critical habitat for leatherback turtles to include the coastal waters adjacent to Sandy Point, St. Croix, U.S. Virgin Islands.

U.S. West Coast
NMFS designated additional critical habitat to provide protection for endangered leatherback sea turtles along the U.S. West Coast in January 2012 (77 FR 4170).



Leatherback Turtle U.S. Virgin Islands Critical Habitat
(click for larger view PDF)

Puerto Rico
On February 2, 2010, the Sierra Club petitioned [pdf] us to revise the critical habitat designation for leatherback sea turtles to include waters adjacent to a major nesting beach in Puerto Rico. We published a negative 90-day finding on the petition [pdf] on July 16, 2010, which found the petition did not present substantial scientific information indicating that the critical habitat revision was warranted for leatherback sea turtles.

The Sierra Club submitted a new petition [pdf] on

November 2, 2010 to revise the critical habitat designation to again include waters in Puerto Rico. On August 4, 2011, NMFS and FWS published a 90-day finding and 12-month determination (76 FR 47133) on the petition to revise critical habitat. We denied the petitioned revision in June 2012 (77 FR 32909).

Leatherback Turtle U.S. West Coast Critical Habitat
(click for larger view JPG)

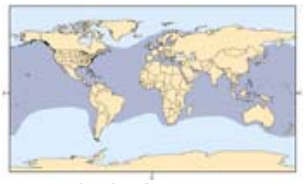
Distribution

Leatherback turtle nesting grounds are located around the world. The largest remaining nesting assemblages are found on the coasts of

- Northern South America
- West Africa

Within the U.S., there are minor--though the most significant nesting in the U.S.--nesting colonies in:

- Caribbean, primarily
  - Puerto Rico
  - U.S. Virgin Islands
- Southeast Florida



Leatherback Range Map
(click for larger view PDF)

Adult leatherbacks are capable of tolerating a wide range of water temperatures and have been sighted along the entire continental east coast of the United States as far north as the Gulf of Maine and south to Puerto Rico, the U.S. Virgin Islands, and into the Gulf of Mexico.

Leatherbacks in the Pacific Ocean are generally smaller in size than leatherbacks in the Atlantic Ocean.

The distribution and developmental habitats of juvenile leatherbacks are poorly understood. In an analysis of available sightings (Eckert 2002), researchers found that leatherback turtles smaller than about 3 feet (100 cm) carapace length were only sighted in waters about 79°F (26°C) or warmer, while adults were found in waters as cold as 32-59°F (0-15°C) off Newfoundland (Goff and Lean 1988).

Population Trends

Because adult female leatherbacks frequently nest on different beaches, nesting population estimates and trends are especially difficult to monitor.

Kids' Times: Leatherback [pdf]
Credit: NOAA

In the Pacific, the International Union for Conservation of Nature (IUCN) notes that most leatherback nesting populations have declined more than 80%.

In other areas of the leatherback's range, observed declines in nesting populations are not as severe, and some population trends are increasing or stable.

In the Atlantic, available information indicates that the largest leatherback nesting population occurs in French Guyana, but the trends are unclear.

Some Caribbean nesting populations appear to be increasing, but these populations are very small when compared to those that nested in the Pacific, even in the late 1990s. Nesting trends on U.S. beaches have been increasing in recent years.

Threats

- harvest of eggs and turtles themselves
- incidental capture in fishing gear, such as
  - gillnets
  - longlines
  - trawls

    - traps/ pots
    - dredges
- general threats to marine turtles

Leatherback turtles face threats on both nesting beaches and in the marine environment. The greatest causes of decline and the continuing primary threats to leatherbacks worldwide are long-term harvest and incidental capture in fishing gear. Harvest of eggs and adults occurs on nesting beaches while juveniles and adults are harvested on feeding grounds. Incidental capture primarily occurs in gillnets, but also in trawls, traps and pots, longlines, and dredges. Together these threats are serious ongoing sources of mortality that adversely affect the species' recovery.

For more information, please visit our threats to marine turtles page.

Leatherback turtle hatchling
(Dermochelys coriacea)
Photo: S.R. Livingstone, University of Glasgow

Conservation Efforts
Because leatherbacks are pelagic (open ocean) animals and make long migrations, they come into contact with people of many nations. Thus, conservation efforts for leatherback populations in one country may be jeopardized by activities in another. Protecting leatherback turtles on U.S. nesting beaches and in U.S. waters alone, therefore, is not sufficient to ensure the continued existence of the species.

Leatherback turtles are protected by various international treaties and agreements as well as national laws:

- CITES: listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Flora and Fauna, which prohibits international trade
- CMS: listed in Appendices I and II of the Convention on Migratory Species and are protected under the following auspices of CMS:
    - Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA)
    - Memorandum of Understanding Concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa
- SPAW: protected under Annex II of the Specially Protected Areas and Wildlife Protocol of the Cartagena Convention
- IAC: The U.S. is a party of the Inter-American Convention for the Protection and Conservation of Sea Turtles, which is the only international treaty dedicated exclusively to marine turtles

In the U.S., NOAA Fisheries and the U.S. Fish and Wildlife Service (USFWS) have joint jurisdiction for leatherback turtles, with NOAA having the lead in the marine environment and USFWS having the lead on the nesting beaches. Both federal agencies, along with many state agencies, have issued regulations to eliminate or reduce threats to sea turtles.

Leatherback turtle
(Dermochelys coriacea)
Photo: Scott R. Benson, NMFS Southwest Fisheries Science Center

In the Atlantic and Gulf of Mexico, we have required measures to reduce sea turtle bycatch in pelagic longline, mid-Atlantic gillnet, Chesapeake Bay pound net, and southeast shrimp and flounder trawl fisheries, such as

- gear modifications
- changes to fishing practices
- time/ area closures

We have worked closely with the shrimp trawl fishing industry to develop turtle excluder devices (TEDs) to reduce the mortality of sea turtles incidentally captured

in shrimp trawl gear. TEDs that are large enough to exclude leatherback turtles are required in shrimp trawl nets. We provide extensive TED training throughout the world.

Since 1989, the U.S. has prohibited the importation of shrimp harvested in a manner that adversely affects sea turtles. The import ban does not apply to nations that have adopted sea turtle protection programs comparable to that of the U.S. (i.e., require and enforce the use of TEDs) or to nations where incidental capture in shrimp fisheries does not present a threat to sea turtles (for example, nations that fish for shrimp in areas where sea turtles do not occur). The U.S. Department of State is the principal implementing agency of this law, while we serve as technical advisor.

We are also involved in cooperative gear research projects designed to reduce sea turtle bycatch in the Gulf of Mexico and Atlantic pelagic longline fisheries, the Hawaii-based deep set longline fishery, the Atlantic sea scallop dredge fishery, the Chesapeake Bay pound net fishery, and non-shrimp trawl fisheries in the Atlantic and Gulf.

Video: Leatherback Turtles-Pacific Upwelling & Jellyfish
NMFS Southwest Fisheries Science Center

Regulatory Overview

The leatherback turtle was listed under the Endangered Species Act as endangered in 1970.

In 1992, we finalized regulations to require TEDs in shrimp trawl fisheries to reduce interactions between turtles and trawl gear. Since then, we have modified these regulations as new information became available on increasing the efficiency of TEDs (for example, larger TEDs are now required to exclude larger turtles).

Leatherback turtle esophagus
(Dermochelys coriacea)
Photo: Karumbé, Sea Turtles of Uruguay

We designated critical habitat in the U.S. Virgin Islands in 1998 for leatherback turtles for the coastal waters adjacent to Sandy Point, St. Croix, USVI.

In 2012, we designated critical habitat along the U.S. West Coast (77 FR 4170).

We implement measures to reduce sea turtle interactions in fisheries by regulations and permits under the ESA and Magnuson-Stevens Fishery Conservation and Management Act. Since the early 1990s, we have implemented sea turtle conservation measures including:

- TEDs in trawl fisheries
- large circle hooks in longline fisheries
- time and area closures for gillnets
- modifications to pound net leaders

A list of our regulations to protect marine turtles is available on our website.

Key Documents

(All documents are in PDF format.)

Title	*Federal Register*	Date
NMFS Initiates 5-year reviews of four sea turtles (Kemp's ridley, olive ridley, leatherback, and hawksbill)	77 FR 61573	10/10/2012
Critical habitat designated for endangered leatherback sea turtles along the U.S. West Coast	77 FR 4170	01/26/2012

- Biological Report
- Economic Report

Sierra Club Re-Petition to NMFS to revise the critical habitat designation to include waters adjacent to a major nesting beach in Puerto Rico	n/a	11/02/2010
▪ 12-month finding on petition to revise leatherback critical habitat in Puerto Rico	77 FR 32909	06/04/2012
▪ NMFS' 90-Day Finding on Re-Petition to revise critical habitat off the coast of Puerto Rico: Finding states that the petitioned action may be warranted	76 FR 25660	05/05/2011
Sierra Club petition to NMFS and USFWS to revise the critical habitat designation to include nesting beach habitat and waters adjacent to the nesting beach in Puerto Rico	n/a	02/22/2010
▪ NMFS' 90-Day Finding on Petition to Revise Critical Habitat: Finding states that the Petition did not include substantial scientific information regarding the petitioned action	75 FR 41436	07/16/2010
▪ USFWS' 90-Day Finding and 12-Month Determination on Petition To Revise Critical Habitat	76 FR 47133	08/04/2011
Proposed Rule to Revise Critical Habitat Designation *Comment Period Extended	75 FR 319 75 FR 7434	01/05/2010 02/19/2010
▪ Public Hearings Presentation ▪ List of References ▪ Economic Analysis ▪ ESA Section 4(b)(2) Report ▪ Biological Report ▪ Map of Proposed Critical Habitat Area ▪ Map of Petitioned Area and Excluded Areas	75 FR 5015	02/01/2010
Petition to Revise the Critical Habitat Designation for the Leatherback Sea Turtle	n/a	09/26/2007
▪ 90-Day Finding on a Petition to Revise Critical Habitat Designation for the Leatherback Sea Turtle	72 FR 73745	12/28/2007
5-Year Review	n/a	08/31/2007
Virginia Pound Net Fishery Regulations	71 FR 36024	06/23/2006
Recovery Plan - U.S. Pacific	63 FR 28359	05/22/1998
Status Review of Sea Turtles Listed Under the Endangered Species Act of 1973	61 FR 17	01/02/1996
TED Regulations for Shrimp Trawls	57 FR 57348	12/04/1992
Recovery Plan - U.S. Caribbean, Atlantic, and Gulf of Mexico	n/a	10/29/1991
Critical Habitat - Sandy Point, St. Croix, U.S. Virgin Islands	44 FR 17710	03/23/1979
○ Proposed Critical Habitat	43 FR 12050	03/23/1978
ESA Listing Rule	35 FR 8491	06/02/1970

More Information

- *Kids' Times*: Leatherback Sea Turtle [pdf]
- Videos of Leatherback Turtles from Southwest Fisheries Science Center
- Sea Turtle Recovery Planning
- NOAA's National Marine Sanctuaries Encyclopedia
  - Cordell Bank Sanctuary Leatherback Species Card

- Hawaiian Islands Humpback Whale Sanctuary Leatherback Species Card
- Northwestern Hawaiian Islands Sanctuary Leatherback Species Card
- U.S. Fish and Wildlife Service Leatherback Turtle Species Profile
- More Sea Turtle Related Links

Literature Cited

- Eckert, S.A. 2002. Distribution of juvenile leatherback sea turtle, *Dermochelys coriacea*, sightings. Marine Ecology Progress Series 230: 289-293.
- Goff, G.P. and J. Lien. 1988. Atlantic leatherback turtles (*Dermochelys coriacea*) in cold water off Newfoundland and Labrador. Canadian Field Naturalist 102 (1):1-5.
- James, M.C., C.A. Ottensmeyer and R.A. Myers. 2005. Identification of high-use habitat and threats to leatherback sea turtles in northern waters: new directions for conservation. Ecology Letters 2005(8):195-201.

Updated: March 4, 2013