

Leatherback Sea Turtle

(*Dermochelys coriacea*)

State Status: Endangered, 1981

Federal Status: Endangered, 1970

Recovery Plans: Federal, 1992

The leatherback sea turtle (Figure 1) is the sole member of the family Dermochelyidae; all other sea turtles belong to the Cheloniidae. The leatherback is the largest, deepest diving, and most migratory and wide ranging of the sea turtles (Figure 2). Adult leatherbacks reach 4-8 feet in length and weigh 500 to 2,000 pounds. The leatherback is the only sea turtle that lacks a hard, bony shell. Its shell is composed of a mosaic of small bones covered by firm, rubbery skin. A leatherback's top shell (carapace) has seven longitudinal ridges and tapers to a blunt point. The skin is predominantly black with varying degrees of pale spotting. The front flippers are proportionally longer than in other sea turtles. The ridged carapace and large flippers are characteristics that make the leatherback uniquely equipped for long distance foraging migrations. Leatherbacks also display several physiological and behavioral traits that enable them to inhabit colder water than other sea turtles.



Figure 1. Leatherback sea turtle hatchling (photo by Scott Benson, NMFS-Southwest Fisheries Science Center).

Leatherback turtle nesting grounds are located around the world in tropical regions, with the largest remaining nesting areas found on the coasts of northern South America and West Africa. The U.S. Caribbean, primarily Puerto Rico and the U.S. Virgin Islands, and southeast Florida support small nesting colonies, but represent the most significant nesting activity within the U.S. In the Pacific Ocean, significant nesting aggregations occur primarily in Mexico, Costa Rica, Indonesia, the Solomon Islands, and Papua New Guinea.

Females lay clutches of about 100 eggs on sandy tropical and subtropical beaches, and may nest several times during a nesting season, typically at 8-12 day intervals. The distribution and developmental habitats of juvenile leatherbacks are poorly known. Individuals smaller than 100 cm carapace length have only been observed in waters 26°C or warmer (Eckert 2002).

Leatherback turtles forage in both pelagic (open ocean) and productive coastal waters. They prey mainly on jellyfish and consume 20-30% of their body weight daily (NMFS 2009). Although leatherbacks are capable of deep diving, most of their time is spent at or near the surface.

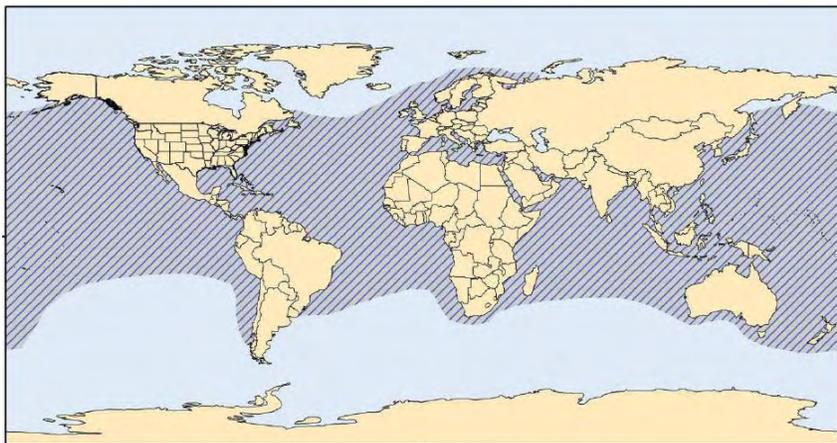


Figure 2. Range of leatherback sea turtles (from NMFS).

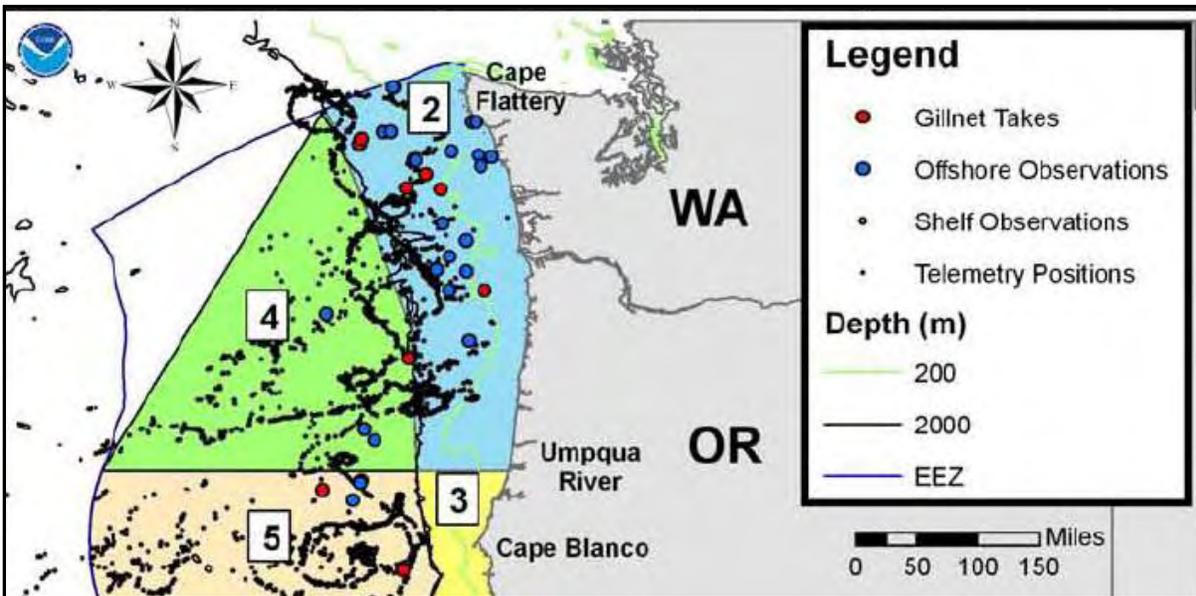


Figure 3. Observations, telemetry data, and gillnet captures of leatherback sea turtles off Washington and Oregon (NMFS 2009). Additional telemetry locations appear in Benson et al. (2011).

Leatherback turtles occur worldwide in tropical and temperate oceans, with a few adults sighted as far north as the Gulf of Alaska and northern Europe (Figure 2). After nesting, females migrate from tropical waters to more temperate latitudes. Leatherbacks regularly occur off the coasts of Washington (especially off the Columbia River mouth), Oregon, and California during the summer and fall when large aggregations of jellyfish form, particularly brown sea nettle (*Chrysaora fuscescens*) and moon jellies (*Aurelia labiata*) (Figure 3; Bowlby et al. 1994, NMFS 2009, 2012, Benson et al. 2011). Recent satellite telemetry has shown that some of the animals visiting Washington have their nesting sites in western New Guinea, and therefore have transited the entire Pacific Basin (Benson et al. 2011).

Pacific leatherback populations are generally smaller than those in the Atlantic, and most Pacific nesting populations have declined more than 80% (Sarti Martinez 2000). In other areas of the species' range, observed declines in nesting populations are not as severe and some populations are increasing or stable. Nesting trends on U.S. beaches have been increasing in recent years.

Conservation. Leatherback turtles face threats at their nesting beaches and at sea. The greatest causes of decline and the continuing primary threats to leatherbacks worldwide are human harvest and incidental capture in fishing gear (NMFS and USFWS 1998). Harvest of eggs and adults occurs on nesting beaches, whereas juveniles and adults are harvested on feeding grounds. In some areas, illegal egg harvest has removed more than 95% of the clutches (Sarti Martinez 2000). 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. Oceanic pollution, particularly plastics, is another cause of mortality (Sarti Martinez 2000). Leatherbacks commonly ingest plastic bags, balloons, and other plastic debris, which are probably mistaken as jellyfish. These forms of plastic can cause partial or even complete obstruction of the gastrointestinal tract. In one recent study, 138 of 408 necropsied leatherbacks contained plastic objects, with 12 having sufficient plastic to block the passage of food and likely cause death (Mrosovsky et al. 2009). Climate change is an additional threat because of potential decreases in egg and hatchling survival at nesting beaches (Santidrián Tomillo et al. 2012).

Because leatherbacks are highly pelagic and make long migrations, they come into contact with people of

many nations. Therefore, conservation efforts in one country may be jeopardized by activities in another. Protecting leatherbacks in U.S. waters and on U.S. nesting beaches alone is therefore not sufficient to ensure the continued existence of the species. The species is protected by various international treaties and agreements, and national laws. It is listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), which prohibits international trade of this species. The U.S. is also 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.



Figure 4. Adult leatherback (photo by Scott Benson, NMFS, Southwest Fisheries Science Center)

In the U.S., NOAA Fisheries (NMFS) and the U.S. Fish and Wildlife Service (USFWS) have joint management authority for leatherback turtles, with NMFS having the lead in the marine environment and the USFWS having the lead at nesting beaches. Both agencies, and a number of state agencies, have promulgated regulations to eliminate or reduce threats to sea turtles. NMFS enacts measures to reduce sea turtle interactions with fisheries through regulations and permits under the ESA and Magnuson-Stevens Fishery Conservation and Management Act. Since the early 1990s, it has implemented conservation measures including turtle exclusion devices in trawl fisheries, large circle hooks in longline fisheries, time and area closures for gillnets, and modifications to pound net leaders.

In 2012, NMFS designated critical habitat for leatherback sea turtles in two nearshore areas serving as important feeding sites off the U.S. West Coast, including the waters 0-80 m deep off Washington extending to the 2,000 m depth contour (Figure 5; NMFS 2012). Waters west of this area were not included because of the reduced availability of prey. Strandings of this species are very rare in Washington (Bowlby et al. 1994), with none recorded from 2002-2012 (K. Wilkinson and L. Todd, unpublished data).

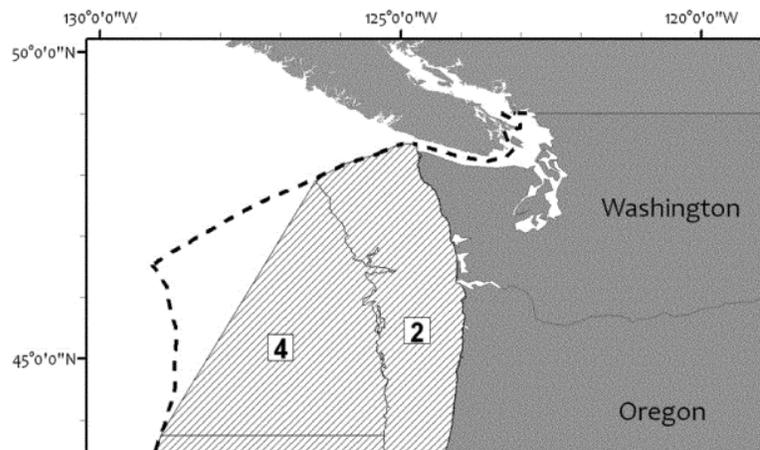


Figure 5. The area of critical habitat off Washington and Oregon (Area 2) designated for leatherback sea turtles by NMFS in 2012 (NMFS 2012). Area 4 was not classified as critical habitat. The dashed line represents the U.S. exclusive economic zone (EEZ).

Partners and cooperators:

National Marine Fisheries Service, U.S. Fish and Wildlife Service.

Literature Cited

- Benson, S. R., T. Eguchi, D. G. Foley, K. A. Forney, H. Bailey, C. Hitipeuw, B. P. Samber, R. F. Tapilatu, V. Rei, P. Ramohia, J. Pita, and P. H. Dutton. 2011. Large-scale movements and high-use areas of western Pacific leatherback turtles, *Dermochelys coriacea*. *Ecosphere* 2(7):art84. doi:10.1890/ES11-00053.1.
- Bowlby, C. E., G. A. Green, and M. L. Bonnel. 1994. Observations of leatherback turtles offshore of Washington and Oregon. *Northwestern Naturalist* 75:33-35.
- Eckert, S. A. 2002. Distribution of juvenile leatherback sea turtle, *Dermochelys coriacea*, sightings. *Marine Ecology Progress Series* 230:289-293.
- Mrosovsky, N., G. D. Ryan, and M. C. James. 2009. Leatherback turtles: the menace of plastic. *Marine Pollution Bulletin* 58:287-289.
- NMFS (National Marine Fisheries Service) and USFWS (U.S. Fish and Wildlife Service). 1998. Recovery plan for U.S. Pacific populations of the leatherback turtle (*Dermochelys coriacea*). National Marine Fisheries Service, Silver Spring Maryland.
- NMFS (National Marine Fisheries Service). 2009. Revision of critical habitat for leatherback sea turtles: biological report. National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, California, and Northwest Science Center, Seattle, Washington.
- NMFS (National Marine Fisheries Service). 2012. Endangered and threatened species: final rule to revise the critical habitat designation for the endangered leatherback sea turtle. *Federal Register* 77(17):4170-4201.
- Santidria'n Tomillo, P., V. S. Saba, G. S. Blanco, C. A. Stock, F. V. Paladino, and J. R. Spotila. 2012. Climate driven egg and hatchling mortality threatens survival of eastern Pacific leatherback turtles. *PLoS ONE* 7(5): e37602. doi:10.1371/journal.pone.0037602.
- Sarti Martinez, A. L. 2000. *Dermochelys coriacea*. In IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 23 May 2013.