Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Characterization of the Distribution, Movements, and Foraging Habitat of Endangered Leatherback Turtles in Designated Critical Habitat off the U.S. West Coast (PC-23-04)
Administered by	Pacific OCS Regional Office
BOEM Contact(s)	Desray Reeb (desray.reeb@boem.gov), Jacob Levenson (jacob.levenson@boem.gov)
Procurement Type(s)	Interagency Agreement and Contract
Conducting Organization(s)	National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), Southwest Fisheries Science Center (SWFSC) and Upwell (NGO)
Total BOEM Cost	$1,805,530 for Phase I
Performance Period	Phase I: FY 2023–2026 Phase II: FY 2026–2028
Final Report Due	NOAA Report: June 30, 2026 Upwell Report: July 23, 2026
Date Revised	November 2, 2023
Problem	The occurrence and habitat use for leatherback sea turtles that occur offshore Oregon and Washington is currently unknown. The absence of these data makes it extremely challenging to accurately assess potential impacts to this species from offshore renewable energy development.
Intervention	Systematic aerial surveys and telemetry tagging of leatherback sea turtles in Oregon and Washington waters will be conducted to understand their abundance, distribution, and habitat use in this region, and compare it to existing data for offshore central California.
Comparison	The data will form the baseline of comparison to understand potential impacts from offshore renewable energy development offshore Oregon and Washington, as well as any BOEM-related activities that may occur in these areas.
Outcome	The combined data will 1) fill a key data gap on leatherback distribution, abundance, and habitat use off California, Oregon, and Washington, and 2) provide a more robust sample size to assess leatherback use of the central California marine ecosystem.
Context	California, Oregon, Washington

BOEM Information Need(s): This project will provide BOEM and NMFS with information essential for evaluating and conducting environmental reviews (ESA and NEPA) of proposed BOEM-permitted activities, including renewable energy activities, and for mitigating potential impacts on endangered leatherbacks and their prey. These data will fill a key data gap on leatherback distribution, abundance, and habitat use offshore California, Oregon, and Washington.

Background: Pacific leatherback turtles, *Dermochelys coriacea*, are federally listed as endangered under the ESA and are recognized as being under threat of extirpation within the Pacific Ocean. Leatherbacks that nest at beaches in the tropical western Pacific migrate across the Pacific to forage on seasonally abundant sea nettles, *Chrysaora fuscescens*, in two known areas off the U.S. West Coast: central California and Oregon-Washington (OR-WA) between June and November. Both areas are designated as Leatherback Critical Habitat (77 FR 4169, 27 February 2012). Since 2000, integrated aerial survey, telemetry, and in-water sampling have been successfully conducted off central California to characterize leatherback distribution, movements, abundance, habitat use, foraging behavior, and health. Some information on leatherback occurrence is available off OR-WA, but no estimate of leatherback abundance is available for that region. Previous studies were very limited seasonally, and had limited sample sizes. NOAA aerial surveys designed to document leatherback occurrence off OR-WA during 2010, 2011, 2014, and 2021 and telemetry tracks of three leatherback turtles tagged at Western Pacific nesting beaches that foraged off OR-WA have revealed that leatherback use of this area is highly variable, patchy, and – at present – spatially unpredictable (Benson et al. 2011, 2020; NMFS and USFWS 2020). This study would significantly expand the dataset.

Objective(s): Characterize the distribution, movements, and foraging habitat of endangered leatherback turtles, and other marine wildlife, within and around designated Critical Habitat offshore California, Oregon, and Washington.

Methods: This is a two-phase study in which Phase I will inform the feasibility of Phase II.

Phase I: Leatherback occurrence in the study area is largely unknown; therefore, this first phase will focus on three years of replicated aerial surveys to document distribution and estimate abundance via line transect methodology. If leatherbacks are routinely sighted in the first two years, the third year of aerial surveys will support satellite and acoustic telemetry efforts to identify movements, following at-sea capture of leatherbacks, using a specially designed leatherback capture vessel complemented by vessel-based telemetry. The plane will guide the boat to surfacing leatherbacks. Sampling will be conducted from early June to early October during leatherback foraging season, targeting waters offshore northern California, including the Humboldt Wind Energy Area, Oregon, and Washington.

Phase II: Following successful detection of leatherback sea turtles for Phase I, Phase II proposes two additional years of satellite and acoustic telemetry to identify movements following at-sea capture of leatherbacks using a specially designed leatherback capture vessel, with plane support to guide the boat to surfacing leatherbacks and suction-cup attached VHF/camera tags with time-depth recorders for fine-scale foraging and behavior studies, also using leatherback capture techniques described above for satellite telemetry.

Specific Research Question(s): The following research questions address leatherback ecology, demography, and status along the U.S. West Coast and will be considered in an environmental context, especially relating to climate change:

Phase I:

1. What are the key areas of aggregation and/or high use for leatherbacks foraging within the poorly understood ESA-designated Critical Habitat off northern California, Oregon, and Washington?
2. When do leatherback turtles occur in the Pacific Northwest (i.e., Oregon and Washington)? Does this vary between California and Pacific Northwest foraging grounds?

Phase II:

3. When compared to existing central California data, do leatherbacks move between California and Pacific Northwest foraging grounds, or are the foraging populations discrete?
4. Does the occurrence of leatherbacks offshore Oregon and Washington inform the status of the population, for example, density and abundance?
5. How do foraging leatherbacks use vertical and horizontal habitat, and what prey species are being consumed, in neritic waters off the US West Coast? Does this vary regionally and temporally?

Current Status: Aerial surveys conducted intermittently from August 16 to September 11, 2023, starting in Washington and ending in Morro Bay, California. Washington/Oregon surveys were focused on areas known to feature favorable leatherback habitat in previous years. On September 6-10, conducted surveys within Oregon wind call areas and northern California BOEM wind energy lease areas. No leatherbacks were detected during this field season, however one leatherback turtle was reported along the central coast of California (on September 15), with two additional reports off southern California during June and August, and one report off central Oregon in early September. In addition to the expected cetacean and pinniped species such as common dolphin, fin whale, humpback whale, harbor porpoise, California sea lion, northern fur seal, and elephant seal, 6 killer whales, a cow/calf pair of Baird's beaked whales, and a single Cuvier's beaked whale. Additional species of note included numerous sharks (mostly blue sharks) and hundreds of large schooling tuna (4-6 ft). Although the tuna species could not be identified from the air, the team suspects they were likely Pacific bluefin tuna. No albatross or large aggregations of seabirds were observed during the survey. This survey completed the aerial survey fieldwork for 2023.

Publications Completed: None

Affiliated WWW Sites: None

References:

Benson SR, Eguchi T, Foley DG, Forney KA, Bailey H, Hitipeuw C, Samber BP, Tapilatu RF, Rei V, Ramohia P, Pita J, Dutton PH. 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

Benson SR, Forney KA, Moore JE, LaCasella EL, Harvey JT, Carretta JV. 2020. A long-term decline in the abundance of endangered leatherback turtles, *Dermochelys coriacea*, at a foraging ground in the California Current Ecosystem. Global Cons Ecol 24: e01371. doi:10.1016/j.gecco.2020.e01371

NMFS and USFWS [U.S. Fish and Wildlife Service]. 2020. Endangered Species Act status review of the leatherback turtle (*Dermochelys coriacea*). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.