

**State of California
Natural Resources Agency
Department of Fish and Wildlife**

REPORT TO THE FISH AND GAME COMMISSION

**EVALUATION OF A PETITION FROM CENTER FOR BIOLOGICAL DIVERSITY
AND TURTLE ISLAND RESTORATION NETWORK
TO LIST PACIFIC LEATHERBACK SEA TURTLE (*DERMOCHELYS CORIACEA*)
AS ENDANGERED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT**



Photo Credit National Marine Fisheries Service

Prepared by
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Executive Summary

On January 23, 2020, The Center for Biological Diversity and Turtle Island Restoration Network (Petitioners) submitted a Petition (Petition) to the Fish and Game Commission (Commission) to list the Pacific leatherback sea turtle (*Dermochelys coriacea*) as endangered pursuant to the California Endangered Species Act (CESA), Fish and Game Code Section 2050 *et seq.*

The Commission referred the Petition to the California Department of Fish and Wildlife (Department) on February 3, 2020, in accordance with Fish and Game Code Section 2073. (Cal. Reg. Notice Register 2019, No. 15-Z, p. 575.) Pursuant to Fish and Game Code Section 2073.5 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations, the Department prepared this Petition Evaluation Report (Petition Evaluation). The purpose of the Petition Evaluation is to assess the scientific information in the Petition in relation to other relevant and available scientific information possessed or received by the Department during the evaluation period, and to recommend to the Commission whether the Petition contains sufficient information to indicate the petitioned action may be warranted, and should be accepted and considered.

After reviewing the Petition and other relevant information, the Department determined the following:

- Population Trend. The Petition contains sufficient information on population trends of the Pacific leatherback sea turtle to suggest a declining population trend.
- Range. The Petition contains sufficient information on the Pacific leatherback sea turtle's current and historic geographic range.
- Distribution. The Petition contains sufficient scientific information on Pacific leatherback sea turtle distribution and the Department has provided additional details on the California distribution.
- Abundance. The Petition contains sufficient scientific information on Pacific leatherback sea turtle abundance to indicate a decline in abundance.
- Life History. The Petition contains sufficient information on the known life history and ecology of the Pacific leatherback sea turtle to show that the species is susceptible to anthropogenic impacts.
- Kind of Habitat Necessary for Survival. The Petition contains sufficient information regarding habitats necessary for Pacific leatherback sea turtle survival.
- Factors Affecting the Ability to Survive and Reproduce. The Petition contains sufficient information to indicate that the long-term survival of the Pacific

leatherback sea turtle is threatened by a number of ongoing and future threats such as habitat modification and loss, incidental take, and other factors.

- Degree and Immediacy of Threat. The Petition discusses the low numbers of Pacific leatherback sea turtles and the primary threat of entanglement and drowning in longline fishing gear, as well as other threats. Though many of these threats do not exist in California, the Petition contains sufficient information to indicate that threats to the long-term survival of the Pacific leatherback sea turtle will continue or potentially worsen in the future.
- Impact of Existing Management Efforts. The Petition describes the inadequacy of existing regulatory mechanisms for protecting the Pacific leatherback sea turtle from threats to its long-term survival. The Petition contains sufficient information on the impact of existing management efforts, and supplemental information on the impact of existing management efforts is provided in this Petition Evaluation.
- Suggestions for Future Management. The Petition provides sufficient management suggestions that may aid in conserving the Pacific leatherback sea turtle.
- A Detailed Distribution Map. The Petition contains a detailed map of only a portion of the distribution of the Pacific leatherback sea turtle. A more comprehensive map of Pacific leatherback sea turtle distribution is provided in this Petition Evaluation.
- Availability and Sources of Information. The Petition contains sufficient information on the availability and sources of information used in the Petition.

The Department's Petition Evaluation is focused on the scientific information provided in the Petition as well as additional scientific information the Department possesses, or has knowledge of, regarding Pacific leatherback sea turtle populations.

In completing its Petition Evaluation, the Department finds there is sufficient information to indicate the petitioned action may be warranted and recommends the Commission accept and consider the Petition.

Section 1. Introduction

1.1 Candidacy Evaluation

The Commission has the authority to list a native species or subspecies as threatened or endangered under CESA. (Fish & G. Code, §§ 2062, 2067, 2070.) The listing process is the same for species and subspecies. (Fish & G. Code, §§ 2070-2079.1.)

CESA sets forth a two-step process for listing a species as threatened or endangered. First, the Commission determines whether to designate a species as a candidate for listing by evaluating whether the petition provides “sufficient information to indicate that the petitioned action may be warranted.” (Fish & G. Code, § 2074.2, subd. (e)(2).) If the petition is accepted for consideration, the second step requires the Department to produce, within 12 months of the Commission’s acceptance of the petition, a peer reviewed report based upon the best scientific information available that advises the Commission on whether the petitioned action is warranted. (Fish & G. Code, § 2074.6.) Finally, the Commission, based on that report and other information in the administrative record, then determines whether the petitioned action to list the species as threatened or endangered is warranted. (Fish & G. Code, § 2075.5.)

A petition to list a species under CESA must include “information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant.” (Fish & G. Code, § 2072.3; see also Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).) The range of a species for the Department’s petition evaluation and recommendation is the species’ California range. (*Cal. Forestry Assn. v. Cal. Fish and Game Com.* (2007) 156 Cal.App.4th 1535, 1551.)

Within ten days of receipt of a petition, the Commission must refer the petition to the Department for evaluation. (Fish & G. Code, § 2073.) The Commission must also publish notice of receipt of the petition in the California Regulatory Notice Register. (Fish & G. Code, § 2073.3.) Within 90 days of receipt of the petition (or 120 days if the Commission grants an extension), the Department must evaluate the petition on its face and in relation to other relevant information and submit to the Commission a written evaluation report with one of the following recommendations:

- Based upon the information contained in the petition, there is not sufficient information to indicate that the petitioned action may be warranted, and the petition should be rejected; or
- Based upon the information contained in the petition, there is sufficient information to indicate that the petitioned action may be warranted, and the petition should be accepted and considered.

(Fish & G. Code, § 2073.5, subds. (a)-(b).) The Department's candidacy recommendation to the Commission is based on an evaluation of whether the petition provides sufficient scientific information relevant to the petition components set forth in Fish and Game Code Section 2072.3 and the California Code of Regulations, Title 14, Section 670.1, subdivision (d)(1).

In *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597, the California Court of Appeals addressed the parameters of the Commission's determination of whether a petitioned action should be accepted for consideration pursuant to Fish and Game Code Section 2074.2, subdivision (e), resulting in the species being listed as a candidate species. The court began its discussion by describing the standard for accepting a petition for consideration previously set forth in *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104:

As we explained in *Natural Resources Defense Council*, "the term 'sufficient information' in section 2074.2 means that amount of information, when considered with the Department's written report and the comments received, that would lead a reasonable person to conclude the petitioned action may be warranted." The phrase "may be warranted" "is appropriately characterized as a 'substantial possibility that listing could occur.'" "Substantial possibility," in turn, means something more than the one-sided "reasonable possibility" test for an environmental impact report but does not require that listing be more likely than not.

(*Center for Biological Diversity, supra*, 166 Cal.App.4th at pp. 609-10 [internal citations omitted].) The court acknowledged that "the Commission is the finder of fact in the first instance in evaluating the information in the record." (*Id.* at p. 611.) However, the court clarified:

[T]he standard, at this threshold in the listing process, requires only that a substantial possibility of listing could be found by an objective, reasonable person. The Commission is not free to choose between

conflicting inferences on subordinate issues and thereafter rely upon those choices in assessing how a reasonable person would view the listing decision. Its decision turns not on rationally based doubt about listing, but on the absence of any substantial possibility that the species could be listed after the requisite review of the status of the species by the Department under [Fish and Game Code] section 2074.6. (*Ibid.*)

1.2 Petition History

On January 23, 2020, the Petitioner submitted the Petition to the Commission. On February 3, 2020, the Commission referred the Petition to the Department for evaluation. On February 7, 2020, the Department requested a 30-day extension of the 90-day Petition evaluation period. The Commission approved the extension request at its February 21, 2020 meeting. The Department submitted this Petition Evaluation to the Commission on June 2, 2020.

The Department evaluated the scientific information presented in the Petition as well as other relevant information the Department possessed at the time of review. The Department did not receive new information from the public during the Petition Evaluation period pursuant to Fish and Game Code Section 2073.4. Pursuant to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations, the Department evaluated whether the Petition included sufficient scientific information regarding each of the following petition components to indicate whether the Petitioned action may be warranted:

- Population trend;
- Range;
- Distribution;
- Abundance;
- Life history;
- Kind of habitat necessary for survival;
- Factors affecting the ability to survive and reproduce;
- Degree and immediacy of threat;
- Impact of existing management efforts;
- Suggestions for future management;
- Availability and sources of information; and
- A detailed distribution map.

1.3 Overview of Pacific Leatherback Sea Turtle Ecology

The Pacific leatherback sea turtle (leatherback, *Dermochelys coriacea*) is the largest turtle species in the world and fourth largest living marine reptile (McClain et al. 2015 p. 39). Although their size varies regionally, the curved carapace length of adult Pacific leatherbacks commonly exceeds 1.5 meters (McClain et al. 2015 p. 41). Adult males and females can reach 2 meters in length while weighing up to 900 kilograms (McClain et al. 2015 p. 39). There are body-size differences between mature turtles from the eastern (smaller) and western Pacific (larger) nesting colonies, which are distinguished on the basis of genetic differentiation discussed in detail below. The unique characteristics of the leatherback's carapace contribute to broad thermal tolerance in adults and enables the species to forage in water temperatures far lower than the leatherback's core body temperature (National Marine Fisheries Service (NMFS) & United States Fish and Wildlife Service (USFWS) 1998 p. 5). Adults have been reported in the Pacific as far north as the Bering Sea in Alaska and as far south as Chile and New Zealand (NMFS & USFWS 1998).

Previous studies have shown that the core body temperature in adults while in cold waters are several degrees Celsius above ambient, evidence of endothermy (warm blood) in a mostly poikilothermic (cold blood) class, Reptilia (Bostrom et al. 2010). Leatherbacks have several morphological adaptations advantageous to large-scale ocean migrations (Benson et al. 2011), deep dives (Eckert et al. 1989), and sustained residence in the open ocean (NMFS & USFWS 1998). Leatherbacks have strong front flippers that are proportionally longer than those of other sea turtle species and may span up to 270 centimeters wide in adults (NMFS & USFWS 1998).

Leatherbacks have a predominately black coloration with varying degrees of pale spotting that covers the scaleless skin and the sculpted ridges of the carapace (NMFS & USFWS 1998). The underside is often mottled, white to pinkish and black, and the degree of pigmentation is variable (NMFS & USFWS 1998). Leatherback hatchlings are mostly black with mottled undersides and covered with small polygonal bead-like scales. Flippers have a white margin and white scales are present as stripes along the back. In contrast to other sea turtle species, leatherbacks lack claws in both front and rear flippers (NMFS & USFWS 1998).

The generic name *Dermochelys* was introduced by Blainville in 1816 (NMFS & USFWS 1998). The specific name *coriacea* was initially used by Vandelli in 1761 and was later adopted by Linnaeus in 1766 (NMFS & USFWS 1998). The species name refers to the unique leathery texture and scaleless skin of adults (NMFS & USFWS 1998). The leatherback turtle is the only surviving species of the taxonomic family Dermochelyidae (NMFS & USFWS 1998).

Western Pacific leatherback feed in waters off California (Dutton et al. 2007). The western Pacific population is known to nest in at least 28 different sites along the tropical shores of Indonesia, Papua New Guinea, the Solomon Islands, and Vanuatu. Eastern Pacific leatherbacks nest on beaches in Mexico, Costa Rica, and Nicaragua. Leatherbacks prefer to nest on unobstructed, mildly sloped, sandy, continental shores adjacent to deep offshore waters (NMFS & USFWS 1998). These nesting colonies all share a common haplotype, a group of genes that tend to be inherited together from a single parent. (Dutton et al. 2007).

Section 2. Sufficiency of Scientific Information to Indicate the Petitioned Action May Be Warranted

The Petition components are evaluated below, with respect to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations.

2.1 Population Trend

2.1.1 *Scientific Information in the Petition*

The Petition discusses leatherback population trends under the “Population Trend” section on page 9. The Petition indicates that Pacific leatherback sea turtles are facing extinction due to incidental bycatch in commercial and artisanal fisheries, overharvest of eggs, and killing of adults at nesting beaches, as well as commercial and residential development on nesting beaches (Kaplan 2005; Tapilatu et al. 2013). The Petition states that this has resulted in a decline of more than 95% in leatherbacks from the eastern and western populations combined over the last 30 years (Spotila et al. 2000; Tapilatu et al. 2013).

2.1.2 *Conclusion*

Scientific information on Pacific leatherback population trends is consistent with that shown in the Petition. NMFS indicates that western Pacific leatherback sea turtles have declined by more than 80% since the 1980s and are anticipated to decline by 96% by 2040 (NMFS 2016). The Petition contains sufficient information on population trends of the Pacific leatherback sea turtle to suggest a declining population trend.

2.2 Geographic Range

2.2.1 *Scientific Information in the Petition*

Information regarding the leatherback geographic range appears on pages 10 through 13 of the Petition and is discussed further here. However, for purposes of Petition Evaluation, “range” is limited to the species’ California range. (*Cal. Forestry Assn. v. Cal. Fish and Game Com.*, supra, 156 Cal. App. 4th at p. 1551.)

The Petition indicates that the Pacific leatherback sea turtle has the largest geographic range of any living marine reptile, spanning the temperate and

tropical waters throughout the Pacific Ocean (Hays et al. 2004; James et al. 2006; Benson et al. 2007a, Benson et al. 2011). Adults have been reported in the Pacific as far north as the Bering Sea in Alaska and as far south as Chile and New Zealand (NMFS & USFWS 1998). In California, Pacific leatherback sea turtles are known to occur.

2.2.2 Conclusion

Given that Pacific leatherback sea turtles are found throughout the Pacific Ocean, the Petition includes sufficient information to describe the Pacific leatherback sea turtle's worldwide geographic range and additional information on the California range is described in Distribution below.

2.3 Distribution

2.3.1 Scientific Information in the Petition

The Petition discusses current and historical leatherback distribution on pages 10 and 11. The Petition indicates Pacific leatherbacks' presence off California is strongly related to seasonal upwelling that spatially drives food availability. Previous studies have shown that leatherback distribution and occurrence in waters off California have been linked to sea surface temperature of 15-16° Celsius during late summer and early fall (Starbird et al. 1993). The Petition notes that leatherback sightings are often reported in Monterey Bay during August by recreational boaters, whale-watching operators, and researchers (Benson et al. 2007b). The greatest leatherback densities off central California have consistently been found where upwelling creates favorable habitat for jellyfish production, their main prey (Benson et al. 2007b). The Petition provides a map of Pacific leatherback sea turtles' known occurrence offshore portions of California on page 13 (Petition Figure 4, included here as Figure 1).

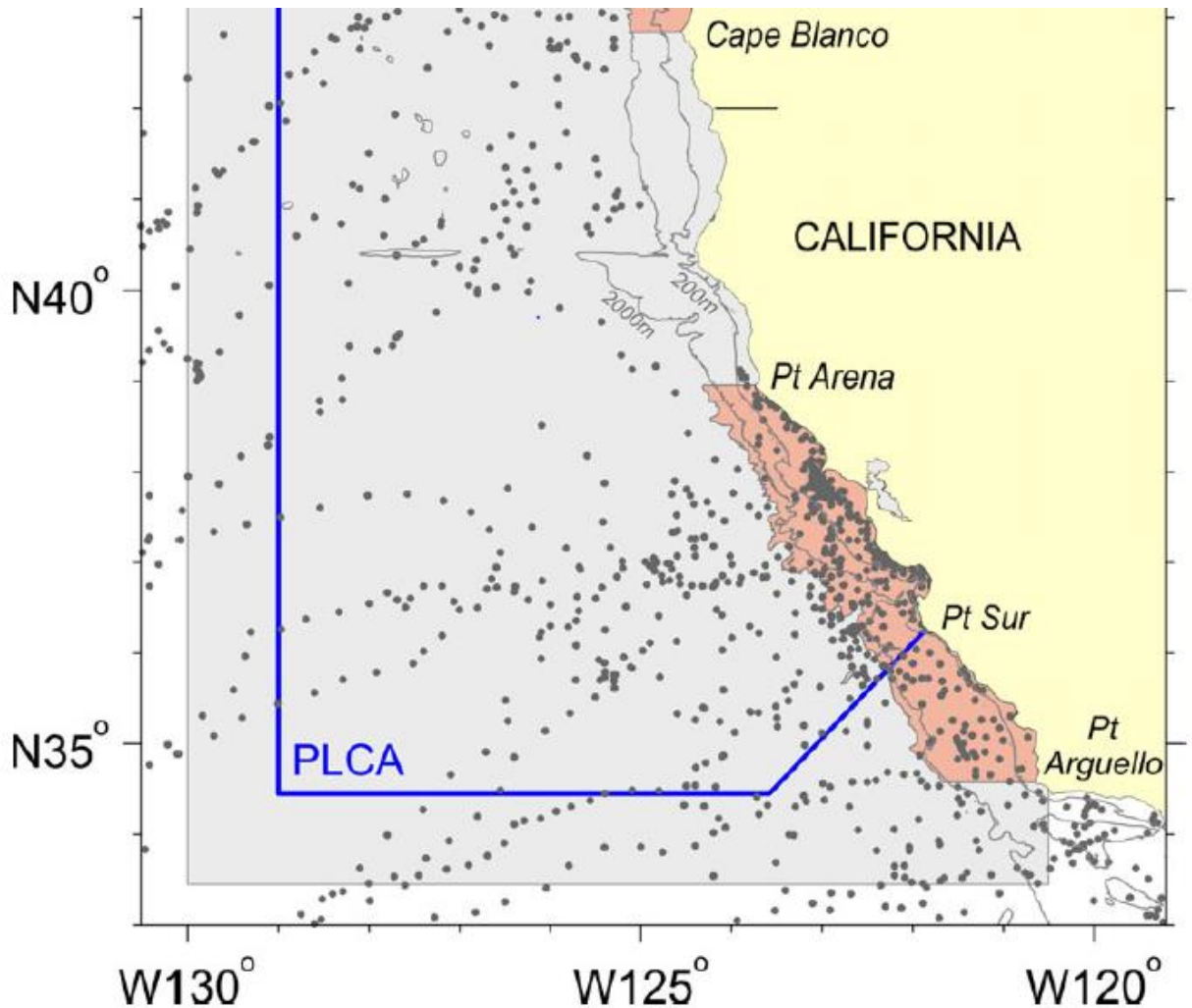


Figure 1. Pacific leatherback sea turtle distribution map from the Petition. Black dots are leatherback sea turtle telemetry data. Pink area indicates the leatherback sea turtle critical habitat designation in California. “PLCA” is the Pacific Leatherback Conservation Area that excludes the drift gillnet fishery for three months each year (NMFS 2017a, in Petition, Figure 4).

2.3.2 Other Relevant Scientific Information

A review of primary literature found that genetic studies have identified three distinct stocks of leatherback sea turtles in the Pacific: an eastern Pacific stock that nests primarily in Mexico and Costa Rica; a western Pacific stock that nests primarily in the Papua Barat, Indonesia, Papua New Guinea, Solomon Islands, and Vanuatu; and a Malaysian stock that nests primarily in Malaysia (Benson et al. 2011). Between July and November, western Pacific stocks migrate to the U.S. Exclusive Economic Zone off the coasts of Washington, Oregon, and California to forage on large aggregations of jellyfish (*Scyphomedusae*) in the California Current ecosystem (Figure 2; Benson et al. 2011; Curtis et al. 2015).

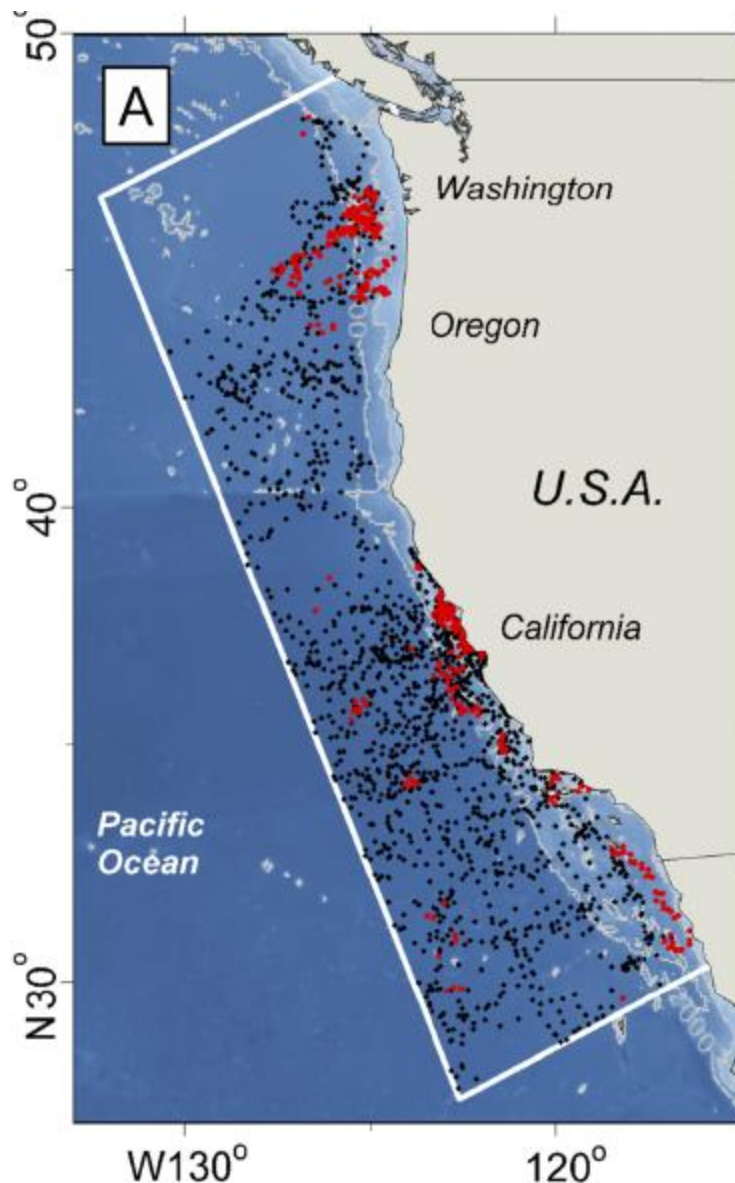


Figure 2. Distribution of western Pacific leatherback sea turtles based on telemetry data of 40 individuals. Red dots represent area restricted search (ARS), the behavior of remaining in an area once an animal encounters prey. Black dots represent transit. (From Benson et al. 2011).

2.3.3 Conclusion

The information provided in the Petition on distribution of the Pacific leatherback sea turtle is consistent with other information available to the Department from occurrence records. While the Petition focuses on the Pacific Leatherback Conservation Area, the Department has provided additional information on the statewide distribution.

2.4 Abundance

2.4.1 Scientific Information in the Petition

The Petition discusses leatherback abundance on pages 9 and 10. The Petition states that the critically endangered Pacific leatherback turtle population has suffered a catastrophic decline over the last three decades. In the Pacific Ocean, leatherback populations have declined at all major nesting beaches resulting in a more than 95% decline from the eastern and western populations combined over the last 30 years (Spotila et al. 2000; Tapilatu et al. 2013). The Petition states that the total western leatherback population was estimated in 2007 to include 2,700-4,500 breeding females with 1,100-1,800 female leatherbacks nesting annually (Dutton et al. 2007). More recently, deriving abundance estimates from nest counts gives a conservative western Pacific population estimate of 562 nesting females (NMFS 2017b). For California, Scott Benson, NMFS, estimated the number of western Pacific leatherbacks in California waters from 2005–2014 averaged 54 individuals annually (Benson, pers. comm. 2015). The prior estimate, using data from 1990-2003, indicated an annual average of 178 western Pacific leatherback sea turtles off California (Benson et al. 2007b).

2.4.2 Other Relevant Scientific Information

Further review of primary literature and personal communication with Scott Benson, NMFS, show a continued trend of decreasing abundance in western Pacific leatherback populations. A study of the long-term western Pacific leatherback population decline found a continual and significant long-term nesting decline of 5.9% per year at primary western Pacific beaches from 1984 to 2011 (Tapilatu et al. 2013). A separate study assessing the population-level impacts of western Pacific leatherback turtle interactions in the Hawaii-based shallow-set longline fishery documented a continual 6.1% annual nesting decline of western Pacific leatherbacks from 2001-2017 (Martin et al. 2020). The current estimated number of western Pacific leatherbacks that forage in California waters annually is approximately 50 turtles, with an approximate annual decline of 5.6% since 1990 (Benson, *pers. comm.* 2020b).

2.4.3 Conclusion

The Petition contains sufficient scientific information on Pacific leatherback sea turtle abundance to indicate the continuing declines in abundance in both the entirety of its range and across the species' range in California.

2.5 Life History

2.5.1 *Scientific Information in the Petition*

The Petition discusses leatherback life history on pages 4 through 9 and states that Pacific leatherbacks are divided into two genetically distinct eastern and western populations. However, as discussed in section 2.3.2, three distinct stocks exist in the Pacific (Benson et al. 2011). Western Pacific leatherback populations are the most common found feeding in waters off California (Dutton et al. 2007). The Petition discusses species description, taxonomy, population genetics, reproduction and growth, diet and foraging ecology, and migration.

The Petition describes the Pacific leatherback sea turtle as the largest turtle species in the world and fourth largest living reptile (McClain et al. 2015). Pacific leatherbacks are a pelagic and endothermic species that forage in Pacific Ocean waters as far north as the Bering Sea in Alaska and as far south as Chile and New Zealand (NMFS & USFWS 1998). Pacific Leatherbacks reach sexual maturity at approximately 9-15 years and reproduce seasonally from June to September (Zug and Parham 1996; Dutton et al. 2005; PFMC & NMFS 2006). Over the course of a single mating season, female Pacific leatherbacks lay an average of five nests at an interval of approximately 9.3-9.5 days (Reina et al. 2002). Pacific Leatherbacks prefer to nest on unobstructed, mildly sloped, sandy, continental shores accompanied by deep offshore waters (NMFS & USFWS 1998). Nesting does not occur on the U.S. west coast. Hatchling sex depends on the temperature of the nest environment during the 55- to 77-day incubation period (NMFS & USFWS 1998), with females becoming increasingly dominant with increasing temperature (Binckley et al. 1998).

The Petition describes how Pacific leatherback sea turtles typically feed on marine invertebrates including jellyfish, tunicates, and other gelatinous zooplankton (Bjorndal et al. 1997; Houghton et al. 2006; Wallace et al. 2006). Pacific leatherbacks are known to exploit convergence zones and areas of upwelling waters where aggregations of prey commonly occur, such as off California (Benson et al. 2007b). Pacific leatherbacks spend most of their time submerged at sea and display patterns of continual diving that suggests frequent surveying of the water column for gelatinous prey (Houghton et al. 2006). Dense aggregation of jellies (*scyphomedusae*) are common in the summer and fall months throughout the nearshore regions from central California to Northern Oregon (Graham et al. 2010). Oceanographic retention

zones and upwelling shadows, such as those in the neritic waters (the shallow ocean near a coast and overlying the continental shelf) off central California, are particularly favorable habitat for leatherback prey (Graham et al. 2010).

The Petition describes the migration patterns of Pacific leatherbacks and how the turtles spend nearly their entire lives in the ocean's pelagic zone (i.e. The water column). Some females may forage year-round in tropical habitats near nesting beaches while others undertake a lengthy migration to exploit temperate foraging habitats like that off central California (Benson et al. 2011; Lontoh 2014). Western Pacific leatherbacks that embark on a trans-Pacific migration to the temperate continental shelf on the U.S. West Coast forage on the seasonally abundant aggregations of gelatinous zooplankton (Bailey et al. 2012; Benson et al. 2007b; Block et al. 2011). Eastern Pacific leatherbacks are known to migrate south from the shores of Mexico, Costa Rica, and Nicaragua, where they nest, through the Galapagos to feeding sites throughout the southeast Pacific off South America's West Coast (Bailey et al. 2012; Block et al. 2011; Shillinger et al. 2008).

2.5.2 Conclusion

The Petition presents sufficient information on the known life history of the Pacific leatherback sea turtle to indicate some elements may render it particularly vulnerable to anthropogenic impacts.

2.6 Kind of Habitat Necessary for Survival

2.6.1 Scientific Information in the Petition

The Petition describes necessary habitat components for the survivability of Pacific leatherbacks on pages 7 through 26. Pacific leatherbacks are a highly migratory species and are known to swim over 10,000 km within a single year (Benson et al. 2007a, Benson et al. 2011; Shillinger et al. 2008). The Petition states that quality foraging areas and nesting grounds are vital habitats for Pacific leatherback survival. The federal government identified California's offshore waters between the 200- and 3000-meter isobaths from Point Sur to Point Arguello, as Pacific leatherback critical habitat (50 CFR 226). The waters off the coasts of California, Oregon, and Washington within the California Current Ecosystem comprise one of the most important foraging habitats in the entire world for western Pacific leatherback populations (Benson et al. 2007b; Harris et al. 2011; NMFS & USFWS 1998). The greatest western Pacific leatherback densities off central California have been found where upwelling creates a favorable habitat for jellyfish production (Benson et al.

2007b). A positive relationship exists between western Pacific leatherback abundance in neritic waters off California and the average Northern Oscillation Index (NOI) (Benson et al. 2007b). Years with positive NOI values appear to correspond with conditions favorable to upwelling along the California Coast. Upwelling leads to phytoplankton and zooplankton (including jellyfish) production, which in turn draws leatherbacks (Benson et al. 2007b). A study on eastern Pacific nesting leatherback turtles found significantly reduced reproductive output during El Niño years (Reina et al. 2009; Santidrián Tomillo et al. 2012). The petition states that previous studies have shown that western Pacific leatherback distribution and occurrence in waters off California have been linked to sea surface temperature of 15-16° Celsius during late summer and early fall.

The Petition describes how nesting sites for western Pacific leatherbacks include at least 28 different sites along the tropical shores in Indonesia, Papua New Guinea, the Solomon Islands, and Vanuatu while the eastern Pacific leatherbacks nest on the shores of Mexico, Costa Rica, and Nicaragua. Leatherbacks prefer to nest on unobstructed, mildly sloped, sandy, continental shores accompanied by deep offshore waters (NMFS & USFWS 1998). The Petition states anthropogenic activity related to fishing, marine debris, pollution, shipping, coastal development, and beach erosion are the greatest factors involved in Pacific leatherback habitat degradation. The Petition emphasizes that successful conservation efforts must include protecting migration corridors and reducing/eliminating the threats mentioned above in Pacific leatherback foraging and nesting areas.

2.6.2 Conclusion

The Petition presents sufficient information regarding the kind of habitat necessary for Pacific leatherback sea turtle survival, including information suggesting the importance of foraging areas of the west coast of the U.S.

2.7 Factors Affecting the Ability to Survive and Reproduce

2.7.1 Scientific Information in the Petition

The Petition discusses the factors affecting Pacific leatherback sea turtle ability to survive and reproduce on pages 13 through 27 in Section 6. The Petition identifies the following factors as threats to Pacific leatherback: (1) modification or destruction of habitat; (2) overexploitation; (3) predation; (4) disease; and (5) other natural events or anthropogenic activities. These factors are discussed separately below.

2.7.1.1 Modification or destruction of habitat:

The Petition indicates most threats to Pacific leatherback foraging areas and nesting sites occur in nearshore marine areas, where the vast majority of human activities (e.g. fishing, swimming, boating) occur in the marine environment. The Petition indicates that Pacific leatherbacks and their preferred prey are in danger from oil and gas extraction activities on and around the California coast, aquaculture facilities, coastal development, entanglement by and ingestion of marine debris, vessel strikes from commercial shipping/other boat traffic, and beach erosion.

Oil and Gas Activities

The Petition describes the general impacts oil and gas activities have on sea turtle populations observed in the United States and implies oil and gas activities off California can similarly impact Pacific leatherback populations. The Petition states that because sea turtles generally do not avoid oil-contaminated areas, they are very vulnerable to harmful contact with oil and its byproducts. The Petition states that sea turtles are known to indiscriminately ingest tar balls that are about the size of their prey. Ingested tar interferes with digestion, sometimes leading to starvation and buoyancy problems, rendering the turtle more vulnerable to predation and less able to forage. Furthermore, the Petition states that juvenile and adult leatherbacks exposed to oil, tar, and spill-related chemicals in the water column can exhibit declining red blood cell counts and increased white blood cell counts, impaired osmoregulation, and sloughing of skin that can lead to infection. The Petition also states that oil spills reduce food availability, and ingestion of contaminated food can expose turtles to harmful hydrocarbons and toxins. The petition describes that oil spill response also presents hazards to sea turtles as oil dispersants contain components that can interfere with lung function, respiration, digestion, excretion, and salt gland function. Lastly, the Petition notes that burning oil at the surface, another potential response to oil spills, can directly harm turtles at the surface.

Aquaculture

The Petition states that the growth of aquaculture off California threatens to obstruct Pacific leatherback sea turtle migration to coastal waters by entangling them in fixed gear. Longlines used in mussel aquaculture are a documented source of mortality to Pacific leatherbacks (Price et al. 2016). In addition, the Petition notes the federal government has described

aquaculture as an activity that may adversely impact leatherback sea turtle migratory pathways to nearshore waters off the U.S. West Coast (77 Fed. Reg. 4191). The petition states that off California in particular, a 100-acre mussel aquaculture facility six-miles offshore poses an entanglement risk to Pacific leatherback sea turtles (NMFS 2012). Further information on this aquaculture facility can be found in section 2.7.2.

Coastal Development Throughout the West Pacific Leatherback's Range

The Petition indicates that as human populations expand throughout the tropical Pacific at unprecedented rates, commercial and residential development on beachfront property increasingly encroaches on Pacific leatherback habitat (NMFS & USFWS 1998, 2013). Recreational use of nesting beaches, litter, and other debris on beaches and in the ocean, and the general harassment of turtles all degrade nesting habitat (NMFS & USFWS 1998). The Petition states that the increased human presence near nesting habitat tends to increase the direct harvest of leatherbacks and their eggs (NMFS & USFWS 1998). Additional information specific to the California coast can be found in Section 2.7.2.

Entanglement by and Ingestion of Marine Debris

The Petition indicates that the entanglement by, and ingestion of, marine debris constitutes a serious and widespread threat to the Pacific leatherback populations (NMFS & USFWS 1998; Schuyler et al. 2014). Pacific leatherbacks are easily entangled in abandoned fishing gear, lines, ropes, and nets (NMFS & USFWS 1998). Pacific leatherbacks also commonly mistake plastic bags, plastic sheets, balloons, latex products, and other refuse for jellyfish, their preferred prey (NMFS & USFWS 1998; Bugoni et al. 2001; Nelms et al. 2016). The Petition states that the mortality from marine debris threatens the Pacific leatherback population throughout the Pacific (Hitipeuw et al. 2007).

Vessel Strikes from Commercial Shipping and Other Boat Traffic

The Petition identifies vessel strikes from commercial shipping and other boat traffic as a threat to the Pacific leatherback and its pelagic habitat. From 1989 through 2014, there have been 12 reported incidents of vessel struck Pacific leatherbacks in California, but the Petition states that this is an underestimate because carcasses that sink or strand in an area where they cannot be detected go unreported or unobserved (NMFS 2017c).

Given that NMFS has identified the waters off central California as an important foraging habitat for Pacific leatherbacks during the summer and fall, the Petition states it is likely that they are affected by ship traffic in that area.

Beach Erosion

The Petition states that many leatherback nesting beaches are subject to seasonal or storm-related erosion and accretion (Hitipeuw et al. 2007). The Petition provides an example from beaches in Indonesia, where from August through October at Jamursba-Medi, high surf and strong currents erode large numbers of unhatched nests. Erosion destroys an estimated 45% of western Pacific leatherback nests at Jamursba-Medi, including 80% of nests at Warmamedi (Hitipeuw et al. 2007). At nearby Wermon, 11% of observed nests were lost to high tides in 2003-2004 (Hitipeuw et al. 2007). The Petition states that as sea levels continue to rise, the Pacific leatherback's fragile habitat will only become more at risk of destruction from wave-induced erosion (Van Houtan & Bass 2007). Additional information specific to the California coast can be found in Section 2.7.2.

2.7.1.2 Overexploitation:

The Petition indicates that leatherbacks, with their large pectoral flippers and active behavior, are vulnerable to entanglement in fishing gear (James et al. 2005). The Petition states that incidental take in fisheries threatens the entire Pacific leatherback population where active and abandoned driftnets and longlines have a long history of entangling and killing turtles (NMFS & USFWS 1998). The Petition states that during the 1990s, gillnet and longline fisheries killed at least 1,500 Pacific leatherbacks annually in the Pacific (Spotila et al. 2000). Off the U.S. West Coast, Pacific leatherbacks have been incidentally caught in drift gillnets off California, Oregon and Washington, on longlines off California and Hawaii (NMFS & USFWS 1998; released alive), in groundfish pot gear off California in 2008 (Eguchi et al. 2017, Jannot et al. 2011; released alive), and in crab trap gear in 2016 (NMFS 2018; released alive). The Petition notes that the groundfish pot fishery demonstrates the difficulty in monitoring and mitigating catch of Pacific leatherbacks in U.S. West Coast fisheries. The Petition notes that conclusive statements about Pacific leatherback bycatch in the groundfish pot fishery cannot be made without more data on the fishery and on the overlap between the fishery and leatherback sea turtles. The Petition states that the interaction of fisheries with Pacific

leatherbacks off California, Oregon, and Washington have a particularly large impact on the population based on the likelihood that the turtles are adult females and any interaction with an adult female is significant to the population (Benson et al. 2007b; Benson et al. 2011). Further review of primary literature indicates that capture studies off central California during 2000-2005 found that 67.5% (27/40) of foraging Pacific leatherbacks were female, although the study did not conclude generally that all Pacific leatherback interactions occurring in fisheries off the coasts of California, Oregon, and Washington were likely female turtles (Benson et al. 2007b; Benson et al. 2011).

California's Pelagic Fisheries

The Petition also indicates that both drift gillnets and longline fishing for swordfish, tuna, and sharks off California interact with and threaten the persistence of Pacific leatherbacks. Observed captures of Pacific leatherbacks in the drift gillnet and longline fisheries coincide with their seasonal foraging in the neritic waters off the U.S. Coast (Benson et al. 2007b). The Petition states that fishing gear interactions will continue to be problematic in California Pacific leatherback habitat and that unless effective mitigation measures are implemented, the diversity of pelagic fishing gears proposed for use off California present a real and persistent threat to leatherback sea turtles.

The Petition states that the California drift gillnet fishery has been the primary threat to Pacific leatherback sea turtles off California in recent decades. In 2013, NMFS issued a biological opinion on the continued authorization of the West Coast drift gillnet fishery anticipating incidental interactions with ten Pacific leatherback sea turtles over a five-year period (NMFS 2013). The Petition states that the anticipated interactions with the drift gillnet fishery will have a population level impact and that NMFS scientists have determined that any more than one leatherback mortality per seven years will delay the population's recovery. However, it is unclear how the source (Curtis et al 2015) relates to the formal NMFS Biological Opinion. More information on California drift gill net fishery (DGN) regulations can be found in section 2.7.2.

The Petition also identified the highly migratory longline fisheries, which are currently prohibited in the U.S. Exclusive Economic Zone, to be a threat to Pacific leatherbacks off California. The Petition claims that industry efforts have focused on introducing longlines, buoy gear and

linked buoy gear to catch pelagic fish off the U.S. West Coast. In 2019, NMFS issued exempted fishing permits to use longline gear in the Exclusive Economic Zone off California (84 Fed. Reg. 20,108 (May 8, 2019)). The Petition states that in Pacific longline fisheries, 27% of captured Pacific leatherbacks are estimated killed, and that the history of longlines provides evidence that this gear is a threat to the persistence of Pacific leatherback sea turtles. However, further review of the statement and source show longline-caused mortality to be 5% and 12% for the eastern and western Pacific population respectively (Kaplan 2005). Further information regarding the deep-set buoy gear and longline fisheries off California can be found in section 2.7.2.

Foreign Fishing Threats

The Petition also states that leatherbacks are highly vulnerable to threats from foreign fishing gear near their nesting habitats (NMFS & USFWS 2013; PFMC & NMFS 2006; Tapilatu 2017). In the western Pacific Ocean, illegal fishing occurs in the waters off Indonesia's most important nesting beaches and communities in the area have reported dead Pacific leatherbacks entangled in fishing nets and marine debris (Hitipeuw et al. 2007).

2.7.1.3 Disease and predation:

The Petition lists fibropapillomatosis as a disease that afflicts leatherback sea turtles. The tumor-forming disease, likely caused by a herpesvirus (Ene et al. 2005), may form internal and external tumors (fibropapillomas) large enough to hamper swimming, feeding, and potential escape from predators (Herbst 1994).

The Petition also identifies predation, and the harvest of adults and eggs at nesting beaches, as a threat to Pacific leatherback sea turtle survivability and reproduction. Historically, female leatherbacks have been harvested at their nesting beaches and at sea (NMFS & USFWS 1998). In addition, the Petition states that across the Pacific, leatherback populations have yet to recover from years of historical egg harvests that depleted recruitment of their populations (Hitipeuw et al. 2007). Leatherback nests are also destroyed by predation from domestic animals and wild species, including rats, mongoose, birds, monitor lizards, snakes, dogs, feral pigs, crabs, ants, and other invertebrates (Hitipeuw et al. 2007; NMFS & USFWS 1998). The Petition states that mortality from fishing along with the severe harvest of Pacific leatherback eggs are two major factors responsible for

the collapse of the Pacific leatherback population (PFMC & NMFS 2006). Additional information specific to the California coast can be found in Section 2.7.2.

2.7.1.4 Other factors:

The Petition indicates other natural events and/or human-related activities affect the ability of the Pacific leatherback to survive and reproduce, and are discussed below:

Climate Change and Ocean Warming Effects

The Petition states that climate change and global warming represent perhaps the greatest long-term threat to Pacific leatherback survival. The Petition describes ocean warming having measurable negative effects on leatherbacks and their habitat as ocean warming inhibits cool, nutrient-rich waters from being upwelled, leading to lower productivity, less prey, and poorer quality foraging areas for leatherback turtles (Roemmich & McGowan 1995; Ruzicka et al. 2012). The Petition states warming anomalies and reduced upwelling in the California Current System have also resulted in marked ecological effects including decreased productivity and altered ecosystem structure.

The Petition also states that phenology shifts in leatherback turtles are already happening due to changes in sea surface temperature (Neeman et al. 2015). Changes of water temperature in foraging grounds delays the timing of the nesting season in some beaches of the Central Atlantic and the Eastern Pacific (Neeman et al. 2015). It is likely that leatherback turtles spend more time in foraging grounds when prey distribution and availability is disrupted during warming conditions (Neeman et al. 2015 p. 121). The Petition notes that the implications of delayed nesting seasons on hatchling success and survival for Pacific leatherbacks nesting in the west Pacific require further study.

The Petition states that the reproductive success of Pacific leatherback turtles in nesting areas of the Pacific is affected by global warming. A study of eastern Pacific nesting leatherback turtles found significantly reduced reproductive output in El Niño years (Reina et al. 2009; Santidrián Tomillo et al. 2012), conditions that are likely to become more common with global warming (Saba et al. 2012). A study predicting severity of the threat of global warming to leatherback sea turtles found that incubation

temperatures would be high enough to induce uncoordinated movement in adults, leading them to leave some regions (Dudley and Porter 2014).

The Petition states that the skewing of sex ratios driven by warming temperatures at nesting beaches are more prevalent given the temperature-dependent nature of egg development (Davenport 1997). In Pacific leatherbacks, high temperatures in nesting beaches at Playa Grande in Costa Rica already are producing 70-90% females and experts predict that 100% of hatchling will be females (or there will be major hatchling failures) with continuing warming (Santidrián Tomillo et al. 2014). At Jamursba-Medi in Indonesia, where California/Oregon Pacific leatherbacks nest, reduced hatching success has been documented with hatch rates of protected nests that were 50-85% until 2003 and 10-15% in 2004-2006 (Tapilatu & Tiwari 2007). The Petition states that the reduction of hatching success and skewing of sex ratios has likely contributed in part to the long-term decline in this important nesting leatherback population (Tapilatu et al. 2013).

Sea Level Rise and Ocean Acidification

The Petition also states that sea level rise will affect nesting success of Pacific leatherback sea turtles. Sea level rise will inundate low-lying beaches where sand depth is a limiting factor for leatherbacks. Flooded nesting sites will decrease the available nesting habitat (Fuentes et al. 2009; Von Holle et al. 2019). In addition, the Petition states that climate change will also affect the nesting success of leatherbacks due to the increase in the severity of storms and changes in the prevailing currents that could lead to increased beach erosion and loss of suitable nesting habitat (Fuentes & Abbs 2010). The capacity of female leatherbacks to occupy new nesting habitat will determine whether this species adapts to rapid sea level rise.

The Petition discusses ocean acidification as a current threat to Pacific leatherback sea turtles. Ocean acidification is directly related to the increase in atmospheric CO₂ emissions globally. As the global oceans uptake the excess of CO₂, seawater chemistry changes and the oceans become more acidic (Carter et al. 2016, 2017; Doney et al. 2009; Fabry 2009; Fabry et al. 2008; Gattuso & Hansson 2011; Orr et al. 2005). The California Current System is already affected by ocean acidification (Freely et al. 2017; Gruber et al. 2012; Hauri et al. 2009), potentially disrupting the food web on which leatherbacks rely for foraging (Ruzicka et al. 2012). The

Petition states that ocean acidification can be an indirect threat to leatherbacks in foraging areas because their primary prey (jellyfish) belongs to a complex food web (Ruzicka et al. 2012) where several taxa are highly vulnerable to acidic conditions. A decline in jellyfish production can affect food availability for leatherbacks along the U.S. West Coast during summer and autumn, when dense aggregations of jellyfish historically have been present (Graham et al. 2010; Benson et al. 2007b).

2.7.2 Other Relevant Scientific Information

Aquaculture

The Petition states that a 100-acre mussel aquaculture project located approximately 7 miles from the shoreline in the San Pedro Basin and 3.1 miles northeast of the oil platform Edith is a potential risk to Pacific leatherbacks foraging off California, and cites a 2012 NMFS consultation letter to the U.S. Marine Corps of Engineers. Further investigation supports the statement, as consultation with CDFW environmental scientists in the Marine Aquaculture Program and Senior Environmental Scientist, Cassidy Teufel, with the California Coastal Commission confirmed the facility and infrastructure of the project was installed and is currently in place (Ray, *pers. comm.* 2020; Teufel, *pers. comm.* 2020). However, due to several compliance issues, the facility closed in 2019 with the remaining infrastructure in poor repair. Loose and broken anchor lines remain an entanglement risk to marine mammals and reptiles. The final disposition of the facility and remaining infrastructure is pending on the results of an auction scheduled to take place in 2020. The NMFS consultation letter and email correspondence with Scott Benson stated that leatherback sea turtle sightings and interactions are rare south of Point Conception (NMFS 2012; Benson, *pers. comm.* 2020a). Telemetry data indicates Pacific leatherbacks primarily use the southern California Bight (Point Conception to San Diego) for transiting with occasional foraging activity, though the region is not a significant foraging area (Benson et al 2011).

California's Pelagic Fisheries

The Petition describes how, in 2001, to reduce the impact of California's pelagic fisheries on Pacific leatherback populations, California implemented restrictions closing the DGN fishery between August 15 and November 15 in an area designated as the Pacific Leatherback Conservation Area. The seasonally closed area is located where, and closed when, most Pacific leatherback interactions have historically occurred. In 2018, California enacted

a DGN Transition Program with the goal of reducing bycatch and enabling a sustainable swordfish fishery. The Transition Program enables permittees to voluntarily surrender their DGN permit and DGN gear in exchange for monetary compensation.

The Petition also describes the threat of the reintroduction of longlines and establishment of deep-set buoy gear in the Exclusive Economic Zone off California, as seen by the exempted fishing permits (EFPs) issued by NMFS in 2019 (84 FR 20108). Further review of the action shows that deep-set buoy gear EFPs were issued in 2018 and 2019, while longline EFPs were issued April 24, 2019 but have since been retracted due to court order. Further mitigation measures required in the EFPs included 100 percent observer coverage during activities, night setting of shallow-set longlines, specified no fishing areas (Figure 3), and ceasing of activities if two Pacific leatherback interactions or one Pacific leatherback mortality occur (84 FR 20108). As noted above, the longline EFPs have been rescinded. To date, no interactions between deep-set buoy gear and Leatherback sea turtles have occurred.



Figure 3. Coastwide view of the no fishing zone listed in the deep-set buoy gear and longline exempted fishing permits. Figure taken from NMFS 2019.

2.7.3 Conclusion

Although the Petition contained a few inaccuracies, the information contained in the petition, and additional information in the Department’s possession, is sufficient to indicate that existing factors are adversely impacting the ability of Pacific Leatherback sea turtle to survive and reproduce.

2.8 Degree and Immediacy of Threat

2.8.1 *Scientific Information in the Petition*

The degree and immediacy of threat to the Pacific leatherback sea turtle is discussed in the following sections of the Petition: “Executive Summary” on pages 1 and 2; “Population Trend, Distribution, and Abundance” on pages 9 through 11; “Importance of California Waters for Leatherbacks” on pages 11 through 13; “Factors Affecting the Ability of the Population to Survive and Reproduce” on pages 13 through 28; and “The Degree and Immediacy of Threat” on page 28. The Petition states that there are only approximately 550 annually nesting adult female western Pacific leatherbacks, and that every individual in waters off California is significant. The Petition indicates that the primary threat to Pacific leatherbacks is entanglement and drowning in longline fishing gear. Other significant threats to Pacific leatherbacks include: oil and gas activities in California; aquaculture; coastal development throughout the western Pacific leatherback’s range; entanglement by and ingestion of marine debris; vessel strikes from commercial shipping and other boat traffic; beach erosion; overexploitation from California’s pelagic fisheries and foreign fishing; disease and predation; and changes associated with the effects of climate change and ocean warming.

2.8.2 *Conclusion*

The Petition contains sufficient information on the degree and immediacy of threats to the Pacific leatherback sea turtle to suggest a threat to its continued survival.

2.9 Impact of Existing Management Efforts

2.9.1 *Scientific Information in the Petition*

The Petition discusses the impact of existing management efforts under the following sections: “Executive Summary” on page 1, “California’s Pelagic Fisheries Threaten Leatherback Sea Turtles” on page 20 and 21, and “Inadequacy of Existing Regulatory Mechanisms” on page 28 and 29. The petition states that despite protections both domestically and internationally, Pacific leatherback populations continue to decline. Federal environmental conservation actions include the Endangered Species Act’s identification of critical habitat and prohibition on take, national marine sanctuaries, and fishing restrictions in the Pacific Leatherback Conservation Area. California management efforts include closure of the “Pacific Leatherback Conservation Area” between August 15th and November 15th since 2001 (PFMC & NMFS 2006). The petition states that California’s introduction of longlines to the U.S. West Coast poses a threat to Pacific leatherbacks, given the history of longline fisheries and leatherback interactions. However, no such introduction within the U.S. EEZ has occurred (see section 2.7.2 on exempted fishing permits). The Petition states that since 2001, two Pacific leatherbacks were observed taken and released alive in the California drift gillnet fishery, one in 2009 and one in 2012 (NMFS 2013). Further information regarding federal management practices can be found in section 2.9.2. Information on the California drift gill net fishery and exempted fishing permits issued in April 2019 can be found in section 2.7.2.

The Petition states that international measures to reduce the threat of shallow-set longline fisheries to Pacific leatherback sea turtles may not be working as well as hoped. Many countries’ commercial fishing fleets operate in areas beyond national jurisdiction and interact with Pacific leatherback sea turtles. For example, the Western and Central Pacific Fisheries Commission (WCPFC) considered in 2008 that the threat to sea turtles was severe enough to warrant the adoption of a measure specifically requiring mitigation to reduce sea turtle mortality from longline interactions (CMM 2008-03); but there is no evidence to suggest that those threats have appreciably diminished (ABNJ 2017).

In summary, the Petition states that fisheries remain the primary threat to Pacific leatherback sea turtles despite a suite of national and international laws designed to protect them, as discussed in detail above. Plastic pollution remains largely unmitigated, and regulations to address this issue on the scale at which it is growing do not yet exist (Iverson 2019). Climate change remains an existential threat to Pacific leatherbacks, as well as other marine animals, due to the inadequacy of regulatory mechanisms to control emissions of carbon dioxide.

2.9.2 Other Relevant Scientific Information

NOAA and the U.S. Fish and Wildlife Service have joint jurisdiction for sea turtles. Federal environmental conservation actions include listing leatherback sea turtles under the Endangered species Act, which makes it illegal to/attempt to harass, harm, pursue, hunt, shoot, kill, or trap federally listed species (NOAA n.d.). The recovery plan for U.S. Pacific leatherback populations includes protecting turtles on nesting beaches, protecting nesting and foraging habitats, reducing bycatch in commercial and recreational fisheries, reducing the effects of entanglement in and ingestion of marine debris, working with international partners to protect turtles in foreign waters, and supporting research with conservation projects consistent with recovery plans (NOAA n.d.). For example, in the U.S., importation of shrimp harvested in a manner that adversely impacts sea turtles is prohibited, a fisheries observer program monitors bycatch from commercial and recreational fisheries, and several sea turtle stranding and recovery programs exist with the goal of improving the survivability of sick, injured, and entangled sea turtles (NOAA n.d.).

2.9.3 Conclusion

Although the Petition does not fully describe all existing federal management measures, information in the Petition regarding population and abundance may indicate existing measures are not fully adequate.

2.10 Suggestions for Future Management

2.10.1 Scientific Information in the Petition

The Petition suggests future management actions for the recovery of the Pacific leatherback sea turtle on pages 29 through 30. The Petition recommends the following specific actions:

- California Department of Fish and Wildlife protects leatherback sea turtles as an endangered species under the California Endangered Species Act;
- California Department of Fish and Wildlife prepares a recovery plan for Pacific leatherback sea turtles pursuant to Cal. Fish & Game Code § 2079.1, including management efforts aimed at reducing toxins in the habitat and impacts from ocean warming and acidification;
- California Department of Fish and Wildlife improves monitoring of leatherback sea turtle abundance and population trends;
- California Department of Fish and Wildlife increases coordination and management with other governments – such as the National Park Service, National Marine Sanctuaries, Department of Defense, and others – to research movements of leatherback sea turtles off the U.S. West Coast;
- California Department of Fish and Wildlife and the California Fish and Game Commission manage California fisheries to reduce interactions (gear modifications, limited soak time for fixed gears, time and area closures, etc.);
- California Department of Fish and Wildlife encourages the Pacific Fisheries Management Council (PFMC) to address continued bycatch of endangered sea turtles and adopt practices to avoid sea turtle entanglements, including phasing out current gear associated with entanglements, particularly in federal gillnet, longline, and pot fisheries;
- California Department of Fish and Wildlife, working with the California Fish and Game Commission, sets a hard limit on the incidental capture of leatherback sea turtles in California-managed fisheries that historically have interacted with leatherback sea turtles or by analogy to fishing gear that has interacted with leatherback sea turtles, and require 100% observer coverage or electronic monitoring to accurately enforce the limit;
- California Department of Fish and Wildlife utilizes existing legal and regulatory frameworks to minimize local contributors to ocean acidification (e.g., eutrophication); and
- The governor declares a climate emergency and takes all necessary action to set California on a path to full decarbonization of our economy by no later than 2045 (for example, banning the sale of new fossil fuel vehicles by 2030 and requiring the generation of all electricity from carbon-free sources by 2030).

The Department notes that on the first bullet, the Fish and Game Commission and not the Department has the authority to list a species under the California Endangered Species Act. In the second to last bullet, the Department notes

that it is unclear what existing legal and regulatory frameworks exist within Department authority could minimize contributors to ocean acidification.

2.10.2 Conclusion

The Petition provides sufficient management suggestions that may aid in conserving the Pacific leatherback sea turtle.

2.11 Detailed Distribution Map

2.11.1 Scientific Information in the Petition

The Petition provides a map detailing a portion of the Pacific leatherback range in California, although it does not provide a map detailing the entire distribution of Pacific leatherback populations. Pages 9 and 13 of the Petition provide maps showing Pacific leatherback sea turtle telemetry data. The Petition text does, however, describe the distribution of the Pacific leatherbacks.

2.11.2 Other Relevant Scientific Information

As noted in section 2.2.1, the Pacific leatherback sea turtle has the largest geographic range of any living marine reptile, spanning the temperate and tropical waters in all oceans (Benson et al. 2007a, 2011; Hays et al. 2004; James et al. 2006). NMFS provides a map of this pan-oceanic distribution on their website (Figure 4). The occurrence of Pacific leatherback sea turtles within California State Waters is extremely limited in comparison to their entire range. A study by Curtis et al. provided a distribution map, specifically of western Pacific leatherback populations (Figure 5).



Figure 4. World map providing approximate representation of the leatherback turtle's range (<https://www.fisheries.noaa.gov/species/leatherback-turtle>; accessed 14 February 2020)

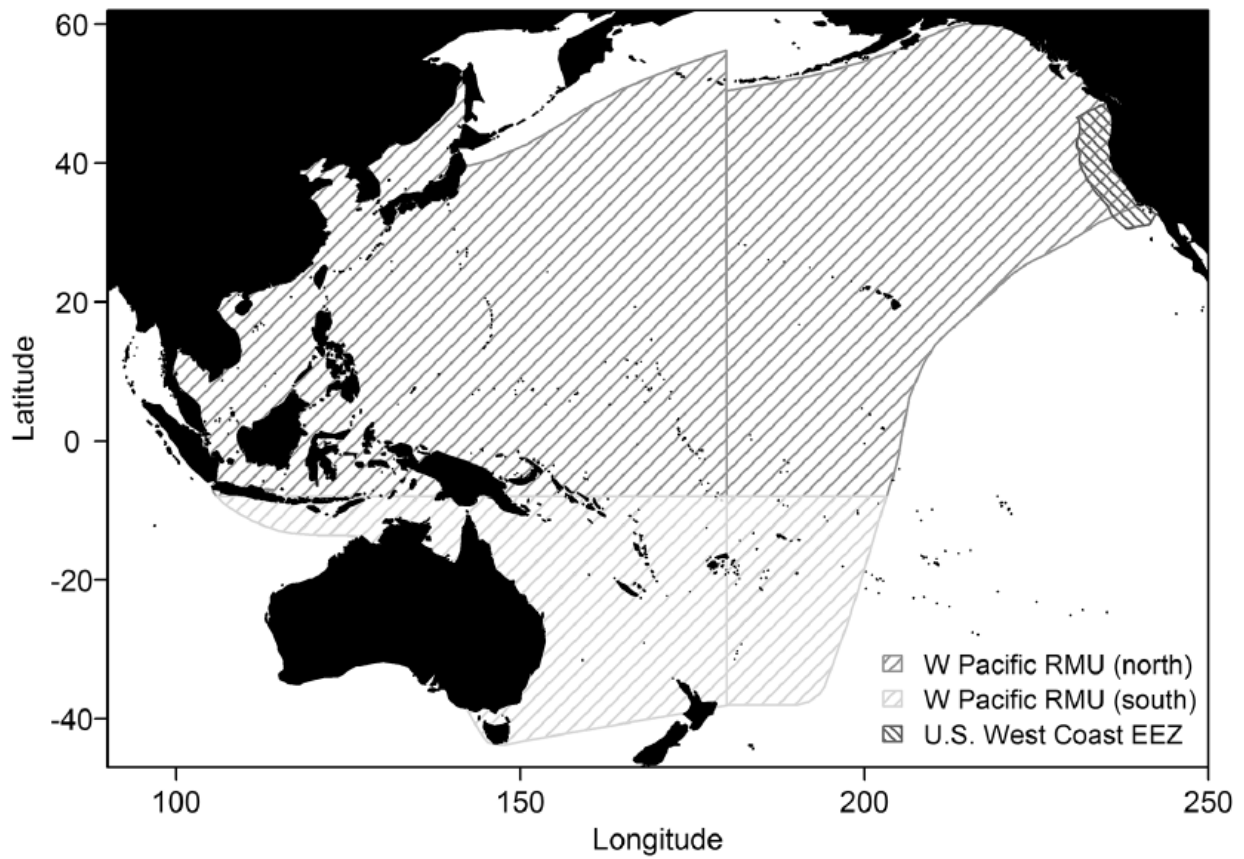


Figure 5. World distribution of western Pacific leatherback sea turtles. Figure taken from Curtis et al. 2015.

2.11.3 Conclusion

The Petition provides a map that illustrates only a portion of Pacific leatherback sea turtle California distribution. A more comprehensive map of Pacific leatherback sea turtle distribution, which is consistent with the Petition text description, is provided in this petition evaluation.

2.12 Sources and Availability of Information

2.12.1 Scientific Information in the Petition

The “Literature Cited” section of the Petition is on pages 32 through 44. Information sources cited in the Petition include published literature and other sources. The Petitioner provided electronic copies of these documents to the Department.

2.12.2 Other Relevant Scientific Information

The Department used additional sources of scientific information cited in this Petition Evaluation document.

2.12.3 Conclusion

The Petition provides sufficient available sources of information to inform whether the petitioned action may be warranted.

Section 3. Recommendation to the Commission

In completing its Petition Evaluation, the Department has determined the Petition provides sufficient scientific information to indicate that the Petitioned action may be warranted for Pacific leatherback sea turtle. Therefore, the Department recommends the Commission accept the Petition for further consideration under CESA.

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